Prepared For:

City of Fort Collins

Presented By:

FEHR PEERS

Adopted October 18, 2016 | DN15-0488

West Elizabeth Enhanced Travel Corridor Plan

project ACKNOWLEDGMENTS

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TABLES

FIGURES

table of CONTENTS

THE WEST ELIZABETH ETC PLAN HAS A SPECIAL FOCUS ON ADDRESSING EXISTING DEFICIENCIES, SUCH AS INADEQUATE TRANSIT SERVICE FOR THE AREA'S DEMANDS, INCOMPLETE BIKE AND PEDESTRIAN NETWORKS, AND HIGHER THAN EXPECTED NUMBERS OF CRASHES IN CERTAIN LOCATIONS.

West Elizabeth Enhanced Travel Corridor Plan

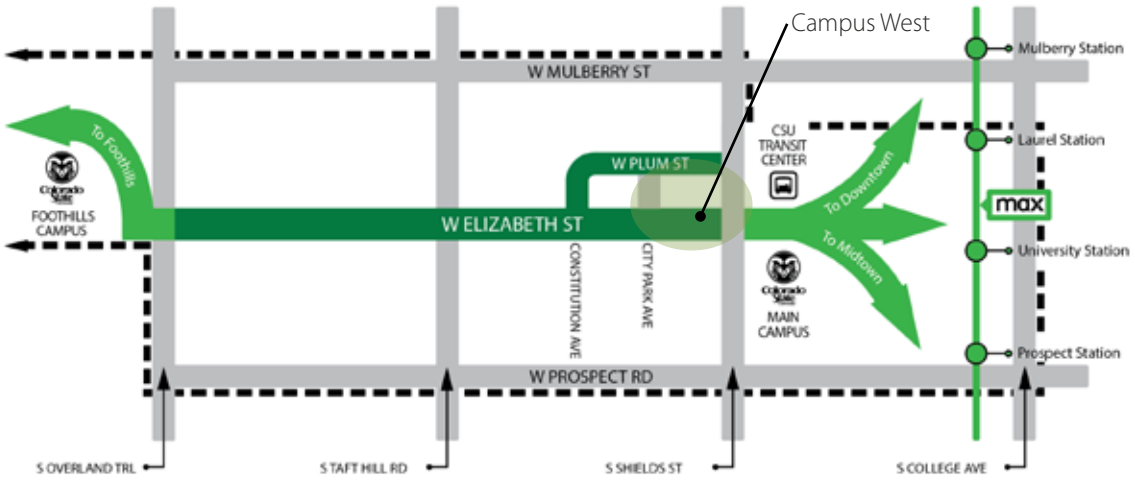
project EXECUTIVE SUMMARY

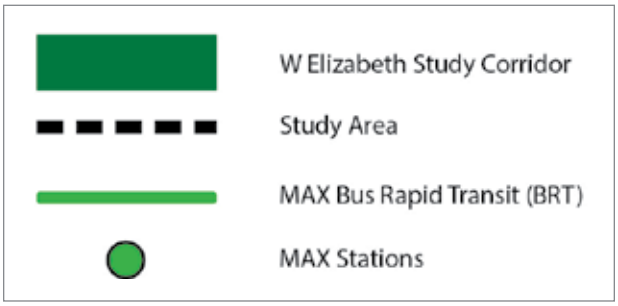
The West Elizabeth corridor is identified as one of several future Enhanced Travel Corridors (ETCs) in the City's Transportation Master Plan (2011). Each ETC will have a planning document that provides a roadmap to achieve a long-term multimodal vision for the corridor. The focus of the plan is to emphasize transit, biking and walking in a way the serves existing and future transportation and land use needs of each area.

The West Elizabeth ETC plan has a special focus on addressing existing deficiencies, such as inadequate transit service for the area's demands, incomplete bike and pedestrian networks, and higher than expected numbers of crashes in certain locations.

This document details the plan to improve upon and emphasize transit, biking and walking in the West Elizabeth Corridor. The Corridor is defined as West Elizabeth Street between Overland Trail and Shields Street, as well as segments of Plum Street, Constitution Avenue, and City Park Avenue. The study area also includes the surrounding network to address connections with the CSU Foothills Campus on the west, the CSU Main Campus on the east, and the rest of the community.

STUDY AREA


Campus West
W MULBERRY ST
Mulberry Station
To Foothills
FOOTHILLS CAMPUS
W PLUM ST
CSU TRANSIT CENTER
Laurel Station
To Downtown
max
W ELIZABETH ST
To Midtown
University Station
CONSTITUTION AVE
CITY PARK AVE
MAIN CAMPUS
Prospect Station
W PROSPECT RD
S OVERLAND TRL
S TAFT HILL RD
S SHIELDS ST
S COLLEGE AVE


W Elizabeth Study Corridor
Study Area
MAX Bus Rapid Transit (BRT)
MAX Stations

PLAN DEVELOPMENT

The West Elizabeth ETC Plan was developed through a combination of community engagement and rigorous technical analysis to inform decision-making. The project was guided by a set of principles that included:

- An emphasis on high-frequency transit, biking and walking to help accommodate growth (per the ETC definition)
- Work within the existing Public Right-of-Way (ROW) as much as possible
- Incorporate potential phasing from the beginning of the design development
- Learn from the evaluation to understand the trade-offs and make further refinements to the design

The plan was developed through a community-driven, context-sensitive process that occurred in 2015 -16. The planning effort included:

- The development of a community-driven **Vision** for the West Elizabeth Corridor
- A context-sensitive **Recommended Design** designed to meet the Vision
- **Phasing of Improvements** to achieve the Recommended Design, including Interim Improvements addressing high-need issues in the near-term
- An **Implementation Strategy** that includes cost estimates and potential funding sources
- **Other Network Considerations** for the study area, such as the larger bicycle facility network and parking

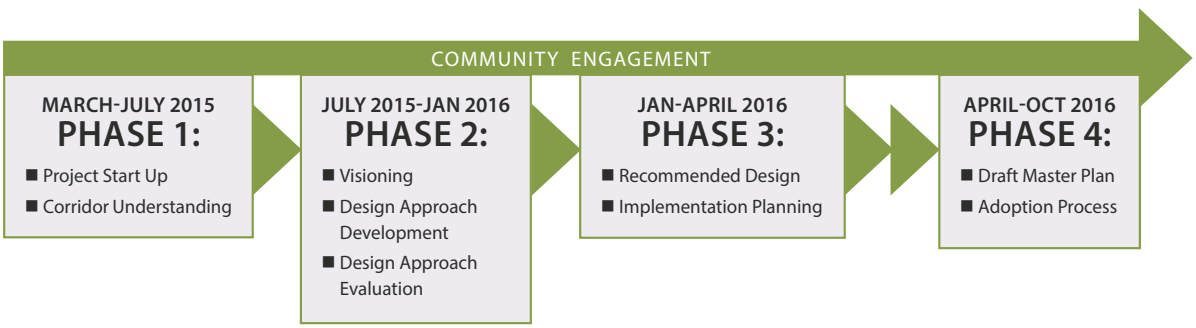
Vision

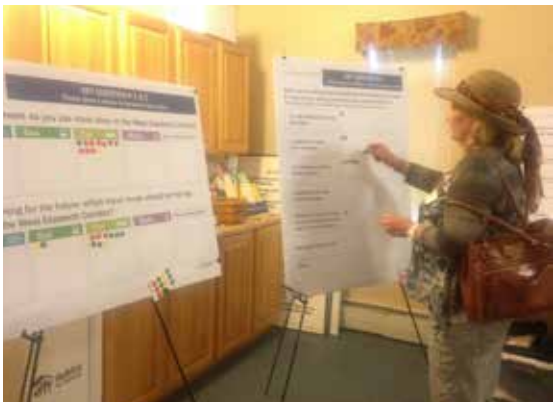
A Vision was developed for the West Elizabeth Corridor to define the long-term desired outcome from the West Elizabeth ETC Plan. The Vision for the West Elizabeth Corridor is that it shall:

- Be unique and adaptable to the distinctive characteristics of each corridor segment
- Be safe and comfortable for all users
- Encourage and prioritize public transportation and active transportation options
- Support the interconnectivity of all modes
- Be a beautiful and vibrant environment

COMMUNITY ENGAGEMENT HIGHLIGHTS:

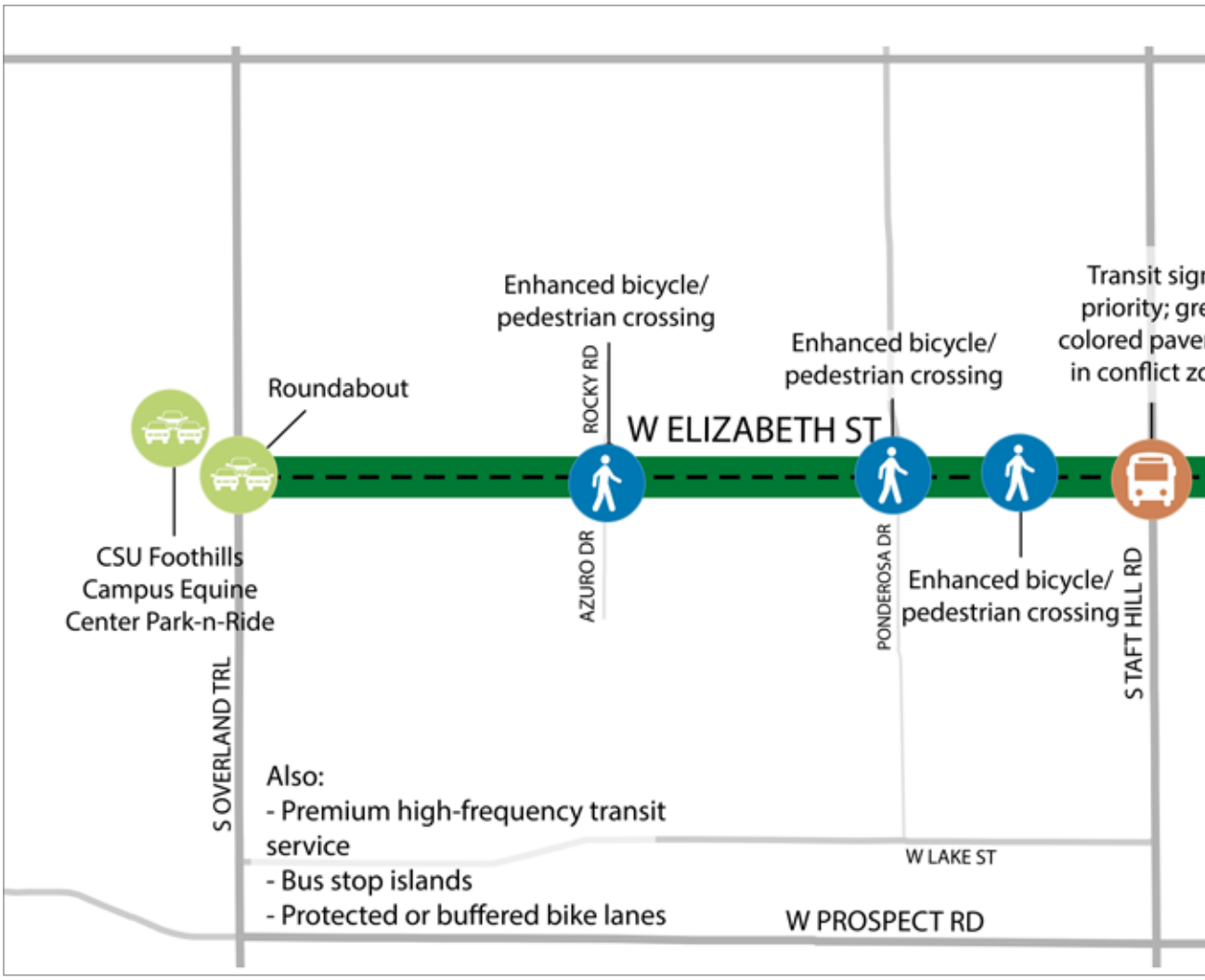
- A Stakeholder Committee made up of residents, property owners, students and other corridor stakeholders that met five times throughout the duration of the project
- Surveys (intercept, paper, text and Web-based)
- Community Open Houses in August 2015, December 2015 and June 2016
- Focus groups with business owners, multifamily property management, CSU facilities and administration, and alternative transportation advocates
- Neighborhood transit, bicycling and walking tours
- An Open Streets event in June 2015
- Listening sessions
- An online WikiMap

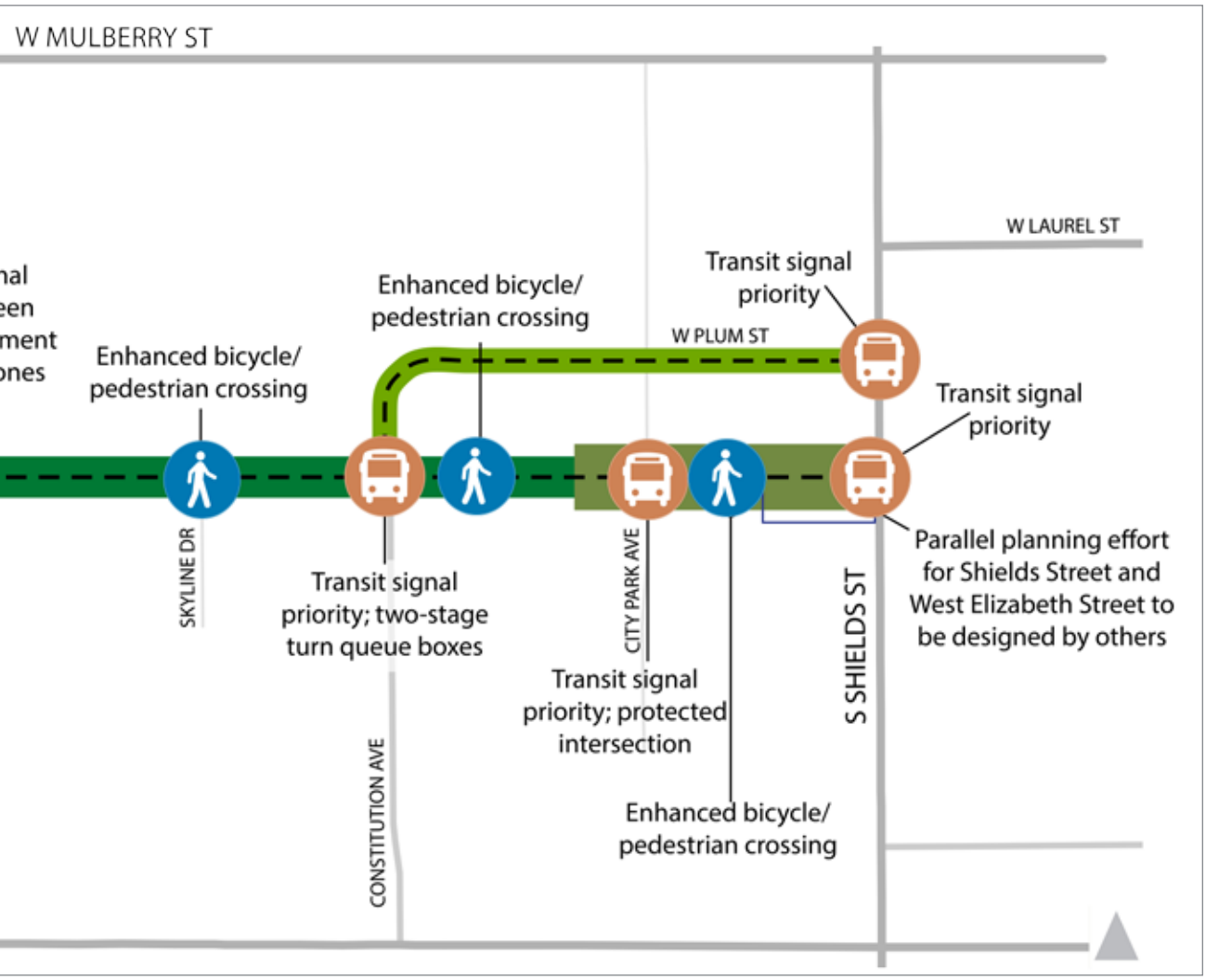


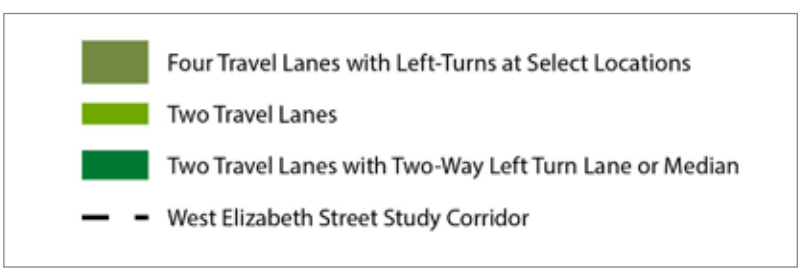


Recommended Design At-A-Glance

The Recommended Design includes enhancement for all modes. Key elements are depicted in the figure below and listed in the table on the following page.




W MULBERRY ST
W LAUREL ST
W PLUM ST
Transit signal priority
Enhanced bicycle/ pedestrian crossing
Enhanced bicycle/ pedestrian crossing
Transit signal priority
SKYLINE DR
Transit signal priority; two-stage turn queue boxes
CITY PARK AVE
Transit signal priority; protected intersection
S SHIELDS ST
Parallel planning effort for Shields Street and West Elizabeth Street to be designed by others
CONSTITUTION AVE
Enhanced bicycle/ pedestrian crossing


Four Travel Lanes with Left-Turns at Select Locations
Two Travel Lanes
Two Travel Lanes with Two-Way Left Turn Lane or Median
West Elizabeth Street Study Corridor

Recommended Design Key Elements

For People Biking	For People Driving
■ Protected or buffered bike lanes ■ Intersection treatments including green colored paint in conflict zones, two stage turn queue boxes and the pilot of a protected intersection ■ New or upgraded north-south crossings ■ Bike lane accommodations through bus stop islands	■ Safety improvements at locations with a demonstrated crash history ■ Four travel lanes in busiest segment and center turn lanes and medians throughout the corridor ■ Traffic calming through medians, separated facilities for other modes, and management of access to businesses ■ Roundabout at West Elizabeth/ Overland Trail
For People Walking or Using Mobility Devices	**For People Riding Transit**
■ Complete, ADA-compliant sidewalks ■ New or upgraded north-south crossings	■ Premium, high-frequency transit service on West Elizabeth Street connecting to Downtown ■ Transit Signal Priority (TSP) ■ Innovative bus stop islands ■ CSU Foothills Campus Transit Station and Park-n-Ride

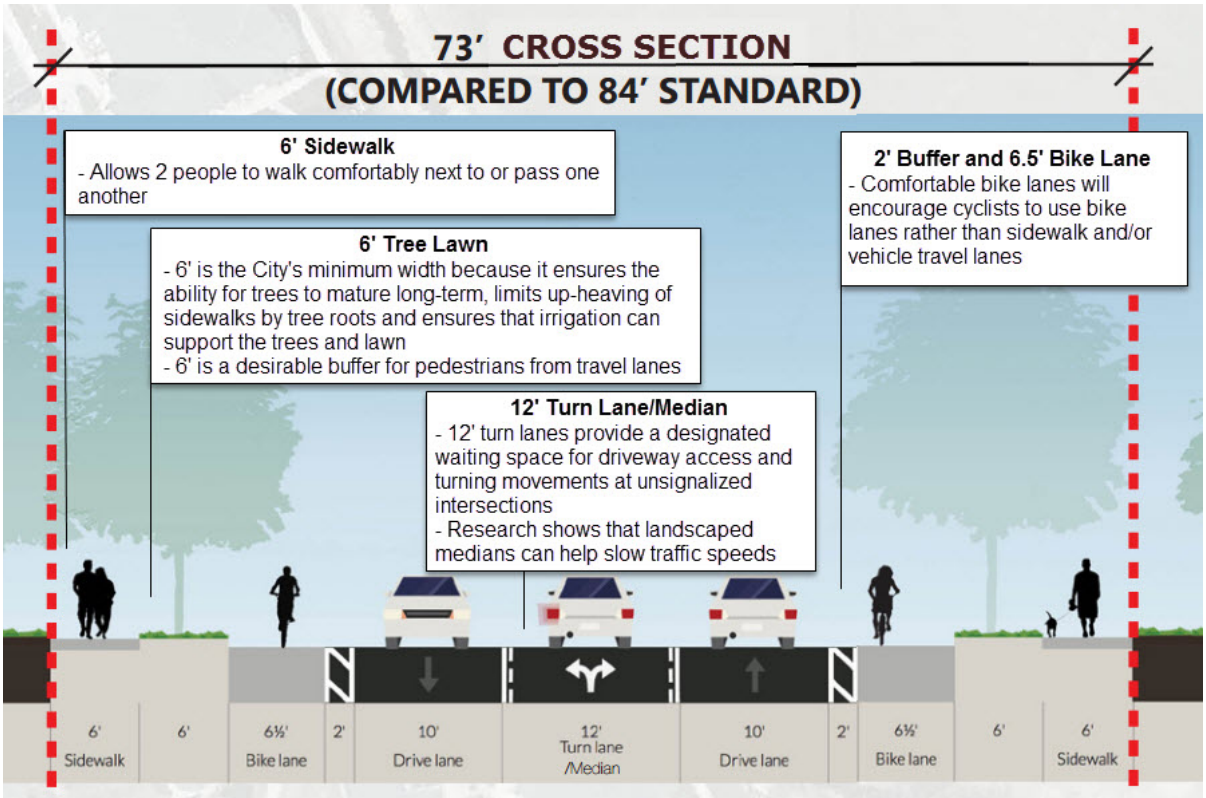
Phasing of Improvements

Construction of the Recommended Design improvements has been planned to take place in phases so that major deficiencies could be addressed without the need to wait for full funding to become available. This smaller set of near-term ("interim") improvements includes providing more adequate transit service and filling in gaps in the pedestrian and bicycle networks. The phased approach described in the Plan is designed to use public funds wisely and efficiently; specifically, the interim design was done with the longer-term Recommended Design in mind with the idea that constructing near-term improvements in the same place as future improvements would minimize potential throw-away costs.

PROPOSED FOR 2016	INTERIM IMPROVEMENTS	RECOMMENDED DESIGN
■ Tweak to improve upon the existing transit service ■ Skyline crossing relocation/improvement	■ Transit service and amenity improvements ■ Completion of the bike network ■ Completion of the sidewalk network (minimum standards)	■ High-frequency transit service ■ Protected/buffered bike lanes and protected intersection ■ Enhance pedestrian network (detached sidewalks) ■ Roundabout at Overland and access management improvements ■ Upgraded and new north-south crossings
		WHAT IF CAMPUS WEST REDEVELOPS? ■ BRT-like transit service ■ Changes in the Campus West Area
COST ESTIMATES <$	$$	$$$$$

Recommended Design Cross Section Key Elements

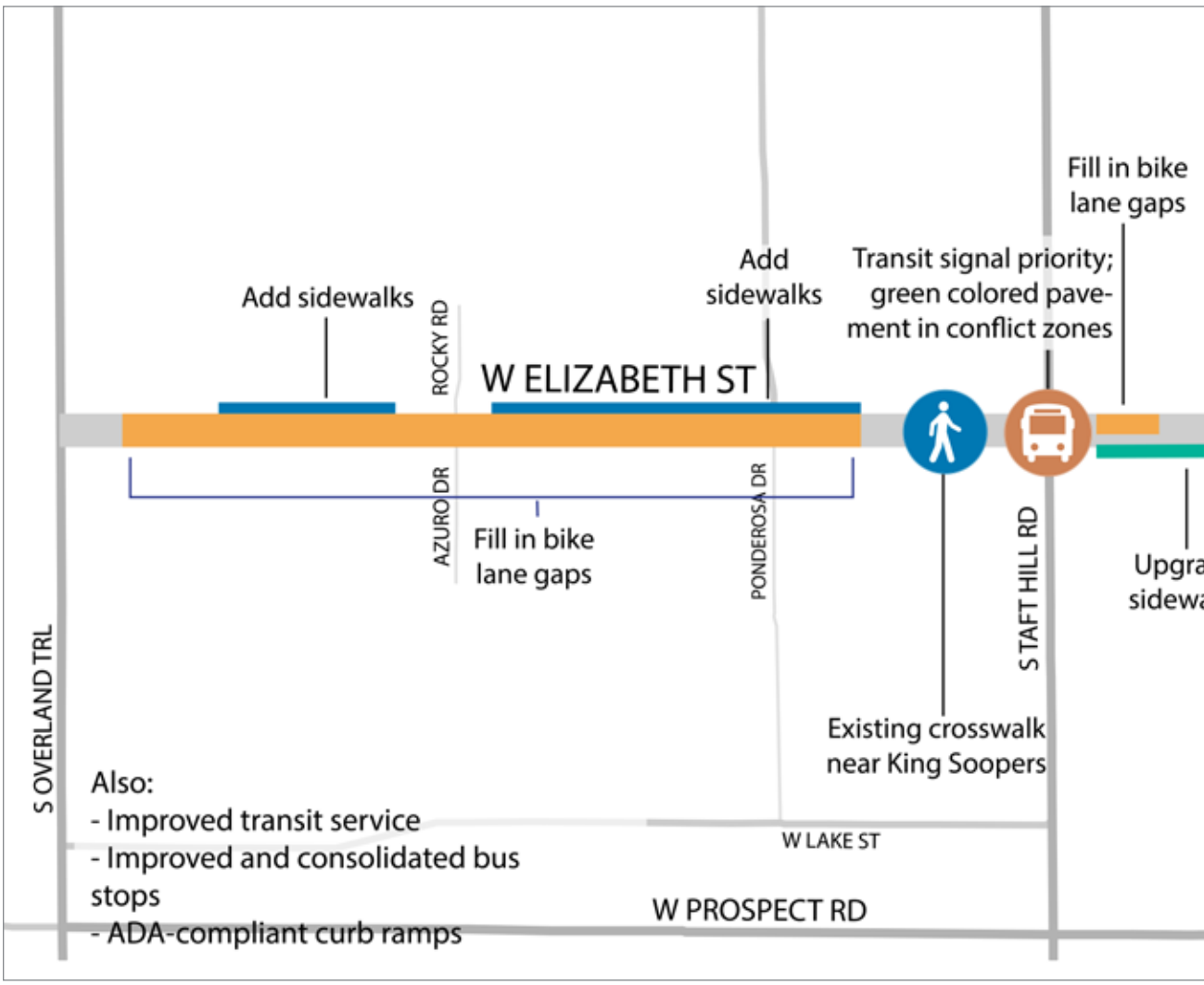
An annotated cross-section of the Recommended Design that describes key elements.

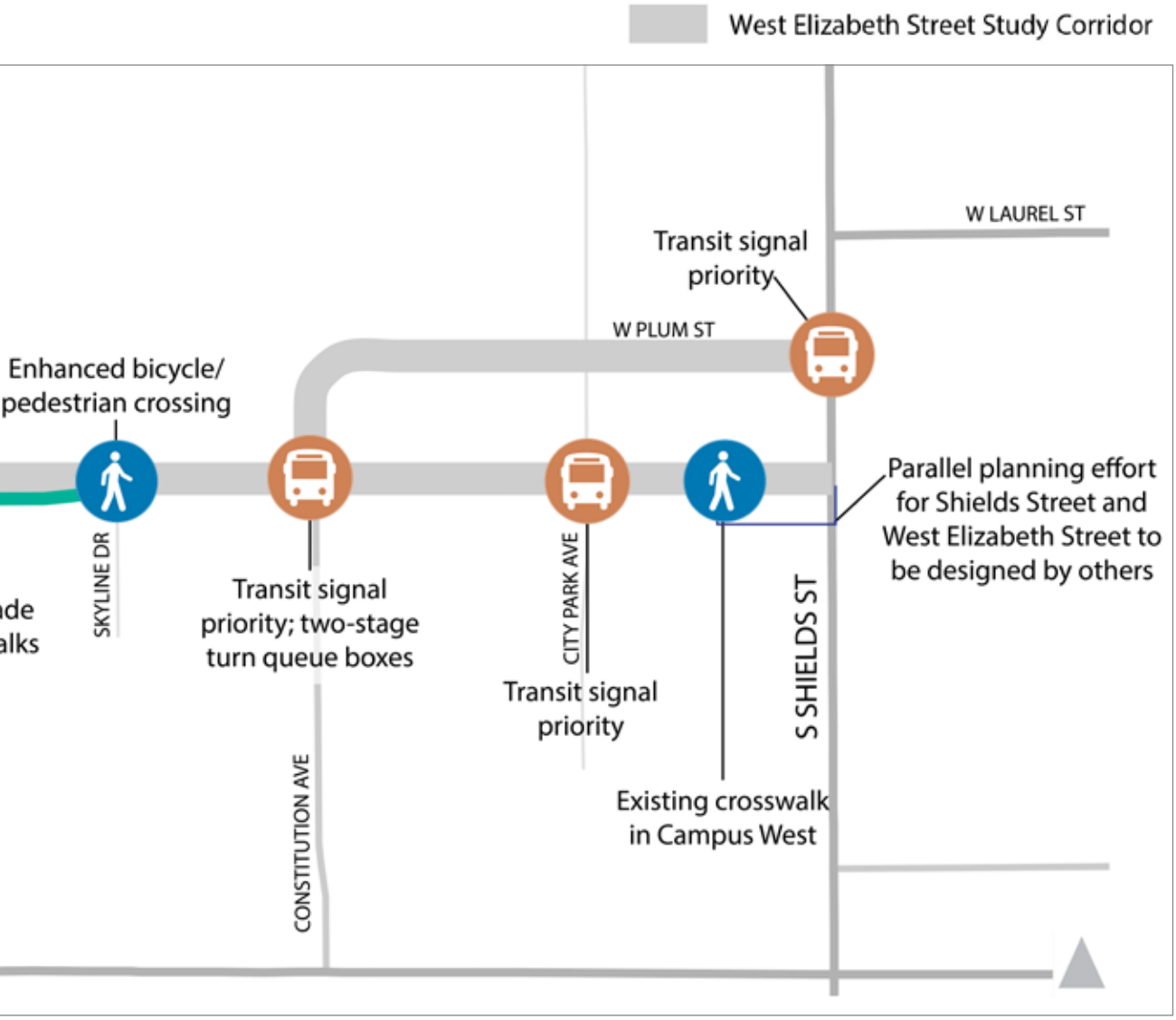



32 VIA ELIZABETH
68

Interim Improvements At-A-Glance

The proposed interim improvements are depicted in the figure below.




West Elizabeth Street Study Corridor
W LAUREL ST
Transit signal priority
W PLUM ST
Enhanced bicycle/ pedestrian crossing
SKYLINE DR
Transit signal priority; two-stage turn queue boxes
CITY PARK AVE
Transit signal priority
Parallel planning effort for Shields Street and West Elizabeth Street to be designed by others
S SHIELDS ST
Existing crosswalk in Campus West
CONSTITUTION AVE

Implementation Strategy

The Plan sets forth a phased strategy for implementing the recommended corridor improvements, depending upon funding availability.

- The first set of improvements will be implemented in August 2016 with tweaks to the transit routes serving the study area, some ADA-related bus stop improvements, and the relocation and upgrade of the bike/pedestrian crossing of West Elizabeth near Skyline using existing budgets.
- Interim Improvements would focus on the major deficiencies identified above. Ideally these improvements would occur within 2-5 years. To that end, the improvements were submitted to be included in the City's 2017-18 budget; the budget is developed through a competitive process and will not be finalized until Fall 2016.
- The Recommended Design is the long-term Vision for the corridor. The improvements were generally planned for a ten- to fifteen-year time-frame, though the actual timing is dependent on funding availability. If funding is secured sooner, the Recommended Design could be realized sooner.

The Recommended Design also includes planning concepts that would come into play if the Campus West area[1] redevelops. With Campus West redevelopment, additional design elements (e.g., enhanced bike and pedestrian facilities) are planned, as well as the implementation of a Bus Rapid Transit-style service on West Elizabeth connecting directly to MAX. The timing of this part of the Recommended Design will depend on private property owners' interest in redeveloping over time.

Other Network Considerations

The Plan includes other network considerations, such as:

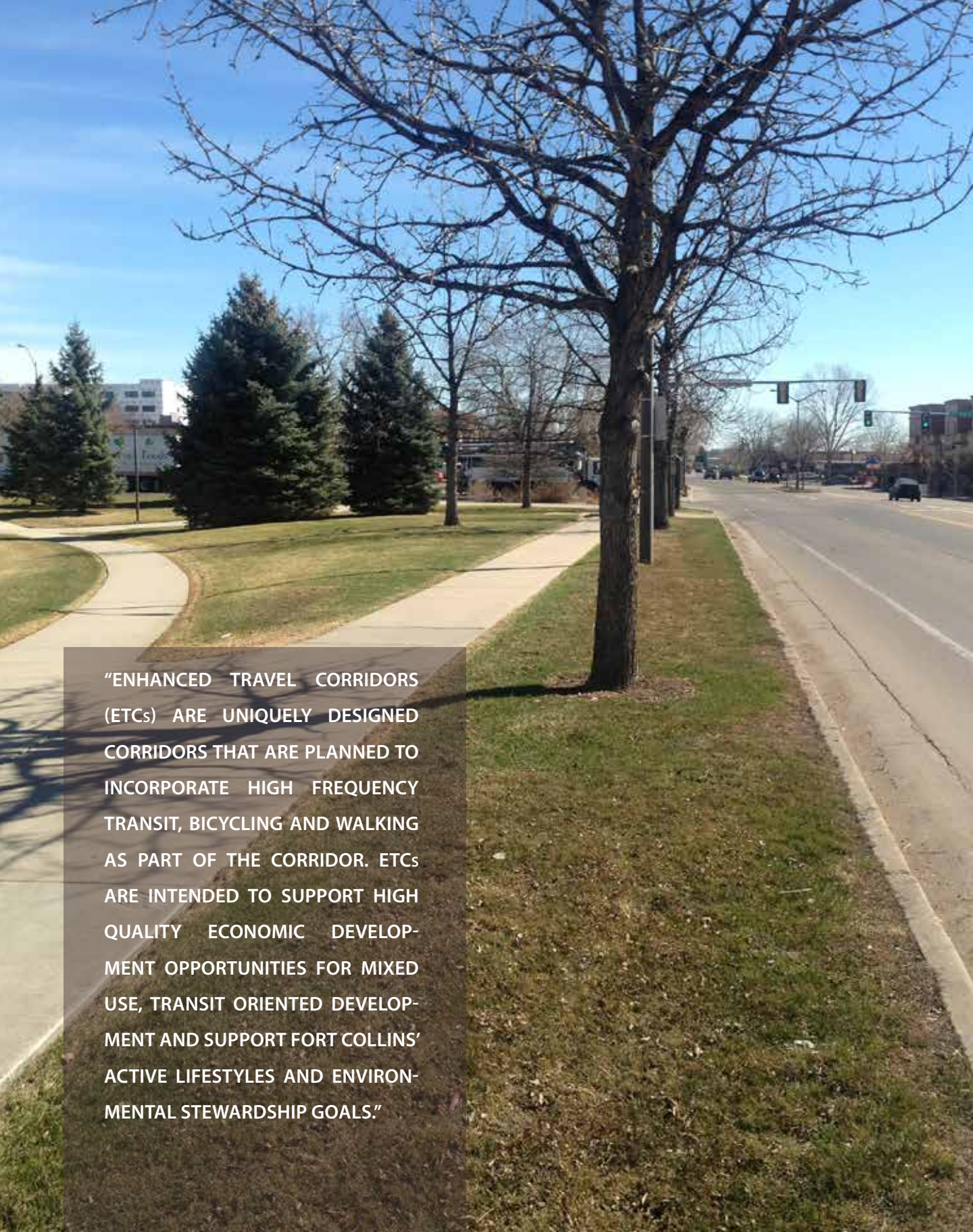
- Parking
- Car Share
- Bicycle Network
- Bike Share

[1] *Campus West is generally the area along West Elizabeth between City Park Avenue and Shields Street.*

Next Steps

Key next steps to take after the adoption of this plan include:

- Complete 35 percent design of the Recommended Design, including a survey of the corridor, a drainage study and a utility study, to develop a more refined cost estimate for the corridor and any incremental projects for which the City may pursue funding.
- Inform the Federal Transit Administration (FTA) of the corridor's longterm plan by conducting a field review with FTA Region 8 staff.
- Complete a National Environmental Policy Act (NEPA) process of the Recommended Design based on FTA recommendations.
- Apply for incremental projects that are a part of the Recommended Design through appropriate funding sources, including Congestion Mitigation and Air Quality (CMAQ) and Transportation Alternatives Program (TAP).
- Apply for large-scale projects, possibly the entire Recommended Design, as a Transportation Investment Generating Economic Recovery (TIGER) discretionary grant. As shown by previously selected projects, it is common to submit three or more application submittals for TIGER discretionary grants before a project is selected.
- Update Master Street Plan to show segment of West Elizabeth between City Park Avenue and Taft Hill Road as Arterial 2 Lanes (instead of Arterial 4 Lanes).
- Incorporate relevant changes into CSU Master Plans.
- Explore strategies to support transit-oriented development in the Campus West area, including potential code changes, parking strategies, funding support and improvement districts that support market conditions.
- Coordinate with the Pedestrian Program and Bridge Replacement/ Maintenance Program to widen the bridge on Plum Street west of City Park Avenue to complete the bike lane and sidewalk through this stretch.
- Monitor the demands at the locations for the recommended enhanced pedestrian/bike crossings. Evaluation will be done using the criteria for implementing enhanced crossings found in the City's Pedestrian Plan to determine if and when installation of the crossings are appropriate.



"ENHANCED TRAVEL CORRIDORS (ETCs) ARE UNIQUELY DESIGNED CORRIDORS THAT ARE PLANNED TO INCORPORATE HIGH FREQUENCY TRANSIT, BICYCLING AND WALKING AS PART OF THE CORRIDOR. ETCs ARE INTENDED TO SUPPORT HIGH QUALITY ECONOMIC DEVELOPMENT OPPORTUNITIES FOR MIXED USE, TRANSIT ORIENTED DEVELOPMENT AND SUPPORT FORT COLLINS' ACTIVE LIFESTYLES AND ENVIRONMENTAL STEWARDSHIP GOALS."

section 1
INTRODUCTION

The West Elizabeth Enhanced Travel Corridor Plan includes a Vision, Recommended Design and implementation plan for a study area that includes West Elizabeth Street and nearby roadways.

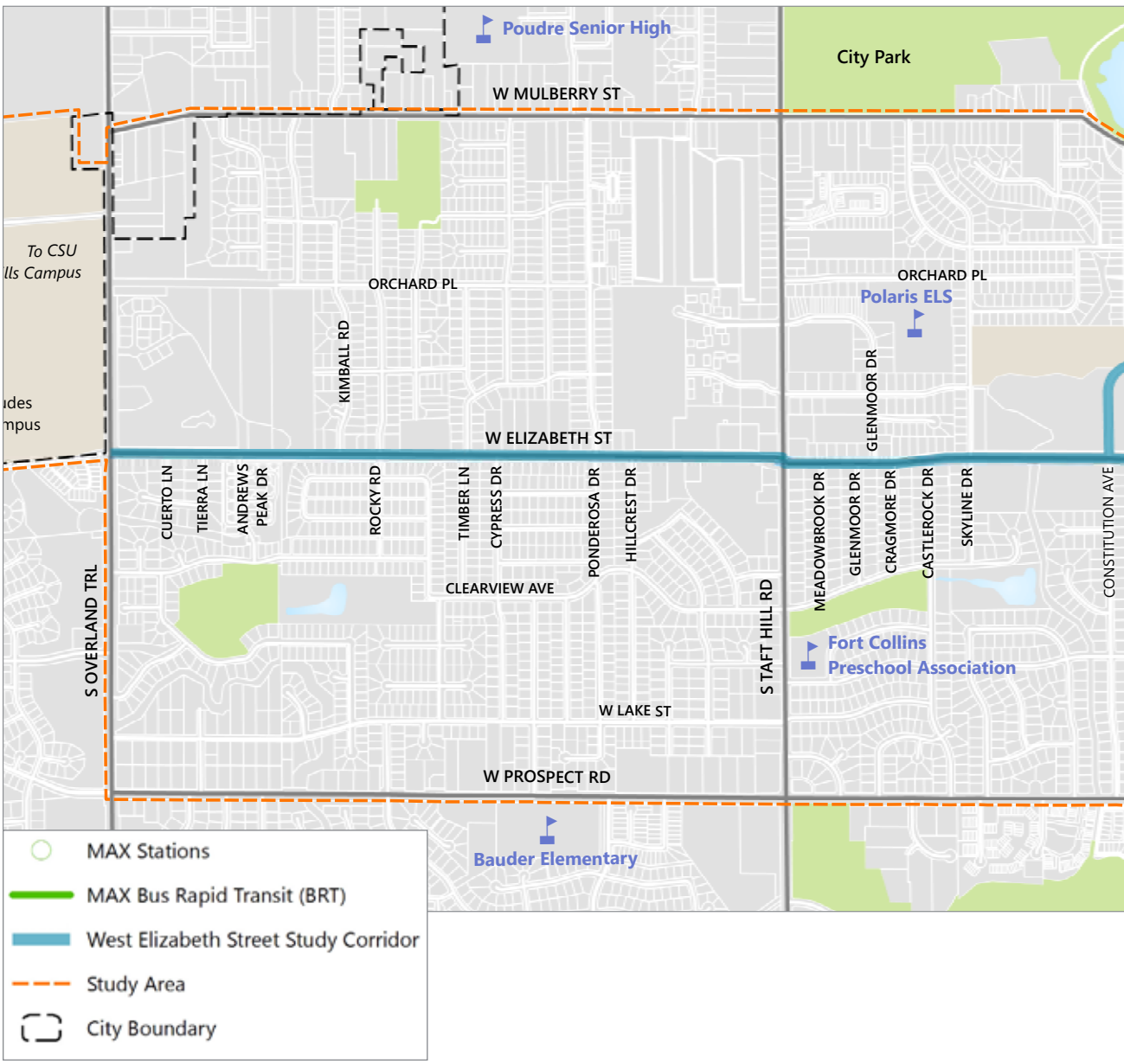
The West Elizabeth Enhanced Travel Corridor Plan is the result of applying the Enhanced Travel Corridor definition and concept to West Elizabeth Street. It was developed through a community driven, context sensitive process that occurred in 2015 and 2016. In some cases, Recommended Design elements of the West Elizabeth Enhanced Travel Corridor Plan are similar to design elements seen elsewhere in Fort Collins. However, in many cases the West Elizabeth Enhanced Travel Corridor Plan's Recommended Design elements are truly unique.

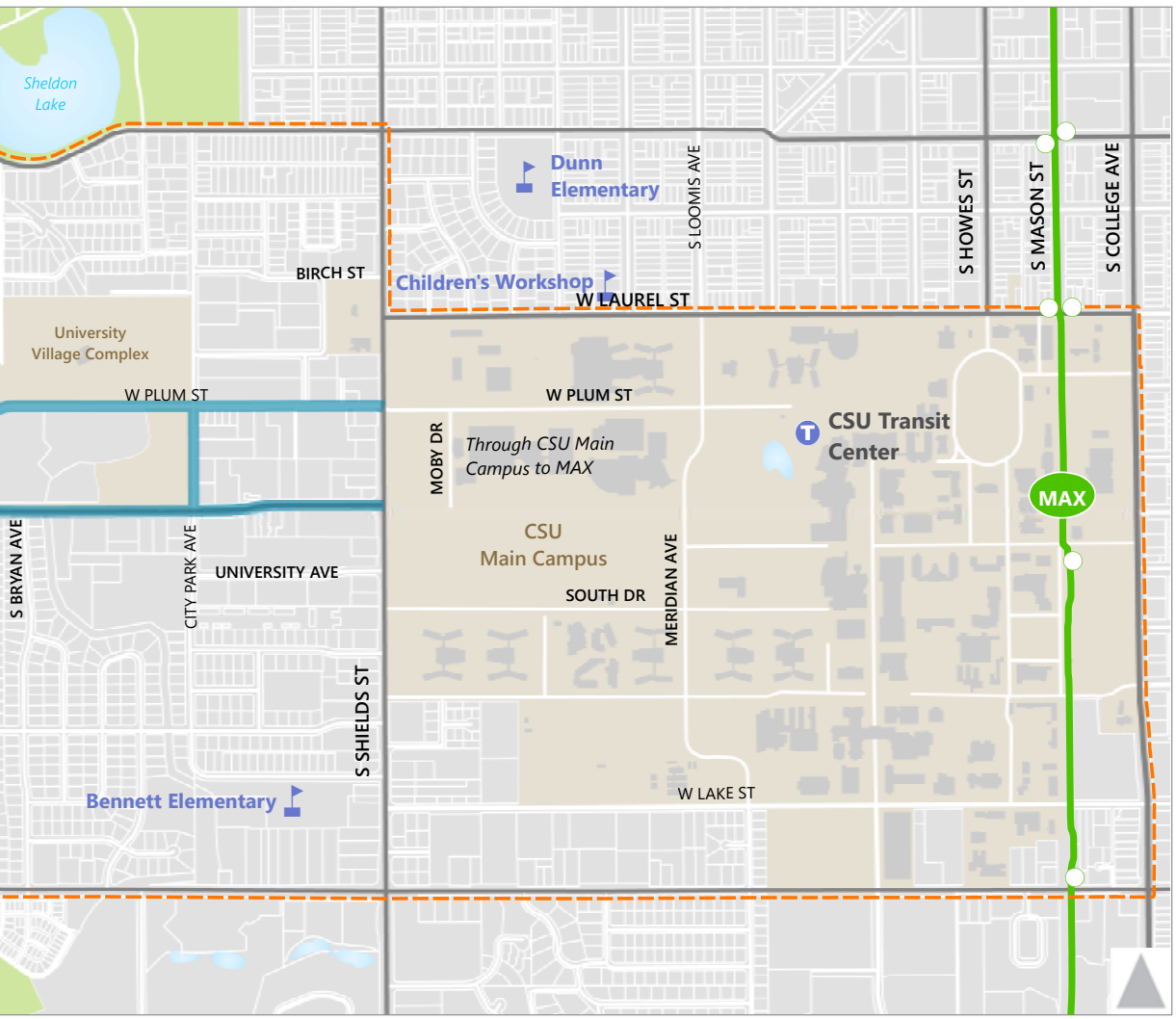
The West Elizabeth Enhanced Travel Corridor Plan includes:

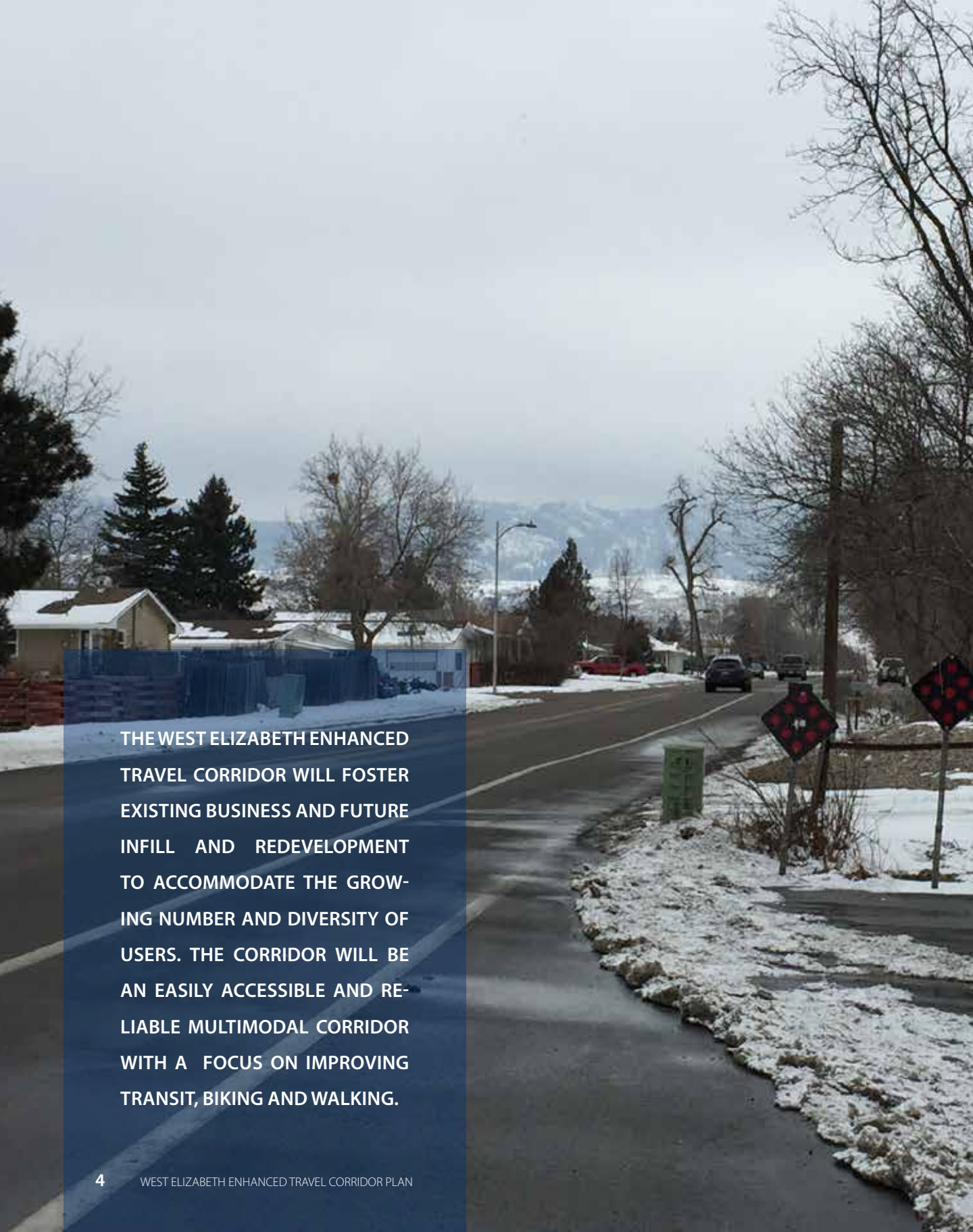
- The corridor's Vision, Purpose and Need
- The corridor's Recommended Design
- An implementation strategy for the Recommended Design including a phasing strategy, cost estimates, funding sources and other considerations

Figure 1: West Elizabeth Enhanced Travel Corridor Plan Study Area:

The West Elizabeth Enhanced Travel Corridor Plan study area includes West Elizabeth Street from Shields Street to Overland Trail, portions of Constitution Avenue, Plum Street and City Park Avenue, the CSU Main Campus and CSU Foothills Campus and nearby neighborhoods.




Sheldon Lake
Dunn Elementary
S LOOMIS AVE
S HOWES ST
S MASON ST
S COLLEGE AVE
BIRCH ST
Children's Workshop
W LAUREL ST
University Village Complex
W PLUM ST
W PLUM ST
MOBY DR
Through CSU Main Campus to MAX
CSU Transit Center
MAX
CSU Main Campus
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
SOUTH DR
MERIDIAN AVE
S SHIELDS ST
Bennett Elementary
W LAKE ST



THE WEST ELIZABETH ENHANCED TRAVEL CORRIDOR WILL FOSTER EXISTING BUSINESS AND FUTURE INFILL AND REDEVELOPMENT TO ACCOMMODATE THE GROWING NUMBER AND DIVERSITY OF USERS. THE CORRIDOR WILL BE AN EASILY ACCESSIBLE AND RELIABLE MULTIMODAL CORRIDOR WITH A FOCUS ON IMPROVING TRANSIT, BIKING AND WALKING.

section 2
VISION, PURPOSE & NEED

The Vision is the long term anticipated outcome of the West Elizabeth Enhanced Travel Corridor Plan's implementation. The Purpose defines the transportation problem being solved through implementation of the Plan and the role of the Plan in the problem solving process. The Need provides information to support the Purpose.

Appendix A includes the detailed Vision, Purpose and Need. Key excerpts from the Vision, Purpose and Need are included below and are important to understanding the impetus of the Plan.

VISION STATEMENT

The Vision for the West Elizabeth Enhanced Travel Corridor is to be an easily accessible and reliable multimodal corridor with an emphasis on connectivity to Colorado State University's Foothills Campus on the west and Colorado State University's Main Campus (including MAX stations) on the east. The corridor will be well integrated and well connected within the City, with a focus on improving transit, biking and walking. The corridor will foster existing business and future infill and redevelopment to accommodate the growing number and diversity of users in the corridor, which include students, families and seniors.

The network shall:

- Be unique and adaptable to the distinctive characteristics of each corridor segment.
- Be safe and comfortable for all users.
- Encourage and prioritize public transportation and active transportation options.
- Support the interconnectivity of all modes.
- Be a beautiful and vibrant corridor.

The goal of this Plan is to address the growing demand for transportation options by increasing and improving transit, bicycling and walking infrastructure and operations. Improvements shall provide users with highly efficient, reliable and frequent transit service as well as bicycling, walking, and driving options that are safe, comfortable, efficient and easy to use.

PROJECT PURPOSE

The Purpose of the West Elizabeth Street Enhanced Travel Corridor Plan is to develop a corridor plan that will serve existing and future transportation demands, with a focus on multimodal transportation improvements. Anticipated growth is expected through infill projects (development of vacant or under used land parcels within existing urban areas) and redevelopment with increased density within and around the study area, thereby increasing travel demand. The goal of this Plan is to address the growing demand for transportation options by increasing and improving transit, bicycling and walking infrastructure and operations. Improvements shall provide users with highly efficient, reliable and frequent transit service as well as bicycling, walking, and driving options that are safe, comfortable, efficient and easy to use. Improvements will foster economic vitality through high quality and attractive facilities, while remaining committed to the long term fiscal responsibility of the City.

Specifically, the Purpose is to:

- **Increase transit capacity, reliability and improve transit stop amenities** to accommodate current demand and future growth in population, student enrollment, and travel demand.
- I**mprove transit system connectivity** to and from West Elizabeth Street, Colorado State University's Main and Foothills Campuses, Downtown and other Transfort routes including MAX.
- **Improve pedestrian facilities for comfort, safety and accessibility** throughout the corridor.
- **Improve bicycling facilities for ease, comfort and safety** and to attract new riders.
- **Maintain vehicular mobility, improve safety and enhance access** to commercial properties in the corridor.
- **Support the interconnectivity** between travel modes.

STATEMENT OF PROJECT NEED

The specific needs to address in the corridor include:

- **Inability to support existing travel demands and anticipated growth,** which will exacerbate existing deficiencies in transit service, pedestrian facilities, bicycle facilities and vehicle safety.
- **Inadequate transit service** due primarily to insufficient system connectivity, low and inconsistent route frequencies, poor reliability, lack of capacity to serve current and future demands and lack of patron stop amenities.
- **Uncomfortable and incomplete pedestrian facilities and safety concerns** due to inconsistent and missing sidewalks, as well as sidewalks that are not Americans with Disabilities Act (ADA)-compliant; in addition, there are limited north/south crossing opportunities, and pedestrians experience significant delays crossing West Elizabeth Street.
- **Uncomfortable and inconsistent bicycle facilities and safety concerns** due to incomplete bike lanes and inadequate intersection treatments. There is also a higher than expected number of bicycle- and vehicle-related crashes in several locations.
- **Vehicular mobility, safety and access concerns** exist due to intersection and driveway turning conflicts, as well as queue spillback (traffic backed up at a left-turn lane, for example) at some signalized intersections.
- **Challenges connecting between modes for trips in the corridor** including inadequate pedestrian and bicycle facilities to and at transit stops and parking challenges in the corridor.

THE WEST ELIZABETH ENHANCED TRAVEL CORRIDOR PLAN TOOK PLACE OVER APPROXIMATELY 18 MONTHS. STAKEHOLDERS INCLUDED RESIDENTS, PROPERTY OWNERS, BUSINESS OWNERS, STUDENTS AND OTHER COMMUNITY STAKEHOLDERS. THEY WERE ENGAGED AND COLLABORATED WITH THROUGH A VARIETY OF COMMUNICATION METHODS AND EVENTS.

section 3
PLAN DEVELOPMENT

The West Elizabeth Enhanced Travel Corridor Plan was developed through a combination of community engagement and rigorous technical analysis to inform decision making.

COMMUNITY ENGAGEMENT

The West Elizabeth Enhanced Travel Corridor Plan took place over approximately 18 months in 2015 and 2016. Stakeholders were prioritized from the start through a community driven process that engaged residents, property owners, business owners, students and other community stakeholders. These stakeholders were engaged through a variety of communication methods and events, including:

- A Stakeholder Committee made up of residents, property owners, students and other corridor stakeholders that met five times throughout the duration of the project
- Community Open Houses in August 2015, December 2015 and June 2016
- Surveys (intercept, paper, text and Web-based)
- Listening sessions
- Focus groups with business owners, multifamily property management, CSU facilities and administration, and alternative transportation advocates
- An online WikiMap
- Neighborhood transit, bicycling and walking tours
- An Open Streets event in June 2015

Community feedback informed every aspect of this plan: the corridor's Vision, Purpose and Need; the design alternatives developed and analyzed in developing a Recommended Design; and refinements to the Recommended Design to ensure that the West Elizabeth Enhanced Travel Corridor Plan is supportable by the area's stakeholders and broad community that uses West Elizabeth Street.

Community Engagement -- Key Themes Identified

During the public engagement process to gather input on the West Elizabeth Street corridor's existing conditions, several common themes regarding the current experience of traveling in the corridor emerged. Below are key issues organized by transportation mode.

For People Riding Transit

- Overcrowded buses, people are left behind
- Not enough bus stop amenities
- Not enough service (e.g., late night, weekend, summer)

For People Biking

- Inconsistent facilities west of Taft Hill Road
- Lots of driveway conflicts in Campus West
- Challenging intersections (e.g., West Elizabeth Street/Taft Hill Road, West Elizabeth Street/City Park Avenue, West Elizabeth Street/Shields Street)
- High number of bicyclist crashes

For People Walking or Using Mobility Devices

- Inconsistent facilities, lack of sidewalks
- Not comfortable
- Largely not ADA-compliant
- Hard to cross West Elizabeth Street at key intersections
- Lack of sufficient midblock crossing opportunities

For People Driving

- Challenging to make left-turns to and from driveways
- Conflicts with pedestrians and bicyclists
- Speeding
- Sight distance issues

Appendix B includes a summary of feedback received through community engagement.

Technical Process

A rigorous technical process informed the West Elizabeth Enhanced Travel Corridor Plan to ensure that the outcomes of the recommendations would result in meaningful and measurable benefits to the corridor. The technical process informed community engagement by reporting various performance measures related to the corridor's Vision, Purpose and Need. Lastly, the technical process was completed in such a way to successfully position the City for available funding sources. Generally, the technical process included:

- Developing a thorough understanding of the corridor's existing conditions. **Appendix C** includes the Corridor Understanding Report.
- Identifying the corridor's Vision, Purpose and Need based on community engagement, the ***Transportation Master Plan's*** definition of an Enhanced Travel Corridor and key findings from the Corridor Understanding Report.
- Generating alternatives that responded to the Vision, Purpose and Need and explored the range of community values.
- Analyzing alternatives using a variety of performance measures to understand how well individual alternatives (or alternative elements) responded to the Vision, Purpose and Need. **Appendix D** includes the alternatives analysis.
- Developing a Recommended Design that incorporated the best performing elements from the alternatives analysis and refining the Recommended Design based on community feedback.

THE RECOMMENDED DESIGN ADDRESSES THE PROJECT'S VISION AND NEED BY IMPROVING CONDITIONS FOR PEOPLE RIDING TRANSIT, BIKING, WALKING AND DRIVING. IT KEEPS COST-EFFECTIVENESS, MINIMIZING IMPACT TO PROPERTY OWNERS AND PHASE IMPLEMENTATION AS KEY ELEMENTS.

section 4
RECOMMENDED DESIGN

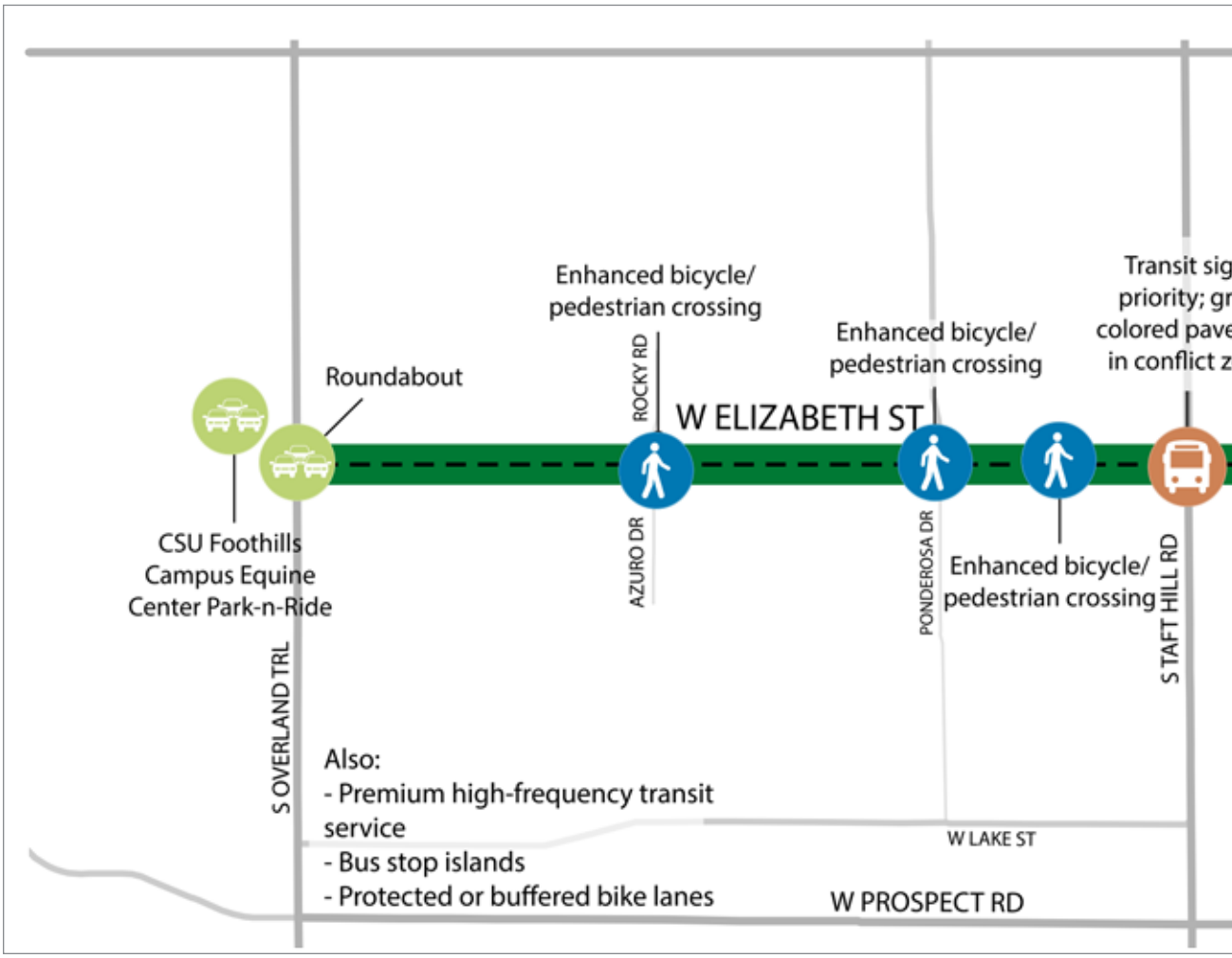
The Recommended Design defines the long term vision for the transportation network the in West Elizabeth Street corridor, including transit service and multimodal improvements. The Recommended Design will further guide infill and redevelopment and future capital improvement in the area.

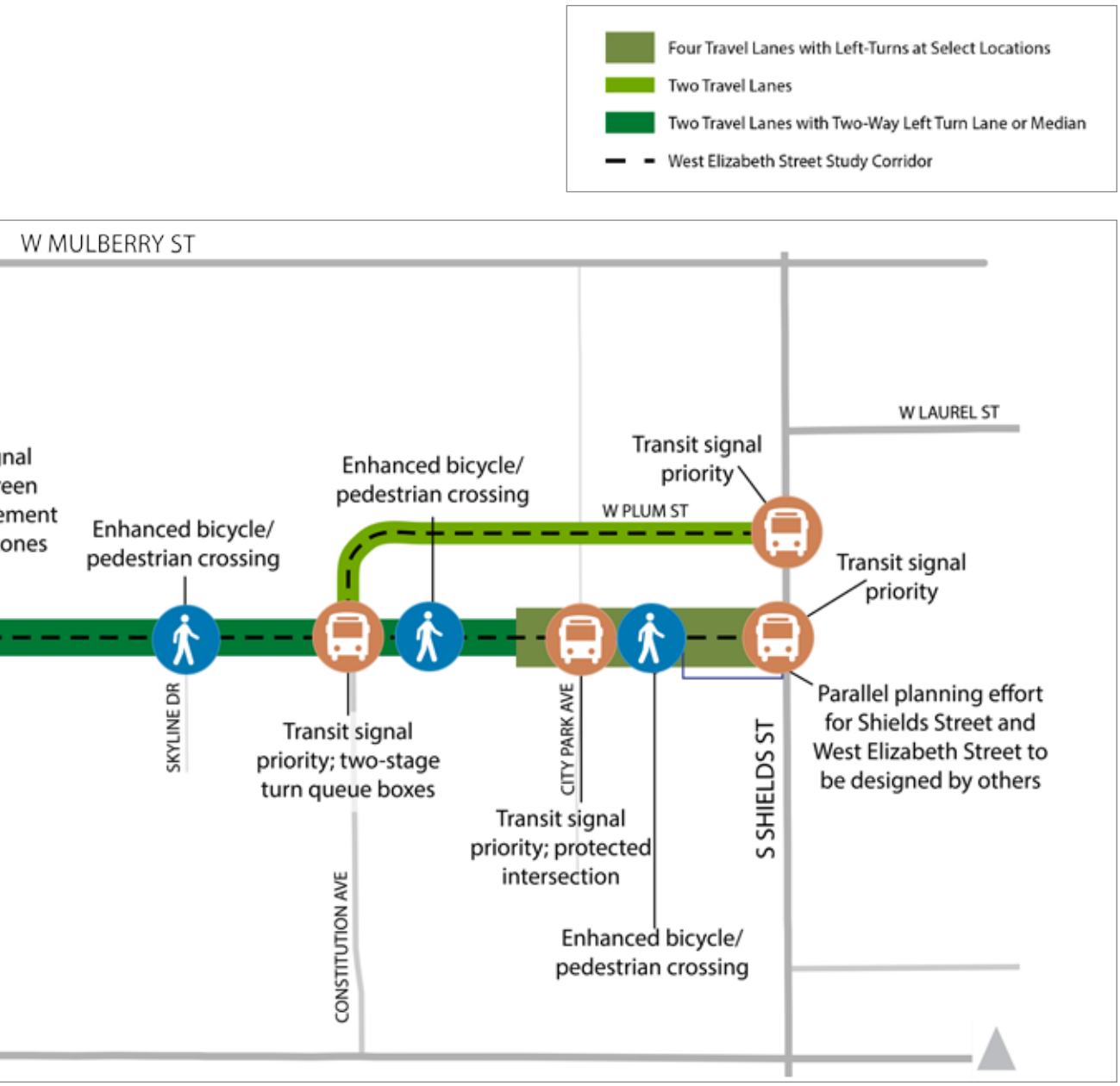
The Recommended Design for West Elizabeth Street was developed specifically to fulfill the project's Vision and to respond to its Purpose and Need. Additionally, three key principles guided the Recommended Design's development:

1. The Recommended Design should meet the project's Vision, Purpose and Need in a **cost-effective** manner.
2. The Recommended Design should **minimize impacts to private property owners** (including limiting right-of-way acquisition).
3. The Recommended Design should **be implementable in phases** and minimize throwaway costs.

The Plan proposes implementation of the Recommended Design in three main phases. The actual implementation of improvements will depend upon funding availability. In addition, the Recommended Design includes considerations for redevelopment, particularly in Campus West.

Figure 2: Recommended Design At-a-Glance:
The Recommended Design includes a variety of multimodal improvements to fulfill the corridor's Vision.




Four Travel Lanes with Left-Turns at Select Locations
Two Travel Lanes
Two Travel Lanes with Two-Way Left Turn Lane or Median
West Elizabeth Street Study Corridor
W MULBERRY ST
W LAUREL ST
W PLUM ST
Transit signal priority
Enhanced bicycle/ pedestrian crossing
Enhanced bicycle/ pedestrian crossing
Transit signal priority
SKYLINE DR
Transit signal priority; two-stage turn queue boxes
CITY PARK AVE
Transit signal priority; protected intersection
S SHIELDS ST
Parallel planning effort for Shields Street and West Elizabeth Street to be designed by others
CONSTITUTION AVE
Enhanced bicycle/ pedestrian crossing

KEY ELEMENTS FOR PEOPLE RIDING TRANSIT:

- **Premium, high-frequency transit service on West Elizabeth Street connecting to Downtown**
- **Transit Signal Priority (TSP)**
- **Innovative bus stop islands**
- **CSU Foothills Campus Transit Station and Park-n-Ride**

RECOMMENDED DESIGN ELEMENTS BY MODE

For People Riding Transit

The transit elements of the Recommended Design intend to improve the capacity, reliability and simplicity of transit service in the West Elizabeth Street study area, including both transit operational changes and transit-related infrastructure

Transit Operations

The Recommended Design's proposed transit operations include five key transit routes:

Route 3 – West Elizabeth Street Route: a cross town route that will run along West Elizabeth Street from the CSU Foothills Campus Equine Center, along West Elizabeth Street and Plum Street, through the CSU Main Campus, to the CSU Transit Center and continuing to Downtown Fort Collins and the Downtown Transit Center via Mason Street. Route 3 will provide a one seat ride for passengers from West Elizabeth Street to Downtown Fort Collins.

Route 31 – Plum Street Route: a circulator route that will operate similar to the existing Route 31 from the CSU Transit Center to Campus West via West Elizabeth Street and Plum Street.

Route 2 – West Prospect Road Route: a radial route that will run along Prospect Road from Overland Trail to Lake Street/College Avenue.

The HORN – a circulator that will serve destinations throughout the CSU Main Campus and CSU Veterinary School, similar to the existing HORN

The CSU Foothills Campus Shuttle – a circulator that will connect destinations within the CSU Foothills Campus off of Rampart Road and off of Laporte Avenue.

Table 1 shows frequency, hours and vehicle types for the transit routes in the study area when CSU is in session; route frequencies are likely to be reduced during periods when CSU is out of session. Route 3, Route 31 and the HORN are expected to be the most productive routes in the study area. Therefore, frequencies on these routes will be high to increase the number of passengers the system can move and to minimize passenger wait times. With 10 minute or less frequencies Route 3, Route 31 and the HORN will all operate frequently enough that passengers do not need to consult a schedule prior to planning their trip. All of the routes will use standard Transfort buses, with the exception of the CSU Foothills Campus Shuttle, which will use a 25 passenger shuttle bus.

Table 1: *Transit Route Frequency & Vehicles Types*

Route	Frequency	Hours	Vehicle Type
2	AM-PM Peak: 15 minutes Evening: 30 minutes	7 AM – 10 PM	Standard Transfort buses
3	AM-PM Peak: 10 minutes Evening: 30 minutes	7 AM – 10 PM	Standard Transfort buses
31	AM-PM Peak: 5 minutes Evening: 10 minutes	7 AM – 7 PM	Standard Transfort buses
HORN	AM-PM Peak: 10 minutes Evening: 20 minutes	6:30 AM – 8 PM	Standard Transfort buses
CSU Foothills Campus Shuttle	All day: 30 minutes	7 AM – 7 PM	25 passenger shuttle bus

Transit Infrastructure

Transit Signal Priority (TSP) will be added to signalized intersections throughout the study area, in locations where possible and beneficial to transit operations. Transit Signal Priority reduces delay at traffic signals by holding green lights longer for approaching buses, giving the buses a higher priority at the intersection. Transit Signal Priority will be added in the east-west directions at the following intersections: West Elizabeth Street/Taft Hill Road, West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, and Plum Street/Shields Street. Transit Signal Priority will also be added to the Laurel Street/Meldrum Street intersection for the new Route 3, which will connect West Elizabeth Street to Downtown Fort Collins via the CSU Transit Center.

The Recommended Design includes innovative bus stop islands that have recently been installed successfully in progressive transit cities such as Seattle and Denver. In some cases the bus islands allow buses to stop in the travel lane while passengers board, which eliminates bus delay waiting to re-enter the travel lane. Bus stop islands that allow buses to stop in the travel lane are less impactful to adjacent private property compared to bus stop islands with pullouts. Generally, the Recommended Design includes bus stop islands that allow buses to stop in the travel lane although bus stop islands with pullouts are recommended at Skyline Drive. Other benefits of the bus stop islands are that they allow for passengers to get on and off the buses from both doors, which minimizes bus dwell time at each stop and allows people biking to pass to the right of the passenger boarding area rather than having to merge into the travel lane to pass the bus. Unique design elements, such as a raised pedestrian crossing across the bike lane or strategically placed planter bollards, will minimize the potential for conflicts between people biking and people walking, or using mobility devises, from the bus to the sidewalks. Bus stop islands will feature typical amenities such as signage, shelters, benches, trash cans and bike racks. Should Bus Rapid Transit (BRT)-style service eventually be implemented on the corridor, the bus stop islands are sufficiently large for future passenger amenities including enhanced shelters, benches, bike racks and kiosks.

A Park-n-Ride at the CSU Foothills Campus Equine Center will take advantage of the 720 space parking lot that is nearly empty on most days. The Park-n-Ride will include a transit station south of the Equine Center with space for passenger boarding and space for buses to layover between routes, if needed. Students, faculty and staff from areas in west Fort Collins bound for CSU Main Campus can park at the Park-n-Ride and ride the bus to the CSU Main Campus.

At the CSU Transit Center, minor modifications to Plum Street south of Allison Hall will allow Route 3 buses to drop-off and pick-up passengers at the CSU Transit Center without circulating through the transit center itself.

Other likely infrastructure improvements may be needed at the College Avenue/Lake Street intersection to facilitate the turning movements for the east leg of Route 2.

For People Biking

Consistent with the recommendations of the City's *Bicycle Master Plan* (2014). The Recommended Design includes one-way protected bike lanes and buffered bike lanes on West Elizabeth Street from Shields Street to Overland Trail. In locations where adequate space for protection exists the protection will consist of a raised

KEY ELEMENTS FOR PEOPLE BIKING:

- **Protected or buffered bike lanes**
- **Intersection treatments including green colored paint in conflict zones, two stage turn queue boxes and the pilot of a protected intersection**
- **New or upgraded north-south crossings**
- **Bike lane accommodations through bus stop islands**

Bottom Left: A two-stage turn queue box allows people biking to turn left in two stages without crossing multiple travel lanes

Bottom Right: A buffered bike lane provides a painted buffer between the bike lane and travel lane

Top Right: A protected bike lane provides a raised curb between the bike lane and travel lane

curb or other treatment to be determined in Final Design. In locations where there is not adequate space for protection there will be a painted buffer between the bike lane and the travel lane.

Various intersection treatments are recommended to make turning movements easier for people bicycling as well as to improve safety. Green colored pavement will be used in conflict zones where people bicycling have the right of way. Two-stage turn queue boxes will be used at signalized intersections so that people biking do not have to cross multiple travel lanes to access a left-turn lane.

The Recommended Design also includes the pilot of a protected intersection at the West Elizabeth Street/City Park Avenue intersection. The protected intersection features corner refuge islands that provide increased separation between vehicles and bicyclists, put the bicyclist stop bar ahead of the vehicle stop bar, set back the bicyclist crossings approximately one car length from the adjacent travel lane and allow for two-stage left-turns and free bicyclist right-turns.

The Recommended Design further implements the City's ***Bicycle Plan*** by providing a variety of north-south crossing treatments, including the protected intersection at City Park Avenue and on street bikeways on Constitution Avenue. Skyline Drive, on which a neighborhood greenway is proposed, is expected to be improved in summer 2016 with either a Rectangular Rapid Flashing Beacon (the crosswalk across Laurel Street at Sherwood Street is a local example of a Rectangular Rapid Flashing Beacon) or a Pedestrian Hybrid Beacon (the crosswalk across Taft Hill Road a Blevins Middle School is a local example of a Pedestrian Hybrid Beacon) at the West Elizabeth Street/Skyline Drive intersection to make crossing West Elizabeth Street safer and more comfortable. Ponderosa Drive is recommended to be improved in the future with enhancements for bicyclists such as medians that allow for people bicycling to cross West Elizabeth Street in two stages.

As described earlier, bus stop islands along the West Elizabeth Street corridor will allow people biking to pass to the right of the passenger boarding area. When buses are stopped, people biking will not have to merge into travel lanes to go around them. Unique design elements at the bus island stops will minimize the potential for conflicts between people biking and people walking, or using mobility devises, from the bus to the sidewalks.

For People Walking or Using Mobility Devices

The Recommended Design will complete the sidewalk network on West Elizabeth Street. In most cases, new sidewalks will be detached with landscaping separating the clear sidewalk width from the adjacent travel lanes. In Campus West sidewalks will include an amenity zone for tree grates, street lighting, bike parking and other amenities separating the clear sidewalk width from adjacent travel lanes. In some cases where private property would be significantly impacted by the preferred detached sidewalk and landscaping between the adjacent travel lanes, sidewalks will be attached (directly adjacent to travel lanes). This condition occurs mostly west of Taft Hill Road. The complete sidewalk network will include accessible design elements throughout the corridor for people with disabilities, including ADA-compliant curb ramps.

People walking, or using mobility devises, will have new and upgraded crossings of West Elizabeth Street. In Campus West, the existing midblock crosswalk will be upgraded to feature a Pedestrian Hybrid Beacon (previously known as a HAWK beacon). A new crossing will be constructed near the Woodbridge Senior Apartments with a median and a Rectangular Rapid Flashing Beacon (the crosswalk across Laurel Street at Sherwood Street is a local example of a Rectangular Rapid Flashing Beacon). The existing crosswalk at Castlerock Drive will be relocated to Skyline Drive and upgraded to feature either a Rectangular Rapid Flashing Beacon or a Pedestrian Hybrid Beacon. Two future crossings will also be added once demand justifies their installation per the crossing policy in the City's *Pedestrian Master Plan:* one at Ponderosa Drive and another at Rocky Road/Azuro Drive. Lastly, the Recommended Design includes a roundabout at Overland Trail and West Elizabeth Street.

KEY ELEMENTS FOR PEOPLE WALKING OR USING MOBILITY DEVICES

- Complete, ADA-compliant sidewalks
- New or upgraded north-south crossings

Rectangular Rapid Flashing Beacons are user-actuated amber LEDs that use a flash pattern that is similar to emergency flashers on police vehicles.

A Pedestrian Hybrid Beacon is a user-actuated beacon that uses amber and red beacons to increase drivers' awareness of pedestrian crossings.


Lockman & Lockman
Drywall Systems, LLC

For People Driving

The Recommended Design maintains four travel lanes with turn lanes on West Elizabeth Street's busiest segment between Shields Street and City Park Avenue. Between City Park Avenue and Constitution Avenue, West Elizabeth Street will transition to two travel lanes with a two-way left-turn lane. This three lane cross section will continue to Overland Trail with medians in certain locations where street and driveway access allow.

The Recommended Design includes a variety of design elements to improve safety at locations with a demonstrated crash history. In most cases access management in Campus West will allow for right-turns and left-turns into driveways and right-turns out of driveways. Left-turns out of driveways, which are a common cause of crashes in Campus West, will be prohibited between Shields Street and City Park Avenue. West of Taft Hill Road, access management will allow for right-turns and left-turns into and out of the King Soopers driveway. Driveways on the north side of West Elizabeth Street will be right-in/right-out. Lastly, a roundabout at Overland Trail will calm traffic on Overland Trail itself and improve the ease of turning onto and off of West Elizabeth Street.

KEY ELEMENTS FOR PEOPLE DRIVING:

- **Safety improvements at locations with a demonstrated crash history**
- **Four travel lanes in busiest segment and center turn lanes and medians throughout the corridor**
- **Traffic calming through medians, separated facilities for other modes, and management of access to businesses**
- **Roundabout at West Elizabeth/ Overland Trail**

West Elizabeth Street/Shields Street Intersection

Prior to and separate from the West Elizabeth Enhanced Travel Corridor Plan, the City and CSU entered into an Intergovernmental Agreement (IGA) addressing various CSU on-campus stadium impacts to nearby City streets. The IGA includes requirements for at-grade improvements at the intersection of West Elizabeth Street and Shields Street and identifies the potential for a grade-separated crossing of Shields Street to help accommodate bicycle and pedestrian movements across Shields Street. Since the IGA's approval, CSU and the City have been working on the design for the at-grade improvements and have completed a feasibility study for the grade-separated crossing. The at-grade improvements and underpass are now in design, a neighborhood meeting has been held and additional opportunities for public input will be provided as the process moves forward.

Due to the overlapping timing of the IGA efforts and the West Elizabeth Enhanced Travel Corridor Plan, and since the goals of each effort are generally in alignment, the detailed design for the West Elizabeth Street/ Shields Street intersection has been left to the IGA team. As such, the Recommended Design for the West Elizabeth Street corridor does not include the design for this area, and instead notes various considerations that should be taken in to account as the design moves toward finalization. These considerations include: business access, driveway crossings and connections to the midblock crossing in Campus West. The West Elizabeth Enhanced Travel Corridor Plan project team will continue to participate in the design work for this intersection to ensure that the final plans fit together well and the goals of the West Elizabeth Enhanced Travel Corridor Plan are carried forward.

RECOMMENDED DESIGN GRAPHICS

The following figures depict the Recommended Design for the West Elizabeth Enhanced Travel Corridor. The first two figures (Figures 3 and 4) are photosimulations that provide perspectives to people walking or using mobility devices. These are followed by the Recommended Design Cross Sections (Figures 5-8). The next set of figures provide an aerial view of the corridor depicting the differing design conditions by each segment and highlighting major intersections (Figures 9-16). The last graphic in this section is the transit route alignments proposed for the Recommended Design (Figure 17).

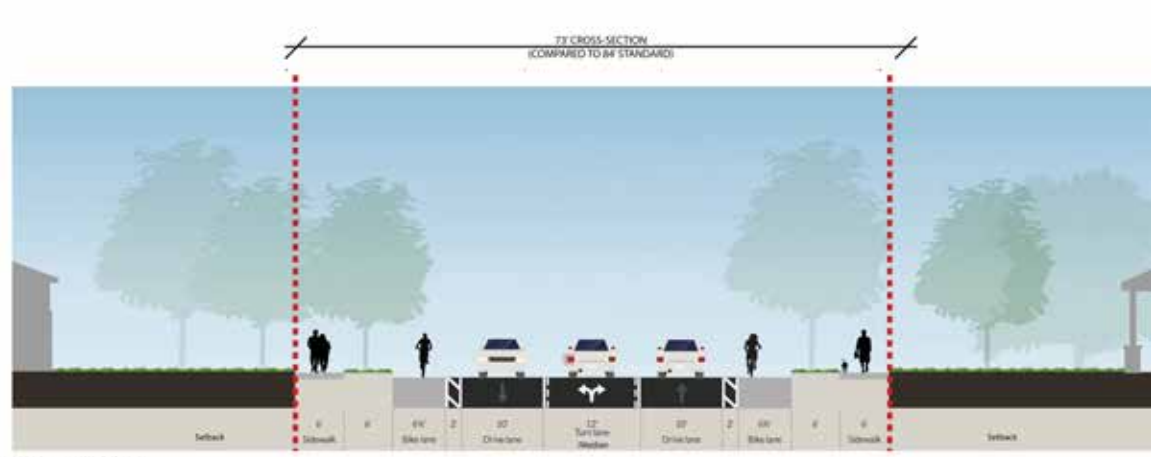
Figure 3: Photo simulation of West Elizabeth Street east of Skyline Drive:
A photo simulation of the Recommended Design as seen looking east from Skyline Drive with protected bike lanes, parkways and sidewalks, and planted median.

Photosimulation - West Elizabeth Protected Bike Lane and Enhanced Median

Figure 4: Photo simulation of West Elizabeth Street and City Park Avenue:
A photo simulation of the Recommended Design as seen at West Elizabeth Street and City Park Avenue with a protected bicycle intersection including corner safety islands, planter pots, pedestrian crosswalks and bike lanes.

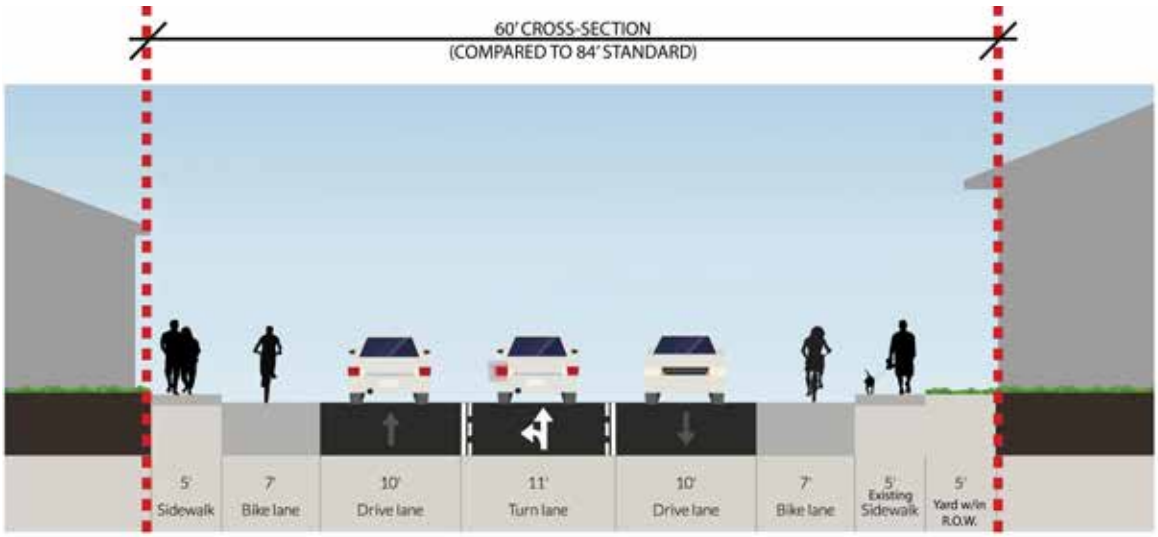
Photosimulation - City Park Ave. and West Elizabeth Protected Intersection

Figure 5: Recommended Design Cross Sections:
A cross-section of the Recommended Design between Overland Trail and Cypress Drive.



Overland Trail to Cypress Drive
Interim Condition: Attached Walk (if Right-of-Way no Available)
Existing Right-of-Way Varies 60'-100'

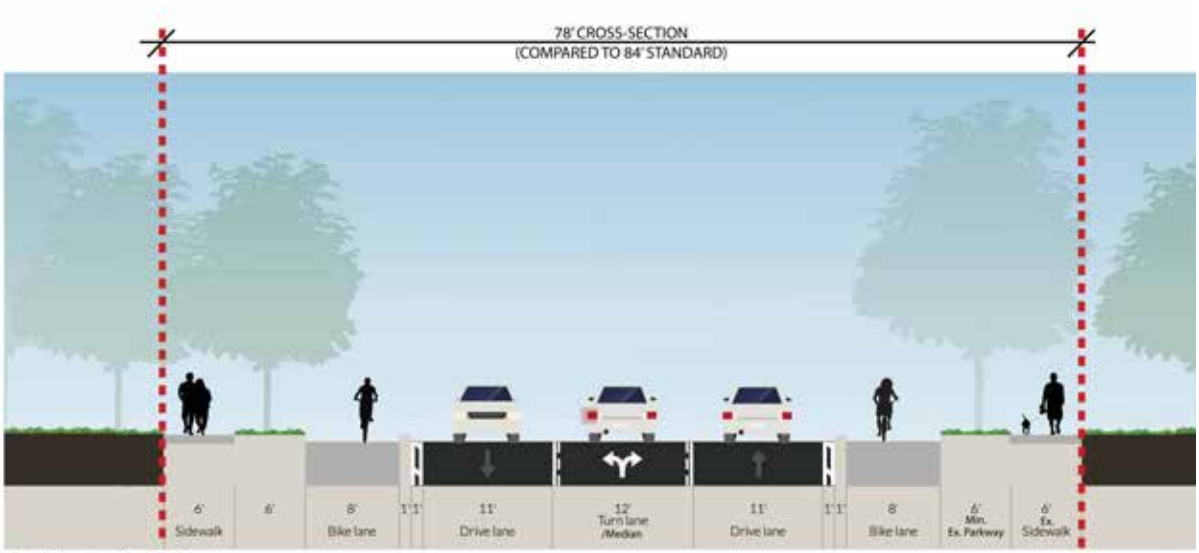
Figure 6: Recommended Design Cross Sections:
A cross-section of the Recommended Design between Cypress Drive and Ponderosa Drive.



Cypress Dr. to Ponderosa Dr.

Figure 7: Recommended Design Cross Sections:
A cross-section of the Recommended Design between Taft Hill Road and City Park Avenue

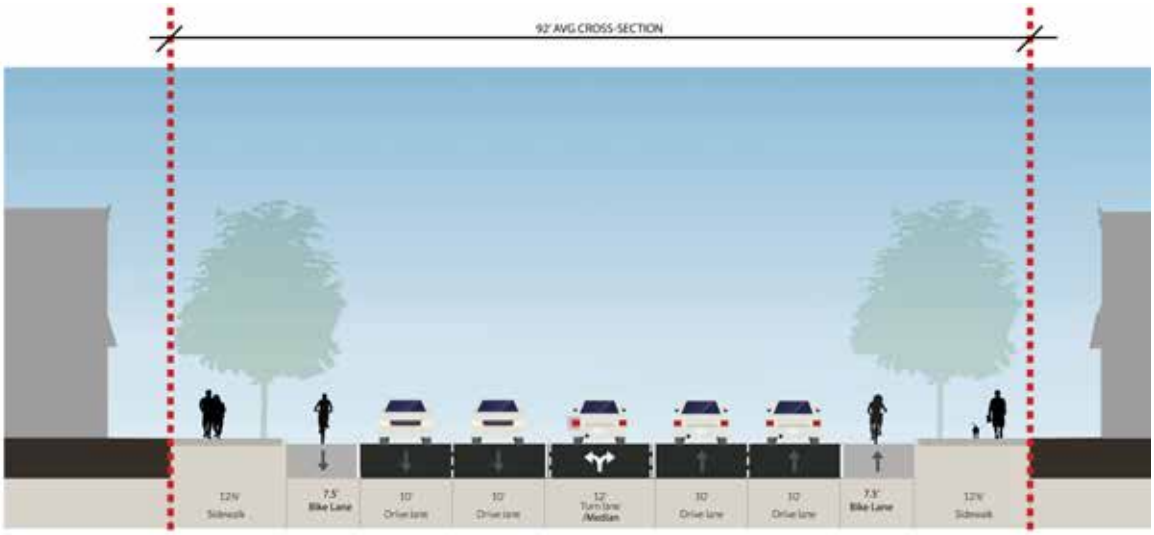
In commercial areas on the south side of West Elizabeth Street between approximately City Park Avenue and Consitution Avenue it may be more appropriate to replace the tree lawn parkway with a paved amenity zone.



Taft Hill Road to City Park Avenue

Figure 8: Recommended Design Cross Sections:
A cross-section of the Recommended Design between City Park Avenue and Shields Street.

This cross-section assumes existing right-of-way; another cross-section that addresses redevelopment is described in the Plannning for Redevelopment Section of this report.



City Park Avenue to Shields Street - Recommended Design Without Redevelopment

Figure 9: Recommended Design Corridor Segments
Overland Trail to Ponderosa Drive

Figure 10: Recommended Design Corridor Segments:
Ponderosa Drive to Taft Hill Road


CYPRESS DRIVE
TIMBER LANE
AZURO DRIVE


MEADOWBROOK DRIVE
TAFT HILL ROAD

Figure 11: Recommended Design Corridor Segments:
Taft Hill Road to City Park Avenue

Figure 12: Recommended Design Corridor Segments:
City Park Avenue to Shields Street

In commercial areas on the south side of West Elizabeth Street between approximately City Park Avenue and Consitution Avenue it may be more appropriate to replace the tree lawn parkway with a paved amenity zone..

aerial views
WEST ELIZABETH STREET INTERSECTIONS

Figure 13: An aerial view of the Recommended Design at Overland Trail.

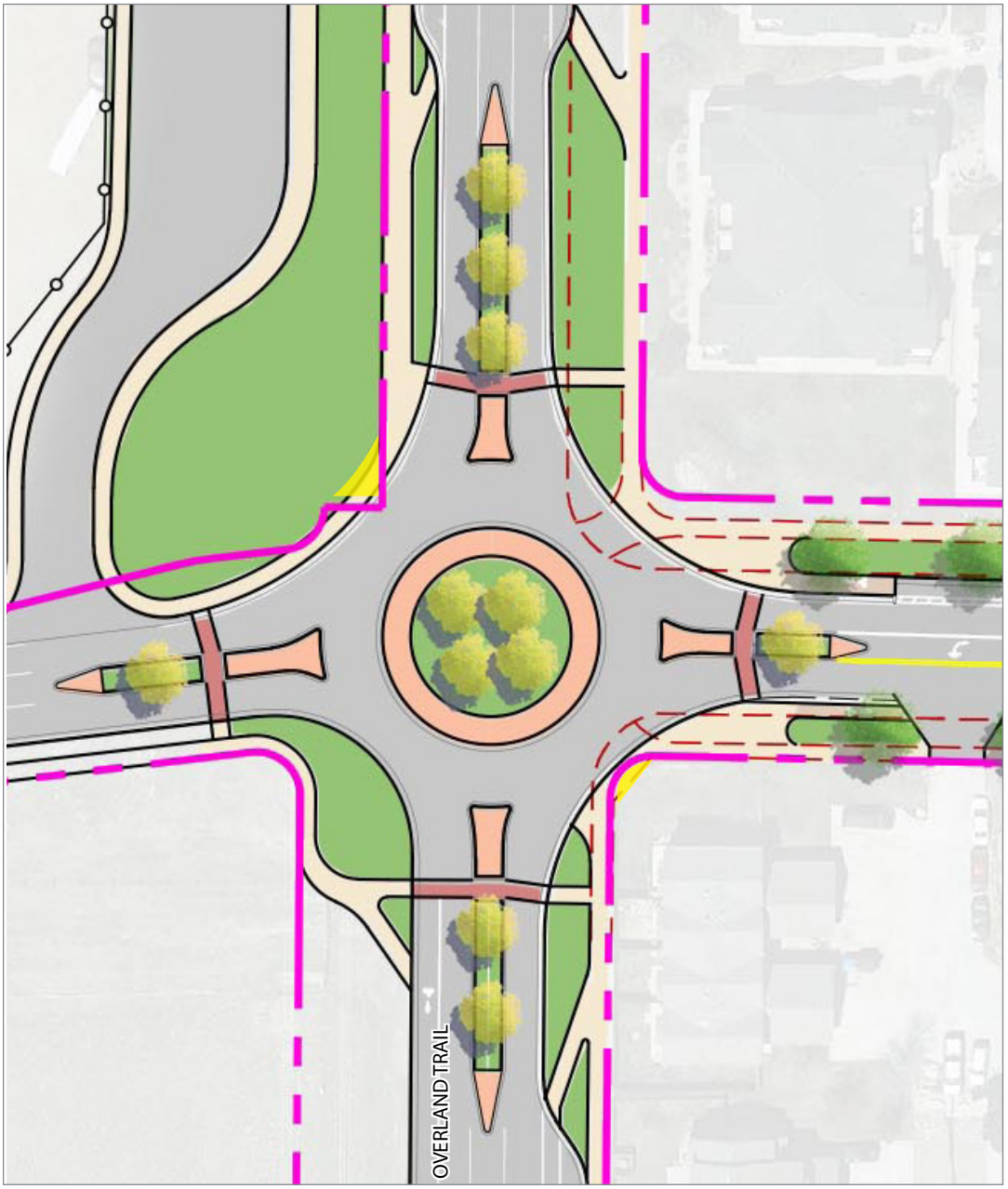
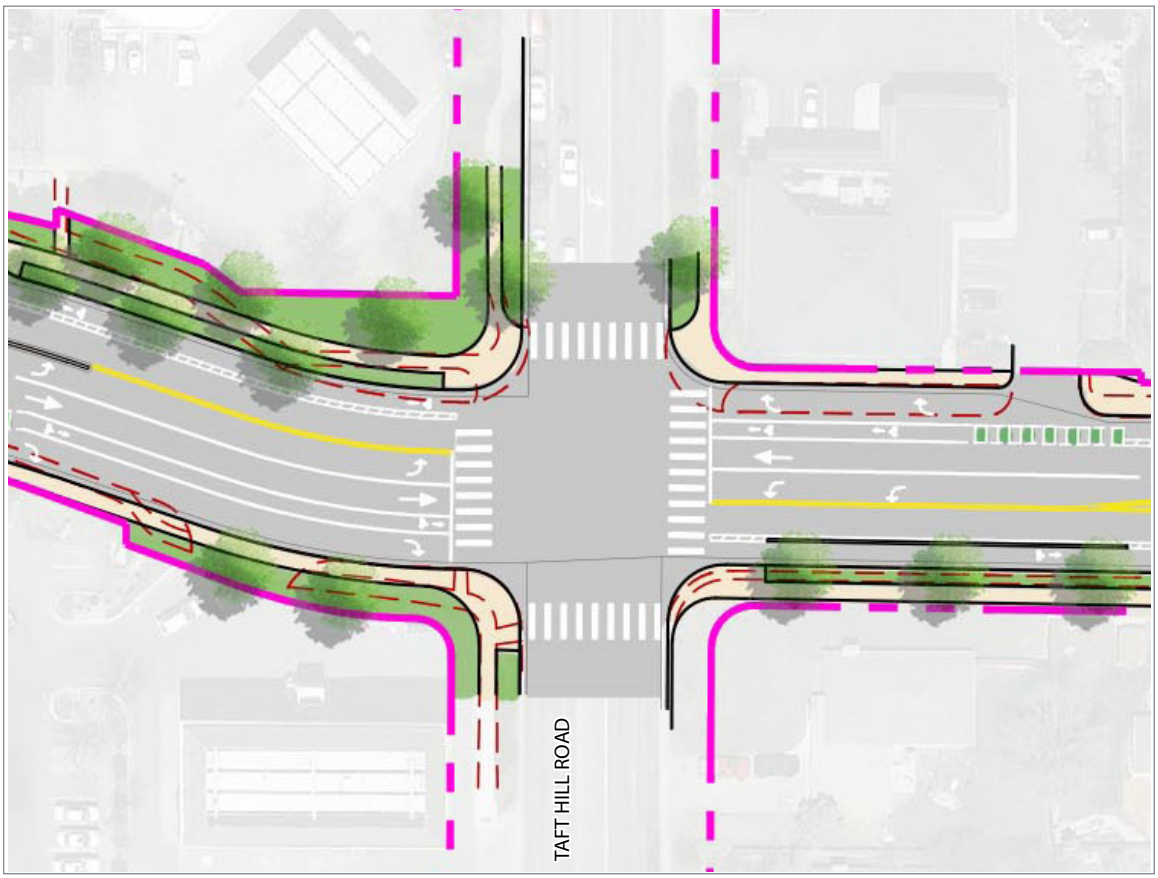


Figure 14: An aerial view of the Recommended Design at Taft Hill Road.



aerial views

WEST ELIZABETH STREET INTERSECTIONS (CONTINUED)

Figure 15: An aerial view of the Recommended Design at Constitution Avenue.

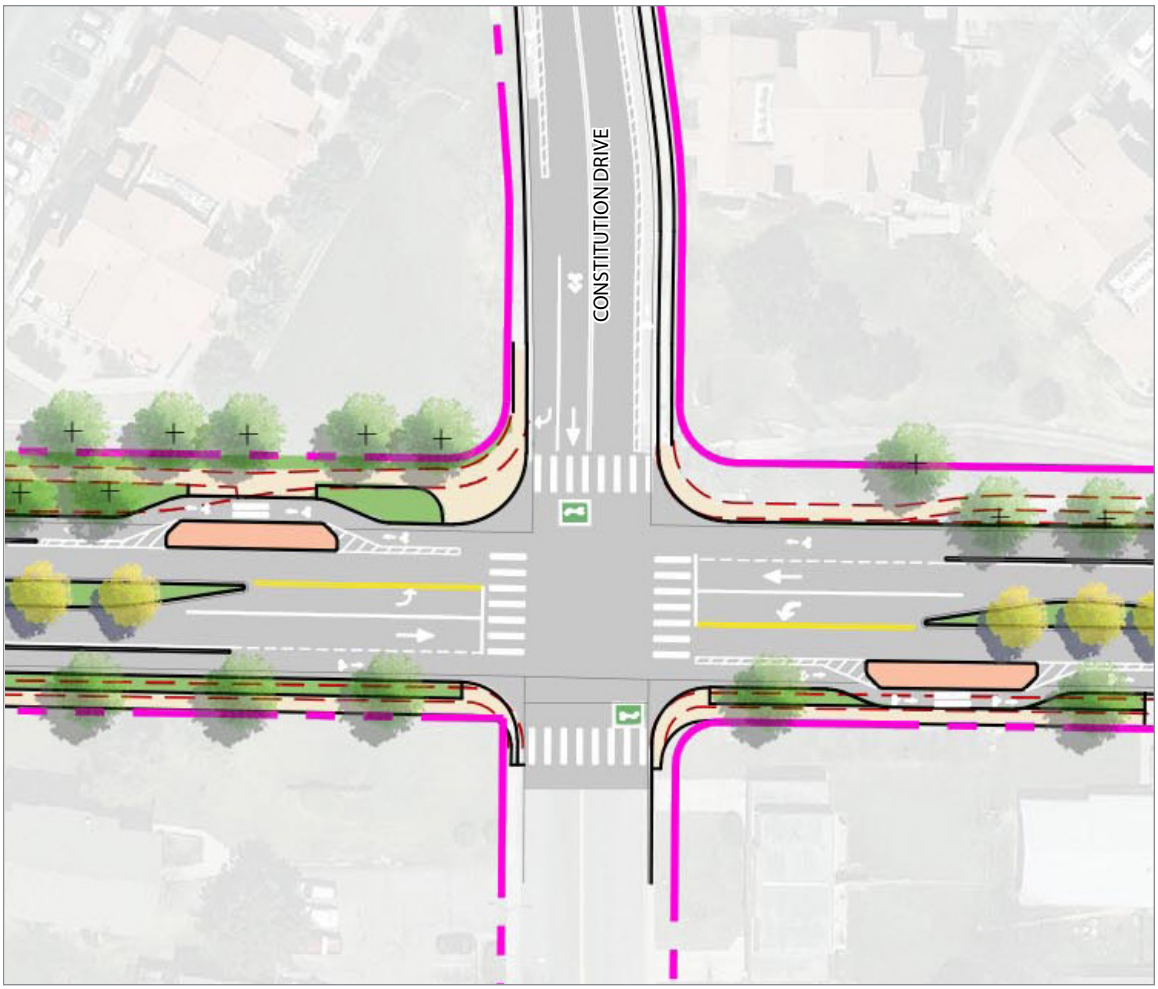


Figure 16: An aerial view of the Recommended Design at City Park Avenue.

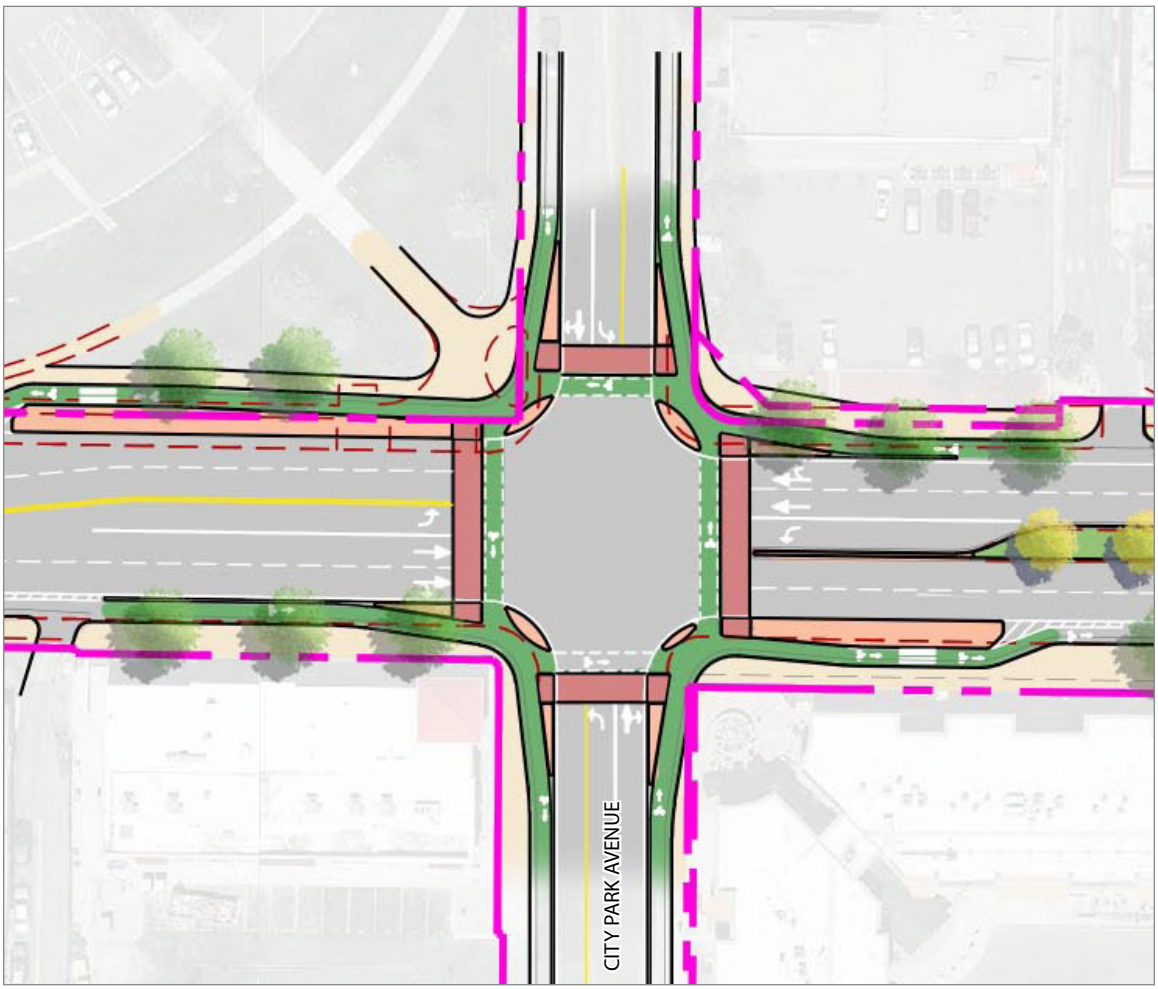
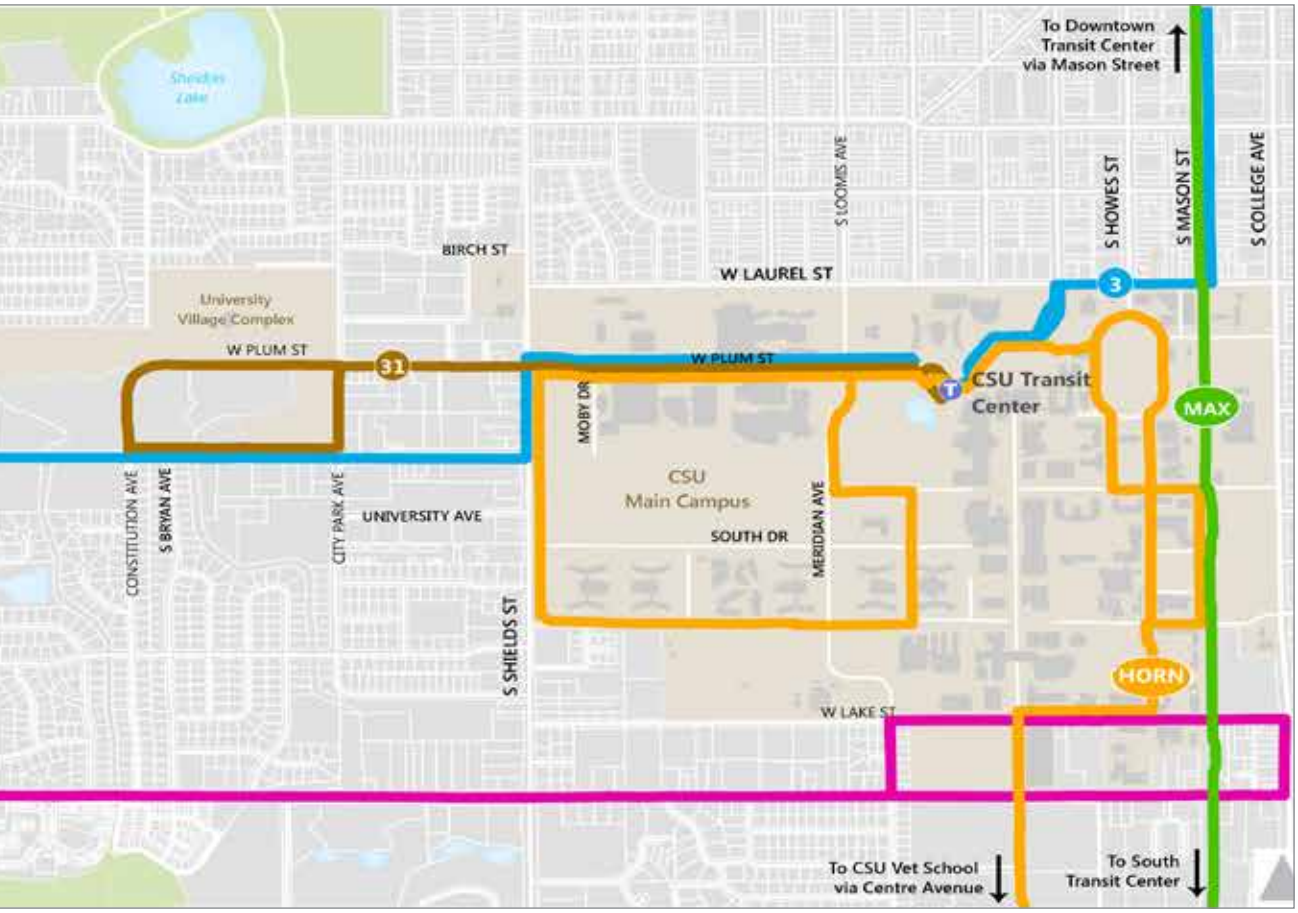


Figure 17: Recommended Design Transit Routes:

The Recommended Design's transit service will be frequent and provide premium amenities for transit patrons.

Route	Frequency	Service Hours
2	AM Peak: 15 minutes PM Peak: 15 minutes Evening: 30 minutes	7 AM - 10 PM
3	AM Peak: 10 minutes PM Peak: 10 minutes Evening: 30 minutes	7 AM - 10 PM
31	AM Peak: 5 minutes PM Peak: 5 minutes Evening: 10 minutes	7 AM - 7 PM
HORN	AM Peak: 10 minutes PM Peak: 10 minutes Evening: 20 minutes	6:30 AM - 8 PM
Foothills Campus Shuttle	All day: 30 minutes	7 AM - 7 PM



Recommended Design

Recommended Alignment

- Route 2
- Route 3
- Route 31
- Horn
- Foothills Campus Shuttle

- City Boundary
- Existing MAX Line

URBAN DESIGN AND PLANNING FOR REDEVELOPMENT

Planning for redevelopment, particularly in Campus West, ensures that the corridor is adaptable to future changes. Planning for redevelopment in Campus West is focused between Shields Street and City Park Avenue and assumes that the Recommended Design is otherwise complete on the corridor.

Land Use and Built Form

Existing properties have already begun to redevelop and additional redevelopment is likely in the future. The existing Land Use Code regulations set the stage for redevelopment that is intended to create a vibrant, pedestrian-oriented, mixed use commercial district. A variety of elements will contribute to this environment. Buildings will be multistory and oriented toward the street with parking behind. The buildings will feature a combination of public spaces such as courtyards, corner plazas, paseos or raised terraces. This plan is consistent with the *Campus West Community Commercial District Planning Study Report* (2001) recommending additional north-south connectivity toward Plum Street and University Avenue to break up the large blocks and improve the walkability to nearby destinations off of West Elizabeth Street.

Currently in the study area residential land uses are focused on Plum Street and commercial land uses are focused on West Elizabeth Street. Currently transit service in the study area is significantly influenced by home-to-school trips and is therefore focused on Plum Street. As Campus West redevelops, West Elizabeth Street may become the epicenter of both commercial and residential activity in the area. Such land uses would generate more diverse trip types using the transit system and may justify shifting the focus of transit service from Plum Street to West Elizabeth Street. Once land use patterns resulting in more diverse trip types are apt to occur on West Elizabeth Street, expansion of Bus Rapid Transit (BRT)-style transit to West Elizabeth Street may be viable.

Bus Rapid Transit-Style Service on West Elizabeth Street

Bus Rapid Transit (BRT) is a rapid transit mode that combines various physical, operating and system elements into a permanently integrated system with a quality image and unique identity. In Fort Collins MAX is an example of a service that features many of the elements typical of BRT, including dedicated right-of-way, specially designed stations and unique vehicles.

BRT-style service on West Elizabeth Street would operate similar to MAX, though not in a dedicated right-of-way, running along West Elizabeth Street from the CSU Foothills Campus Equine Center Park-n-Ride, through the CSU Main Campus (generally parallel to University Avenue), to Mason Street and continuing to Downtown Fort Collins and the Downtown Transit Center. Similar to Route 3, BRT-style service on Elizabeth Street would operate at 10 minute frequencies during the AM peak, midday and PM peak. In the evening it may operate at 15 or 30 minute frequencies.

In addition to supportive land use on West Elizabeth Street, BRT-style service will be most direct if it uses an alignment central to the CSU Main Campus generally parallel to University Avenue. Through the West Elizabeth Enhanced Travel Corridor Plan, CSU indicated that support does not currently exist for such an alignment. However, the City should continue to work with CSU to understand if support for this alignment may exist in the future. In the event that supportive land use forms on West Elizabeth Street without support from CSU for an alignment generally parallel to University Avenue, the City and CSU may choose to implement an interim BRT-style service on Plum Street.

A variety of BRT-supporting elements can be implemented once transit service is upgraded on West Elizabeth Street, including: branding, articulated buses, styled transit stations with shelters and seating, off board fare payment technologies and passenger information and wayfinding. Off board fare payment, whether with ticket machines or future ticketless technologies, would significantly reduce bus dwell time at stops as it would allow for all door boarding.

Each of these elements can be designed with a unique style to match that of the West Elizabeth Street corridor while still unifying the Transfort brand.

Other Infrastructure

Redevelopment and its resulting changes to the built form create a real opportunity to effect transportation infrastructure change in Campus West. Specifically, once properties are assembled and parceled, buildings can be located with regularly spaced, consolidated access points. Right-of-way can be dedicated on both sides of West Elizabeth Street to accommodate 12 foot sidewalks with a 10 foot amenity zone as currently identified in the ***Campus West Community Commercial District Planning Study Report*** (2001). Protected bike lanes, previously infeasible in Campus West due to the frequent spacing of driveways, can be constructed. And, a BRT stop can be provided midblock by relocating the existing midblock crosswalk. Other design considerations may include elements to improve environmental sustainability, such as bioswales built into parkways or center medians to help improve the water quality from runoff generated in the area.

The 16th Street Mall in Denver is an example of a roadway that successfully mixes transit vehicles with people walking or using mobility devices.

Urban Design

As a part of the West Elizabeth Enhanced Travel Corridor Plan's community engagement, an effort was made to understand what the community felt was the overriding character of the corridor. While there was not a strong consensus regarding the overall theme for West Elizabeth Street, many community engagement participants generally identified the corridor's already artful, unique feel which was attributed to the existing eclectic urban design and public art installations on the corridor (such as the foundations on street light poles in Campus West). Many community engagement participants also thought it would be appropriate to distinguish the design of Campus West from the CSU Main Campus.

Figure 18: Urban Design Elements:
Artful urban design elements will create a cohesive look and feel for the corridor.

Lighting

Seating

Walls

Wayfinding & Placemaking Elements

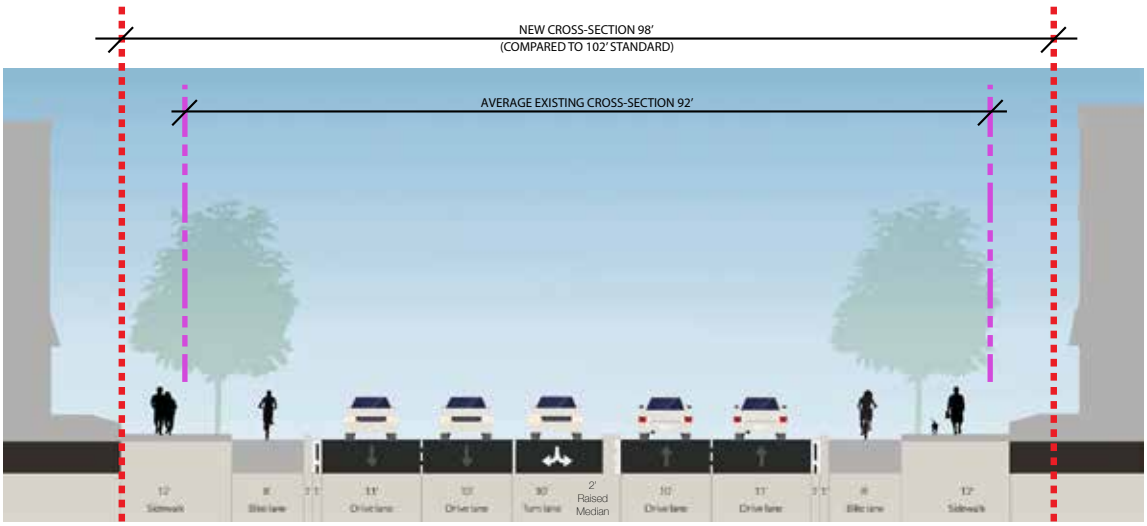
Transit Shelters

Covered Bike Parking

Planters

Bike Racks

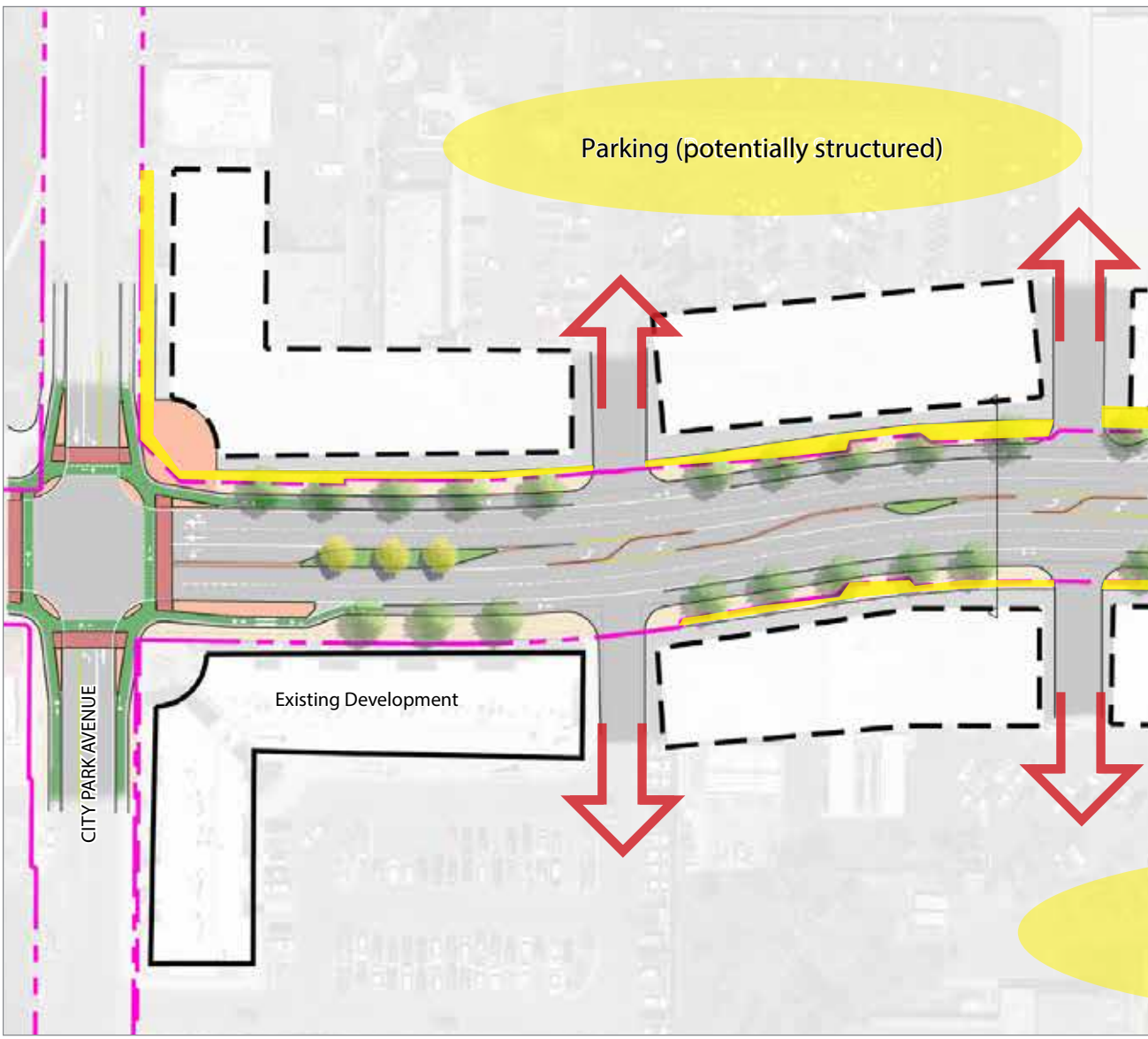
Figure 19: Planning for Redevelopment Cross Section:
A cross-section of the Recommended Design that plans for redevelopment between City Park Avenue and Shields Street.



City Park Avenue to Shields Street - Recommended Design With Redevelopment

Existing Condition in Campus West

Figure 20: Planning for Redevelopment Conceptual Design.
An aerial view of the Recommended Design that plans for redevelopment in Campus West. Key elements include: Buildings closer to the street, parking behind or underneath buildings (possibly structured), consolidated driveway access and a pedestrian spine connecting up to Plum Street and down to University Avenue.



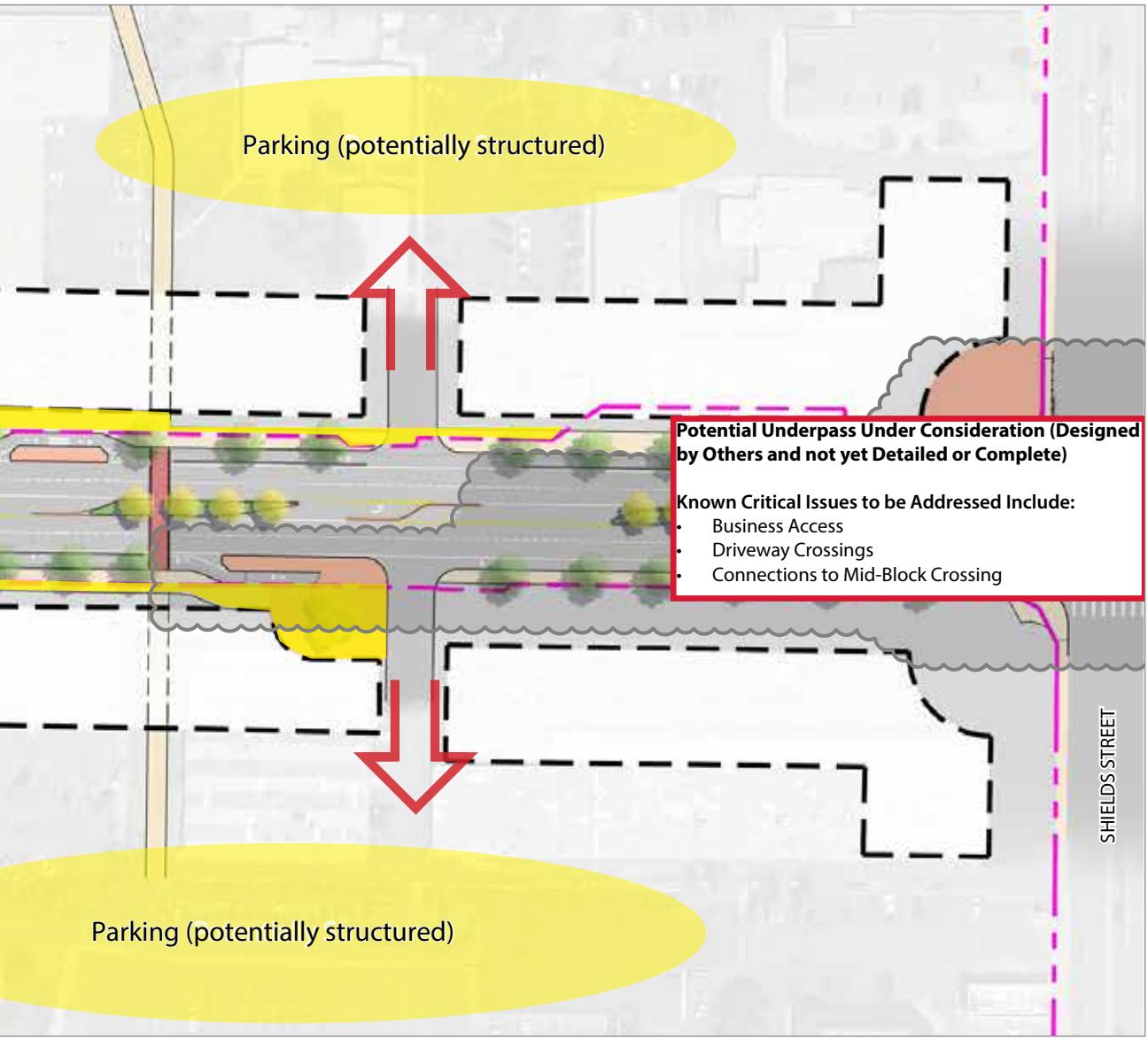
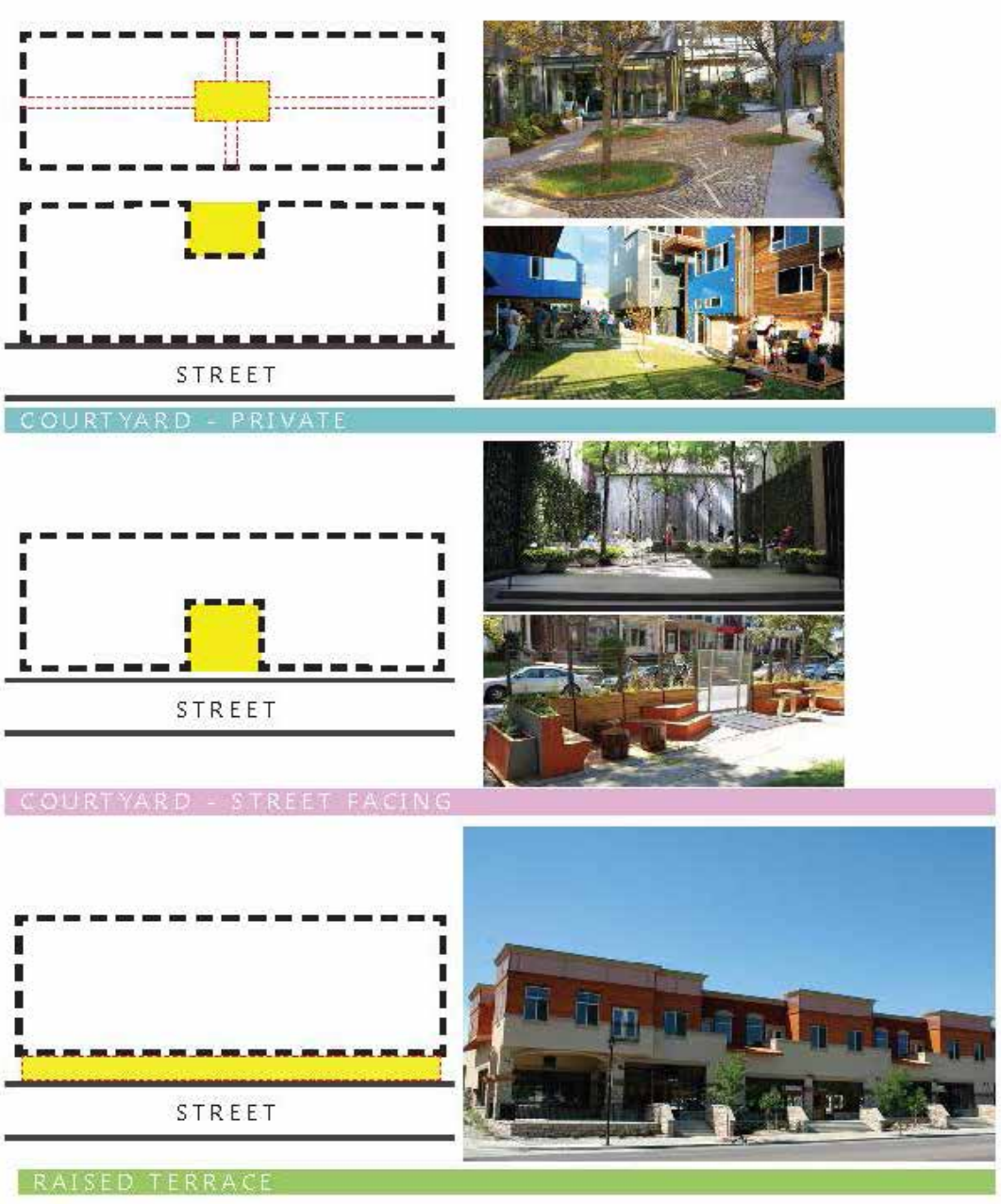
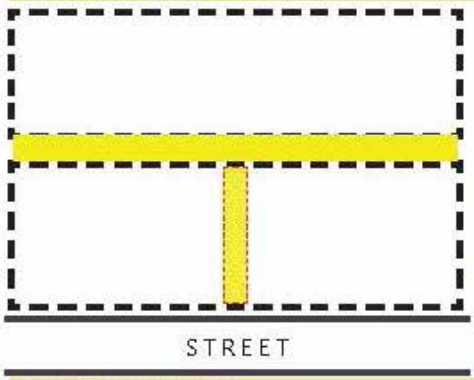

Parking (potentially structured)
Potential Underpass Under Consideration (Designed by Others and not yet Detailed or Complete)
Known Critical Issues to be Addressed Include:
• Business Access
• Driveway Crossings
• Connections to Mid-Block Crossing
SHIELDS STREET
Parking (potentially structured)

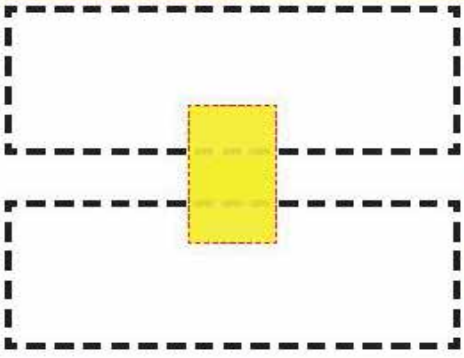
Figure 21: Planning for Redevelopment Urban Design.
With redevelopment, new buildings on Campus West will feature a variety of privately-owned public spaces such as courtyards, raised terraces, corner plazas and paseos.



CORNER PLAZA

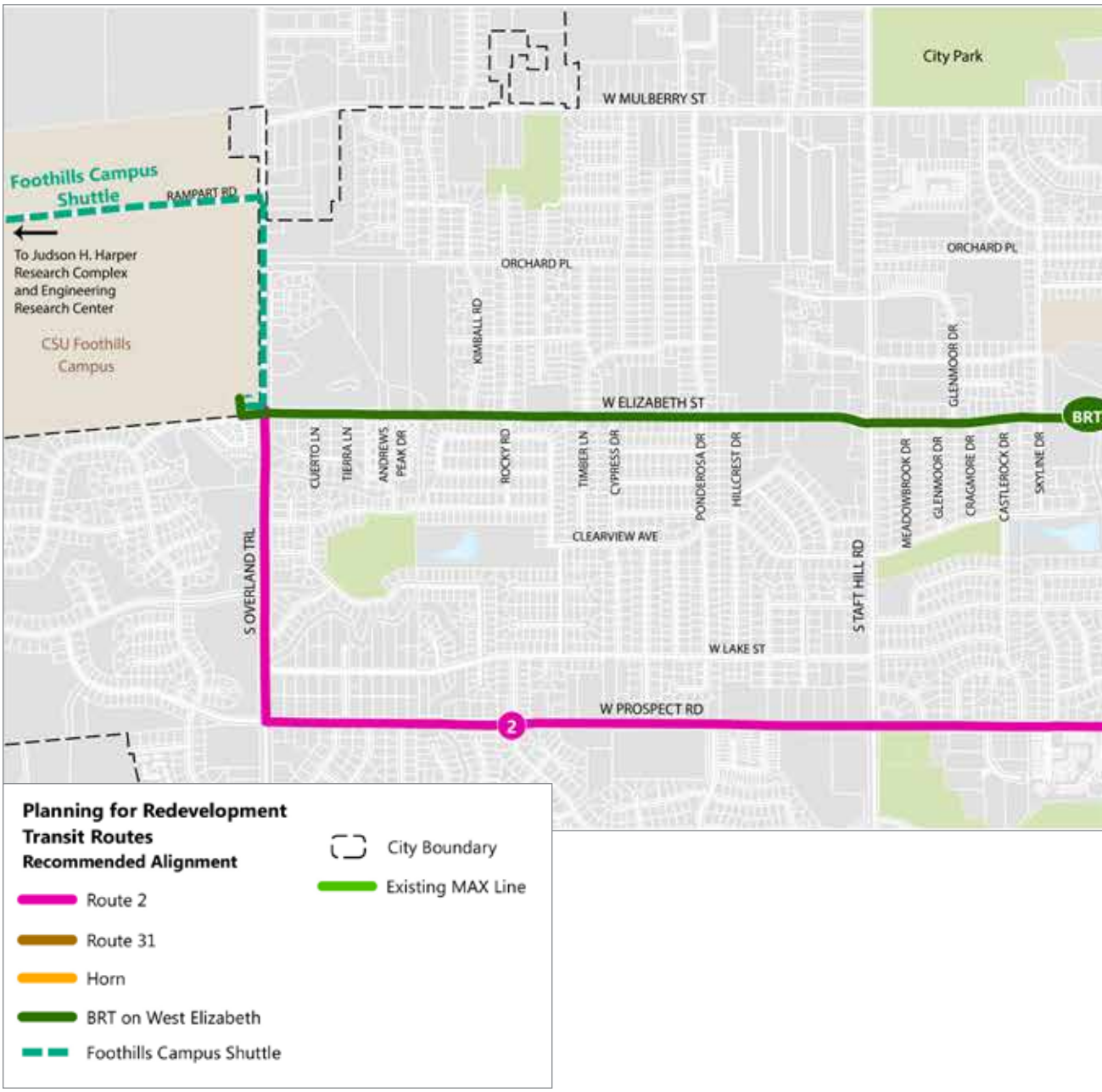


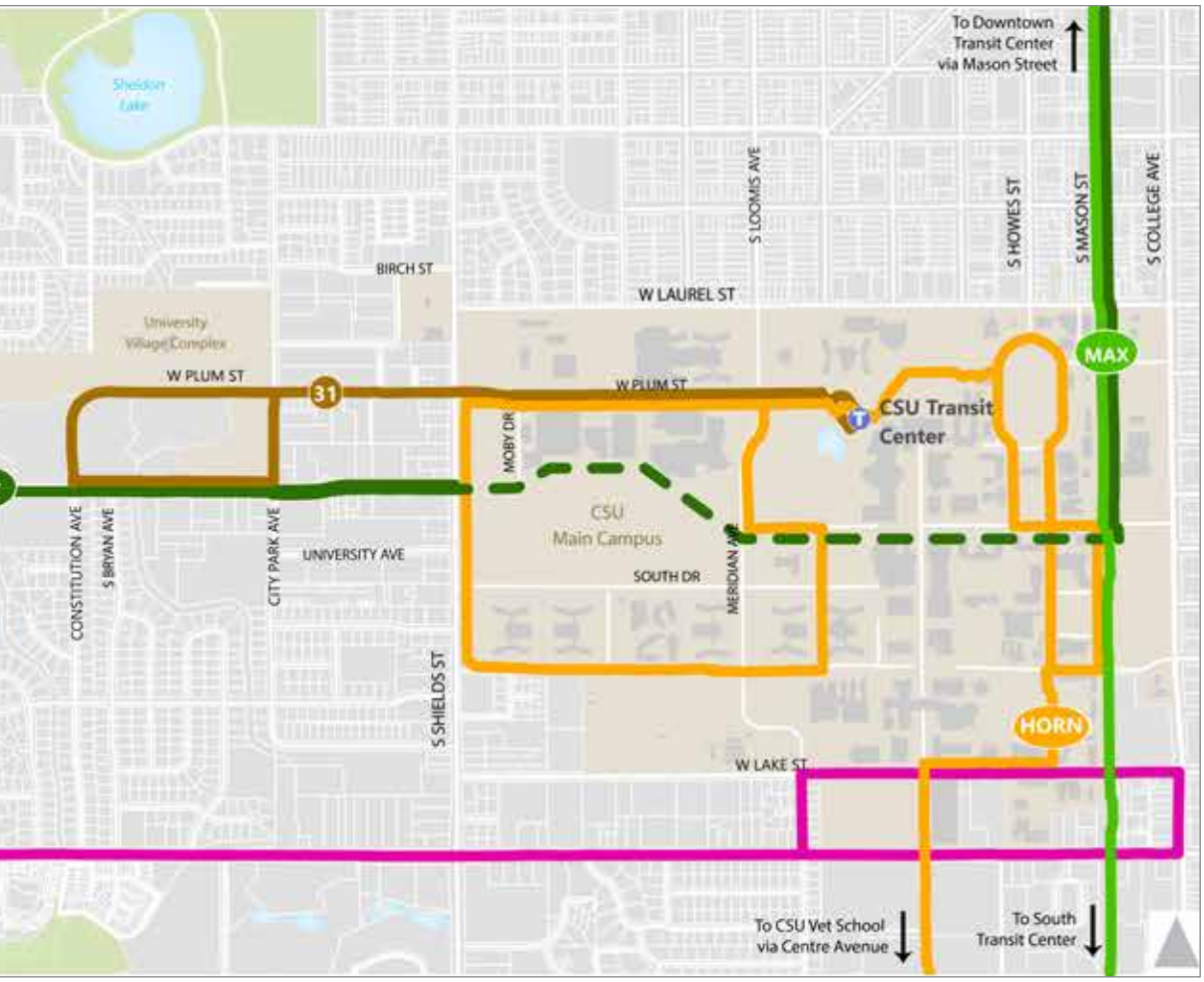
PASEO/ALLEY



CONNECTIVITY

Figure 22: Planning for Redevelopment Transit Routes:
Redevelopment in the corridor will be a catalyst for BRT-style transit service.





Through the West Elizabeth Enhanced Travel Corridor Plan, CSU indicated that support does not currently exist for such an alignment. However, the City should continue to work with CSU to understand if support for this alignment may exist in the future. In the event that supportive land use forms on West Elizabeth Street without support from CSU for an alignment generally parallel to University Avenue, the City and CSU may choose to implement an interim BRT-style service on Plum Street.

Recommendations recognize that study area roadways operate as a system and also includes elements on Constitution Avenue and Plum Street.

RECOMMENDATIONS FOR OTHER STREETS

Constitution Avenue & Plum Street

For people biking, the Recommended Design for Constitution Avenue and Plum Street from West Elizabeth Street to Shields Street includes buffered bike lanes, consistent with the recommendations of the City's Bicycle Master Plan (2014). West of City Park Avenue, an existing canal bridge is too narrow for both bike lanes and sidewalks. The Recommended Design includes the widening of this bridge to provide for continuous buffered bike lanes. Additionally, there are occasional obstructions in the sidewalk on Plum Street (including streetlight poles) and segments with narrow sidewalks that are not ADA-compliant; these obstructions would be removed as a part of the Recommended Design, and sidewalks would be upgraded through redevelopment to the benefit of people walking.

OTHER NETWORK CONSIDERATIONS

Parking

As transit is improved along West Elizabeth Street, there may be an increase in unintended park-n-ride activity in nearby neighborhoods and surface parking. This effect has been realized on the Mason Street corridor with the implementation of MAX. Recent increases in parking permit prices at CSU may further increase the likelihood of unintended park-and-ride activity. At the same time, CSU has invested over $1 million in biking, walking, and transit in an effort to reduce parking demand.

While the new Park-n-Ride at the CSU Foothills Campus Equine Center will, in part, alleviate demand for unintended park-and-ride activity by creating a formal area for it, additional parking management practices may be necessary. A Residential Parking Permit Program (RP3) may be necessary to control parking within single family neighborhoods. For multifamily housing and commercial properties, a new parking district may be more appropriate. In a parking district, participating property owners would pay into a common fund used to implement a parking

management and enforcement strategy. The City may also incur some of the costs of such a management and enforcement strategy. Existing zoning can inform where a Residential Parking Permit Program or Parking District may be appropriate; however, the exact boundaries for such programs will change year to year as development occurs and land uses change.

Car Share

Additional car share in the West Elizabeth Street study will provide personalized mobility for a variety of situations, especially corridor residents who take public transit but need a car sometimes or corridor residents who occasionally need a second car. Car share reduces the need for residents of the corridor to own a car and makes it easier for corridor residents and visitors to primarily rely on other modes (including bicycling, transit and walking) and access a car for special occasions.

Future focus areas for car share (i.e. areas in which car share will be more viable) include locations with high residential or employment density.

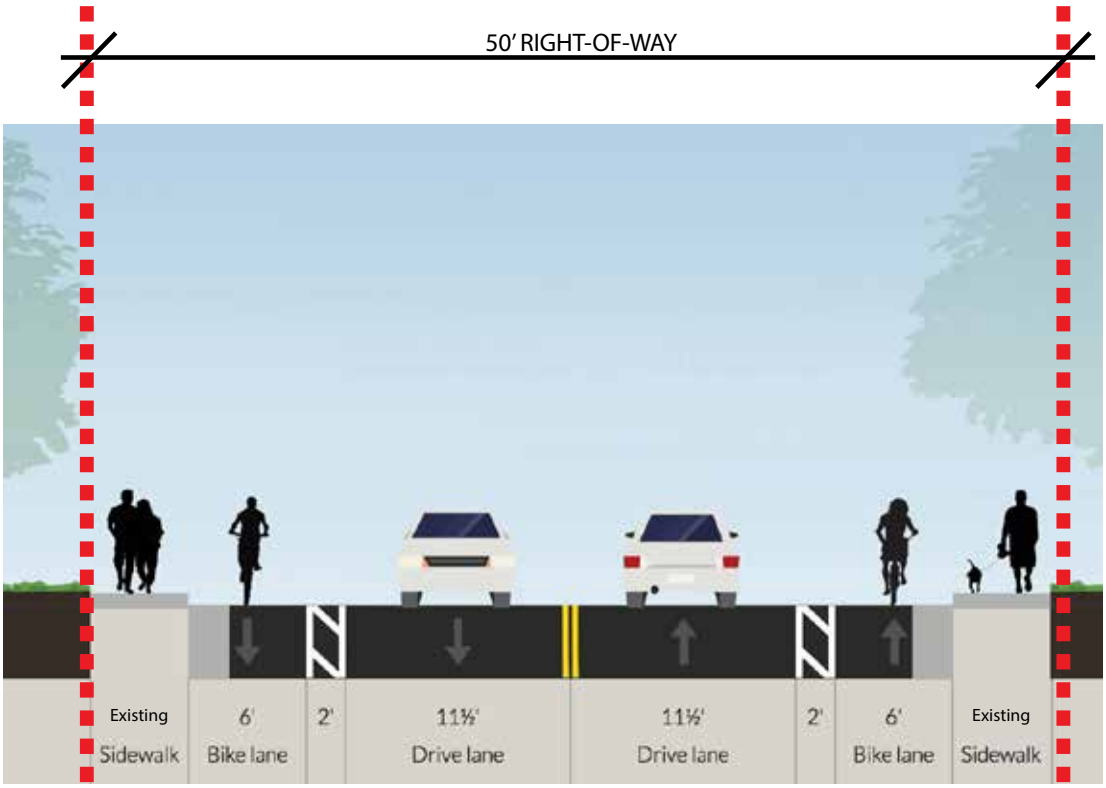
Bicycle Network

Through the development of the West Elizabeth Enhanced Travel Corridor Plan, revisions to the full build bicycle network in the Bicycle Master Plan were identified. Specifically, a neighborhood greenway is now recommended on Skyline Drive south of West Elizabeth Street to connect the bike lanes north of West Elizabeth Street to Avery Park and the Springfield Drive neighborhood greenway. In addition, Plum Street provides a low-stress alternative to biking on West Elizabeth. Through this plan, it is now recommended to have buffered bike lanes with a connection through University Village to Skyline (implemented summer 2016)

Bike Share

Bike share launched in Fort Collins in April 2016, and the City has a Bike Share Business Plan for future expansion of the system. CSU desires 10 to 15 stations on its Main Campus but currently has no plans for stations at the CSU Foothills Campus. Additionally, three high quality locations for bike share stations were identified in the Bike Share Business Plan in the West Elizabeth Street study area: near the Plum Street/City Park Avenue intersection, in Campus West and near the commercial land uses at the West Elizabeth Street/Taft Hill Road intersection.

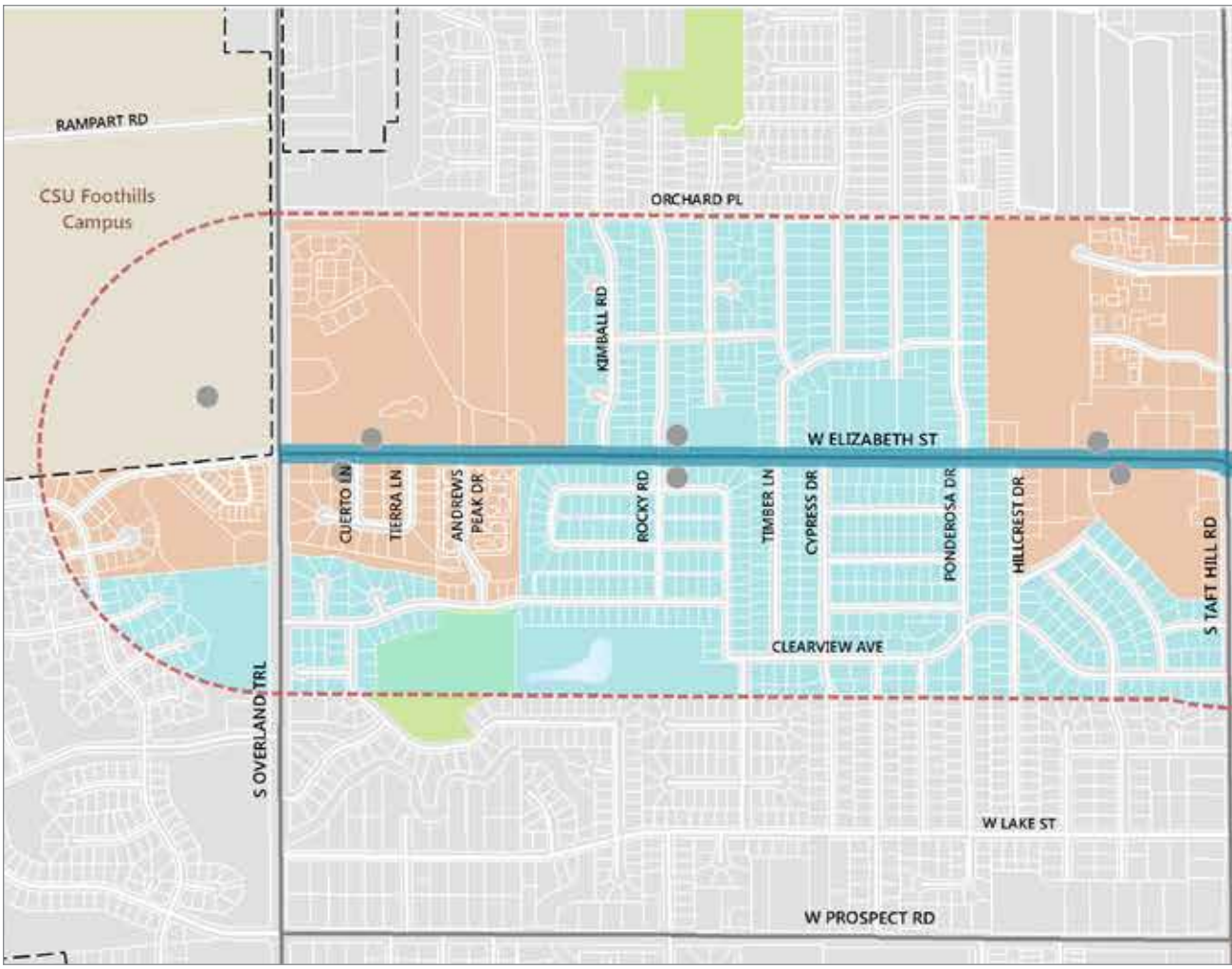
Figure 23: Recommended Design Cross Sections:
Constitution Avenue and Plum Street



Section: Plum Street/Constitution Avenue west of City Park Avenue


WAIT HERE

Figure 24: Parking Management Focus Areas:
Parking management, either in the form of a Residential Parking Permit Program or a parking district, will help discourage undesired park-n-ride activity.




ORCHARD PL
BIRCH ST
W LAUREL ST
University
Village Complex
W PLUM ST
W PLUM ST
GLENMOOR DR
MOBY DR
MEADOWBROOK DR
GLENMOOR DR
CRAGMORE DR
CASTLEROCK DR
SKYLINE DR
CONSTITUTION AVE
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
S SHIELDS ST
CSU
Main Campus
SOUTH DR
1/4 Mile Study Corridor Buffer
Parking Management District Focus Areas
Residential Parking Permit Program Focus Areas
MAX Station (Phase 4)
West Elizabeth Street Study Corridor
City Boundary

Figure 25: Car Share:
Additional car share in the corridor will provide additional mobility options without owning a car.

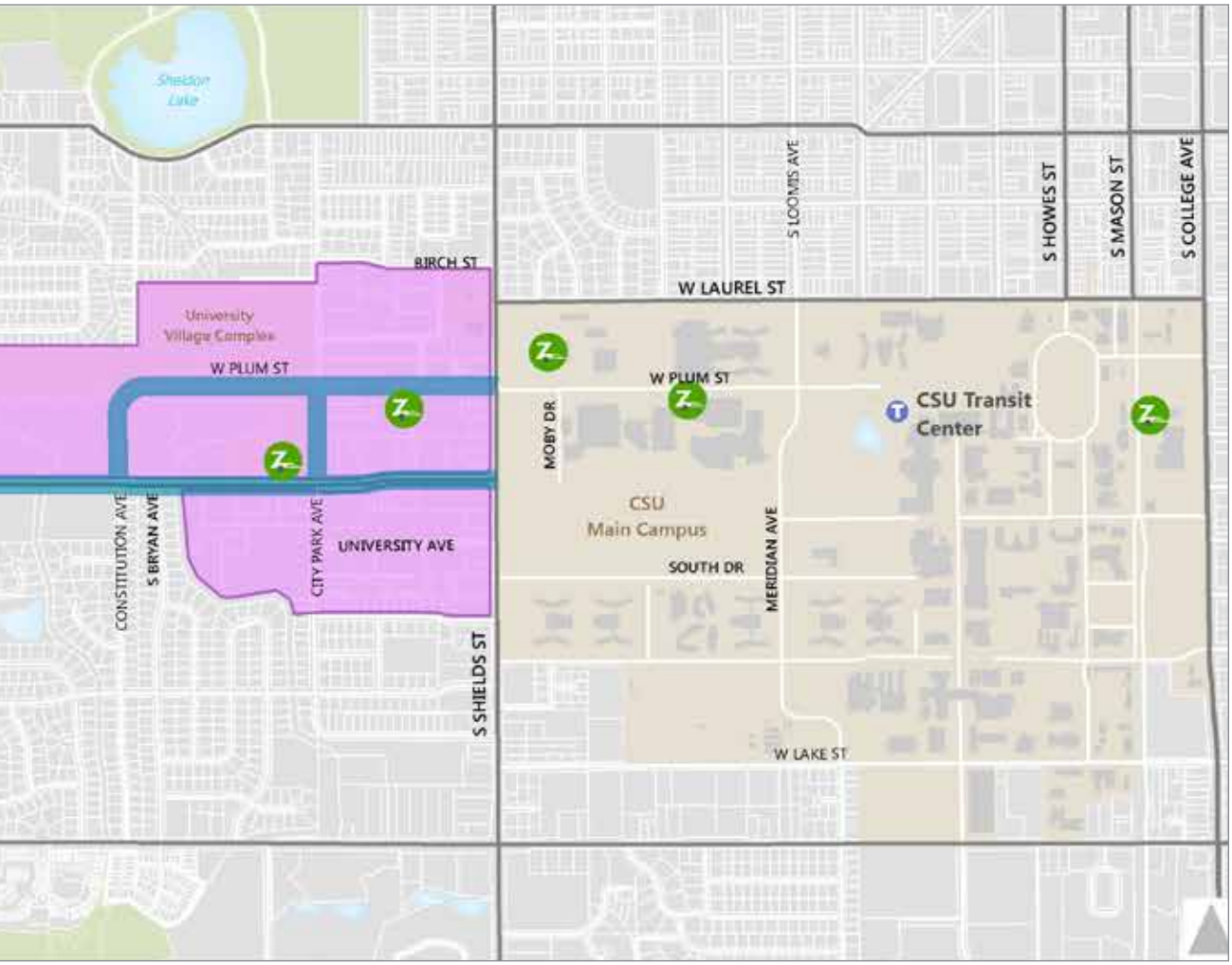
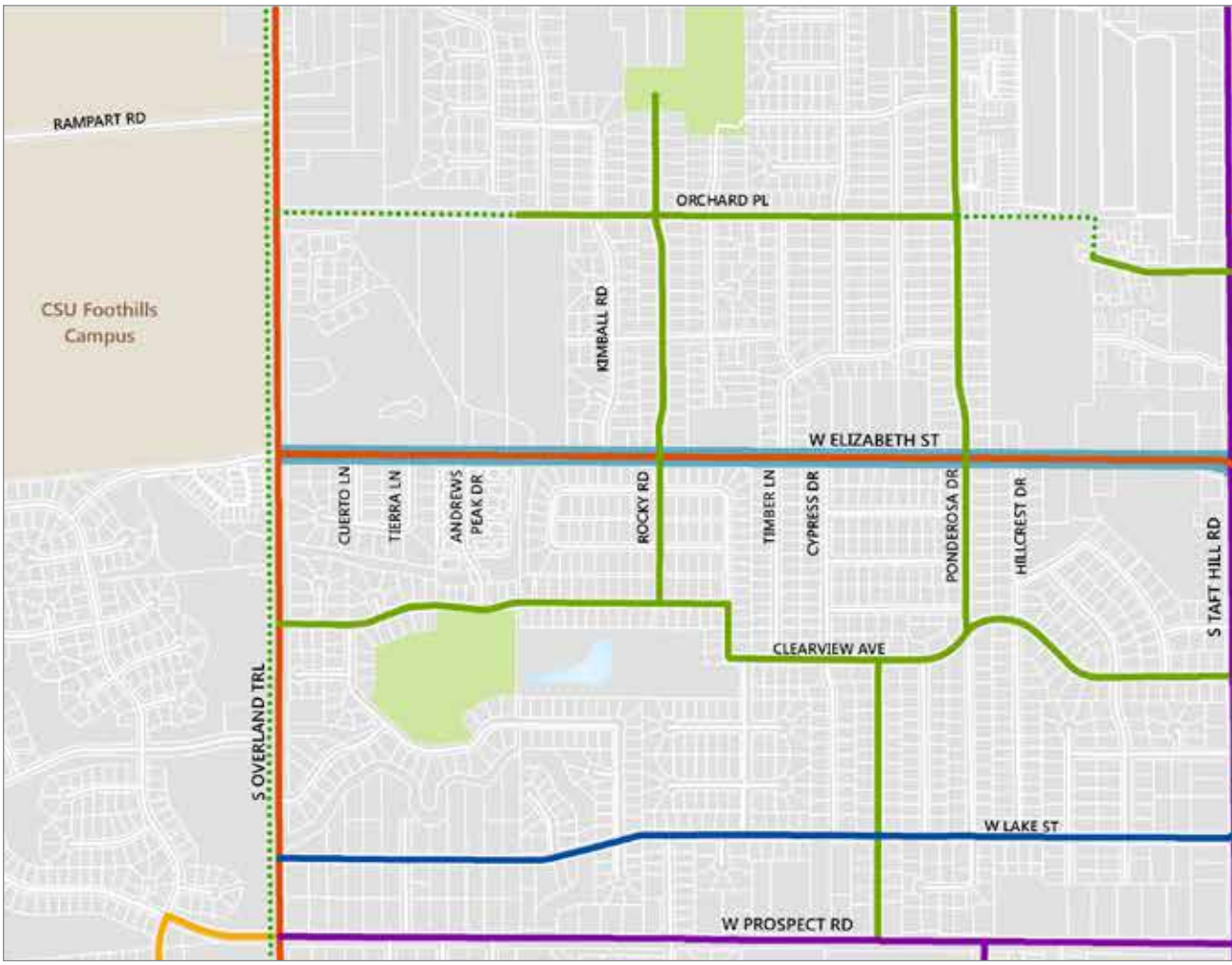
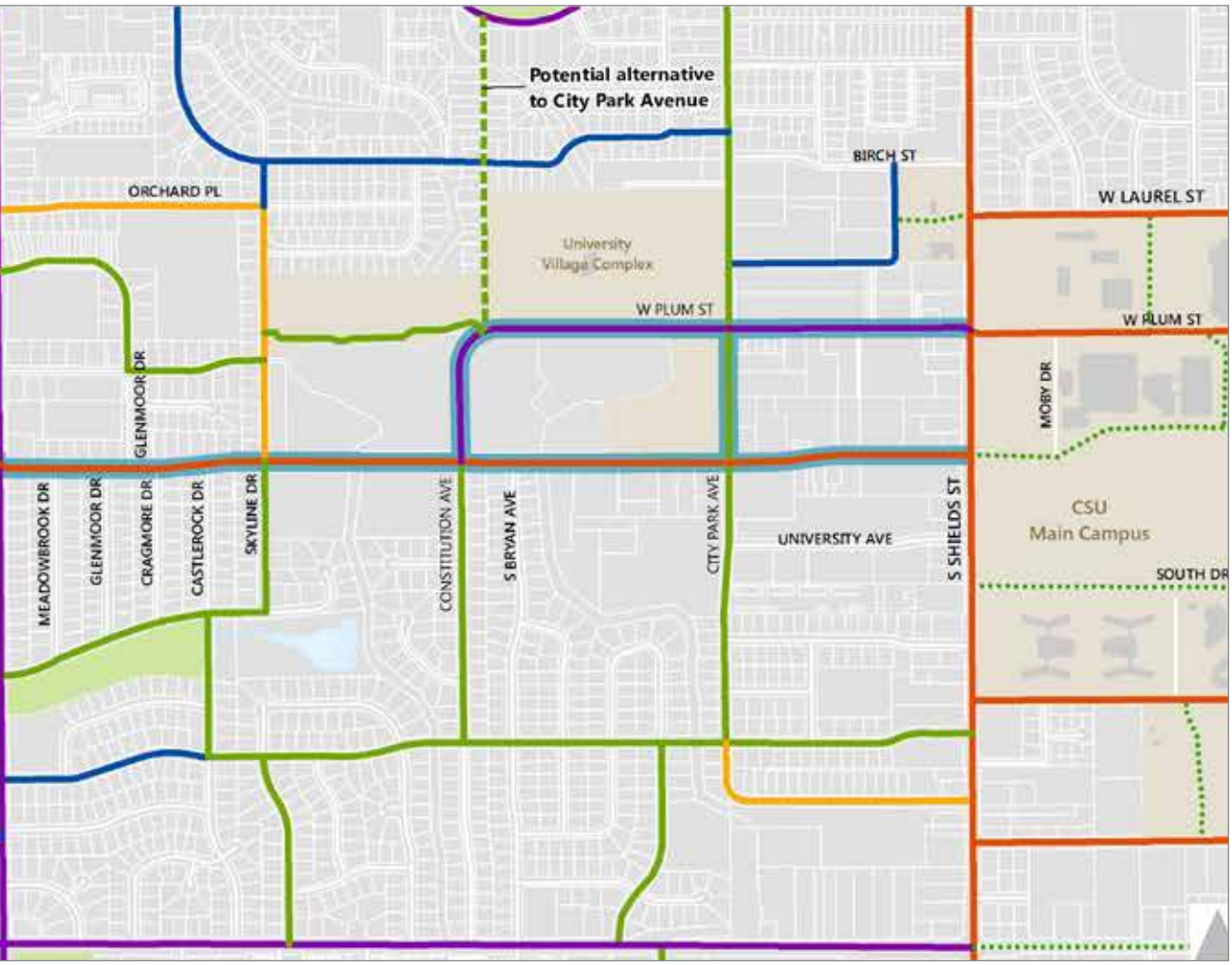

Sheldon Lake
BIRCH ST
University Village Complex
W PLUM ST
CONSTITUTION AVE
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
S SHIELDS ST
S LOOMIS AVE
W LAUREL ST
S HOWES ST
S MASON ST
S COLLEGE AVE
MOBY DR
W PLUM ST
CSU Transit Center
CSU Main Campus
SOUTH DR
MERIDIAN AVE
W LAKE ST
Existing Zipcar Location
Proposed Car Share Focus Area
West Elizabeth Street Study Corridor
City Boundary

Figure 26: Bike Network:
The West Elizabeth Enhanced Travel Corridor Plan is designed to integrate seamlessly with the citywide bicycle network.



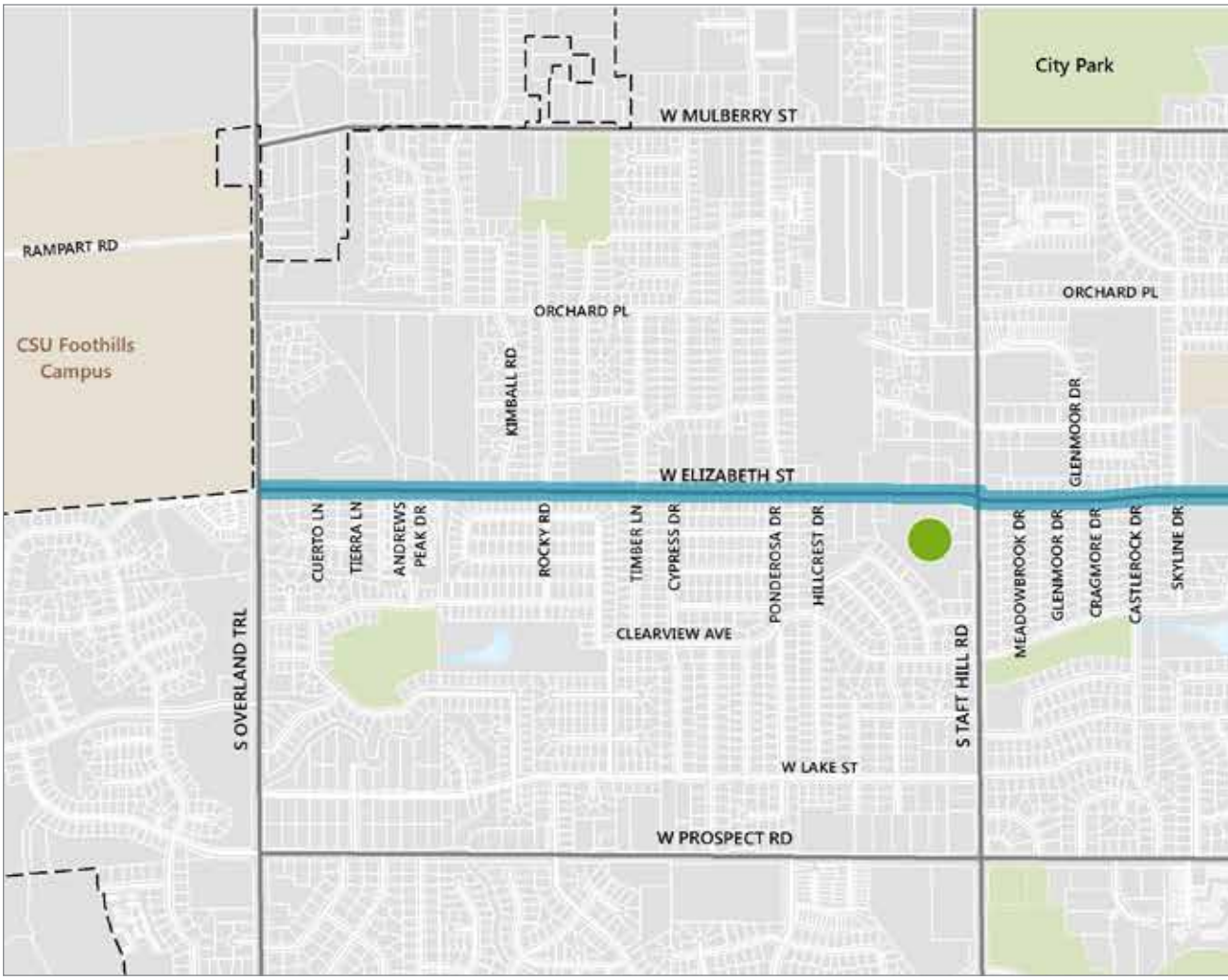


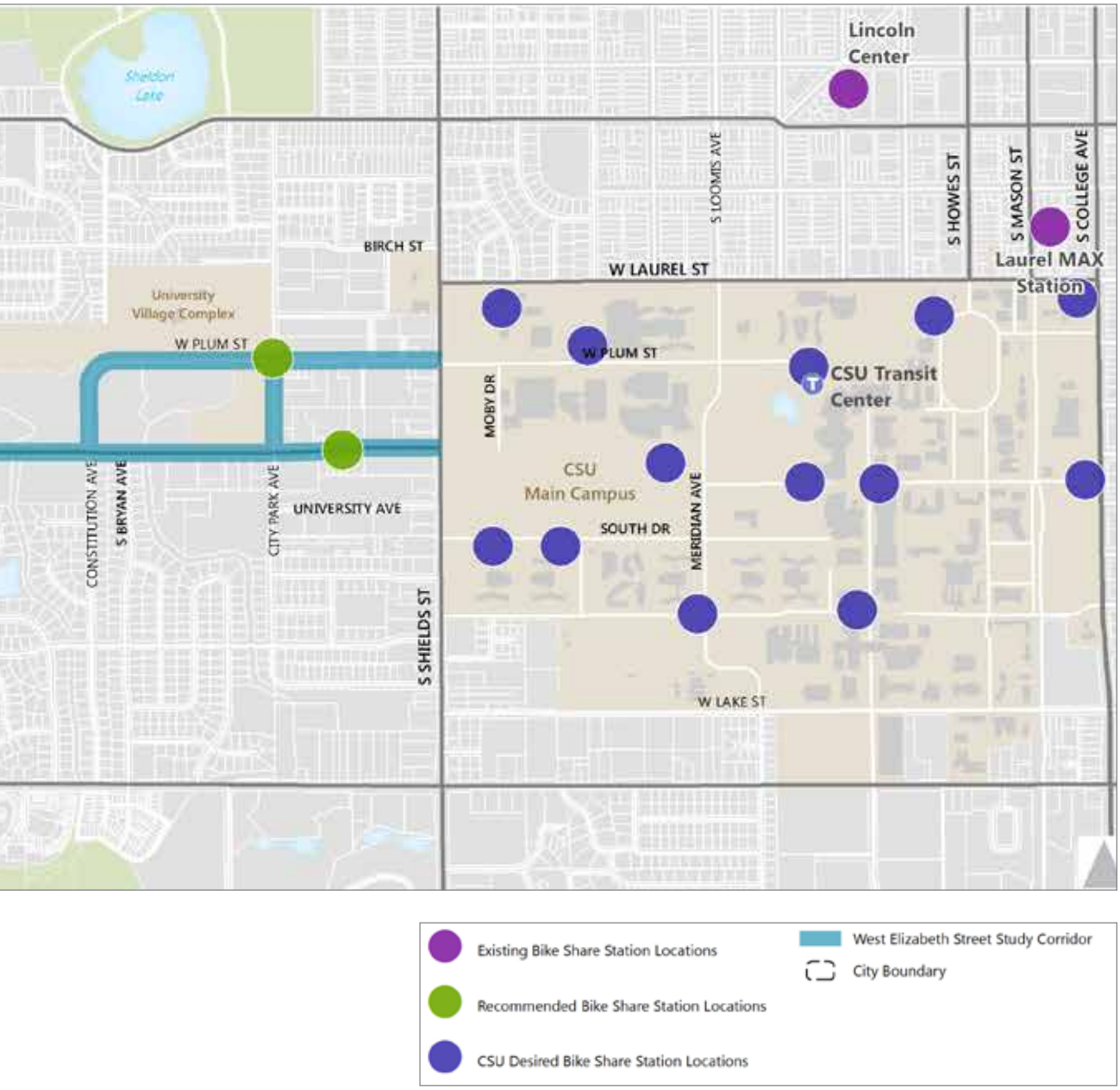
Bicycle Network Full Build Plan

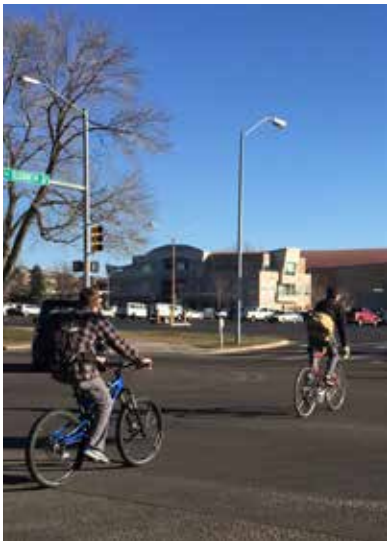
- Buffered Bike Lane
- Bike Lane
- Neighborhood Greenway
- Neighborhood Greenway Alternative
- Protected Bike Lane
- Shared Lane Markings
- Shared-Use Path
- West Elizabeth Street Study Corridor
- City Boundary

Source: Fort Collins Bicycle Master Plan, 2014 (with updates from the West Elizabeth Enhanced Travel Corridor project)

Figure 27: Bike Share:
Bike share on the CSU Main Campus and on the West Elizabeth Street corridor will provide an additional mobility option in the area.




Sheldon Lake
Lincoln Center
S LOOMIS AVE
S HOWES ST
S MASON ST
S COLLEGE AVE
Laurel MAX Station
BIRCH ST
W LAUREL ST
University Village Complex
W PLUM ST
W PLUM ST
MOBY DR
CSU Transit Center
CSU Main Campus
CONSTITUTION AVE
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
SOUTH DR
MERIDIAN AVE
S SHIELDS ST
W LAKE ST
Existing Bike Share Station Locations
Recommended Bike Share Station Locations
CSU Desired Bike Share Station Locations
West Elizabeth Street Study Corridor
City Boundary



FULFILLING THE PROJECT VISION

The Recommended Design was specifically developed to the fulfill project Vision:

- **Be unique and adaptable** to the distinctive characteristics of each corridor segment

  The Recommended Design is context sensitive proposing different treatments throughout the corridor.
  Examples include:
  Phased implementation – improvements are recommended to be phased-in over time and as properties redevelop to adapt to the changing demands in the corridor, including transit service and bicycle and pedestrian facilities.)

  Bicycle facility design – protected and buffered bike lanes adapt to the context of the surrounding area.

  Sidewalk network – pedestrian facilities differ throughout the corridor to create a complete pedestrian network while minimizing impacts to private property.

  Travel lanes – the number of travel lanes in the corridor varies depending on traffic volumes.

- **Be safe and comfortable** for all users

  The Recommended Design emphasizes safety and comfort by integrating the following improvements:
  Bus stop islands – convenient, easily accessible bus stops with enhanced amenities to improve patron comfort and safety.

  Bicycle facility design – protected or buffered bike lanes and the pilot of a protected intersection at West Elizabeth Street/ City Park Avenue improve comfort and safety for people biking.

  North/south crossings – additional north/south crossings are recommended to improve the comfort and safety of crossing West Elizabeth Street.

Street design – medians, parkways, pedestrian crossings and a roundabout are recommended to calm traffic and reduce conflict points between users.

- **Encourage and prioritize public transportation** and active transportation options

  The Recommended Design encourages and prioritizes public transportation and active transportation options through the following treatments:

  Premium/high-frequency transit service – transit service is high-frequency with enhanced passenger amenities, including bus stop islands that help reduce bus dwell time and delay pulling back into traffic

  Protected/buffered bike lanes and bus stop islands – bicycling is encouraged by improved separation from vehicles via protected/buffered bike lanes and a bike lane behind bus stop islands

  Sidewalk network – the pedestrian environment is improved to help encourage more walking in the corridor

- **Support the interconnectivity** of all modes

  The Recommended Design supports interconnectivity for all modes through the following:

  Improved bus stops – integration of bike parking and premium passenger amenities at stops make it easier to walk or bike to transit.

Park-n-Ride and future parking considerations – a Park-n-Ride is recommended at the CSU Foothills Campus Equine Center to decrease the need for people driving from far away to park at CSU Main Campus. Additionally, a parking district is recommended at key areas in the corridor to decrease informal park-n-ride activity as transit service is enhanced.

- **Be a beautiful and vibrant** corridor

  The Recommended Design provides for a beautiful and vibrant corridor through the following enhancements:

  Sidewalk network – the pedestrian environment is improved to include parkways with landscaping between the sidewalk and adjacent travel lanes.

  Street design – the street design includes medians with landscaping to help beautify the corridor.

  Urban design – unique, artful urban design elements will be incorporated into the public realm and the private realm.

  Redevelopment – future redevelopment in the Campus West area will provide privately-owned public spaces that foster a vibrant environment for corridor visitors.

Appendix F describes how the West Elizabeth Enhanced Travel Corridor Plan responds to the Project Need.

Figure 28: Multi-modal Level of Service (MMLOS) Before/After: Bicycle
MMLOS for bicyclists significantly improves with implementation of the Recommended Design.

Bicycle LTS

- 1
- 2
- 3
- 4
- 5

LTS applies the same methodology that is used in the 2014 Bicycle Master Plan. The score from 1-5 represents the level of bicyclist comfort based on traffic volume, speed, number of lanes, and presence and quality of the bikeway.

Figure 29: Multi-modal Level of Service (MMLOS) Before/After: Pedestrian

MMLOS for pedestrians significantly improves with implementation of the Recommended Design.

Pedestrian LOS

- 2 - 5 (Low)
- 6 - 7
- 8 - 10 (Medium)
- 11 - 12
- 13 - 15 (High)

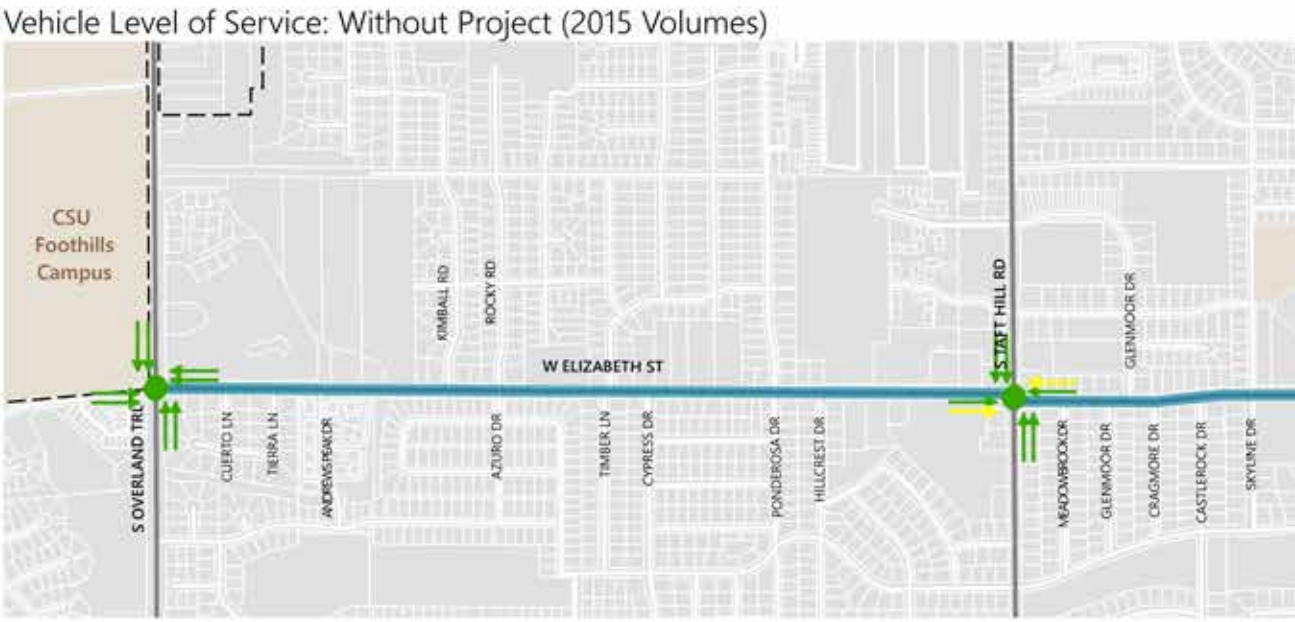
The pedestrian score is based on sidewalk width, buffer width and distance to the nearest crossing.

Figure 30: Multi-modal Level of Service (MMLOS) Before/After: Motor Vehicle

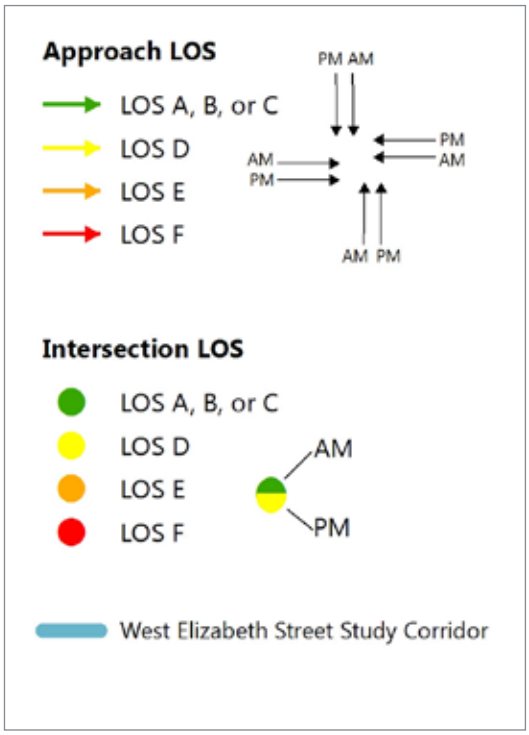
Vehicular Level of Service: Existing Volumes (2015) with Existing Conditions and Vehicular Level of Service: Existing Volumes (20

Level of Service for vehicles is maintained at a reasonable level with implementation of the Recommended Design.

Appendix G *includes detailed traffic operations calculations for 2015 and 2040 conditions.*



015) with Recommended Design.



Potential Underpass Under Consideration (Designed by Others and not yet Detailed or Complete)

Known Critical Issues to be Addressed Include:
- Business Access
- Driveway Crossings
- Connectiions to Mid-Block Crossing

THE RECOMMENDED DESIGN'S DEVELOPMENT IS IMPLEMENTABLE IN THREE KEY PHASES. ADDITIONALLY, THE ENHANCED TRAVEL CORRIDOR PLAN IS PREPARED TO BE ADAPTABLE TO FUTURE CHANGES THAT MAY AFFECT THE CORRIDOR.

section 5
IMPLEMENTATION

Implementing the West Elizabeth Enhanced Travel Corridor Plan will take many years. During this time, the City will implement early project phases, conduct further planning and environmental studies, refine the Recommended Design, and pursue a variety of funding sources.

RECOMMENDED DESIGN PHASING

A key principle that guided the Recommended Design's development was that it should be implementable in phases. The plan for implementation of the Recommended Design presented here includes three main phases, although the Recommended Design may ultimately be implemented as multiple projects depending on the availability of funding. Additionally, the Enhanced Travel Corridor Plan is prepared to be adaptable to future changes that may affect the corridor.

Technicalanalysisandthepublicprocesshelpedshapethetransitservicechanges,whichare focusedonthehighestdemandareaofthecorridor.The2016transitserviceincludesnewand modified routes as well as existing routes.

The **first phase** includes transit service changes, bus stop consolidation and upgrades, and an improved bicycle/pedestrian crossing of West Elizabeth at Skyline; these changes were implemented starting in August 2016.

The interim design implements elements that address the highest need, such as sidewalk and bike lane gap closures and additional transit service. This is the **second phase.** A budget offer in the City's biennial budget process, Budgeting for Outcomes, for 2017-18 has been submitted to fund the interim design. The budget will be finalized in fall 2016; however, it cannot currently be guaranteed that the interim design will be included.

Building upon the first and second phases, completion of the Recommended Design is the **third phase.** Because funding for further design and construction has not yet been secured, there is currently no estimate of when the Recommended Design will be complete. Planning for redevelopment, particularly in Campus West, ensures that the corridor is adaptable to future change.

PROPOSED FOR 2016	INTERIM IMPROVEMENTS	RECOMMENDED DESIGN
■ Tweak to improve upon the existing transit service ■ Skyline crossing relocation/improvement	■ Transit service and amenity improvements ■ Completion of the bike network ■ Completion of the sidewalk network (minimum standards)	■ High-frequency transit service ■ Protected/buffered bike lanes and protected intersection ■ Enhance pedestrian network (detached sidewalks) ■ Roundabout at Overland and access management improvements ■ Upgraded and new north-south crossings
		WHAT IF CAMPUS WEST REDEVELOPS? ■ BRT-like transit service ■ Changes in the Campus West Area
COST ESTIMATES <$	$$	$$$$$

2016 Transit Service Changes

In August 2016 Transfort implemented a variety of transit service changes to improve the capacity and reliability of transit service in the West Elizabeth Street study area. Technical analysis and the public process helped shape the transit service changes, which are focused on the highest demand area of the corridor, on West Elizabeth Street between Ponderosa Drive and the CSU Main Campus. The 2016 transit service includes new and modified routes as well as existing routes.

New and modified routes:

Route 3: a new radial route that will run east/west along West Elizabeth Street and Plum Street from West Elizabeth Street/Ponderosa Drive intersection to the CSU Transit Center.

Route 33 (CSU Foothills Campus Shuttle): a new radial route connecting the CSU Foothills Campus to the CSU Main Campus utilizing Mulberry Road and Laporte Avenue.

Existing routes that will remain:

Route 2: the existing loop route that runs south on Shields Street, west along Prospect Road, north on Overland Trail and then east on West Elizabeth Street back to the CSU Transit Center.

Route 31: the existing radial route that connects the Plum Street neighborhood to the CSU Transit Center.

Route 32: the existing loop route that runs west along West Elizabeth Street, south on Overland Trail, then east on Prospect Road back to the CSU Transit Center.

The HORN: the on-campus circulator route that links the CSU South Campus to the CSU Main Campus, including the Lory Student Center and Moby Arena.

In addition to new and modified routes, three existing bus stops on West Elizabeth Street will be consolidated with nearby stops to improve bus travel time and reliability.

KEY ELEMENTS 2016 TRANSIT SERVICE CHANGES

- Route 3, a direct, radial route from between Ponderosa Drive and CSU
- The Foothills Campus Shuttle, directly between the CSU Transit Center and the CSU Foothills Campus

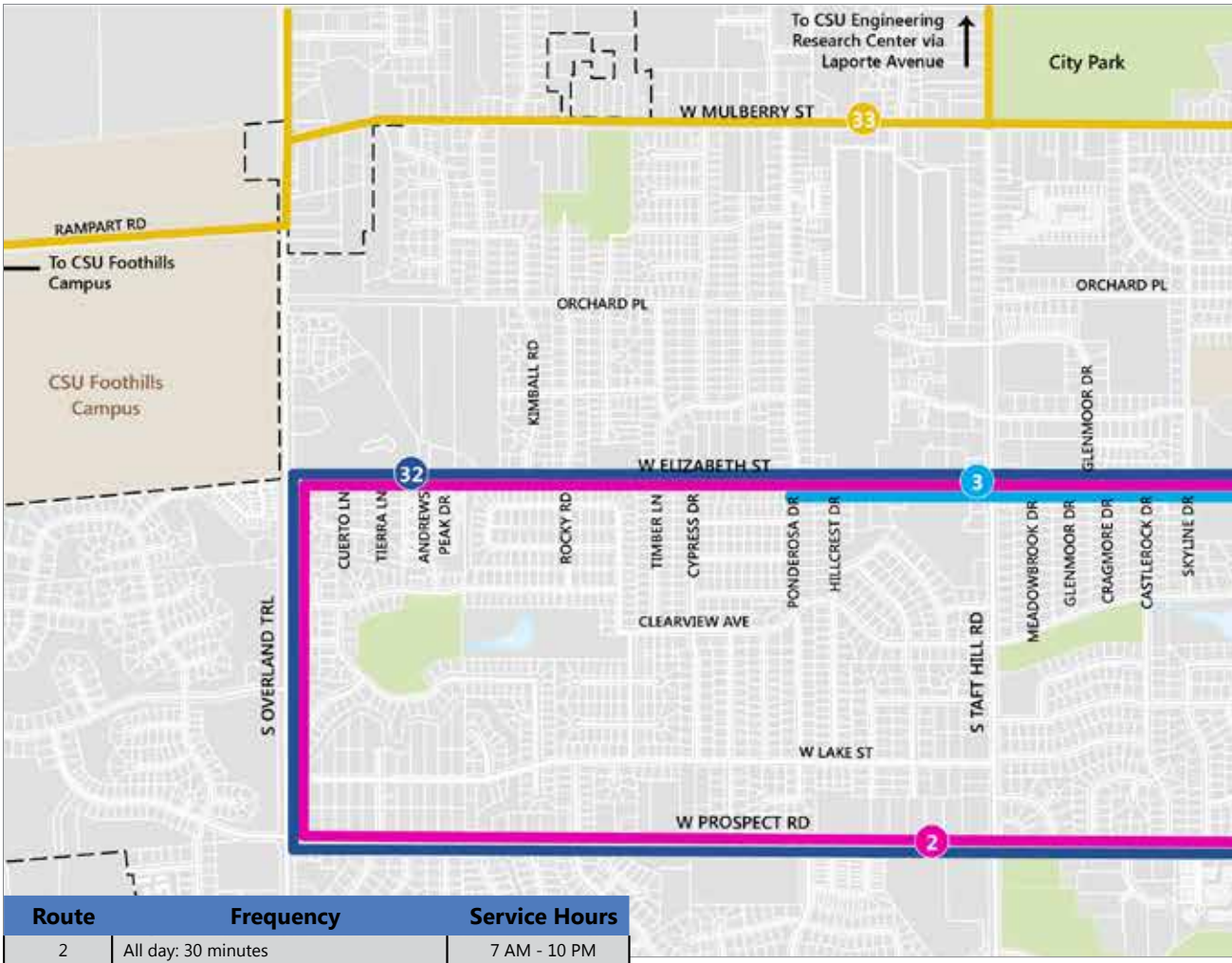
Table 2 shows frequencies, service hours and service enhancements during peak periods of demand for transit service as a part of the 2016 transit service changes.

Table 2: *2016 Transit Route Frequencies & Service Hours*

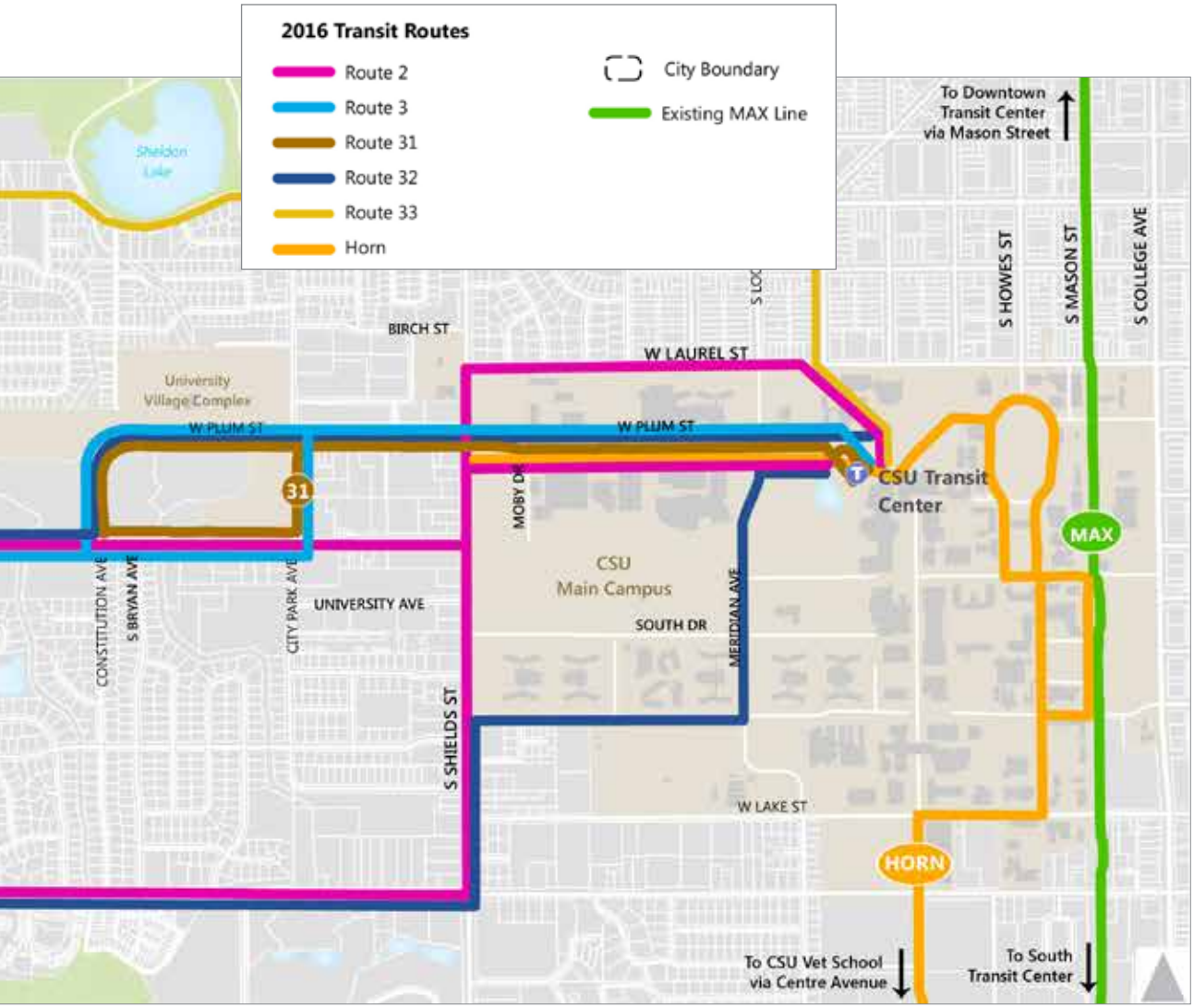
Route	Frequency (CSU out of session, if service changes)	Hours	Peak Period Service Enhancements
2	All day: 30 minutes	7:00 AM – 7:00 PM	Trailer bus during morning hours when CSU is in session
3	All day: 15 minutes (All day: 30 minutes)	7:00 AM – 10:00 PM	N/A
31	All day: 10 minutes[1]	7:00 AM – 7:00 PM	Trailer buses during morning hours (2 additional) and afternoon hours (1 additional) when CSU is in session
32	All day: 30 minutes[1]	7:00 AM – 7:00 PM	Trailer bus during morning hours when CSU is in session
33	All day: 60 minutes[1]	7:00 AM – 7:00 PM	N/A
HORN	All day: 10 minutes[1] (All day: 30 minutes)	7:00 AM – 7:00 PM	N/A

Notes: 30 series routes only operate when CSU is in session.

Figure 31: 2016 Proposed Transit Routes:
Transfort implemented these service changes in August 2016.



Route	Frequency	Service Hours
2	All day: 30 minutes	7 AM - 10 PM
3	All day: 15 minutes All day (CSU out of session): 30 minutes	7 AM - 10 PM
31	All day: 10 minutes	7 AM - 7 PM
32	All day: 30 minutes	7 AM - 7 PM
HORN	All day: 10 minutes All day (CSU out of session): 30 minutes	7 AM - 7 PM
Foothills Campus Shuttle	All day (CSU out of session): 60 minutes	7 AM - 7 PM


2016 Transit Routes
Route 2
Route 3
Route 31
Route 32
Route 33
Horn
City Boundary
Existing MAX Line
Sheldon Lake
University Village Complex
BIRCH ST
W LAUREL ST
W PLUM ST
W PLUM ST
31
CONSTITUTION AVE
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
MOBY DR
CSU Main Campus
SOUTH DR
MERIDIAN AVE
S SHIELDS ST
W LAKE ST
CSU Transit Center
To Downtown Transit Center via Mason Street
S HOWES ST
S MASON ST
S COLLEGE AVE
MAX
HORN
To CSU Vet School via Centre Avenue
To South Transit Center

KEY ELEMENTS OF THE INTERIM DESIGN:

- Complete, ADA-compliant sidewalks
- Complete bike lanes between Shields Street and Taft Hill Road
- Additional transit service

Phase Two - Interim Design

A budget request has been submitted for the interim design, which includes elements of the Recommended Design with the highest need, such as sidewalk gap closures, ADA-compliant curb ramps, bike lane gap closures and additional transit service. These improvements have been proposed to be funded through the City's biennial budget for 2017-18. The budget will be finalized in fall 2016; however, it cannot currently be guaranteed that the interim design will be included. The elements in the interim design are formed such that the full Recommended Design can later be constructed with minimal throwaway costs.

For people riding transit, routes in the study area will be implemented similar to the Recommended Design although some routes themselves change and other routes have lower frequencies.
The CSU Foothills Campus Shuttle will continue to operate between the CSU Transit Center and CSU Foothills Campus destinations off of Rampart Road and Laporte Avenue (in the Recommended Design, the CSU Foothills Campus Shuttle will operate exclusively on the CSU Foothills Campus once an on campus roadway connection is available between Rampart Road and Laporte Avenue). **Table 3** shows frequencies and vehicle types for the transit routes in the study area after implementation of the interim design.

Transit Signal Priority at signalized intersections will be implemented with the interim design. Basic bus stop amenities, including ADA-compliant platforms and signage, will be constructed. Lastly, the City is working with CSU to make improvements to the CSU Foothills Campus Equine Center facility to provide for a Park-n-Ride and transit turnaround which will significantly improve transit operations efficiency and provide a Park-n-Ride opportunity for CSU students, faculty and staff.

For people biking green colored pavement will be added to conflict zones where people biking have the right-of-way. Two-stage turn queue boxes will be installed at City Park Avenue as an interim solution (until implementation of the pilot protected intersection) and at Constitution Avenue. Bike lane gaps will be closed throughout the corridor, including the existing gaps at the Taft Hill Road intersection and on the north side of West Elizabeth Street west of Hillcrest Drive. For people walking or using mobility devices ADA-compliant sidewalks and curb ramps will be completed along West Elizabeth Street. These sidewalk gaps are primarily between Skyline Drive and Taft Hill Road (on the south side of West Elizabeth Street) and between Hillcrest Drive and Andrews Peak Drive (on the north side of West Elizabeth Street).

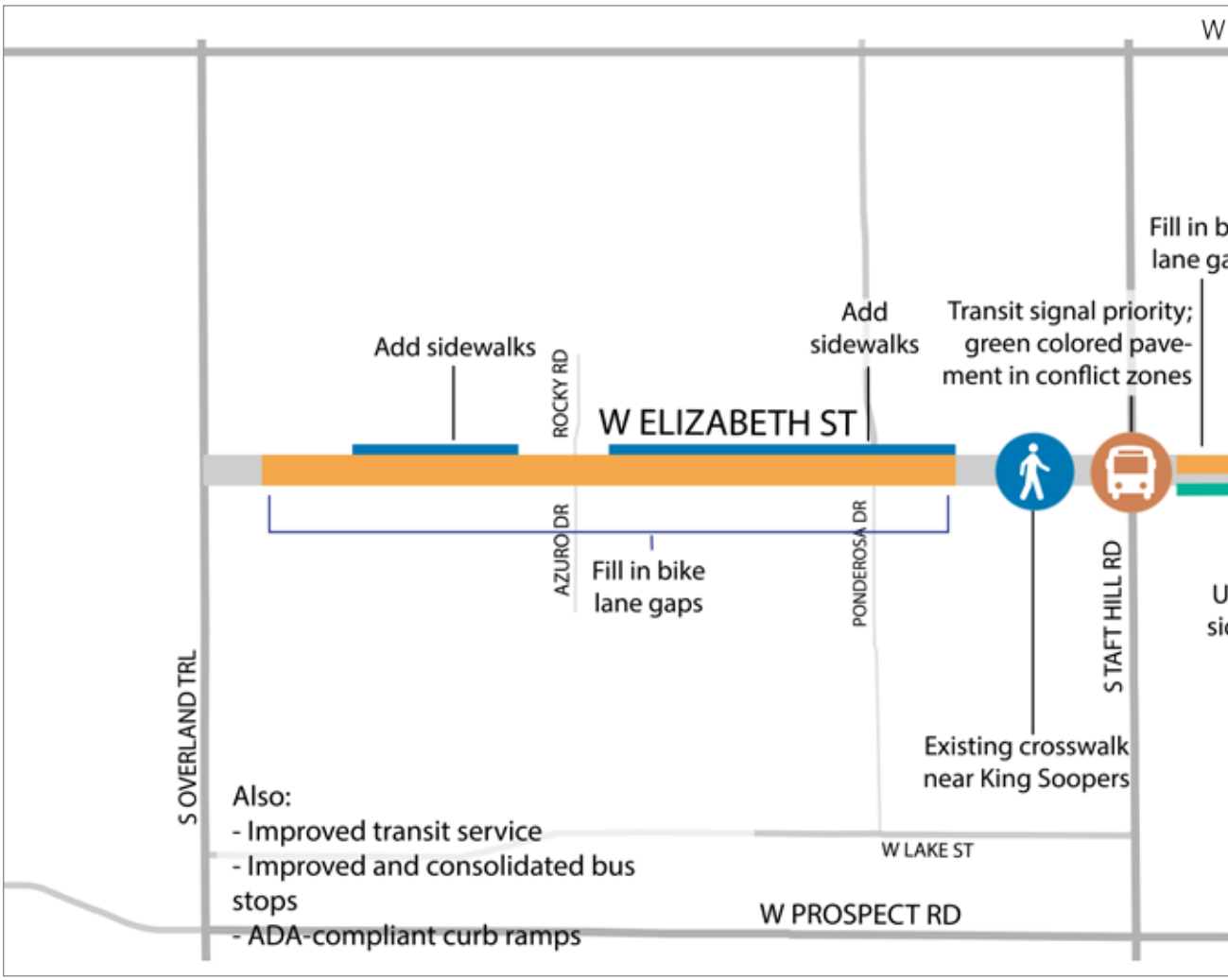
Table 3: *Interim Design Transit Route Frequencies, Service Hours & Vehicles Types*

Route	Frequencies	Service Hours	Vehicle Type
2	All day: 30 minutes	7 AM - 7 PM	Standard Transfort buses
3	AM-PM Peak: 15 minutes Evening: 30 minutes	7 AM – 10 PM	Standard Transfort buses
31	All day: 10 minutes	7 AM – 7 PM	Standard Transfort buses
HORN	AM-PM Peak: 10 minutes Evening: 20 minutes	6:30 AM – 8 PM	Standard Transfort buses
33 (CSU Foothills Campus Shuttle)	All day: 60 minutes	7 AM – 7PM	25 passenger shuttle bus

Notes: 30 series routes only operate when CSU is in session.

Figure 32: Interim Improvements At-A-Glance:
The interim design includes elements of the Recommended Design with the highest need, such as sidewalk gap closures, ADA-compliant curb ramps, bike lane gap closures and additional transit service.

Appendix E includes a conceptual, aerial view of the interim design.



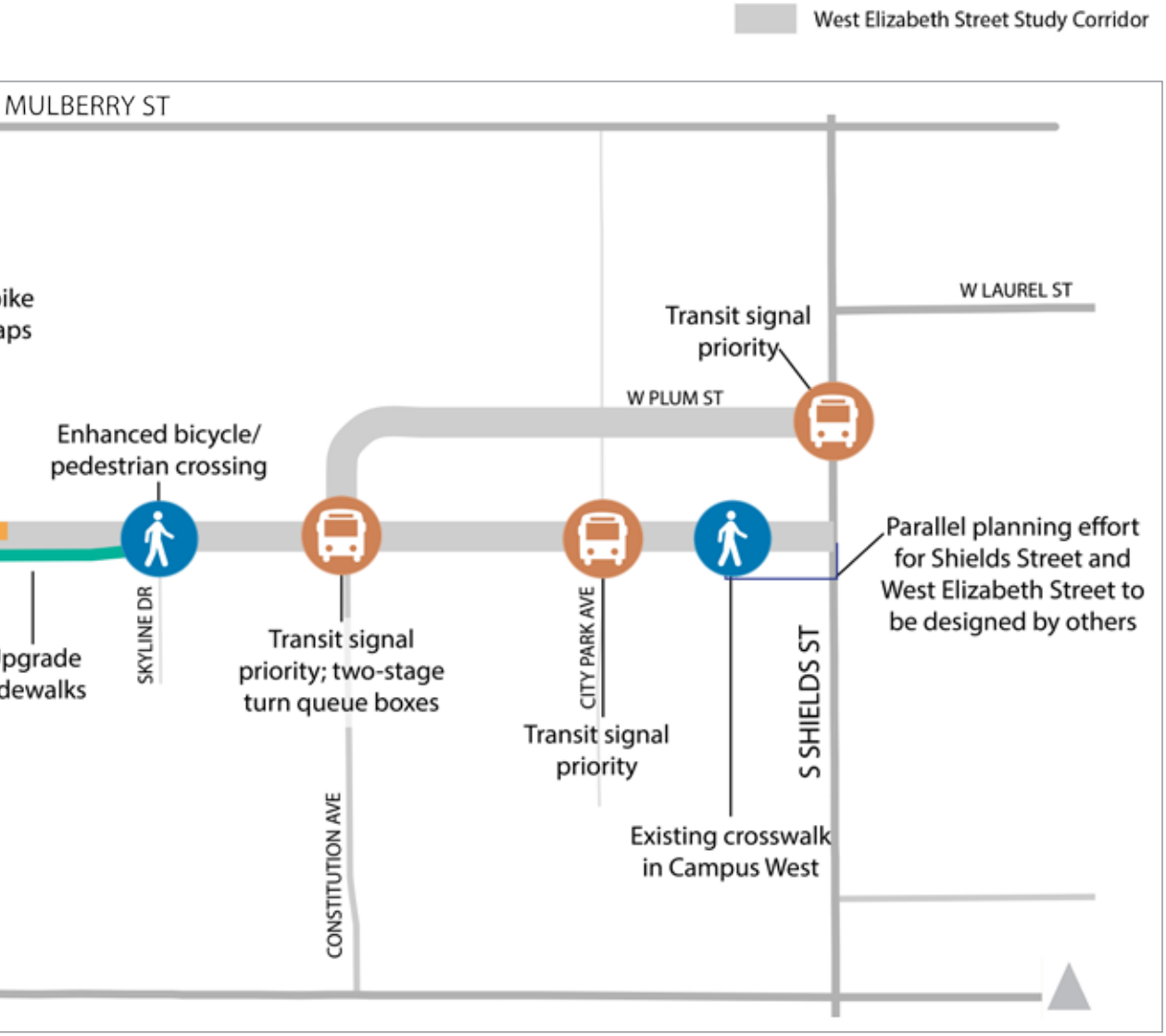
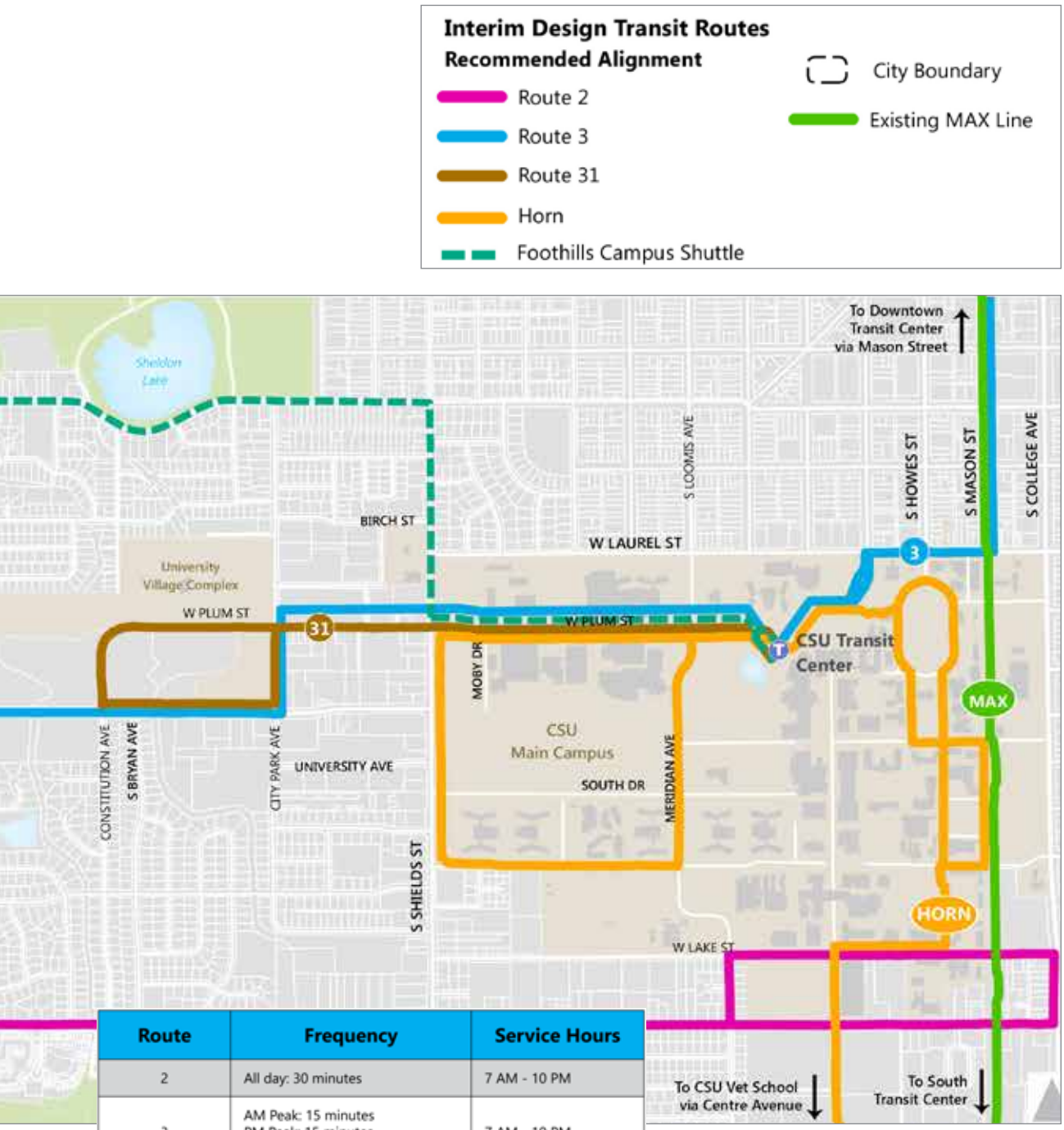
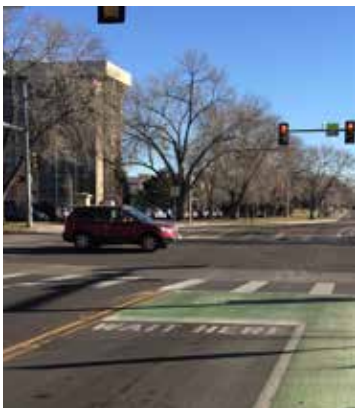

West Elizabeth Street Study Corridor
MULBERRY ST
W LAUREL ST
Transit signal priority
W PLUM ST
Enhanced bicycle/ pedestrian crossing
SKYLINE DR
Transit signal priority; two-stage turn queue boxes
CITY PARK AVE
Transit signal priority
S SHIELDS ST
Parallel planning effort for Shields Street and West Elizabeth Street to be designed by others
CONSTITUTION AVE
Existing crosswalk in Campus West

Figure 33: Interim Design Transit Routes:
Transit service with the interim design will include more efficient transit routing so that Transfort can more cost-effectively provide higher frequency service in the area.



Route	Frequency	Service Hours
2	All day: 30 minutes	7 AM - 10 PM
3	AM Peak: 15 minutes PM Peak: 15 minutes Evening: 30 minutes	7 AM - 10 PM
31	All day: 10 minutes	7 AM - 7 PM
HORN	AM Peak: 10 minutes PM Peak: 10 minutes Evening: 20 minutes	6:30 AM - 8 PM
Foothills Campus Shuttle	All day: 60 minutes	7 AM - 7 PM



COST ESTIMATES & FUNDING SOURCES

Cost estimates include both capital costs and ongoing operations and maintenance expenses. Detailed cost estimates are included in Appendix H.

Capital Cost Estimates

Capital costs to implement the West Elizabeth Enhanced Travel Corridor Plan include the costs of final design, infrastructure construction and transit vehicles. The cost estimates of each phase are:

- Interim Design **(second phase)**

  Design - $300,000

  Infrastructure costs – $1.4-$2.6 million ($2.0 million most probable cost)

  Transit vehicles – one additional vehicle necessary at approximately $400,000 each

- Recommended Design **(third phase)**

  Design - $2-4.5 million

  Infrastructure costs – $13.0-24.3 million ($18.7 million most probable cost)

  Transit vehicles – four additional vehicles necessary at approximately $400,000 each

- Recommended Design's planning for redevelopment

  Infrastructure costs – $1.2-2.3 million ($1.7 million most probable cost)

  Transit vehicles – five BRT vehicles necessary (including one spare) at approximately $800,000 each

  BRT-like amenities – 12-14 stations at approximately $100,000-250,000 per station

Ongoing Cost Estimates

As elements of the West Elizabeth Enhanced Travel Corridor Plan are implemented, ongoing costs associated with operations and maintenance of new facilities and services will need to be identified and included in ongoing budgets.

Operating Expenses

The Plan recommends significant improvements to the transit service in the West Elizabeth Street corridor study area. Ongoing annual cost estimates for each phase are:

Near-term 2016 transit service changes **(first phase)** – an additional $160,000 per year is being shifted from an under performing route to fund the 2016 transit service changes on West Elizabeth Street.

Interim Design **(second phase)** - $2.05 million

Recommended Design **(third phase)** - $7.31 million

Recommended Design's planning for redevelopment $7.63 million

The West Elizabeth Street Enhanced Travel Corridor Plan's Recommended Design includes a diverse set of projects that require an equally diverse and resourceful plan to implement.

Maintenance Considerations

Some high quality elements, such as protected bike lanes, new landscape medians and potential custom transit station amenities, will require more time to maintain and may require the purchase of specialized equipment, incurring higher maintenance costs. For example, based on analysis completed for the ***Bicycle Master Plan,*** the Fort Collins Streets Department estimated that it costs $17,900 per year to sweep and plow one mile of protected bike lane (compared to $3,970 per year to sweep and plow one mile of standard bike lane).

As elements go through final design, the project management team shall work closely with the Transfort, Streets Department, Forestry, and the Parks Department to identify mitigation requirements, context appropriate materials, and maintenance responsibilities. Cost estimates based on the final design and the maintenance considerations will be integrated into future budget requests at the time the recommended facilities are built. Additional information on maintenance costs is included in **Appendix H.**

Funding Sources

The West Elizabeth Street Enhanced Travel Corridor Plan's Recommended Design includes a diverse set of projects that require an equally diverse and resourceful plan to implement.

Table 4 shows funding recommendations for all three phases of the project.

As new funding opportunities arise out of federal, state or local actions, momentum and progress on the corridor add tremendous weight to those awarding grants or prioritizing funding.

The phases identified in **Table 4** are not necessarily consecutive and will have periods of overlap. For example, the National Environmental Policy Act (NEPA) process could begin relatively soon and last a year or more. Meanwhile Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants and other grants should be pursued. An important and complex corridor like West Elizabeth Street will need an ongoing champion who is dedicated to aggressively pursue funding and overall project support.

Table 4: *Funding Sources*

Phase	Potential Source(s)	Implementation Steps or Actions
2016 Transit Service Changes (first phase)	N/A – does not require additional funding	Transfort to implement transit service changes in 2016
Interim Design (second phase)	Budgeting for Outcomes for infrastructure Congestion Mitigation and Air Quality Improvements (CMAQ) Program for transit service upgrades and/or transit signal priority	Apply during the CMAQ call for projects, summer 2016
Recommended Design (third phase)	Transportation Alternatives Program (TAP) or Great Outdoors Colorado (GOCO) for smaller-scale projects Transportation Investment Generating Economic Recovery (TIGER) or Building on Basics (BOB) 3.0 for corridor-wide improvements	Apply during the TAP call for projects, summer 2016
Planning for Redevelopment	Federal Transit Authority (FTA) Section 5309 (Small Starts) for Bus Rapid Transit CMAQ for Bus Rapid Transit TIGER for Bus Rapid Transit	Conduct a field review with FTA Region 8 staff, summer 2016 Initiate a NEPA process along the corridor based on FTA recommendation

TRACKING PERFORMANCE

As elements of the West Elizabeth Enhanced Travel Corridor Plan are implemented, tracking the corridor's performance will be important for demonstrating the Plan's benefits, acquiring future funding and possibly refining the Recommended Design. There are a variety of performance measures that should be tracked over time to understand the Plan's effects:

- Health and safety, as measured by crashes, vehicular travel speed and crime on the corridor
- Multimodal effects, as measured by user delay, travel time, travel time reliability, user counts, mode split and vehicle miles traveled (per capita)
- Economic development, as measured by commercial and residential vacancies, tax yields and property values
- Culture, as measured by arts creation and community participation in area events

A CRITICAL NEXT STEP IN IMPLEMENTING THE SHORT-TERM AND LONG-TERM ACTIONS OF THE WEST ELIZABETH ENHANCED TRAVEL CORRIDOR PLAN IS TO IDENTIFY A PROJECT CHAMPION (EITHER AN INDIVIDUAL OR A DEPARTMENT).

section 6
NEXT STEPS

A critical next step in implementing the short-term and long-term actions of the West Elizabeth Enhanced Travel Corridor Plan is to identify a Project Champion (either an individual or a department). The Project Champion's responsibility is to regularly identify and coordinate next steps, including pursuing grant opportunities or submitting projects to Budgeting for Outcomes, the City's budgeting process.

Key next steps to the implementation of the West Elizabeth Enhanced Travel Corridor Plan are:

- Complete 35 percent design of the Recommended Design, including a survey of the corridor, a drainage study and a utility study, to develop a more refined cost estimate for the corridor and any incremental projects for which the City may pursue funding.
- Inform the Federal Transit Administration of the corridor's long-term plan by conducting a field review with FTA Region 8 staff.
- Complete a National Environmental Policy Act (NEPA) process of the Recommended Design based on FTA recommendations.
- Apply for incremental projects that are a part of the Recommended Design through appropriate funding sources, including CMAQ and TAP.
- Apply for large-scale projects, possibly the entire Recommended Design, as a TIGER discretionary grant. As shown by previously selected projects, it is common to submit three or more application submittals for TIGER discretionary grants before a project is selected.

- Update Master Street Plan to show segment of West Elizabeth between City Park Avenue and Taft Hill Road as Arterial 2 Lanes (instead of Arterial 4 Lanes).
- Incorporate relevant changes into CSU Master Plans.
- Explore strategies to support transit-oriented development in the Campus West area, including potential code changes, parking strategies, funding support, and improvement districts that support market conditions.
- Coordinate with the Pedestrian Program and Bridge Replacement/ Maintenance Program to widen the bridge on Plum Street west of City Park Avenue to complete the bike lane and sidewalk through this stretch.
- Monitor the demands at the locations for the recommended enhanced pedestrian/bike crossings. Evaluation will be done using the criteria for implementing enhanced crossings found in the City's Pedestrian Plan to determine if and when installation of the crossings are appropriate.

For any competitive grant, more letters of support or City Council actions voicing support for the project will increase the project's competitiveness. However, public and political support for a project can wane when implementation slows. One of the Project Champion's responsibilities is to continuously generate support for the project. Continuing implementation of the West Elizabeth Enhanced Travel Corridor Plan, even in small steps, is a key to maintaining consistent project support.

FURTHER PLANNING

Through the West Elizabeth Enhanced Travel Corridor Plan's development process, the futures of City Park Avenue and Shields Street were explored at a high-level. This process revealed that further corridor planning is necessary on these streets to identify a community - and City-supported vision for infrastructure on these corridors.

APPENDICES

Appendix A: Vision, Purpose & Need

Appendix B: Community Engagement Summary

Appendix C: Corridor Understanding Report

Appendix D: Alternatives Analysis Summary

Appendix E: Conceptual Design and Phasing Summary

Appendix F: Responding to the Project Need

Appendix G: Traffic Operations Calculations

Appendix H: Cost Estimates Summary and Methodology

Appendix I: Maintenance Considerations

Appendix J: Final Design Considerations

West Elizabeth Enhanced Travel Corridor Plan

West Elizabeth Enhanced Travel Corridor Plan

appendix: A
VISION, PURPOSE & NEED

West Elizabeth Enhanced Travel Corridor

Vision, Purpose and Need

Prepared for:
City of Fort Collins

November 24, 2015

DN15-0488

West Elizabeth Enhanced Travel Corridor Plan

FEHR & PEERS

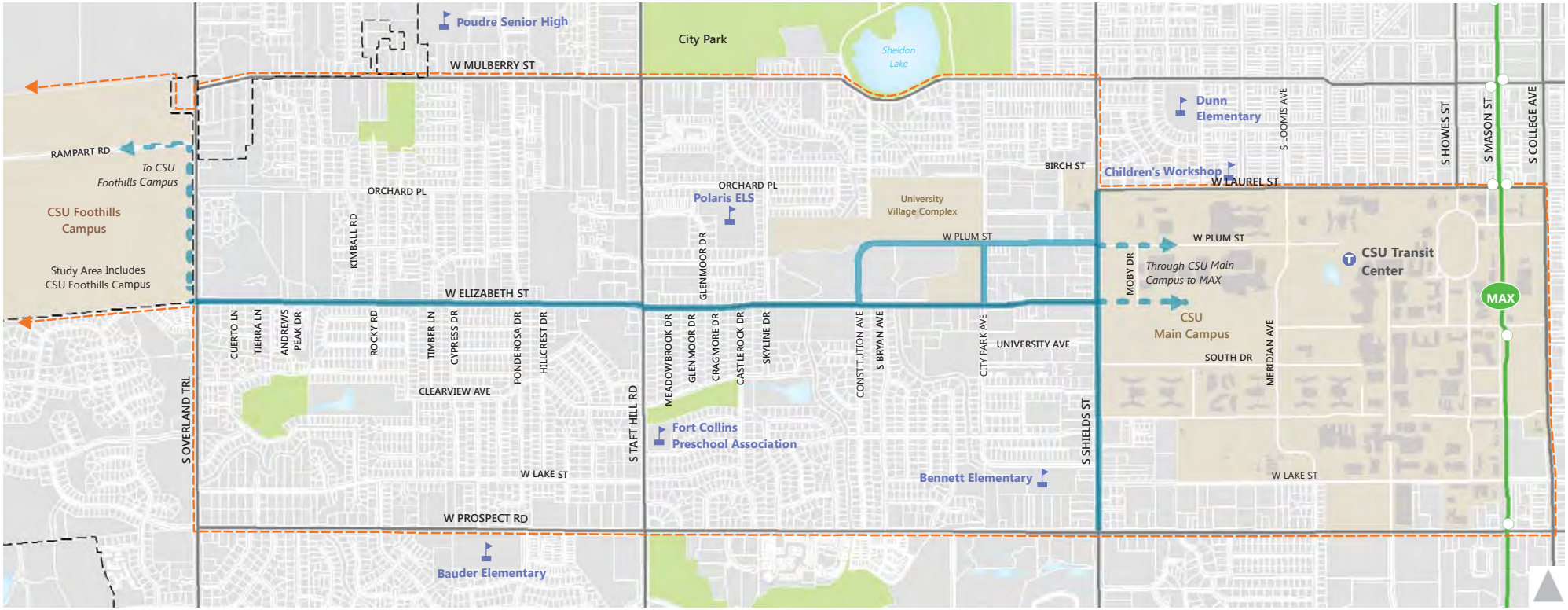
Table of Contents

1. INTRODUCTION

The West Elizabeth Street corridor has been identified in the Transportation Master Plan (TMP) as part of a citywide network of Enhanced Travel Corridors (ETCs) – uniquely designed corridors with an emphasis on high-frequency transit, bicycling and walking. ETCs are intended to support high-quality economic development opportunities for mixed-use, transit-oriented development and support Fort Collins' active lifestyles and environmental stewardship goals. The West Elizabeth ETC Plan will develop a short- and long-term vision for the corridor based on an understanding of the transportation, land use, environmental, economic and social needs of the area.

The corridor plan focuses on West Elizabeth Street from Overland Trail to Shields Street, with an emphasis on connectivity to CSU's Foothills Campus on the west, and CSU's Main Campus (including MAX stations) on the east, as shown in **Figure 1**. In addition to West Elizabeth Street itself, adjacent corridors are also considered as key to the overall study area's transportation network: Constitution Avenue (north of West Elizabeth Street), Plum Street (between Constitution Avenue and Shields Street), City Park Avenue (between West Elizabeth Street and Plum Street) and Shields Street (between Prospect Road and Laurel Street). An initial analysis of Shields Street was conducted as part of the West Central Area Plan (WCAP), and this corridor is undergoing additional analysis as a part of the West Elizabeth ETC Plan given its nexus to issues identified through this plan. To a lesser extent, other adjacent streets will be considered—for example, related to cut-through traffic and/or their role in the Low-Stress Bike Network proposed in the Bicycle Master Plan. The Study Area Map (**Figure 1**) represents the project's focuses.

West Elizabeth Enhanced Travel Corridor Plan



- MAX Stations
- MAX Bus Rapid Transit (BRT)
- West Elizabeth Street Study Corridor
- Study Area
- City Boundary

West Elizabeth Street Study Area

Figure 1

2. VISION

The vision for the West Elizabeth Enhanced Travel Corridor is to be an easily accessible and reliable multimodal corridor with an emphasis on connectivity to CSU's Foothills Campus on the west and CSU's Main Campus (including MAX stations) on the east. The corridor will be well-integrated and well-connected within the city, with a focus on improving transit, walking and biking. The corridor will foster existing business and future infill and redevelopment to accommodate the growing number and diversity of users in the corridor, which include: students, families and seniors. The network shall:

- **Be unique and adaptable** to the distinctive characteristics of each corridor segment.
- **Be safe and comfortable** for all users.
- **Encourage and prioritize public transportation** and active transportation options.
- **Support the interconnectivity** of all modes.
- **Be a beautiful and vibrant** environment.

3. PURPOSE AND NEED

3.1 INTRODUCTION

The purpose and need statement identifies the goals and needs for the West Elizabeth Enhanced Travel Corridor (ETC) study area. The project is needed because of the current deficiencies in the multimodal transportation system on the corridor. These deficiencies include: inadequate transit service; incomplete, non-ADA compliant (Americans with Disabilities Act, 1990) pedestrian facilities; incomplete, low-comfort bikeways, vehicular safety concerns, and conflicts between pedestrians, bicyclists, and vehicles at access points–all resulting in potential safety issues for users in the corridor. The current deficiencies also present challenges in serving the anticipated growth in population, employment, student enrollment and travel demand in the study area.

3.2 PROJECT PURPOSE

The purpose of the West Elizabeth Street Enhanced Travel Corridor Plan is to develop a corridor plan that will serve existing and future transportation demands, with a focus on multimodal transportation improvements. Anticipated growth is expected through infill projects (development of vacant or under-used land parcels within existing urban areas) and redevelopment with increased density within and around the study area, thereby increasing travel demand. The goal of this ETC Plan is to address the growing demand for transportation options by increasing and improving transit, bicycling and walking infrastructure. Improvements shall provide users with highly efficient, reliable and frequent transit service as well as walking, bicycling, and driving options that are safe, comfortable, efficient and well-marked. Improvements will foster economic vitality through high-quality and attractive facilities, while remaining committed to the City's long-term fiscal responsibility. Specifically, the purpose is to:

- **Increase transit capacity, reliability, and improve transit stop amenities** to accommodate current demand and future growth in population, student enrollment, and travel demand.
- **Improve transit system connectivity** to and from West Elizabeth Street, Colorado State University's Main and Foothills Campuses, and other Transfort routes including MAX.
- **Improve pedestrian facilities for comfort, safety, and accessibility** throughout the corridor.
- **Improve bicycling facilities for ease, comfort, and safety** and to attract new riders.
- **Maintain vehicular mobility, improve safety and enhance access** to commercial properties in the corridor.
- **Support the interconnectivity** between travel modes.

3.3 STATEMENT OF PROJECT NEED

The West Elizabeth Enhanced Travel Corridor Plan shall address the following needs that have been identified throughout the corridor:

- **Inability to support existing travel demands and anticipated growth,** which will exacerbate existing deficiencies in transit service, pedestrian facilities, bicycle facilities, and vehicle safety.
- **Inadequate transit service** due primarily to insufficient system connectivity, low and inconsistent route frequencies, poor reliability, lack of capacity to serve current and future demands, and lack of patron stop amenities.
- **Uncomfortable and incomplete pedestrian facilities and safety concerns** due to inconsistent and missing sidewalks, as well as sidewalks that are not ADA-compliant; in addition, there are limited north/south crossing opportunities, and pedestrians experience significant delays crossing West Elizabeth Street.
- **Uncomfortable and inconsistent bicycle facilities and safety concerns** due to incomplete bike lanes and inadequate intersection treatments. There is also higher than expected rate of bicycle- and vehicle-related crashes in several locations.
- **Vehicular mobility, safety, and access concerns** exist due to intersection and driveway turning conflicts, as well as queue spillback (traffic backed up at a left-hand turn lane, for example) at some signalized intersections.
- **Challenge connecting between modes for trips in the corridor** including inadequate pedestrian and bicycle facilities to and at transit stops and parking challenges in the corridor.

3.3.1 SUPPORT EXISTING TRAVEL DEMANDS AND ANTICIPATED GROWTH

Study area growth in population, employment, and CSU student enrollment will increase demand for travel. Without a transformation of the corridor, future travel demand in the study area will most likely mirror the study area's existing mode share. This will further stress the study area's existing transit service, walkways, and bikeways. Additionally, a lack of transformation will result in high growth rates for vehicle travel. Without improvements to transit service, walkways and bikeways the North Front Range Regional Travel Model projects the following growth rates in vehicle travel from 2012 to 2040:

- West Elizabeth Street – 23 percent (0.8 percent per year) during the AM peak hour and 12 percent (0.5 percent per year) during the PM peak hour.
- Shields Street – 16 percent (0.6 percent per year) during the AM peak hour and 19 percent (0.8 percent per year during the PM peak hour

The 2040 forecast generally assumes a 0.53 percent annual growth in population and 0.33 percent annual growth in employment with no major changes to existing transit service or walk/bike mode share.

3.3.2 INADEQUATE TRANSIT SERVICE

System Connectivity

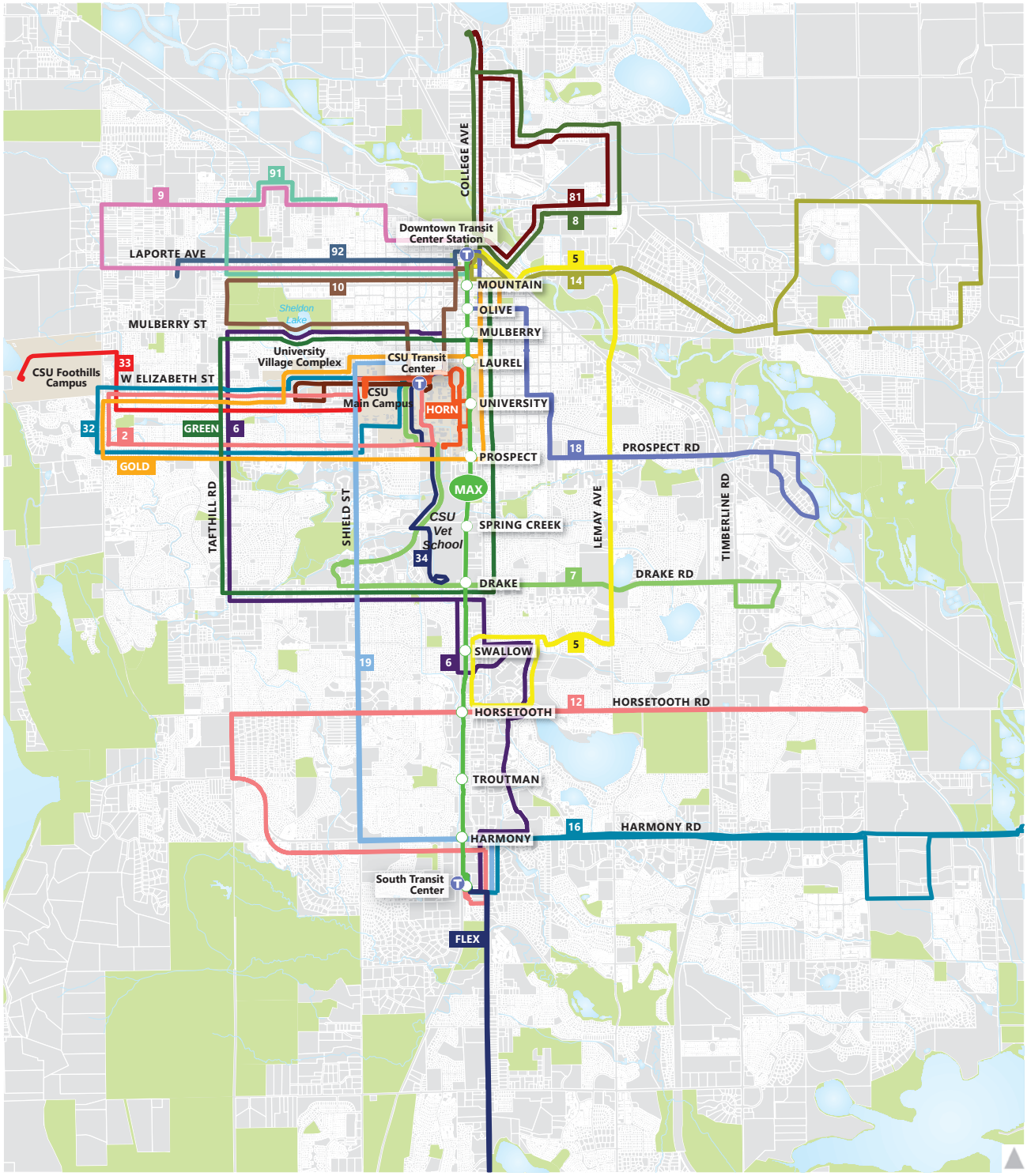
Transfort has designed a hybrid grid/hub-and-spoke network, as shown in **Figure 2**. This service structure is typically utilized in areas with lower service frequencies. It allows passengers to transfer between routes at hub locations, often via timed transfers while still maintaining a grid configuration where strong mixed-use corridors are present. Because of this network configuration, there is a lack of connectivity between routes in the study area and the rest of the system. It takes at least one transfer to reach most major destinations from the study area, with the exception of Colorado State University. More transfers and increased travel time deter both existing and new ridership.

Low and Inconsistent Frequencies

Service frequency is the most important factor in recruiting and attracting new transit ridership. The table below shows the distribution of frequency (10, 30 and 60 minutes) of the nine routes in the study area (Transfort Routes 2, 6, 10, 19, 31, 32, 33, HORN and MAX). During the Peak and Midday time periods, only three of the nine routes run every ten minutes (MAX, HORN, and 31). During the summer (when CSU is not in session), only one route operates at ten-minute frequencies (MAX) and the remainder of the routes run every 30 or 60 minutes or are not in service. Frequency and service is reduced even further on evenings, weekends and during the summer. This means that the majority of routes do not run frequently enough to allow for "spontaneous use" during peak, midday periods or when CSU is not in session. The current frequencies require users to check the schedule before arriving at the bus stop, making transit less convenient.

Table 1: Frequency of Transfort Routes

Frequency (minutes)	Number of Routes		
	Peak (AM/PM)	Midday	CSU not in Session
10	3	3	1
30	4	3	2
60	2	3	3
Does not run	--	--	3



Data shown is as of Spring 2015

MAX Stations

16 Bus Route

MAX Bus Rapid Transit (BRT)

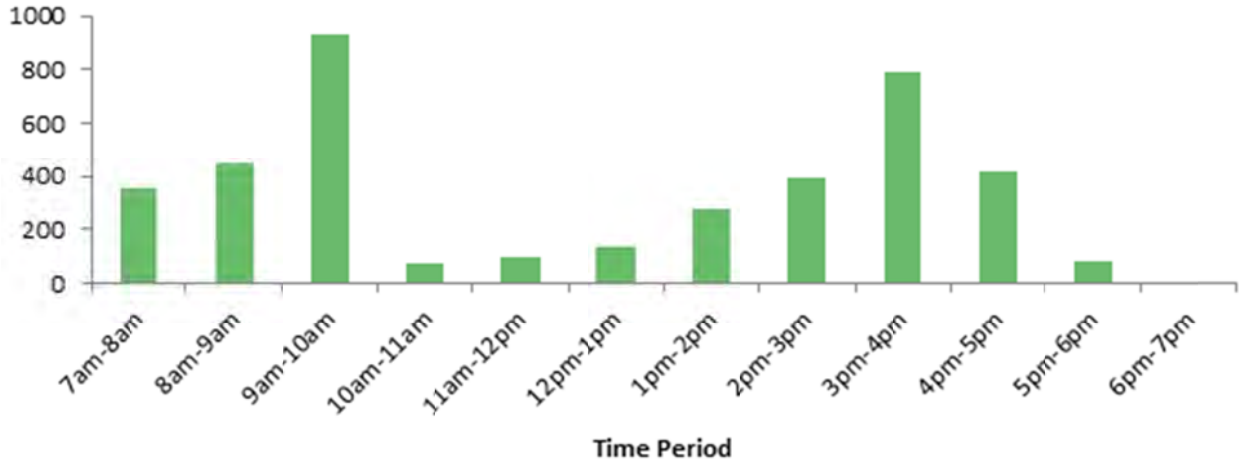
Poor Reliability

The nine Transfort routes that travel within the study area range in their level of on-time performance. Transfort service standards define on-time trips as those trips that serve a time-point stop within 0 to 5 minutes of the published schedule. Based on this standard, 85 percent of trips in the West Elizabeth Corridor study area are on-time, 14 percent are late, and 1 percent of trips are early. Within the study area, on-time performance ranges from a high of 98 percent for the HORN and Route 31 to a low of 72 percent for Route 2. This range and high upper limit is an indicator of inadequate reliability of the routes running within the study area. Reliability of service is important to maintain existing riders and recruit new riders.

Lack of Capacity to Serve Existing and Future Demand

Transfort Route 31 currently presents a challenge with passengers not being accommodated – meaning passengers who are unable to board the arriving bus and must wait for the next due to high ridership volumes and lack of service capacity. The hindrance is concentrated along Plum Street just west of the CSU Main Campus in the mornings and at the CSU Transit Center (CTC) during the afternoon. In an attempt to address this issue during the periods of highest demand, Transfort has supplemented Route 31 with additional buses that are not otherwise part of the regular schedule. Without additional transit vehicle capacity and/or frequencies the potential for overcrowding and passengers not accommodated will increase, especially as the area continues to develop/redevelop and more student-oriented housing is built. **Figure 3** shows the number of passengers left behind by all routes in the study area between January and April 2015 by time period.

Figure 3: Passengers Left Behind by Time Period



Note: Passenger leave behind data covers January to April 2015

Lack of Patron Stop Amenities and Access to Stops

The bus stops in the study area have very few patron amenities and are often not accessible using the pedestrian and bicycle networks. Providing pedestrian and bicycle access to transit stops is an important component to making riding transit safer, more accessible and comfortable. The study area does not provide complete and ADA accessible sidewalks, and bus stop loading and unloading areas and stops are not always located near signalized or enhanced crossings. Bike lanes are also inconsistent with a lack of end of trip bike facilities such as bike parking.

3.3.3 UNCOMFORTABLE AND INCOMPLETE PEDESTRIAN FACILITIES AND SAFETY CONCERNS

The sidewalks in the study area are inconsistent in width, incomplete in many sections, and generally non-compliant with ADA standards and requirements. Other pedestrian amenity deficiencies include lack of crossing opportunities and/or significant delay for pedestrians crossing in many locations in the study area. Together these deficiencies create an uncomfortable environment for pedestrians and encourage unsafe behavior, such as crossing at unmarked locations. **Figure 4** shows the level of safety and comfort for pedestrians within the study area, based on sidewalk width, buffer width, and difficulty in midblock crossing.

Safety Concerns

The Shields Street/Plum Street, West Elizabeth Street/ Shields Street, West Elizabeth Street/Castlerock Drive and West Elizabeth Street/Taft Hill Road intersections have the highest number of pedestrian-related crashes in the study area, and some of the highest in the City. The Plum Street/City Park Avenue, West Elizabeth Street/City Park Avenue, West Elizabeth Street/Constitution Avenue and West Elizabeth Street/Ponderosa Drive intersections also have pedestrian-related crashes.

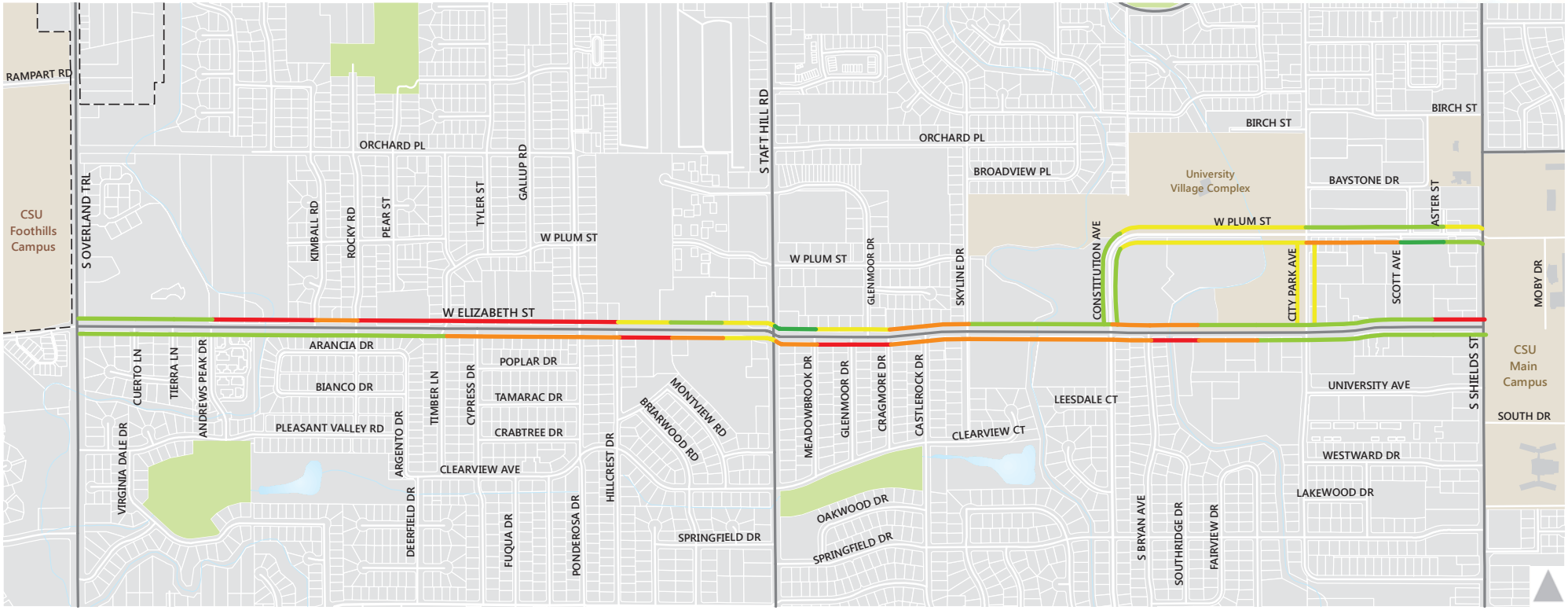
Uncomfortable, Incomplete and ADA Non-Compliant

On West Elizabeth Street, several blocks west of Taft Hill Road and one block west of Shields Street sidewalks are missing completely. In the segment west of Constitution Avenue, current sidewalk infrastructure is generally below the four foot (48 inches) minimum width required to be ADA compliant. In addition, the majority of sidewalks in the study area do not have tree lawn buffers to provide a space between pedestrians and vehicular traffic. Other challenges for pedestrians include the many driveways throughout the whole corridor, specifically in the Campus West area as well as the western segment of the study area; these driveways sometimes have the sidewalk slant at an uncomfortable angle for walking and for people in mobility devices. The driveways also introduce conflicts for pedestrians with turning vehicles. The overall result is a less comfortable pedestrian experience.

Limited Midblock Crossings and Delay at Crossings

The western mile of the West Elizabeth Street Corridor currently offers no marked north/south pedestrian crossings opportunities, other than the Overland Trail and Taft Hill Road intersections. One crossing is planned to be constructed approximately ¼ mile west of Taft Hill Road in Fall 2015; however, that leaves a ¾ mile segment of West Elizabeth without a north/south crossing location. At most signalized intersections, the average pedestrian delay is relatively high during both the AM and PM peak hours. Five of the nine intersections in the study area have a delay greater than 45 seconds in the AM peak hour and greater than 50 seconds in the PM peak hour.

Shields Street has a high demand for pedestrian crossings and a perceived low level of comfort. Aside from the Plum Street and West Elizabeth Street intersections, the next marked crossing to the north is 600 feet from Plum Street at Laurel Street and the next marked crossing to the south is 2,000 feet from West Elizabeth Street at Lake Street. Additionally, there are a high number of driveway conflicts in certain areas on Shields Street. As the area west of Shields Street continues to develop at a higher density, and as CSU's master plan is built out, demand for crossing in this area will likely increase.



Pedestrian LOS

- 2 - 4 (Low)
- 5 - 7
- 8 - 9 (Medium)
- 10 - 12
- 13 - 15 (High)

The pedestrian score is based on sidewalk width, buffer width and distance to the nearest crossing.

Pedestrian Level of Service (LOS)

Figure 4

3.3.4 UNCOMFORTABLE AND INCONSISTENT BICYCLE FACILITIES AND SAFETY CONCERNS

Improving bicycle facilities will address current safety and comfort issues as well as encourage new riders. **Figure 5** shows the Level of Traffic Stress (LTS) for bicyclists within the study area, based on traffic volume, speed, number of lanes and presence and quality of bikeway.

Safety Issues

The intersections of West Elizabeth Street/City Park Avenue and West Elizabeth Street/Ponderosa Drive have more crashes than at similar intersections. In addition, there are more crashes along West Elizabeth Street than at similar segments. There are also a high number of driveway conflicts for bicyclists in certain sections of West Elizabeth Street, particularly near King Soopers and in the Campus West area.

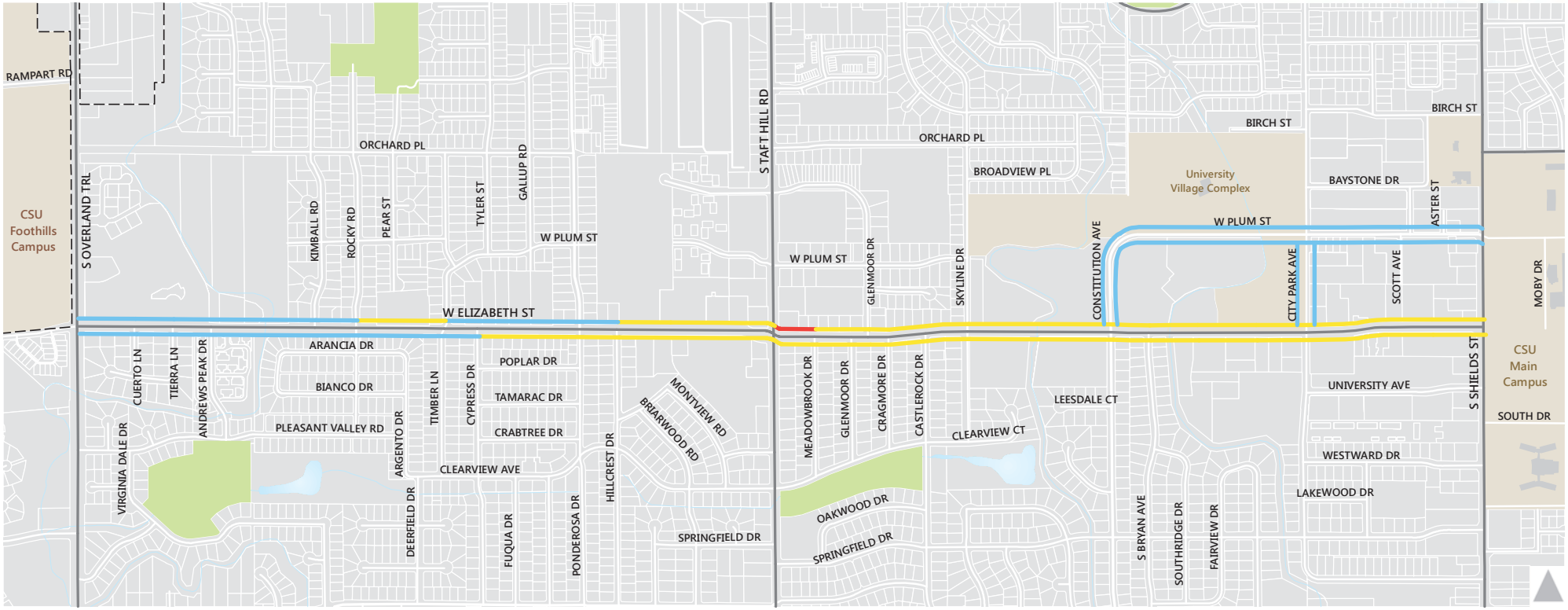
Inconsistent Bike Lanes

Bicycle facilities within the study area are inconsistent in width, type and existence in some locations. Along West Elizabeth Street, bike lanes range from five feet to seven feet in width and are absent from certain segments. The inconsistencies in bicycle facilities can lead to a perceived low level of comfort for bicyclists. Bike lanes on Shields Street within the study area have similarly been identified as having a low level of comfort.

Inadequate Intersection Treatments

There are inadequate intersection treatments for bicyclists at several of the signalized intersections, both at the approach to a number of intersections as well as through the intersection. For example, the intersection of West Elizabeth Street/Shields Street has the largest number of bicyclists in the peak hour but does not have intersection treatments to assist with bicyclist turning movements. In addition, average bicyclist delay at three intersections in the study area in both the AM and PM peak hour is greater than 30 seconds, LOS (Level of Service) D or E. The highest average bicyclist delays are observed at the West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, Shields Street/Laurel Street, and Shields Street/Lake Street intersections. These inadequate intersection treatments and delays encourage risky bicycling behavior contributing to the safety issues observed in the corridor.

In addition there is demand for crossing opportunities at several un-signalized locations, resulting in cyclists engaging in risky travel behavior. This is most prevalent at Shields Street between Lake Street and West Elizabeth Street where cyclists often attempt crossing traffic in a two-step process using the center turn lane as a refuge.



Bicycle Level of Traffic Stress (LTS)

- 2 (Low Stress)
- 3
- 5 (High Stress)

LTS applies the same methodology that is used in the 2014 Bicycle Master Plan. The score from 1-5 represents the level of bicyclist comfort based on traffic volume, speed, number of lanes, and presence and quality of the bikeway.

Bicycle Level of Traffic Stress (LTS)

Figure 5

3.3.5 VEHICULAR MOBILITY, SAFETY AND ACCESS CONCERNS

A traffic and safety analysis identifies the current challenges related to vehicles in the corridor.

Safety Issues

There are higher than expected numbers of crashes at two intersections and three of the seven segments within the study area.. The intersection with the highest number of crashes is the West Elizabeth Street/Shields Street intersection, followed by the West Elizabeth Street/Taft Hill Road and then the Shields Street/Plum intersections. A heat map of all crash types in the study area is shown **Figure 6.**

Intersection and Driveway Turning Conflicts (Access)

There are more than 20 access points, including driveways and intersections, along West Elizabeth Street between Shields Street and Constitution Avenue and more than 10 access points in the quarter mile west of Taft Hill Road, thereby creating a number of conflicts with vehicles turning in or out of driveways, resulting in a history of crashes along these segments and confusion and frustration for road users.

Queue Spillback at Signalized Intersections

Vehicular issues are resulting from the spillback of vehicles at signalized intersections, and in some cases is exacerbated by a low intersection level of service (LOS) and high approach delay. Of specific concern are movements where queued traffic spills back into moving travel lanes. The northbound left-turn at the West Elizabeth Street/Shields Street intersection has been identified by the public and stakeholders for its queue spillback issues; this movement currently operates at LOS F during the PM peak hour.

Safety issues resulting from turn conflicts and queue spillback at intersections will increase in the future if countermeasures to these issues are not developed. Additionally, high growth rates in vehicle travel resulting from a lack of improvements to transit service, walkways and bikeways may exacerbate these safety issues.

Alternative Routes/Cut-Through Traffic

Due to congestion and delay at several intersections in the study area, vehicles are finding alternative, more efficient routes. Common alternative routes include City Park Avenue and University Avenue. This rerouting has potentially negative implications for surrounding neighborhoods and adjacent corridors including speeding, additional traffic and congestion.

All Crash Types 2010-2014

- 1-8
- 9-32
- 33-78
- 79-144
- 145+

West Elizabeth Street Study Corridor

City Boundary

Source: City of Fort Collins, 2014

All Crash Types - 2010 - 2014

Figure 6

3.3.6 LACK OF CONNECTIVITY BETWEEEN MODES

There is a lack of interconnectivity between modes in the West Elizabeth Corridor. This is often referred to as the first-mile/last-mile problem, which describes the lack of facilities and accessibility between transit stops and origins and destinations. The bus stops in the study area have very few patron amenities and lack end of trip facilities such as bike parking. When coupled with low onboard bicycle accommodations this inhibits one's ability to make connections between modes for trips. Furthermore, there is a need to make bus stops more accessible via the pedestrian and bicycle networks which is an important component of making riding transit safer, more accessible and comfortable. In general accessing stops can be challenging as they are not always located near signalized and enhanced midblock marked crossings. In addition, informal vehicle park-n-ride locations in neighborhoods have been observed in some areas on the corridor indicating a need for drivers to connect to transit; with increasing parking rates on CSU's campuses and additional transit service, this phenomenon is likely to exacerbate in the future.

West Elizabeth Enhanced Travel Corridor Plan

appendix: B
COMMUNITY ENGAGEMENT SUMMARY

West Elizabeth Enhanced Travel Corridor Plan

Community Engagement Appendix

City of Fort Collins

October 2016

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Table of Contents

1. Community Engagement Overview

This appendix documents the key outreach activities that occurred throughout the West Elizabeth Enhanced Travel Corridor (ETC) planning process. The effort was divided into four phases, as follows:

- Phase 1 – Corridor Understanding
- Phase 2 – Corridor Visioning and Design Approach Development and Evaluation
- Phase 3 – Recommended Design and Implementation Planning
- Phase 4 – Drafting the West Elizabeth Enhanced Travel Corridor Plan and Plan Adoption

A public engagement plan was developed to guide the outreach activities for each phase of the project. The goal was to engage all stakeholders in an effective, meaningful, and equitable way. Planned outreach for each phase included a range of activities, such as: neighborhood listening sessions, walking tours lead by residents/business owners and City staff; traditional public meetings/open houses; attending pre-existing events (CSU Housing Fair, Earth Day Festivities, Open Streets, City Planning, Development and Transportation Open House, etc.); pop-up meetings at CSU and other venues; virtual meetings; intercept and online surveys; and Stakeholder Committee and Technical Advisory Committee meetings. These approaches were intended to reach the wide range of stakeholders, all of whom had differing levels of involvement, interest and availability.

Table 1 below provides estimates for the number of people reached during each phase of the project. The activities related to Phases 3 and 4 overlapped and are presented together. Table 2, on the following page, provides details for the various engagement efforts that took place during each phase of the project. The following sections describe the input received at some of the key engagement activities that occurred throughout the plan's development.

Table 1. Outreach Summary of People Reached

	Face-to-face Interactions	Survey Participants	Mail/Email Communication
Phase 1 – Corridor Understanding	550	150	8,200+
Phase 2 – Corridor Visioning and Design Approach Development and Evaluation	1,150	1,100	7,600+
Phase 3 – Recommended Design and Implementation Planning and Phase 4 – Draft Plan and Plan Adoption	325	120	8,100+
Total	**2,025**	**1,370**	**23,900**

Table 2. Overview of Public Outreach Activities by Project Phase

	Project Specific Activities	Other Events	Interest Group (organized-committees)	Online/Email/Mail/ Social Media Efforts
Phase 1 Corridor Understanding	• Listening Sessions (2) • Neighborhood Walking Tours (5) • Focus Group Meetings (4) • Stakeholder Committee Meeting	• *CSU Housing Fair* • *CSU Conservation Leadership Through Learning Class* • *CSU Earth Day Fair* • City Joint Planning Open House • Open Streets	• *CSU Bicycle Advisory Committee (CSUBAC)* • *Associated Students of CSU (ASCSU) Senate Meeting* • Bicycle Advisory Committee (BAC) • Planning and Zoning Board (P&Z) • Senior Advisory Board (SAB) • Public Transportation Advisory Group (PTAG)	• WikiMap • Online Survey (150) • Direct mailing to residents within ½ mile of the corridor (8,230) • Project Email updates (4) • Articles in Newsletters (3)
Phase 2 Visioning and Design Approach Development and Evaluation	• Focus Groups Meetings (5) • Visioning Open House • Bus Stop Pop-up meetings (3) • *CSU Rec-Center Pop-up meeting* • Stakeholder Committee Meetings (3) • Alternatives Open House	• *CSU Lagoon Concert Series* • *CSU Move-in Day* • Transfort Tuesday • *CSU Urban Design Class* • *CSU Built Environment Class*	• *CSUBAC* • *ASCSU Senate Meeting* • NFRMPO Technical Advisory Committee • P&Z (2) • Commission on Disability (COD) (2) • BAC • SAB • Transportation Board • Air Quality Advisory Board (AQAB) • Energy Board • Local Legislative Affairs Committee (LLAC) • *CSU Institute for Built Environment*	• Direct mailing to all residents on West Elizabeth Street (7,614) • Online Visioning Survey • Textizen Surveys (5 surveys, 700 responses) • Question of the Week Online Surveys (4 surveys, 391 responses) • Project Email updates (4)
Phase 3 and 4 Recommended Design, Draft Plan and Plan Adoption	• Focus Group Meetings (4) • Stakeholder Committee Meeting • Recommended Design Open House • **City Council Adoption Hearing** – October 18, 2016	• *CSU Earth Day Fair* • *CSU Built Environment Class* • FC Bikes Bike Fair • Transfort Route Change Open House • *CSU Housing Fair* • *CSU Conservation Leadership Through Learning Class* • *CSU Earth Day Fair* • City Joint Planning Open House • Open Streets	• **City Council Work Session** • *ASCSU Senate Meeting* • *CSU Professional Learning Institute Sessions (2)* • AQAB • *CSU BAC* • BAC • P&Z (2) • SAB • Transportation Board • COD • LLAC • PTAG	• Direct mailing (7,833) • Textizen Update • Project Email Updates (6) • Online Draft Plan Comments Survey (96) • Articles in Newsletters (5)

**Green font denotes CSU-focused outreach*

2. Stakeholder Committee

This Stakeholder Committee was formed to explore the issues and opportunities facing West Elizabeth and help develop a plan to achieve the community's long-range vision for the area's future. The committee's role was to help establish a vision for the West Elizabeth corridor, identify areas of focus, and contribute to the development of the plan. The following table lists the member of the Stakeholder Committee and the area of the corridor they represented.

Table 3. Stakeholder Committee Members

Location	Name
Segment 1: Overland to Timber Ln.	Gail McKee
	Troy Ocheltree
	Peter Rhoades
	Michael Werner
Segment 2: Timber Ln. to Taft Hill Rd.	Gene Schoonveld
	Dave Thompson
	Bonnie Michael
Segment 3: Taft Hill to Constitution Ave.	Laurel Grimm
	Carol Kruse
	Jordan Sowell
Segment 4: Constitution Ave. to Shields St.	Aaron Buckley
	Jay Henke
	Justie Nicol
	Jean Robbins
Segment 5: Colorado State University	Alison Anson
	Madi Book
	Rick Callan
	Edward Kendall

The Stakeholder Committee met as a group five times throughout the approximately 18-month planning process. Meetings were intended to allow for discussion, debate, and working through the topics to be included in the plan. In addition, Stakeholder Committee members were encouraged to continually reach out to others in the community for broad-based public input.

3. Phase 1 – Corridor Understanding

Phase 1 outreach was extensive and generally covered March – July 2015. Engagement details are documented separately as Appendix E of the project's Corridor Understanding report. The key elements include:

- Surveys (online and paper)
- Listening Sessions
- WikiMap
- Walking, Biking, and Transit Tours
- Open Streets

4. Phase 2 – Project Visioning and Design Approach Development and Evaluation

Phase 2 outreach generally covered July 2015 – January 2016. The key elements include:

- Visioning Survey
- Alternatives Open House (December 3, 2016)
- Questions of the Week

Visioning Survey

In an effort to develop a Vision for the West Elizabeth Enhanced Travel Corridor, two visioning surveys were available for public input. One survey was available online and the other was a text-based survey, using a tool called Textizen. The surveys had two different audiences in mind; the online was a bit longer requiring approximately 15-20 minutes to complete; the Textizen survey was an abbreviated version of the online survey intended for the Colorado State University audience. Survey questions were designed to gauge how the public currently uses the corridor, how they would describe their existing experience and how they would like to see change occur in the corridor.

Table 4. Visioning Survey Summary of Responses

Survey Instrument	Date	Responses
Online Survey (SurveyGizmo)	August 2015	132 complete 53 partials
Textizen Survey	Mid-August through Mid-September	411
	Total	**596**

Online Survey

The online survey consisted of 14 multiple choice questions and one ranking question. Several of the questions allowed for multiple responses as well as an "Other" option with a write-in

response. In addition, four visual preference questions asked participants what they liked about specific treatments.

Textizen Survey

Textizen is a text-based survey instrument in which participants opt to receive survey questions via text to their mobile devices. The survey consisted of nine questions: four multiple choice questions, two open ended questions, two ranking questions, and an initial "hook" question whose purpose was to attract participation in the survey.

While the content of two surveys were similar in concept, some of the questions varied due to survey instrument restrictions. All questions, including demographic information, were optional. However, most respondents did complete the entire survey, which is helpful for understanding the experience of respondents from different viewpoints.

Questions that appeared on both surveys are indicated by "***Q#,***" the results are combined and presented in the "Results" section. A comparison of the survey questions is shown in the Table 5 below. Key topic areas include:

- Background
- Travel behavior
- Prioritization for the future
- Current vs. desired future conditions
- Potential improvements
- Demographics
- Other comments

Table 5. Visioning Survey List of Questions

Question	Online Survey	Textizen Survey
BACKGROUND		
Q1. Which of the following apply to you? (Please select all that apply) *	✓	✓
TRAVEL BEHAVIOR		
Q2. Which travel mode do you use most often on the West Elizabeth Corridor?	✓	✓
Q3. On average, how often do you use active transportation (biking, walking, buses) in this corridor?	✓	✓
PRIORITZATION FOR THE FUTURE		
Hey Fort Collins, what about MAX on West Elizabeth Street? (Hook question for Textizen survey)		✓

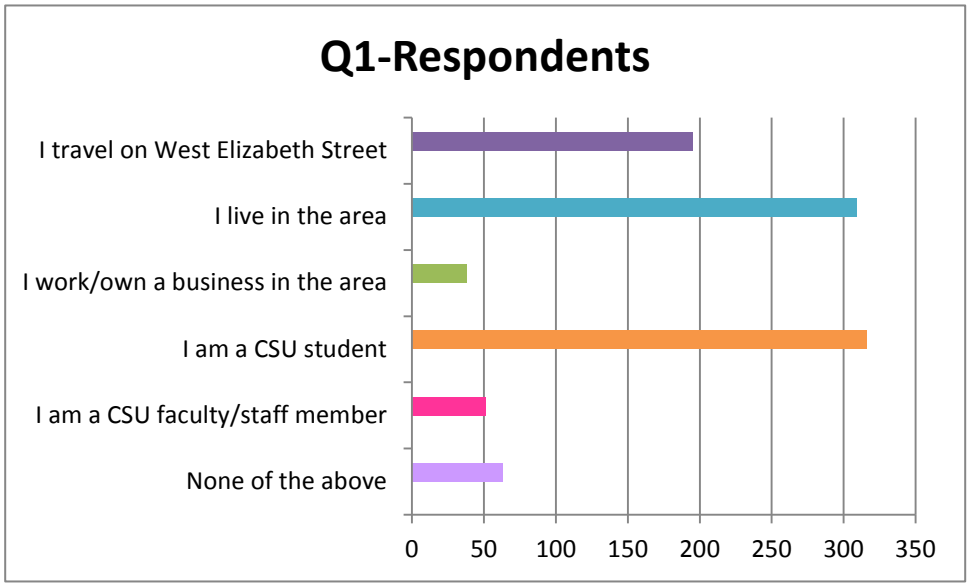
Question	Online Survey	Textizen Survey
Q4. When planning for the futures, which travel mode(s) should be prioritized in the West Elizabeth Corridor?	✓	✓
Success in the West Elizabeth Corridor should be defined by improvements in? (Select 2)	✓	
Success in the West Elizabeth Corridor should be defined by improvements in? (Select 2)	✓	
Would you be willing to spend additional time driving in the West Elizabeth Corridor to make transit, walking, and biking safer and more efficient?	✓	
CURRENT VS. DESIRED FUTURE CONDITIONS		
Q5. What word describes your <u>existing</u> experience in the West Elizabeth Corridor?	✓	✓
Q6. What word describes your <u>desired future</u> experience in the West Elizabeth Corridor?	✓	✓
POTENTIAL IMPROVEMENTS		
Which pedestrian treatment do you prefer for the various segments of West Elizabeth Street?	✓	
Which bicycle treatment do you prefer for the various segments of West Elizabeth Street?	✓	
What type of transit do you prefer for the West Elizabeth Corridor?	✓	
DEMOGRAPHICS		
With what gender do you identify?	✓	
What is your age?	✓	
With what ethnicity do you identify?	✓	
OTHER COMMENTS		
Please share any comments or suggestions related to the West Elizabeth Corridor or the West Elizabeth ETC Plan.	✓	

**This contents of this question were split into two separate questions in the Textizen survey.*

Results

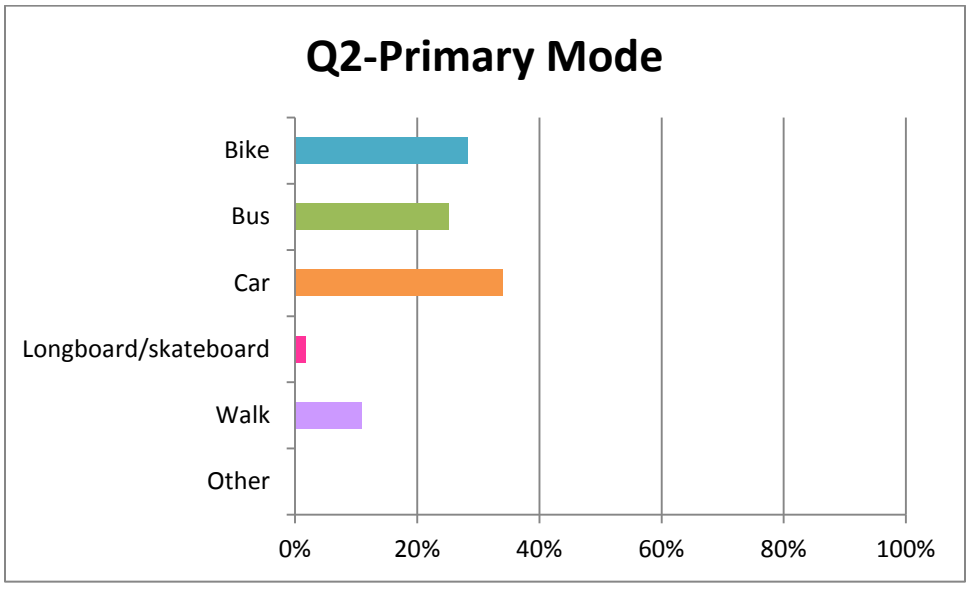
Background

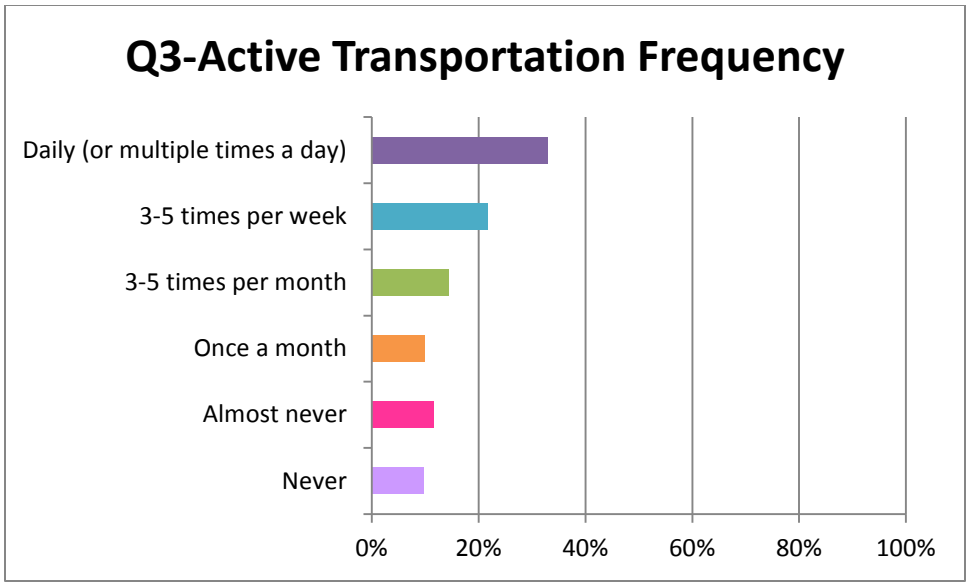
- A total of 596 people participated in the two West Elizabeth visioning surveys.
- The majority of respondents were CSU students who lived in the study area.
    - A particularly high number of CSU students responded to the Textizen campaign, while the majority of people who participated in the online survey were other community members who traveled in the corridor.



Travel Behavior

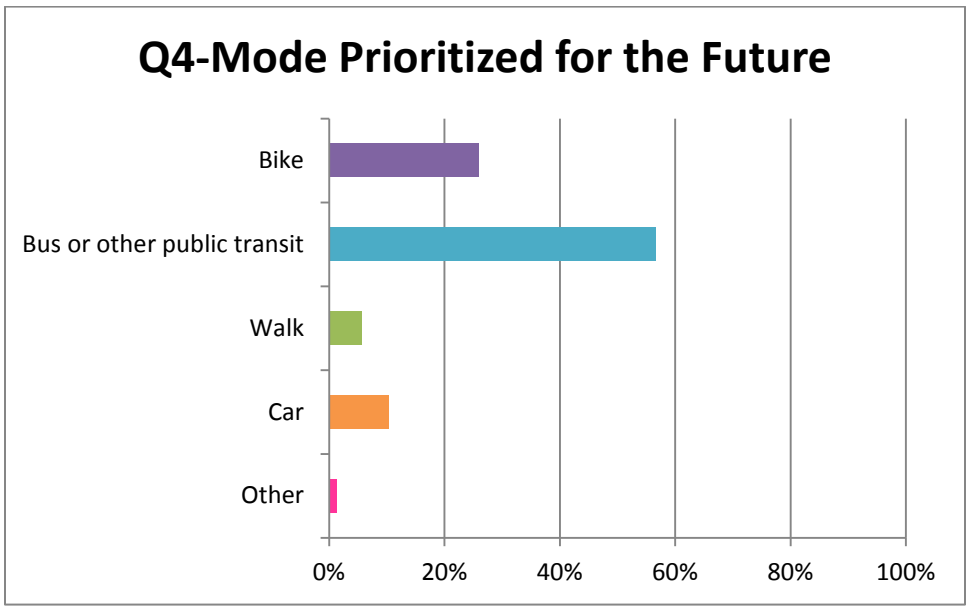
- The primary mode of travel used in the corridor was fairly evenly split between bus (25%), biking (28%), and car (33%) with slightly more people driving.
- One-third of respondents (33%) used active transportation (biking, walking, buses) on a daily basis, while 22% of respondents never or almost never used active modes.





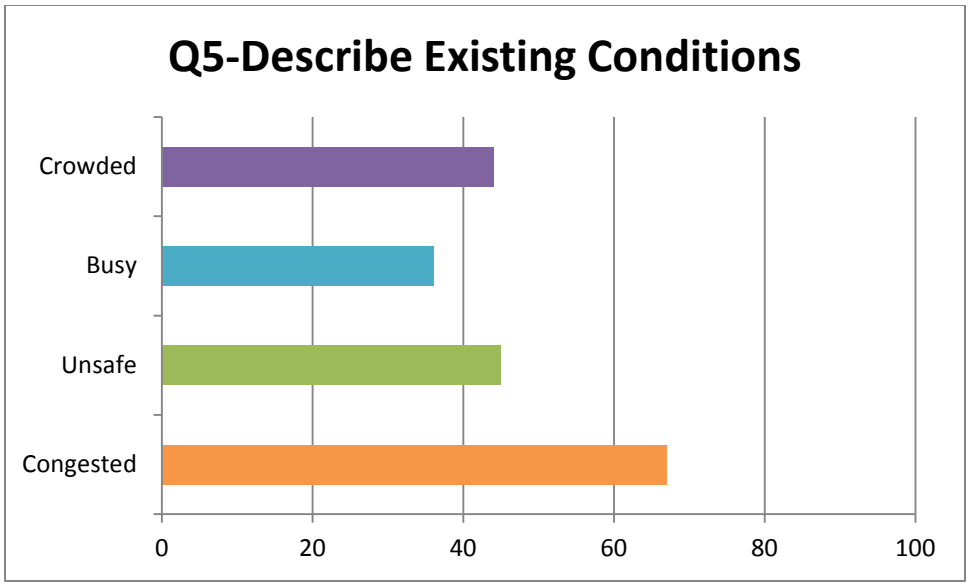
Prioritization for the Future

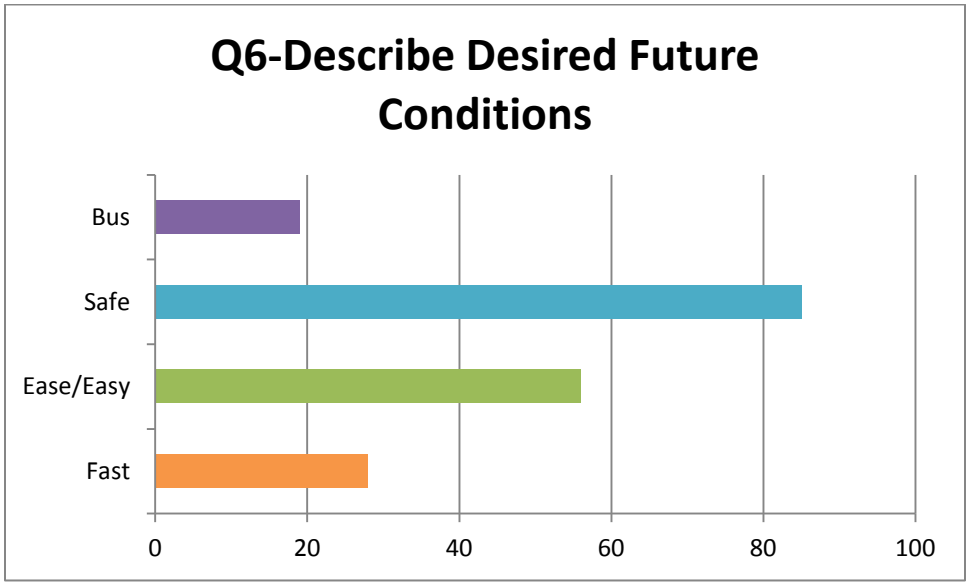
- The majorty of reponsents selected bus or other public transit as the travel mode that should be prioritized for the future in the corridor (57%) followed by bikes (26%).



Current vs. Desired Future Conditions

- Common themes for describing the corridor were congested, crowded, busy and unsafe.
- When envisioning what the corridor should be like in the future, making it safe was the top response followed by easy to use.


Q5-Describe Existing Conditions
Crowded
Busy
Unsafe
Congested
0
20
40
60
80
100


Q6-Describe Desired Future Conditions
Bus
Safe
Ease/Easy
Fast
0
20
40
60
80
100

Alternatives Open House (December 3, 2015)

Summary of West Elizabeth Proposed Alternatives Public Outreach Comments

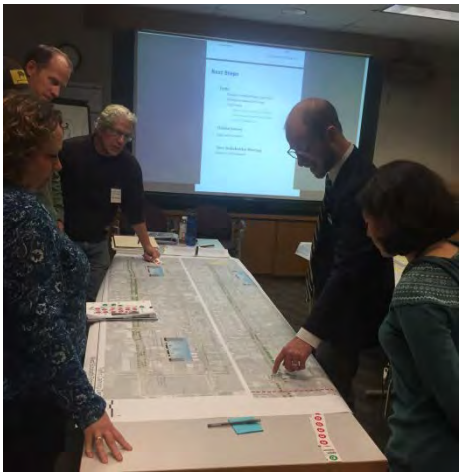
Stakeholder Committee - December 2, 2015
Open House - December 3, 2015

General

- Bike facilities on surrounding low stress network
- Make bike treatments around the city consistent
- Transit service on Mulberry
- Keep neighborhood feel
- Separate people from traffic
- Slow traffic
- Designate Campus West employee parking at CSU Moby
- Woonerf in progress from Local-Plum to Elizabeth

Traffic Calming

- Two way stop control at Plum/City Park good—people blow through intersection anyway
- Look at Taft Hill existing traffic approaching Elizabeth
- Number of comments on access to King Soopers
    - Longer WBLT pocket
    - Potential for roundabout?
    - Bike/ped conflicts
- Challenging pedestrian crossing at Castlerock
- Acute right turn into church in Campus West
- Concern about bikes at Elizabeth/Shields
- Consider trucks and loading on Campus West
- Add street lights
    - Especially City Park/Elizabeth
- Visually paint curb
- Additional medians on Elizabeth near Andrews Park Drive
- Bike lanes on Plum west of Skyline
- Move midblock crossing east of Skyline
- Ensure bike crossing at Skyline signal
- Mixed feedback on raised cycle track
    - Don't feel comfortable, need more distinction from traffic, not visible enough to cars
    - Like them—separated from traffic
- Left turn signal arrows both directions at City Park/Elizabeth
- Focus bike/ped improvements at Pitkin/Shields to relieve Elizabeth
- Provide bike/ped connection from cul de sac at Orchard



place

- Need more traffic calming between Ponderosa and Overland
- Fix some ROW/property lines
- Concern about roundabout safety for bike/ped
- Raised pedestrian crossing
- Like Plum as primary transit service
- Good for transit and cars but potentially bad for peds
- Add two stage crossing at Ponderosa
- Split phase Plum/Shields

MAX on West Elizabeth

- No widening beyond ROW
- Move ped crossing at Castlerock to Skyline
- Bring Skyline low stress bikeway through Avery Park
- Address access control further
- Like separated bike facility
- Prefer CTC transfer to MAX transfer
- Show bus stops on west end of corridor- recommend farther apart than existing
- Investigate potential for parking structure or shared parking
- BRT station between Taft Hill and Overland
- Bike facility on City Park, part of low stress network
- Opportunity for speed table/raised crosswalk on Elizabeth of off Elizabeth entering driveways
- West Elizabeth/Overland safety concerns: sight line, signal, decel lanes, crosswalk, sidewalk
- In favor—it is good for residents and visitors and business is developing in this direction

CSU

- Need left turn signal NB at Plum/Shields
- Prefer to put bikes into CSU on Plum instead of Shields
- Need bike loop detectors near CSU
- Need to make a bike facility E-W through CSU (dismount zone not ideal)

Redevelopment (on street parking)

- Mixed review for on street parking
    - Pro—creates urban feel, slows traffic, satisfies parking demand
    - Con—confuses traffic, conflict for bikes, conflict for other cars
- Maintain access to businesses
- Don't like parking buffered bike lane
    - Conflict at driveways due to reduced visibility
    - Doesn't like this design at Laurel

Redevelopment (BRT)

- The value of dedicated transit lane is lost if only in a section

- Make bike space more visible, especially at night
- MAX is a good long term vision for the corridor
- Best option for thinking long term

Questions of the Week

Starting in January 2016, the project team published some background about a key element, along with key questions for the community once a week for four weeks. The topics are listed below, and additional information, including a summary of responses, is included in the subsequent pages.

1. Protected intersection
2. Transit connection between the West Elizabeth corridor and MAX
3. Transit signal priority
4. Protected bike lanes

Question of the week #1:
Would a protected intersection address some of the key issues experienced at the City Park and West Elizabeth intersection?

What is a protected intersection?

An intersection that provides enhanced separation and protection for pedestrians and cyclists from vehicular traffic.

Typical features include:

- ***Corner refuge Island*** – physical separation that provides a secure refuge for those waiting at a red signal and physically separates cyclists as they make right turns.
- ***Forward stop bar for bicyclists*** – drivers stop behind the crosswalk, while cyclists stop at a waiting area further ahead in the intersection. Advantages include: increased bicyclist visibility, a head start for bicyclists crossing the road, and reduced crossing distance for bicyclists.
- ***Setback pedestrian crossing*** – with the intersection geometry, drivers turn 90 degrees before they cross bicycle and pedestrian crossings, increasing visibility. The setback crossing further allows a vehicle space to stop before the crossing in case of potential conflicts.
- ***Bicycle-friendly signal phasing*** – protected signal phasing for bicyclists use red signals to prevent conflicting car turning movements (if applicable).

For more information on protected intersections:

https://vimeo.com/86721046 Source: Nick Falbo, Senior Planner Alta Planning + Design
https://www.youtube.com/watch?v=FlApbxLz6pA Source: Mark Wagenbuur

Why are we considering a protected intersection here?

- This intersection serves a lot of bicyclists (upwards of 2,000 per day!), and also has higher than expected bicycle-related crashes compared to other similar intersections.
- City staff has observed—and you have confirmed your experience of—unpredictable and unsafe bicyclist maneuvers at the intersection. Providing dedicated space and signal phasing can improve predictability for all users.
- The benefits of a protected intersection align with the city's goals to create a low-stress bicycle network—may significantly improve the safety and comfort of cycling for people of all ages and abilities.

Question of the week #1: Protected Intersection

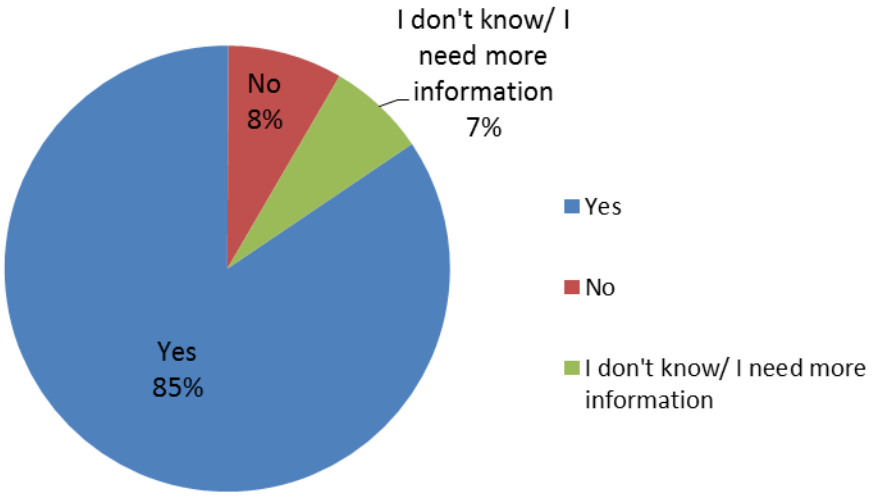
Participation Snapshot

Survey Instrument	Participants
SurveyGizmo (online)	84
Textizen (text message-based)	141
Total	*225*

What we heard from you…

SurveyGizmo Reponses:

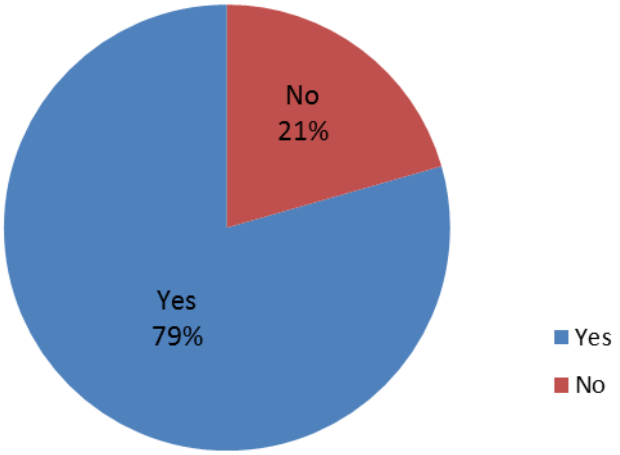
1. Would a protected intersection address some of the key issues experienced at the City Park & West Elizabeth intersection?



Value	Percent	Count
Yes	85%	71
No	8%	7
I don't know/ not enough information	7%	6
Total		*84*

Textizen Reponses:

1. Would the W Elizabeth and City Park intersection benefit from more separation of bikes & vehicles, e.g., refuge islands or special bike signals?



Value	Percent	Count
Yes	79%	112
No	21%	29
Total		*141*

...here is what some of your fellow citizens had to say

"What a wonderful idea! I think it's essential to have clearly marked lanes and obvious bike signaling to encourage safe/proper behavior."

"There are no guarantees, but the more protection that can be afforded to people on bikes and pedestrians, the safer it becomes to use those modes of transportation. Subsequently, more people ride and walk because they feel safer."

""I think it may help on the surface, but I am not sure it would improve the unsafe habits of the bicycle riders which seems to be more of the problem."

Question of the week #2:
Do you think providing a transit connection between the West Elizabeth Corridor and the MAX would be a worthwhile investment?

The current situation

Currently, the West Elizabeth Corridor lacks a direct transit connection to MAX and Downtown. To reach Downtown you must transfer buses at CSU's Transit Center (CTC) or walk from the CTC to the nearest MAX station.

One-seat ride to MAX

One of the goals of the West Elizabeth ETC Plan is to better connect the corridor to the rest of the city. During our outreach we heard a desire for a one-seat ride to Downtown and/or MAX, so the project team is exploring extending transit service from the West Elizabeth Corridor to the MAX Mulberry station. The alignment could start in the western part of the corridor, travel through CSU, and continue to the Mulberry Station as shown on the map below. Providing connections on the west side of the train tracks would improve reliability and minimize delays caused by train crossings.

Potential transit route to MAX

What's the trade-off?

Providing a direct connection to MAX could result in higher capital costs (e.g., purchasing additional vehicles) as well as higher annual operating costs for the City/Transfort.

Question of the week #2: One-Seat Ride to Downtown

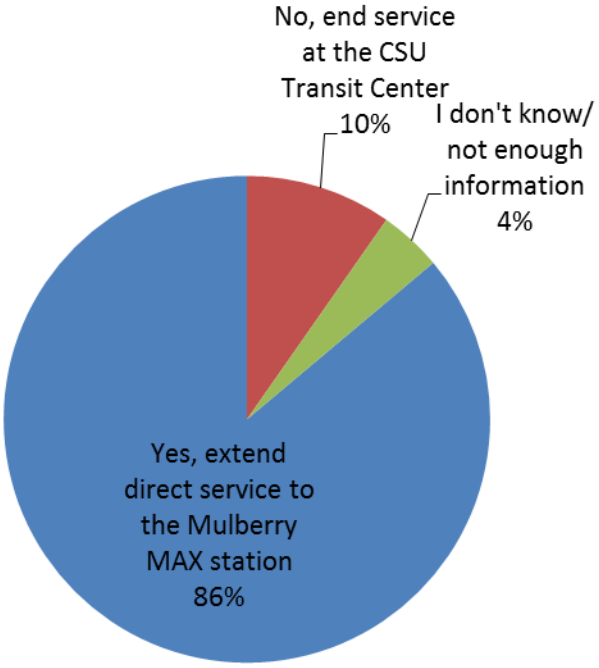
Participation Snapshot

Survey Instrument	Participants
SurveyGizmo (online)	72
Textizen (text message-based)	133
Total	*205*

What we heard from you…

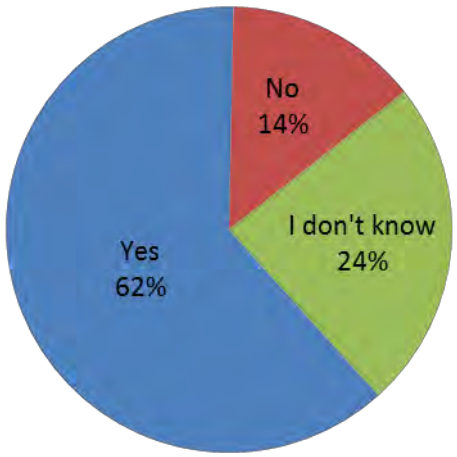
SurveyGizmo Reponses:

1. Do you think providing a transit connection between the West Elizabeth Corridor and the MAX (as shown above) would be a worthwhile investment?



Value	Percent	Count
Yes, extend direct service to the Mulberry MAX station	86%	62
No, end service at the CSU Transit Center	10%	7
I don't know/ not enough information	4%	3
Total		*72*

2. Would you use bus service that provided a direct connection between the West Elizabeth Corridor and the MAX?



Value	Percent	Count
Yes	62%	44
No	14%	10
I don't know/ not enough information	24%	17
Total		*71*

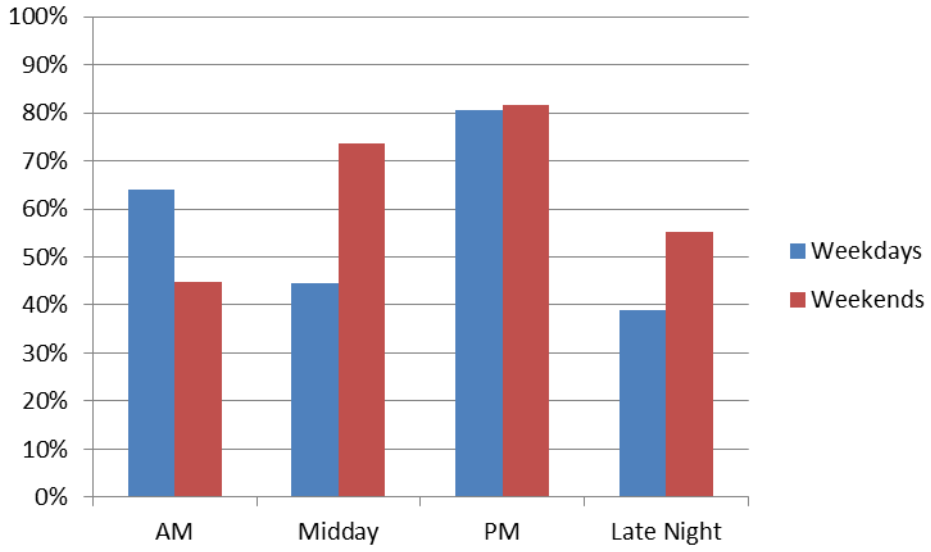
If answered no: why not?

"I use my own transportation on a daily basis. It's just more time efficient than waiting on the bus system."

"It's not connected closely enough with my neighborhood."

"Doesn't serve my travel needs.

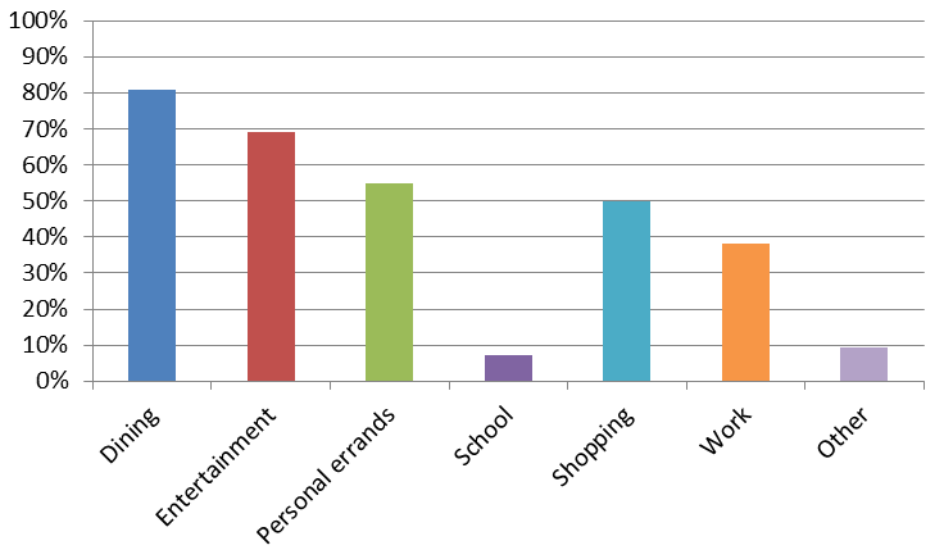
If answered yes: when? (select all that apply)



Value	Percent	Count
Weekdays		
AM	64%	23
Midday	44%	16
PM	81%	29
Late Night	39%	14
Weekends		
AM	45%	17
Midday	74%	28
PM	82%	31
Late Night	55%	21
Total*		74

*Respondents could select more than one answer, percentages may add up to more than 100%

If answered yes: for what purpose(s)? (select all that apply)

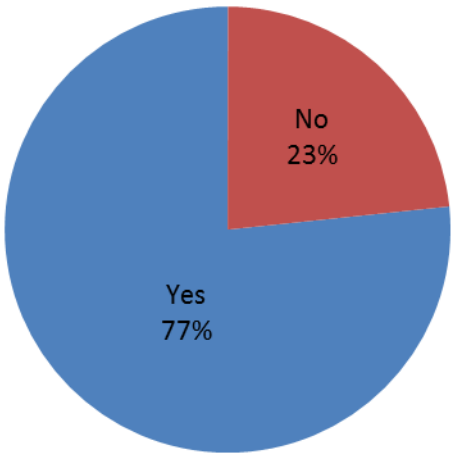


Value	Percent	Count
Dining	81%	34
Entertainment	69%	29
Personal errands	55%	23
School	7%	3
Shopping	50%	21
Work	38%	16
Other	10%	4
Total*		130

*Respondents could select more than one answer, percentages may add up to more than 100%

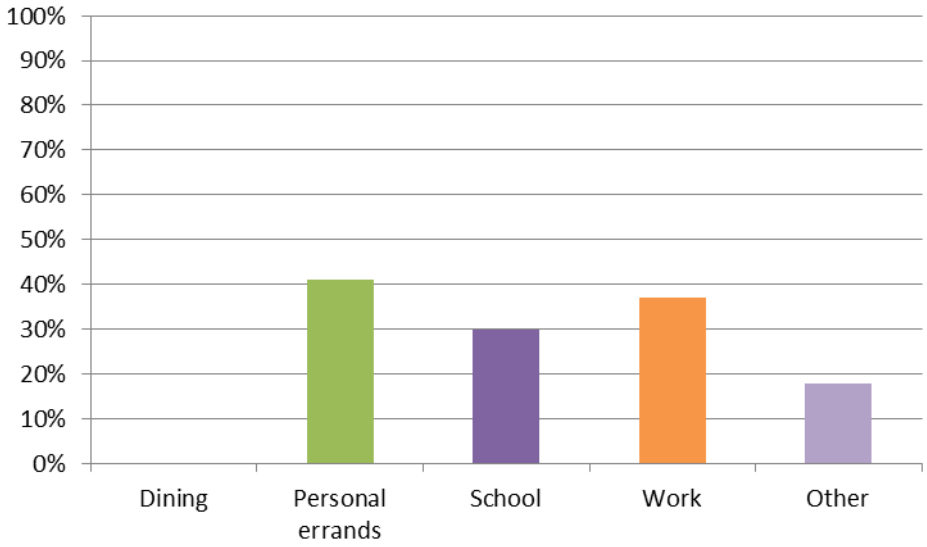
Textizen Reponses:

1. Would you use the bus service more often if a direct connection was provided to/from MAX?



Value	Percent	Count
Yes	62%	102
No	14%	31
Total		133

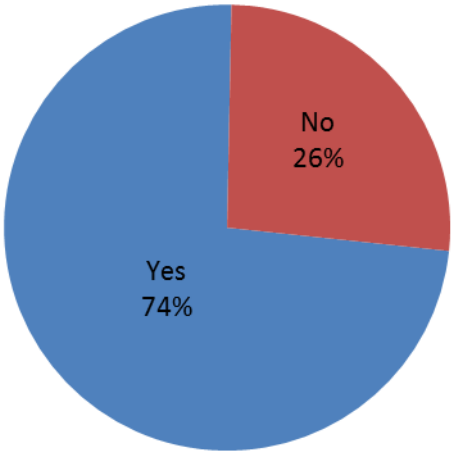
2. For what purpose(s) would you use a bus to MAX?



Value	Percent	Count
Dining	0%	0
Personal errands	40%	40
School	30%	30
Work	37%	37
Other	18%	18
Total*		126

*Respondents could select more than one answer, percentages may add up to more than 100%

3. A direct bus connection to MAX could result in additional operational costs for the City. Do you think that it is a worthwhile investment?



Value	Percent	Count
Yes	74%	95
No	26%	34
Total		133

...here is what some of your fellow citizens had to say

"I don't consider it a transit system if your focus routes don't connect. Go big or go home!"

"It would be a wonderful option to have. I am retired, but still want to remain active in my community."

"Not everyone on this side of town is involved in CSU--expand the connection."

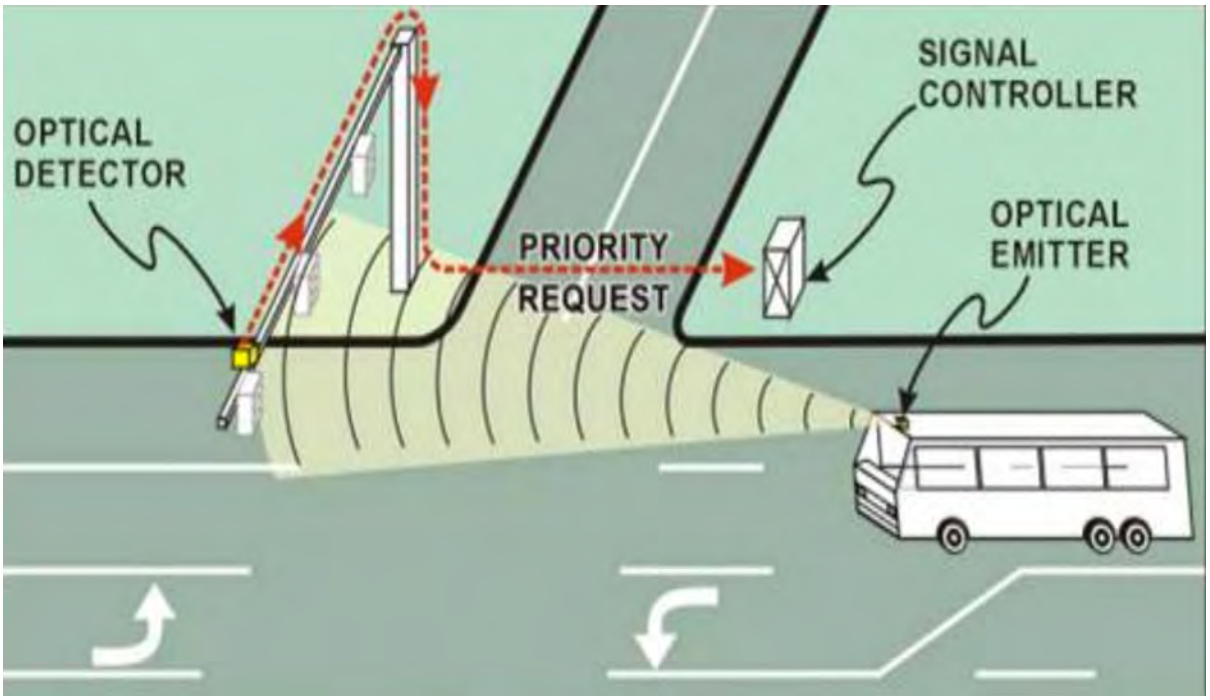
Question of the week #3:
Should Transit Signal Priority (TSP) be used at key intersections to make buses faster and more reliable in the corridor?

Make transit a top priority

We heard from you that transit should be a priority in this corridor due to the high usage along West Elizabeth Street. One way to decrease bus travel time and increase transit reliability is to provide Transit Signal Priority (TSP) at key intersections.

What is Transit Signal Priority (TSP)?

TSP are operational improvements to signals that help reduce how long a bus waits at intersections. A good portion of existing delay for buses occurs at intersections, so reducing this delay will ultimately make the buses go faster and improve transit reliability. This project is considering modifications to intersection signals that would sense when a bus is nearby and keep the light green so that the bus gets through the intersection.



What's the trade-off?

While TSP could improve transit reliability and travel time by approximately 30-45 seconds (5-8%) between Overland and Shields, it would increase delays for north/south traffic by 2-3 seconds at Taft Hill and West Elizabeth and 2-3 seconds at Shields and Plum.

Question of the week #3:
Should Transit Signal Priority (TSP) be used at key intersections to make buses faster and more reliable in the corridor?

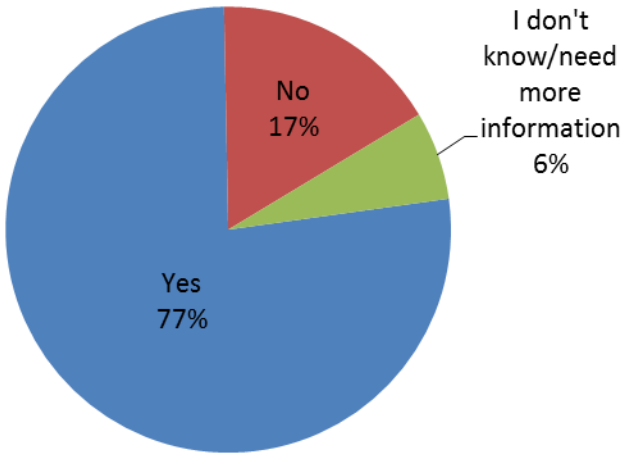
Participation Snapshot

Survey Instrument	Participants
SurveyGizmo (online)	78
Textizen (text message-based)	129
Total	*207*

What we heard from you…

SurveyGizmo Reponses:

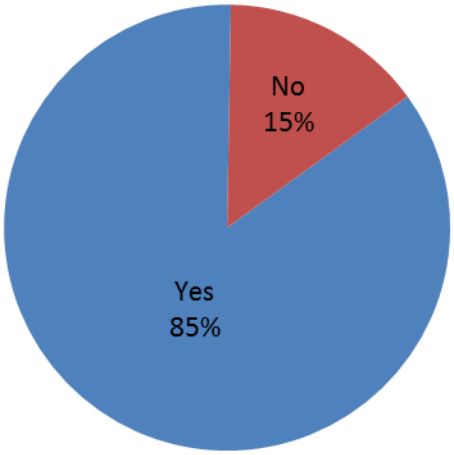
1. Should Transit Signal Priority (TSP) be used at key intersections to make buses faster and more reliable in the corridor?



Value	Percent	Count
Yes	77%	60
No	17%	13
I don't know/ not enough information	6%	5
Total		*78*

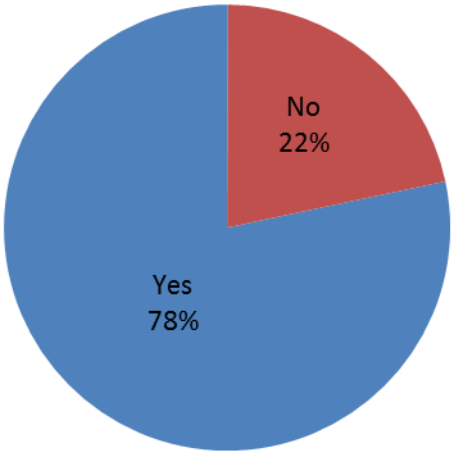
Textizen Reponses:

1. Signal improvements in the corridor could reduce bus travel time by 30-45 sec. Do you support this type of improvement to prioritize transit?



Value	Percent	Count
Yes	85%	110
No	15%	19
Total		*129*

2. These changes could delay N/S traffic 3-15 sec at Taft and at Shields if a bus is approaching. In this case do you support prioritizing transit?



Value	Percent	Count
Yes	78%	98
No	22%	27
Total		*125*

...here is what some of your fellow citizens had to say

"Reliable bus timing is a key to encouraging citizens to use the system."

"It is good, and sends a good message to all, that mass transit benefits all of us even if we do not use it that often-- it does benefit all of us."

"The bus as a means of transportation should always take priority over single occupant vehicles."

"No they should wait just like the other vehicles."

Question of the week #4:
What should protected bike lanes in the corridor look like?

What are protected bike lanes?

Protected bike lanes provide an additional element of vertical separation between vehicular travel lanes and bike lanes. The vertical separation can take the form of a curb, plastic posts, parked cars, planters, or a raised path. Two examples of protected bike lanes in Fort Collins include Shields Street between Richmond Drive and Swallow Road and the recently built protected bike lane on Laurel Street between College Avenue and Howes Street.

For more information on protected bike lanes:

https://www.youtube.com/watch?v=-6LZ0iRO-TM by PeopleForBikes

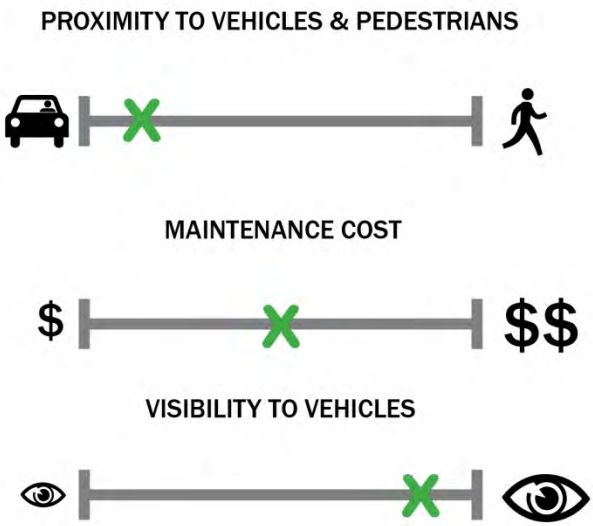
Why are we considering protected bike lanes here?

- The City's Bike Master Plan recommends protected bike lanes on West Elizabeth Street.
- The West Elizabeth Corridor has over 2,000 daily cyclists and is also one of the top locations for bicycle related crashes in the city; protected bike lanes could help reduce vehicle/bike conflicts.
- Bicyclists and motorists both comment on the unpredictability for cyclists in the corridor; a protected and dedicated facility would help clarify to all users where cyclists should be. Protected bike lanes are known to increase comfort and encourage use for a range of cyclists. This could result in more people biking and fewer people driving.
- This type of facility could create a sense of place and a neighborhood identity.

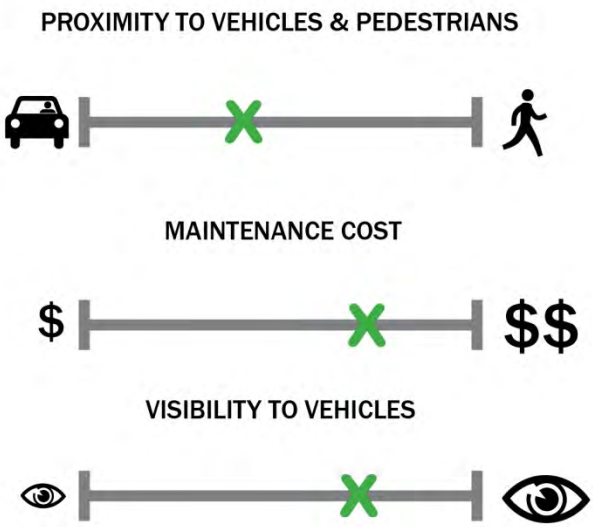
What are the options?

The West Elizabeth Corridor could include protected bicycle facilities on West Elizabeth while retaining the existing number of travel lanes and remaining within the public right-of-way. The project team is currently evaluating three different protected bike lane options for the western part of the corridor. Each of these options has tradeoffs. Some of these trade-offs relate to the proximity of cyclists to vehicles and pedestrians, snow maintenance costs, and visibility to vehicles.

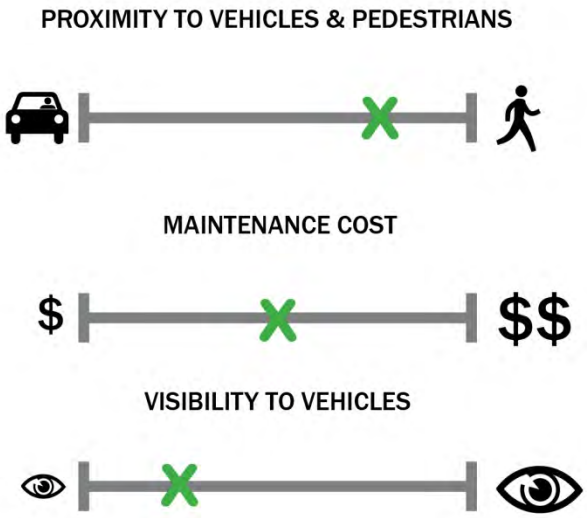
Option A: In-Street Protected Bike Lane



Option B: Raised Protected Bike (next to travel lane)



Option C: Raised Protected Bike Lane (next to sidewalk)



Question of the week #4:
***What should protected bike lanes in the corridor look like*?**

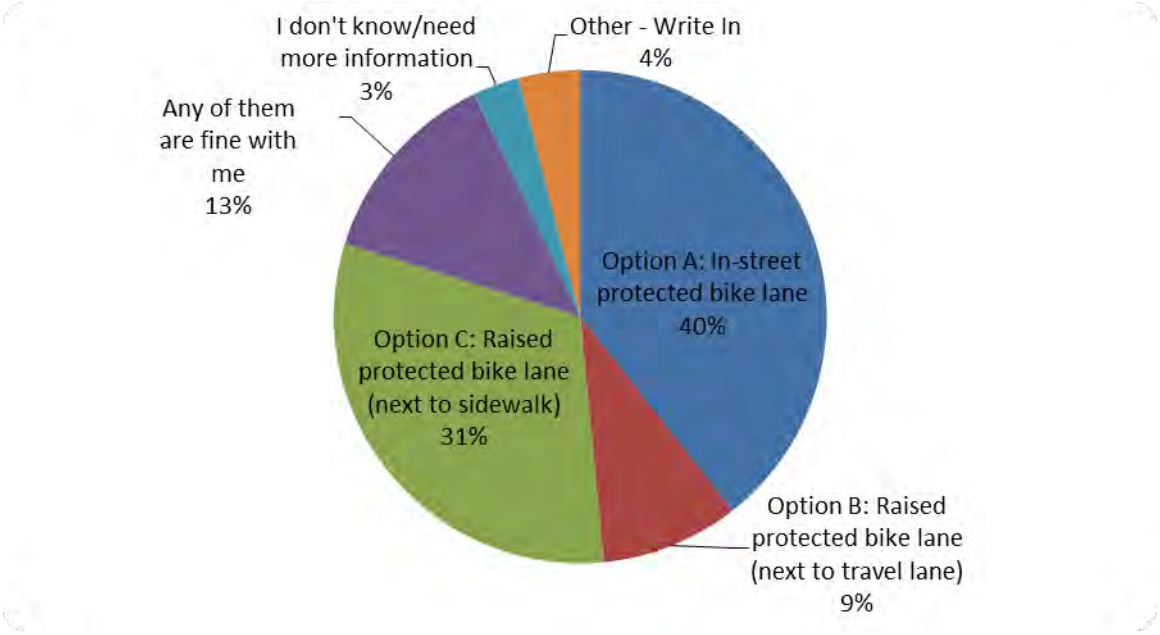
Participation Snapshot

Survey Instrument	Participants
SurveyGizmo (online)	157
Total	*157*

What we heard from you…

SurveyGizmo Reponses:

1. Which option would you prefer for the western part of the West Elizabeth Corridor?



Value	Percent	Count
Option A: In-street protected bike lane	40%	62
Option B: Raised protected bike lane (next to travel lane)	9%	14
Option C: Raised protected bike lane (next to sidewalk)	31%	49
Any of them are fine with me	13%	20
I don't know/need more information	3%	5
Other - Write In	5%	7
Total		*157*

...here is what some of your fellow citizens had to say

Option A: In-street protected bike lanes

"Visibility to vehicles is more important to me than either being physically raised or spatially separated from vehicles. It is also the most economical and easy to maintain in snow conditions."

"The balance of cost, visibility, and proximity to pedestrians seems to be best with option A. Being too close to the sidewalk comes with its own risks, and most motorists are used to seeing cyclists near traffic lanes."

"I really want cars to be able to see the bikers. I think that helps a lot with reduction of accidents."

Option B: Raised protected bike lane (next to travel lane)

"This will make it safer for pedestrians on the sidewalk, and help prevent vehicles from encroaching on the bike lanes."

"Currently the plows bury the bike lanes in snow during the winter time. A raised bike lane will not get buried during the winter season, and will still be separated from both bikes and pedestrians year round."

"The greater the buffer there is between autos and bicycles the fewer collisions there will be between them and the more comfortable the interested-but-hesitant cyclist will be riding on W. Elizabeth."

Option C: Raised protected bike lane (next to sidewalk)

"Keeping bikes away from the car lanes are the safest method of transportation for all parties involved."

"Maintaining a pedestrian sidewalk and dedicated bike lane side by each would be cost effective. Use on-pavement signage to indicate users and direction. Pedestrian and bike traffic is much slower than vehicular speeds."

"Cyclists will ride more comfortably next to pedestrians than cars. Cyclist will be less likely to cross the street at dangerous points if the bike path is separated from the road."

Any of them are fine with me

"I have difficulty envisioning how a single solution would be appropriate for the entire study area. Any of these options would be an improvement (particularly for areas between Taft & Overland where there is currently no bike lane at all!)"

"I assume there are lots of students on that stretch. I would want the most safety for them without disrupting an already congested traffic pattern."

Other Comments

"I'm very excited to see these changes being considered! I've had many close calls as a cyclist, particularly now that the bike lane at Shields and Elizabeth is nearly nonexistent paint-wise. As a driver, I can understand the frustration because the lane isn't visible, and many drivers don't realize that the right turn lane is in fact to the right of the bike lane at this intersection. I think a separated lane would improve clarity and safety for everyone."

"We need bike lanes that are completely protected from vehicles. Buffered bike lanes just don't do enough."

"I think it's a great idea, and will provide a greater incentive to bike around Fort Collins. I know many people who prefer to drive because they know it's a safer option, so protected bike lanes will allow for an increase in safety."

5. Phase 3 – Recommended Design and Implementation Planning and Phase 4 – Draft Plan and Adoption Process

Outreach for Phases 3 and 4 generally covered January – October 2016. The key elements include:

- City Council Work Session (March 10, 2016)
- Recommended Design Open House (June 16, 2016)
- Recommended Design Online Survey
- Draft Plan Review

City Council Work Session (March 10, 2016)

Staff brought the project to City Council for feedback and an update in March 2016. Topics presented included:

- What is an Enhanced Travel Corridor (ETC)?
- Project Study Area
- What are we trying to solve?
- Community Engagement—What We Did
- Community Engagement—What We Heard
- Vision
- Design Approaches
- Evaluation Process
- Preliminary Recommendations
- Next Steps

Key questions for Council included:

1. What are Council's thoughts on the recommended elements and proposed phasing concepts presented? Are there any elements that are missing or that you would like to see implemented differently?
2. Would Council like another Work Session on this project prior to considering adoption of the plan in July[1]? Are there specific items Council would like covered beyond what is listed in Next Steps?

Highlights of Council discussion included:

- Support for elements and phasing presented, particularly those elements that will improve safety.
    - Complete sidewalk network.
    - Complete bike facility network with connections to rest of low-stress network.
    - Additional transit service and amenities.
- Questions about CSU contributions for future potential BRT-like service.

[1] Note: The project originally had the adoption hearing scheduled for July 2016; the schedule was later adjusted.

- Interest in exploring a rapid transit solution that could be Bus Rapid Transit (BRT) or express bus in nature, or a new technology.
- No additional work session is needed unless content changes markedly.
- Interest in more information on the bike share system.

Follow-up Items included:

- Explore cost-effective opportunities to include sidewalk improvements beyond minimum standards in near-term implementation package.
- Consider potential funding sources as part of Implementation Planning.
- An update on bike share launch plans, including a map of station locations will be provided by the end of March.

AIS materials are available on the City Clerk's website at http://www.fcgov.com/cityclerk/agendas.php.

Recommended Design Open House (June 16, 2016)

Table 6. Summary of West Elizabeth Recommended Design Open House Comments

Comment	Board	Specific comment location
Some concern about deterring bike theft if bikes are left for long period, even if they're locked	Urban Design	Bike parking (all)
Prefer dense bike parking that takes up less space and is accessible from both sides	Urban Design	Bike parking (all)
Make it modern	Urban Design	Bike parking (all)
Need weather protection for seating	Urban Design	Seating (all)
Signage to educate bicyclists on use of innovative facilities	Bicycle Facilities Full Build	N/A
Add curb cut at bridge on Mulberry	Bike Share	Mulberry east of Taft Hill
Add bus stop	Phase 1 Transit	Mulberry at Tyler Street
Pedestrian scramble at Shields and Elizabeth, consider double right turn SB to Shields	Interim Design plots	Shields and W Elizabeth
At Shields and Elizabeth, add leading pedestrian interval, longer pedestrian phase, remove shrub at SW corner	Interim Design plots	Shields and W Elizabeth
Losing connection from King Soopers and Prospect, now that 2 and 32 don't loop, providing N-S connection	Phase 1 Transit	
Extra traffic on Plum and Springfield due to no left turns on Elizabeth	Recommended Design Plots	Plum and Springfield
Parking for Campus West	Recommended Design Plots	Campus West
Specify left turn lanes from Shields onto Elizabeth so people don't change lanes mid-turn	Recommended Design Plots	Shields and W Elizabeth

Comment	Board	Specific comment location
Restricted WB traffic with only 1 lane, but can only access businesses from the WB	Recommended Design Plots	Campus West
Right turns from W Elizabeth onto Shields: shorten light, make distinct separation between right turns for vehicles, bikes and pedestrians	Recommended Design Plots	Shields and W Elizabeth
No left turn in at St Paul's, Hot Wok, Krazy Karl	Recommended Design Plots	Campus West
Extend single west lane on Elizabeth just west of Shields further west past where underpass concludes, so people don't accelerate so close to intersection	Recommended Design Plots	W Elizabeth EB approaching Shields
No bus stop in Campus West at AM	Recommended Design Plots	Campus West
Remove parking on City Park north of University	Recommended Design Plots	City Park south of W Elizabeth
Add speed bumps on City Park north of University	Recommended Design Plots	City Park south of W Elizabeth
Sightline of bikes blocked by buildings and railing	Recommended Design Plots	W Elizabeth west of City Park
Need proposed crosswalk between Constitution and City Park ASAP	Recommended Design Plots	W Elizabeth east of Constitution
Move EB bus stop at Skyline from east of Skyline to west of Skyline	Recommended Design Plots	W Elizabeth at Skyline
Push Foothills to Main Campus traffic to mulberry or Prospect	Recommended Design Plots	
Improve crossing at Orchard and Taft Hill	Recommended Design Plots	Taft Hill and Orchard
Concern about left out at properties north of King Soopers - needs to be maintained	Recommended Design Plots	W Elizabeth and Taft Hill
Bushes at corner of Ponderosa and W Elizabeth need to be cut to improve sightline	Recommended Design Plots	W Elizabeth and Ponderosa
Liability of snow clearance on West Elizabeth	Recommended Design Plots	Throughout corridor
Garages will obstruct sidewalks	Recommended Design Plots	Throughout corridor
Check on maintenance, streets: snow plowing, mowing and watering	Recommended Design Plots	Throughout corridor
Noise mitigation concern	Recommended Design Plots	Throughout corridor
Love the bike/bus combinations at bus islands	Recommended Design Plots	Throughout corridor
Build a raised buffer between car and bike lane	Cross Section	W Elizabeth at Cragmore
Add bike detection	Photosimulation: Protected	W Elizabeth and City Park

Comment	Board	Specific comment location
	Intersection	
Add bike parking at bus stop islands	Typical Bus Stop Design	
Don't like MAX cutting through middle of campus	Phase 4 Transit	CSU Main Campus
Close off Elizabeth from City Park to Shields for special events	What if Campus West Redevelops?	
Is there data for mode split to businesses	What if Campus West Redevelops?	Campus West
Concerned parking situation doesn't improve with this scenario	What if Campus West Redevelops?	Campus West
Could trucks make deliveries to both sides with curb	What if Campus West Redevelops?	Campus West
Concerned parking behind building harder for those with walkers, wheelchairs and other accessibility challenges	What if Campus West Redevelops?	Campus West
Connect back parking lots all the way across	What if Campus West Redevelops?	Campus West
Concern that no left out for businesses on the south side	What if Campus West Redevelops?	Campus West
Can't lose convenience with improvements, concern losing access to businesses	What if Campus West Redevelops?	Campus West
If parking removed at Spoons, make sure other parking improvements happen before	What if Campus West Redevelops?	Campus West
Priority for bikes and pedestrians at Shields and Elizabeth	What if Campus West Redevelops?	Shields and W Elizabeth
Like private courtyard	What if Campus West Redevelops?- Prototypical Designs	N/A
Don't like raised terrace option - not enough buffer left over	What if Campus West Redevelops?- Prototypical Designs	N/A
Buildings too big in corner plaza option	What if Campus West Redevelops?- Prototypical Designs	N/A

Recommended Design Online Survey

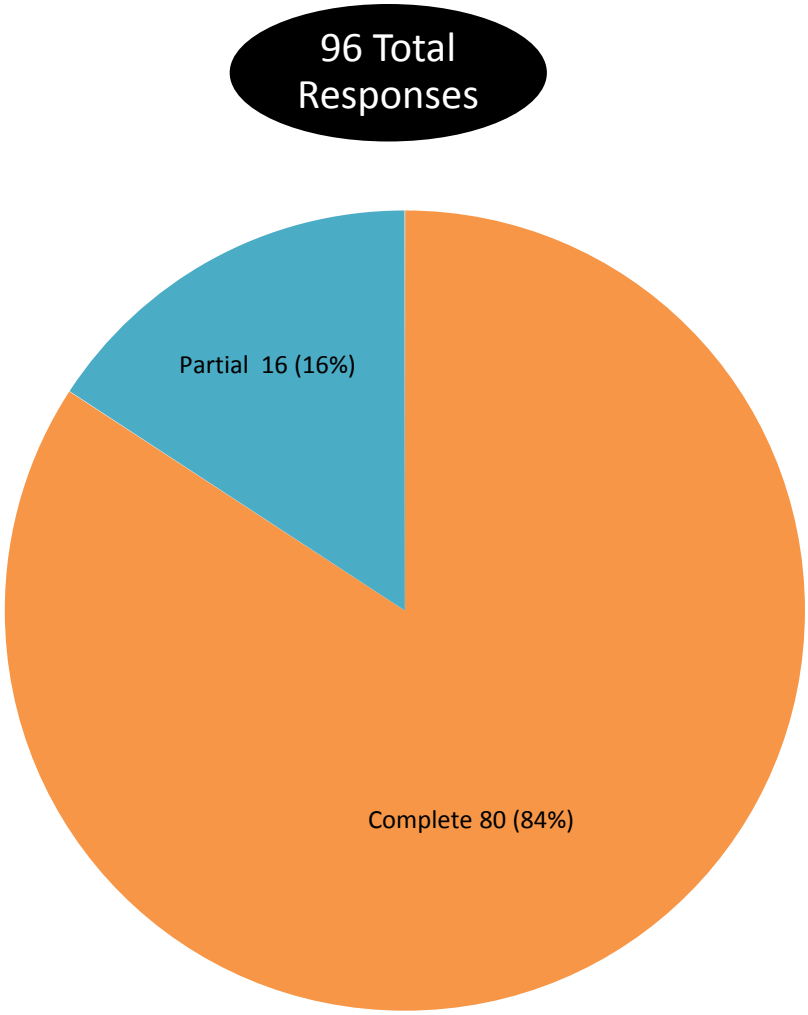
Background

The Recommended Design for the West Elizabeth Enhanced Travel Corridor including proposed phasing was presented to the public at an open house on June 16, 2016. In an effort to share the design with a greater audience an online survey featuring highlights from

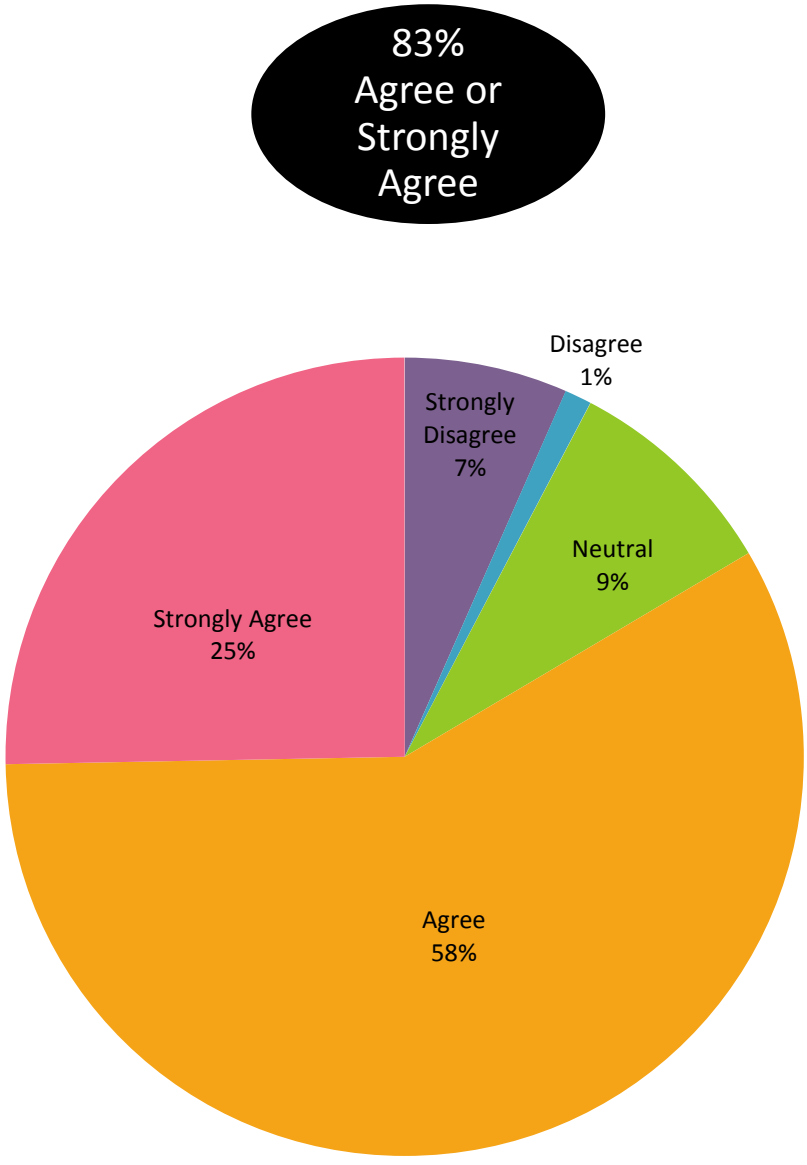
the Recommended Design was created which further provided citizens the opportunity to provide feedback.

Results

Participation Snapshot



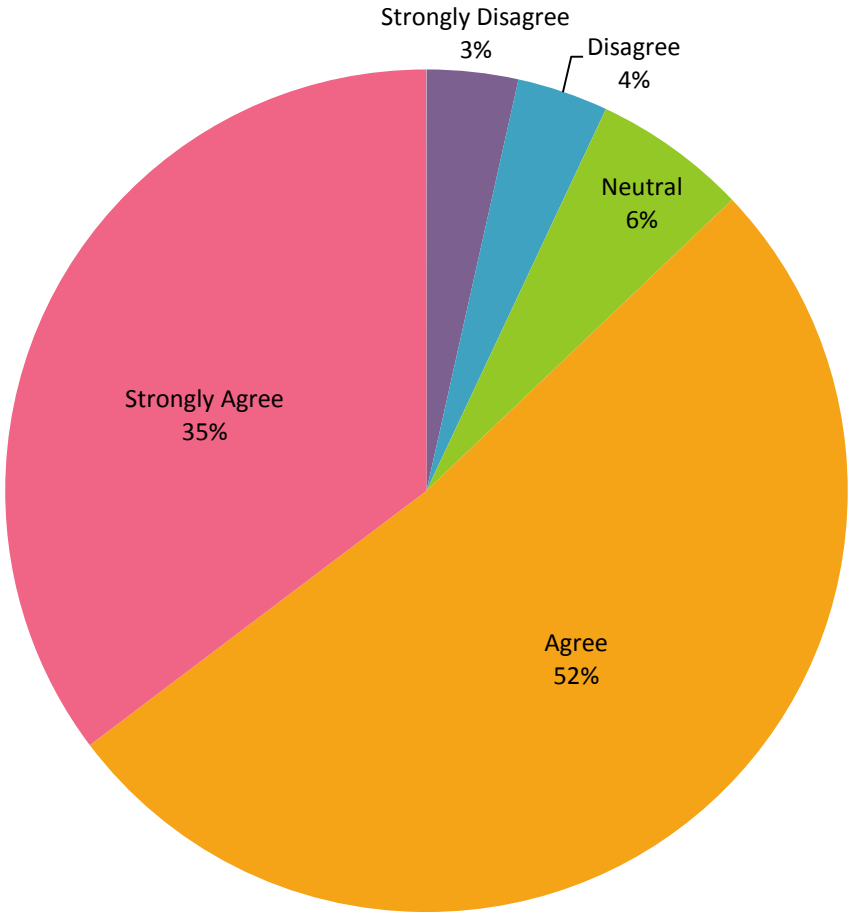
1. ***The Recommended Design's transit improvements address the Identified Needs and accomplish the Corridor Vision described above?***



Comments:

1	Before I even saw the Recommended Design, I'd prepared to present a case for constructing a roundabout at the intersection of West Elizabeth & South Overland. (Of course I also think these would facilitate better and safer multi-modal transit at the intersections involving South Overland with Mulberry and (replacing the stoplight at) Prospect.
1	Exciting plan
1	Good approach to phased in work.
1	I thought a goal was to calm the traffic in light of bikes and pedestrians and businesses requiring access. Seems like focus has been to move car traffic at shields and west elizabeth.
1	It appears to change from 2 lanes to 1 lane traffic which I find unacceptable for the people who live in the area who are not students. There is no example that I can see that a relates to the area west of Taft hill Rod., where that amount of space is not available. I really am selfish and do not care or wish to have money spent on special bus stop areas, special bike lane areas or anything much that changes. I feel that businesses are going to get the short end of the stick and people on the north side of the west end of Elisabeth or going to lose their front yards.
1	It is a major error to send the bicycle path BEHIND the bus stops: 1) conflicts between pedestrians and bicyclists; 2) loss of visability between cyclists and motorists.
1	Love the transit stations and the integrated bike lanes. Hope that the direct bus service between Elizabeth and Downtown happens sooner rather than later. Huge potential for a direct to downtown bus to connect Elizabeth folks to jobs and night life if open late.
1	Mass transit is going to need a higher priority - sooner.
1	Not to be critical: Are some people (e.g., seniors, visually impaired, those using wheelchairs) going to be intimated crossing the bike lane? Is there some sort of elevation change or other notice to alert cyclists to people crossing, who may be moving quickly to get to the bus? I'm a cyclist; just expressing concern. Thanks.
1	Phase in all work. People need to adjust slowly.
1	Thank you and done!
1	The bus islands should help the flow of traffic when buses have to stop!
1	The improvements look terrific. Increasing bus service is vital.
1	There is a need for a stop further south down Overland by Drake
1	Where is the traffic that now uses the corridor going to go? How will the businesses on Elizabeth be accessed? Is the bus transit more important than existing uses?
1	Why buses on Plum? Elizabeth has room for them, and is just a block away. I oppose buses on Plum --- there is not enough room.
1	late night transit options for weekdays and weekends
1	like that transit is a priority

2. ***The Recommended Design's biking improvements address the Identified Needs and accomplish the Corridor Vision described above?***

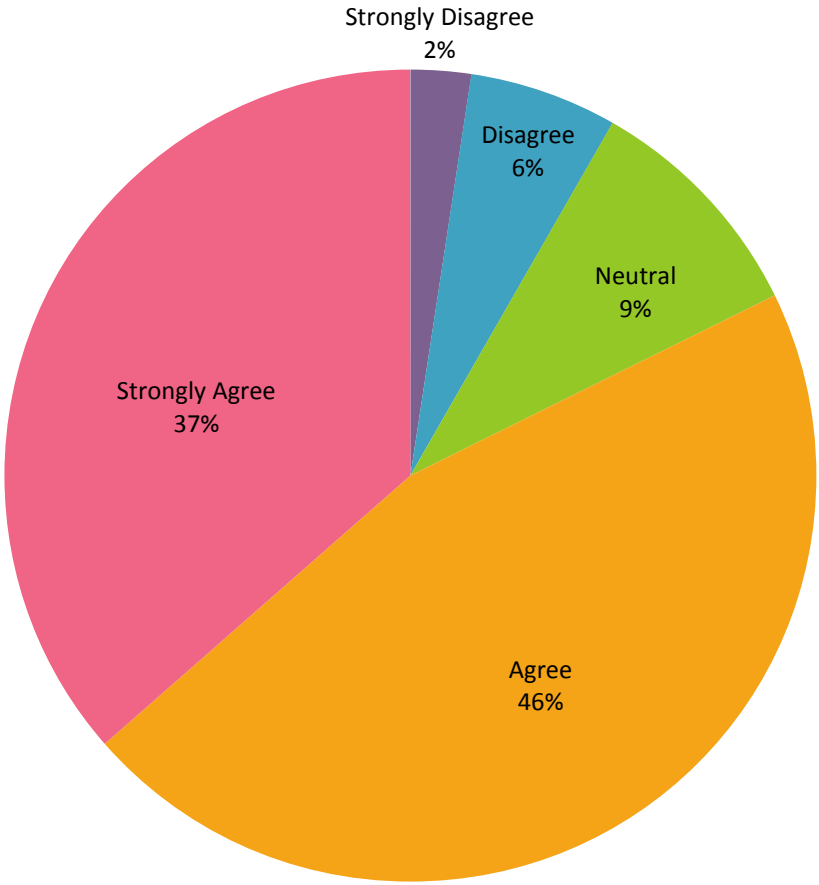


Comments:

1	I think this would need to be accompanied by a strong educational/marketing push so cyclists understand how the new intersections work. I love the two-stage turn boxes!
1	Improvements to the intersection of skyline and Elizabeth including a signal light are badly needed. The current signal light west of this intersection is useless
1	No mention is made of the proposed raised curbs for bike lane buffers. Failure to mention this is itself a problem. Raised curbs as bike lane buffers are a serious hazard for cyclists, motorists, and pedestrians. Bulbouts and other obstructions in the roadway are also a hazard and an inconvenience and are unacceptable. What, exactly, does the phrase "Safe and comfortable Protected Intersection" mean?
1	Re. Segregated bike lanes: Where appropriate, it may be helpful to include barriers designed to prevent bikes from entering and/or crossing the motor vehicle lanes. (as at Laurel west of College?) Re. Signage designed to instruct cyclists: Be sure these indicate clearly what a cyclist is expected or asked to do. Don't use the term "path" (as on Centennial Rd at LeMay) when the obvious meaning is a sidewalk. Leave "path" for what will be immediately recognized as a bicycle route (as on Heatheridge at W Prospect and - not so much - on Lynnwood at W Prospect.) And remember that paint on pavement fades rapidly.
1	Supporting bikes is key to a modern transportation design.
1	The W Elizabeth and City Park Ave bicycle DETOUR and so-called "protected island" obstacles, as well as raised bicycle curb separators are dangerous and thus unusable.
1	The protected bike lanes and intersection additions to improve cycling safety are great! I think these will be a wonderful and needed addition to the community. More areas of Fort Collins should implement them too!
1	A big improvement! The problem with the City Park and Elizabeth intersection in particular is that the city allowed development too close to the corner, so that when you are on City Park stopped at the light, heading north with 7-11 on your left side, you can not SEE the bikes coming at all, so no amount of improvement will help the situation. Also the black railing further blocks the view. Overdevelopment of busy intersections with a lack of proper set back creates dangerous situations for bicyclists. We also need speed bumps on City Park, south side of this intersection, to slow traffic as it exits all the businesses and goes into the neighborhood or into the intersection. Finally take OUT the parking spots on City Park street southeast after the shopping strip exit. These vehicles BLOCK the view of City Park and University, where few people come to a stop and I was HIT by a car while walking.
1	As many protected bike lanes as possible. Particularly with concrete curbing as in Europe and other places.
1	City of Fort Collins also needs to hold cyclists responsible for using lights at night--this would go a long way towards increasing safety.
1	Except for sidewalks, not needed from S. Taft to Overland. Crossing improvements definitely needed.
1	Great bike improvments, however the underpass at sheilds should be better addressed. If it happens, how do westbound bikes get to bike lanes after exiting the underpass?
1	Having the bus cross bike lanes to get to a protected loading/unloading zone is not a good idea.
1	Hope the phase-in "over time" is well thought-out and not too long in duration. Not sure about the pilot protected intersection; missed the example/drawing if there was one.
1	I am a bike commuter and so this is the most important priority for me. I like the idea of the buffered bike lanes but I was hoping they would be raised for the entirety of the W Eliz. Corridor.
1	I support underpass

1	Too many drivers AND cyclists do NOT know what a "sharrow" is, and thus as an avid road cyclist, mt-biker, motorcyclist, fuel efficient automobile driver; and League of American Bicyclists League Cycling Instructor, I've often been concerned about cyclists and drivers knowledge and safety along West Elizabeth - particularly where the sharrow is located (W-bound), and where designation of the bike line (E-bound) disappears (despite the road appearing to be approximately the same width before and after this disappearance).
1	Well done.
1	not a fan of the protected intersection, seems more like a gimmick than actually being beneficial to bikers. The angles that the bikers have to turn seem unsafe rather than safer. Protected bikes are also an over treatment. Buffered would be better from a safety perspective and the maintenance would be less expensive.

3. The Recommended Design's walking improvements address the Identified Needs and accomplish the Corridor Vision described above?

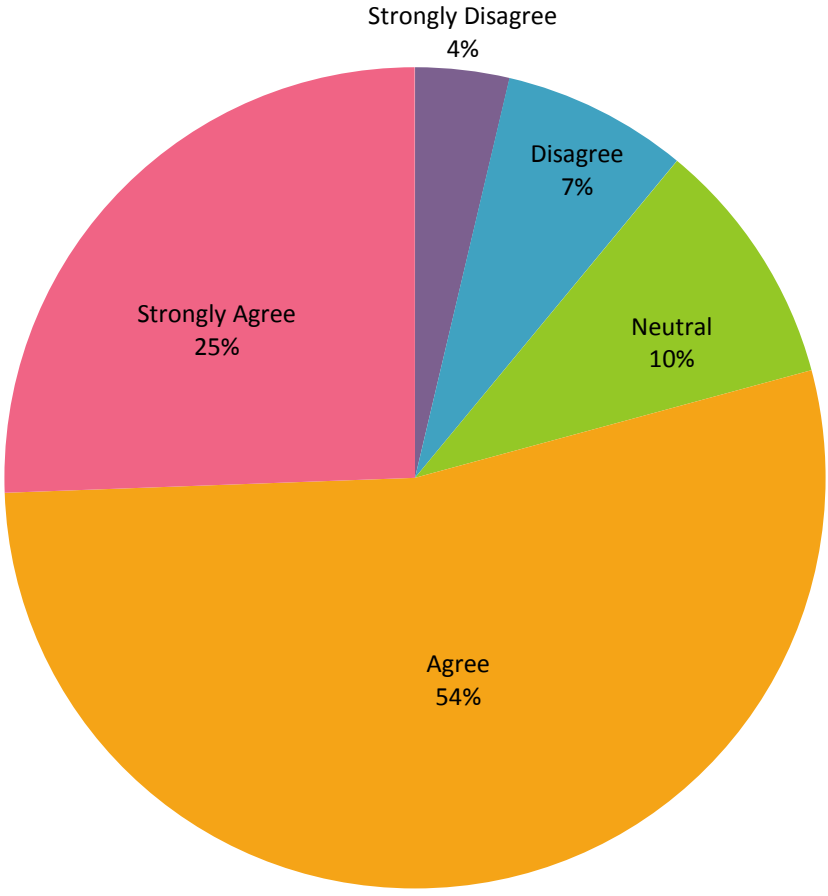


Comments:

1	"protected intersection" --- MEANING? ---definition please. Only acceptable if "bulbouts" and other obstructions in the road are eliminated.
1	An under/overpass at Shields would, in my opinion, greatly improve pedestrian safety.
1	As long as parking spots and building setbacks allow for a view of crosswalks.
1	Crosswalks should NOT be set-back from intersections (such as shown above at Ponderosa Dr) as pedestrians should not have to make a detoured path from the continuation of the sidewalk. The traffic stoplines can be setback but the crosswalks should stay aligned with the sidewalks.
1	Current users are mostly college aged people who will jay walk regardless of additional crossings. Design should anticipate this.
1	GREAT to read there will be a crossing at the senior housing and that everything (I believe) will be ADA compliant.
1	I think east and west bound West Eliz between City Park and Shields should be a single lane with turn lanes with 25 mph and raised pedestrian crosswalks
1	Identify locations most likely on Elizabeth East of Campus West
1	It might be helpful to define "Campus West" because you use it for every question.
1	It's not clear, but if adding a sidewalk on the W-bound side of the road between Taft Hill and South Overland is included in the Recommended Design, then I "strongly agree" that walking improvements address the identified needs. That is, a safely protected, wide sidewalk is necessary on BOTH sides of the street.
1	Pedestrian crosswalks apart from intersections need bright intermittent lights to catch attention of drivers. Side streets like Springfield need electronic speed limit signs.
1	Sidewalks=good :)
1	That may help out, so long it doesn't impede on shop territories and parking there --otherwise conflicts will occur
1	The consistency is a big issue. Also, the mid-block crossing at Ponderosa is a hazard--the flashing lights are blinding to vehicles and yet the actual crosswalk is completely unlit. It is very hard to see where pedestrians are.
1	The current sidewalk infrastructure in Fort Collins is laughable. Many section are non existent and those that do exist are usually narrow and adjacent to the roadway. This is dangerous and scary!
1	The plan doesn't address on-street parking for residences along Elizabeth St.

4. The Recommended Design's driving improvements address the Identified Needs and accomplish the Corridor Vision described above?

79% Agree or Strongly Agree



Comments:

1	All the plantings will impede visuals for drivers, bicyclists, and walkers. Will there be a height limit? Will neighborhood access be maintained all along the corridor?
1	Design won't slow vehicle down much, just makes it a challenge for them to drive through as fast as they can.
1	Didn't see anything written about vehicular speed. As a cyclist, this is my biggest concern, even over infrastructure. {I can ride anything (e.g., with sparrows) IF the speed is low.} Roundabouts are great and will be used -- if the speed is low enough for the comfort and safety of cyclists and pedestrians.
1	I like everything except the 4 travel lanes which to my mind continues to encourage car use when bus , pedestrian or bike bicycle travel would be more appropriate.
1	I like the idea of the roundabout and bringing the lanes down to one in both directions.
1	I support round abouts for most intersections like overland Elizabeth.
1	I'm uncertain how enough room may exist in some areas to facilitate four lanes, protected bicycle lanes, AND center medians (i.e., given preexisting property boundaries and ownership easements [?]) without decreasing value of some adjacent properties, but if it's possible....
1	Instead of using superlatives in your descriptions, you need to provide more factual detail.
1	Round abouts are horrible and should be banned
1	Turning west out of the King Soopers parking lot is a challenge as is turning east off Ponderosa from the north because of visibility. Not sure how a roundabout at Overland would help
1	What a crazy idea to place truck loading zones in the center of the street! Even if trucks currently use the center turning lanes for loading, this remains very, very dangerous and is a very bad idea. It is not a substitute for real loading zones at the businesses. If there is no other space, then remove parking.
1	Would like to also see more roundabouts along Elizabeth to slow traffic.
1	Would like to see speed bumps or more speed-reducing designs included in the plan. Roundabouts are not enough.
1	agree, you have speeded up the turn/wait times at Shields and Eliz

5. Additional Comments?

Comments:

1	As many protected bike lanes as possible
1	Continue this measured approach.
1	Hopefully, these get implemented
1	I am excited for the improvements on Elizabeth.
1	I am so very appreciative of the effort, time, inclusion of citizens, along with the experience and intelligence that go into the design and planning in Fort Collins. Great to see the drawings with the changes to come. Please keep pushing the envelope and yourselves!
1	I appreciate all the efforts the City has put into this project. Keeping the citizens informed and listening to all of our comments/complaints is not an easy task.
1	I like the general W Elizabeth travel corridor plan, but the above comments point out real mistakes. There is NO information about the possible Shields St. pedestrian and bicycle underpass.
1	I wish there was a sooner direct transit link to the max.
1	I would like to see a MAX shuttle bus equivalent run the entirety of the W Eliz. Corridor also.
1	Invest in multi modal transportation and invest in the future.
1	It's not good to sacrifice easy driving for a better bike lane. Access to Campus West shopping center needs to be improved.
1	Looking good so far!
1	Looks awesome!!
1	Nice work in addressing shared space for all users.
1	Route 2 should be extended to Remington and have a Lake circulator route as soon as possible.
1	Thank you and we'll done!
1	Thank you for all your hard work on this massive endeavor!
1	Thank you for listening to the concerns voiced by the citizen stakeholders on the West side! 😀
1	Thank you for prioritizing this project. This will definitely help.
1	Thanks for all of the public input opportunities.
1	Thanks for all the work and gathering of input on this. Really hoping it is a grand success.

1	To reiterate, I'm ecstatic to learn that a roundabout has been proposed for West Elizabeth and South Overland and PROTECTED bike lanes are included in the proposed enhanced travel corridor plan. That being said, I also hope that FC Moves and others educate those involved with this planning that bike lanes ABSOLUTELY CANNOT taper out of existence upon nearing a traffic light, for MOST cyclists and drivers both do NOT know CO road rules. Thus, I propose that CDOT, etc. Rules of the Road educational material be developed into a permanent component of each transit station. Ideally, this would also be a location for stocking bike maps, road rules, pocket guides, etc.; however, I understand that this would take resources likely above and beyond that which FC Moves, Bicycle Pedestrian Education Coalition (BPEC), etc. could maintain adequately with volunteers. Hmmm, is it possible to incorporate some of these materials into the Transfort system vehicles themselves (and thus drivers could a
1	You survey is short on descriptive detail and long on self congratulatory superlatives. Also, you should use text which can be copied rather than images. Raised curb buffers, blubouts, porkchops, and other road obstructions muste eliminated from the plan.
1	we need a turn lane into episcopal chrch/Krazy Karls parking lot for eastbound elizabeth traffic. I worry about the acceleration that will be invited by going from one to two lanes on westbound elizabeth from Shields--- suggest expanding to two lanes after City Park ave

Draft Plan Review

During July and August, the draft plan was posted online for review and comment, and staff arranged small-group and one-on-one interactions with property owners and residents to help refine the corridor design. Some of the key topics included questions about:

- Plans at Shields/Elizabeth (which were forwarded to the project team working on the underpass and other intersection improvements)
- Impacts to property, speeds being proposed, maintenance, etc. (which were clarified via interactions with neighbors and through an FAQ on the project website)
- Design elements in the western part of the corridor, including the proposed park-n-ride, roundabout at Overland, and the design along some of the single-family residential areas (which we clarified via interactions with neighbors and through an FAQ on the project website)

The plan is scheduled to come to Council for consideration of adoption October 2016.

West Elizabeth Enhanced Travel Corridor Plan

appendix: C
CORRIDOR UNDERSTANDING REPORT

Presented To:

City of Fort Collins

Presented By:

FEHR PEERS

Corridor Understanding Report

November 2015

West Elizabeth Enhanced Travel Corridor Plan

Photographs provided by the City of Fort Collins
and Fehr & Peers; sources credited.

Design and Layout by Fehr & Peers
621 17th Street, Suite 2301
Denver, CO 80293

City of Fort Collins FEHR & PEERS TMD TRANSPORTATION MANAGEMENT & DESIGN, INC. NKE Engineering, LLC russell+mills studios

table of CONTENTS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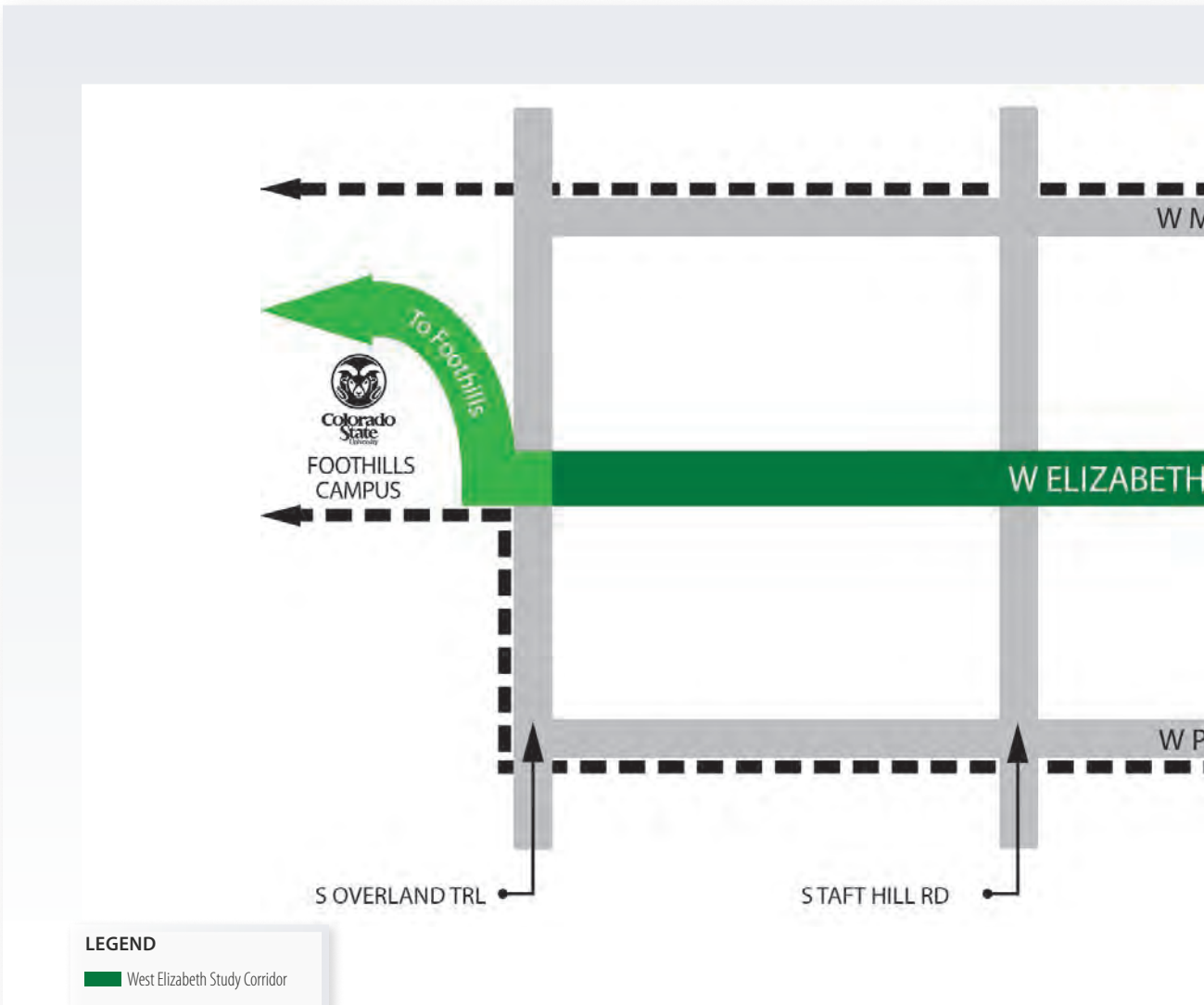
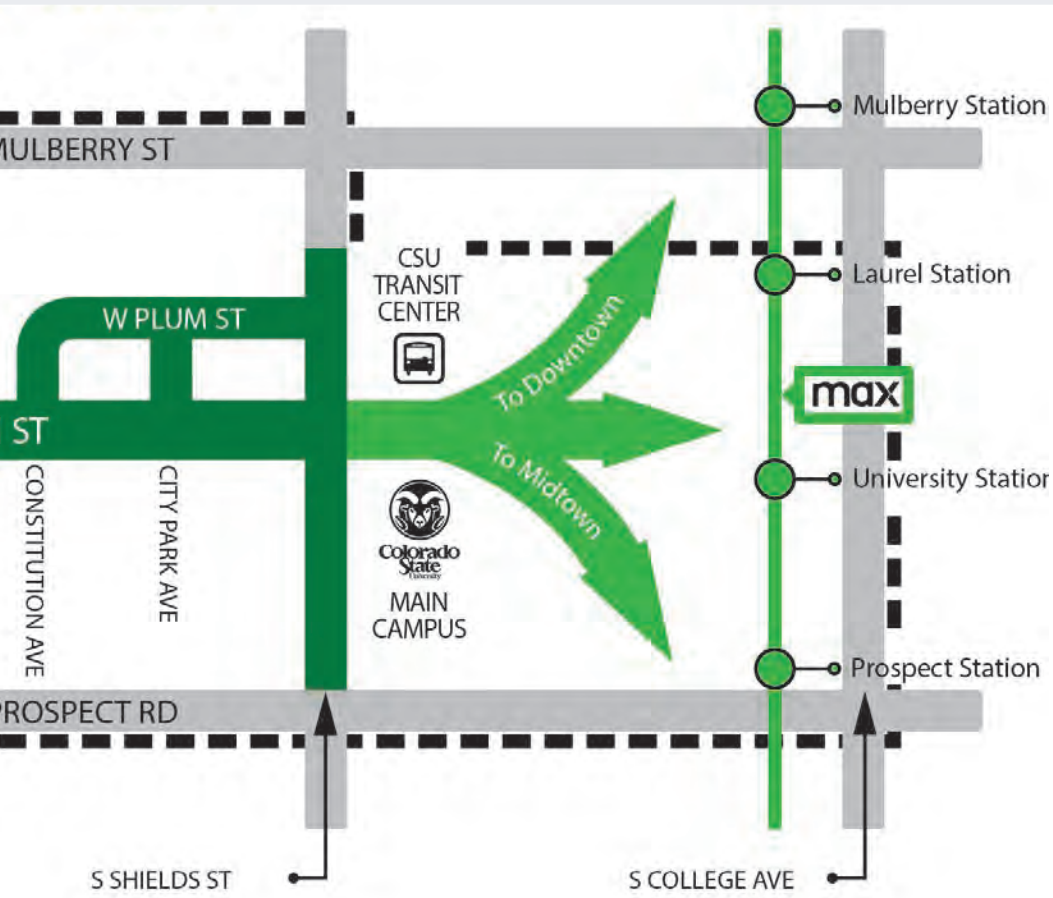
EXECUTIVE SUMMARY

THE WEST ELIZABETH ENHANCED TRAVEL CORRIDOR PLAN WILL PROVIDE A ROAD MAP FOR BOTH SHORT-TERM RECOMMENDATIONS AND A LONG-TERM VISION FOR THE CORRIDOR BASED ON AN UNDERSTANDING OF THE TRANSPORTATION AND LAND USE NEEDS OF THE AREA.

ENHANCED TRAVEL CORRIDORS (ETCs) are defined by the City's Transportation Master Plan (TMP) as corridors that emphasize high-frequency transit, bicycling and walking. This Corridor Understanding Report documents the West Elizabeth Corridor's history and context, previous planning that has influenced the corridor, and existing conditions of the corridor's infrastructure and performance for different modes of transportation. Future steps of the West Elizabeth Enhanced Travel Corridor Plan development process will build upon the Corridor Understanding Report: developing a Purpose and Need Statement and Corridor Vision, developing and evaluating alternative improvement scenarios, and developing a preferred alternative, with both near-term and longer-term implementation recommendations.

STUDY AREA

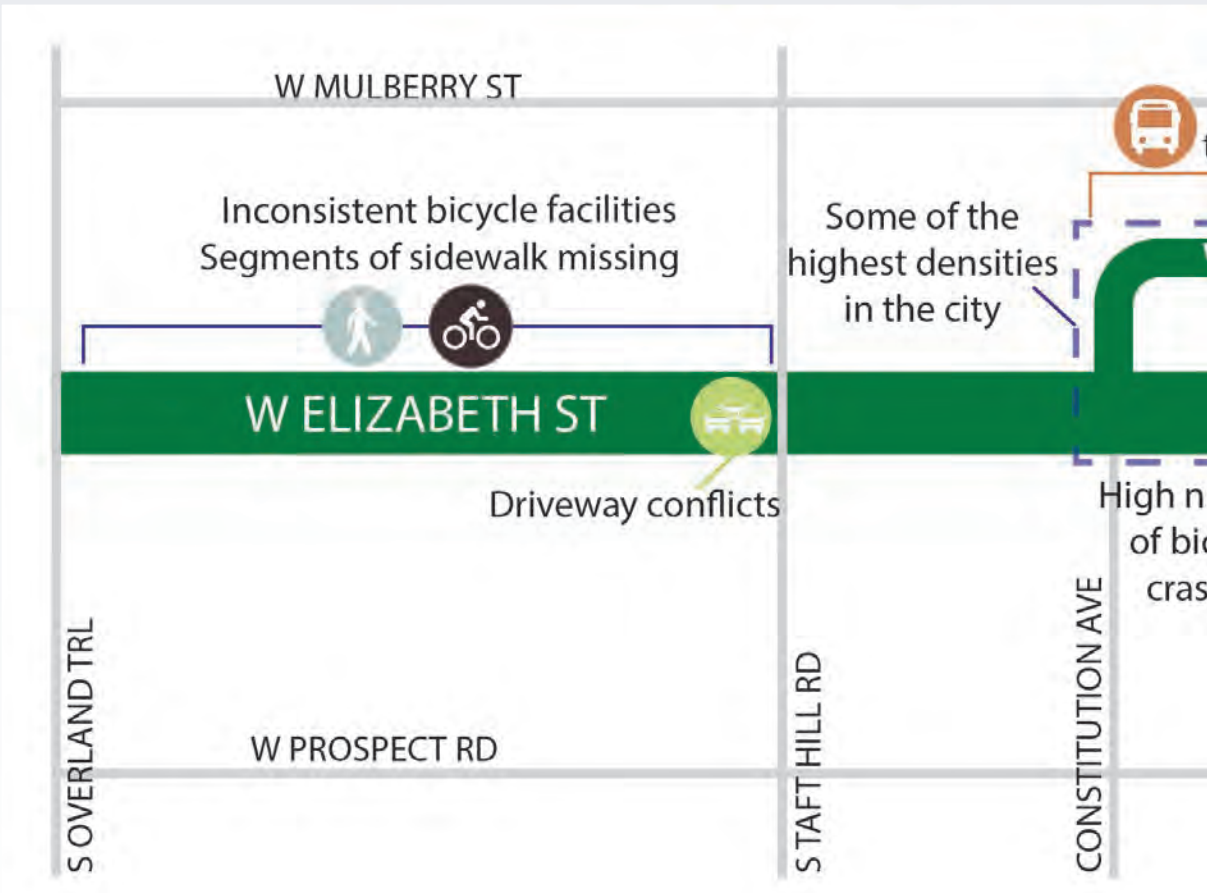

W M
To Foothills
Colorado State University
FOOTHILLS CAMPUS
W ELIZABETH
W P
S OVERLAND TRL
S TAFT HILL RD
LEGEND
West Elizabeth Study Corridor
Study Area
MAX Bus Rapid Transit (BRT)
MAX Stations

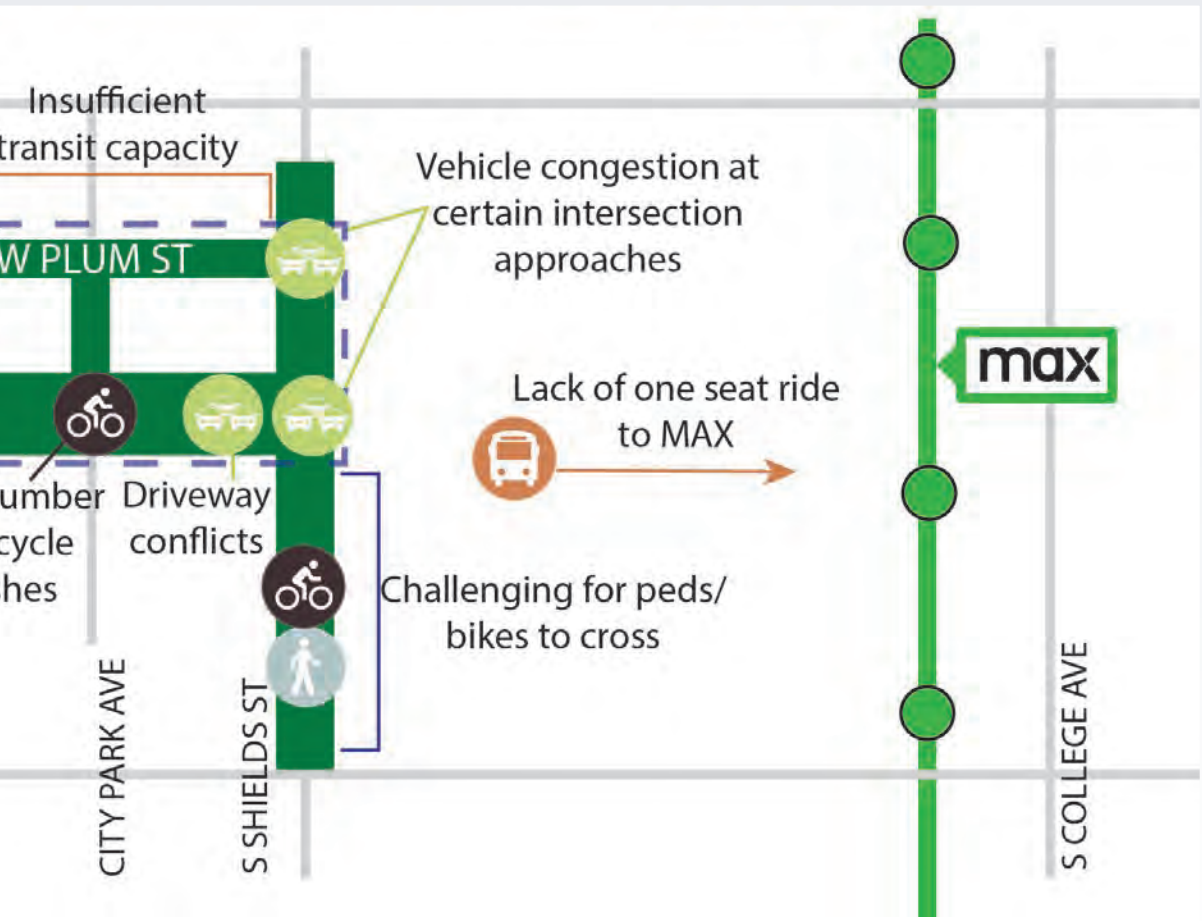


The West Elizabeth ETC focuses on West Elizabeth Street between Overland Trail and Shields Street, as well as segments of Plum Street, Constitution Avenue, and City Park Avenue. The study area also includes the surrounding network, and the plan will look at how this corridor connects with the CSU campuses and the rest of the community.

WEST ELIZABETH CORRIDOR

SUMMARY OF KEY ISSUES




Insufficient
transit capacity
W PLUM ST
Vehicle congestion at
certain intersection
approaches
Lack of one seat ride
to MAX
max
umber
cycle
hes
Driveway
conflicts
Challenging for peds/
bikes to cross
CITY PARK AVE
S SHIELDS ST
S COLLEGE AVE

EXECUTIVE SUMMARY

1»LAND USE

Land use on the West Elizabeth Corridor includes a mix of types and densities of development, including multi-family, single family, as well as commercial parcels near the West Elizabeth Street/Shields Street and West Elizabeth Street/Taft Hill Road intersections. Land use surrounding the Campus West area has **some of the highest densities allowed in the city,** including dense multi-family housing on Plum Street affiliated with Colorado State University. A large proportion of the study area's residents are renters, many of whom are CSU students.

2»RIGHT-OF-WAY

Right-of-way on the corridor **varies from 60 to 100 feet** between Shields Street and Overland Trail.

3»CROSS SECTIONS

West Elizabeth Street's cross section includes **two to four travel lanes** between Shields Street and Overland Trail. Near Shields Street, West Elizabeth Street has four travel lanes (two in each direction) with a two-way left-turn lane. West of Skyline Drive, West Elizabeth Street has two travel lanes with a two-way left-turn lane. West of Kimball Drive, West Elizabeth Street has two travel lanes.

4»TRAVEL DEMAND

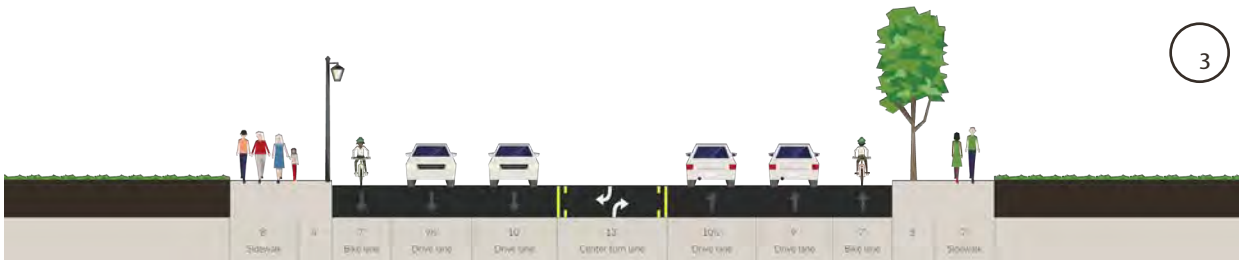
The amount of traffic on West Elizabeth Street generally increases from west to east. Near Timber Lane the Average Daily Traffic (ADT) is 4,400 vehicles per day and near Shields Street the ADT is over 18,000 vehicles per day. West Elizabeth Street also carries a large number of transit passengers, bicyclists and pedestrians. **Transfort routes in the study area have an average weekday ridership of almost 5,000 passengers per day.** Over 2,000 bicyclists per day use West Elizabeth Street west of Shields Street and over 100 pedestrian crossings occur during peak hours at Shields Street/West Elizabeth Street, City Park Avenue/West Elizabeth Street and Plum Street/Shields Street intersections. **Furthermore, the Plum Street/Shields Street intersection has the largest number of transit passengers, bicyclists and pedestrians in the study area.**

5» VEHICLE OPERATIONS

Analysis shows that most study intersections operate at an acceptable vehicle level of service (LOS), a measure of average vehicle delay, during peak hours. **However, key approaches to certain intersections experience notable congestion:** the northbound left-turn, eastbound left-turn, and eastbound right-turn at the West Elizabeth Street/Shields Street intersection and the eastbound and westbound movements at the Plum Street/Shields Street intersection.

1


2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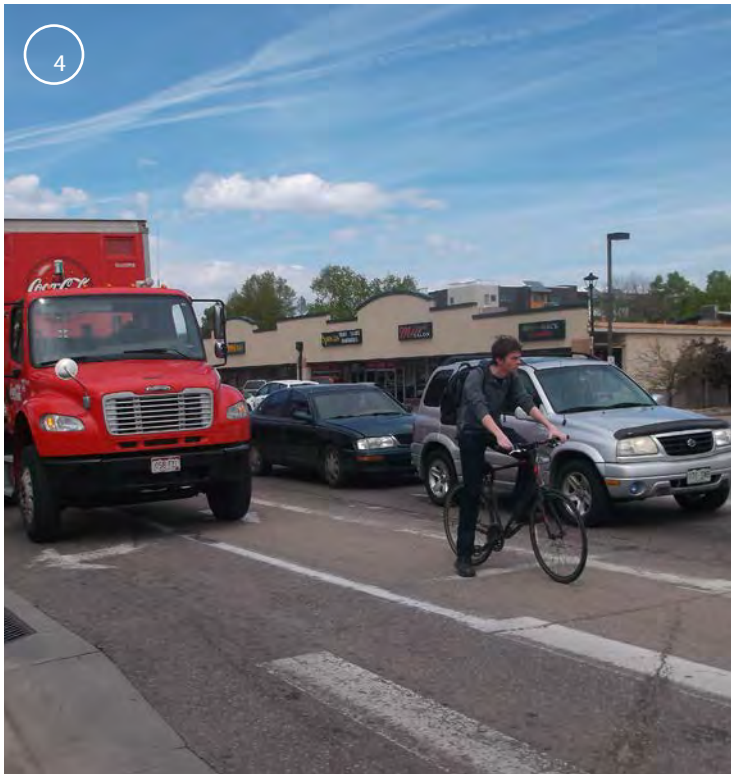
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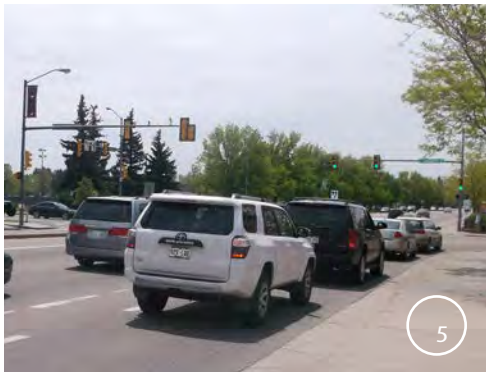

5

6

This Corridor Understanding Report documents the West Elizabeth Corridor's history and context, previous planning that has influenced the corridor, and existing conditions of the corridor's infrastructure and performance for different modes of transportation.

6 » TRANSIT

Several Transfort bus routes serve the study area, the majority of which connect to the CSU Transit Center. Route 31, which connects West Elizabeth Street and Plum Street to the CSU Transit Center, runs every 10 minutes. The HORN and MAX also run every 10 minutes. Most other routes operate every 30 minutes. **Transfort ridership in the area is generally high. In fact, ridership is so high on some routes bound for CSU that drivers regularly have to turn away passengers because the buses are full, even with the addition of trailer buses during peak hours.** Top ridership stops in the study area include the CSU Transit Center, stops along Plum Street, Constitution Avenue between Shields Street and West Elizabeth Street, and stops on West Elizabeth Street just west of Taft Hill Road. Some of the study area's routes, including Route 31, Route 32, and Route 2, have a high productivity as measured by weekday passengers per revenue hour and weekday passengers per revenue mile.

7 » PEDESTRIANS

For pedestrians, a variety of sidewalk conditions exist on the corridor. Some sidewalks are attached, some are detached, and **there are many locations where no sidewalk exists or sidewalk width is too narrow for people using mobility devices.** In addition to marked crossings at signalized intersections, there are two midblock crossings on the corridor: one west of Shields Street and another west of Skyline Drive. Pedestrian delay at signalized intersections is relatively high at most study intersections during peak hours. **Significant lengths of West Elizabeth Street have a low pedestrian level of service, a measurement of the quality of the pedestrian environment that accounts for sidewalk presence and width as well as other amenities.**

8 » BICYCLISTS

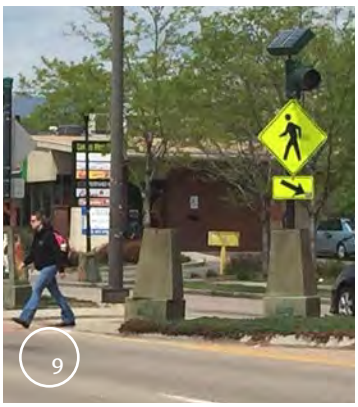
Bike lanes are provided along the majority of the corridor, but are missing from key segments of West Elizabeth Street, including several segments west of Taft Hill Road. Most of the corridor is sufficiently comfortable for the many residents and college students who currently ride on West Elizabeth Street. However, these segments are generally not comfortable for lower-confidence adults/college students as well as children.

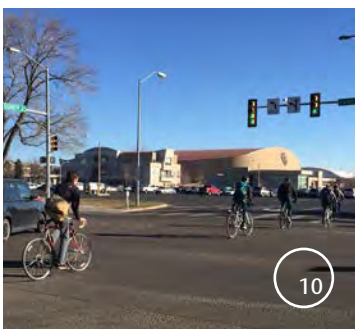
9» SAFETY

The study area has some intersections and roadway segments with a higher than expected number of crashes. For example, the West Elizabeth Street/Shields Street intersection has more crashes than expected compared to similar locations, and the West Elizabeth Street/City Park Avenue intersection has more bicyclist-vehicle crashes than expected compared to similar locations. West Elizabeth Street between Shields Street and City Park Avenue also has more crashes than expected compared to similar locations.

10» DELAY BY MODE

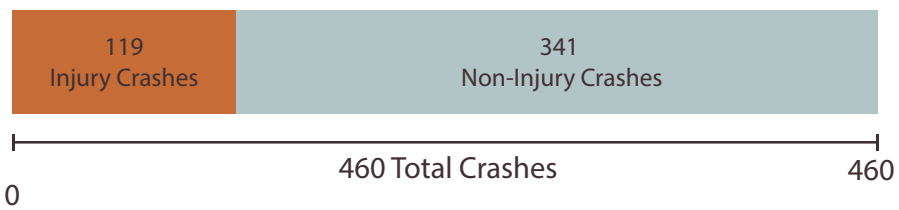
Over half of the users at the intersection of Shields Street and Plum Street are using transit, walking or biking. At this intersection, transit passengers, pedestrians and bicyclists experience a lot of delay, while vehicle drivers and passengers do not experience a lot of delay.



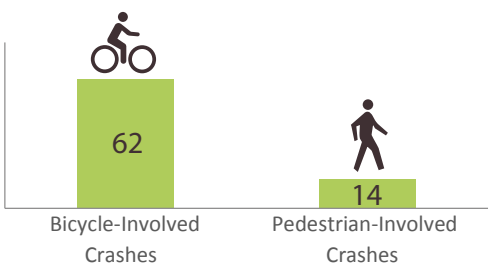


WEST ELIZABETH CORRIDOR
EXISTING CONDITIONS HIGHLIGHTS

SAFETY
CRASHES ON WEST ELIZABETH STREET BETWEEN
2010 & 2014



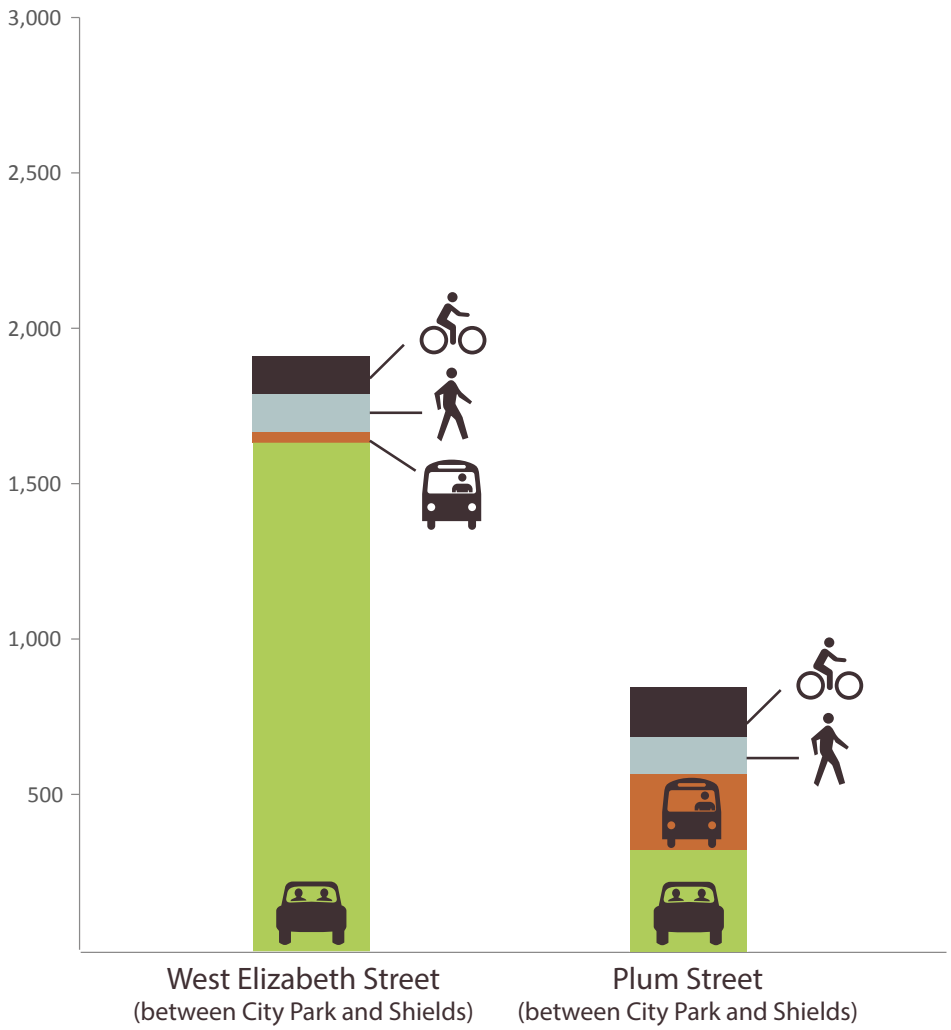
Average of 1 crash every 4 days.



Indicates more crashes than expected compared to similar **intersections** within the city

Indicates more crashes than expected compared to similar **segments** within the city

NUMBER OF PEOPLE BY MODE
PM PEAK HOUR
WEST ELIZABETH STREET & PLUM STREET



WEST ELIZABETH CORRIDOR
EXISTING CONDITIONS HIGHLIGHTS

TRANSIT

Almost 5,000 riders a day within the study area (9 routes): Highest ridership in the city

Over 3,700 passengers left behind on Route 31 from January to April 2015. That's equivalent to over 37 MAX buses or 75 standard Transfort buses.

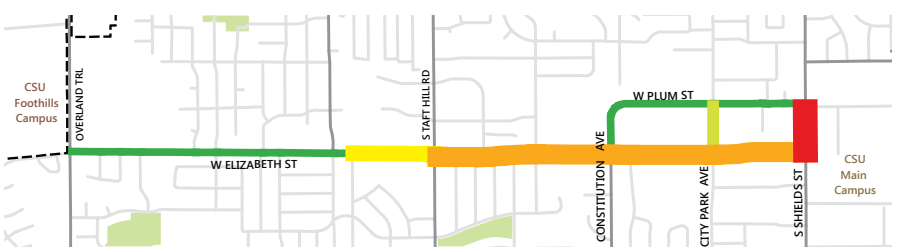
TRANSIT BOARDINGS

Transit boardings from January - April 2015 APC Data

● < 100 ● 100 - 200 ● > 200

DRIVING

AVERAGE DAILY TRAFFIC



Average Daily Traffic (ADT)

< 5,000 | 5,001 - 10,000 | 10,001 - 15,000 | 15,001 - 20,000 | > 20,000

WALKING

36%

of sidewalks in the corridor are non-ADA compliant, of which:

7%

are missing sidewalks.

PEDESTRIAN LEVEL OF COMFORT* CORRIDOR-WIDE

Low Pedestrian Comfort	Medium Pedestrian Comfort	High Pedestrian Comfort
30%	42%	28%

*Pedestrian Level of Comfort is based on a technical analysis of existing data

AVERAGE PM PEAK HOUR PEDESTRIAN DELAY

West Elizabeth Street & City Park Avenue

After 30 seconds, research has indicated that pedestrians partake in more risk-taking behavior.

West Elizabeth Street & Shields Street

BICYCLING

BICYCLIST LEVEL OF COMFORT | CORRIDOR-WIDE

Low Bicyclist Comfort	Medium Bicyclist Comfort	High Bicyclist Comfort
1%	50%	49%

*Bicyclist Level of Comfort is based on a Level of Traffic Stress (LTS) technical analysis of existing data sources

Section 1

INTRODUCTION

THE WEST ELIZABETH ENHANCED TRAVEL CORRIDOR PLAN WILL DEVELOP A LONG-TERM VISION FOR THE WEST ELIZABETH CORRIDOR BASED ON AN UNDERSTANDING OF THE TRANSPORTATION, LAND USE, ENVIRONMENTAL, ECONOMIC, AND SOCIAL NEEDS OF THE AREA. ENHANCED TRAVEL CORRIDORS (ETCS) ARE DEFINED BY THE CITY'S TRANSPORTATION MASTER PLAN (TMP) AND EMPHASIZE HIGH-FREQUENCY TRANSIT, BICYCLING AND WALKING.

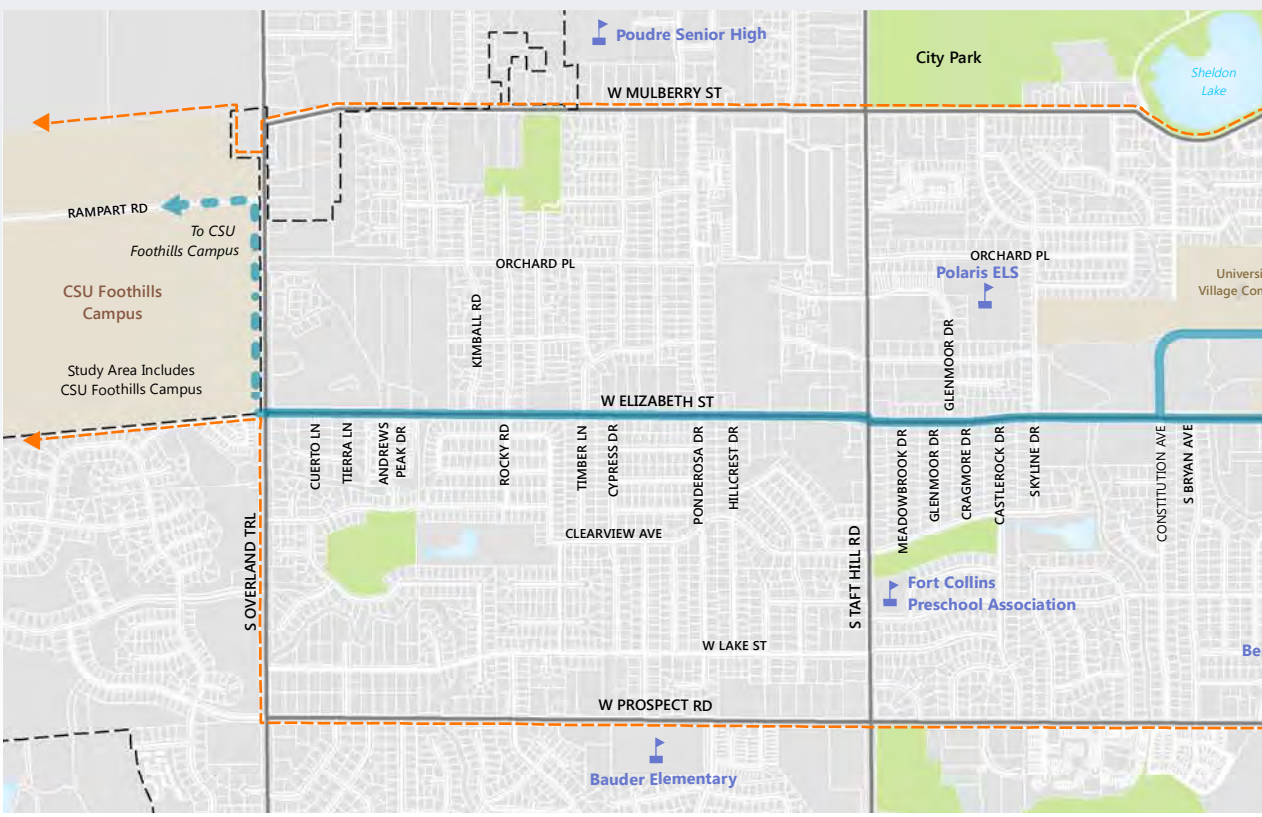
THIS CORRIDOR UNDERSTANDING REPORT documents the West Elizabeth Corridor's history and context, previous planning that has influenced the corridor, and existing conditions of the corridor's infrastructure and performance for different modes of transportation. Future steps of the West Elizabeth Enhanced Travel Corridor Plan development process will build upon the Corridor Understanding Report: developing a purpose and need statement and corridor vision, developing alternative improvement scenarios, analyzing alternative improvement scenarios, and selecting and developing a preferred alternative.

INTRODUCTION

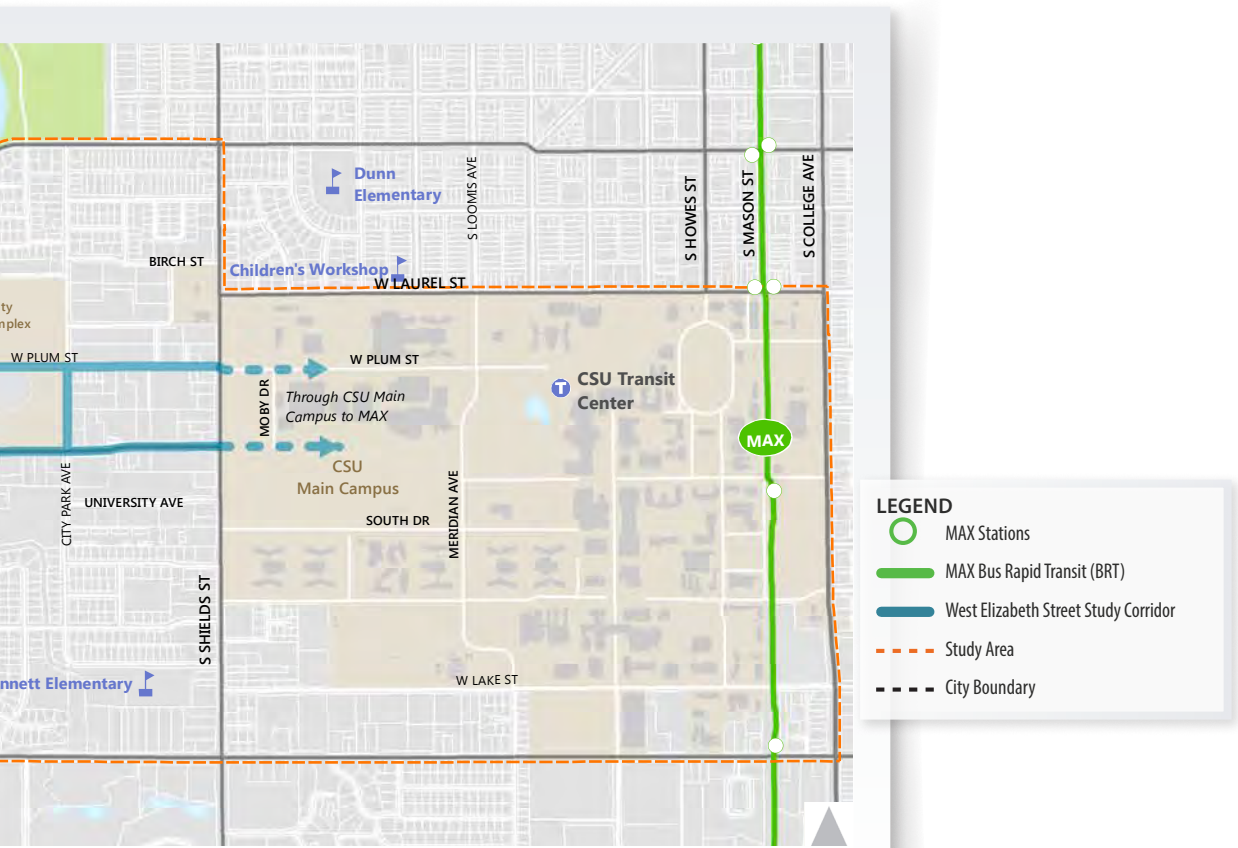
STUDY AREA

As one of six Enhanced Travel Corridors in the City of Fort Collins, West Elizabeth Street has been identified by the City for multimodal improvements. This Corridor Understanding Report is a part of the larger master plan for the corridor, the West Elizabeth Enhanced Travel Corridor Plan. This report documents the existing conditions and context for the West Elizabeth Street Corridor from Shields Street to Overland Trail. The plan also focuses on

FIGURE 1: West Elizabeth Study Area



Plum Street between Shields Street and Constitution Avenue, Constitution Avenue and City Park Avenue between Plum Street and Elizabeth Street and north to Mulberry Street and south to Prospect Road. In addition, the study will consider connections on the Foothills and Main CSU campuses. The broader study area is shown in **Figure 1.**



Elizabeth Street is likely named after Mrs. Elizabeth "Aunty" Stone, who built the first permanent dwelling in Fort Collins with her husband. She also helped operate the City's first hotel, mill and mess hall, built by her husband.[1]

[1] *http://history.poudrelibraries.org/archive/newsflashback/street.php*

HISTORY OF THE WEST ELIZABETH CORRIDOR

Parcels adjoining West Elizabeth Street were annexed into the City during the years between 1950 and 1980. Between Taft Hill Road and Shields Street adjoining parcels were annexed in the 1950s and 1960s while adjoining parcels west of Taft Hill Road were annexed in the 1960s and 1970s. Much of CSU's campus growth west of Meridian Avenue also occurred during this period, including the student housing complexes off of Plum Street, South Drive and Pitkin Street as well as the Indoor Practice Facility at the southeast corner of Plum Street and Meridian Avenue.

West Elizabeth Street has been the location of multi-family housing and retail for a number of decades; much of the multi-family housing was constructed before 2000. However, land uses along the West Elizabeth Corridor have been slowly increasing in density in recent years. In the past few years, higher-density student housing has been infilled along Plum Street. West of Taft Hill Road, the corridor has transformed from a rural agricultural road to one that serves both single-family homes and multi-family housing.

Due to the land uses and proximity to CSU, this corridor has moved a significant amount of vehicular, transit, pedestrian and bicycle traffic for decades. As land use density increases, these volumes are continuing to increase. This increase in travel by all modes and key connections provided by the corridor prompted the designation of the West Elizabeth Corridor as one of six Enhanced Travel Corridors in the 2011 Transportation Master Plan. This designation entails an emphasis on improvements that support transit, biking and walking along and across the corridor.

focus on improving transit, biking and walking in the corridor




REGIONAL AND LOCAL CONTEXT

West Elizabeth Street provides a key east-west connection across the west central part of Fort Collins, including the Campus West area. The West Elizabeth Enhanced Travel Corridor is located between South Shields Street and Overland Trail, acting as a connection from CSU's Main Campus to Foothills Campus for adjacent neighborhoods to the north and south of the corridor. The study of this corridor also considers access to and across CSU's Main Campus. The corridor is situated in one of Fort Collins' most dense areas, which includes a large quantity of rental properties primarily occupied by students.

Regionally, the corridor creates an east-west connection to the MAX Bus Rapid Transit (BRT) line via various Transfort transit routes. Currently, the transition from lines on West Elizabeth to MAX requires a transfer or a half-mile walk from the CSU Transit Station. The corridor also links two major commercial centers located at the West Elizabeth Street/Shields Street intersection and the West Elizabeth Street/Taft Hill Road intersection to the CSU campuses and adjacent neighborhoods. The closest east-west through streets are Mulberry Street a half-mile to the north and Prospect Road a half-mile to the south. **Figure 2** shows a contextual map of how this study correlates to other major destinations in the area.

West Elizabeth Street provides a key east-west connection across the west central part of Fort Collins, including the Campus West area.

Between the CSU Main Campus and CSU Foothills Campus, this corridor provides access to a mix of commercial, mixed use, and residential land uses. There are also a number of CSU-owned multi-family residential properties that are accessed along West Elizabeth Street and Plum Street. The majority of the dense commercial land uses are on the east side of the corridor. There are also commercial shopping centers on the northwest and southwest corners of the West Elizabeth Street/Taft Hill Road intersection.

This corridor was identified as an Enhanced Travel Corridor (ETC) in the 2011 Transportation Master Plan (TMP). This distinction recognized Elizabeth as a high priority corridor with a significant amount of transit, bicycle and pedestrian activity in addition to vehicular use. Another goal of the ETCs is to accomplish the triple bottom line of economic, human and environmental sustainability.

See **Figure 3** for a map of all of the designated Enhanced Travel Corridors. The concept of Enhanced Travel Corridors (ETC) was introduced in the 2004 Transportation Master Plan (TMP) to "promote safe, convenient, and direct travel, with an emphasis on high frequency transit service and bicycle and pedestrian facilities."

West Elizabeth is the third ETC to begin the corridor planning process (after Harmony Road and College Avenue/Mason Corridor) See the description of the Transportation Master Plan in Section 3 (Existing Plans) for more details.

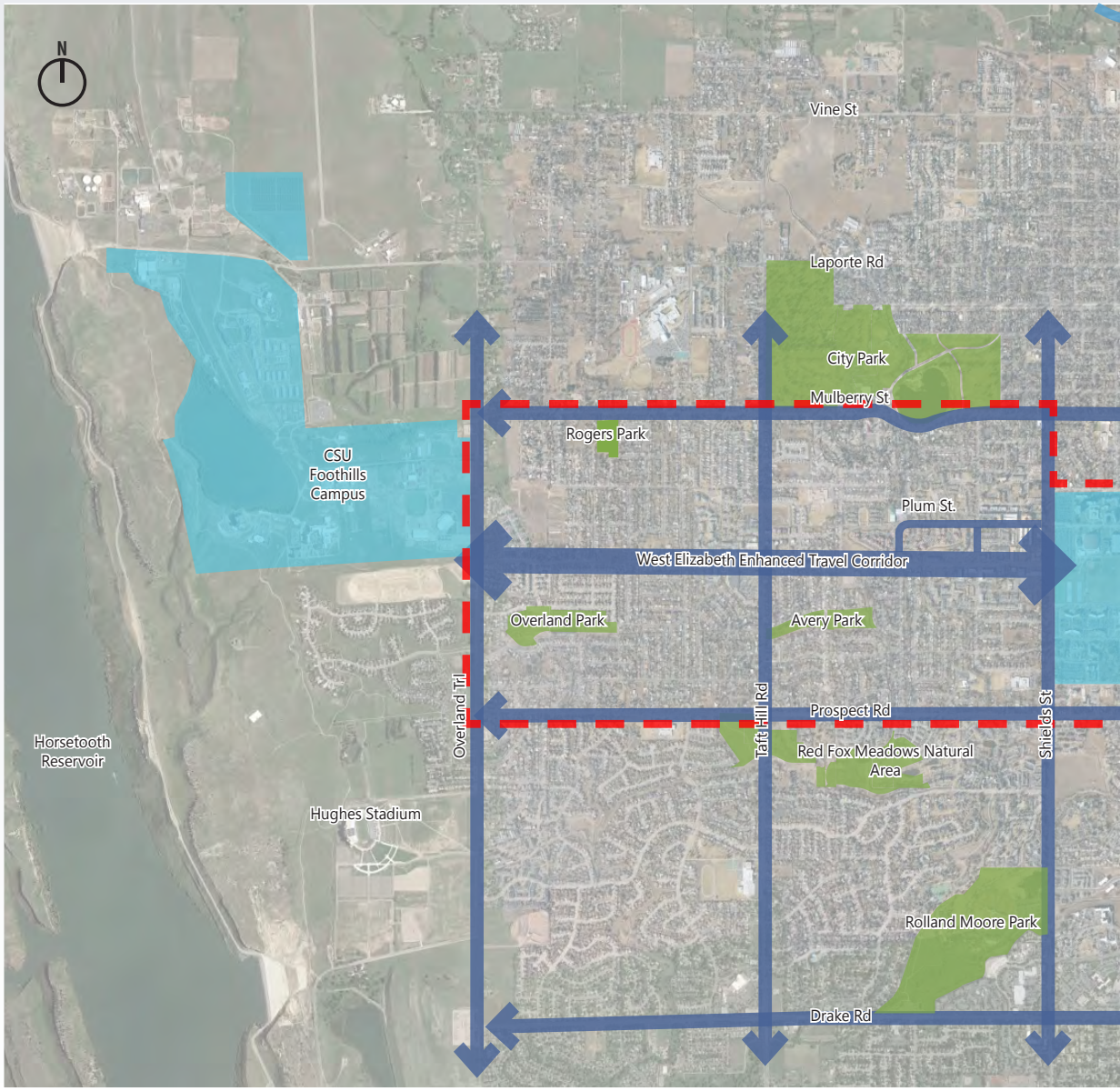
The 2004 Transportation Master Plan (TMP) identified the following four Enhanced Travel Corridors:

- Harmony Road
- College Avenue/Mason Corridor
- Mountain Vista/North College
- Timberline Road/Power Trail

The 2011 TMP added two new Enhanced Travel Corridors:

- Prospect Road
- West Elizabeth Street

FIGURE 2: **Regional Context Map**



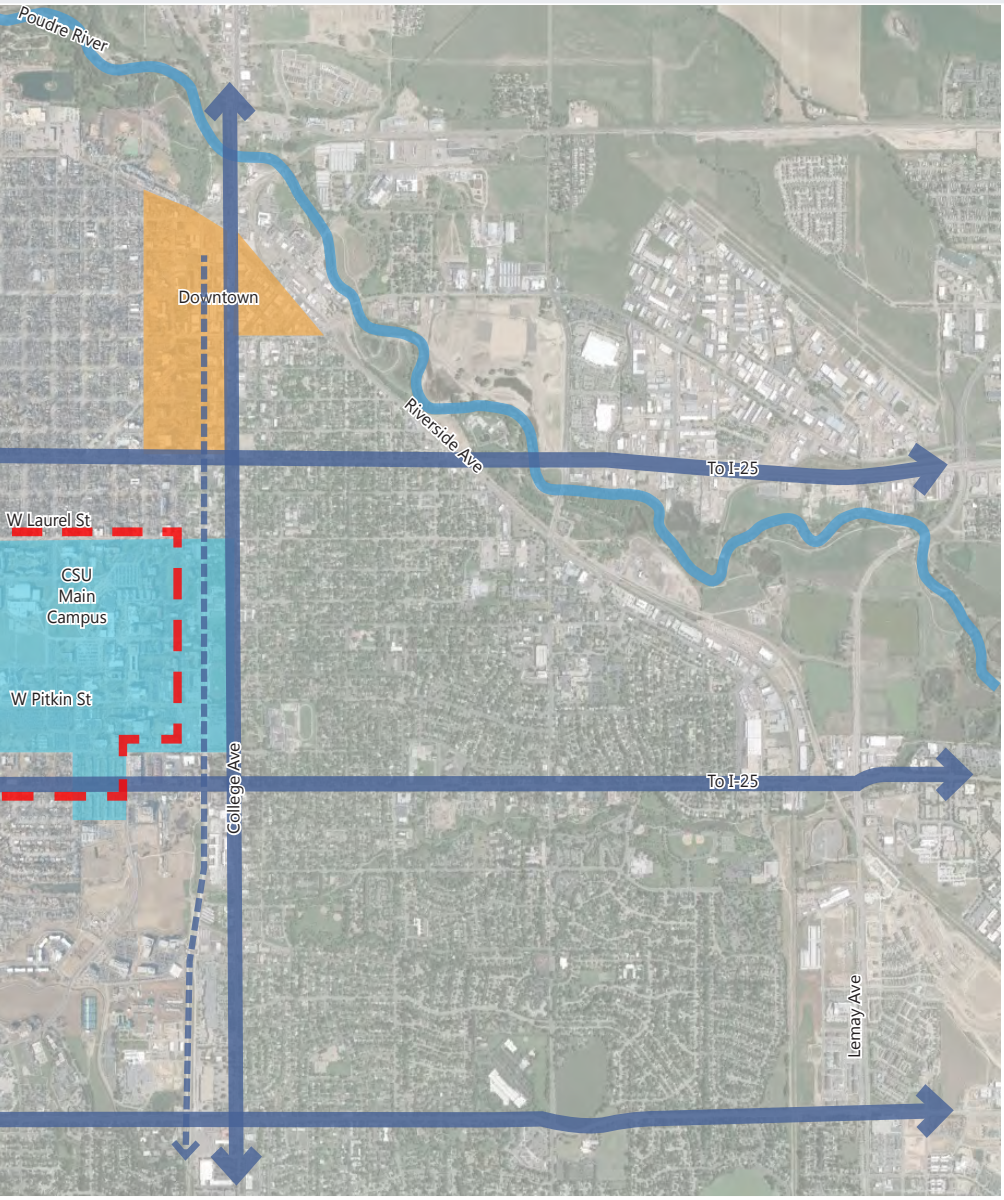
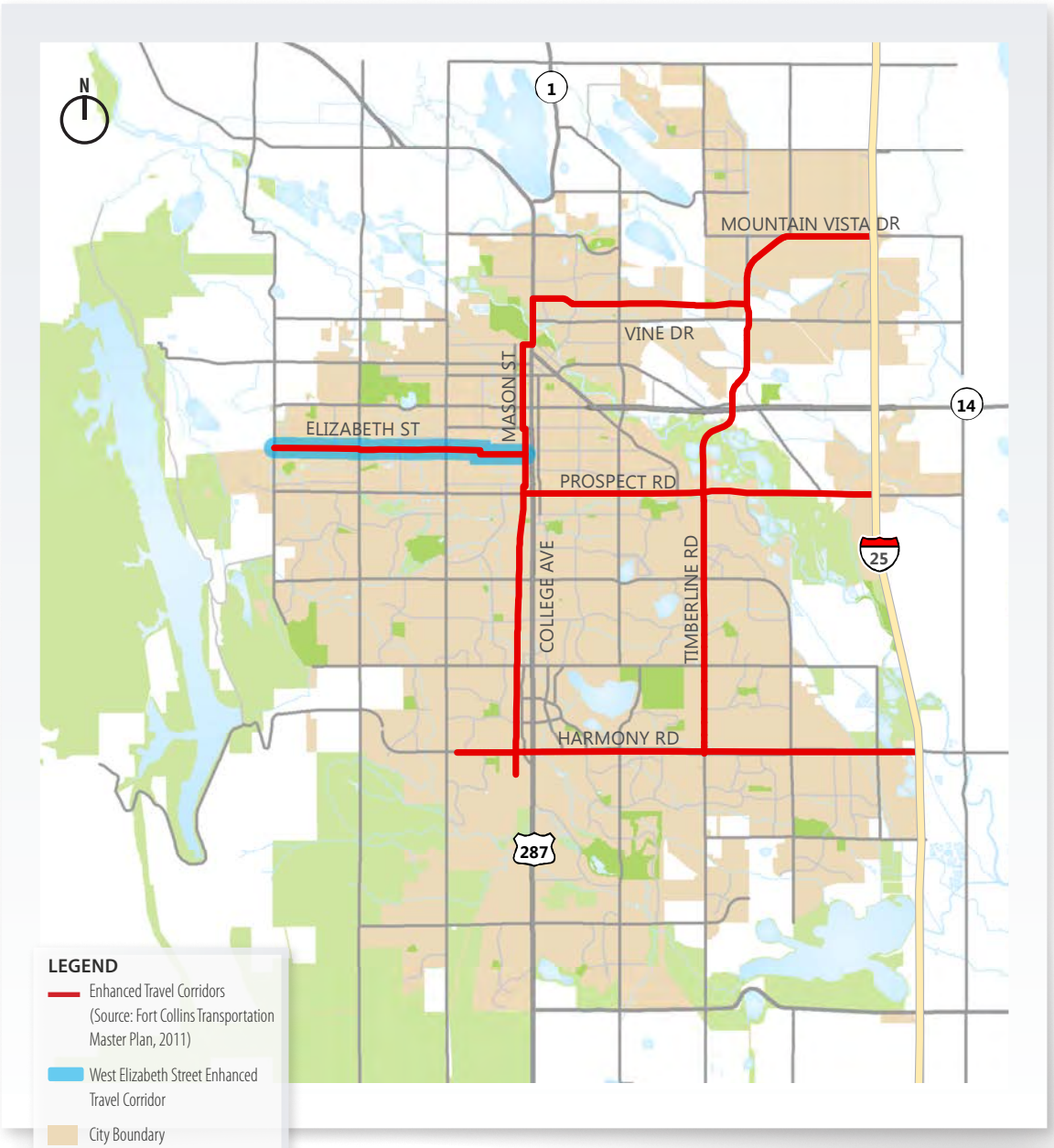

Poudre River
Downtown
Riverside Ave
To I-25
W Laurel St
CSU
Main
Campus
W Pitkin St
College Ave
To I-25
Lemay Ave
LEGEND
Study Area
West Elizabeth Enhanced Travel Corridor
Key Arterial
Corridor Study Segments: Plum St., Constitution Ave., City Park Ave.
MAX
Parks and Natural Areas
CSU

FIGURE 3: Enhanced Travel Corridors



EXISTING LAND USE

Land use in the western section of West Elizabeth and the remainder of the study area is largely single-family residential properties. Land use along Plum Street and the eastern section of West Elizabeth Street is largely multi-family and commercial. Multi-family developments exist near commercial centers at the West Elizabeth Street/Shields Street intersection, West Elizabeth Street/Taft Hill Road intersection, and the West Elizabeth Street/ Overland Trail intersection. A number of religious institutions exist within the study area as well, primarily in the area from Shields Street to Taft Hill Road between Mulberry Street and Prospect Road. Neighborhood parks and small open spaces are found throughout the study area; however, no major open spaces exist here, aside from City Park, located north of Mulberry Street. The land use mix along the corridor is shown in **Figure 4.** CSU, which has 27,086 students and 7,000 employees, heavily influences transportation demand on the corridor.[2]

Zoning

A large portion of the study area is zoned RL – Low Density Residential, as shown in **Figure 5.** West Elizabeth Street and Plum Street consists primarily of zone districts of medium density mixed-use neighborhood in the eastern portion of the corridor. There is also a district of neighborhood commercial at West Elizabeth Street and Taft Hill Road as well as a large area zoned CC – Community Commercial, near the West Elizabeth Street/ Shields Street intersection. Within this zone, a range of land uses are permitted, such as religious institutions, multi-family residential or commercial.

Services and Destinations

Services and destinations along the corridor primarily exist within commercial centers near the West Elizabeth Street/Shields Street intersection and the West Elizabeth Street/Taft Hill Road intersection. Destinations here include restaurants, retail and shopping centers/markets. Two elementary schools and one combined middle/high school exist within the study area Polaris ELS is K-12 (combined Elem/MS/ HS) as well as a few immediately outside of the area. CSU's two campuses, Main Campus and Foothills Campus, are also key destinations. **Figure 6** shows services and destinations in the study area.

Demographics

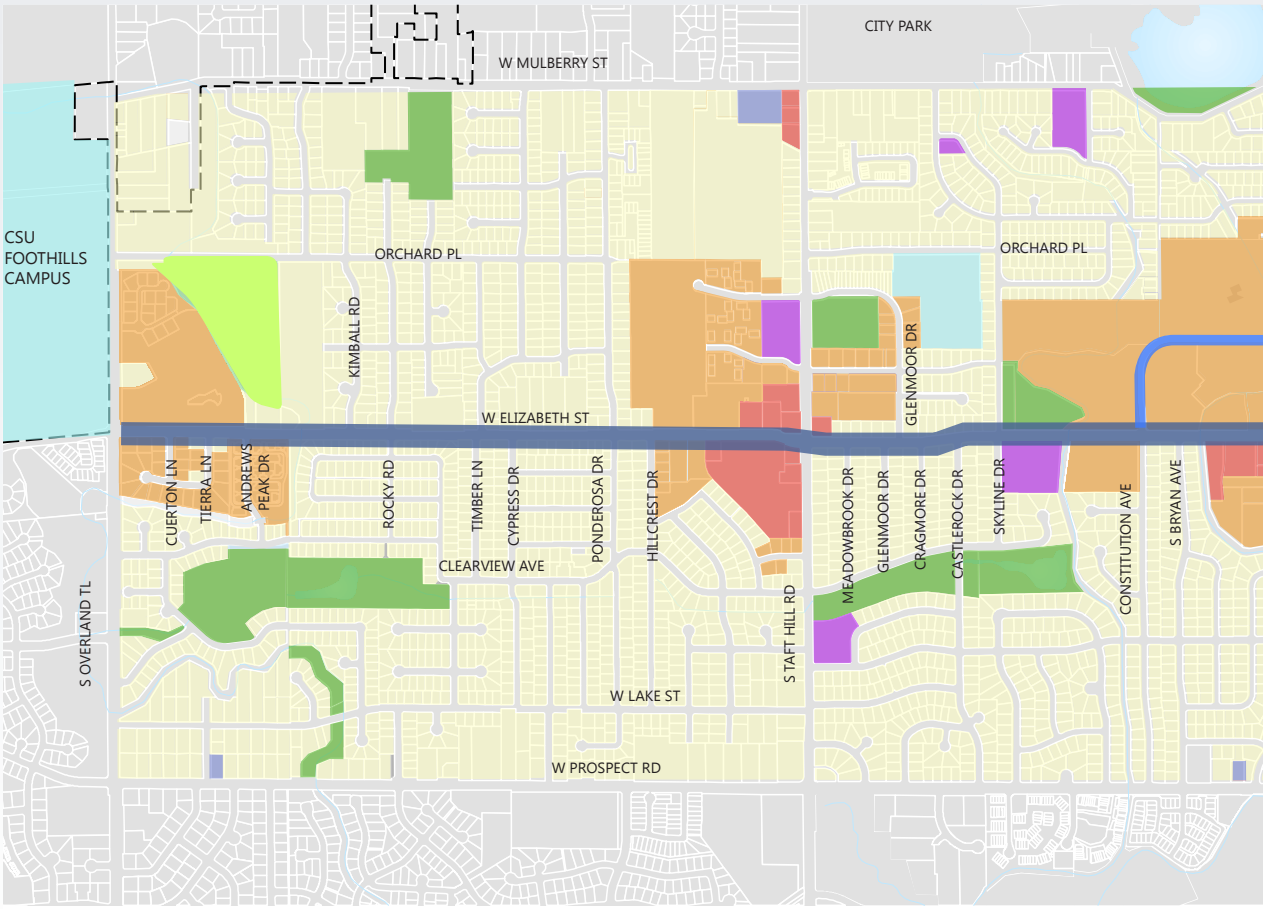
The study area is one of the most densely populated areas in the City of Fort Collins, due to the high number of multi-family and/or student-oriented facilities. Within the area, there are between 16,500 and 24,000 residents based on US Census data. This is approximately 10 percent of the total population of the City of Fort Collins within four percent of the land area in City Limits. The total population by census tract is shown in **Figure 7. Appendix A** shows the distribution of employees and students within the study area. The West Elizabeth study area houses over 5,000 CSU students and 835 CSU employees. It is important to note that the number of students in the corridor is likely underrepresented as the data is based on students voluntarily providing local addresses (which approximately 50% have done).

[2] *http://www.ir.colostate.edu/pdf/fbk/1415/Students/index.htm*

The North Front Range Regional Travel Model (NFR Model) shows approximately 20,000 employees within the study area in 2012. Out of these employees, about 80 percent work in services (including CSU), 14 percent work in retail, 4 percent in medical and the remaining 2 percent are categorized by the model as "basic" employees.

The study area has a significant proportion of rental properties. Between 52 percent and 87 percent of the population within the study area are renters, of whom most are CSU students.

FIGURE 4: Existing Land Use



This is higher than other areas nearby, where between 42 percent and 52 percent of the population are renters rather than owners. **Figure 8** shows the percent of renters in various segments of the study area.

Demographic data is from the US Census Bureau.

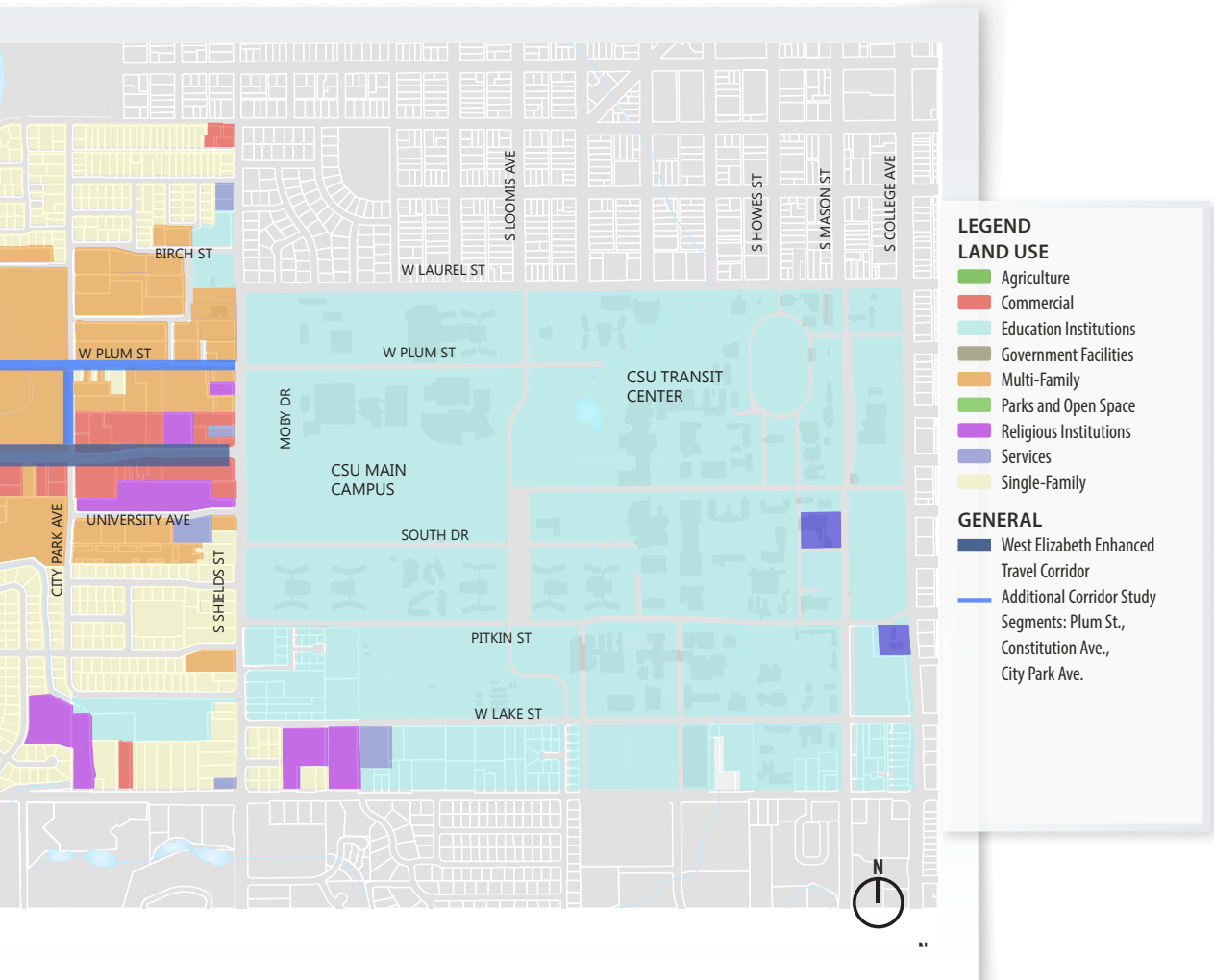
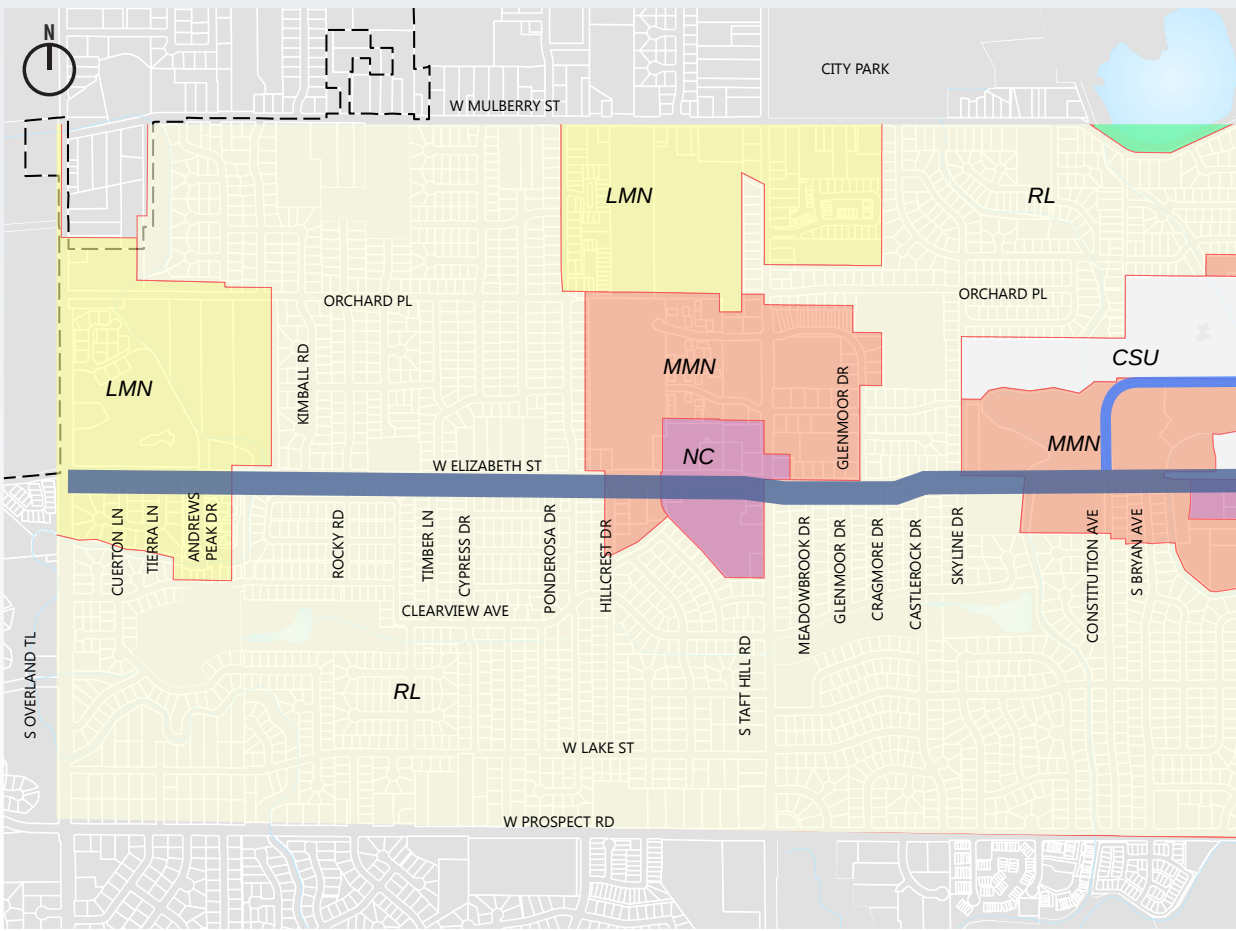
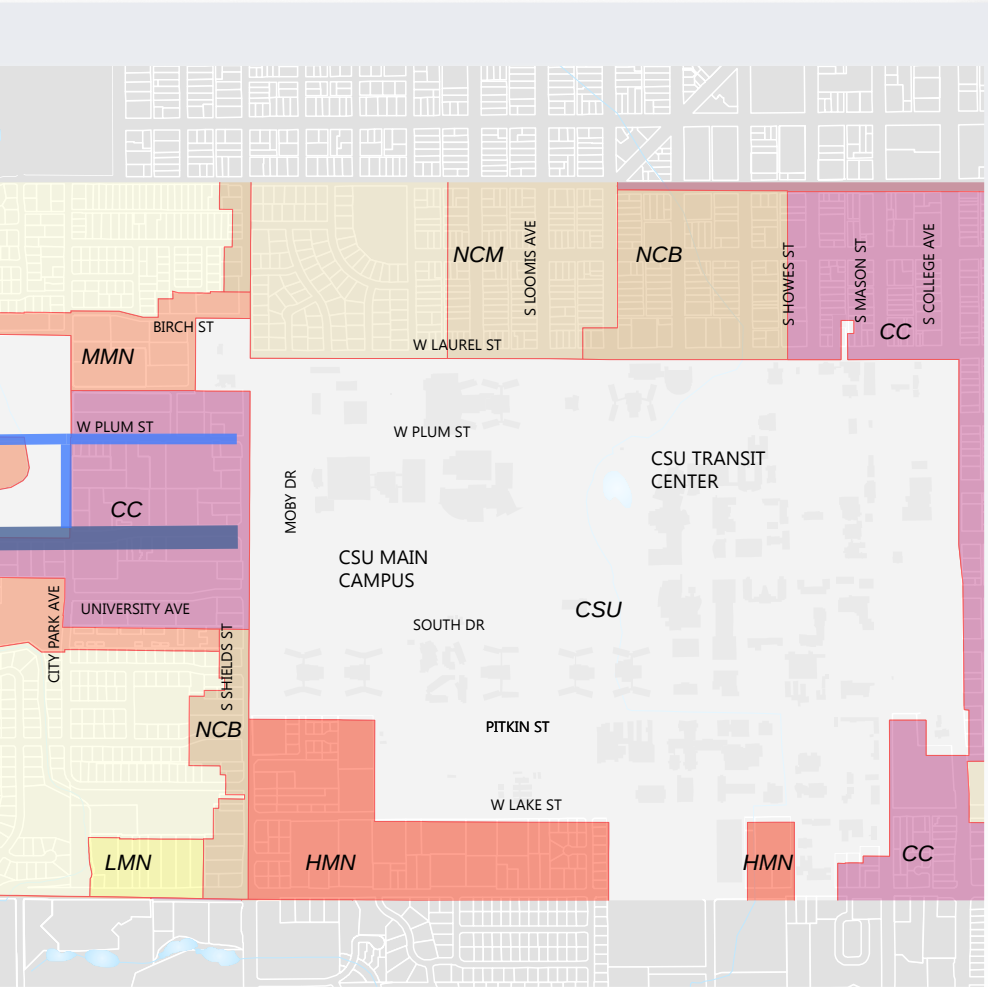


FIGURE 5: **Existing Zoning**





LEGEND

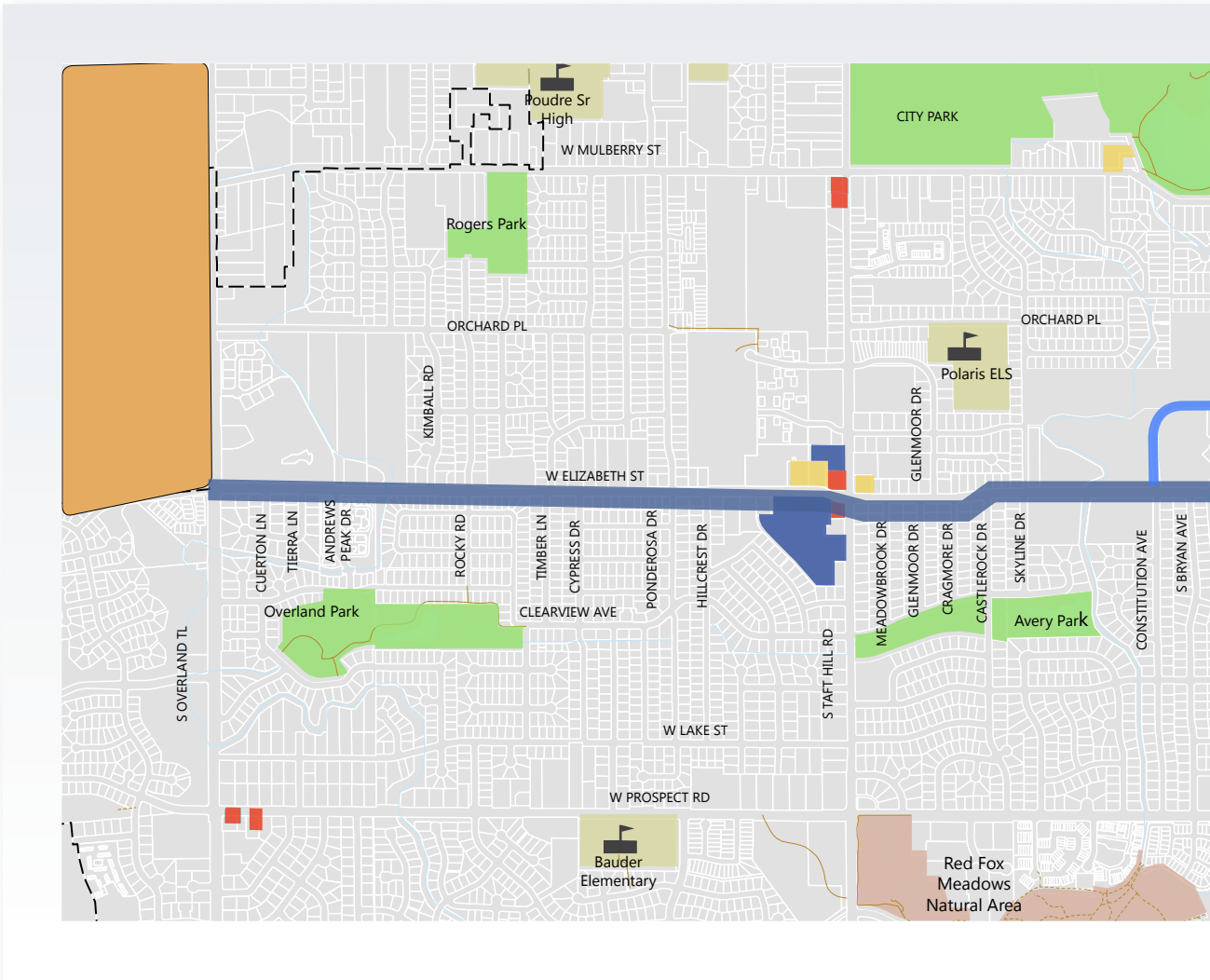
ZONE

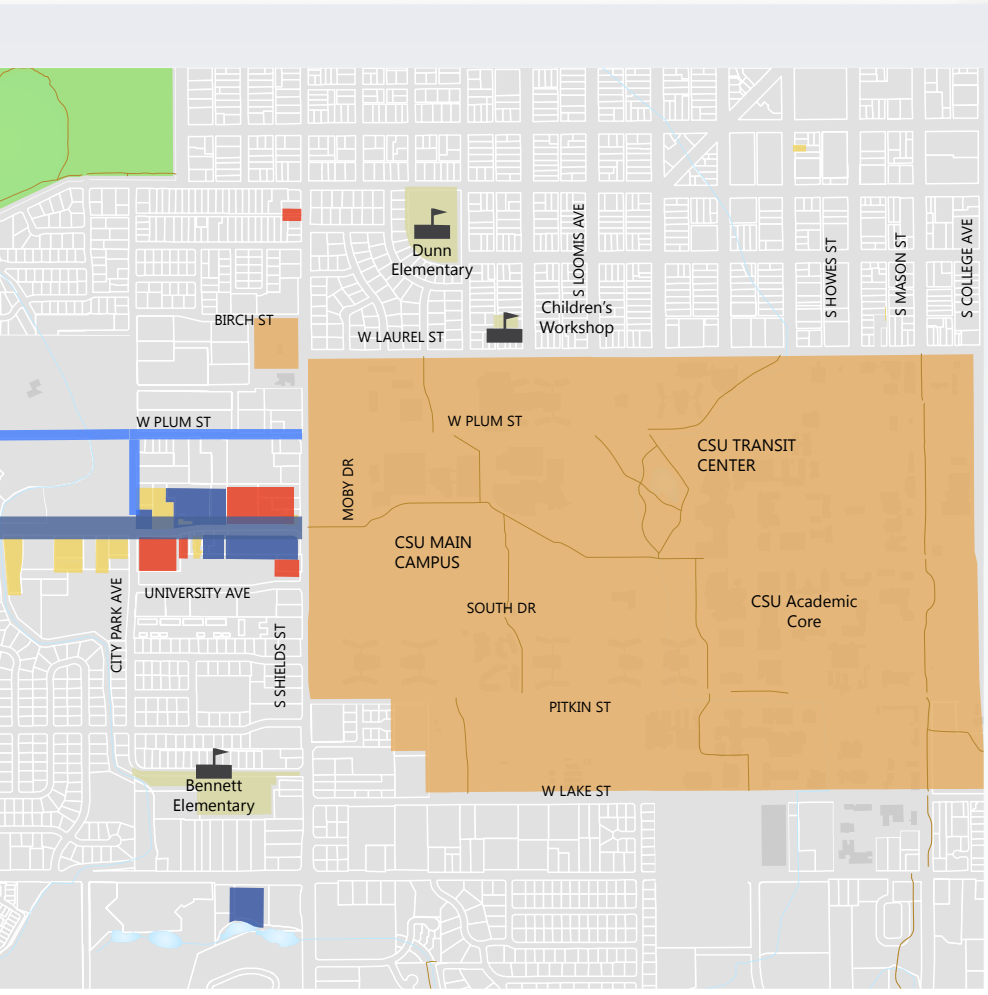
- Community Commercial (CC)
- CSU
- Downtown (D)
- Employment (E)
- High Density Mixed-Use Neighborhood (HMN)
- Low Density Mixed-Use Neighborhood (LMN)
- Medium Density Mixed-Use Neighborhood (MMN)
- Neighborhood Commercial (NC)
- Neighborhood Conservation Buffer (NCB)
- Neighborhood Conservation Low Density (NCL)
- Neighborhood Conservation Medium Density (NCM)
- Public Open Lands (POL)
- Low Density Residential (RL)
- Urban Estate (UE)

GENERAL

- West Elizabeth Enhanced Travel Corridor
- Additional Corridor Study Segments: Plum St., Constitution Ave., City Park Ave.

FIGURE 6: **Existing Services and Destinations**





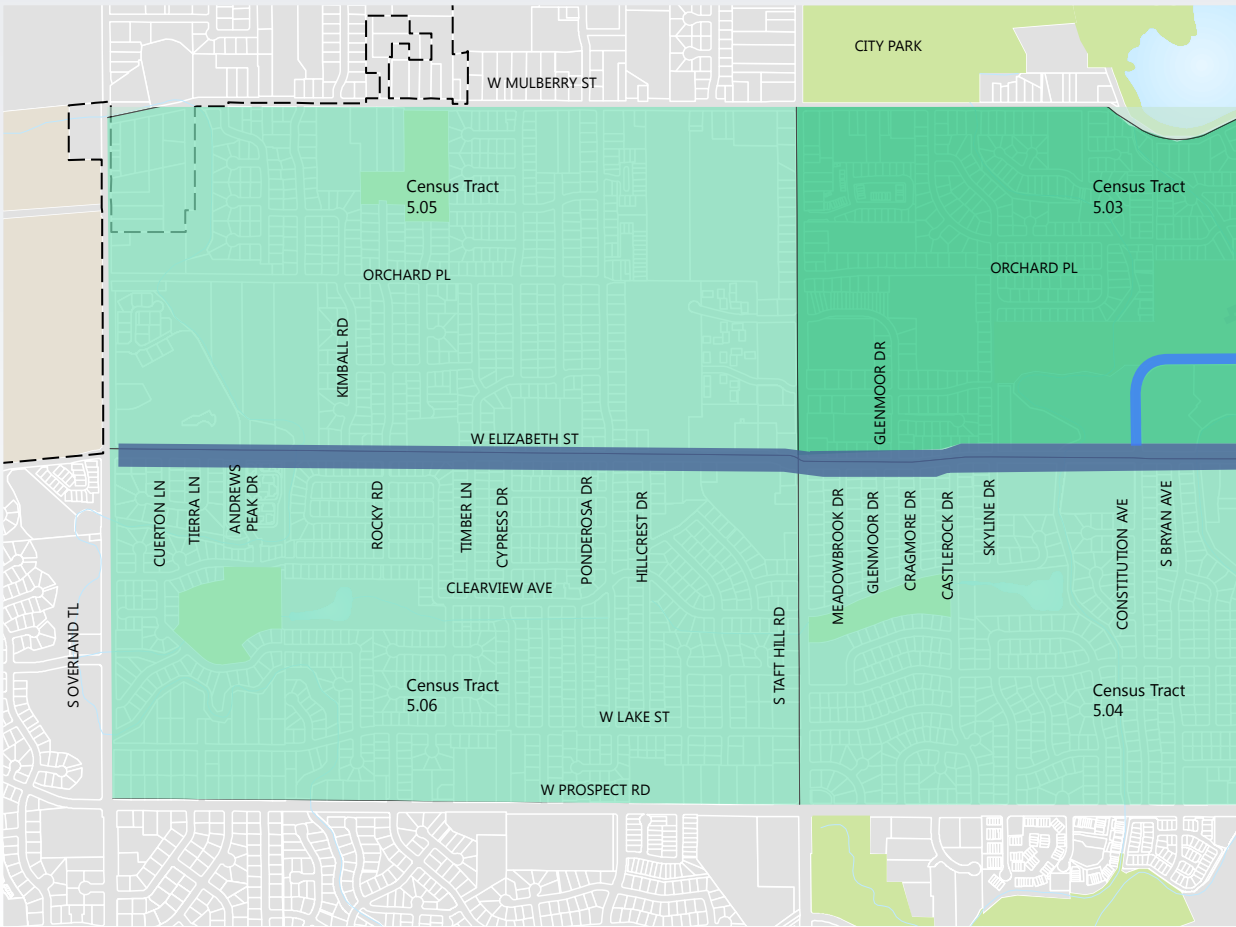
LEGEND

SERVICE TYPE
- Restaurant/Bar
- Misc. Retail/Commercial
- Neighborhood Shopping Center

SCHOOLS, PARKS, NATURAL AREAS
- City of Fort Collins Natural Area
- Parks
- Schools
- Schools
- Colorado State University
- Paved Major Trail
- Natural Surface Major Trail
- Paved Minor Trail
- Natural Surface Minor Trail

GENERAL
- West Elizabeth Enhanced Travel Corridor
- Additional Corridor Study Segments: Plum St., Constitution Ave., City Park Ave.

FIGURE 7: **Existing Population**



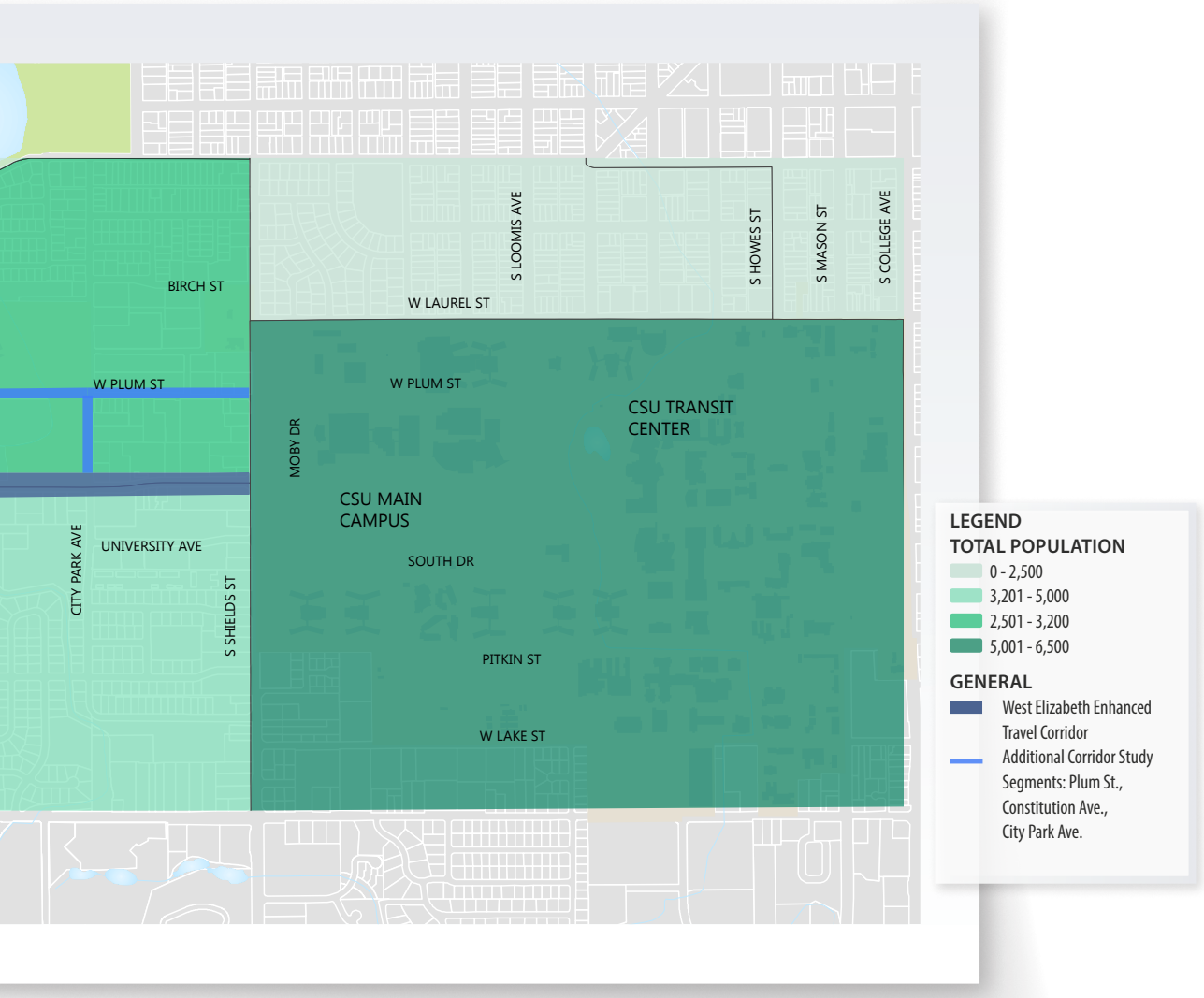
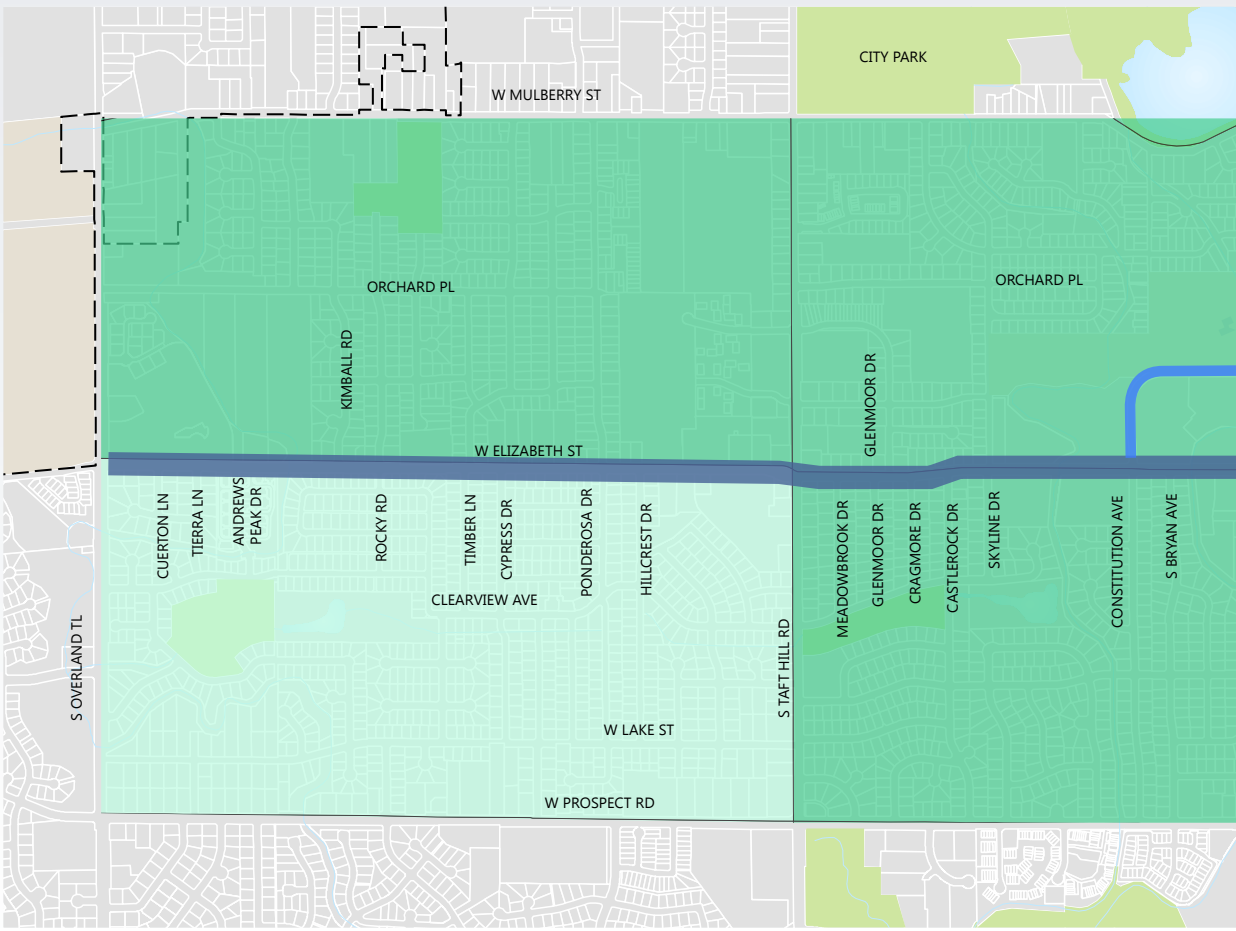
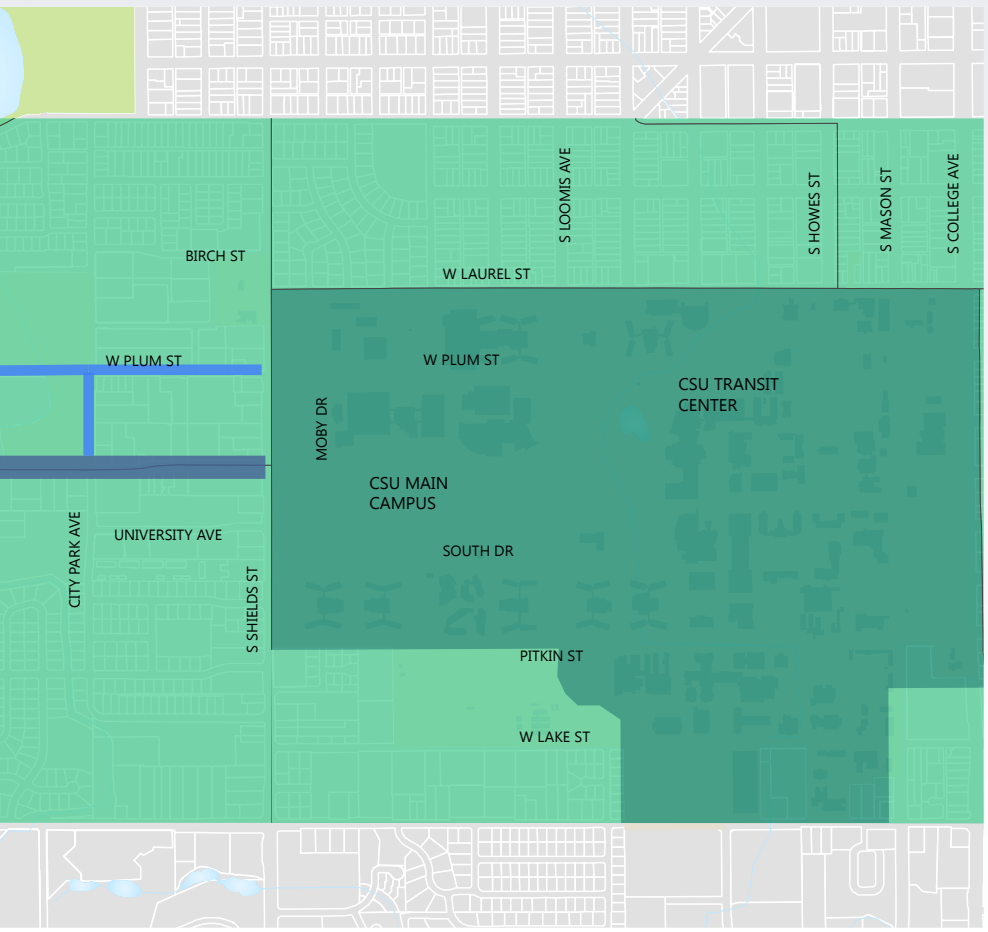

BIRCH ST
W LAUREL ST
S LOOMIS AVE
S HOWES ST
S MASON ST
S COLLEGE AVE
W PLUM ST
W PLUM ST
MOBY DR
CSU TRANSIT CENTER
CSU MAIN CAMPUS
SOUTH DR
CITY PARK AVE
UNIVERSITY AVE
S SHIELDS ST
PITKIN ST
W LAKE ST
LEGEND
TOTAL POPULATION
0 - 2,500
3,201 - 5,000
2,501 - 3,200
5,001 - 6,500
GENERAL
West Elizabeth Enhanced Travel Corridor
Additional Corridor Study Segments: Plum St., Constitution Ave., City Park Ave.

FIGURE 8: **Existing Percent Renters**




S LOOMIS AVE
S HOWES ST
S MASON ST
S COLLEGE AVE
BIRCH ST
W LAUREL ST
W PLUM ST
W PLUM ST
MOBY DR
CSU TRANSIT CENTER
CSU MAIN CAMPUS
UNIVERSITY AVE
CITY PARK AVE
S SHIELDS ST
SOUTH DR
PITKIN ST
W LAKE ST
LEGEND
PERCENT RENTERS
42%-52%
53%-87%
88%-100%
GENERAL
West Elizabeth Enhanced Travel Corridor
Additional Corridor Study Segments: Plum St., Constitution Ave., City Park Ave.
Between 52 percent and 87 percent of the population within the study area are renters, of whom most are CSU students

Section 2

EXISTING PLANS

Fort Collins values its transportation network and understands the need for accessibility, mobility, and capacity associated with all modes: vehicles, transit, pedestrians and bicyclists. Recently the City has worked with consultant teams and citizens to evaluate each transportation element and to develop the Transportation Master Plan *(TMP) (February 2011)* and City Plan *(February 2011)*. These plans, as well as other related studies and plans, were reviewed and are summarized on the following pages.

EXISTING PLANS

TRANSFORT STRATEGIC OPERATING PLAN FINAL REPORT *(August 2009)*

The Transit Strategic Plan (TSP) was a collaborative effort between the City of Fort Collins-Transfort, the City of Loveland-COLT, and the Poudre School District (PSD). It updated the 2002 Transfort Strategic Operating Plan (TSOP), the 2004 COLT Transit Plan, and included an analysis of the opportunities public transportation offers PSD high schools. The plan also addressed the Mason Corridor MAX project and its impact on other transit services within the City; identified funding mechanisms and practical phasing options; and developed financial solutions required to create and sustain a high-performing transit system. Six primary goals were developed to guide the development of this plan: (1) meet the Transportation Master Plan and City plan policies; (2) exceed the 2008 Climate Action Plan goal; (3) provide enhanced mobility for transit-dependent populations; (4) develop a transit system that reduced roadway-related costs; (5) provide funding recommendation for implementation and (6) stimulate the local economy. The plan outlined three phases of proposed service concepts:

Phase 1 – Planned near-term (3-year horizon) transit service improvements that were recommended to enhance efficiency. These improvements included changes in the schedules of seven routes, the elimination of one route, the addition of one route, and the implementation of MAX and coordination of other routes. Partial implementation of Phase 1 occurred in May 2014 with the implementation of MAX BRT service; full Phase 1 improvements are not fully realized.

Phase 2 – Short-term (5-year horizon) solutions to provide better connectivity and accessibility locally and regionally. This phase recommended significant expansion of the current transit service in Fort Collins, additional regional connections to Denver, and continued refinement of local routes to coordinate with MAX. Phase 2 introduced a transition to a grid network in Fort Collins and provided greater route coverage, higher service frequencies, and longer span of service. A portion of the Phase 2 recommendations have been implemented.

Phase 3 – Long-term (7-year horizon) plan for additional transit growth in Fort Collins. This phase included longer service hours and limited Sunday transit service, as well as expansion of regional service to Denver, Boulder, Berthoud, and Longmont. This phase also completed the transition to a full grid network in Fort Collins.

In May 2014, the MAX had its grand opening to showcase the newest transit route in Fort Collins. This Bus Rapid Transit (BRT) system runs along the Mason Corridor from the South Transit Center (south of Harmony Road) to Downtown. It serves the major activity and employment centers of Fort Collins and links transit routes, park-n-rides, and trails, while minimizing delays as compared to those experienced on parallel corridors.

West Elizabeth Corridor: West Elizabeth Street is identified in each of the 3 phases of service concepts. Phase 1 recommends West Elizabeth Street alignment changes to Route 2 and the elimination of its reverse loop route (current Route 32). Phase 2 recommends extending evening service hours until midnight. Phase 3 assumes the implementation of two new east/west MAX routes from Overland Trail through campus that interline onto the MAX guideway, one connecting to the Downtown Transit Center and the other continuing south to the South Transit Center.

TRANSPORTATION MASTER PLAN/MASTER STREET PLAN *(2011)*

The Transportation Master Plan (TMP), along with City Plan, comprises Plan Fort Collins. The TMP describes the long-term (2035) multimodal vision for Fort Collins and the steps necessary for implementation in order to achieve the City's vision, including policy guidance. It provides actions and strategies for implementing projects to meet short-term needs while also working towards long-term goals. This document is a dynamic guide for city council, City staff, boards, commissioners and the community.

Fort Collins understands the need for accessibility, mobility, and capacity associated with all modes: vehicles, transit, pedestrians and bicyclists.

The Master Street Plan (MSP), an appendix to the Transportation Master Plan, is a map of the City's long-range vision for its major street network. This includes

existing and future vehicle connections throughout the City and its growth management area. The MSP also reflects the classification of roadways (collector, arterial, etc.) and the general location for planned transportation connections. Final street alignments are determined and designed at the time of development.

During the 2010-2011 update, 14 locations were evaluated to determine the implications of changing their classification. One of the major outcomes was that no streets were identified to expand their current street classification through the 2035 horizon year. This indicates that the current roadway classification is adequate. In some cases, the updated plan proposed to reduce the classification for specific street segments to redefine the purpose and mode hierarchy. The MSP also includes an overlap map to identify roadways that should be redesigned as Enhanced Travel Corridors (ETCs).

ETCs provide direct and accessible connections between major activity centers like Downtown, CSU, Midtown, employment centers, shopping destinations, and neighborhoods. While ETCs have a general purpose to decrease travel times along the corridor, each individual corridor will have a different, unique way to provide the specific needs and connections. The ETCs are defined as special focus areas that emphasize enhanced infill and redevelopment along the corridor, increase overall corridor capacity while better utilizing alternative modes and defining space for each of the travel modes.

West Elizabeth Corridor: The TMP identified West Elizabeth Street from CSU to Overland as one of two new Enhanced Travel Corridors. This corridor is identified due to its strong connections to CSU Foothills, Campus West, and MAX. This project is an opportunity to expand on bicycle, pedestrian and transit improvements to key destinations.

The City's current ETCs include:

College Avenue/Mason Corridor – connecting Downtown to the communities approximately ½ mile south of Harmony Road (the Mason Corridor Environmental Assessment Technical Report was completed in 2008, the MAX BRT Re-evaluation was completed in 2010, and the Midtown in Motion: College Avenue Transportation Study was completed in 2014);

Harmony Road – connecting I-25 to Front Range Community College (FRCC), which will be extended to the Mason Corridor (the Harmony Road ETC Master Plan and Alternatives Analysis was completed in 2013);

Mountain Vista Drive/North College Avenue Corridor – connecting the Downtown Transit Center to Mountain Vista neighborhood;

Prospect Road (from CSU/Mason to I-25);

Timberline Road/Power Trail – connecting Harmony Road to Mountain Vista; and

West Elizabeth Street (from CSU to Overland/CSU Foothills).

CITY PLAN *(February 2011)*

City Plan is the comprehensive plan for Fort Collins. It describes the vision for the city for the next 25 years and beyond, and the steps necessary to reach that ultimate vision. City Plan was updated in 2010 simultaneous with the Transportation Master Plan update in order to increase collaboration and share resources between planning processes. Together, these plans and processes comprise Plan Fort Collins.

West Elizabeth Corridor: City Plan identified the West Elizabeth Street Enhanced Travel Corridor Plan as a longer-term action, marked for 2013 and beyond.

PEDESTRIAN PLAN

(February 2011)

The Pedestrian Plan outlined issues and proposed solutions to problems for pedestrians with the ultimate goal of providing safe, easy, and convenient pedestrian travel for all members of the community. This effort also updated and prioritized the City's list of pedestrian improvement projects and explored potential funding options. The purpose of the Pedestrian Plan was to promote a pedestrian-friendly environment that will encourage the choice to walk for visitors, students, and residents. The plan utilized a new GIS analysis tool that forecasted pedestrian demand using citywide "indices" of walking demand. These forecasts were used to evaluate future pedestrian improvements.

The 2010-11 update includes a pedestrian priority project list. This list combines remaining 2004 Capital Improvement Program (CIP) projects and new projects identified by citizens over the previous year. The plan also includes crossing guidelines such as when and how to mark a crosswalk and treatments to use at uncontrolled intersections.

West Elizabeth Corridor:
The West Elizabeth study area from Shields Street to City Park Avenue is identified as a part of the Downtown/CSU pedestrian district.

COLORADO STATE UNIVERSITY (CSU) MASTER PLAN UPDATE

(Spring 2012)

The CSU Master Plan is the document that maps the physical needs of the University and provides a tool to assess and plan for the future. This document provided University leadership with an outline of current and future program needs and budget requirements to successfully direct and build a legacy for future generations. This plan provided a collection of maps, conceptual designs, and graphical displays that updated the 2004 Campus Master Plan, including a history of the campus master plan, zoning conditions, projects under construction, funded projects, pedestrian and green space, access, transit, and housing redevelopment. The plan separated the campus into three sections—(1) Foothills, (2) Main Campus, and (3) South Campus—to depict current and future conditions and a framework diagram.

West Elizabeth Corridor: The framework diagram that is a part of the master plan shows West Elizabeth Street as a corridor for transit, bikes, and vehicles. Two relevant guiding principles identified as a part of this diagram are to make campus permeable to the community and maximize alternative modes of transportation. Guiding principles identified for the Foothills Campus are to establish bicycle and pedestrian gateways and to establish mass transit.

ARTERIAL INTERSECTION PRIORITIZATION STUDY

(March 2012)

The purpose of the Arterial Intersection Priority Study was to identify intersections that are in need of mobility and safety improvements. The study included an evaluation of traffic volume, intersection accidents, intersection delay, pedestrian and bicycle safety and transit operations. The analysis also relied on input from the community to help clarify local concerns and provide input on arterial intersections throughout the City. The community values developed in Plan Fort Collins were used to evaluate the intersections utilizing a data-driven process. The study applied "a wide breadth of evaluation criteria to ensure that the selected projects addressed specific transportation needs and also aligned with the City's core values." The evaluation process included three main steps:

Level 1 - Initial screening to identify intersections with the greatest safety and operational needs. Based on those results, and input from staff and others stakeholders, various alternatives or improvement options were developed for further consideration and evaluation.

Level 2 - Detailed evaluation of the alternatives. This evaluation was based on community values and designed to test options to find alternatives that meet these values and address the safety and operational issues identified in the initial screening.

Level 3 - Conceptual designs were developed for the final set of intersections.

West Elizabeth Corridor: Thirty-two intersections throughout the City were carried forward from Level 1 to the Level 2 analysis, including one within the West Elizabeth Enhanced Travel Corridor Plan study area: the Elizabeth Street/Shields Street intersection. This intersection was not carried forward for Level 3 analysis.

An update to this study is currently in progress.

CAPITAL IMPROVEMENT PLAN DOCUMENTATION *(December 2012)*

The Transportation Capital Improvement Plan (CIP) is an inventory of all multimodal transportation projects throughout the City and is a part of the Transportation Master Plan (TMP). The CIP was updated using an interdisciplinary team and 'triple bottom line' approach that included environmental, economic, and social factors as project prioritization criteria in conjunction with the traditional transportation criteria. The CIP is a tool that facilitates the allocation of resources based on project- and system-level prioritization reflecting the TMP's visions and community needs. The focus of the 2012 update was to ensure that the CIP is accurate, up-to-date, and more user-friendly than previous versions by refining project rankings, better identifying a fiscally constrained list and assisting with the project selection process for funding and grant applications. The update also supported the action steps specified in the 2011 TMP. This is an administrative update to the CIP.[3]

The CIP is updated periodically (approximately every two years); an update to this study is currently in progress.

West Elizabeth Corridor: Several CIP improvement projects are within the West Elizabeth study area. One of these projects is to upgrade Elizabeth Street from Overland Trail to Taft Hill Road to two lane arterial standards. This project is a Tier 1 and has a "Medium" cost-adjusted category. A complete streets CIP project is to upgrade West Elizabeth Street from a two lane to a four lane arterial from Taft Hill Road to Constitution Avenue. The Transit CIP list includes Transit Signal Priority (TSP). Phase 3—vehicle replacement, new vehicles, and capital improvements (which includes Elizabeth BRT). Another project in the study area is to add bicycle lanes on West Elizabeth Street between Kimball Road and Ponderosa Drive.

This study applied "a wide breadth of evaluation criteria to ensure that the selected projects addressed specific transportation needs and also aligned with the City's core values."

[3] *www.fcgov.com/cip*

STUDENT HOUSING ACTION PLAN

(February 2013)

The Student Housing Action Plan's (SHAP) mission was to "strive to develop community-driven strategies that encourage and provide quality student housing while maintaining neighborhood quality and compatibility." The purpose of this effort was to work with stakeholders including Colorado State University (CSU), Front Range Community College (FRCC), neighbors, students, property owners, and developers to "identify strategies to address the increasing need for multi-family student housing; identify key issues for development or redevelopment; and understand potential impacts and compatibility issues." In particular, staff was asked to address developments near existing single-family residential neighborhoods. As a result of this, the following items have been adopted by City Council:

» Apply elements of the Land Use Code and the City's development standards for the Medium-Density Mixed-Use Neighborhood zone district. It should be applied to all multi-family projects outside of the TOD (transit–oriented development) Overlay Zone by incorporating those requirements into the general standards of the Land Use Code.

» Modify requirements in the Neighborhood Conservation zone district to restrict 100 percent secondary uses, such as residential development on land parcels of five acres or less, rather than the previous allowance of 10 acres or less.

» Require any multi–family project with greater than 50 units or 75 bedrooms to have a Type 2 Administrative Hearing.

West Elizabeth Corridor: The TOD Overlay Zone includes CSU's main campus and extends into the West Elizabeth ETC plan area east of City Park Avenue, between Plum Street on the north and Westward Drive on the south. This represents an area of the corridor that has seen redevelopment of single-family homes into large student oriented multi-family housing projects. Future development will be subject to the changes recommended in the SHAP. An action item in the report, still in need of further development before going to City Council for future implementation, is a grade-separated pedestrian/bicycle crossing at or near the intersection of Shields Street/West Elizabeth Street. This crossing is currently being analyzed as part of this effort in conjunction with the stadium IGA.

COLORADO STATE UNIVERSITY PARKING AND TRANSPORTATION MASTER PLAN *(April 2014)*

The CSU Parking and Transportation Master Plan goals includes providing strategies to improve overall campus access, to develop a more sustainable program of transportation alternatives, and improved customer service for the CSU community going forward. This plan included an overview of current parking management strategies, TDM (Transportation Demand Management) existing conditions and best practices, a community engagement and strategic communications plan, traffic impact assessment and traffic simulation model, PARK+ for campus parking and multimodal demand modeling.

West Elizabeth Corridor: The key recommendations in this plan relevant to the West Elizabeth Enhanced Travel Corridor Plan study area are as follows:

- Adopt a lower parking space to population ratio as the key parking planning benchmark.
- Develop an aggressive Transportation Demand Management (TDM) and Transportation Alternatives Program.
- Prioritize short-term parking development projects.
- Integrate the new Around the HORN Internal Campus Circulator Shuttle in conjunction with the inauguration of the MAX Bus Rapid Transit Service and transit route enhancements by Transfort.
- Determine parking pricing options and mobility management support.
- Develop strategic communications, campus parking and mobility program branding and marketing and ongoing program monitoring and benchmarking.
- Expand local and regional transportation planning and funding strategies.
- Adopt a range of new parking and planning technologies.
- Leverage parking and transportation to support campus sustainability and climate commitment goals.

INTERGOVERNMENTAL AGREEMENT RELATED TO AN ON-CAMPUS STADIUM

As a part of the CSU On-Campus Stadium, an intergovernmental agreement (IGA) was developed between CSU and the City in March 2015 to identify mitigation needs and recommendations for transportation during events. Mitigation needs and recommendations include transportation, parking and transit operational strategies, and multimodal transportation infrastructure.

West Elizabeth Corridor:
Strategies and improvements that will affect West Elizabeth Street include increased transit service (10 minute headways) and lane improvements at the West Elizabeth Street/ Shields Street intersection. An action item in the report, still in need of further development before going to City Council for future implementation, is a grade-separated pedestrian/ bicycle crossing at or near the intersection of Shields Street/ West Elizabeth Street.

TRANSIT-ORIENTED DEVELOPMENT PARKING STUDY

(November 2014)

The Transit Oriented Development (TOD) Parking Study identifies modifications to the TOD Overlay Zone standards adopted in 2006. The 2006 standards removed minimum parking requirements for mixed-use and multi-family dwellings in order to incentivize redevelopment on infill sites and investment in the MAX Corridor. The 2014 update was in response to increased development activity in the overlay zone, which caused a perceived lack of development-provided parking and consequent spillover into adjacent neighborhoods.

This plan makes five recommendations based on these problems:

- » Minimum parking requirements based on land use
- » Alternative compliance based on parking demand mitigation strategies
- » On-street paid parking
- » Public-private partnerships for parking structures
- » Monitor effects of MAX on parking in the long-term

West Elizabeth Corridor:
In the project study area, West Elizabeth Street and Plum Street between Shields Street and City Park Avenue are part of the TOD overlay zone.

FORT COLLINS BICYCLE MASTER PLAN

(December 2014)

The 2014 updated Bicycle Master Plan defined the vision of Fort Collins as a world-class city for bicycling where people of all ages and abilities have access to a comfortable, safe and connected network of bicycle facilities and where bicycling is an integral part of daily life and the local cultural experience.

The Bicycle Master Plan sets a number of goals for bicycling in Fort Collins in 2020 including:

- 20 percent of people commuting by bike
- Zero bicycle fatalities
- Fewer bicycle crashes than in 2014
- A 162 mile network of low-stress bikeways
- 80 percent of residents living within ¼ mile of a low-stress bike route

The plan emphasizes a low-stress network of connected bike facilities throughout the City.

West Elizabeth Corridor: This plan identifies the low-stress corridors that parallel West Elizabeth Street, as well as specific facility types for various streets in the study area; these include:

- West Elizabeth Street from Shields Street to Overland Trail is designated as a protected bike lane
- Shields Street within the study area is also designated as a protected bike lane
- Plum Street from Shields Street to West Elizabeth Street (including Constitution Avenue) is identified as a buffered bike lane
- City Park Avenue within the study area is designated as a neighborhood greenway.
- The Bicycle section of this report builds off the analysis and methodology applied in the Bicycle Master Plan.

COLORADO STATE UNIVERSITY BICYCLE MASTER PLAN

(September 2014)

The CSU Bicycle Master Plan analyzes current policies, program and infrastructure and provides best practices as seen at peer institutions. The plan intends to improve bicyclists' experience and safety on campus by prioritizing investment, recommending ongoing data collection and guiding bicycle incorporation into new buildings.

West Elizabeth Corridor: This plan identifies intersection improvements at West Elizabeth Street and Shields Street as a medium priority project. It also recommends an improvement to the intersection of Pitkin Streets, Shields Street and Springfield Drive to create a comfortable and safe crossing as a medium priority project.

WEST CENTRAL AREA PLAN *(WCAP) (March 2015)*

The West Central Area Plan provides a land use and transportation vision for the neighborhoods bound by Taft Hill Road, Drake Road, Mason Street and Mulberry Street. The plan proposed policies, projects and programs to improve the quality of life in the area by updating the 1999 West Central Area Plan. The transportation component features challenges, issues and opportunities associated with the transportation infrastructure. The report highlights three corridors: Prospect Road, Lake Street and Shields Street. The work done at the intersection on Shields Street and Elizabeth Street will carry forward into the West Elizabeth Enhanced Travel Corridor Master Plan.

West Elizabeth Corridor:
An action item of WCAP was the development of the West Elizabeth Enhanced Travel Corridor Plan. WCAP also contains an analysis of Shields corridor from Laurel Street to Prospect Road. The analysis of Shields is continuing within the West Elizabeth Street ETC plan.

Some additional action items in WCAP that are relevant to the West Elizabeth study area include:

- Shared-use parking opportunities for transit users
- Additional transit service
- Bus stop improvements
- Intersection improvements at Shields Street/West Elizabeth Street and City Park Avenue/West Elizabeth Street
- Roadway improvements on West Elizabeth Street between Shields Street and City Park Avenue.

WCAP includes a detailed analysis of the Prospect Corridor between Shields Street and College Avenue. The design in this section of the plan recommends a widened sidewalk, tree lawn, bike lane and sections of shared use path This cross section will inform the discussion within the West Elizabeth study area.

TRAFFIC SAFETY SUMMARY *(APRIL 2015)*

This report summarizes the traffic crash history from 2010 to 2014 that have occurred on public streets throughout Fort Collins. It includes a summary of crashes, evaluation of the most common types of crashes, and identification of locations with a high frequency of crashes.

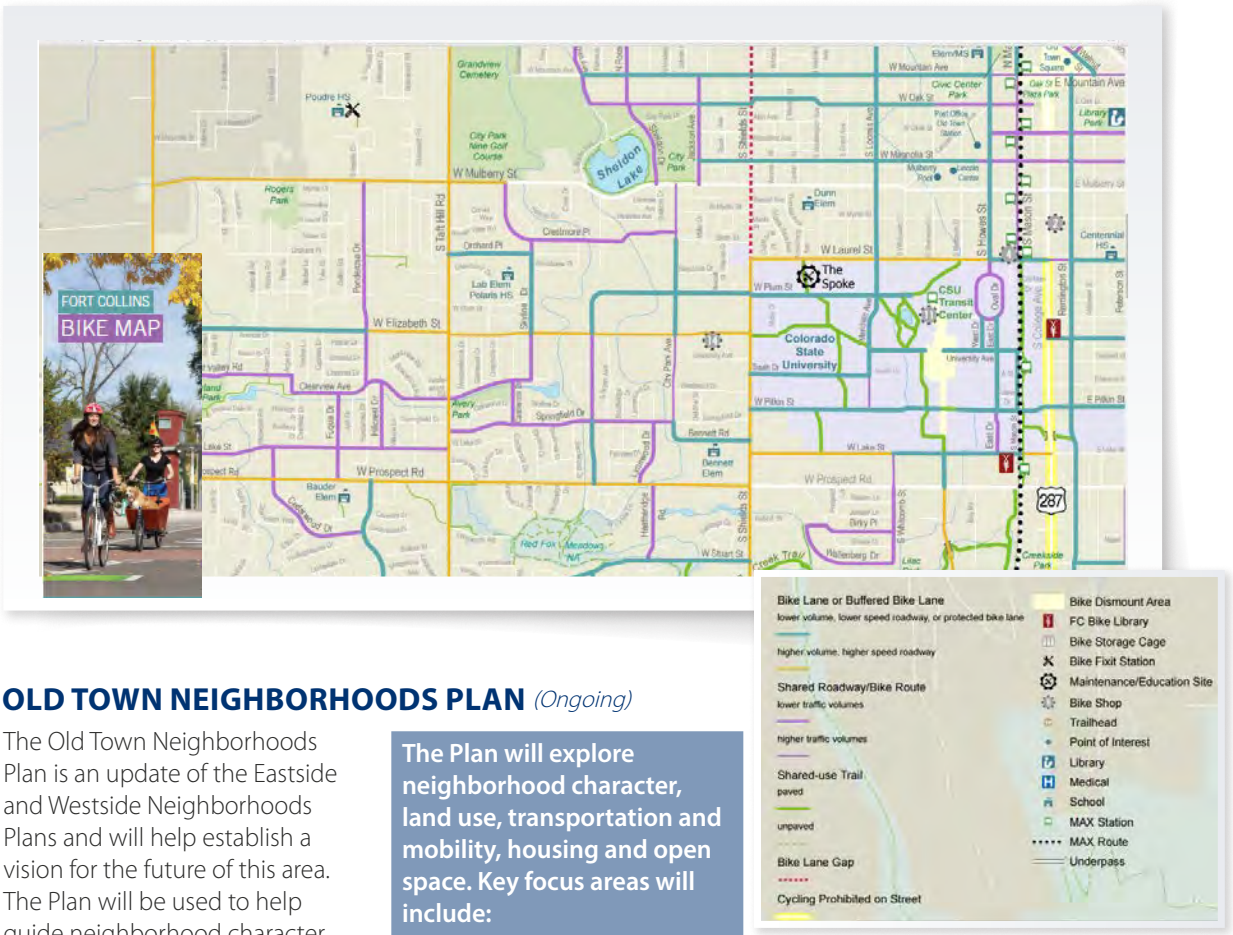
West Elizabeth Corridor: The Traffic Safety Summary is the primary source of data used in the West Elizabeth Corridor analysis detailed in the Safety section of this document.

FORT COLLINS BIKEWAY SYSTEM MAP *(June 2015)*

The Fort Collins bikeway system map, as shown in **Figure 9,** was updated in 2015 to show the most recent existing and proposed soft-surface multi-use trails, hard-surface multi-use trails, bike lanes, and designated bike routes. This map was published and is being widely distributed to ease route planning for bicyclists navigating Fort Collins. This is an updated version of the previous Fort Collins bike map that provides additional emphasis on low-stress routes.

West Elizabeth Corridor:
There are a number of on-street, off-street or designated bike route bicycle facilities within the West Elizabeth Enhanced Travel Corridor Plan area that connect to the surrounding neighborhoods.

FIGURE 9: **Bikeway System Map**



OLD TOWN NEIGHBORHOODS PLAN *(Ongoing)*

The Old Town Neighborhoods Plan is an update of the Eastside and Westside Neighborhoods Plans and will help establish a vision for the future of this area. The Plan will be used to help guide neighborhood character, policies and investment. This updated plan allows the neighborhoods to shape or reconfirm the neighborhood's vision, goals, and policies to reflect current and future conditions.

The Plan will explore neighborhood character, land use, transportation and mobility, housing and open space. Key focus areas will include:

- Development within comprising districts
- Existing conditions and options for the Mulberry & North Shields arterial corridors
- Neighborhood Design Guidelines & Pattern Book

West Elizabeth Corridor:
The design concepts developed in this plan for Mulberry Street between Taft Hill Road and Shields Street is within the West Elizabeth study area and will affect connections recommended as a part of this plan.

Section 3

EXISTING CONDITIONS

Existing right-of-way varies considerably throughout the corridor and can be characterized into three distinct areas from west to east: Overland Trail to Taft Hill Road, Taft Hill Road to Constitution Avenue, and Constitution Avenue to Shields Street. As a result, West Elizabeth varies between a two-lane and four-lane arterial.

EXISTING CONDITIONS

EXISTING RIGHT-OF-WAY

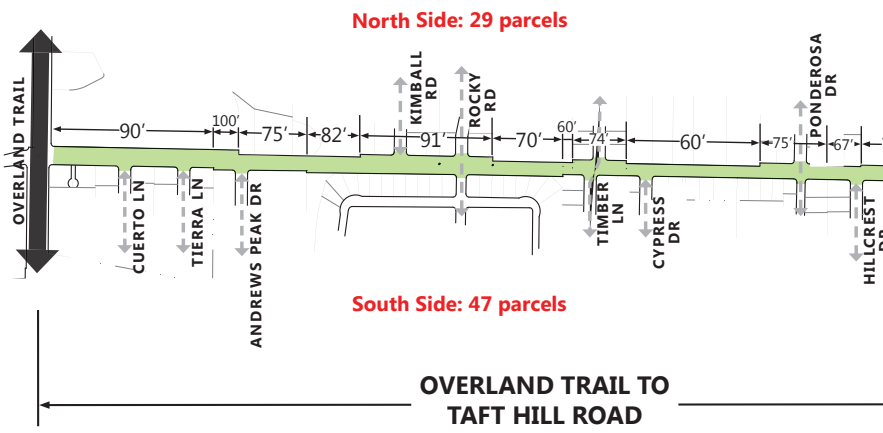
West Elizabeth varies between a two-lane and four-lane roadway. In general, the roadway has two travel lanes between Overland Trail and Constitution Avenue and four travel lanes between Constitution Avenue and Shields Street, though a second eastbound travel lane begins west of Constitution Avenue near Skyline Drive.

Overland Trail to Taft Hill Road – varies from 60 feet to 100 feet. The right-of-way in this area is inconsistent overall due to many of the northern parcels being annexed into the City Limits from Larimer County, and right-of-ways remaining as they were in the County. Many of these parcels take direct access off of Elizabeth Street, and the parcels vary considerably in width.

Taft Hill Road to Constitution Avenue – varies from 75 feet to 90 feet. The right-of-way in this area is relatively consistent, mostly exceeding 80 feet in width. A number of single-family parcels take direct access off of West Elizabeth Street.

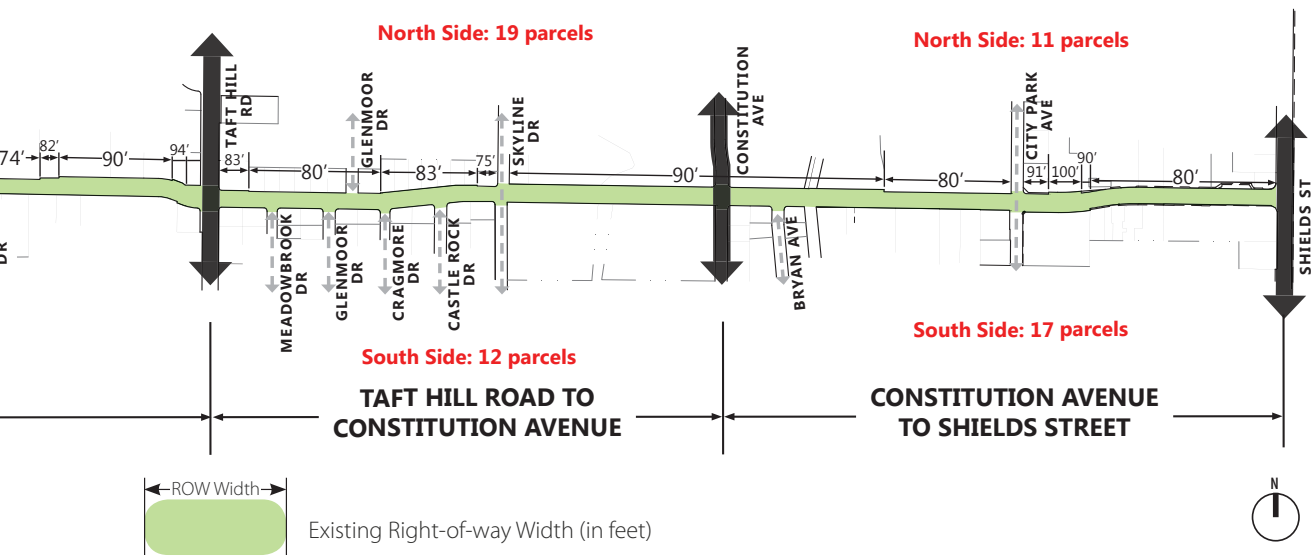
Constitution Avenue to Shields Street – varies from 80 feet to 100 feet. The right-of-way in this area is a minimum of 80 feet with approximately 50 percent of the area exceeding this. Multi-family adjacent parcels do not take direct access off of West Elizabeth Street, however, nearly all commercial parcels access directly off of West Elizabeth Street.

FIGURE 10: Existing Right of Way



EXISTING CROSS SECTIONS

The cross section along the West Elizabeth Street corridor varies between Shields Street and Overland Trail. Similar to right-of-way, there are three primary variations of cross sections. The three locations that exemplify each of the cross sections are shown in **Figure 11. Figure 11** also shows the location of the cross sections at Plum Street, City Park Avenue and Constitution Avenue. The cross sections along West Elizabeth Street are shown in **Figure 12.** The eastern-most cross section on West Elizabeth Street has four travel lanes, a center turn lane, a 7 foot bike lane that is a flush, single-pour concrete, and a 12-foot sidewalk on either side that includes an amenity zone. Between Skyline Drive and Taft Hill Road, the cross section has two travel lanes, a center turn lane, a 6.5 foot bike lane that includes a 2 foot gutter, and a 3.5 foot sidewalk. The western-most cross section has two travel lanes, a 6.5 foot bike lane including a 2 foot gutter (in most sections) , and a 5 foot sidewalk with a wide 10 foot landscaped buffer (south side only). The cross sections along Plum Street, City Park Avenue and Constitution Avenue are shown in **Figure 13.** Plum Street also has two travel lanes, with a 5 to 6 foot bike lane and an 8 foot sidewalk on both sides, City Park Avenue has two travel lanes, on street parking, a 5 foot attached sidewalk on both sides and a bike lane. Constitution Avenue has two travel lanes, a 5 foot bike lane and 4 foot detached sidewalk with a 5 foot landscaped buffer on both sides.



Source: City of Fort Collins document survey and parcel data.

FIGURE 11: Existing Cross Section Index

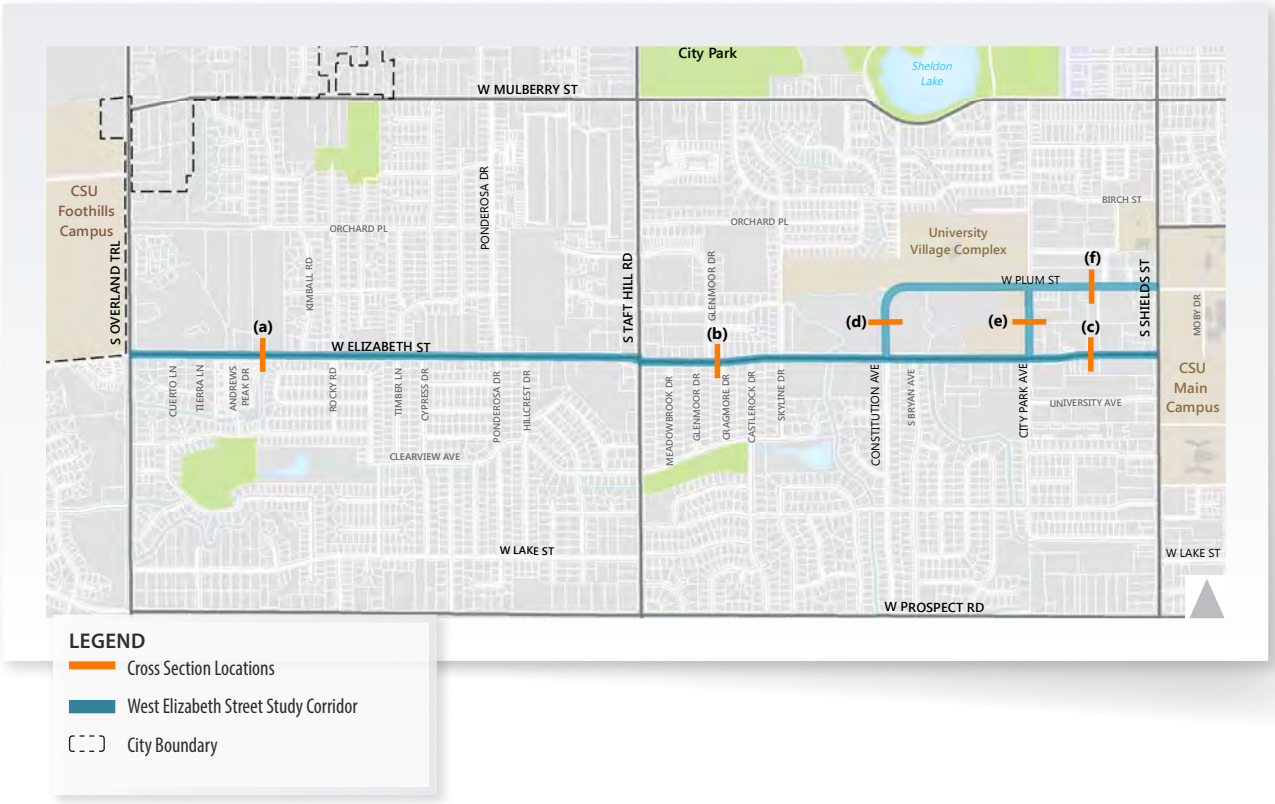
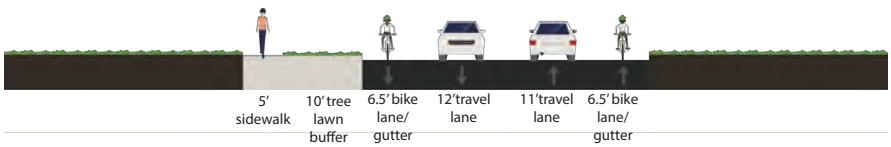
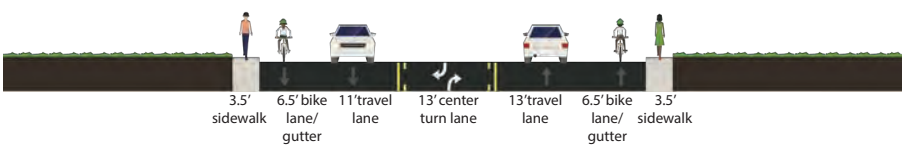


FIGURE 12: West Elizabeth Street Existing Cross Sections

a. West Elizabeth Street between Kimball Drive and Overland Trail



b. West Elizabeth Street between Skyline Drive and Taft Hill Road



c. West Elizabeth Street between Shields Street and City Park Avenue

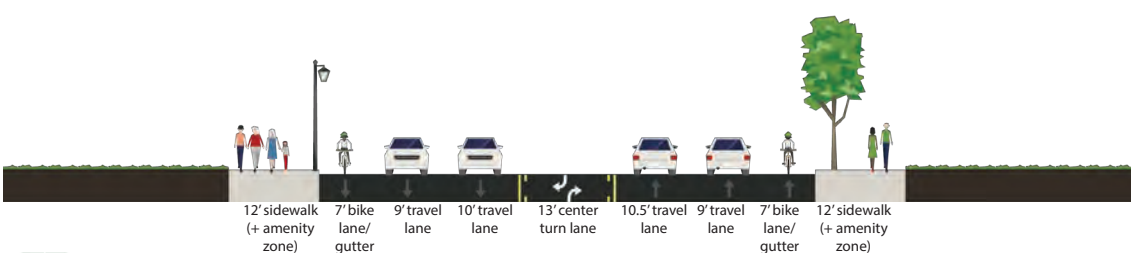
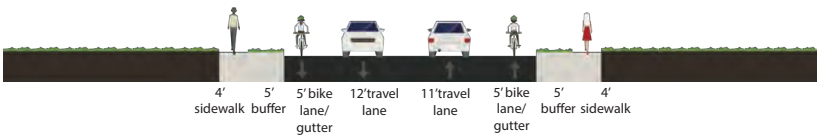
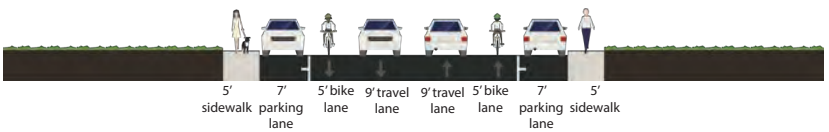


FIGURE 13: Plum Street, City Park Avenue and Constitution Avenue Existing Cross Sections

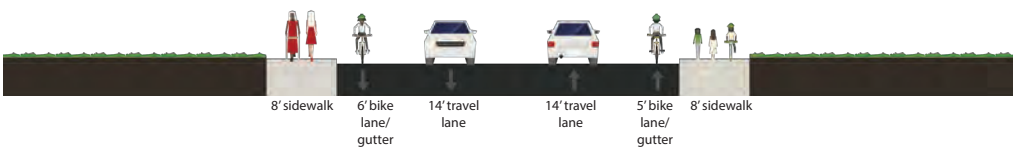
d. Constitution Avenue between Plum Street and Elizabeth Street



e. City Park Avenue between Plum Street and Elizabeth Street



f. West Plum Street between Shields Street and City Park Avenue



VEHICLES

This section analyzes the performance of the West Elizabeth Street study area for vehicles. The findings from this analysis provide a framework for shaping recommendations in the corridor. This section identifies existing and future traffic volumes that may inform travel lane needs in the corridor and operations issues at intersections that may inform improvements at study intersections. Key items documented in this section include a summary of traffic volumes in the study area, vehicle level of service calculations for study intersections, and 2040 traffic volume forecasts.

Figure 14 shows average daily traffic, peak hour vehicle movements, and lane configurations. Counts were provided by the City of Fort Collins Traffic Operations.

Intersection level of service (LOS) was calculated using Vissim, a microscopic multimodal traffic flow simulation software package. The Vissim model was created to represent West Elizabeth Street between Overland Trail and Shields Street, Shields Street between Mulberry Street and Prospect Road and Plum Street between Constitution Avenue and Shields Street. All of the West Elizabeth Enhanced Travel Corridor Plan intersections are included in the Vissim model.

The Vissim model was calibrated to existing traffic counts (including automobiles, transit vehicles, bicyclists, and pedestrians), travel times collected using Bluetooth detection, and observed phase green times at each signalized intersection. **Appendix B** includes detailed validation statistics.

Vissim simulates interactions between different modes of transportation, including vehicle-pedestrian and vehicle-bicyclist interactions. In a corridor with high volumes of transit vehicles, pedestrians, and bicyclists, capturing these interactions is important for understanding operations and level of service for all modes.

Vissim simulates interactions between different modes of transportation, including vehicle-pedestrian and vehicle-bicyclist interactions.

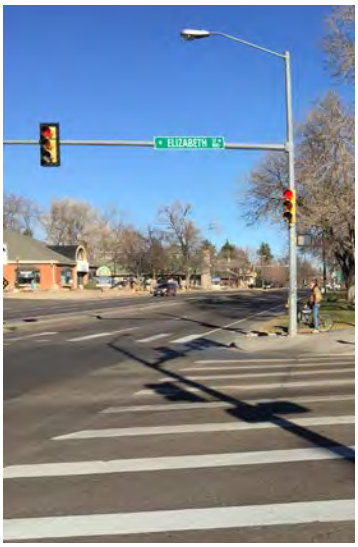
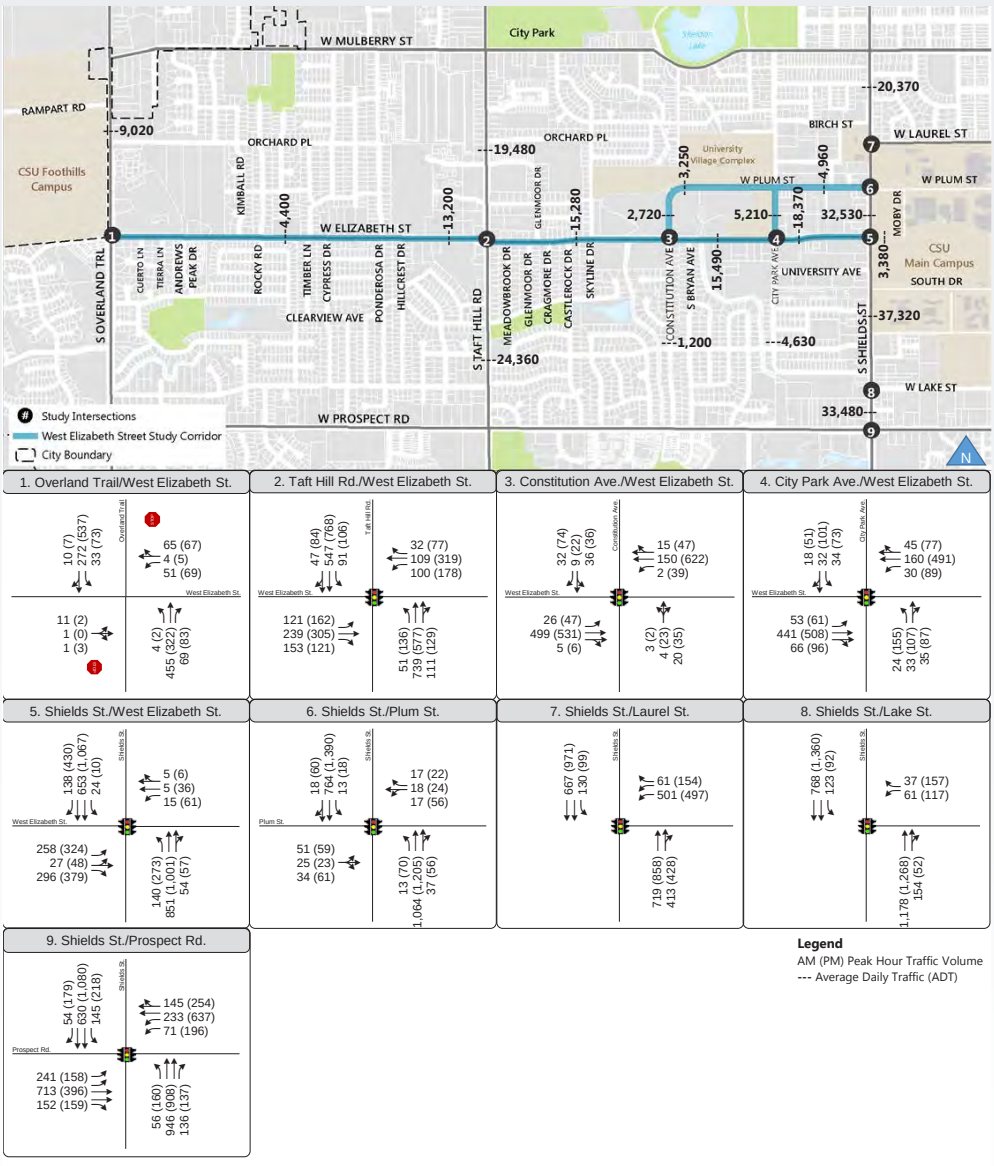


FIGURE 14: Existing Conditions Turning Movements and Lane Configurations



EXISTING CONDITIONS

Level of Service (LOS)

Level of service on West Elizabeth Street and Shields Street is displayed in **Table 1** and shown in **Figure 15. Table 1** shows average intersection and delay at each study intersection, and the appendix includes delay by approach and movement.

LOS for signalized intersection is based on average vehicle delay on all approaches which can conceal the high delay (poor LOS) conditions at specific approaches that may have a small percentage of the intersection's overall volume. Intersections with such higher delay on specific approaches include:

- **West Elizabeth Street/Shields Street –** the eastbound approach operates at LOS E during the PM peak hour. The northbound left turn operates at LOS F.
- **Shields Street/Plum Street –** the eastbound approach operates at LOS E during the AM peak hour; both the eastbound and westbound approaches operate at LOS E during the PM peak hour.
- **Shields Street/Laurel Street –** the westbound approach operates at LOS E during the PM peak hour.
- **Shields Street/Prospect Road –** the eastbound approach operates at LOS F during the AM peak hour; the westbound approach operates at LOS F during the PM peak hour.

TABLE 1: Existing Conditions Intersection Level of Service

Intersection	Control	Existing Conditions			
		AM		PM	
		Delay *(seconds)*	LOS	Delay *(seconds)*	LOS
West Elizabeth Street/Overland Trail	Side-Street Stop[1]	3 *(average)* 23 *(westbound left)*	A C	3 *(average)* 27 *(westbound left)*	A D
West Elizabeth Street/Taft Hill Road	Signal [2]	22	C	34	C
West Elizabeth Street/ Constitution Avenue	Signal	6	A	9	A
West Elizabeth Street/City Park Avenue	Signal	8	A	15	B
West Elizabeth Street/Shields Street	Signal	18	B	42	D
Shields Street/Plum Street	Signal	9	A	14	B
Shields Street/Laurel Street	Signal	12	B	24	C
Shields Street/Lake Street	Signal	7	A	12	B
Shields Street/Prospect Road	Signal	67	E	51	D

[1]Delay for side street stop intersections is provided both for the worst case movement as well as the average of all movements.
[2]Delay for signalized intersections is provided for the average of all movements.

There are a large number of access points on West Elizabeth Street, resulting in frequent driveway conflicts, especially between Shields Street and Constitution Avenue.

Speed and Travel Time
Speed data was collected on West Elizabeth Street mid-block between City Park Avenue and Constitution Avenue. The 85th percentile eastbound and westbound speeds at this location were 37 mph and 33 mph respectively. The posted speed limit is 30 mph.

Table 2 shows a comparison of the VISSIM model travel times on West Elizabeth and the actual travel times based on Bluetooth data.

FIGURE 15: Vehicle Level of Service (LOS)

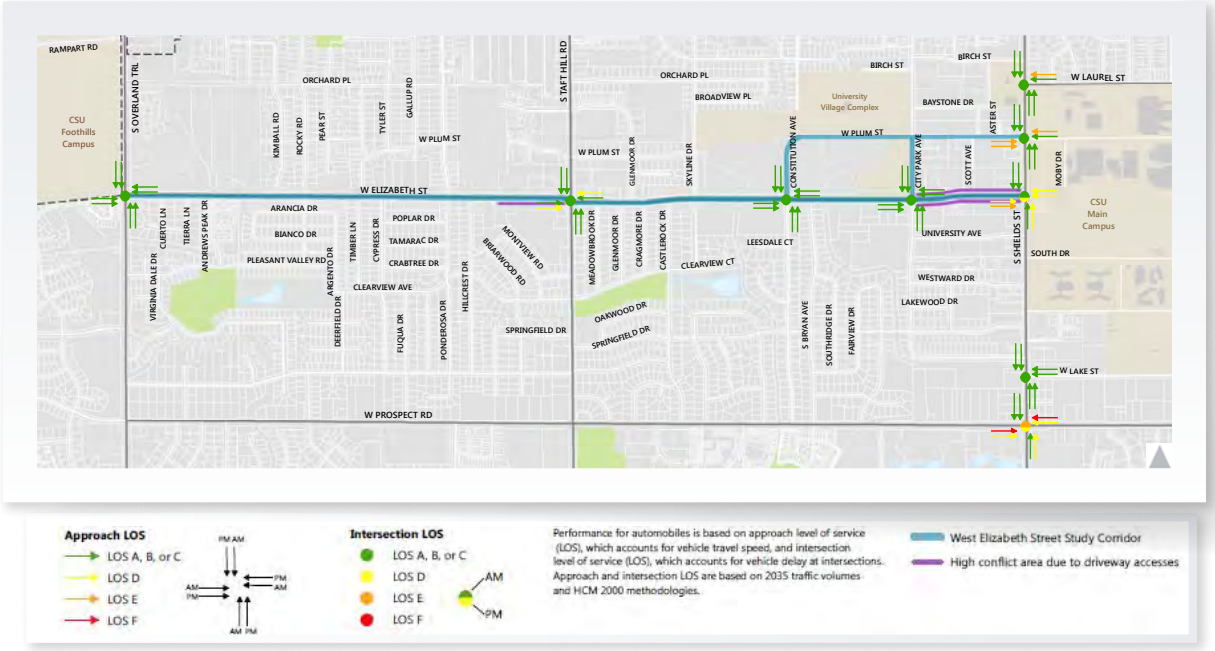


TABLE 2: West Elizabeth Street Travel Time

Roadway Segment	Time Period	Travel Time	
		VISSIM *(seconds)*	Bluetooth *(seconds)*
EB Taft Hill to Constitution	AM	65	54
	PM	68	55
EB Constitution to Shields	AM	101	86
	PM	122	112
WB Shields to Constitution	AM	72	67
	PM	81	73
WB Constitution to Taft Hill	AM	97	71
	PM	14	86

FUTURE CONDITIONS

(2040)

The North Front Range Regional Travel Model (NFR Model) was used to estimate traffic volumes in 2040. The NFR Model's roadway network includes the City of Fort Collins as well as the cities of Loveland, Windsor and Greeley. The NFR Model is calibrated to 2012 conditions and contains future year data reflecting 2040 economic and demographic forecasts and specific transportation projects expected to be constructed by 2040. Within the West Elizabeth Enhanced Travel Corridor Plan study area the model contains a low level of detail; therefore, the model was used to develop growth rates that were used to develop 2040 turning movement forecasts.

Specifically, the model projects the following growth rates from 2012 to 2040:

» West Elizabeth Street – 23 percent (0.8 percent per year) during the AM peak hour and 12 percent (0.5 percent per year) during the PM peak hour.

» Shields Street – 16 percent (0.6 percent per year) during the AM peak hour and 19 percent (0.8 percent per year during the PM peak hour.

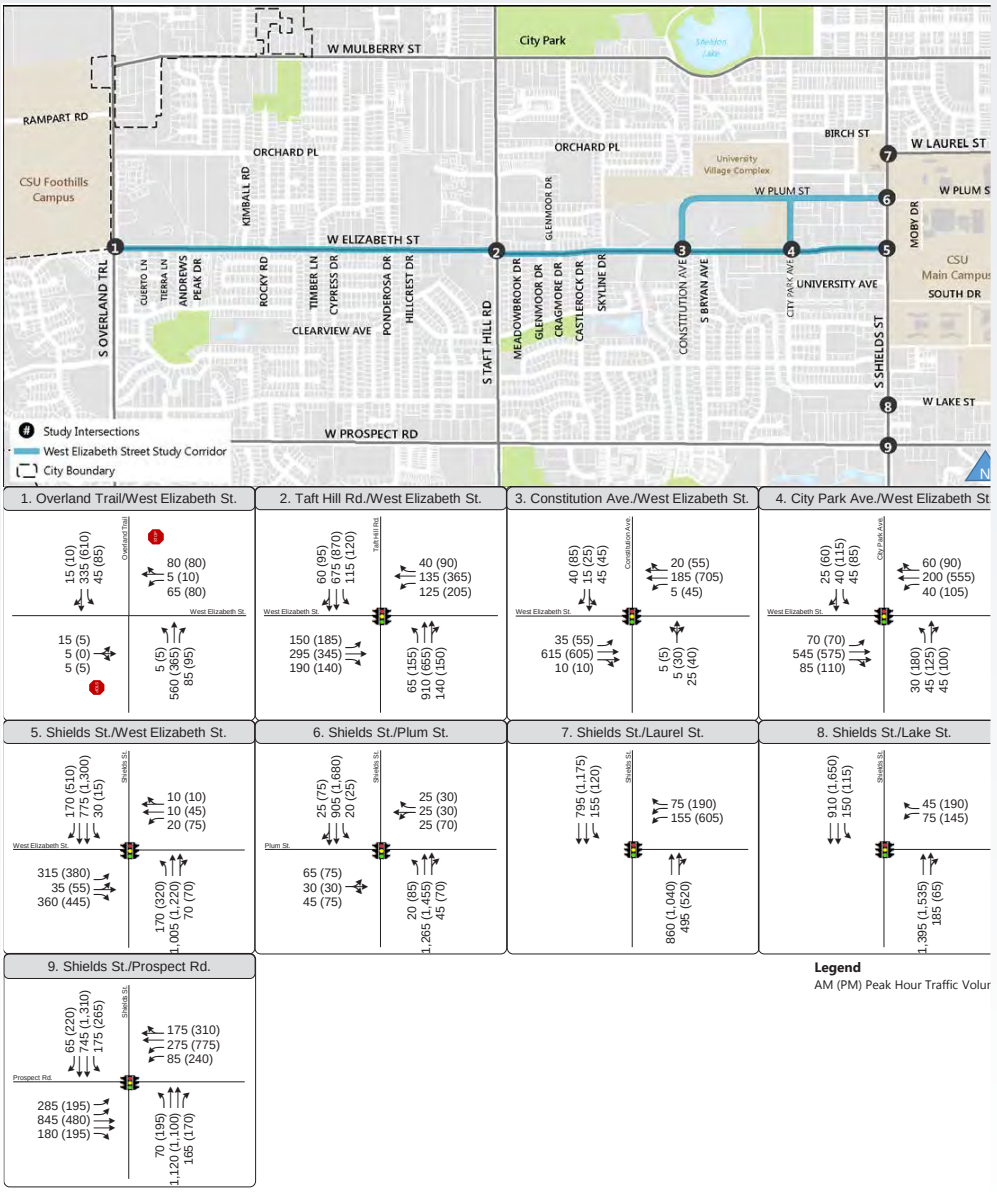
These growth rates were applied to intersection turning movements on West Elizabeth Street and Shields Street. At the West Elizabeth Street/Shields Street intersection the West Elizabeth Street growth rates were applied to the east-west through movements on West Elizabeth Street; the Shields Street growth rates were applied to the north-south through movements on Shields Street and an average of the two growth rates was applied to turning movements.

These 2040 forecasts for the study area generally assume a 0.53 percent annual growth in population and 0.33 percent annual growth in employment with no major changes to existing transit service or walk/bike mode share. Improvements that serve to significantly improve transit service or conditions for pedestrians and bicyclists may justify modified forecasts. This will be explored further as part of the alternatives analysis.

Figure 16 shows the 2040 peak hour turning movement forecasts.

2040 traffic operations analysis will be included in the alternatives analysis.

FIGURE 16: 2040 Conditions Turning Movements and Lane Configurations



PARKING

The study area, especially between City Park Avenue and Shields Street, has a high demand for parking given its proximity to the CSU campus and amount of commercial properties and dense, multi-family and student housing. There are a few sections of on-street parking within the additional corridor study segments. These sections are:

- On City Park Avenue between Plum Street and West Elizabeth Street
- On some short segments of West Elizabeth Street west of Taft Hill Road
- Residential streets north of Plum Street
- Residential streets north of Elizabeth Street
- Residential streets south of Elizabeth Street

There are some areas of off-street parking in the study area. These are primarily located at commercial and multi-family properties west of Shields Street and the single-family neighborhoods within the study area. The Campus West area faces a parking shortage due to the large number of vehicle trips generated by CSU, the dense student population with cars living in the neighborhood, and the number of businesses located on West Elizabeth Street between Shields Street and Constitution Avenue. As of July 2015, there are parking restrictions on CSU campus but no Residential Parking Permit Program in the study area. Some property owners have developed shared parking agreements with adjacent property owners. A complete list of these agreements is not available.

KEY FINDINGS

Traffic volumes on West Elizabeth Street generally increase from west to east. Near Timber Lane the ADT is 4,400 vehicles per day and near Shields Street the ADT is over 18,000 vehicles per day.

Traffic volumes on area collectors Plum Street (4,960 vehicles per day), Constitution Avenue (2,720 vehicles per day), and City Park Avenue (5,210 vehicles per day) are lower than the traffic volumes on West Elizabeth Street.

Most study intersections operate at LOS D or better during peak hours. The Shields Street/Prospect Road intersection operates at LOS E during the AM peak hour.

Key approaches to certain intersections experience notable congestion: the northbound left-turn, eastbound left-turn, and eastbound right-turn at the West Elizabeth Street/Shields Street intersection and the eastbound and westbound movements at the Plum Street/Shields Street intersection.

By 2040 and without other significant changes to transit service or conditions for pedestrians and bicyclists, traffic volumes on West Elizabeth Street are expected to grow approximately 23 percent (0.8 percent per year) during the AM peak hour and 12 percent (0.5 percent per year) during the PM peak hour.

There are a large number of access points on West Elizabeth Street, resulting in a number of driveway conflicts, especially between Constitution Avenue and Shields Street.

TRANSIT

This section analyzes the performance of Transfort services in the West Elizabeth Street study area in order to develop a data-driven understanding of the local network. The findings from this analysis provide a framework for shaping both short-term and longer-term recommendations on the corridor. More specifically, this section identifies opportunities to improve service quality, maximize the use of Transfort resources, continue ridership growth, and address unmet mobility needs both today and as the corridor continues to develop.

This section begins with an overview of the Transfort network of services and the local operating environment. This provides context for understanding Transfort's current role. This section then assesses the key routes that serve the study area. It describes the design decisions that shape these services, and the impact that these decisions have on performance across different metrics. This section concludes with a summary of key findings that will help form a framework for achieving the corridor vision.

Data Sources

This analysis utilizes monthly Transfort service performance data to evaluate weekday performance at the study area and route level. For time period analysis and stop level analysis, this analysis uses Trip Summary and Automated Passenger Counter (APC) ridership data, respectively. Route profiles and the analysis of Saturday performance are included in **Appendix C.**

Context

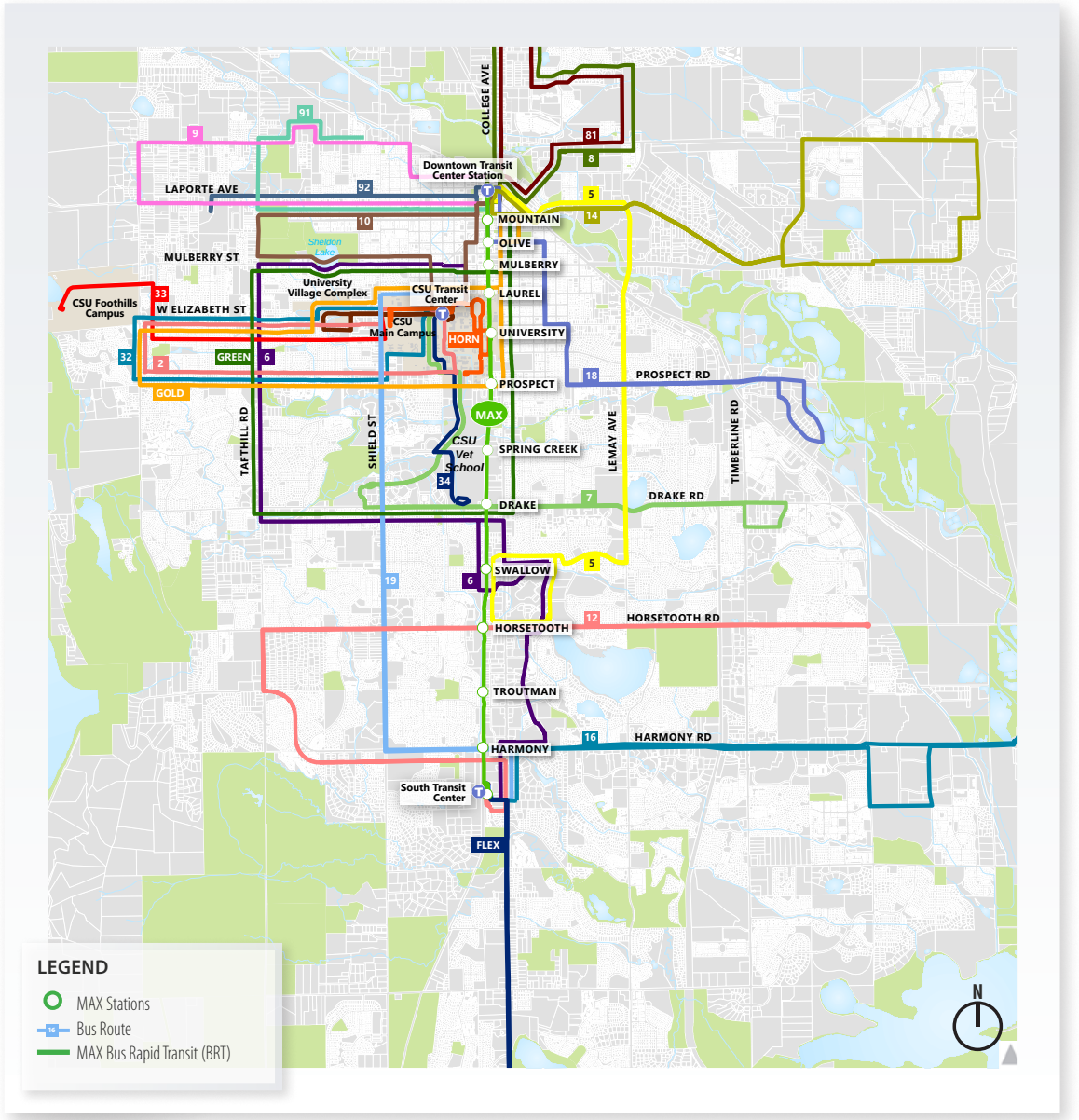
Transfort Network Overview

Transfort is a department within the Planning, Development, and Transportation service area for the City of Fort Collins. The agency operates 24 fixed-routes to serve the City of Fort Collins. Local and shuttle routes provide community circulation and often feed into MAX, a high-frequency BRT and critical network spine. FLEX is a regional service with connections to Loveland, Berthoud, and Longmont.[4] Transfort also operates Gold and Green Routes, which are two weekend evening/late-night circulators.

Figure 17 shows Transfort's system map. Transfort has designed a hybrid grid/hub-and-spoke network. This service structure is typically utilized in areas with lower service frequencies. It allows passengers to transfer between routes at hub locations, often via timed transfers while still maintaining a grid configuration where strong mixed use corridors are present. Transfort's hub-and-spoke network features three major transfer hubs: the Downtown Transit Center, the CSU Transit Center, and the South Transit Center. Many Transfort services connect to one of these hubs.

[4] *Extended service to Boulder is expected to begin January 2016.*

FIGURE 17: Transfort System Map



Overall, the study area route network is confusing, with many routes providing overlapping service and different routes providing service in each direction on the same corridor (often with slightly different alignments). It is not surprising that the most productive and highest ridership routes are those that are the easiest to understand and use.

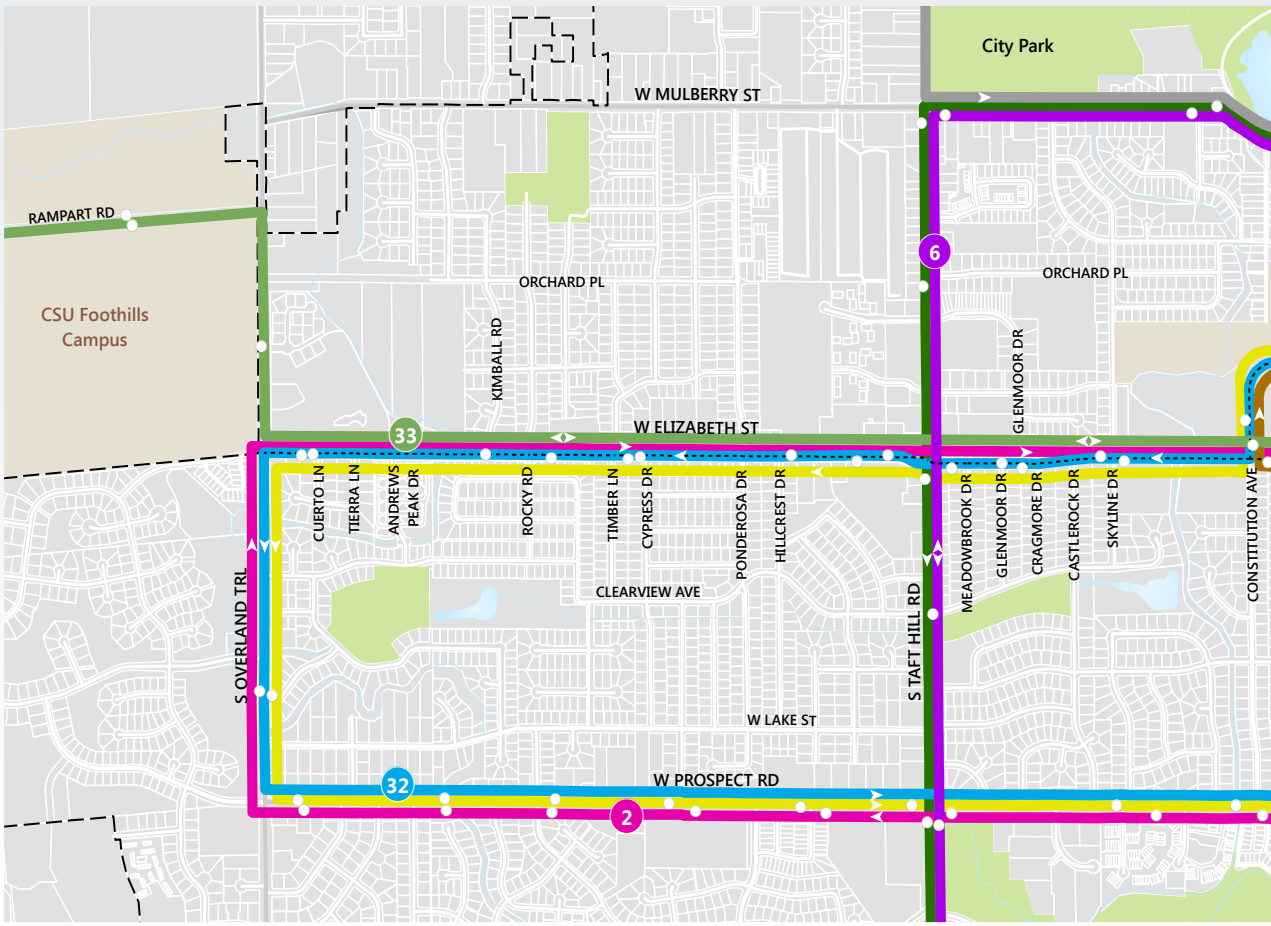
Certain routes only operate while CSU is in session such as the 31, 32, 3and 33. However, these services are funded primarily through a partnership with the University and Associated Students of Colorado State University (ASCSU) which mostly serve the needs of their students, faculty, and staff. While the routes are in operation they provide additional service frequency for the entire community that Transfort would not be able to otherwise offer.

Corridor Study Area

CSU heavily influences local demand for transit, its design, and ultimately, its performance. Universities are strong markets for transit because they typically attract a high concentration of households with limited access to vehicles. Understanding this operating environment will be critical for developing cost-effective transit solutions and identifying enhanced transit mobility options for the corridor.

The study focuses specifically on evaluating Routes 2, 6, 10, 19, 31, 32, 33, HORN, and MAX. These Transfort services have the most impact on mobility within the study area. Routes 2, 6, 10, 19, HORN, and MAX operate year around. Routes 31, 32, and 33, only operate when CSU is in session. The key hub in this area is the CSU Transit Center, the central hub for routes serving the university. **Figure 18** shows existing transit routes and stops in the study area.

FIGURE 18: Existing Transit Routes and Stops



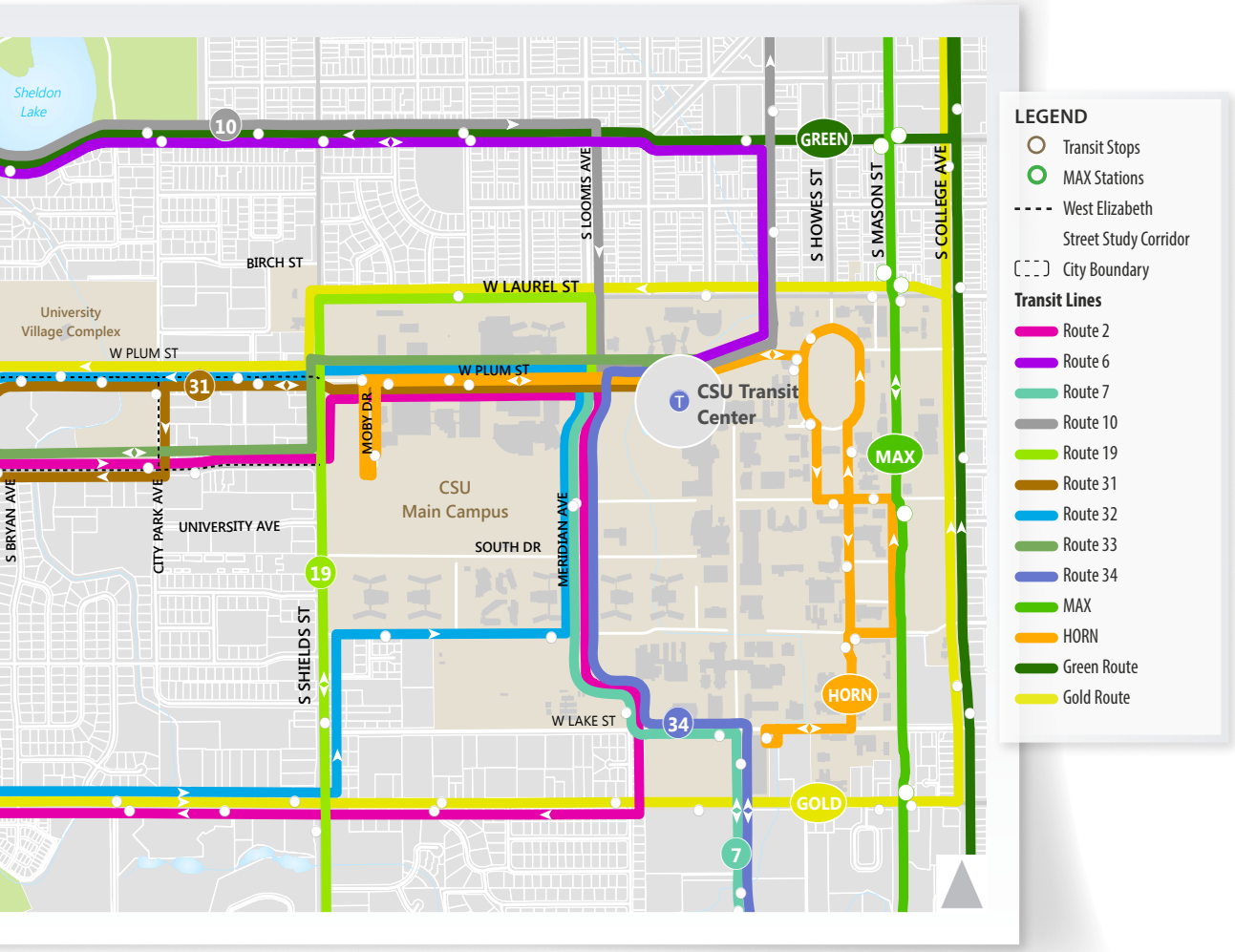
ROUTE CHARACTERISTICS

This section begins with an overview of the design decisions for the routes in the study area. Decisions on factors such as alignment, span, frequency, and infrastructure have significant impacts on a service's potential role and performance.

Route Descriptions

The nine Transfort routes in the study area each have a different role in providing regional, community, and neighborhood mobility.

Routes 2, 32, and 33 are the primary services on the West Elizabeth Street Corridor. Route 2 is a year-round service while Routes 32 and 33 provide additional overlay service when CSU is in session.



Route 31 is a high-frequency, walk extender that operates on Plum Street, a three-minute walk from West Elizabeth Street.

The HORN also operates on Plum Street from Moby Arena through the CSU Transit Center to provide campus circulation to East Drive, the Mason Corridor, and the Lake Street Parking Garage.[6]

Route 10 is an hourly, one-way loop that runs north of the CSU Transit Center to downtown Fort Collins.

Routes 6 and 19 offer a north-south connection between CSU and the South Transit Center via corridors such as Taft Hill Road and Shields Street.

MAX is the very frequent BRT spine that connects downtown Fort Collins and the South Transit Center along a linear corridor on the east end of the University's main campus. Transfort launched MAX and a redesigned service network in 2014 to fully leverage this new investment.

[6] During the next service change, the HORN will be extended further south to serve the CSU Veterinary School and will replace Route 34.

Frequency

Frequency is one of the most important attributes of a route because it influences both the attractiveness of a service[5] and the resources needed to operate it. At frequent service levels of every 15 minutes or better, service comes often enough that most riders will not have to consult a schedule to plan their trips; they simply show up at the bus stop. Frequent transit makes a sustainable mobility lifestyle viable in higher density communities.

Lifeline, or basic mobility, transit services operate at frequencies of every 60 minutes or less often. Such frequencies require that passengers plan their trips in advance and often increase overall wait times. Passengers of lower frequency services typically arrive at stops earlier in order to ensure that they make their trip. The limitations of basic mobility frequencies make it difficult for these services to perform productively or cost-effectively. These frequencies are usually reserved for lower-demand, coverage-based mobility markets.

Table 3 shows existing weekday frequencies for routes in the study area. These study area frequencies are heavily dependent on school demand. Overall service levels decrease when CSU or Poudre School District are not in session with Routes 31, 32, and 33 even ceasing operation during these periods. Transfort recognizes how much the university affects the demand for transit and Transfort's frequency decisions reflect these significant seasonal changes in market conditions.

TABLE 3: Transfort Route Frequencies

Route	Frequencies *(CSU in Session) (minutes)*		Change when CSU out of Session
	Peak *(AM/PM)*	Midday	
2	30	30	No change
6	60	60	No change
10	60	60	No change
19	30	60	60 minutes all day
31	10	10	Does not run
32	30	30	Does not run
33	30	30	Does not run
HORN	10	10	30 minutes all day
MAX	10	10	No change

[5] The top two attributes in attracting new customers are frequency and fast travel times in that order. Thus, fast, less frequent transit attracts fewer riders than a very frequent service with reasonable travel times. One that does both, like MAX, is highly attractive to consumers. Note that these attributes influence initial trial use of transit; delivering reliable, on-time service in sufficient capacity every day is the key to retaining customers.

Table 3 shows that routes in the corridor study area have a wide range of frequencies, from low basic needs frequencies (e.g., 60 minute frequency) to high "spontaneous use" frequencies (e.g., 10 minute frequency). This reinforces the notion that Transfort is willing to stratify its service product, which is an effective strategy. The highest frequency services are Route 31, HORN, and MAX. These services operate every 10 minutes during the day, attractive to transit lifestyle mobility needs. The lower frequencies services such as Routes 6 and 10 target lower density corridors and neighborhoods.

While Transfort has invested a high level of service in the immediate study area, this investment is spread across multiple routes and corridors. And in the case of West Elizabeth Street and Plum Street, the frequency investments are spread across two corridors less than ¼-mile apart. The Corridor Understanding Report will evaluate the impact this decision has on performance, efficiency, and the passenger experience.

Span

Service span describes the hours of operation for a transit service. A longer service span helps increase ridership by offering more trip opportunities and usually increases ridership at both ends of the trip, since expanded spans make round trips possible on transit. **Table 4** shows the service span for routes within the study area. Most of the services in the study area start just before 7 AM and end between 6 PM and 7:45 PM. This span effectively serves traditional work trips, school trips, and midday circulation. However, this limits other types of trips (e.g., service jobs, second shift, evening shopping) to just three routes in the study area that operate wider spans: Routes 2, 6, and MAX.

TABLE 4: Transfort Route Span

Route	Span *(CSU in Session)*	Change when *(CSU out of Session)*
2	6:22 AM - 10:00 PM	No change
6	6:06 AM - 10:18 PM	No change
10	6:45 AM - 7:08 PM	No change
19	6:52 AM - 7:43 PM	No change
31	6:58 AM - 6:20 PM	Does not run
32	6:50 AM - 6:40 PM	Does not run
33	6:52 AM - 5:49 PM	Does not run
HORN	6:42 AM - 6:38 PM	No change
MAX	5:10 AM - 12:16 AM	No change

Fares

The fare structure affects a system's ability to attract riders, generate revenue, and stay financially sustainable. **Table 5** shows Transfort fare groups. At the time of this report, revenue data was not available to fully evaluate financial performance at the route level. In addition to passenger fare revenue, Transfort receives funding from Colorado State University that allows CSU students, faculty, and staff to ride for free.[7] The free fares allow students, faculty, and staff to use transit as part of their lifestyle mobility (augmenting walking and biking).

TABLE 5: Transfort Fare Groups

Fare Group	Single Ride Fare	Annual Pass Price
Adult	$1.25	$154
Seniors	$0.60	$25
Disabled and Medicare	$0.60	$25
Youth	Free	Free
CSU Students, Faculty, and Staff	Free	Free
Transfers	Free	N/A
Late-Night Downtown Service	$1.00/$0.50	N/A

[7] *Technically, the students do not ride for free, but pre-pay for transit as part of their student fees.*

EVALUATION OF EXISTING SERVICES

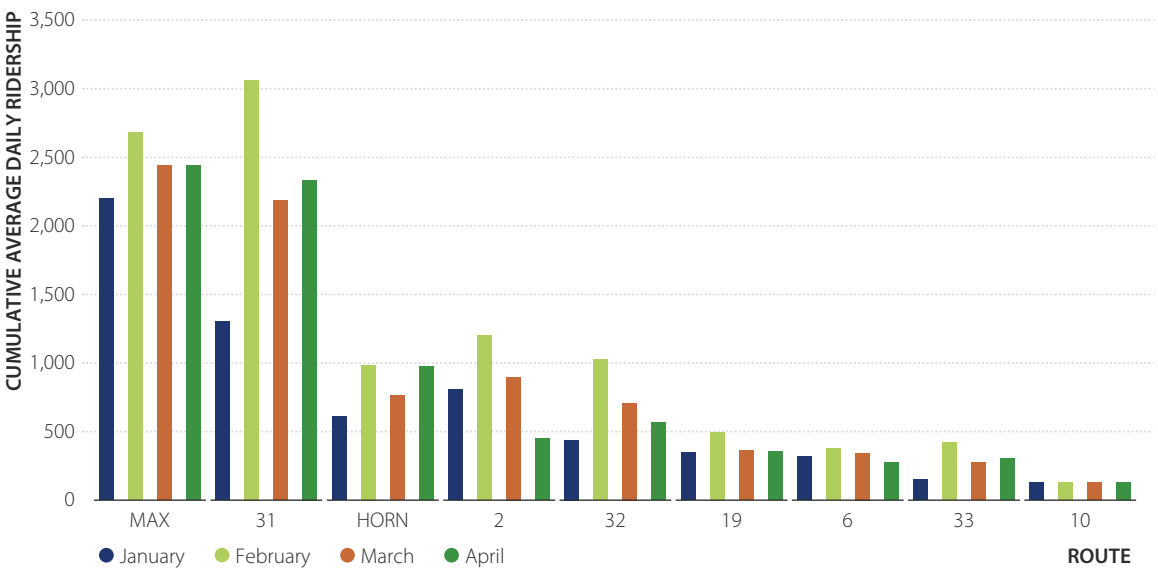
This section evaluates the performance of the system within the study area[8] across different metrics. The observed performance is the result of many factors, including service design decisions and local market conditions. The findings from this analysis provide insight into existing strengths and opportunities for improvement.

Ridership

System Ridership

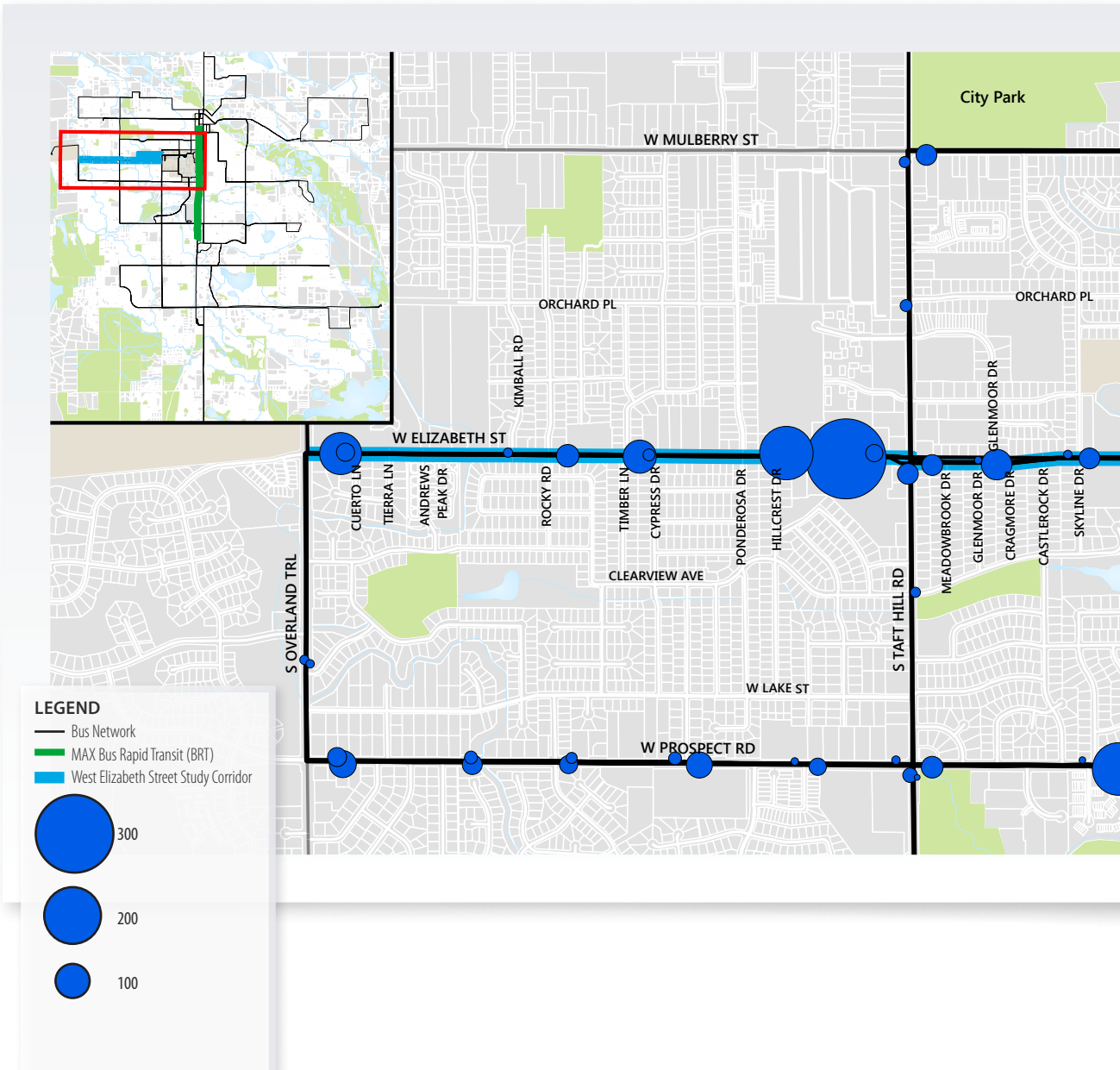
Figure 19 displays the average weekday ridership for all of the routes in the study area. The data shows the influence of Colorado State University on transit demand. The University's spring semester did not start until January 20, 2015. As a result, Routes 31, 32, and 33 did not operate until that date, and overall ridership volumes were down for the month. With the exception of a spring break from March 15-22, school was continuously in session until May 15, 2015. Additionally, ridership is higher during the beginning of the semester when the weather is colder and before students start dropping classes. The Corridor Understanding Report is based on data between January and April in order to get a more consistent understanding of peak, school-based demand. Between January and April, the Transfort routes serving the study area, not including MAX, averaged 8,700 passenger boardings per weekday. Approximately 4,500 of these total passenger boardings originated within the study area.

FIGURE 19: Average Weekday Ridership Chart (Transfort routes serving the study area)



[8] *Ridership data is from January 2015-April 2015.*

FIGURE 20: **Average Weekday Ridership Boarding Map**



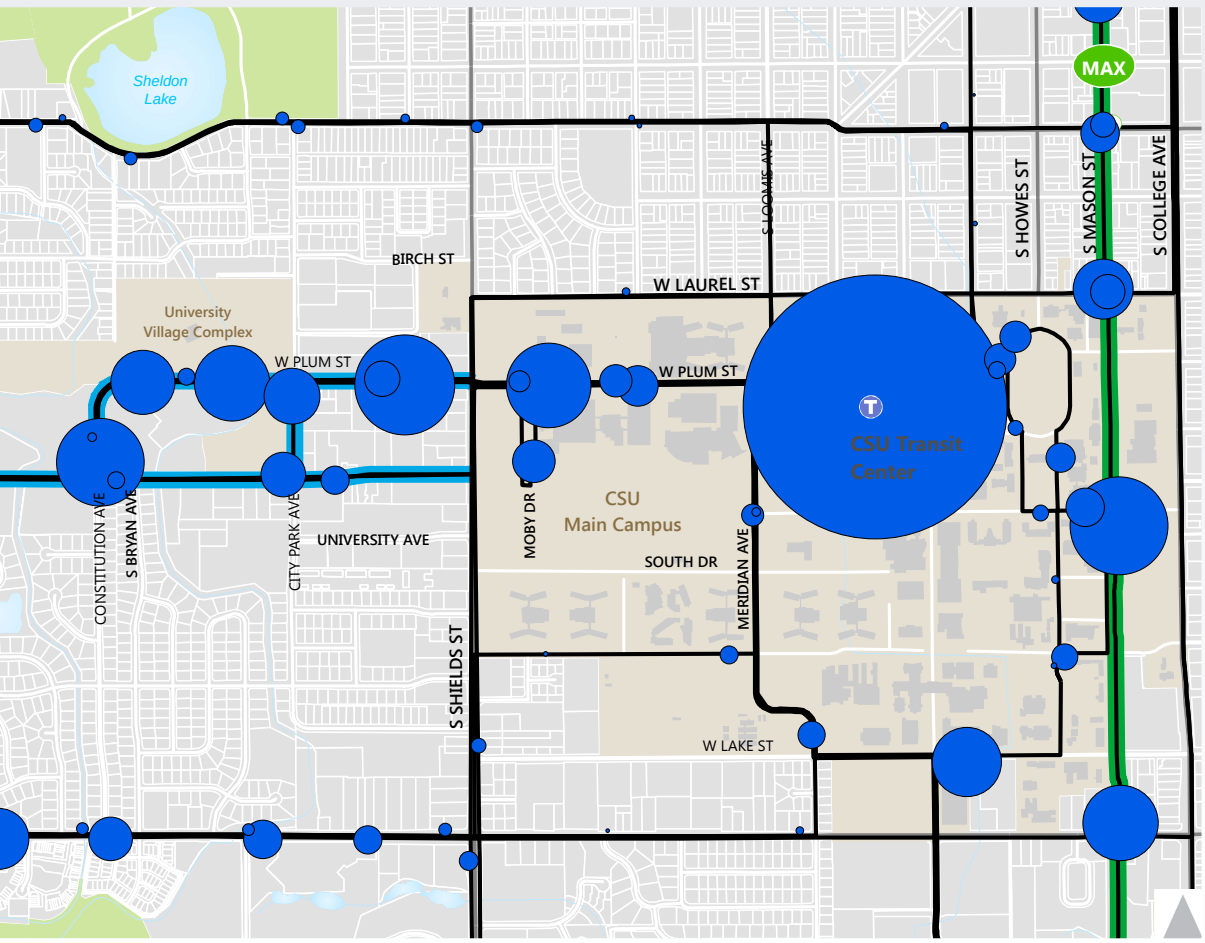

Sheldon Lake
BIRCH ST
University Village Complex
W PLUM ST
W PLUM ST
W LAUREL ST
S LOOMIS AVE
S HOWES ST
S MASON ST
S COLLEGE AVE
MAX
CSU Transit Center
CSU Main Campus
MOBY DR
SOUTH DR
MERIDIAN AVE
CONSTITUTION AVE
S BRYAN AVE
CITY PARK AVE
UNIVERSITY AVE
S SHIELDS ST
W LAKE ST

Figure 20 shows how the average weekday ridership is distributed at the stop level. The map shows how ridership is concentrated across key corridors and centers. The largest center is CSU, which is by far the dominant hub in the study area with over 20 percent of the boardings. West Elizabeth Street, Plum Street, and the MAX corridor are the corridors with the highest ridership. **Table 6,** which shows the top five stops in the study area, also reinforces the importance of key locations to the overall network ridership.

TABLE 6: Top Five Stops

Stop	Average Daily Boardings
CSU Transit Center	1,795
Plum Street at Bluebell Street	257
MAX University Station	247
West Elizabeth Street at King Soopers	220
Constitution Avenue at West Elizabeth Street	200

Ridership by Time of Day

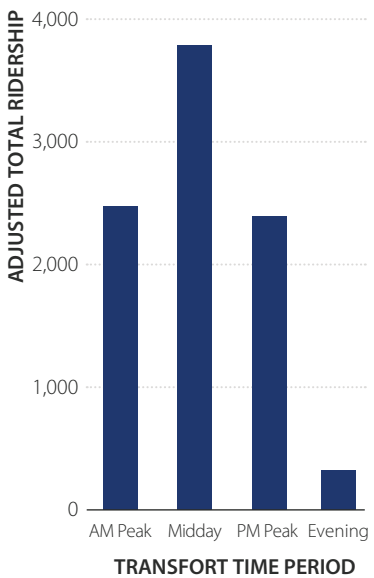
Evaluating ridership by time of day offers additional information on usage patterns that can help with resource investment and system optimization. Transfort uses the following definitions for its time periods:

AM Peak:	6:00 AM – 10:00 AM
Midday:	10:00 AM – 3:00 PM
PM Peak:	3:00 PM – 7:00 PM
PM (Evening):	7:00 PM – 11:00 PM
Late Night:	11:00 PM – 3:00 AM

The ridership distribution by time period does not deviate from expectations given that frequencies are fairly consistent throughout most of the day. In many systems that provide lifestyle mobility rather than just work and school commute travel, the midday ridership will equal the sum of AM and PM Peak time periods. Transfort follows this positive pattern once the wider peak periods are taken into account. The low ridership during the PM reflects the significant drop in evening service levels after the PM Peak Period in response to lower levels of general travel activity.

Figure 21 shows weekday ridership by time period for the corridor routes.[9]

FIGURE 21: Weekday Ridership by Time Period (West Elizabeth Study Area)



[9] *Note that none of the routes evaluated have late night service. Data is from January to April 2015.*

Ridership by Route

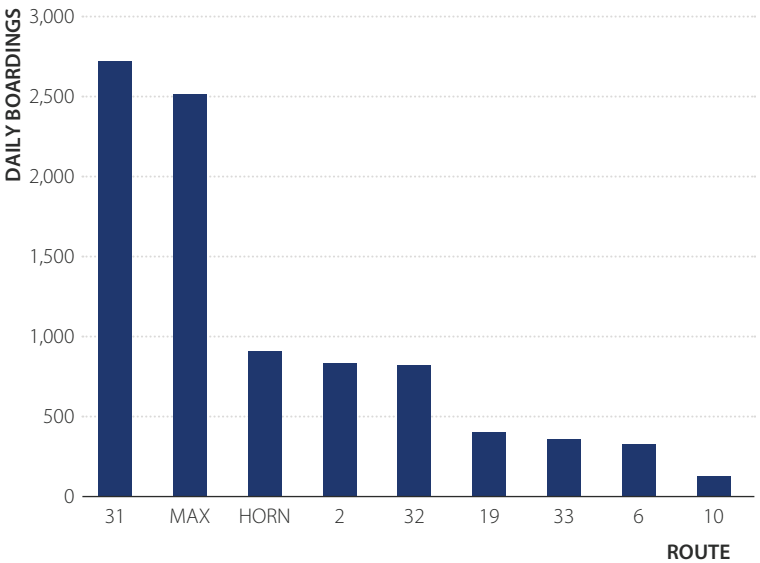
In addition to ridership being concentrated across key corridors and centers, ridership is also concentrated at the route level. **Figure 22** shows average weekday boardings by route.

Routes 31 and MAX account for nearly 60 percent of the average weekday boardings at all stops for routes in the study area. Passengers have responded positively to these frequent, linear routes. These services provide key connections to major destinations and hubs such as the CSU Transit Center, downtown Fort Collins, and the South Transit Center.

HORN is also a frequent service providing campus circulation every 10 minutes. This service is a new service that was implemented in August 2014. While it is the third most popular route, it carries less than the riders of Route 31, perhaps as a result of CSU being very walkable and making circulation by transit less necessary, especially when it is operating around the periphery of campus. Ridership will likely increase after the August 2015 service change when the HORN is extended south to serve the CSU Veterinary School and periphery campus parking lots. This change will result in the elimination of Route 34 and will improve operational efficiencies.

Routes 6 and 10 have the lowest ridership at all stops combined for routes in the study area. They serve lower density corridors, have less direct alignments, and operate at lower frequencies.

FIGURE 22: Average Weekday Boardings by Route



Ridership Composition

Within the study area 85% of all boardings were completed by riders with CSU fare media such as RamCards.[10] This illustrates the large impact that CSU has on the study area and the level to which ridership is associated with commute patterns of members of the university community.

CSU customers are especially concentrated on Routes 31, 32, 33, and 2 as these routes directly connect student housing communities to CSU facilities, as shown in **Figure 24.**

FIGURE 23: Method of Fare Payment

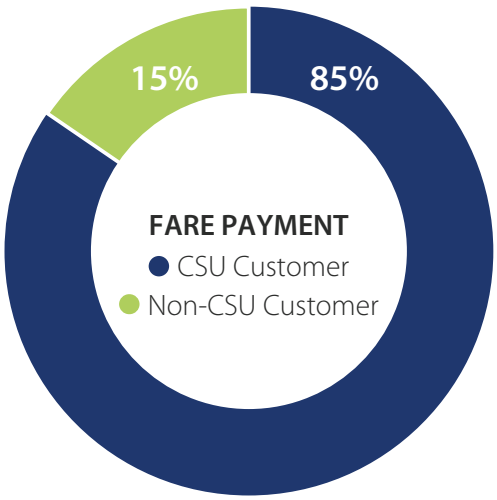
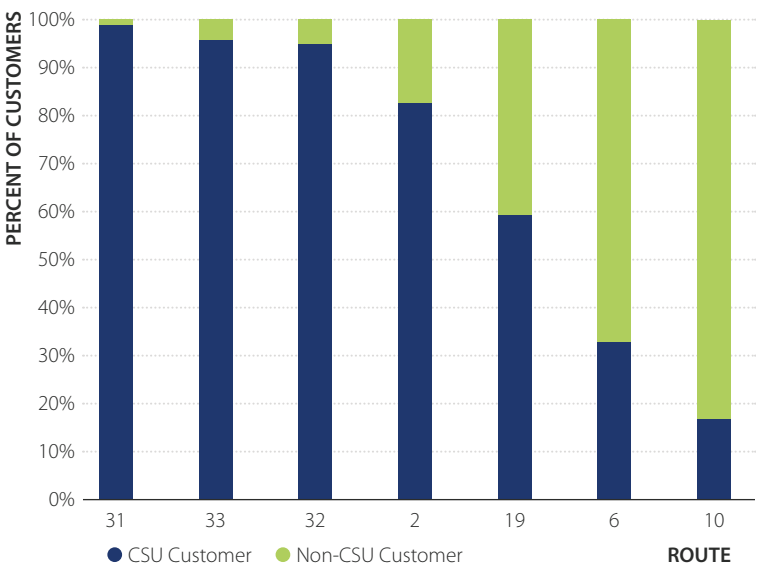


FIGURE 24: Method of Fare Payment by Route



[10] Based on farebox data from January 2015-March 2015. The majority of this time period CSU was in session. Ridership composition is likely different while CSU is out of session. Farebox data available for Routes 2, 6, 10, 19, 31, 32, and 33.

Passengers per Revenue Hour (Productivity or Service Effectiveness)

Productivity by Time Period

The routes in the study area had an average productivity of 37 passengers per revenue hour. This is a high level of productivity that satisfies Transfort's standards for most service types. When broken down by time period, midday service is the most productive period. This is a strong indication that transit is providing lifestyle mobility in the West Elizabeth Street study area, not surprising for a university community. **Figure 25** shows weekday passengers per revenue hour by time period.

FIGURE 25: Weekday Passengers per Revenue Hour by Time Period

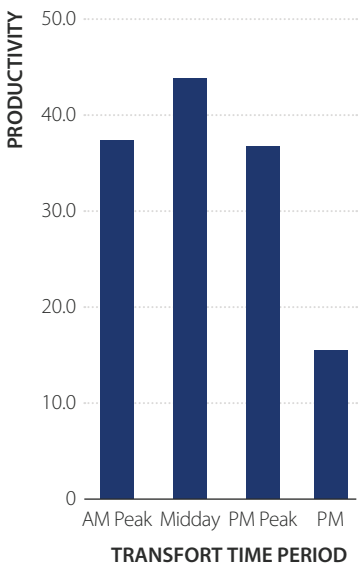


TABLE 7: Transfort Productivity by Route Performance Standards

Classification	Rapid Route *(boardings/ revenue hour)*	University Route *(boardings/ revenue hour)*	Residential Route *(boardings/ revenue hour)*
Exceeds	>50	>60	>40
Satisfactory	41 - 50	30 - 60	20 - 40
Marginal	20 - 40	20 - 30	15 - 20
Unsatisfactory	<20	<20	<15

Productivity by Route

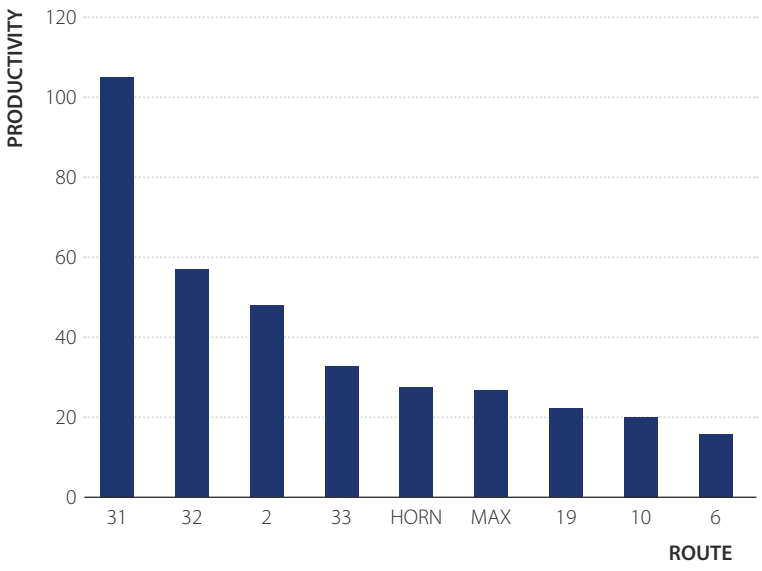
Evaluating productivity by route provides an opportunity to identify potential mismatches between market demand and transit supply. Transfort has established performance standards for routes based on service type; these performance standards are shown in **Table 7.** The agency recognizes that different routes should have different expectations based on their role. University-based services have higher thresholds given their larger potential market. **Figure 26** shows weekday passengers per revenue hour by route.

Routes 31, 32, and 33 are able to generate more than the minimum 30 passengers per revenue hour for university routes. In fact, Route 31 greatly exceeds the top university route standard by over 2½ times, generating more than 100 passengers per revenue hour. Transfort has developed a well-designed, highly effective route that presents some lessons learned for the rest of the study area: frequent, direct alignment that is easy to understand and use generates ridership. The four most productive routes in the study area all operate in the West Elizabeth Street Corridor (Routes 2, 31, 32, and 33) with direct alignments.

Both MAX and the HORN are frequent, but generate marginal productivity. The HORN provides peripheral transit circulation around a very walkable campus – especially one that has a coffee shop between the main Transit Center and classes. The HORN is fairly circuitous[11] and takes three buses to operate. MAX is similar to the HORN in that it operates frequently, also with a marginal productivity. As the key spine route, MAX is not fully leveraging the network due to a lack of direct connections with other high productivity[12] routes, most notably in the West Elizabeth Street Corridor.

The other three routes in the study area (Routes 19, 10, and 6) have the lowest productivity rates. Productivity can be improved by generating additional ridership or reducing resource requirements. The transit recommendations to be developed in this ETC Plan for the West Elizabeth Corridor will explore opportunities for these services via streamlined alignments and scheduling design efficiencies.

FIGURE 26: Weekday Passengers per Revenue Hour by Route



[11] The HORN has the frequency to capture spontaneous use riders, but not the alignment (peripheral) or fast travel (it is circuitous) necessary to achieve productivity goals.

[12] Productivity metrics based on boardings per revenue hour can be misleading for Rapid/BRT service given their longer average passenger trip lengths. A better comparison is Passenger Miles per Revenue Hour or Mile as it levels the productivity "playing field" between high turnover routes (e.g., Route 31) and lower turnover routes (e.g., MAX).

Passengers per Revenue Mile

Transfort also monitors passengers per revenue mile, another way of normalizing ridership over a unit of service. This metric tracks with productivity per hour except where there are differences in operating speed (i.e., operate fewer miles per hour). **Table 8** shows Transfort's standards for passengers per revenue mile.

TABLE 8: Transfort Passenger per Revenue Mile Standards

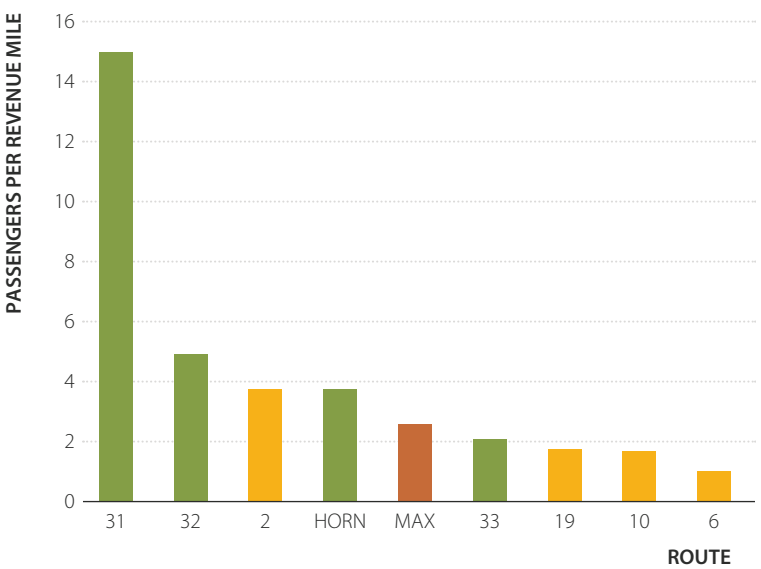
Classification	Rapid Route	University Route	Residential Route	Commercial Route
Exceeds	>8	>5	>2	>3.5
Satisfactory	6 - 8	3 - 5	1.5 - 2	2.5-3.5
Marginal	4 - 5	1.5 - 3	1 - 1.5	1.5-2.5
Unsatisfactory	<4	<1.5	<.5	<1.5

Once again, Route 31 is the top performer. Its high ridership volumes and short alignment allow it to perform well in this metric, reinforcing Route 31's role as a walk extender. Routes 2 and 32 are the other services on the study corridor that meet Transfort's passengers per revenue mile standards. However, Route 33 is in the 'marginal' category. It is one of the longer routes on the corridor, but passenger activity begins to drop at Ram's Pointe and King Soopers.

MAX does not generate high passengers per revenue mile. It has a longer alignment that serves a significant portion of Fort Collins. Rapid services are designed to accommodate longer trips and this type of service should be expected to have lower passengers per revenue mile.

Figure 27 shows weekday passengers by revenue mile.

FIGURE 27: Weekday Passengers per Revenue Mile by Route



Scheduling Efficiencies

Analyzing schedule recovery time and in-service time provides insight into opportunities for potential improvements to scheduling efficiencies. High recovery percentages increase unproductive resource requirements because more vehicles will be needed to provide a certain level of service. Service recovery efficiency is optimized during both route design and service scheduling based on cycle time divided by frequency. The less frequent the service, the greater the efficiency challenge at the scheduling phase.[13] However, even infrequent transit service can be designed to be efficient if the route alignment, running times, and frequencies are synchronized.

Typical industry efficiency targets for recovery time of 10-15 percent are sufficient to ensure next trip on-time departures while providing operator layover. Scheduled recovery for Transfort in the study area averages 27 percent, twice the target. When taking into account actual running time compared to scheduled running time, all routes in the study area complete trips in less time on average than what is scheduled.

TABLE 9: Weekday Recovery Efficiency

Route	Scheduled Revenue Hours	Scheduled Recovery	Scheduled Recovery %
2	17.5	3.5	25.1%
6	20.8	2.7	14.7%
10	6.4	1.4	28.1%
19	18.1	4.8	36.5%
31	25.9	6.9	36.5%
32	14.5	3.6	33.2%
33	10.9	1.4	14.3%
HORN	33.0	12.0	57.0%
MAX	94.4	15.2	19.3%
Total	**241**	**52**	27.1%

Route	Running Time		Difference
	Scheduled	Actual	
2	13.8	12.5	1.2
6	17.6	16.6	1.0
10	4.9	4.2	0.7
19	12.9	11.2	1.6
31	18.8	13.8	5.1
32	10.7	10.1	0.6
33	9.3	9.3	0.1
HORN	21.0	16.3	4.7
MAX	78.3	63.0	15.3
Total	**187.3**	**157.0**	**30.4**

[13] Any running time number (in-service time) divided by a large frequency number (e.g., 60 minutes) is more likely to leave a larger remainder (the recovery time). Frequent services (i.e., 15 minutes or less) can be scheduled efficiently regardless of route design (smaller denominator, less residual). While the normal "efficient" transit target is 10-15 percent recovery to ensure that the next trip leaves on-time, it is often impossible to achieve at the scheduling phase if an infrequent route has not been designed from the start to use resources efficiently.

The highest layover ratios occur on routes with some of the shortest alignments: 31, 32, and HORN. Synchronizing route alignments, in-service running time, and frequencies should be a key objective of the West Elizabeth Enhanced Travel Corridor Plan. Where efficient individual route cycles are not feasible, the interlining of individual routes where they share recovery time should be considered. When taking into account actual running time versus scheduled running time, each route within the study area takes less time to complete trips. When analyzing trends at a segment level, many routes are running just a few minutes behind or a few minutes ahead with the notable exception of the last segment in a trip pattern. For most routes, excessive scheduled running time is allocated between the second to last and last time point of a trip.

Segment Running Time Analysis

On-Time Performance

Transfort service standards define on-time trips as those trips that serve a time-point stop within 0 to 5 minutes of the published public schedule. Using this standard, 85% of trips in the West Elizabeth Corridor study area are on-time, 14% are late, and 1% of trips are early. Within the study area, on-time performance ranges from a high of 98% for the HORN and Route 31 to a low of 72% for Route 2. Route 31 and the HORN are relatively short routes with fewer time-points which helps keep them on-time. Route 2 on the other hand travels longer distances on major streets without signal priority which makes it more difficult to stay on schedule. Regardless of the route characteristic, reliability is a critical component in attracting new riders and more importantly, keeping transit existing riders. The below chart outlines the on-time performance of the nine routes in the West Elizabeth Corridor study area.

FIGURE 28: On-Time Performance

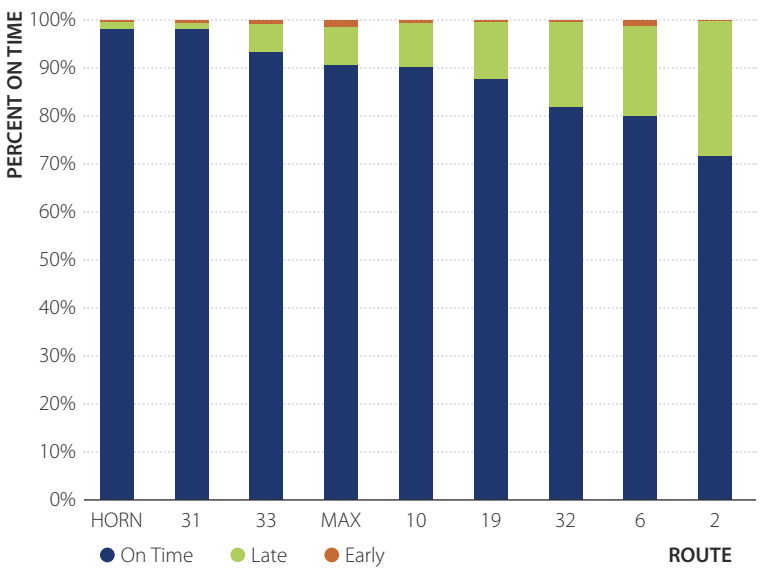


FIGURE 29: Passenger Leave Behinds by Time Period

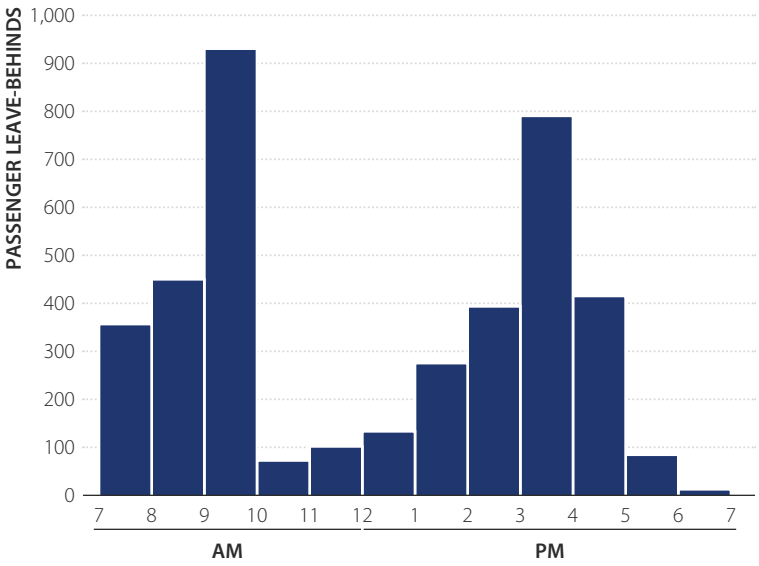
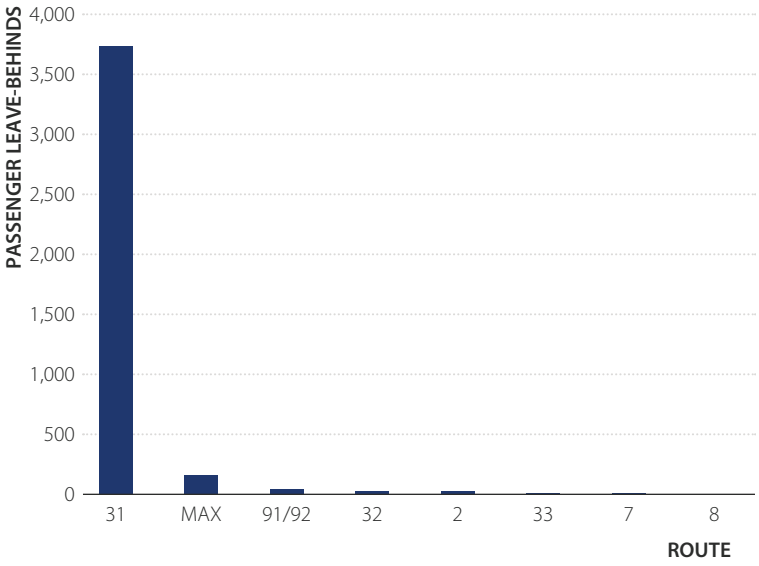


FIGURE 30: Passenger Leave Behinds by Route



Passenger Leave Behinds

Transfort currently deals with significant passenger leave behind issues. Particularly on Route 31 and during the AM Peak and PM Peak many students are not able to fit on board the bus. The problem is concentrated[14] along Plum Street just west of the CSU Main Campus in the mornings and at the Colorado Transit Center (CTC) during the afternoon. In an attempt order to address this issue, Transfort has supplemented Route 31 with additional trailer buses that are not part of the schedule during the most impacted time periods. As the West Campus area continues to develop and more student oriented housing is built in this area, the potential for overcrowding and passenger leave behinds will increase without additional vehicle capacity and frequencies.

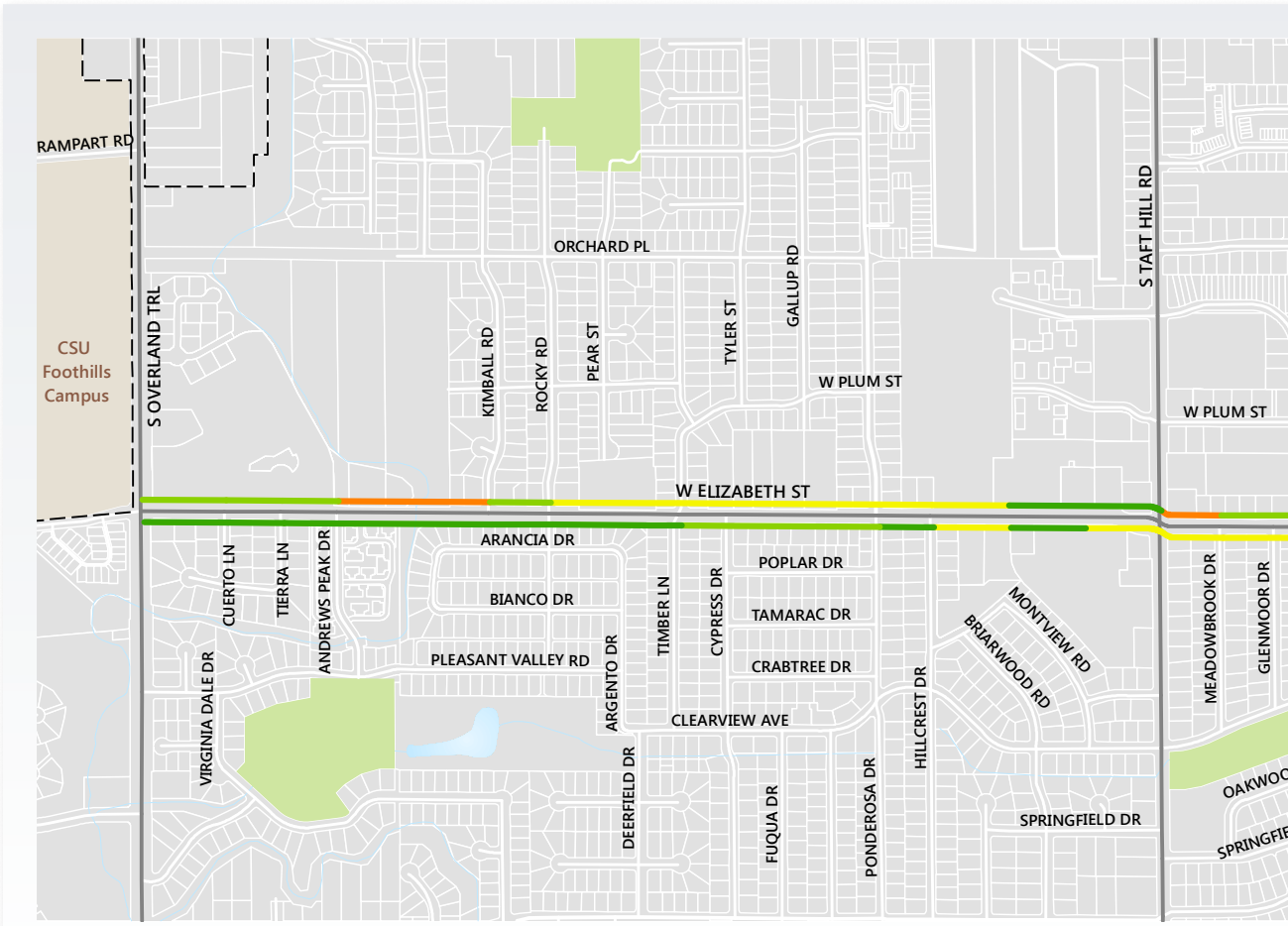
[14] Passenger leave behind data covers January to April 2015.

TRANSIT LEVEL OF SERVICE

A transit level of service assessment was performed which accounts for key transit route quality factors, as well as built environment attributes that affect a passenger's experience. Specifically the methodology accounts for reliability (whether there is dedicated transit right-of-way, whether mixed-flow level of service is acceptable, or whether mixed-flow level of service is unacceptable), first-mile and last-mile pedestrian and bicyclist infrastructure, bus operational amenities (bus bulb-outs or transit signal priority), and bus stop amenities.

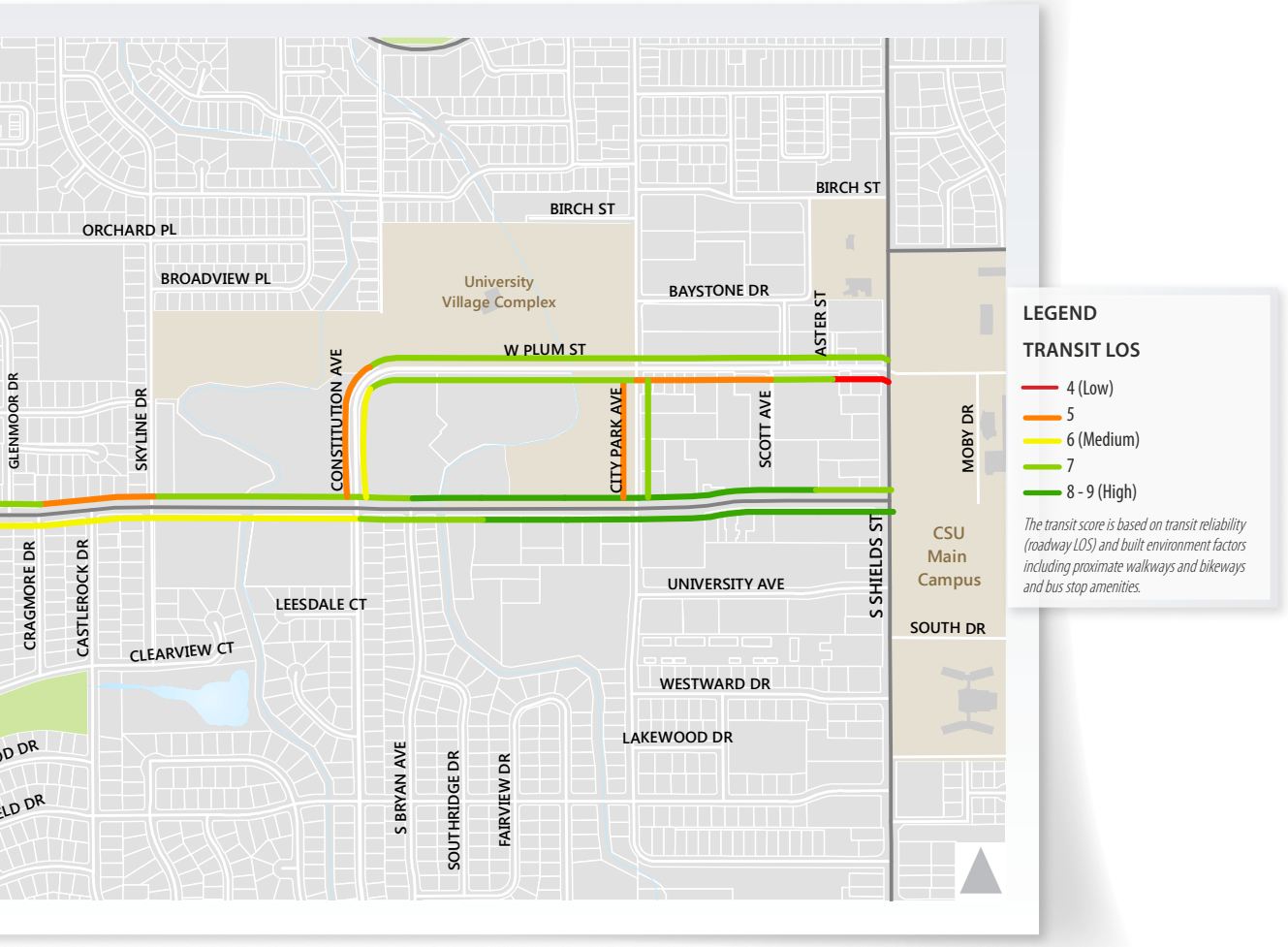
Figure 31 shows transit level of service in the study area according to this methodology. Because buses operate in mixed-flow lanes, and there are no bus bulb-outs or transit signal priority,

FIGURE 31: Transit Level of Service



the results of this analysis are heavily influenced by first-mile and last-mile pedestrian and bicyclist infrastructure and bus stop amenities. Study segments with a poor pedestrian level of service, as discussed later in this report, frequently have lower transit level of service as well.

The bus stops in the study area have very few patron amenities and are often not accessible using the pedestrian and bicycle networks. Providing pedestrian and bicycle access to transit stops is an important component of making riding transit safer, more accessible and comfortable. The study area does not provide complete and ADA accessible sidewalks, and bus stop loading and unloading areas and stops are not always located near signalized and enhanced midblock marked crossings. Bike lanes are also inconsistent with a lack of end of trip bike facilities such as bike parking.



KEY FINDINGS AND ISSUES

Transit service performance is highly influenced by matching market opportunities with a good network and route design. The following section lists key findings and issues that should be considered when moving forward with the corridor vision and alternatives development.

Opportunity to Simplify Study Corridor

The West Elizabeth Street Corridor is a productive segment of the Transfort network. However, study area transit is quite complex and confusing for customers to easily use as a network. For example, on the West Elizabeth Street there are four routes that serve this corridor, each with a different frequency, alignment, and schedule. Although these routes provide a combined total of 14 one-way trips between 8 to 9 AM, service effectiveness is diminished because customers must learn how each of these routes operate. This layer of complexity creates a barrier to transit route and network use that needs to be reevaluated in the development of the proposed mobility plan.

Infrastructure

Improvements need to be made to infrastructure within the corridor in order to optimize route performance and service delivery. These improvements include but are not limited to: intersection redesign, signal prioritization, bus stop infrastructure, accessibility of transit, and direct connectivity through the CSU Main Campus to MAX service.

Corridor Roles

West Elizabeth Street and Plum Street are in close proximity to one another. These streets are separated by a ¼ mile, 3-minute walk, yet both of these corridors are served by multiple routes. Industry best practices suggest that this type of complex corridor duplication should be consolidated to maximize efficient and effective delivery of frequent transit. While the operating environment surrounding West Elizabeth Street and CSU is unique, the idea of corridor roles and priorities should still be discussed.

Continue to Match Frequency and Span with Demand

Transfort has generally done a good job of recognizing varying market needs within the study area, operating routes at different frequencies depending on projected market demand. The exception to this practice has been inadequate level of service to meet the demand along Route 31 which is reflected in the large number of passenger leave behinds during peak periods while CSU is in session. The alternatives should assess other opportunities to increase frequencies in areas with higher demand, as well as scale back service levels in areas with lower demand. Transfort services typically end in the early evening. The alternatives should also consider expanding spans where it makes sense. This should be implemented on a route-by-route and trip-by-trip basis.

Leverage MAX Service
MAX is a key spine in the Fort Collins transit network. However, the only close connection between MAX and the CSU Transit Center is via the HORN (and only in the northbound HORN direction). Creating a better connection between the study corridor and MAX will improve the passenger experience and can potentially move this part of the network towards a grid. This connection could be via a separate route or a MAX branch alignment on the West Elizabeth Corridor.

Scheduling Efficiency
Transfort has a significant amount of schedule recovery that reduces service and operating efficiency. The development of alternatives should prioritize efficient route and network design such that efficient schedule cycles result.

KEY FINDINGS SUMMARY

The study area route network is complex and confusing to customers with four different routes serving the same general area with different alignments, configurations, and frequencies.

Infrastructure improvements ranging from bus stop amenities to intersection designs are required to enhance service delivery.

Significant numbers of passengers are left behind on Route 31 and to a lesser extent on MAX during peak AM and PM periods. Additional buses are scheduled at critical times but often fail to meet the demand for service.

For all Transfort routes that serve the study area, average weekday ridership was approximately 10,000 in February 2015 and 8,000 in March and April 2015.

Top ridership stops in the study area include the CSU Transit Center, stops along Plum Street and Constitution Avenue between Shields Street and West Elizabeth Street, and stops on West Elizabeth Street just west of Taft Hill Road.

Of routes in the study area, the routes with the highest frequencies and most direct routing have the highest ridership. Route 31 and MAX have the highest average weekday boardings.

PEDESTRIANS

This section analyzes the performance and comfort of the West Elizabeth Street study area for pedestrians. The findings from this analysis provide a framework for shaping recommendations for the corridor. This section identifies locations where it may be appropriate to improve pedestrian infrastructure. Key items include the locations of existing pedestrian infrastructure, pedestrian counts in the study area, peak hour pedestrian delay at study intersections, and pedestrian level of service on the corridor.

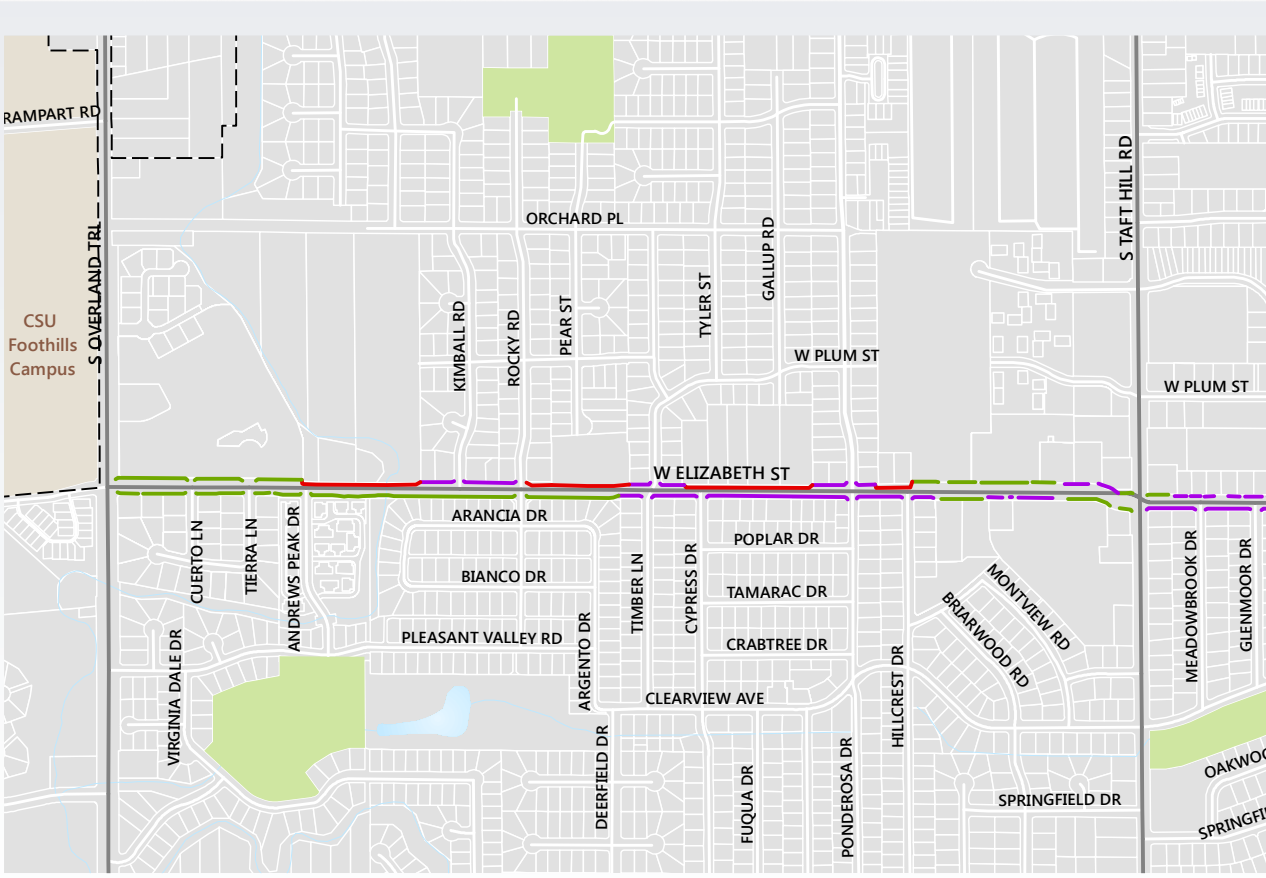
The presence of sidewalks and buffers (for detached sidewalk) along West Elizabeth Street varies, as shown in **Figure 32.** The sidewalk network is incomplete, with many sections that are missing or narrow and not ADA accessible. The sidewalk east of Taft Hill Road is a mix of attached and detached sidewalk, except for the short segment of sidewalk immediately west of Shields Street on the north side. This segment of sidewalk jogs through a parking lot, creating a high conflict area with turning vehicles. West of Taft Hill Road, there are large sections of missing sidewalk on the north side of West Elizabeth Street. Segments in the west part of the corridor with existing sidewalk are a mix of both attached and detached walk. Plum Street and City Park Avenue have almost all attached sidewalks, while Constitution Avenue has all detached sidewalks.

The sidewalks in the study area range in their condition. The sidewalks in front of newly developed properties, such as on Plum Street, are wide and in good condition. Many sidewalk segments in the study area, primarily in the western section of West Elizabeth Street, are in poor condition due to either width or pavement condition. Sidewalks are generally well maintained and with minimal obstructions. The majority of segments with sidewalks present have curb ramps. However, many sections of the study area, primarily west of Taft Hill Road, have segments of sidewalk below the ADA standard width of four feet, with some sections as narrow as three feet. In particular, some of the sections of narrow sidewalk over bridges and on ditches are in poor condition.

There are currently two midblock crossings in the study area in addition to crossings at signalized intersections—on West Elizabeth Street west of Shields Street and on West Elizabeth Street west of Skyline Drive. A third midblock crossing on West Elizabeth Street west of Taft Hill Road, west of the King Soopers driveway, is pending and will be implemented in Fall 2015.

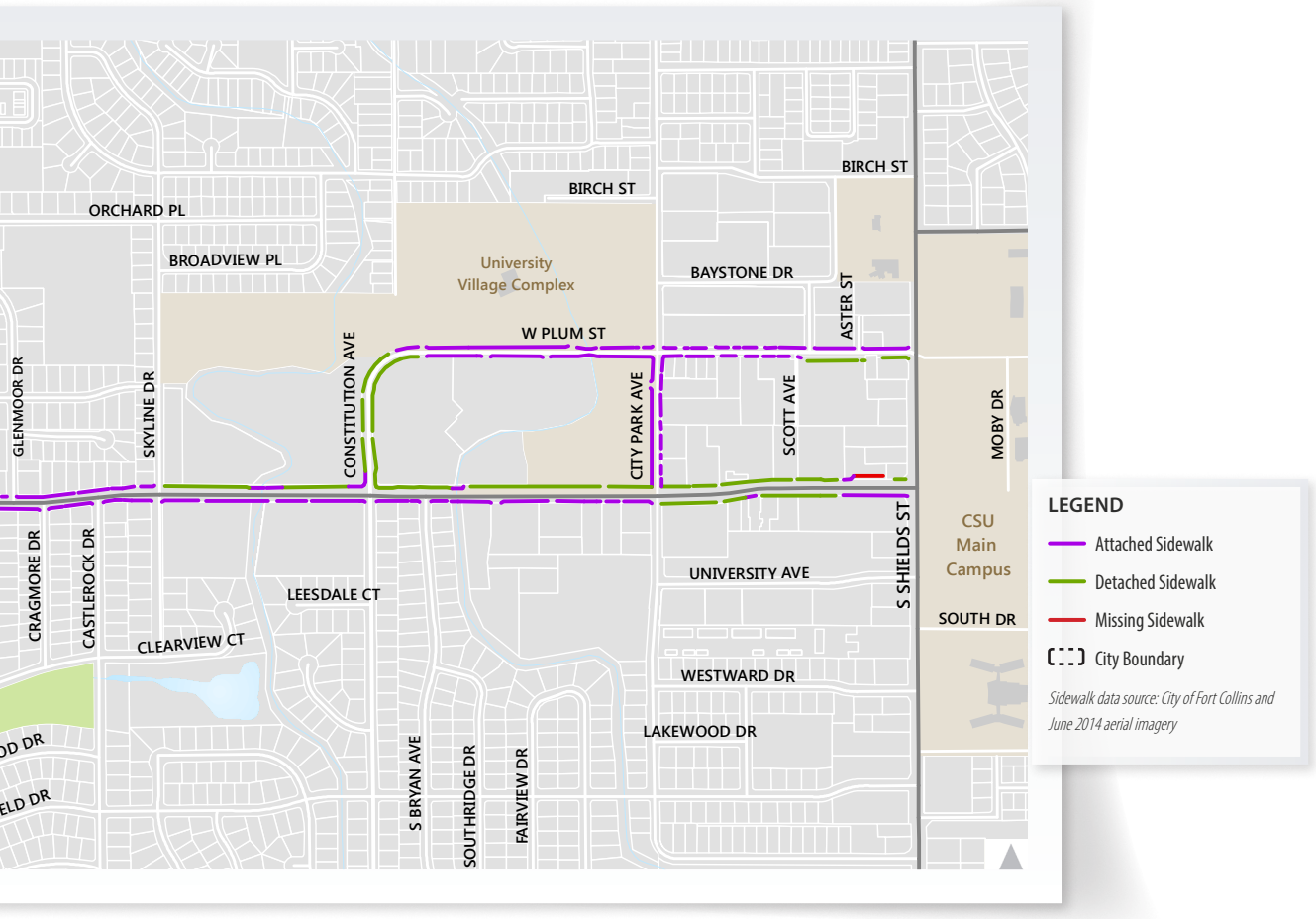
Pedestrian volumes at intersections and midblock in the AM and PM peak hours are shown in **Figure 33.** Counts were provided by the City of Fort Collins Traffic Operations. Pedestrian volumes are highest at the West Elizabeth Street/Shields Street intersection and the Plum Street/Shields Street intersection for pedestrians traveling east-west. High pedestrian volumes have also been observed just

FIGURE 32: Existing Sidewalk Network



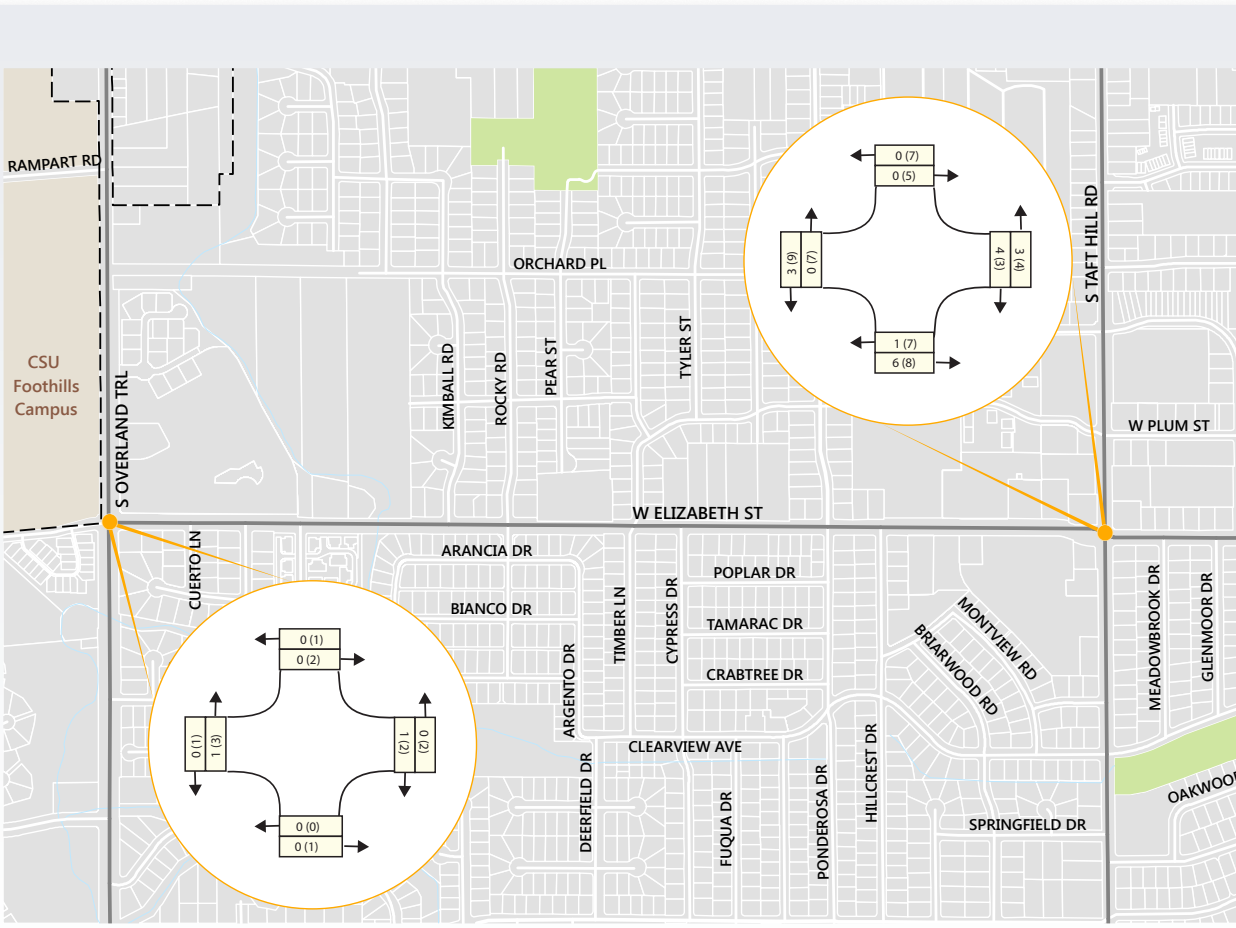
Note: Gaps in sidewalk infrastructure indicate street or driveway access and is not indicative of missing sidewalk infrastructure. Gaps indicating access points may not be comprehensive.

west of Taft Hill Road, in front of the King Soopers driveway, at the location of the pending third midblock crossing in the study area. Pedestrian volumes are low at the West Elizabeth Street/Constitution Avenue intersection and the West Elizabeth Street/Overland Trail intersection. The city analyzed midblock pedestrian volumes on West Elizabeth between City Park Avenue and Constitution Avenue as well as in front of King Soopers. This analysis revealed a sufficient demand for a midblock crossing in front of King Soopers but not between City Park Avenue and Constitution Avenue based on volumes at the time.



The pedestrian level of service was calculated for the study segments and is shown in **Figure 34.** This value represents the level of comfort of the pedestrian experience. This calculation considers the width of the sidewalk, width of the buffer, distance between crossings, and appropriate midblock crossing treatment if one were to be installed. The required crossing treatment is an indicator of the level of comfort associated with crossing the street. The pedestrian LOS is highest (most comfortable) on West Elizabeth Street in the Campus West area (west of Shields Street) and just east of Overland Trail, and on

FIGURE 33: Existing Pedestrian Volumes



Constitution Avenue and Plum Street between City Park Avenue and Shields Street. Pedestrian LOS is the lowest (least comfortable) on the north side of West Elizabeth Street between Hillcrest Drive and Andrews Peak Drive due to the missing sidewalk.

Average pedestrian delay at each signalized intersection was also calculated using Vissim. **Table 10** shows the average pedestrian delay and level of service at each signalized study intersection.

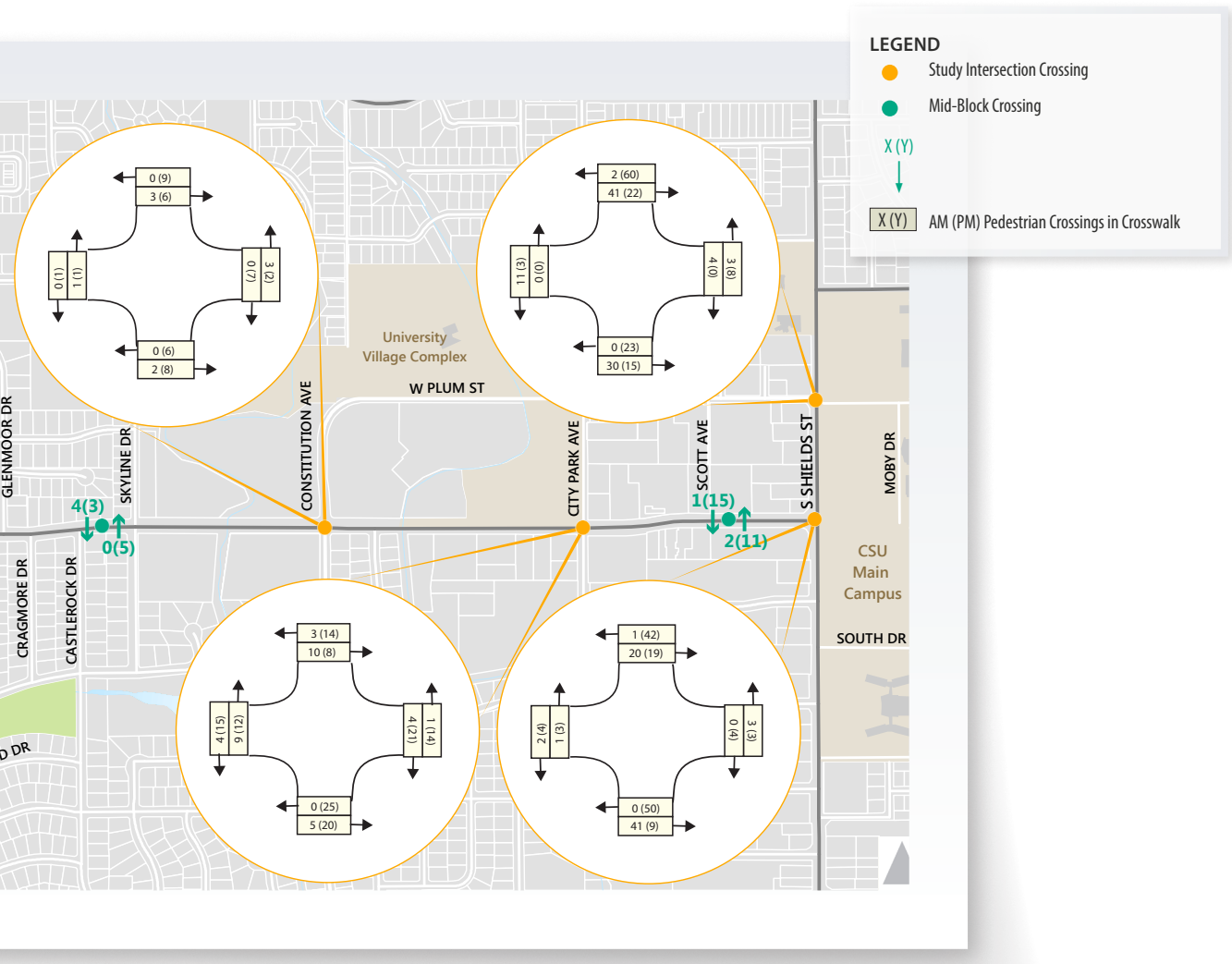


FIGURE 34: Pedestrian Level of Service

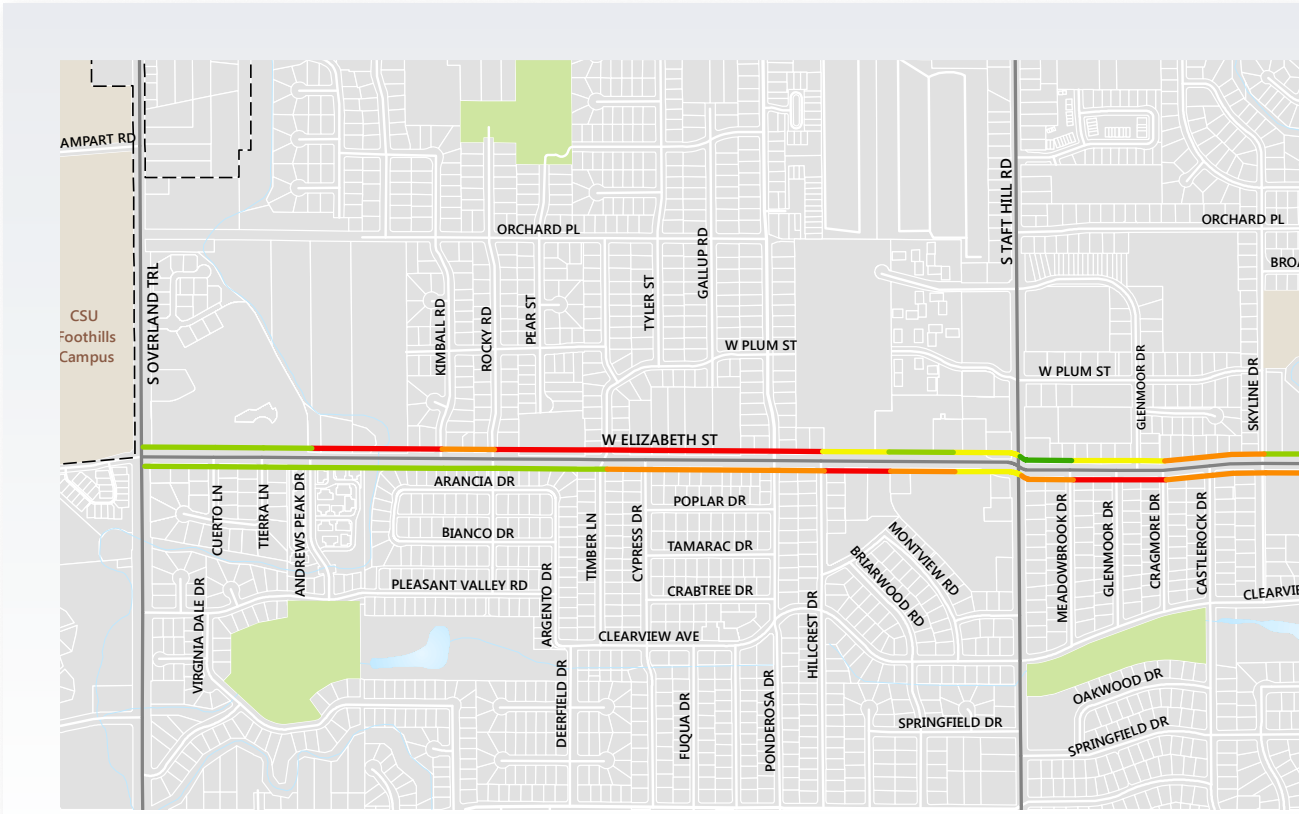


TABLE 10: Existing Pedestrian Delay and Level of Service

Intersection	Control	Existing Conditions			
		AM		PM	
		Delay *(seconds)*	LOS	Delay *(seconds)*	LOS
West Elizabeth Street/ Overland Trail	Side-Street Stop	N/A – side-street stop intersection			
West Elizabeth Street/Taft Hill Road	Signal	34	D	45	E
West Elizabeth Street/Constitution Avenue	Signal	16	B	21	C
West Elizabeth Street/City Park Avenue	Signal	20	B	29	C
West Elizabeth Street/Shields Street	Signal	53	E	57	E

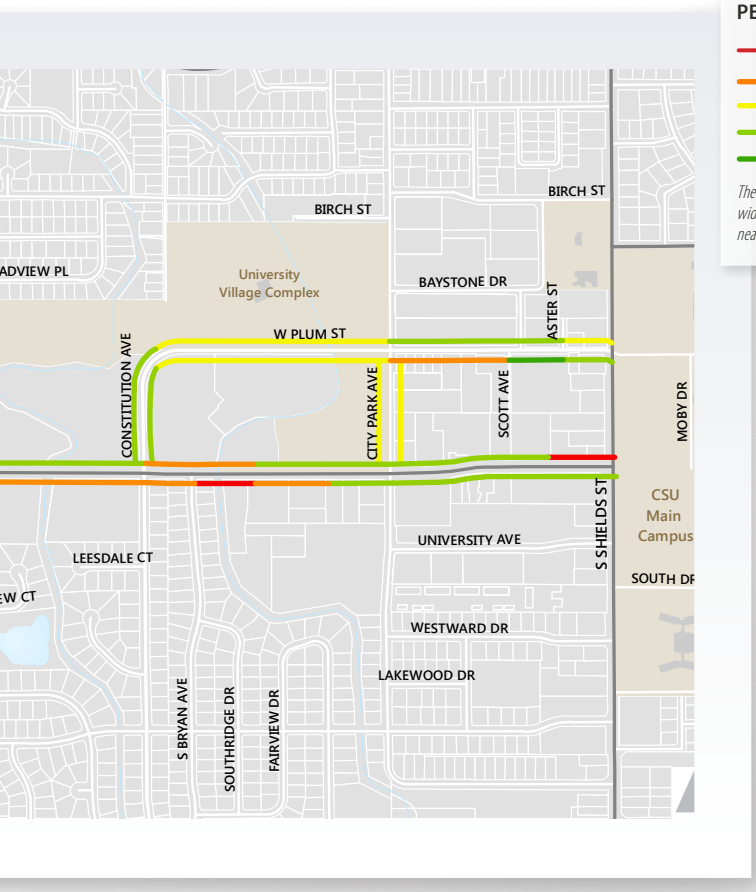


Table 10 shows that average pedestrian delay is relatively high at most study intersections during both the AM and PM peak hour, with the exception of the West Elizabeth Street/ Constitution Avenue and West Elizabeth Street/City Park Avenue intersections. When a pedestrian is forced to wait 30 seconds or longer, research has indicated that he/she becomes impatient and partakes in risk-taking behavior.

TABLE 10: Existing Pedestrian Delay and Level of Service

Intersection	Control	Existing Conditions			
		AM		PM	
		Delay *(seconds)*	LOS	Delay *(seconds)*	LOS
Shields Street/Plum Street	Signal	52	E	58	E
Shields Street/Laurel Street	Signal	46	E	61	F
Shields Street/Lake Street	Signal	49	E	53	E
Shields Street/Prospect Road	Signal	52	E	69	F

Note: The City of Fort Collins does not have a minimum acceptable delay-based pedestrian LOS.

KEY FINDINGS

Some sidewalks are attached, some are detached, and there are many locations where no sidewalk exists or sidewalk width is too narrow for people using mobility devices.

Significant lengths of West Elizabeth Street have a low pedestrian level of service, a measurement of the quality of the pedestrian environment that accounts for sidewalk presence and width as well as other amenities.

In addition to marked crossings at signalized intersections, there are two existing midblock crossings on the corridor, one west of Shields Street and another west of Skyline Drive, and one planned marked crossing, just west of King Soopers driveway.

Over 100 pedestrian crossings (all directions) occur during peak hours at four signalized intersections within the study area.

Pedestrian delay at some signalized intersections is relatively high (greater than 40 seconds) at most study intersections during peak hours.

BICYCLISTS

This section analyzes the performance and comfort of the West Elizabeth Street study area for bicyclists. The findings from this analysis provide a framework for shaping recommendations on the corridor. This section identifies locations where it may be appropriate to improve bicyclist infrastructure. Key themes include the locations of existing and proposed bicyclist infrastructure, peak hour bicyclist delay at study intersections, and bicyclist Level of Traffic Stress (LTS) on the corridor.

Figure 35 shows the number of bicyclists at intersections along West Elizabeth Street during AM and PM peak hours. The largest number of bicyclists is at the Plum Street/Shields Street intersection, traveling eastbound or westbound. The West Elizabeth Street/Shields Street intersection has only slightly fewer bicyclists traveling eastbound or westbound. Daily bicyclist volumes on West Elizabeth Street generally increase from west to east: west of Taft Hill Road and west of Skyline Drive there are approximately 700 to 800 bicyclists per day, and west of Shields Street there are approximately 2,040 bicyclists per day. At all intersections, the large majority of bicyclists cross the intersection in the roadway, with only a small number using the marked crosswalks. Counts were provided by the City of Fort Collins Traffic Operations.

It is important to consider existing bicycle facilities in the study area as well as facilities in the surrounding street network. West Elizabeth Street, Plum Street, Shields Street, and City Park Avenue and Constitution Avenue between Plum Street and West Elizabeth Street have existing bike lanes. A number of streets in the surrounding area have bike lanes, sharrows, or are designated bike routes. Existing bicycle facilities in the area can be seen in **Figure 36.**

Figure 37 shows facilities recommended in the 2014 Bicycle Master Plan (BMP) as part of a comprehensive, low-stress network to be implemented over the next 25 to 50 years. As shown in the figure, West Elizabeth Street from Shields Street to Overland Trail is designated as a protected bike lane. Shields Street within the study area is also

designated as a protected bike lane. Plum Street from Shields Street to West Elizabeth Street (including Constitution Avenue) is identified as a buffered bike lane. City Park Avenue is designated as a neighborhood greenway. The ETC Plan will build off the BMP recommendations to further evaluate appropriate types of facilities/design details that best serve the area.

Average bicyclist delay at each signalized intersection was also calculated using Vissim. **Table 11** shows the average bicyclist delay and level of service at each signalized study intersection.

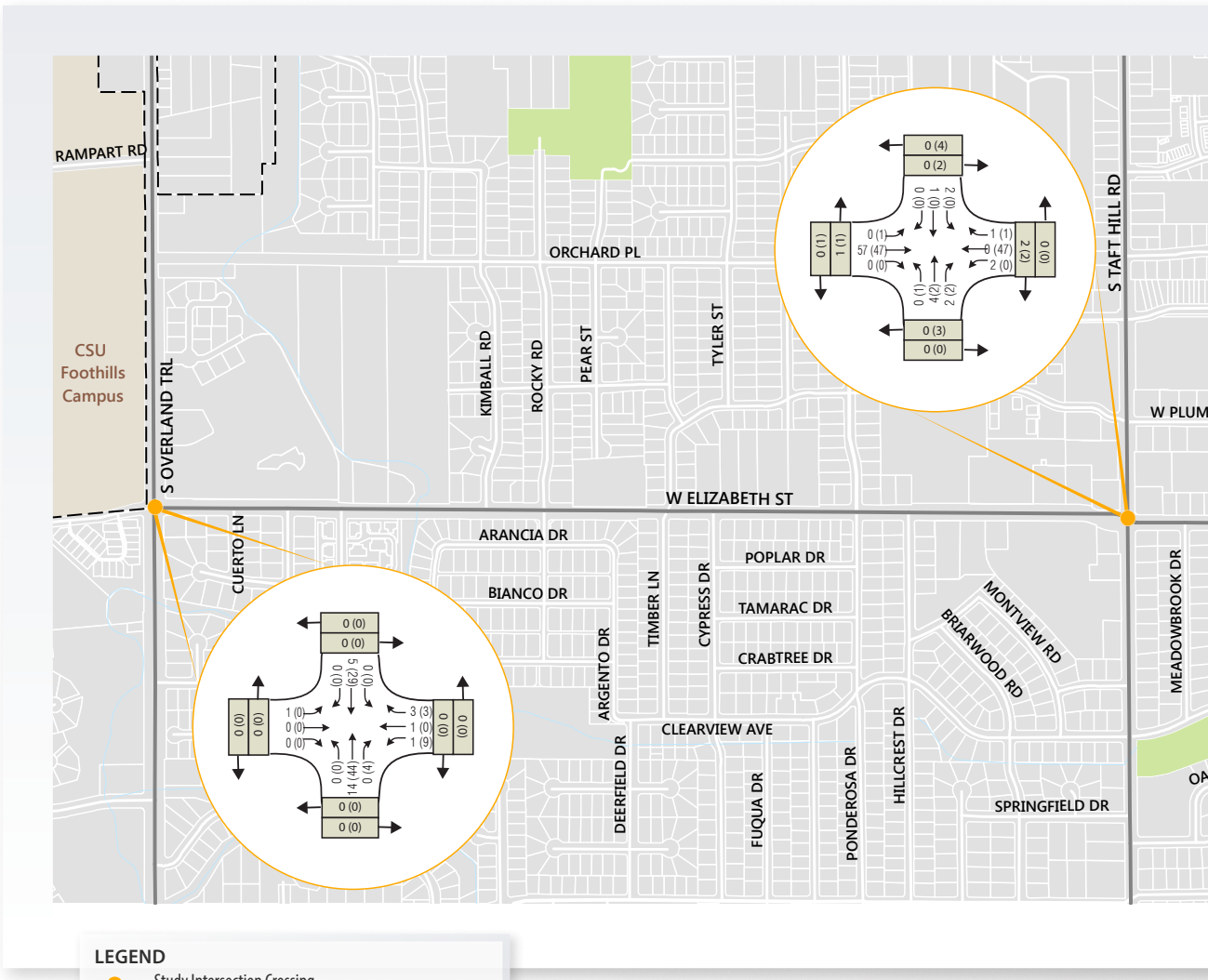
Table 11 shows that average bicyclist delay ranges from low ("A") to high ("E"). The lowest average bicyclist delays are observed at the West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, Shields Street/Laurel Street, and Shields Street/Lake Street intersections. Relatively high average bicyclist delays are observed at the Shields Street/Prospect Road intersection during the AM peak hour and the West Elizabeth Street/Shields Street and West Elizabeth Street/Plum Street intersections during the PM peak hour.

TABLE 11: Existing Bicyclist Delay and Level of Service

Intersection	Control	Existing Conditions			
		AM		PM	
		Delay	LOS	Delay	LOS
West Elizabeth Street/Overland Trail	Side-Street Stop	N/A – side-street stop intersection			
West Elizabeth Street/Taft Hill Road	Signal	31	D	36	D
West Elizabeth Street/Constitution Avenue	Signal	13	B	10	B
West Elizabeth Street/City Park Avenue	Signal	10	B	13	B
West Elizabeth Street/Shields Street	Signal	38	D	40	E
Shields Street/Plum Street	Signal	32	D	44	E
Shields Street/Laurel Street	Signal	12	B	18	B
Shields Street/Lake Street	Signal	5	A	18	B
Shields Street/Prospect Road	Signal	44	E	29	C

Note: the City of Fort Collins does not have a minimum acceptable delay-based bicyclist LOS.

FIGURE 35: Existing Bicycle Volume



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SCOTT AVE
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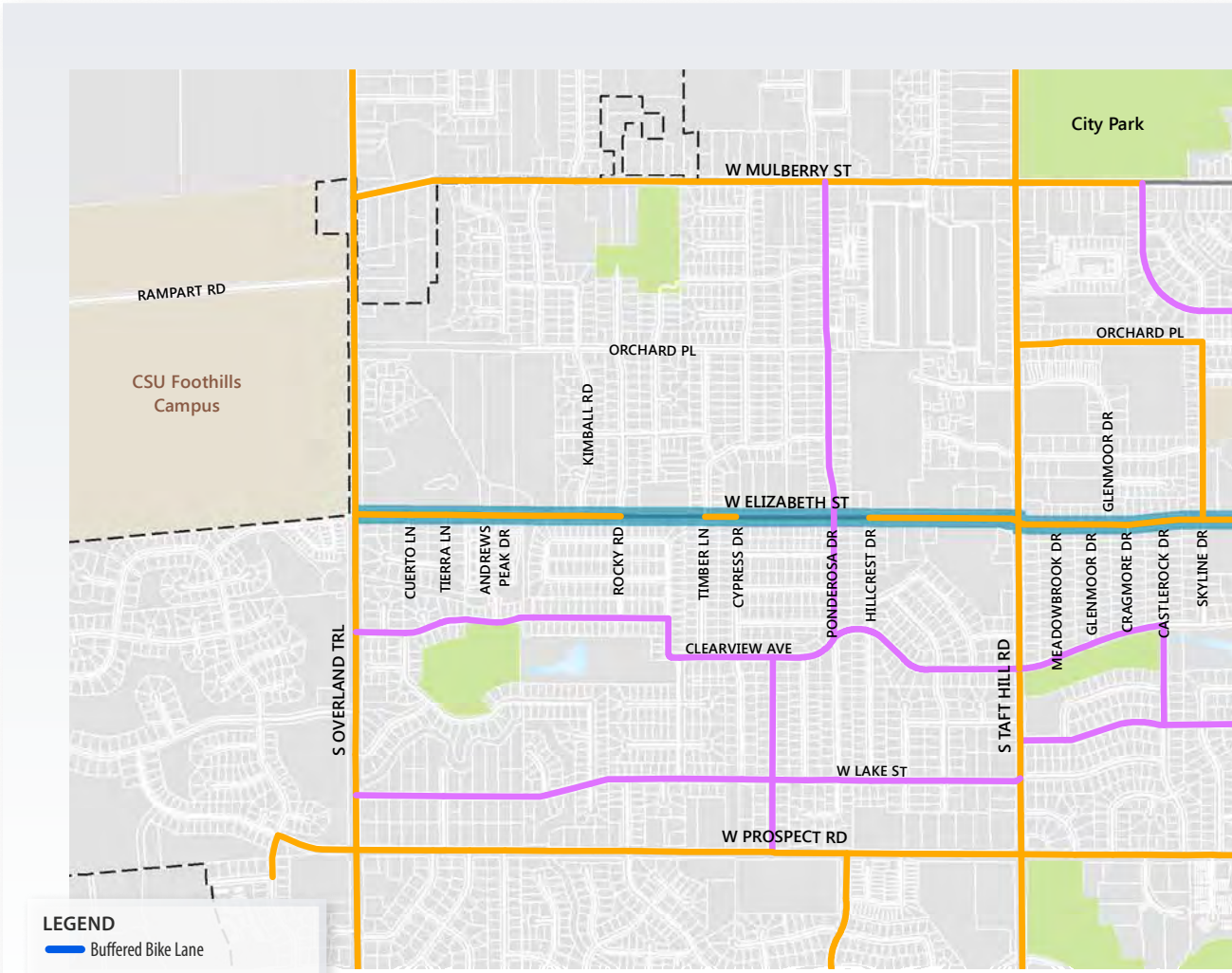
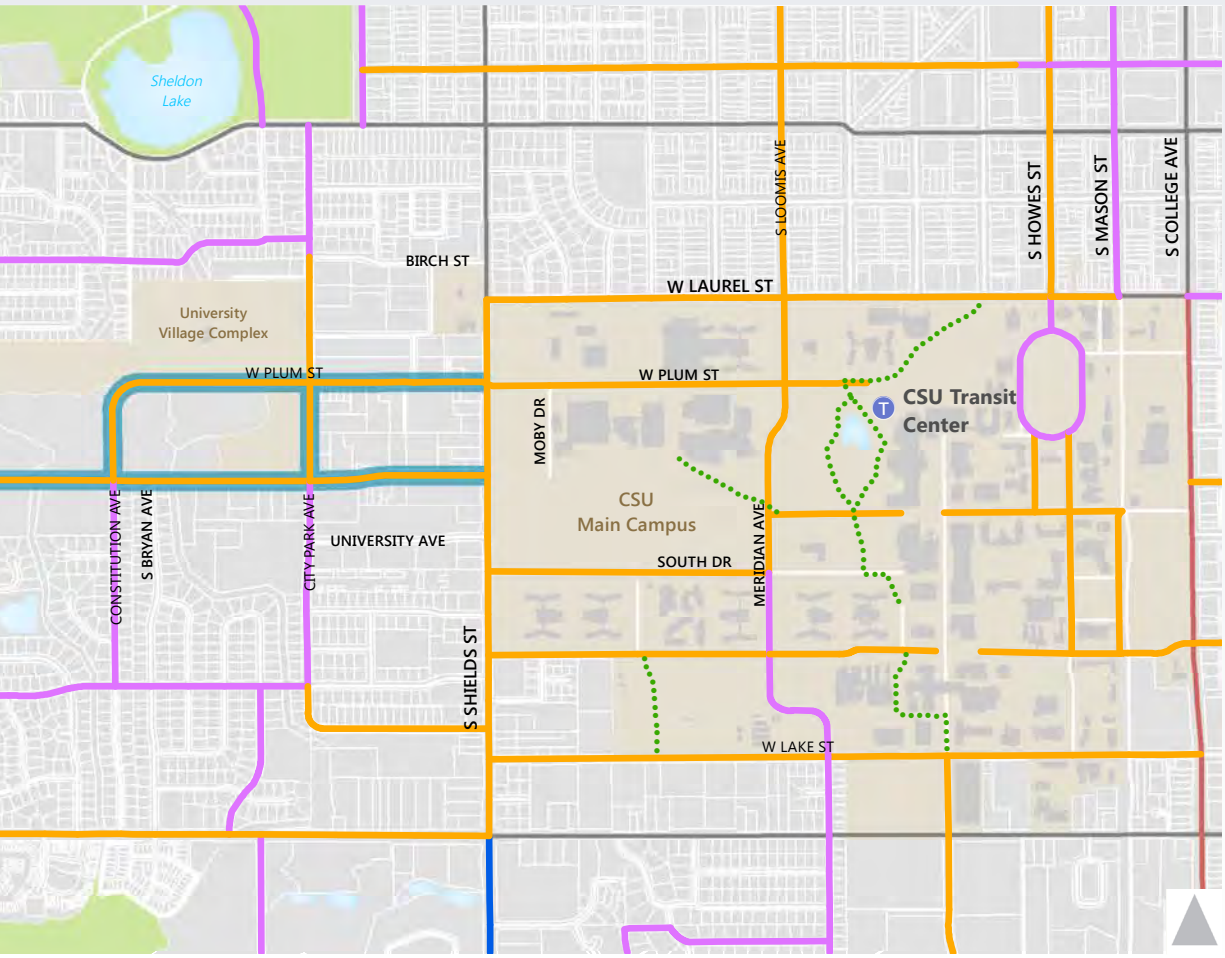
GLENMOOR DR
CRAGMORE DR
CASTLEROCK DR
SOUTH DR
CSU Main Campus

FIGURE 36: Existing Bicycle Facilities

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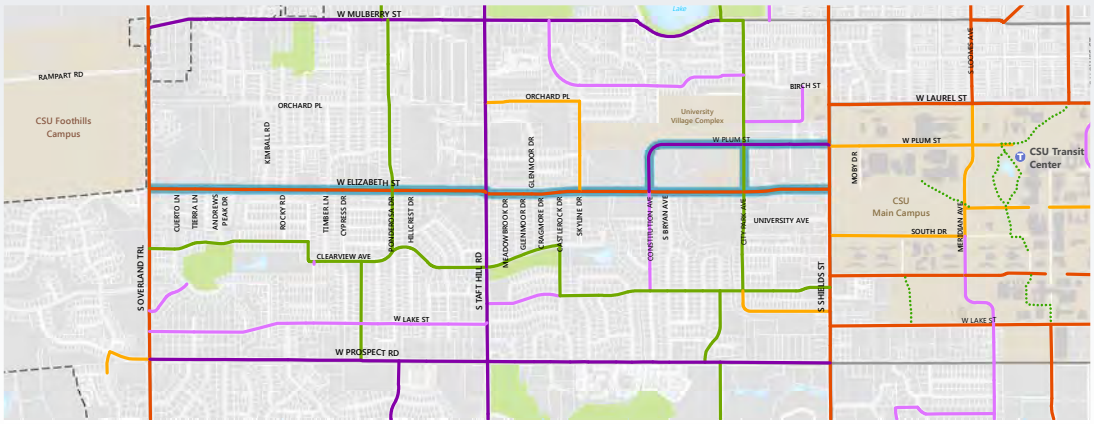
S COLLEGE AVE

FIGURE 37: Bicycle Facilities Full Build Plan



BICYCLE NETWORK FULL BUILD PLAN

- Buffered Bike Lane
- Bike Lane
- Neighborhood Greenway
- Protected Bike Lane
- Priority Shared Lane; Shared Roadway, Recommended Route; Bike Route; Signed Route
- CSU Bike Paths
- West Elizabeth Street Study Corridor
- City Boundary

Source: Fort Collins Bicycle Master Plan, 2014

The Bicycle Level of Traffic Stress (LTS) was calculated for the study area using the methodology outlined in the Fort Collins 2014 Bicycle Master Plan, as shown in **Figure 38.** This calculation considers speed on the roadway, average daily traffic, and the bicycle facility type. The LTS on the study segments, as shown in **Figure 39,** is lowest (most comfortable) along Plum Street, Constitution Avenue, and City Park Avenue. West Elizabeth Street has the lowest LTS at the half mile just east of Overland Trail due to the lower ADT and two travel lanes, compared to the higher stress conditions with four travel lanes further east on the corridor. There are a number of access points along the corridor, especially between City park Avenue and Shields Street, that creates additional conflict points for bicyclists.

FIGURE 38: Bicycle LTS Table (2014 Bicycle Master Plan)

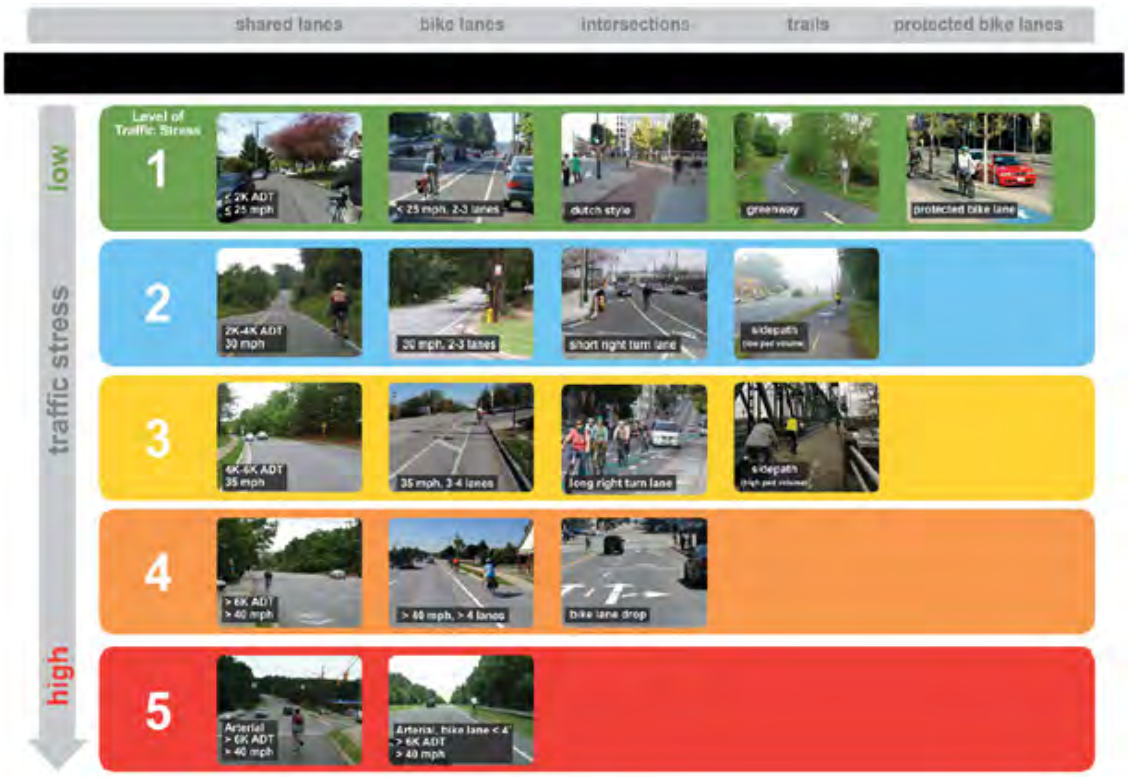
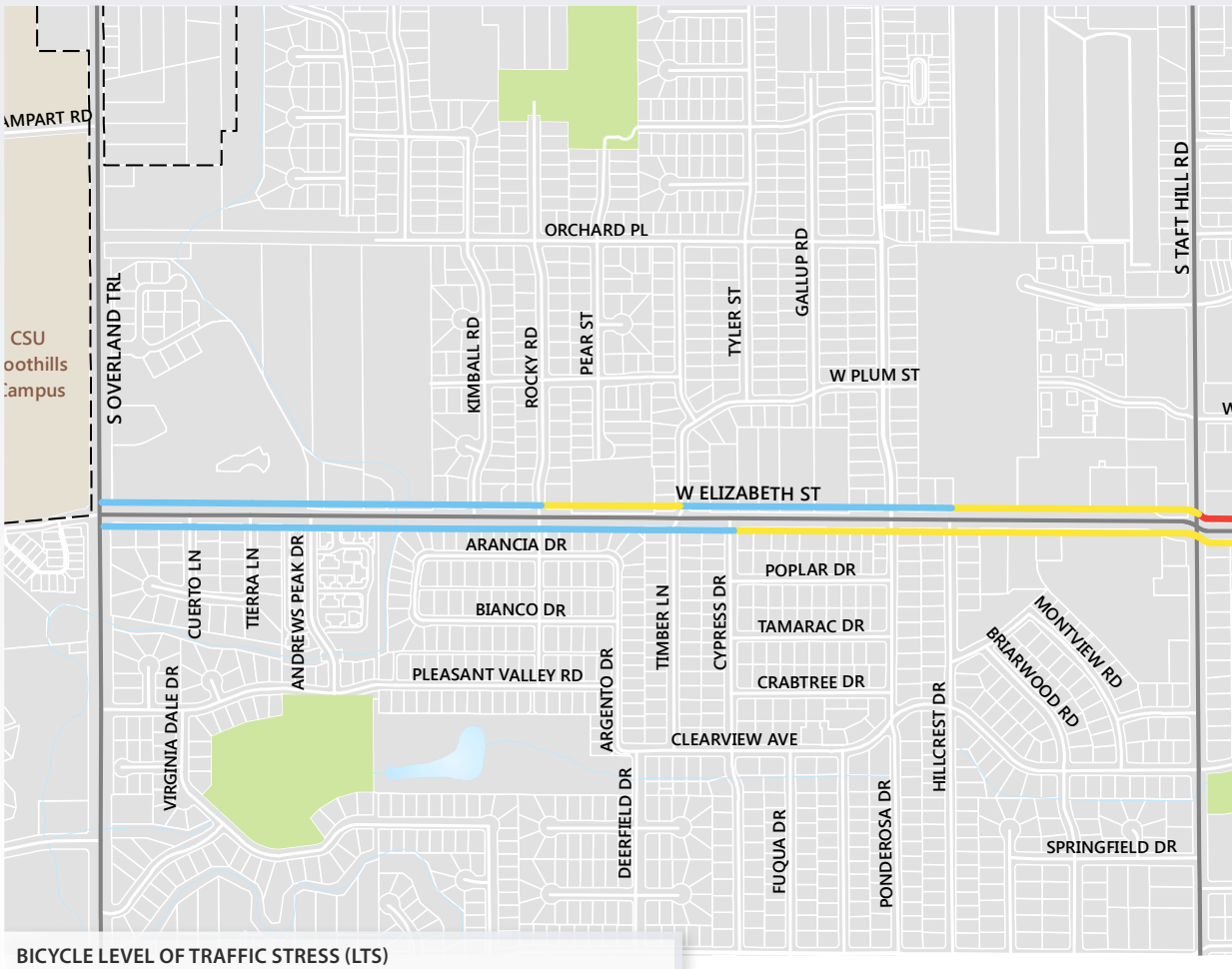


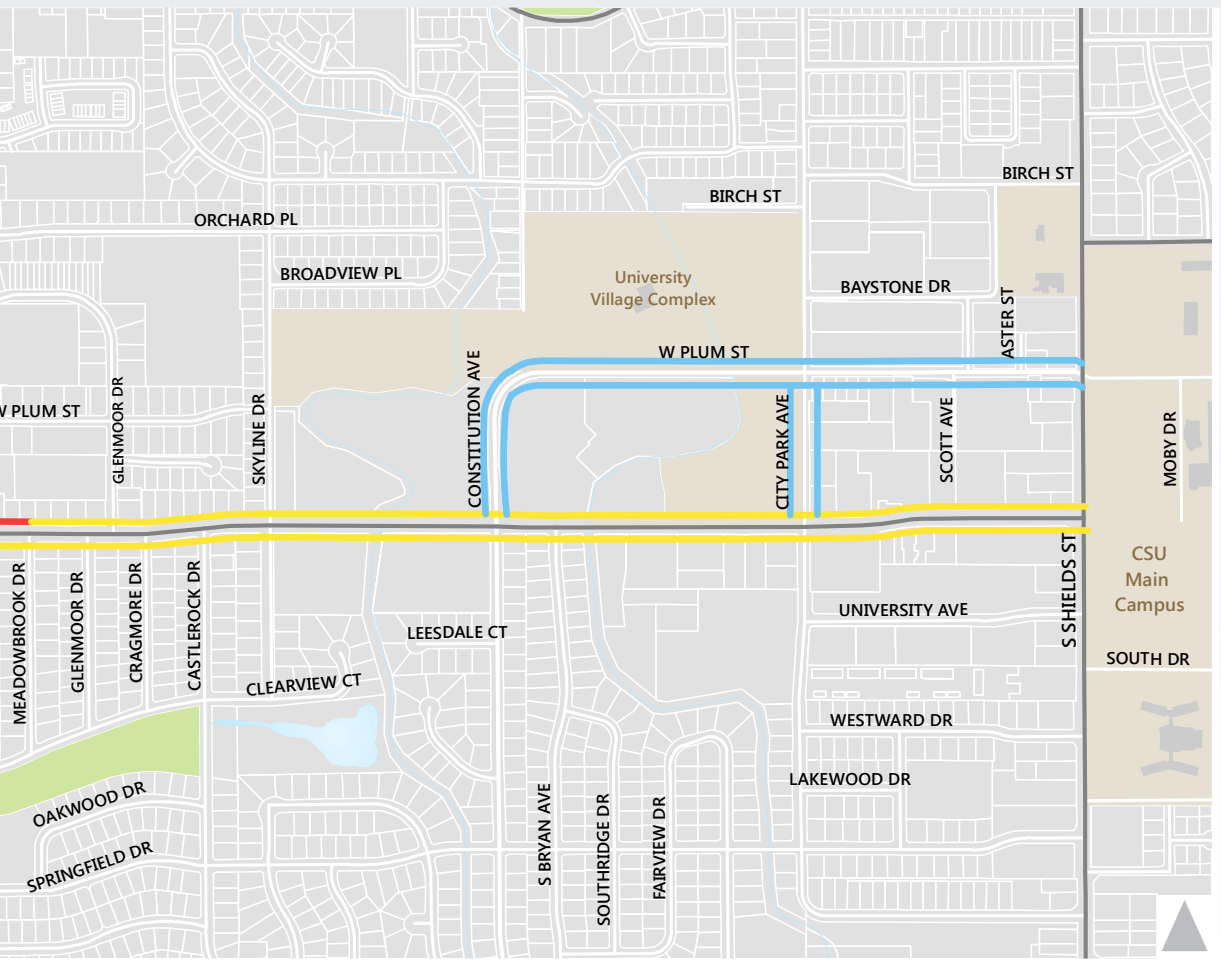
FIGURE 39: Bicycle Level of Traffic Stress (LTS)



BICYCLE LEVEL OF TRAFFIC STRESS (LTS)

- 2 (Low Stress)
- 3
- 5 (High Stress)

LTS applies the same methodology that is used in the 2014 Bicycle Master Plan. The score from 1-5 represents the level of bicyclist comfort based on traffic volume, speed, number of lanes, and presence and quality of the bikeway.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CITY PARK AVE
SCOTT AVE
MOBY DR
CSU
Main
Campus
MEADOWBROOK DR
GLENMOOR DR
CRAGMORE DR
CASTLEROCK DR
LEESDALE CT
CLEARVIEW CT
UNIVERSITY AVE
S SHIELDS ST
SOUTH DR
WESTWARD DR
LAKEWOOD DR
OAKWOOD DR
SPRINGFIELD DR
S BRYAN AVE
SOUTHRIDGE DR
FAIRVIEW DR

KEY FINDINGS

Bike lanes are provided on many sections of West Elizabeth Street. However, bike lanes are missing from key segments of West Elizabeth Street, including several segments west of Taft Hill Road. Bike lanes are also provided on Plum Street, Constitution Avenue and City Park Avenue.

The Fort Collins Bicycle Master Plan proposes a protected bike lane on West Elizabeth Street, buffered bike lanes on Plum Street and Constitution Avenue and a neighborhood greenway on City Park Avenue.

Over 2,000 bicyclists per day use West Elizabeth Street west of Shields Street.

Bicyclist delay at signalized intersections ranges from low to high. The lowest bicyclist delays are observed at the West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, Shields Street/Laurel Street, and Shields Street/Lake Street intersections. Relatively high bicyclist delays are observed at the Shields Street/Prospect Road, West Elizabeth Street/Shields Street, and West Elizabeth Street/Plum Street intersections.

Bicyclist level of traffic stress (LTS), an indication of bicyclist comfort on the corridor, is generally low (indicating relatively high comfort). Most of the corridor is LTS 3, which is sufficiently comfortable for the many residents and college students who currently ride on West Elizabeth Street. However, LTS 3 is generally too low comfort for the 'interested but concerned' bicyclist.

There are a large number of access points, particularly on West Elizabeth Street between Shields Street and Constitution Avenue. These access points create conflicts between vehicles and bikes.

SAFETY

An analysis of crash data from 2010 to 2014 reveals that the study area contains some of the City's intersections with the highest number of crashes.

Crashes involving all modes in the study are shown in **Figure 40.** The intersection with the largest number of crashes is the West Elizabeth Street/Shields Street intersection, followed by the West Elizabeth Street/Taft Hill Road and then the Shields Street/Plum intersections.

Pedestrian crashes from 2010 to 2014 in Fort Collins are shown in **Figure 41**. This map reveals that the Shields Street/Plum Street, West Elizabeth Street/Shields Street, West Elizabeth Street/Castlerock Drive and West Elizabeth Street/Taft Hill Road intersections have the highest number of pedestrian-related crashes in the study area, and some of the highest in the City. The Plum Street/City Park Avenue, West Elizabeth Street/City Park Avenue, West Elizabeth Street/Constitution Avenue and West Elizabeth Street/Ponderosa Drive intersections also have pedestrian-related crashes.

Figure 42 shows bicycle-related crashes in the study area. The West Elizabeth Street/City Park Avenue intersection has the highest number of bicycle-related crashes in the study area, followed by the West Elizabeth Street/Taft Hill Road and West Elizabeth Street/Shields Street intersections.

Table 12 and **Table 13** show crash screening information used to identify locations with more crashes than expected on West Elizabeth.

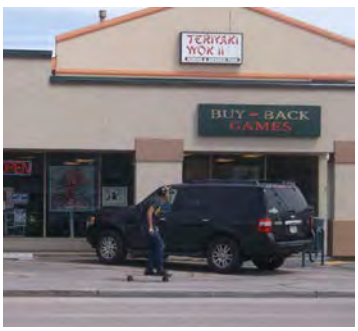
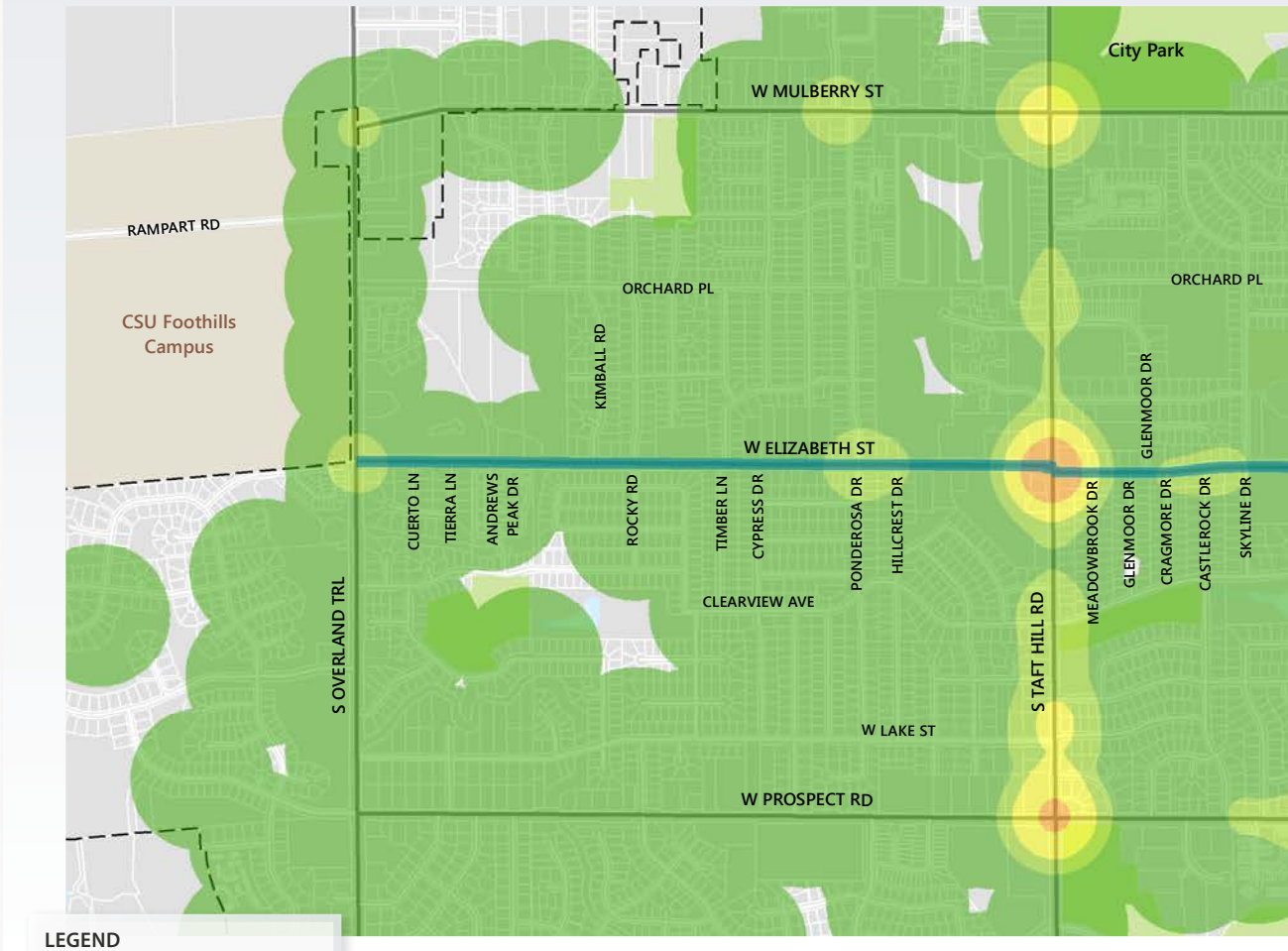


FIGURE 40: All Crashes 2010-2014



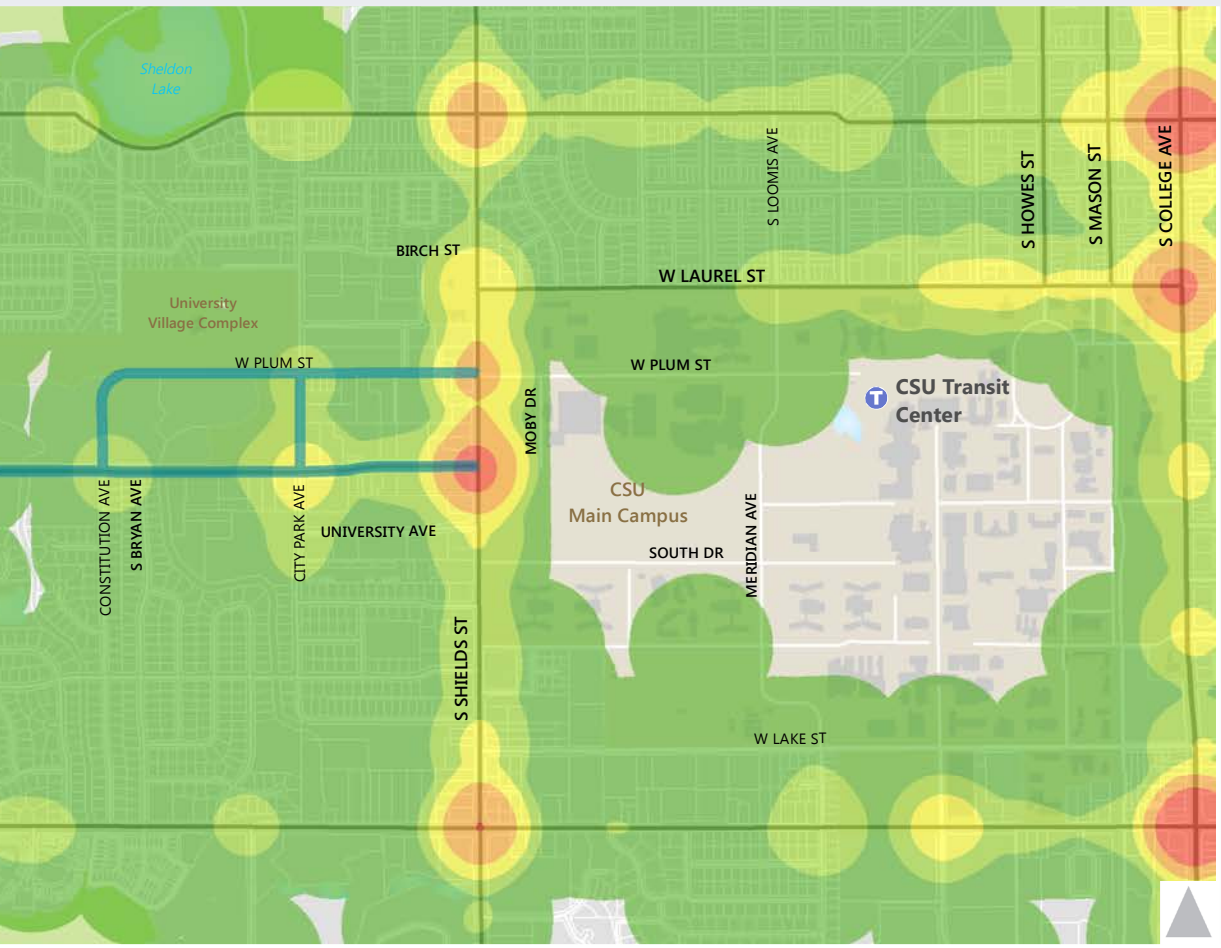

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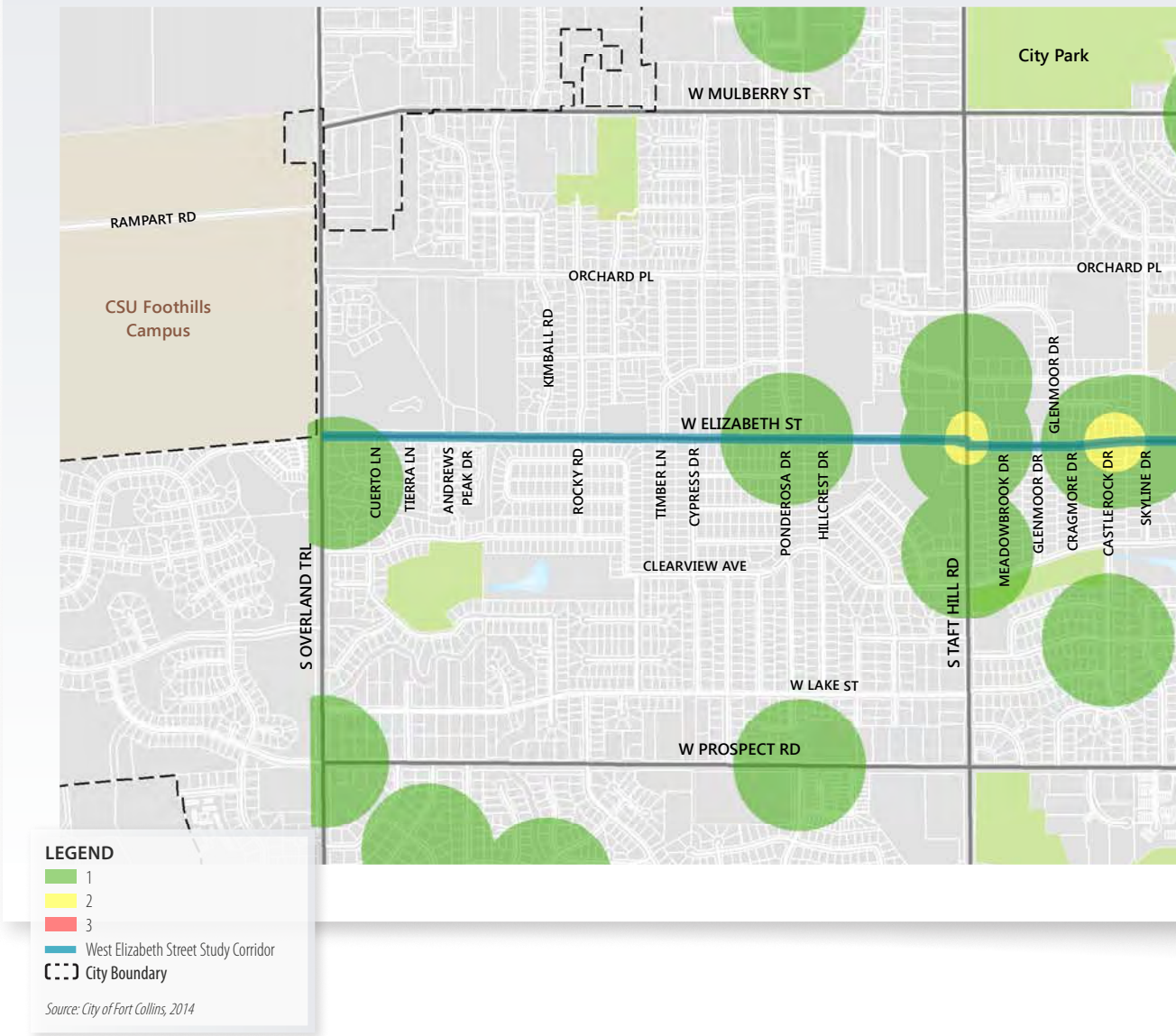
FIGURE 41: Pedestrian Crashes 2010-2014



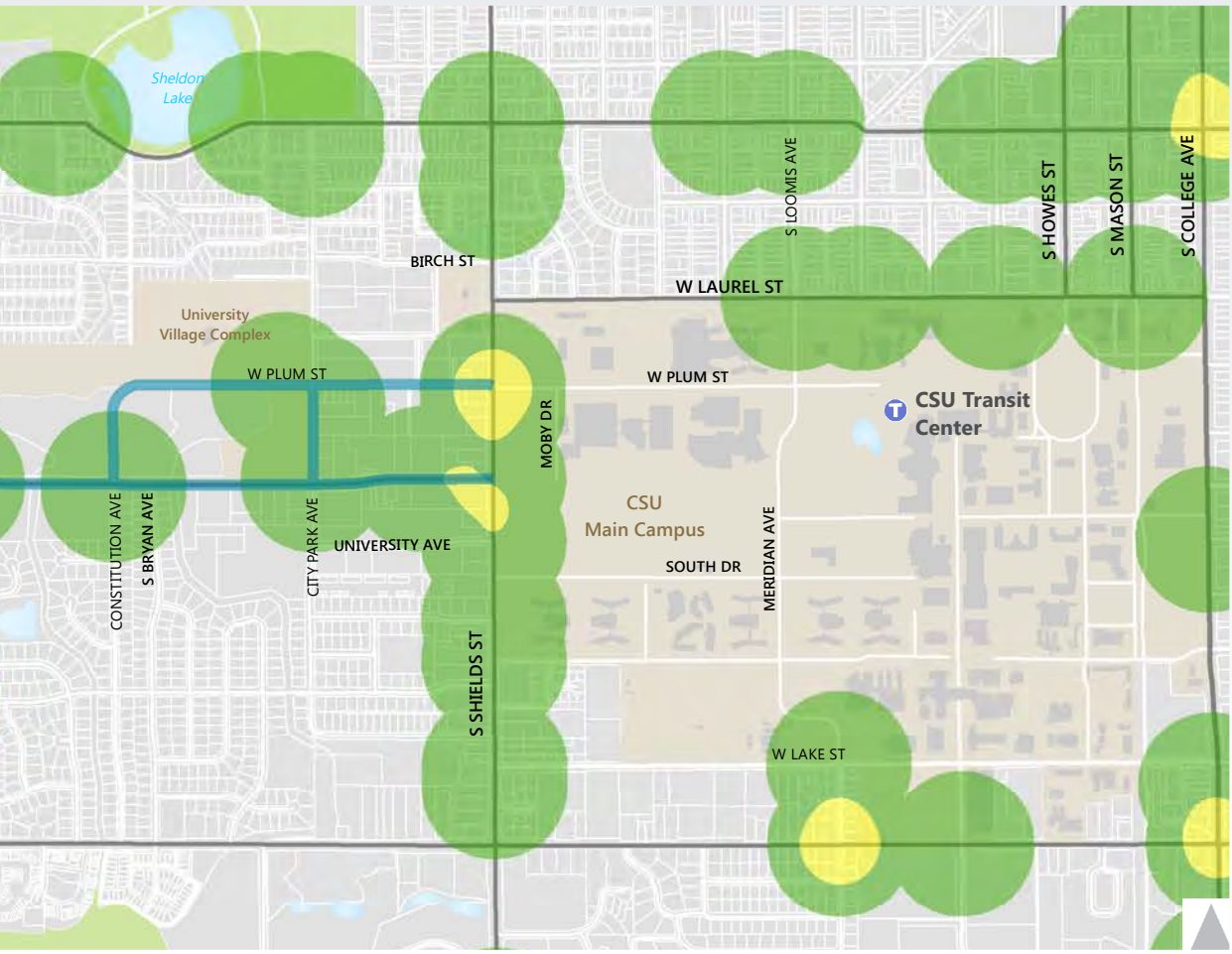

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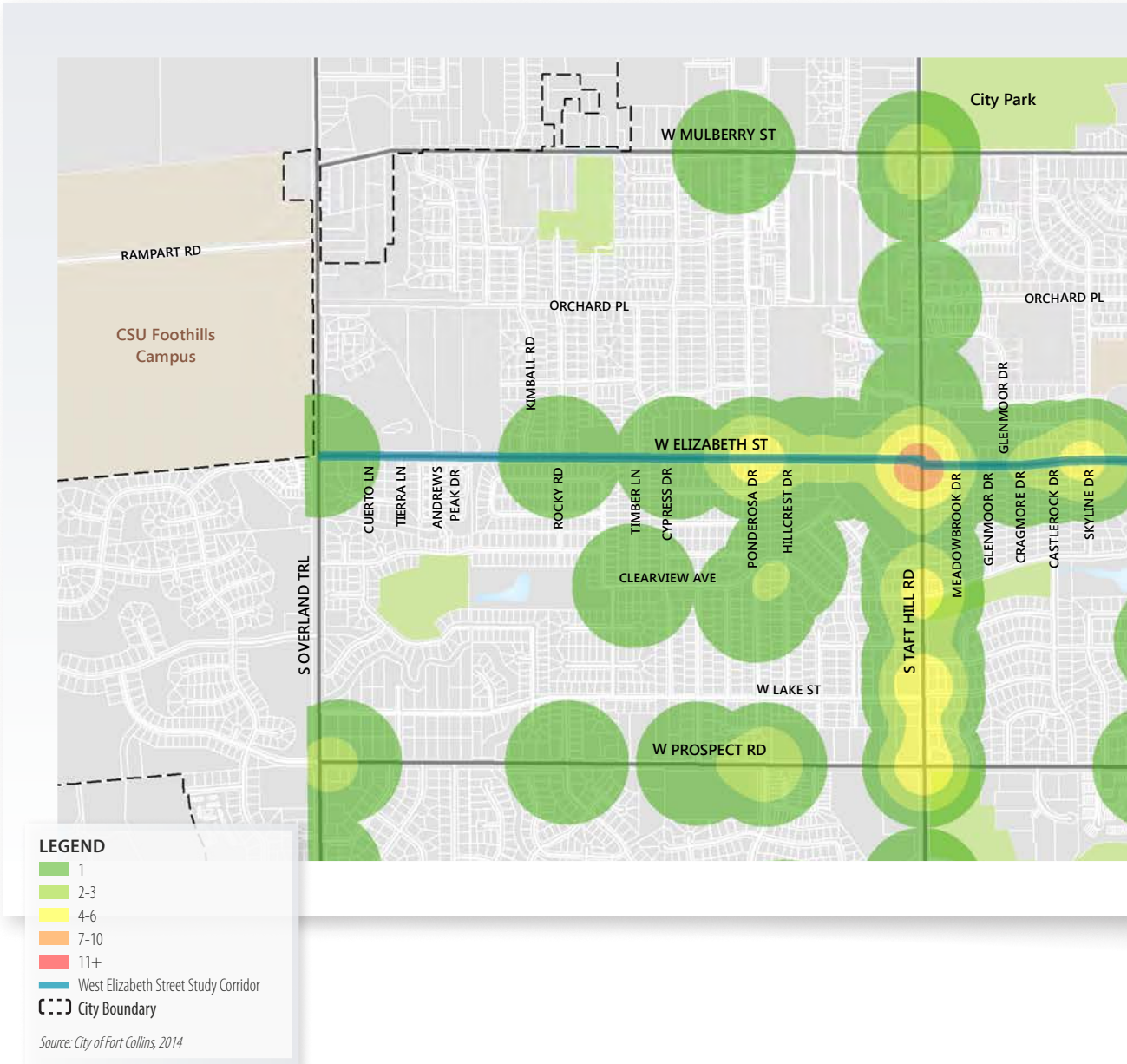
FIGURE 42: Bicycle Crashes 2010-2014



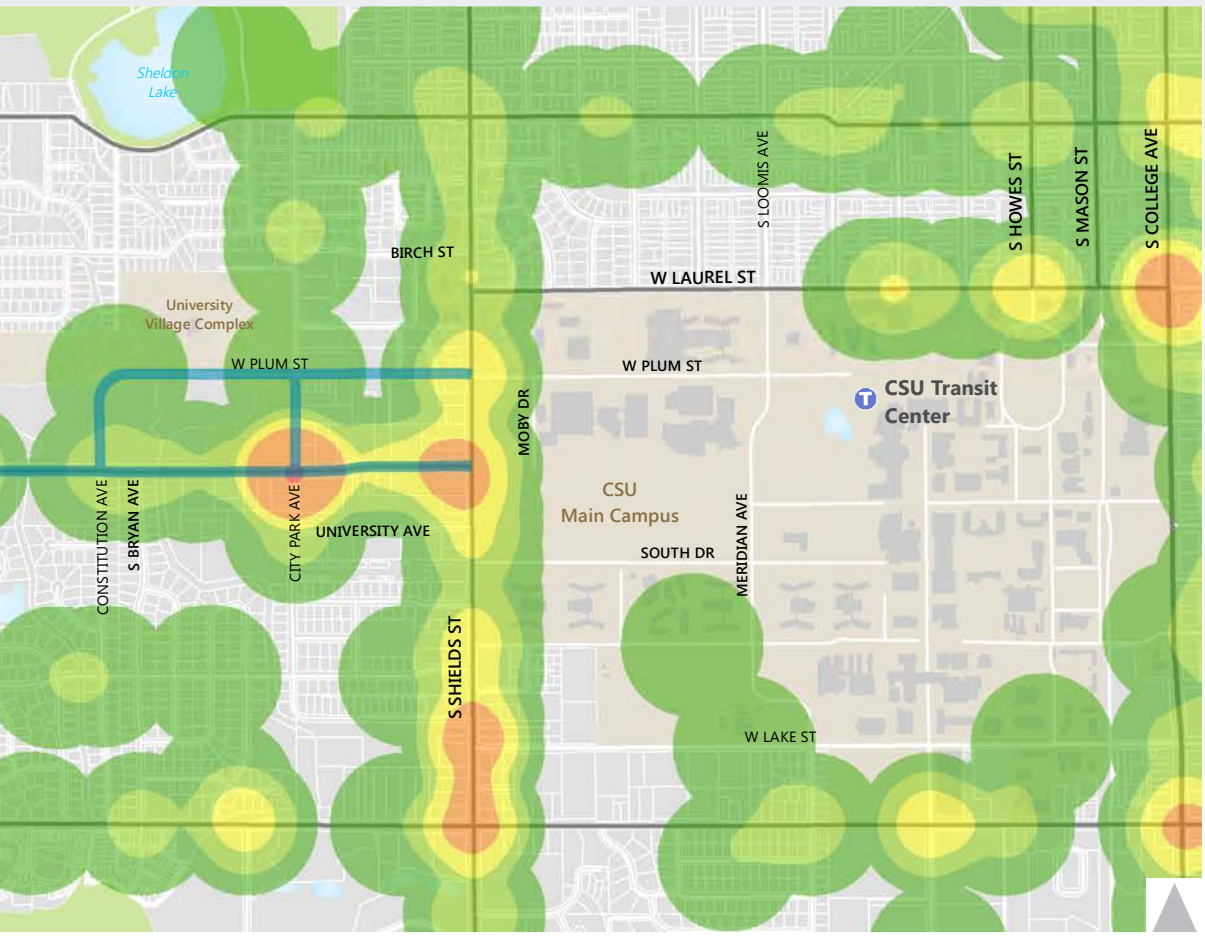

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TABLE 12: West Elizabeth Intersection Crashes (2010-2014)

Street	Cross Street	Entering Volume *(vehicles per day)*	# of Crashes	# of Injury Crashes	# of Bike Crashes	# of Pedestrian Crashes
Shields Street	West Elizabeth Street	46,350	**154**	**28**	3	2
City Park Avenue	West Elizabeth Street	21,450	32	10	**15**	0
Bryan Avenue	West Elizabeth Street	16,000	5	2	2	0
Constitution Avenue	West Elizabeth Street	18,000	14	7	2	1
Skyline Drive	West Elizabeth Street	17,550	6	5	3	0
Castlerock Drive	West Elizabeth Street	16,700	4	2	1	1
Cragmore Drive	West Elizabeth Street	16,700	2	1	1	0
Glenmoor Drive	West Elizabeth Street	16,700	2	0	0	0
Meadowbrook Drive	West Elizabeth Street	16,700	1	1	1	0
Taft Hill Road	West Elizabeth Street	35,950	70	16	2	2
Hillcrest Drive	West Elizabeth Street	9,300	1	0	0	0
Ponderosa Drive	West Elizabeth Street	10,300	12	6	**4**	1
Cypress Drive	West Elizabeth Street	6,500	1	0	0	0
Timber Lane	West Elizabeth Street	6,000	2	1	0	0
Rocky Road	West Elizabeth Street	5,500	1	0	0	0
Kimball Road	West Elizabeth Street	5,000	0	0	0	0
Andrews Peak Drive	West Elizabeth Street	4,400	0	0	0	0
Tierra Lane	West Elizabeth Street	4,400	0	0	0	0
Cuerto Lane	West Elizabeth Street	4,400	0	0	0	0
Overland Trail	West Elizabeth Street	13,550	**17**	1	1	0

Notes: Bold *and underlined text indicates more crashes than expected compared to similar locations*
Bold *text indicates slightly more crashes than expected compared to similar locations*
Source: City of Fort Collins – Traffic Operations

Table 12 shows that the West Elizabeth Street/Shields Street intersection has more crashes than expected compared to similar locations and slightly more injury crashes than expected compared to similar locations. The West Elizabeth Street/City Park Avenue intersection has more bike crashes than expected compared to similar locations. The West Elizabeth Street/Ponderosa Road intersection and West Elizabeth Street/Overland Trail intersection also have slightly more crashes than expected. There were no fatalities in the study area during this period.

The intersection with the largest number of crashes is the West Elizabeth Street/Shields Street intersection, followed by the West Elizabeth Street/Taft Hill Road and then the Shields Street/Plum intersections.

Table 13 presents data for crashes between intersections (segments). The table shows that West Elizabeth Street from Shields Street to City Park Avenue has more crashes, injury crashes, and bike crashes than expected compared to similar locations. West Elizabeth Street from City Park Avenue to Constitution Avenue has slightly more crashes, injury crashes, and bike crashes than expected compared to similar locations. West Elizabeth Street from Taft Hill Road to Ponderosa Drive has more crashes, injury crashes, bike crashes, and pedestrian crashes than expected when compared to similar locations. There were no fatalities in the study area during this period.

TABLE 13: West Elizabeth Non-Intersection Crashes (2010-2014)

Block #	Description	Segment Length *(miles)*	ADT	# of Crashes	# of Injury Crashes	# of Bike Crashes	# of Pedestrian Crashes
1100 - 1399	Shields Street – City Park Avenue	0.24	18,350	**59**	**15**	**11**	2
1400 - 1599	City Park Avenue – Constitution Avenue	0.26	16,000	**19**	**8**	**5**	0
1600 - 1899	Constitution Avenue – Skyline Drive	0.19	16,200	3	0	0	**0**
1900 – 2099	Skyline Drive – Taft Hill Road	0.26	15,000	8	3	1	**2**
2100 – 2399	Taft Hill Road – Ponderosa Drive	0.26	11,000	**38**	**11**	**9**	**3**
2400 – 2599	Ponderosa Drive – Timber Lane	0.18	6,000	7	1	1	**0**
2600 – 3099	Timber Lane to Overland Trail	0.5	4,400	2	1	0	**0**

Notes: Bold *and underlined text indicates more crashes than expected compared to similar locations*
Bold *text indicates slightly more crashes than expected compared to similar locations*
Source: City of Fort Collins – Traffic Operations

DETAILED EVALUATION OF HIGH CRASH LOCATIONS

Intersections

West Elizabeth Street/ Shields Street

This is a signalized intersection with a predominant crash type of rear end crashes. Sideswipe crashes on the eastbound approach are also common. There is higher than normal congestion at the intersection due to lane configuration. Required split phasing east-west contributes to rear end crash potential and a higher than normal crash frequency. In 2014, about 30% of collisions occurred on Shields Street, 60% on Elizabeth Street and 10% in the center of the intersection.

West Elizabeth Street/ City Park Avenue

This is a signalized intersection with a predominant crash type of bicycle-related crashes (six approach turns, five right hooks and four right-angle bike crashes). The high volume of cyclists is a likely contributor (over 2,000 bikes per day counted on West Elizabeth Street). Five out of six approach turn crashes were at night with unlit bikes. Traffic signal violations are another contributing factor to bike approach turn crashes.

West Elizabeth Street/ Skyline Drive

This is a two-way stop controlled intersection northbound/ southbound. The predominant crash type is bicycle-related crashes (two right-angle and one sideswipe-opposite directions). The large bike volume is a likely contributor. One bike crash involved a wrong-way sidewalk rider and one occurred after midnight.

West Elizabeth Street/ Ponderosa Drive

This is a two-way stop controlled intersection northbound/ southbound. The predominant crash type is bicycle-related crashes (one right-angle, one approach turn, one right hook and one unknown). The large bike volume is a likely contributor.

West Elizabeth Street/ Overland Trail

This is a two-way stop controlled intersection eastbound/ westbound. The predominant crash type is right-angle crashes involving westbound motorists. All the right-angle crashes resulted from a failure to yield after stopping at the stop sign. Four of the nine right-angle crashes noted a non-contact vehicle (three of which were Transfort buses) in the northbound right turn lane that obstructed views. This intersection does not currently meet warrants for a traffic signal.

Segments

West Elizabeth Street from Shields Street to City Park Avenue

This segment has four travel lanes and a striped center turn lane. It has heavy commercial activity and numerous driveway access points. The predominant crash type is right-angle crashes (24 crashes) at driveways – nearly all of which occurred during a left turn attempt from a driveway onto West Elizabeth Street. Sixteen out of 24 right-angle crashes were at driveways on the south side of West Elizabeth. There have also been 11 bike crashes (four approach turns, four right-angle and four right hooks). All of the bike crashes occurred at driveways. There were also two pedestrian crashes. One was a multiple-threat crash in the mid-block crossing equipped with flashing yellow beacons and the other was an overtaking turn at a driveway.

West Elizabeth Street from City Park Avenue to Constitution Avenue

This segment has four travel lanes and a striped center turn lane. There have been five bike crashes (two approach turns,

three right-angle – in all of which the bicyclist riding against traffic) all at driveways. There have also been five right-angle crashes, all at driveways (four on the south side of West Elizabeth).

West Elizabeth Street from Taft Hill Road to Ponderosa Drive

This segment has two travel lanes, a striped center turn lane, and a continuous right turn lane in the westbound direction starting about 120 feet west of Taft Hill. There have been ten right-angle crashes, all at driveways (five on the north side and five on the south side). There have been nine bicycle crashes (five approach turns four of which were at King Soopers driveway(s), three right-angle and one overtaking turn) all at driveway accesses. Westbound drivers are making left turns through the queue of cars eastbound stopped at Taft Hill. The queue blocks the westbound drivers' view of bicyclists in the adjacent bike lane. There have also been eight rear end crashes, all at driveways. There have been three pedestrian crashes, two of which involved turning vehicles at apartment driveways and one of which was after midnight with an inebriated pedestrian walking in the street.

See **Appendix D** for crash diagrams at the West Elizabeth Street/Shields Street intersections, West Elizabeth Street/City Park Avenue, West Elizabeth Street/Skyline Drive, West Elizabeth Street/Ponderosa Drive, and West Elizabeth Street/ Overland Trail. **Table 14** shows a summary of crash trends.

TABLE 14: Crash Type Summary

Location	Predominant Crash Type	Contributing Factors
Intersections		
West Elizabeth Street/ Shields Street	Rear end, sideswipe	Intersection congestion and split phasing
West Elizabeth Street/ City Park Avenue	Bicycle-related	High volume of bikes, traffic signal violations, nighttime crashes with unlit bikes
West Elizabeth Street/ Skyline Drive	Bicycle-related	High volume of bikes
West Elizabeth Street/ Ponderosa Drive	Bicycle-related	High volume of bikes
West Elizabeth Street/ Overland Trail	Right-angle	Failure to yield at stop sign after stopping
Segments		
West Elizabeth Street: Shields to City Park	Right-angle	Failure to yield at driveway
West Elizabeth Street: City Park to Constitution	Bicycle-related, right-angle	Wrong way riding, failure to yield
West Elizabeth Street: Taft Hill to Ponderosa	Right angle, bicycle-related	Failure to yield, queue blocking visibility of bicyclists

KEY FINDINGS

The West Elizabeth Street/Shields Street intersection has more crashes than expected compared to similar locations and slightly more injury crashes than expected compared to similar locations. The predominant crash type is rear end crashes; sideswipe crashes on the eastbound approach are also common.

The West Elizabeth Street/City Park Avenue intersection has more bike crashes than expected compared to similar locations. Traffic signal violations and nighttime crashes with unlit bikes are a contributing factor to bike approach turn crashes.

West Elizabeth Street from Shields Street to City Park Avenue has more crashes, injury crashes, and bike crashes than expected compared to similar locations. The predominant crash type is right angle crashes at driveways, nearly all of which occurred during a left-turn attempt from a driveway onto West Elizabeth Street.

West Elizabeth Street from City Park Avenue to Constitution Avenue has slightly more crashes, injury crashes, and bike crashes than expected compared to similar locations.

West Elizabeth Street from Taft Hill Road to Ponderosa Drive has more crashes, injury crashes, bike crashes and pedestrian crashes than expected compared to similar locations.

DELAY BY MODE

Table 15 and **Table 16** show the peak hour volumes for each mode. **Figure 43** and **Figure 44** also show peak hour volumes by transportation mode (vehicle, pedestrians, bicyclists, and transit users). The Shields Street/ Plum Street intersection has the highest number of pedestrians and bicyclists during both the AM and PM Peak hours, but pedestrian and bicyclist volumes are present at all of the study intersections on West Elizabeth Street. Higher volumes are typically seen in the PM peak hour, as compared to the AM peak hour.

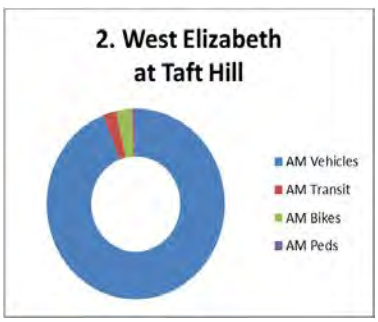
TABLE 15: AM Peak Volume by Mode

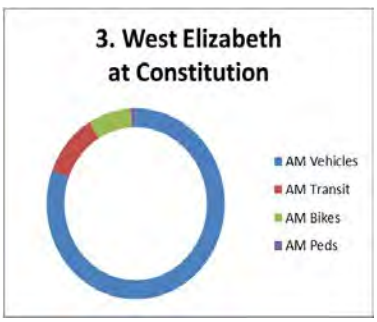
Intersection	Vehicle Drivers & Passengers	Transit Passengers	Pedestrians	Bicyclists	Total
1. West Elizabeth at Overland Trail	976	29	25	2	1,032
2. West Elizabeth at Taft Hill	2,340	59	72	17	2,488
3. West Elizabeth at Constitution	801	106	77	9	993
4. West Elizabeth at City Park	971	93	147	36	1,247
5. West Elizabeth at Shields	2,339	85	164	68	2,656
6. Plum at Shields	2,022	222	194	91	2,529

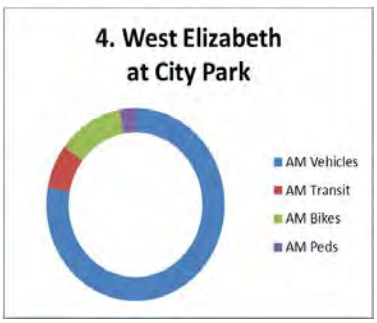
TABLE 16: PM Peak Volume by Mode

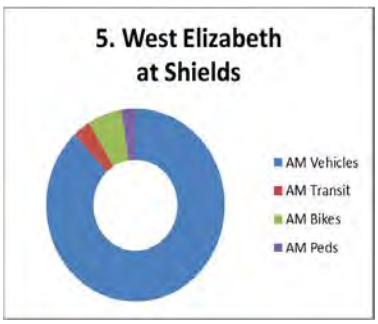
Intersection	Vehicle Drivers & Passengers	Transit Passengers	Pedestrians	Bicyclists	Total
1. West Elizabeth at Overland Trail	1,170	32	89	12	1,303
2. West Elizabeth at Taft Hill	2,962	90	114	50	3,216
3. West Elizabeth at Constitution	1,484	169	150	40	1,843
4. West Elizabeth at City Park	1,896	132	194	129	2,351
5. West Elizabeth at Shields	3,846	61	173	134	4,214
6. Plum at Shields	2,950	312	203	131	3,596

FIGURE 43: Existing Conditions AM Peak Hour Volumes by Mode









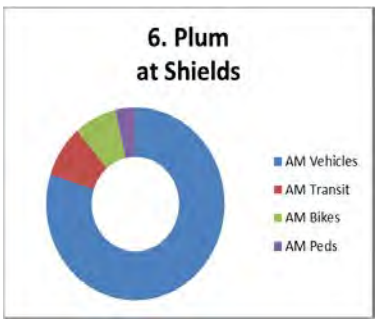
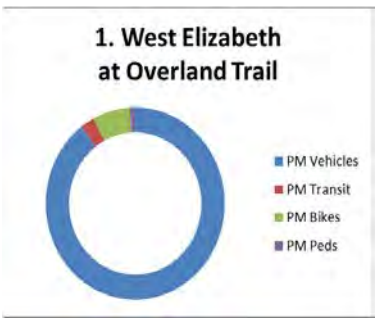
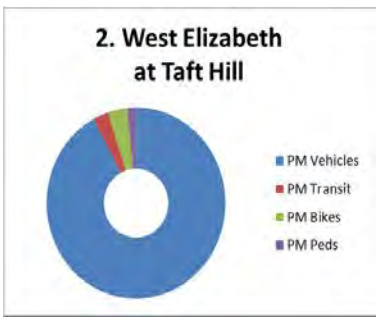
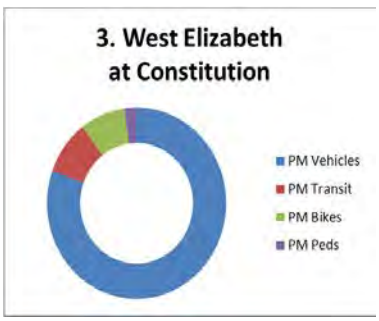
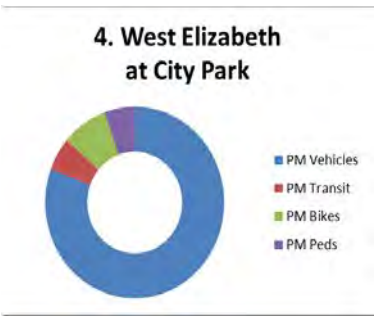


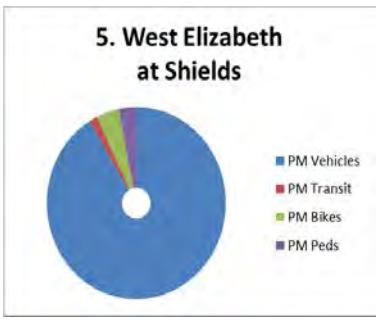
FIGURE 44: Existing Conditions PM Peak Hour Volumes by Mode

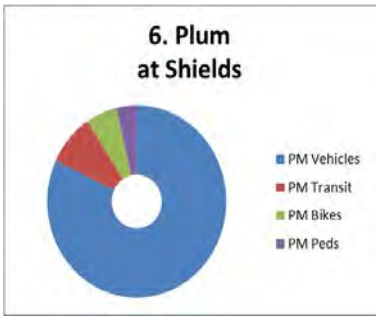












Mobility-based performance measures, such as person-delay, can complement comfort-based performance measures and accessibility-based performance measures (such as the bicycle Level of Traffic Stress and the pedestrian level of service presented earlier in this report) to help more thoroughly explain intersection and corridor performance and the underlying reasons why people travel the way they do.

The calibrated Vissim model to measure corridor performance for vehicles, transit, bicyclists and pedestrians was used to calculate mobility-based performance measures at the person level.

Analysis of American Community Survey Means of Transportation to Work data revealed that average vehicle occupancy in Fort Collins is approximately 1.1 persons per vehicle.

Estimates of person delay by mode account for delay incurred by each mode at intersections as well as the number of people using each mode at the intersection, accounting for average vehicle occupancy in Fort Collins and transit ridership. Analysis of American Community Survey Means of Transportation to Work data revealed that average vehicle occupancy in Fort Collins is approximately 1.1 persons per vehicle. Transfort provided transit ridership data from the Automatic Passenger Counters (APCs), and the City provided bicyclist and pedestrian count data.

Table 17 and **Table 18** show total person delay by mode at signalized intersections in the study area during the AM and PM peak hour, respectively. **Appendix B** includes detailed calculations. These tables show that in many cases delay incurred by vehicle drivers and passengers constitutes most of the peak hour delay incurred by all people at study intersections, especially at some of the study area's busiest intersections, such as the West Elizabeth Street/ Taft Hill Road, West Elizabeth Street/Shields Street, and Shields Street/Prospect Road intersections. However, at some of the study area's intersections with lower vehicle volumes, delay incurred by transit passengers, pedestrians, and bicyclists constitutes a substantial portion of overall person delay. For example, delay incurred by transit passengers, pedestrians,

and bicyclists constitutes over 30 percent of overall person delay at the West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, and Shields Street/Plum Street intersections during both the AM and PM peak hours. At the Shields Street/Plum Street intersection, transit passenger, pedestrian, and bicyclist delay constitutes 55 percent and 46 percent of overall person delay during the AM and PM peak hours, respectively. It is important to consider not only level of service, but person-mobility as we plan for the future in order to reduce delay for vehicles, transit, pedestrians and bicyclists.

TABLE 17: AM Peak Hour Person Delay by Mode (Minutes)

Intersection	Control	Vehicle Drivers & Passengers	Transit Passengers	Pedestrians	Bicyclists	Total	% Transit, Ped. & Bike
West Elizabeth Street/ Overland Trail	Side-Street Stop	N/A – side-street stop intersection					
West Elizabeth Street/ Taft Hill Road	Signal	949	66	9	35	1,059	10%
West Elizabeth Street/ Constitution Avenue	Signal	82	34	3	13	132	38%
West Elizabeth Street/ City Park Avenue	Signal	131	36	12	21	200	35%
West Elizabeth Street/ Shields Street	Signal	819	57	80	96	1,052	22%
Shields Street/ Plum Street	Signal	310	191	93	89	683	55%
Shields Street/ Laurel Street	Signal	472	4	26	9	511	8%
Shields Street/ Lake Street	Signal	285	1	43	9	338	16%
Shields Street/ Prospect Road	Signal	4,067	123	57	52	4,299	5%

TABLE 18: PM Peak Hour Person Delay by Mode (Minutes)

Intersection	Control	Vehicle Drivers & Passengers	Transit Passengers	Pedestrians	Bicyclists	Total	% Transit, Ped. & Bike
West Elizabeth Street/ Overland Trail	Side-Street Stop	N/A – side-street stop intersection					
West Elizabeth Street/ Taft Hill Road	Signal	1,832	89	48	61	2,030	10%
West Elizabeth Street/ Constitution Avenue	Signal	247	76	14	23	360	31%
West Elizabeth Street/ City Park Avenue	Signal	477	130	115	33	755	37%
West Elizabeth Street/ Shields Street	Signal	2,801	18	151	89	3,059	8%
Shields Street/ Plum Street	Signal	754	368	146	117	1,385	46%
Shields Street/ Laurel Street	Signal	1,259	29	63	5	1,356	7%
Shields Street/ Lake Street	Signal	645	9	21	8	683	6%
Shields Street/ Prospect Road	Signal	3,948	35	82	24	4,089	3%

KEY FINDINGS

The Plum Street/Shields Street intersection has the largest number of transit passengers, bicyclists and pedestrians in the study area (almost 650 during the PM peak hour).

Other intersections with a large number of transit passengers, bicyclists and pedestrians include the West Elizabeth Street/City Park Avenue intersection (455 during the PM peak hour), the West Elizabeth Street/Shields Street intersection (almost 370 during the PM peak hour) and the West Elizabeth Street/Constitution Avenue intersection (almost 360 during the PM peak hour).

Delay incurred by vehicle drivers and passengers constitutes most of the peak hour delay incurred by all corridor users at study intersections, especially at some of the study area's busiest intersections including the West Elizabeth Street/Taft Hill Road, West Elizabeth Street/Shields Street, and Shields Street/Prospect Road intersections.

At some of the study area's intersections with lower vehicle volumes, delay incurred by transit passengers, pedestrians and bicyclists constitutes a substantial portion of overall person delay.

Delay incurred by transit passengers, pedestrians and bicyclists constitutes over 30 percent of overall person delay at the West Elizabeth Street/Constitution Avenue, West Elizabeth Street/City Park Avenue, and Shields Street/Plum Street intersections during both the AM and PM peak hours.

At the Shields Street/Plum Street intersection, transit passenger, pedestrian and bicyclist delay constitutes 55 percent and 46 percent of overall person delay during the AM and PM peak hours, respectively.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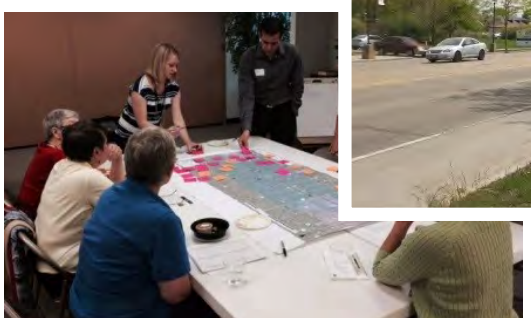
Section 4

COMMUNITY ENGAGEMENT

The West Elizabeth Enhanced Travel Corridor Plan process began Spring 2015. From the beginning, a high priority was to directly engage residents, businesses, and stakeholders in an effective, meaningful, and equitable way to ensure their interests and concerns would be heard and that their ideas would be reflected in the future vision for the corridor.

COMMUNITY ENGAGEMENT



HIGH-TECH TOOLS & BROADCAST MEDIA

- Online Surveys
- Online WikiMap
- Electronic Polling
- Press Releases
- News Articles
- Postcard Mailings
- Email Notifications
- Flyers
- Posters

PUBLIC ACTIVITIES & EVENTS

- Neighborhood Listening Sessions
- Walking, Biking & Transit Tours
- Open Streets
- Focus Groups
- Technical Advisory Committee Meetings
- Stakeholder Committee Meetings

KEY STAKEHOLDERS

- Neighborhood Residents
- Business Owners
- CSU Students, Faculty, Staff & Administration
- Property Owners
- Local Developers
- HOAs & Neighborhood Associations
- Multi-family Housing Managers
- Alternative Transportation Advocates
- Safe Routes to School
- City Boards & Commissions
- City Departments

OUTREACH STRATEGIES

Three strategies for public engagement were used through the Corridor Understanding (Phase 1) of the planning process: high-tech tools and broadcast media; public activities and events; and outreach to boards and committees. These events and tools were used to:

- Explain the planning process and how the West Elizabeth ETC relates to other planning efforts
- Set the foundation for an ongoing dialogue about the issues, needs, vision, and priorities for the corridor
- Seek to understand current and future opportunities, issues, and needs for the area

PHASE 1 OUTREACH EVENTS

MARCH

CSU Housing Fair: March 4

CSU Conservation Leadership Through Learning Class: March 9

APRIL

CSU Bicycle Advisory Committee: April 9

CSU Built Environment Class: April 13

CSU Earth Day Fair: April 22

Associated Students of CSU Meeting: April 22

Bicycle Advisory Committee: April 27

Neighborhood Listening Session: April 29

MAY

Neighborhood Listening Session: May 4

City Joint Planning Open House: May 6

Planning & Zoning Board: May 8

Neighborhood Walking, Biking & Transit Tours: May 11-14

Transfort Shift Meetings: May 13

Senior Advisory Board: May 13

Technical Advisory Committee Meeting #1: May 19

Transportation Board: May 20

Transfort Employee Engagement: May 28

JUNE

Open Streets: June 7

JULY

Woodbridge Senior Housing Listening Session: July 1

Focus Group Meeting: July 8

Stakeholder Committee Meeting #1: July 8

CSU Bicycle Advisory Committee: July 9

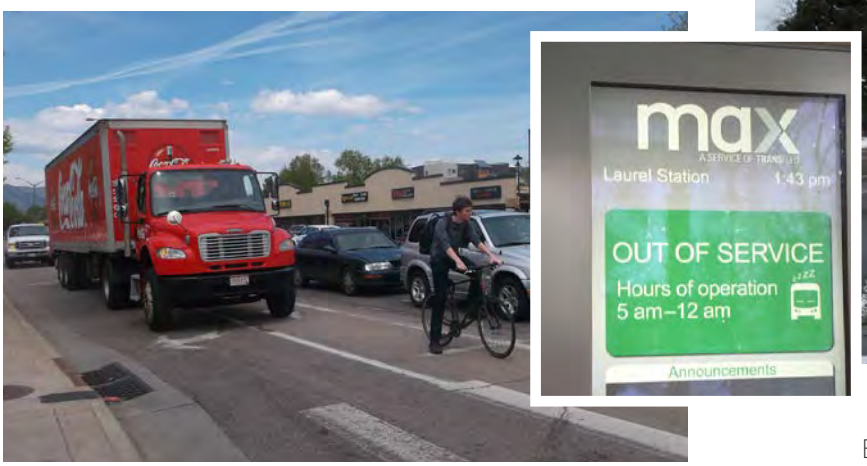
North Front Range MPO TAC Meeting: July 15

WHAT WE'VE HEARD

During the public engagement process to gather input on existing conditions, several common themes regarding the current experience of traveling in the corridor emerged. Below are key themes organized by transportation mode. Please see **Appendix E** for additional outreach details.

DRIVING

- Challenging to make left turns to and from driveways
- Conflicts with pedestrians and bicyclists
- Speeding
- Sight distance issues



Challenges exist between cars, bikes, and pedestrians in heavily trafficked areas such as Campus West where multiple access points exist to reach local businesses and housing.

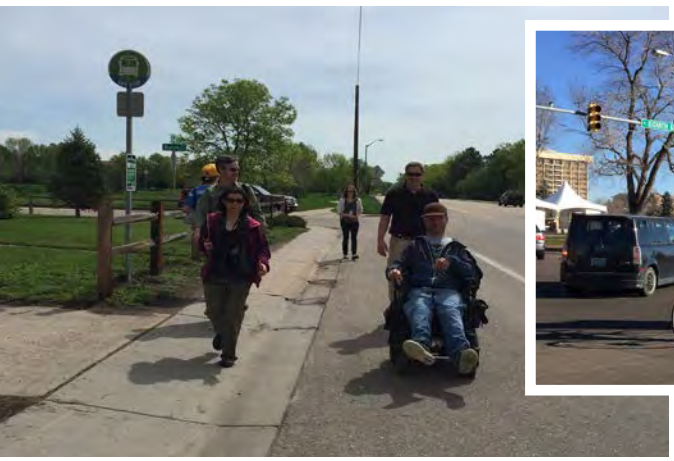
TRANSIT

- Overcrowded buses, people are left behind
- Not enough bus stop amenities
- Not enough service (e.g., late-night, weekend, summer)

Bus stops across the corridor often lack benches, shelters, as well as ADA-compliant adjacent sidewalks, and loading pads.

WALKING

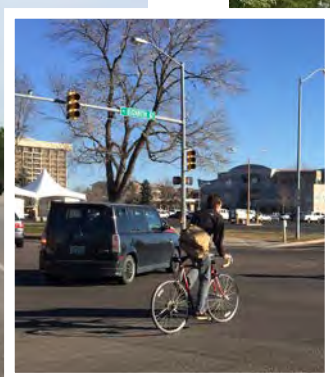
- Inconsistent facilities, lack of sidewalks
- Not comfortable
- Largely not ADA-complaint
- Hard to cross West Elizabeth Street at key intersections
- Lack of sufficient midblock crossing opportunities



Several portions of West Elizabeth are not ADA-compliant, forcing people using mobility devices to travel in bike lanes next to vehicular traffic.

BIKING

- Inconsistent facilities in west segment
- Lots of driveway conflicts in Campus West
- Challenging intersections (e.g., West Elizabeth at Taft Hill, City Park, Shields)
- High number of cyclist crashes



Bicycle facilities are inconsistent, disappearing or turning into shared lane conditions in the western portion of the corridor.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Section 5

SUMMARY

The West Elizabeth Corridor's context is unique in the City of Fort Collins. Previous planning efforts have identified needs for a corridor-focused plan to meet the Transportation Master Plan's vision of an Enhanced Travel Corridor that emphasizes high-frequency transit, bicycling, and walking.

SUMMARY

The West Elizabeth Corridor currently performs well in some areas while other areas can be improved. **Figure 45** shows multimodal performance in the corridor that combines level of service for all modes: vehicles, transit, pedestrians and bicyclists. Several segments of the corridor have a low pedestrian level of service which reflects a low level of comfort. Bicyclist level of traffic stress indicates a relatively high level of comfort; however, the comfort of existing bicycling infrastructure is not high enough to serve lower-confidence bicyclists and does not consider the conflict caused by high traffic access points. Transit level of service, primarily a measure of stop amenities and transit access by walking and biking, is relatively high. However, deeper analysis of the corridor's transit ridership and operations reveals areas for improvement. Vehicle operations on the corridor are generally good although there are some intersections which experience congestion during peak hour.

Future steps of the West Elizabeth Enhanced Travel Corridor Plan development process will build upon the findings of this Corridor Understanding Report.

In addition to the multimodal level of service analysis, this report's safety analysis reveals some intersections and segments on the corridor with more crashes than expected, including the intersections of West Elizabeth Street/Shields Street and West Elizabeth Street/Overland Trail. Finally, person-mobility analysis on the corridor reveals that not all intersection users incur the same levels of delay.

Future steps of the West Elizabeth Enhanced Travel Corridor Plan development process will build upon the findings of this Corridor Understanding Report: developing the purpose and need statement and corridor vision, developing alternative improvement scenarios, analyzing alternative improvement scenarios, and selecting and developing a preferred alternative.


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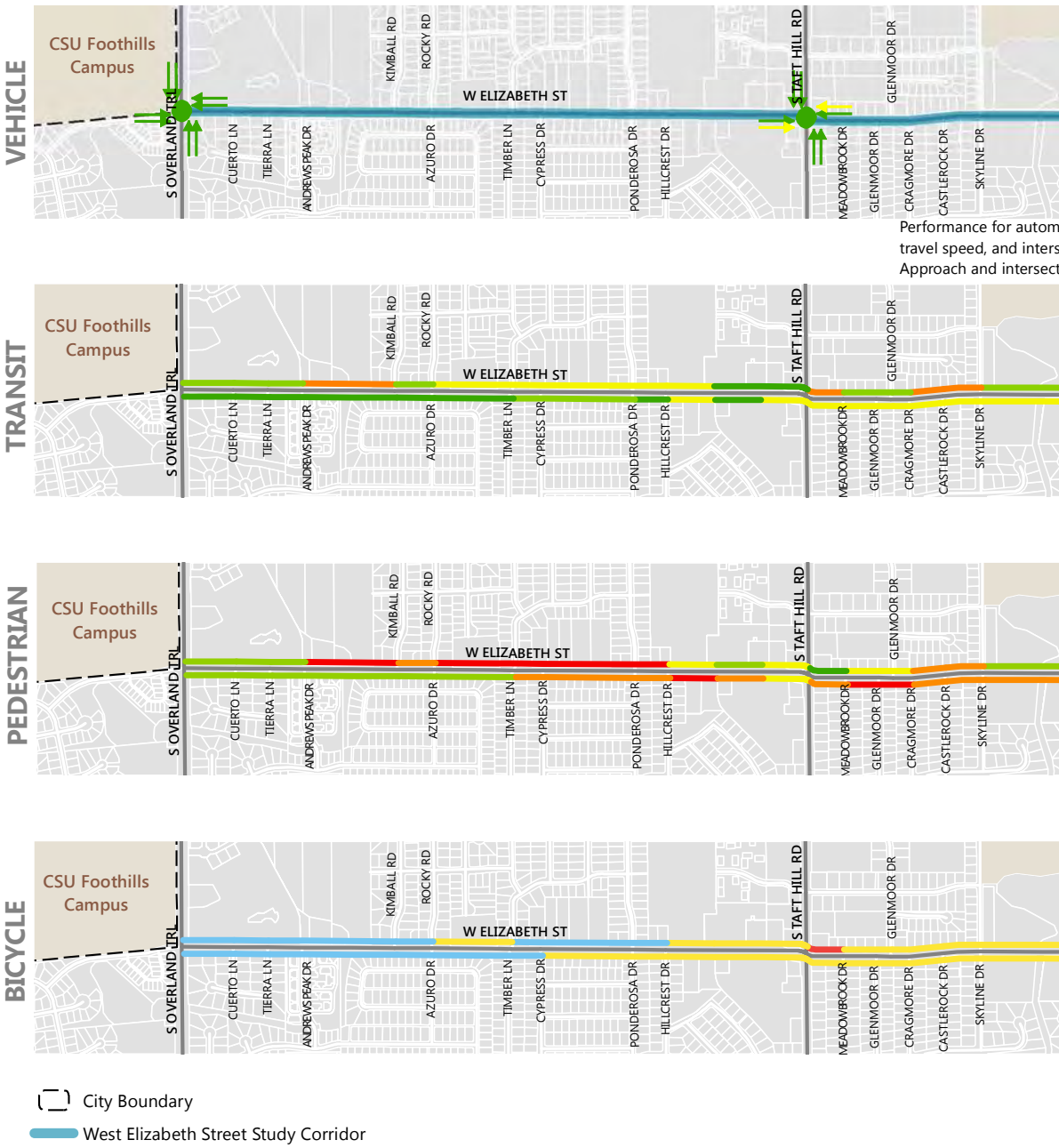
31

FIGURE 45: West Elizabeth Street Multimodal Level of Service



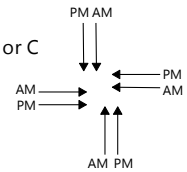
Performance for autom
travel speed, and inters
Approach and intersect

***Additional study intersections can be viewed on the Vehicle Level of Service map**

obiles is based on approach level of service (LOS), which accounts for vehicle
section level of service (LOS), which accounts for vehicle delay at intersections.
tion LOS are based on 2035 traffic volumes and HCM 2000 methodologies.

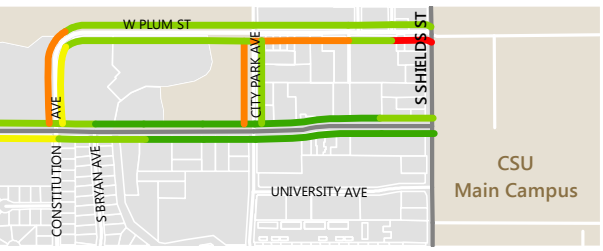
Approach LOS

- LOS A, B, or C
- LOS D
- LOS E
- LOS F



Intersection LOS

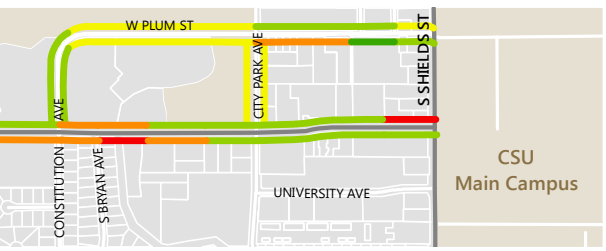
- LOS A, B, or C
- LOS D
- LOS E
- LOS F



Transit LOS

- 4 (Low)
- 5
- 6 (Medium)
- 7
- 8 - 9 (High)

The transit score is based on transit reliability (roadway LOS) and built environment factors including proximate walkways and bikeways and bus stop amenities.



Pedestrian LOS

- 2 - 4 (Low)
- 5 - 7
- 8 - 9 (Medium)
- 10 - 12
- 13 - 15 (High)

The pedestrian score is based on sidewalk width, buffer width and distance to the nearest crossing.

Bicycle LTS

- 2
- 3
- 5

LTS applies the same methodology that is used in the 2014 Bicycle Master Plan. The score from 1-5 represents the level of bicyclist comfort based on traffic volume, speed, number of lanes, and presence and quality of the bikeway.

Section 7

APPENDICES

APPENDIX A: CSU Student and Employee Residence Data

APPENDIX B: Traffic Operation Calculations

APPENDIX C: Transfort Route Profiles

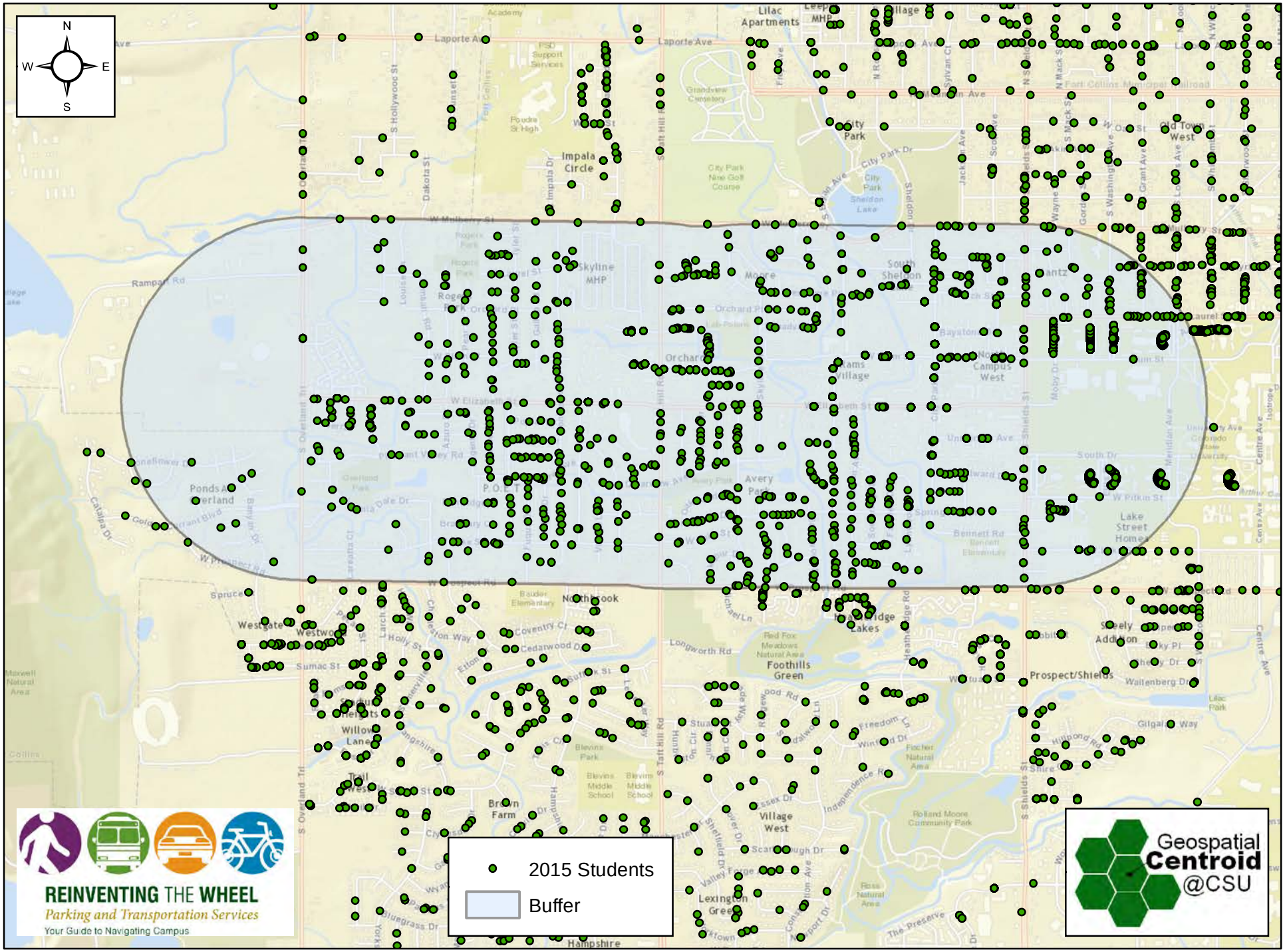
APPENDIX D: Crash Diagrams

APPENDIX E: Community Engagement Details

West Elizabeth Enhanced Travel Corridor Plan

APPENDIX A: CSU STUDENT AND EMPLOYEE RESIDENCE DATA

5,098 Students within West Elizabeth Study Area



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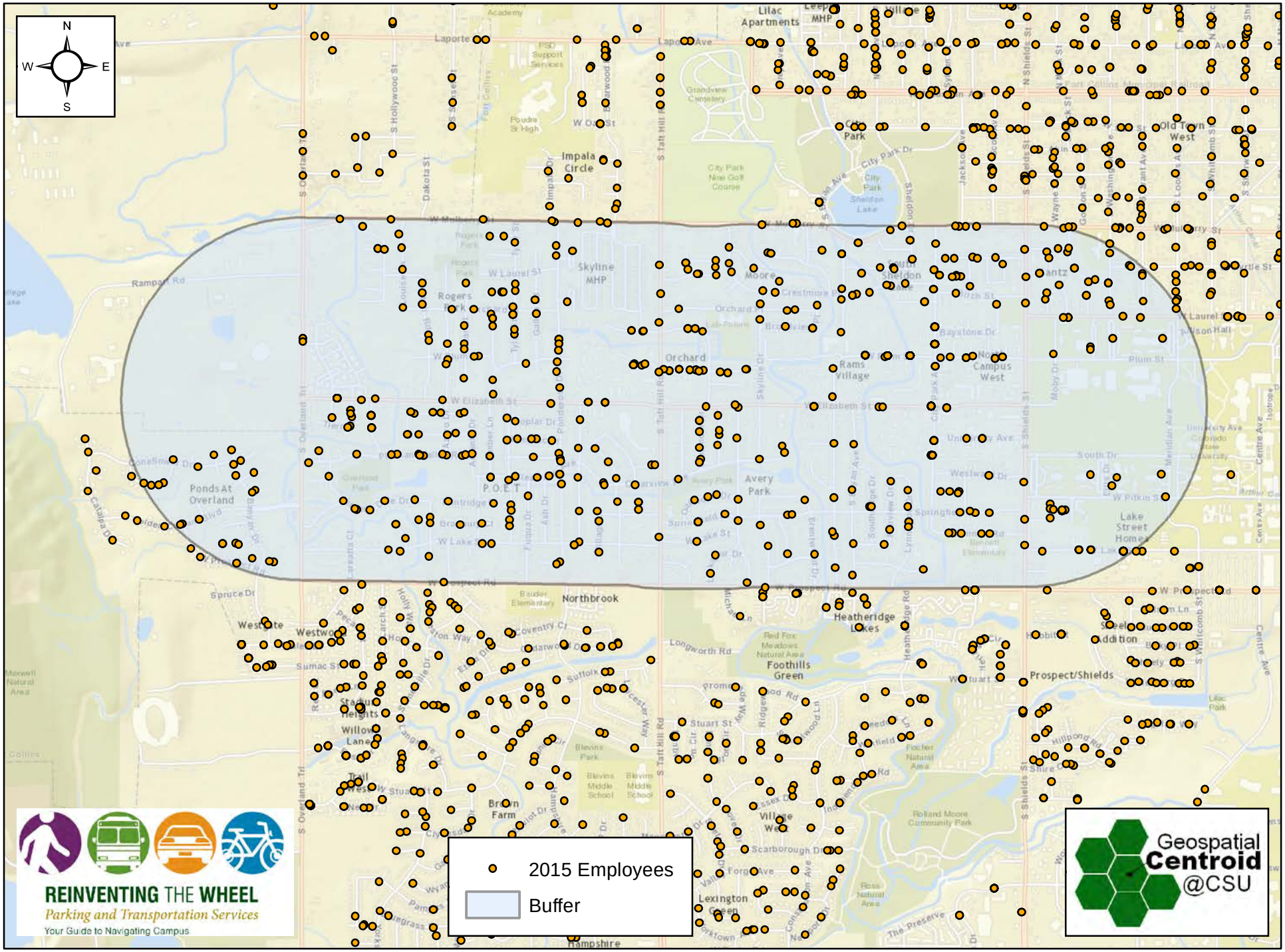
835 Employees within West Elizabeth Study Area



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APPENDIX B: TRAFFIC OPERATIONS CALCULATIONS

MOTORIZED VEHICLE DELAY AND LEVEL OF SERVICE

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **Existing**
Volume and Delay by Movement **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	710	98.8%	6.7	1.8	A	87
	Right Turn	413	410	99.2%	9.1	1.7	A	68
	Subtotal	1,132	1,120	98.9%	7.6	1.5	A	155
SB	Left Turn	130	133	102.3%	24.8	4.7	C	61
	Through	667	659	98.8%	11.8	1.1	B	143
	Right Turn							
	Subtotal	797	792	99.4%	14.0	1.3	B	204
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	124	97.0%	45.7	4.9	D	104
	Through							
	Right Turn	61	58	94.9%	9.1	1.8	A	10
	Subtotal	189	182	96.3%	34.4	3.0	C	114
Total		2,118	2,094	98.9%	12.0	1.1	B	472

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	13	96.2%	8.0	7.0	A	2
	Through	1,064	1,057	99.4%	3.2	1.2	A	61
	Right Turn	37	39	104.3%	4.2	2.2	A	3
	Subtotal	1,114	1,108	99.5%	3.3	1.1	A	66
SB	Left Turn	13	13	100.8%	25.7	14.6	C	6
	Through	764	756	98.9%	5.5	0.6	A	77
	Right Turn	18	17	93.3%	6.3	3.7	A	2
	Subtotal	795	786	98.8%	5.9	0.7	A	85
EB	Left Turn	51	51	100.6%	59.8	14.9	E	56
	Through	25	32	126.0%	61.7	8.9	E	36
	Right Turn	34	34	98.5%	51.7	13.6	D	32
	Subtotal	110	116	105.7%	58.0	11.3	E	124
WB	Left Turn	17	18	104.7%	39.2	24.2	D	13
	Through	18	26	143.3%	41.1	10.2	D	19
	Right Turn	17	17	98.2%	10.2	6.4	B	3
	Subtotal	52	60	116.0%	33.2	8.4	C	35
Total		2,071	2,071	100.0%	9.4	1.1	A	310

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	142	101.1%	27.9	6.6	C	72
	Through	851	841	98.8%	13.1	1.7	B	202
	Right Turn	54	55	101.5%	11.9	3.6	B	12
	Subtotal	1,045	1,038	99.3%	15.1	1.9	B	286
SB	Left Turn	24	24	97.9%	39.9	16.3	D	17
	Through	653	647	99.1%	7.4	2.2	A	88
	Right Turn	138	137	98.9%	3.3	0.7	A	8
	Subtotal	815	807	99.0%	7.7	2.0	A	114
EB	Left Turn	258	263	101.8%	42.9	4.8	D	206
	Through	27	27	100.4%	44.0	8.9	D	22
	Right Turn	296	294	99.4%	32.9	10.9	C	177
	Subtotal	581	584	100.5%	38.3	3.2	D	406
WB	Left Turn	15	14	92.7%	41.6	29.7	D	11
	Through	5	5	92.0%	17.8	25.0	B	1
	Right Turn	5	5	94.0%	8.4	15.5	A	1
	Subtotal	25	23	92.8%	37.8	23.9	D	13
Total		2,466	2,452	99.4%	18.3	1.3	B	819

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **Existing**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,182	100.4%	3.1	0.7	A	68
	Right Turn	154	150	97.1%	3.7	1.4	A	10
	Subtotal	1,332	1,332	100.0%	3.2	0.7	A	78
SB	Left Turn	123	116	94.1%	37.7	7.5	D	80
	Through	768	752	97.9%	5.2	1.0	A	72
	Right Turn							
	Subtotal	891	868	97.4%	9.6	2.2	A	151
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	61	100.3%	46.3	3.3	D	52
	Through							
	Right Turn	37	35	94.6%	5.1	1.0	A	3
	Subtotal	98	96	98.2%	33.1	2.9	C	55
Total		2,321	2,296	98.9%	7.4	1.2	A	285

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	53	95.4%	25.6	6.2	C	25
	Through	946	940	99.4%	23.9	3.2	C	412
	Right Turn	136	133	97.6%	17.1	2.6	B	42
	Subtotal	1,138	1,126	99.0%	23.2	3.1	C	479
SB	Left Turn	145	153	105.3%	38.1	10.6	D	107
	Through	630	602	95.6%	7.2	1.3	A	80
	Right Turn	54	55	101.1%	2.5	0.6	A	2
	Subtotal	829	810	97.7%	13.2	2.9	B	189
EB	Left Turn	241	241	99.8%	171.5	47.8	F	756
	Through	713	727	101.9%	151.0	37.8	F	2,011
	Right Turn	152	145	95.1%	109.7	36.5	F	291
	Subtotal	1,106	1,112	100.5%	149.9	38.9	F	3,058
WB	Left Turn	71	71	99.9%	55.7	8.0	E	72
	Through	233	237	101.7%	41.7	5.1	D	181
	Right Turn	145	147	101.1%	32.4	6.7	C	87
	Subtotal	449	455	101.2%	41.1	4.7	D	341
Total		3,522	3,503	99.4%	66.8	14.0	E	4,067

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	27	110.4%	20.2	8.1	C	10
	Through	33	35	106.1%	20.4	2.5	C	13
	Right Turn	35	36	101.7%	9.3	2.9	A	6
	Subtotal	92	97	105.5%	16.8	3.3	B	29
SB	Left Turn	34	36	105.0%	26.8	8.1	C	18
	Through	32	33	104.1%	0.6	0.5	A	0
	Right Turn	18	25	136.1%	8.0	1.4	A	4
	Subtotal	84	94	111.3%	12.5	4.3	B	22
EB	Left Turn	53	52	97.5%	7.5	2.3	A	7
	Through	441	441	100.0%	5.2	1.1	A	42
	Right Turn	66	68	102.7%	7.5	1.3	A	9
	Subtotal	560	561	100.1%	5.7	1.0	A	59
WB	Left Turn	30	30	99.7%	13.0	4.4	B	7
	Through	160	159	99.1%	4.5	2.0	A	13
	Right Turn	45	42	93.6%	2.5	1.8	A	2
	Subtotal	235	231	98.1%	5.2	1.8	A	22
Total		971	982	101.1%	7.6	1.0	A	131

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	3	106.7%	7.4	7.2	A	0
	Through	4	4	87.5%	11.9	12.5	B	1
	Right Turn	20	20	102.0%	4.9	1.1	A	2
	Subtotal	27	27	100.4%	7.4	2.2	A	3
SB	Left Turn	36	38	105.3%	22.8	5.3	C	16
	Through	9	9	101.1%	26.1	8.1	C	4
	Right Turn	32	38	117.8%	8.5	3.0	A	6
	Subtotal	77	85	110.0%	16.7	3.3	B	26
EB	Left Turn	26	24	92.3%	5.5	2.4	A	2
	Through	499	497	99.7%	4.2	1.2	A	38
	Right Turn	5	5	108.0%	2.4	2.7	A	0
	Subtotal	530	527	99.4%	4.3	1.2	A	41
WB	Left Turn	2	2	75.0%	1.3	2.9	A	0
	Through	150	153	101.7%	3.2	1.9	A	9
	Right Turn	15	22	144.7%	5.8	2.9	A	2
	Subtotal	167	176	105.3%	3.5	1.7	A	11
Total		801	814	101.7%	6.0	1.2	A	82

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	49	95.3%	16.6	5.1	B	15
	Through	739	740	100.2%	19.5	2.0	B	265
	Right Turn	111	105	94.3%	18.2	2.0	B	35
	Subtotal	901	894	99.2%	19.2	2.0	B	314
SB	Left Turn	91	94	103.7%	23.6	5.0	C	41
	Through	547	550	100.5%	13.8	1.4	B	139
	Right Turn	47	48	102.1%	12.5	4.6	B	11
	Subtotal	685	692	101.1%	15.0	1.5	B	191
EB	Left Turn	121	122	100.8%	32.3	5.1	C	72
	Through	239	243	101.5%	44.9	3.2	D	200
	Right Turn	153	154	100.6%	17.8	4.8	B	50
	Subtotal	513	519	101.1%	33.9	3.6	C	322
WB	Left Turn	100	98	98.3%	29.4	2.5	C	53
	Through	109	116	106.3%	30.7	3.6	C	65
	Right Turn	32	33	103.4%	5.9	2.0	A	4
	Subtotal	241	247	102.6%	27.4	2.7	C	122
Total		2,340	2,352	100.5%	22.1	1.9	C	949

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	97.5%	3.0	1.9	A	0
	Through	455	447	98.2%	0.5	0.1	A	4
	Right Turn	69	68	98.1%	0.9	0.1	A	1
	Subtotal	528	519	98.2%	0.6	0.1	A	6
SB	Left Turn	33	38	115.2%	7.7	1.9	A	5
	Through	272	282	103.5%	0.4	0.1	A	2
	Right Turn	10	10	103.0%	0.4	0.2	A	0
	Subtotal	315	330	104.7%	1.2	0.3	A	8
EB	Left Turn	11	12	108.2%	9.5	4.0	A	2
	Through	1	1	100.0%	0.7	2.1	A	0
	Right Turn	1	1	60.0%	1.0	2.1	A	0
	Subtotal	13	14	103.8%	9.3	4.0	A	2
WB	Left Turn	51	56	109.0%	23.0	8.6	C	23
	Through	4	4	95.0%	6.1	6.0	A	0
	Right Turn	65	64	98.5%	15.2	6.1	C	18
	Subtotal	120	123	102.8%	19.0	7.6	C	42
Total		976	985	101.0%	3.2	1.0	A	57

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	840	97.9%	6.9	2.0	A	107
	Right Turn	428	422	98.5%	8.9	1.7	A	69
	Subtotal	1,286	1,261	98.1%	7.6	1.7	A	176
SB	Left Turn	99	96	97.3%	48.6	10.1	D	86
	Through	971	932	96.0%	17.5	1.9	B	298
	Right Turn							
	Subtotal	1,070	1,028	96.1%	20.7	2.1	C	384
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	495	99.5%	65.5	11.3	E	594
	Through							
	Right Turn	154	151	97.8%	38.1	12.3	D	105
	Subtotal	651	645	99.1%	59.7	11.3	E	699
Total		3,007	2,935	97.6%	24.0	3.3	C	1259

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	62	88.6%	129.0	63.7	F	147
	Through	1,205	1,189	98.6%	3.8	0.6	A	82
	Right Turn	56	60	107.0%	3.2	1.6	A	3
	Subtotal	1,331	1,310	98.5%	10.2	5.2	B	232
SB	Left Turn	18	16	90.0%	38.0	13.3	D	11
	Through	1,390	1,354	97.4%	8.7	3.4	A	216
	Right Turn	60	57	95.5%	6.6	2.8	A	7
	Subtotal	1,468	1,427	97.2%	9.0	3.3	A	234
EB	Left Turn	59	54	92.0%	70.3	18.8	E	70
	Through	23	26	113.5%	73.5	23.4	E	35
	Right Turn	61	59	97.0%	73.1	25.6	E	79
	Subtotal	143	140	97.6%	72.7	20.6	E	185
WB	Left Turn	56	50	90.0%	64.7	40.5	E	60
	Through	24	28	117.1%	63.1	25.7	E	33
	Right Turn	22	20	90.0%	27.5	12.7	C	10
	Subtotal	102	98	96.4%	56.6	32.9	E	102
Total		3,044	2,976	97.8%	14.0	3.6	B	754

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	252	92.4%	122.8	43.6	F	568
	Through	1,001	983	98.2%	39.2	21.5	D	707
	Right Turn	57	57	100.7%	28.5	17.6	C	30
	Subtotal	1,331	1,292	97.1%	54.0	25.7	D	1305
SB	Left Turn	10	8	82.0%	40.9	27.7	D	6
	Through	1,067	1,036	97.1%	25.4	6.8	C	483
	Right Turn	430	412	95.7%	16.5	4.9	B	125
	Subtotal	1,507	1,456	96.6%	23.1	6.0	C	614
EB	Left Turn	324	326	100.7%	59.2	6.7	E	354
	Through	48	46	95.8%	63.9	11.7	E	54
	Right Turn	379	355	93.7%	60.8	19.7	E	396
	Subtotal	751	727	96.9%	60.7	10.3	E	804
WB	Left Turn	61	63	103.3%	41.0	10.4	D	47
	Through	36	35	96.9%	46.5	8.9	D	30
	Right Turn	6	4	73.3%	13.0	14.7	B	1
	Subtotal	103	102	99.3%	43.0	6.9	D	78
Total		3,692	3,578	96.9%	41.7	8.6	D	2801

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,261	99.4%	2.8	0.5	A	65
	Right Turn	52	51	98.8%	2.8	1.3	A	3
	Subtotal	1,320	1,312	99.4%	2.8	0.5	A	68
SB	Left Turn	92	90	97.4%	40.0	9.2	D	66
	Through	1,360	1,300	95.6%	16.1	5.6	B	384
	Right Turn							
	Subtotal	1,452	1,389	95.7%	17.6	5.6	B	450
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	117	99.8%	48.8	8.6	D	104
	Through							
	Right Turn	157	155	98.7%	8.1	1.7	A	23
	Subtotal	274	272	99.2%	26.6	5.3	C	127
Total		3,046	2,973	97.6%	12.2	3.1	B	645

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	159	99.1%	53.1	4.6	D	154
	Through	908	901	99.2%	34.5	5.0	C	570
	Right Turn	137	135	98.5%	22.9	3.4	C	57
	Subtotal	1,205	1,195	99.1%	35.9	4.3	D	781
SB	Left Turn	218	220	101.0%	55.3	14.2	E	223
	Through	1,080	1,015	94.0%	23.7	6.1	C	441
	Right Turn	179	170	94.9%	14.4	5.6	B	45
	Subtotal	1,477	1,405	95.1%	28.0	5.8	C	709
EB	Left Turn	158	154	97.4%	57.5	6.2	E	162
	Through	396	395	99.7%	41.2	3.7	D	298
	Right Turn	159	163	102.2%	19.4	2.6	B	58
	Subtotal	713	711	99.8%	39.5	3.0	D	518
WB	Left Turn	196	181	92.2%	111.4	12.8	F	369
	Through	637	624	97.9%	97.5	13.1	F	1115
	Right Turn	254	251	98.9%	98.8	12.2	F	455
	Subtotal	1,087	1,056	97.1%	100.2	12.1	F	1939
Total		4,482	4,367	97.4%	50.6	3.1	D	3948

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	155	100.0%	34.4	10.7	C	98
	Through	107	106	99.3%	24.9	6.9	C	49
	Right Turn	87	87	100.5%	20.3	9.0	C	33
	Subtotal	349	349	99.9%	28.1	9.2	C	179
SB	Left Turn	73	74	100.7%	23.1	9.5	C	31
	Through	101	103	101.8%	2.8	2.0	A	5
	Right Turn	51	56	109.6%	13.9	3.0	B	14
	Subtotal	225	232	103.2%	12.1	4.9	B	51
EB	Left Turn	61	60	98.0%	18.7	3.7	B	21
	Through	508	501	98.6%	7.9	0.6	A	72
	Right Turn	96	96	99.5%	10.3	1.3	B	18
	Subtotal	665	656	98.7%	9.3	0.7	A	111
WB	Left Turn	89	84	94.8%	28.2	5.3	C	44
	Through	491	463	94.3%	9.5	1.0	A	80
	Right Turn	77	73	94.7%	9.9	1.7	A	13
	Subtotal	657	620	94.4%	12.0	1.2	B	137
Total		1,896	1,857	98.0%	14.5	2.4	B	477

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	85.0%	6.3	11.8	A	0
	Through	26	25	94.2%	22.8	8.8	C	10
	Right Turn	35	35	98.6%	6.7	3.5	A	4
	Subtotal	63	61	96.3%	13.2	3.2	B	15
SB	Left Turn	36	36	100.6%	25.4	8.2	C	17
	Through	22	20	90.9%	20.4	7.4	C	7
	Right Turn	74	81	108.8%	12.6	2.6	B	19
	Subtotal	132	137	103.6%	17.1	3.3	B	43
EB	Left Turn	47	46	98.5%	26.3	14.4	C	22
	Through	531	524	98.7%	5.8	1.1	A	56
	Right Turn	6	7	115.0%	3.2	3.1	A	0
	Subtotal	584	578	98.9%	7.4	1.8	A	78
WB	Left Turn	39	40	103.3%	8.5	3.4	A	6
	Through	622	586	94.2%	8.8	3.7	A	95
	Right Turn	47	52	111.5%	10.2	4.2	B	10
	Subtotal	708	679	95.9%	8.9	3.5	A	111
Total		1,487	1,454	97.8%	9.0	2.3	A	247

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	131	96.0%	33.9	4.4	C	81
	Through	577	578	100.2%	20.6	2.2	C	219
	Right Turn	129	125	97.1%	17.0	2.8	B	39
	Subtotal	842	834	99.0%	22.3	1.8	C	339
SB	Left Turn	106	107	100.8%	47.3	14.7	D	93
	Through	768	747	97.3%	32.7	6.9	C	448
	Right Turn	84	86	101.9%	34.6	9.1	C	54
	Subtotal	958	939	98.1%	34.5	7.6	C	595
EB	Left Turn	162	158	97.5%	56.9	19.1	E	165
	Through	305	308	100.8%	47.2	6.4	D	266
	Right Turn	121	115	95.0%	27.9	8.5	C	59
	Subtotal	588	580	98.7%	46.2	10.0	D	490
WB	Left Turn	178	164	92.2%	53.6	17.8	D	161
	Through	319	308	96.4%	41.4	9.8	D	233
	Right Turn	77	75	97.3%	10.3	4.2	B	14
	Subtotal	574	547	95.2%	41.4	10.2	D	409
Total		2,962	2,900	97.9%	34.3	4.0	C	1832

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	3.4	4.6	A	0
	Through	322	319	99.0%	0.5	0.1	A	3
	Right Turn	83	80	96.9%	1.1	0.2	A	2
	Subtotal	407	401	98.6%	0.6	0.1	A	4
SB	Left Turn	73	75	102.7%	4.5	1.1	A	6
	Through	537	539	100.3%	0.6	0.1	A	5
	Right Turn	7	9	125.7%	0.7	0.4	A	0
	Subtotal	617	622	100.9%	1.0	0.2	A	12
EB	Left Turn	2	3	140.0%	8.4	11.2	A	0
	Through							
	Right Turn	3	3	96.7%	2.5	2.6	A	0
	Subtotal	5	6	114.0%	7.5	10.0	A	1
WB	Left Turn	69	67	97.1%	26.8	7.0	D	33
	Through	5	6	124.0%	8.0	7.2	A	1
	Right Turn	67	64	96.1%	10.3	2.5	B	12
	Subtotal	141	138	97.6%	18.1	3.9	C	46
Total		1,170	1,167	99.7%	3.1	0.6	A	63

TRANSIT INTERSECTION DELAY

AM PEAK HOUR

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	52.8	5.1	4.2
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	52.8	5.1	4.2
Total		4	120	4	100.0%	35.2	3.4	4.2

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	0.0	0.0	0.0
	Right Turn	3	205	3	100.0%	11.5	9.0	9.8
	Subtotal	5	306	5	100.0%	11.5	9.0	9.8
SB	Left Turn							
	Through	2	19	2	100.0%	16.4	2.9	1.3
	Right Turn							
	Subtotal	2	19	2	100.0%	16.4	2.9	1.3
EB	Left Turn							
	Through	6	490	6	100.0%	78.6	40.5	160.4
	Right Turn							
	Subtotal	6	490	6	100.0%	78.6	40.5	160.4
WB	Left Turn	2	16	2	100.0%	92.4	6.6	6.2
	Through	8	58	8	100.0%	55.0	36.0	13.3
	Right Turn							
	Subtotal	10	74	10	100.0%	67.4	22.9	19.4
Total		23	889	23	100.0%	51.5	15.9	191.0

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	43.2	29.0	18.2
	Right Turn							
	Subtotal	2	101	2	100.0%	43.2	29.0	18.2
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn	2	16	2	100.0%	0.0	0.0	0.0
	Subtotal	4	35	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	205	3	100.0%	45.8	32.0	39.1
	Through							
	Right Turn							
	Subtotal	3	205	3	100.0%	45.8	32.0	39.1
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	341	9	100.0%	29.7	13.1	57.3

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	243	2	100.0%	0.0	0.0	0.0
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	25	2	100.0%	3.4	3.3	0.4
	Subtotal	2	25	2	100.0%	3.4	3.3	0.4
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	268	4	100.0%	2.2	2.2	0.4

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	103	2	100.0%	55.1	9.3	23.6
	Subtotal	2	103	2	100.0%	55.1	9.3	23.6
SB	Left Turn Through Right Turn	2	25	2	100.0%	0.0	0.0	0.0
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	139	2	100.0%	171.5	47.8	99.3
	Subtotal		139					99.3
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	267	4	100.0%	36.7	6.2	123.0

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	154	6	100.0%	30.3	10.0	19.4
	Subtotal	6	154	6	100.0%	30.3	10.0	19.4
EB	Left Turn Through Right Turn	3	201	3	100.0%	18.2	10.6	15.2
	Subtotal	3	201	3	100.0%	18.2	10.6	15.2
WB	Left Turn Through Right Turn	2	16	2	100.0%	15.3	9.2	1.0
	Subtotal	2	16	2	100.0%	15.3	9.2	1.0
Total		11	371	11	100.0%	23.6	6.8	35.7

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	12	2	100.0%	12.4	10.0	0.6
	Subtotal	2	12	2	100.0%	12.4	10.0	0.6
EB	Left Turn							
	Through	3	196	3	100.0%	26.5	29.7	21.7
	Right Turn							
	Subtotal	3	196	3	100.0%	26.5	29.7	21.7
WB	Left Turn							
	Through	2	19	2	100.0%	19.9	9.8	1.6
	Right Turn	6	198	6	100.0%	12.6	5.4	10.4
	Subtotal	8	217	8	100.0%	15.0	5.3	12.0
Total		13	425	13	100.0%	17.0	8.1	34.2

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	38	1	100.0%	19.5	2.0	3.1
	Right Turn							
	Subtotal		38					3.1
SB	Left Turn							
	Through	1	9	1	100.0%	13.8	1.4	0.5
	Right Turn							
	Subtotal		9					0.5
EB	Left Turn							
	Through	4	160	4	100.0%	85.2	13.4	56.8
	Right Turn							
	Subtotal	4	160	4	100.0%	85.2	13.4	56.8
WB	Left Turn							
	Through	4	29	4	102.5%	46.4	16.1	5.6
	Right Turn							
	Subtotal	4	29	4	102.5%	46.4	16.1	5.6
Total		8	236	8	101.3%	60.0	14.2	66.0

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	26	2	100.0%	0.0	0.0	0.0
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn	2	7	2	100.0%	12.6	8.9	0.4
	Through							
	Right Turn							
	Subtotal	2	7	2	100.0%	12.6	8.9	0.4
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	65	2	100.0%	0.0	0.0	0.0
	Through							
	Right Turn	2	16	2	100.0%	64.8	26.8	4.3
	Subtotal	4	81	4	100.0%	64.8	26.8	4.3
Total		8	114	8	100.0%	31.0	10.8	4.7

PM PEAK HOUR

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	19	2	100.0%	0.0	0.0	0.0
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	96.2	48.1	29.2
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	96.2	48.1	29.2
Total		4	92	4	100.0%	64.1	32.1	29.2

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	0.0	0.0	0.0
	Right Turn	3	62	3	100.0%	4.6	5.1	1.2
	Subtotal	5	80	5	100.0%	4.6	5.1	1.2
SB	Left Turn							
	Through	2	73	2	100.0%	18.8	15.1	5.7
	Right Turn							
	Subtotal	2	73	2	100.0%	18.8	15.1	5.7
EB	Left Turn							
	Through	6	211	6	100.0%	116.6	51.6	102.5
	Right Turn							
	Subtotal	6	211	6	100.0%	116.6	51.6	102.5
WB	Left Turn	2	90	2	100.0%	120.3	37.5	45.1
	Through	8	795	8	100.0%	64.3	28.1	212.9
	Right Turn							
	Subtotal	10	885	10	100.0%	83.0	28.2	258.1
Total		23	1,249	23	100.0%	64.8	12.4	367.5

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	74.3	24.1	5.6
	Right Turn							
	Subtotal	2	18	2	100.0%	74.3	24.1	5.6
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn	2	90	2	100.0%	0.0	0.0	0.0
	Subtotal	4	163	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	62	3	100.0%	48.0	34.4	12.4
	Through							
	Right Turn							
	Subtotal	3	62	3	100.0%	48.0	34.4	12.4
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	243	9	100.0%	40.8	16.3	18.0

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	124	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	75	2	100.0%	29.4	15.5	9.2
	Right Turn							
	Subtotal	2	75	2	100.0%	29.4	15.5	9.2
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	199	4	100.0%	19.6	10.3	9.2

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	26	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	75	2	100.0%	35.6	39.9	11.1
	Right Turn							
	Subtotal	2	75	2	100.0%	35.6	39.9	11.1
EB	Left Turn	2	99	2	100.0%	57.5	6.2	23.7
	Through							
	Right Turn							
	Subtotal		99					23.7
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	200	4	100.0%	23.8	26.6	34.8

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	365	6	100.0%	76.5	11.0	116.3
	Subtotal	6	365	6	100.0%	76.5	11.0	116.3
EB	Left Turn							
	Through	3	71	3	100.0%	27.9	10.1	8.2
	Right Turn							
	Subtotal	3	71	3	100.0%	27.9	10.1	8.2
WB	Left Turn							
	Through	2	90	2	100.0%	15.2	5.0	5.7
	Right Turn							
	Subtotal	2	90	2	100.0%	15.2	5.0	5.7
Total		11	526	11	100.0%	49.0	6.9	130.3

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	199	2	100.0%	43.2	18.1	35.8
	Subtotal	2	199	2	100.0%	43.2	18.1	35.8
EB	Left Turn							
	Through	3	74	3	100.0%	27.0	13.2	8.3
	Right Turn							
	Subtotal	3	74	3	100.0%	27.0	13.2	8.3
WB	Left Turn							
	Through	2	88	2	95.0%	27.6	26.6	10.1
	Right Turn	6	316	6	98.3%	16.7	8.8	22.0
	Subtotal	8	404	8	97.5%	20.6	7.9	32.1
Total		13	677	13	98.5%	27.6	6.3	76.2

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through		14	1	100.0%	20.6	2.2	1.2
	Right Turn							
	Subtotal		14					1.2
SB	Left Turn							
	Through		13	1	100.0%	32.7	6.9	1.8
	Right Turn							
	Subtotal		13					1.8
EB	Left Turn							
	Through	4	71	4	92.5%	106.7	26.6	31.6
	Right Turn							
	Subtotal	4	71	4	92.5%	106.7	26.6	31.6
WB	Left Turn							
	Through	4	261	4	100.0%	50.5	24.5	54.9
	Right Turn							
	Subtotal	4	261	4	100.0%	50.5	24.5	54.9
Total		8	359	8	96.3%	81.8	18.0	89.4

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	59	2	100.0%	0.0	0.0	0.0
	Subtotal	2	59	2	100.0%	0.0	0.0	0.0
SB	Left Turn	2	6	2	100.0%	12.1	6.8	0.3
	Through							
	Right Turn							
	Subtotal	2	6	2	100.0%	12.1	6.8	0.3
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	55	2	95.0%	12.1	25.4	2.8
	Through							
	Right Turn	2	7	2	100.0%	57.1	4.9	1.7
	Subtotal	4	62	4	97.5%	57.8	4.5	4.4
Total		8	127	8	98.8%	29.7	4.8	4.7

BICYCLE INTERSECTION DELAY

AM PEAK HOUR

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	10	23	232.0%	8.3	3.9	1.4
	Right Turn	5	4	82.0%	0.1	0.5	0.0
	Subtotal	15	27	182.0%	7.1	3.1	1.4
SB	Left Turn	15	12	77.3%	16.8	11.1	4.2
	Through	4	3	65.0%	2.6	5.6	0.2
	Right Turn						
	Subtotal	19	14	74.7%	15.1	9.2	4.4
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	78.0%	34.4	31.6	2.9
	Through						
	Right Turn						
	Subtotal	5	4	78.0%	34.4	31.6	2.9
Total		39	45	116.4%	12.3	4.5	8.6

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	14	12	84.3%	6.7	10.4	1.6
	Right Turn	5	4	82.0%	0.0	0.0	0.0
	Subtotal	19	16	83.7%	6.7	10.4	1.6
SB	Left Turn	3	3	86.7%	7.9	13.5	0.4
	Through	5	3	60.0%	0.1	0.4	0.0
	Right Turn	1	1	90.0%	0.0	0.0	0.0
	Subtotal	9	7	72.2%	4.4	6.7	0.4
EB	Left Turn	1	1	100.0%	8.4	26.5	0.1
	Through	140	138	98.6%	36.0	3.2	84.0
	Right Turn	2	2	90.0%	8.8	16.1	0.3
	Subtotal	143	141	98.5%	35.9	3.2	84.4
WB	Left Turn						
	Through	7	4	55.7%	19.5	27.5	2.3
	Right Turn						
	Subtotal	7	4	55.7%	19.5	27.5	2.3
Total		178	167	93.9%	31.8	3.1	88.7

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn	1	1	80.0%	3.1	6.4	0.1
	Through	6	12	196.7%	3.4	4.2	0.3
	Right Turn	9	9	102.2%	0.4	1.0	0.1
	Subtotal	16	22	136.3%	2.5	2.7	0.5
SB	Left Turn	4	4	87.5%	12.6	16.5	0.8
	Through	2	0	15.0%	0.0	0.0	0.0
	Right Turn	1	1	110.0%	0.0	0.0	0.0
	Subtotal	7	5	70.0%	10.4	15.5	0.8
EB	Left Turn	8	7	87.5%	29.2	31.0	3.9
	Through	112	140	125.0%	45.5	12.7	85.0
	Right Turn	2	2	100.0%	17.3	29.7	0.6
	Subtotal	122	149	122.1%	45.1	12.7	89.5
WB	Left Turn	3	2	66.7%	26.1	31.1	1.3
	Through	6	6	95.0%	37.4	28.2	3.7
	Right Turn	5	4	82.0%	0.7	1.1	0.1
	Subtotal	14	12	84.3%	28.1	18.7	5.1
Total		159	188	117.9%	38.3	10.2	95.9

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	11	12	107.3%	6.7	10.4	1.2
	Right Turn	52	67	128.5%	0.6	0.8	0.5
	Subtotal	63	79	124.8%	1.1	1.0	1.7
SB	Left Turn	1	1	80.0%	0.5	1.7	0.0
	Through	6	4	63.3%	5.1	8.1	0.5
	Right Turn						
	Subtotal	7	5	65.7%	5.6	7.9	0.5
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	90.0%	44.9	23.6	6.0
	Through						
	Right Turn	7	5	72.9%	7.2	7.8	0.8
	Subtotal	15	12	82.0%	34.7	21.4	6.8
Total		85	96	112.4%	5.4	2.6	9.0

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	41	54	131.0%	15.7	5.5	10.7
	Right Turn						
	Subtotal	41	54	131.0%	15.7	5.5	10.7
SB	Left Turn	1	1	110.0%	5.9	9.7	0.1
	Through	13	9	71.5%	2.1	4.7	0.5
	Right Turn						
	Subtotal	14	10	74.3%	3.1	4.7	0.6
EB	Left Turn	22	25	113.2%	62.9	20.9	23.1
	Through	10	15	149.5%	85.8	36.8	14.3
	Right Turn	4	7	166.3%	55.8	36.8	3.7
	Subtotal	36	68	189.2%	75.5	16.8	41.1
WB	Left Turn						
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	1	0	0.0%	0.0	0.0	0.0
Total		92	132	143.7%	44.3	7.1	52.4

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	6	7	110.0%	16.0	13.1	1.6
	Second Right						
	Subtotal	27	29	105.6%	7.5	2.9	1.6
SB	Left Turn	6	8	126.7%	17.4	15.0	1.7
	Through	2	3	135.0%	0.7	1.7	0.0
	Second Right						
	Subtotal	8	10	128.8%	12.4	13.9	1.8
EB	Left Turn	2	1	50.0%	0.2	0.7	0.0
	Through	93	116	124.5%	11.0	2.7	17.0
	Second Right						
	Subtotal	97	130	134.3%	10.8	2.5	17.0
WB	Left Turn						
	Through	3	3	106.7%	4.0	7.0	0.2
	Second Right						
	Subtotal	6	5	88.3%	3.4	5.7	0.2
Total		138	174	126.4%	10.3	2.6	20.6

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn	1	1	60.0%	0.0	0.0	0.0
	Through	1	0	30.0%	0.0	0.0	0.0
	Right Turn	5	3	50.0%	2.1	1.8	0.2
	Subtotal	7	3	48.6%	2.1	1.8	0.2
SB	Left Turn	1	6	600.0%	17.6	10.8	0.3
	Through	1	6	560.0%	18.5	10.1	0.3
	Right Turn						
	Subtotal	2	23	1160.0%	20.1	8.1	0.6
EB	Left Turn	1	1	120.0%	2.0	5.4	0.0
	Through	62	61	98.5%	12.1	6.4	12.5
	Right Turn						
	Subtotal	63	62	98.9%	12.0	6.5	12.6
WB	Left Turn						
	Through	3	3	103.3%	1.2	2.6	0.1
	Right Turn						
	Subtotal	3	3	103.3%	1.2	2.6	0.1
Total		75	92	122.7%	12.72	4.4	13.4

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	4	4	90.0%	11.9	16.8	0.8
	Right Turn	2	2	85.0%	8.4	14.5	0.3
	Subtotal	6	5	88.3%	13.8	12.8	1.1
SB	Left Turn	2	2	90.0%	4.7	13.7	0.2
	Through	1	1	50.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	3	2	76.7%	4.7	13.7	0.2
EB	Left Turn						
	Through	57	57	99.3%	35.6	9.4	33.8
	Right Turn						
	Subtotal	57	57	99.3%	35.6	9.4	33.8
WB	Left Turn	2	1	25.0%	4.6	14.4	0.2
	Through						
	Right Turn	1	2	150.0%	0.7	1.4	0.0
	Subtotal	3	2	66.7%	3.7	9.5	0.2
Total		69	66	95.9%	30.7	7.5	35.2

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Delay (min)
NB	Left Turn						
	Through	14	15	105.0%	0.0	0.1	0.0
	Right Turn						
	Subtotal	14	15	105.0%	0.0	0.1	0.0
SB	Left Turn						
	Through	5	5	100.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	5	5	100.0%	0.0	0.0	0.0
EB	Left Turn	1	1	120.0%	0.8	1.7	0.0
	Through						
	Right Turn						
	Subtotal	1	1	120.0%	0.8	1.7	0.0
WB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	1	120.0%	3.9	9.7	0.1
	Right Turn	3	0	0.0%	0.0	0.0	0.0
	Subtotal	5	1	24.0%	3.9	9.7	0.1
Total		25	22	88.4%	0.8	1.7	0.1

PM PEAK HOUR

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	3	4	126.7%	9.6	11.6	0.5
	Right Turn	5	4	82.0%	0.5	0.9	0.0
	Subtotal	8	8	98.8%	6.8	7.9	0.5
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	5	81.7%	31.8	32.9	3.2
	Through						
	Right Turn	7	7	95.7%	13.4	13.6	1.6
	Subtotal	13	12	89.2%	28.2	20.3	4.7
Total		23	20	84.8%	17.7	9.4	5.3

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	2	240.0%	143.0	171.5	2.4
	Through	7	5	71.4%	3.4	6.3	0.4
	Right Turn	3	1	26.7%	1.7	5.3	0.1
	Subtotal	11	8	74.5%	87.2	114.6	2.9
SB	Left Turn						
	Through	5	3	64.0%	1.2	2.5	0.1
	Right Turn	2	2	90.0%	0.7	1.5	0.0
	Subtotal	7	5	71.4%	1.5	1.7	0.1
EB	Left Turn	1	2	150.0%	9.9	21.9	0.2
	Through	36	35	97.5%	37.2	11.8	22.3
	Right Turn						
	Subtotal	37	37	98.9%	36.2	11.9	22.5
WB	Left Turn	2	2	100.0%	25.9	53.7	0.9
	Through	119	118	98.7%	45.6	17.9	90.4
	Right Turn						
	Subtotal	121	120	98.8%	46.4	20.2	91.2
Total		176	169	96.2%	43.81	11.0	116.68

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	2	2	85.0%	24.1	39.5	1
	Through	9	5	55.6%	3.4	6.3	0.5
	Right Turn	5	4	82.0%	0.9	2.7	0.1
	Subtotal	16	11	67.5%	18.7	31.3	1.4
SB	Left Turn	1	1	120.0%	26.8	47.5	0.4
	Through	3	2	60.0%	1.1	1.9	0.1
	Right Turn	3	2	76.7%	1.3	2.2	0.1
	Subtotal	7	5	75.7%	25.8	47.7	0.6
EB	Left Turn	1	1	140.0%	26.8	35.6	0.4
	Through	12	12	95.8%	47.0	19.0	9.4
	Right Turn	1	1	130.0%	1.7	2.6	0.0
	Subtotal	14	14	101.4%	43.0	16.9	9.9
WB	Left Turn	3	3	96.7%	19.3	26.4	1.0
	Through	102	101	98.9%	44.8	5.5	76.1
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	106	105	98.9%	43.9	5.2	77.1
Total		143	135	94.5%	40.1	5.4	88.9

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	9	5	55.6%	9.2	12.1	1.4
	Right Turn						
	Subtotal	9	5	55.6%	9.2	12.1	1.4
SB	Left Turn						
	Through	7	6	90.0%	8.0	13.6	0.9
	Right Turn						
	Subtotal	7	6	90.0%	8.0	13.6	0.9
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	86.3%	40.8	26.6	5.4
	Through						
	Right Turn	7	6	90.0%	5.3	8.7	0.6
	Subtotal	15	13	88.0%	27.6	18.7	6.1
Total		31	25	79.0%	17.8	9.9	8.4

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	0	0.0%	0.0	0.0	0
	Through	25	22	86.0%	25.8	10.5	10.7
	Right Turn	1	2	150.0%	0.0	0.0	0.0
	Subtotal	27	23	85.2%	24.7	10.1	10.7
SB	Left Turn						
	Through	15	13	84.7%	20.0	16.3	5.0
	Right Turn						
	Subtotal	15	13	84.7%	20.0	16.3	5.0
EB	Left Turn	9	7	77.8%	48.4	36.2	7.3
	Through	2	2	95.0%	27.5	31.6	0.9
	Right Turn						
	Subtotal	11	9	80.9%	50.1	28.8	8.2
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	45	84.2%	28.8	8.6	23.9

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	3	3	90.0%	5.4	11.1	0
	Through	9	8	93.3%	14.9	6.1	2.2
	Right Turn	4	5	115.0%	2.7	4.7	0.2
	Subtotal	16	16	98.1%	14.5	6.7	2.7
SB	Left Turn	5	5	98.0%	15.8	14.2	1.3
	Through	8	9	106.3%	0.4	0.4	0.0
	Right Turn	1	1	60.0%	1.0	1.7	0.0
	Subtotal	14	14	100.0%	7.9	6.5	1.4
EB	Left Turn	1	1	130.0%	8.2	15.1	0.1
	Through	29	33	113.1%	16.4	5.0	7.9
	Right Turn	1	1	110.0%	0.3	0.9	0.0
	Subtotal	31	35	113.5%	16.4	5.3	8.1
WB	Left Turn	10	11	110.0%	16.5	12.6	2.8
	Through	88	86	97.4%	11.7	4.9	17.2
	Right Turn	15	14	92.7%	5.1	6.4	1.3
	Subtotal	113	111	97.9%	11.7	4.9	21.2
Total		174	176	100.9%	12.8	2.8	33.4

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	2	2	85.0%	0.0	0.0	0.0
	Right Turn	2	2	120.0%	1.9	2.1	0.1
	Subtotal	4	4	102.5%	1.5	1.6	0.1
SB	Left Turn	3	2	80.0%	5.5	10.4	0.3
	Through	12	13	108.3%	18.4	12.9	3.7
	Right Turn	11	12	104.5%	2.7	7.1	0.5
	Subtotal	26	27	103.5%	10.5	5.9	4.5
EB	Left Turn	1	1	90.0%	5.9	17.6	0.1
	Through	38	41	106.6%	14.0	3.0	8.9
	Right Turn						
	Subtotal	39	41	106.2%	14.3	2.6	9.0
WB	Left Turn						
	Through	69	68	98.7%	8.3	3.7	9.6
	Right Turn	4	3	80.0%	2.8	8.4	0.2
	Subtotal	73	71	97.7%	8.3	3.7	9.7
Total		142	144	101.2%	10.1	2.6	23.3

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	70.0%	5.9	12.5	0
	Through	2	1	50.0%	10.7	17.6	0.4
	Right Turn	2	2	80.0%	9.7	14.2	0.3
	Subtotal	5	3	66.0%	14.5	16.2	0.8
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	47	48	101.1%	32.6	9.5	25.5
	Right Turn						
	Subtotal	47	48	101.1%	32.6	9.5	25.5
WB	Left Turn						
	Through	47	45	94.7%	44.6	12.3	34.9
	Right Turn	1	2	150.0%	1.6	5.1	0.0
	Subtotal	48	46	95.8%	44.5	12.4	35.0
Total		100	97	96.8%	36.4	7.1	61.3

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	44	44	99.8%	0.8	0.6	0.6
	Right Turn	4	3	82.5%	0.0	0.0	0.0
	Subtotal	48	47	98.3%	0.7	0.6	0.6
SB	Left Turn						
	Through	29	29	100.0%	0.1	0.2	0.0
	Right Turn						
	Subtotal	29	29	100.0%	0.1	0.2	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	7	74.4%	6.4	2.4	1.0
	Through						
	Right Turn	3	3	83.3%	3.3	3.6	0.2
	Subtotal	12	9	76.7%	6.6	2.3	1.1
Total		89	85	96.0%	1.3	0.7	1.7

CROSSWALK INTERSECTION DELAY

AM PEAK HOUR

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Shields St/W Laurel St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
37	34	91.4%	46.2	8.0	26.0

Shields St/W Plum St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
106	107	101.3%	51.7	6.6	92.6

Shields St/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
90	90	100.3%	53.0	3.9	79.7

Shields St/Lake St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
54	54	99.3%	48.6	10.0	43.4

Shields St/Prospect

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
68	66	96.6%	51.8	10.8	56.8

Ped Crossing/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
1	1	90.0%	0.0	0.0	0.0

City Park Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
36	36	101.1%	19.9	5.7	12.1

Constitution Ave/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
9	9	103.3%	16.1	13.1	2.5

Ped Signal/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
2	2	90.0%	10.4	15.7	0.3

Taft Hill Rd/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
17	16	91.8%	33.8	8.8	8.8

Overland Trail/W Elizabeth St

Demand Volume (pph)	Served Volume (pph) Average	Percent	Total Delay (sec/person) Average	Std. Dev.	Total Person Delay (min)
2	2	100.0%	0.5	1.6	0.0

PM PEAK HOUR

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Shields St/W Laurel St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
64	62	96.9%	60.8	9.9	62.8

Shields St/W Plum St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
157	152	96.5%	57.7	10.6	145.6

Shields St/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
162	159	98.3%	57.0	9.4	151.2

Shields St/Lake St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
25	23	93.6%	52.7	40.3	20.5

Shields St/Prospect

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
71	71	100.4%	68.8	13.1	81.7

Ped Crossing/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
15	16	105.3%	1.0	1.6	0.3

City Park Ave/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
239	236	98.5%	29.4	2.7	115.3

Constitution Ave/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
40	40	100.0%	21.1	5.6	14.1

Ped Signal/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
4	4	87.5%	21.6	16.1	1.3

Taft Hill Rd/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
50	51	101.0%	44.8	5.3	37.7

Overland Trail/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
12	11	90.0%	0.8	1.4	0.2

ADDITIONAL VALIDATION AND TRAVEL TIME DATA

PM Peak Green Time Validation using Modeled and Measured Phase Green Times by Intersection

Shields/Prospect

Phase	Measured	Modeled	Delta	% Delta
1	12	10	-2	17%
2	46	49	3	7%
3	12	11	-1	8%
4	28	29	1	4%
5	16	12	-4	25%
6	42	47	5	12%
7	8	7	-1	13%
8	32	31	-1	3%

Shields/Lake

Phase	Measured	Modeled	Delta	% Delta
2	92	91	-1	1%
5	4	6	2	50%
6	86	89	3	3%
8	17	16	-1	6%

Shields/Elizabeth

Phase	Measured	Modeled	Delta	% Delta
1	17	13	-4	24%
2	42	45	3	7%
4	20	20	0	0%
5	1	4	3	300%
6	62	60	-2	3%
8	19	22	3	16%

Shields/Plum

Phase	Measured	Modeled	Delta	% Delta
2	85	82	-3	4%
4	24	25	1	4%
6	85	82	-3	4%
8	24	25	1	4%

Shields/Laurel

Phase	Measured	Modeled	Delta	% Delta
2	85	81	-4	5%
5	4	7	3	75%
6	78	76	-2	3%
8	24	27	3	13%

Elizabeth/City Park

Phase	Measured	Modeled	Delta	% Delta
2	17.5	17	-0.5	3%
4	32	32	0	0%
6	17.5	17	-0.5	3%
8	32	32	0	0%

Elizabeth/Constitution

Phase	Measured	Modeled	Delta	% Delta
2	9.5	10	0.5	5%
4	40	43	3	8%
6	9.5	10	0.5	5%
8	40	43	3	8%

Elizabeth/Taft Hill

Phase	Measured	Modeled	Delta	% Delta
1	8	7	-1	13%
2	36.5	39	2.5	7%
3	7	7	0	0%
4	24	24	0	0%
5	5	6	1	20%
6	40.5	42	1.5	4%
7	6	6	0	0%
8	25	25	0	0%

Existing Peak Hour Segment Vehicle Travel Time Validation

Roadway	Roadway Segment	Period	Travel Time		Absolute	Percent
			VISSIM	Blue Tooth	Difference	Difference
Shields	NB Prospect to Mulberry	AM	147.8	N/A	N/A	N/A
		PM	175.1	156	19.1	12%
	SB Mulberry to Prospect	AM	139.0	N/A	N/A	N/A
		PM	175.4	180	-4.6	-3%
Elizabeth	EB Taft Hill to Constitution	AM	65.4	54	11.4	21%
		PM	68.1	55	13.1	24%
	EB Constitution to Shields	AM	101.4	86	15.4	18%
		PM	122.1	112	10.1	9%
	WB Shields to Constitution	AM	71.8	67	4.8	7%
		PM	80.6	73	7.6	10%
	WB Constitution to Taft Hill	AM	96.8	71	25.8	36%
		PM	104.4	86	18.4	21%

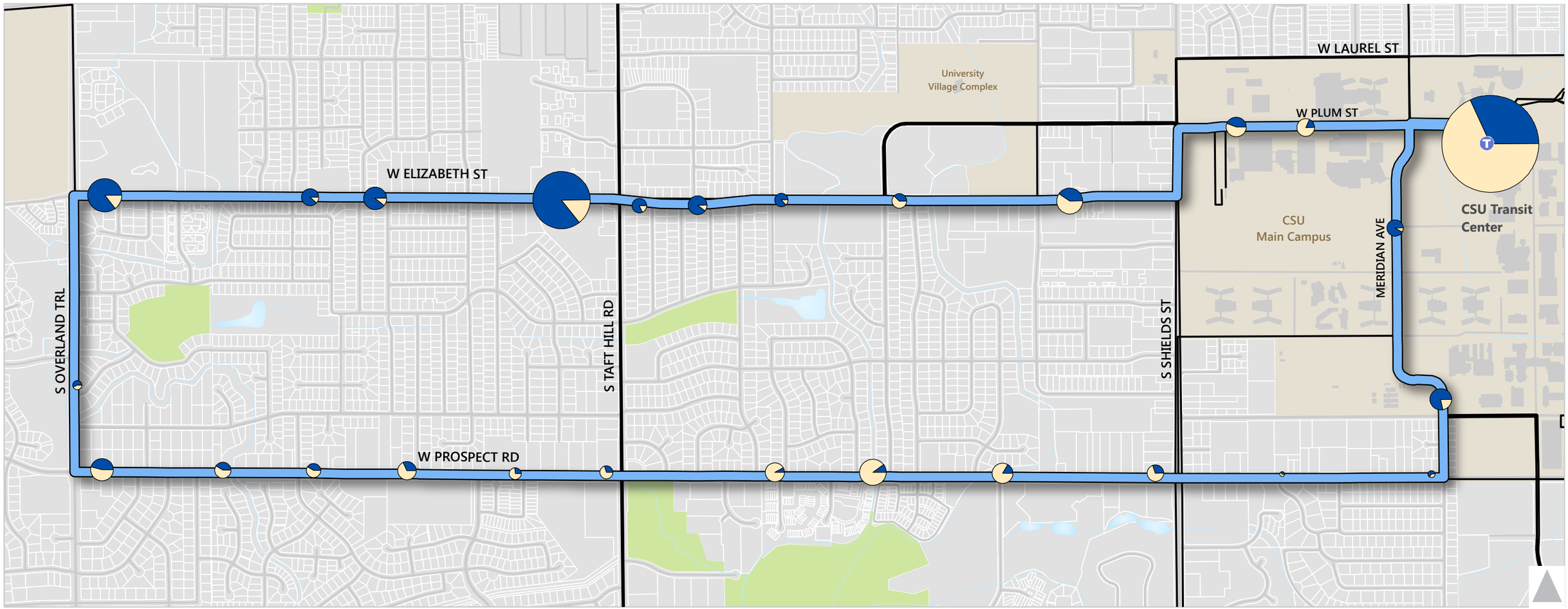
Transit Travel Time along Elizabeth St by Segment		
Segment	Travel Time including dwell time (sec)	
	AM	PM
WB Shields City Park	42.1	41.9
WB City Park to Taft	211.4	205.1
WB Taft Hill to Overland	265.4	265.0
WB Shields to Overland	**518.9**	**511.9**
EB Overland to Taft Hill	249.2	254.0
EB Taft Hill to City Park	221.5	218.7
EB City Park to Shields	110.6	110.7
EB Overland to Shields	**581.4**	**583.5**

APPENDIX C: TRANSFORT ROUTE PROFILES

ROUTE 2

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan

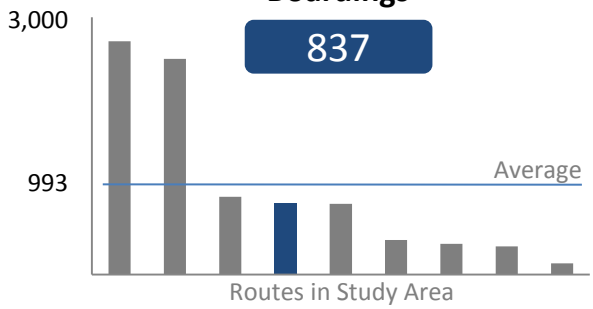


Route 2 Daily Ridership

Route 2

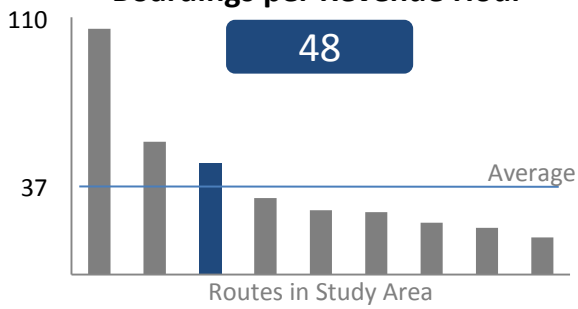
Service every **20/30 minutes peak, 30 minutes off-peak**
Hours of operation: **6:22 AM - 10:00 PM, Monday - Saturday**

Average Weekday Boardings



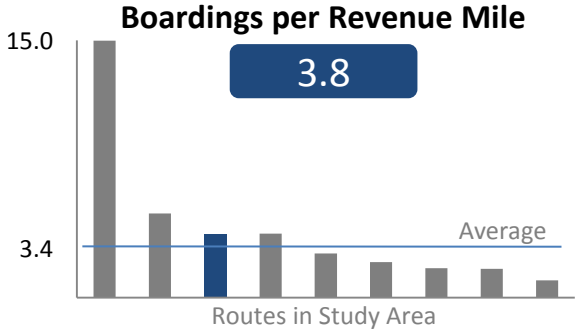
Saturday
325

Average Weekday Boardings per Revenue Hour



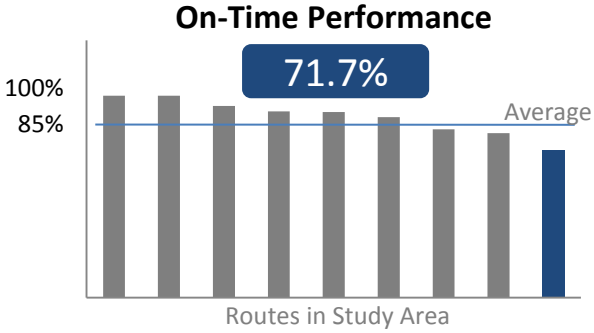
Saturday
21

Average Weekday Boardings per Revenue Mile



Saturday
1.6

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
2	12	11	8	6	N/A

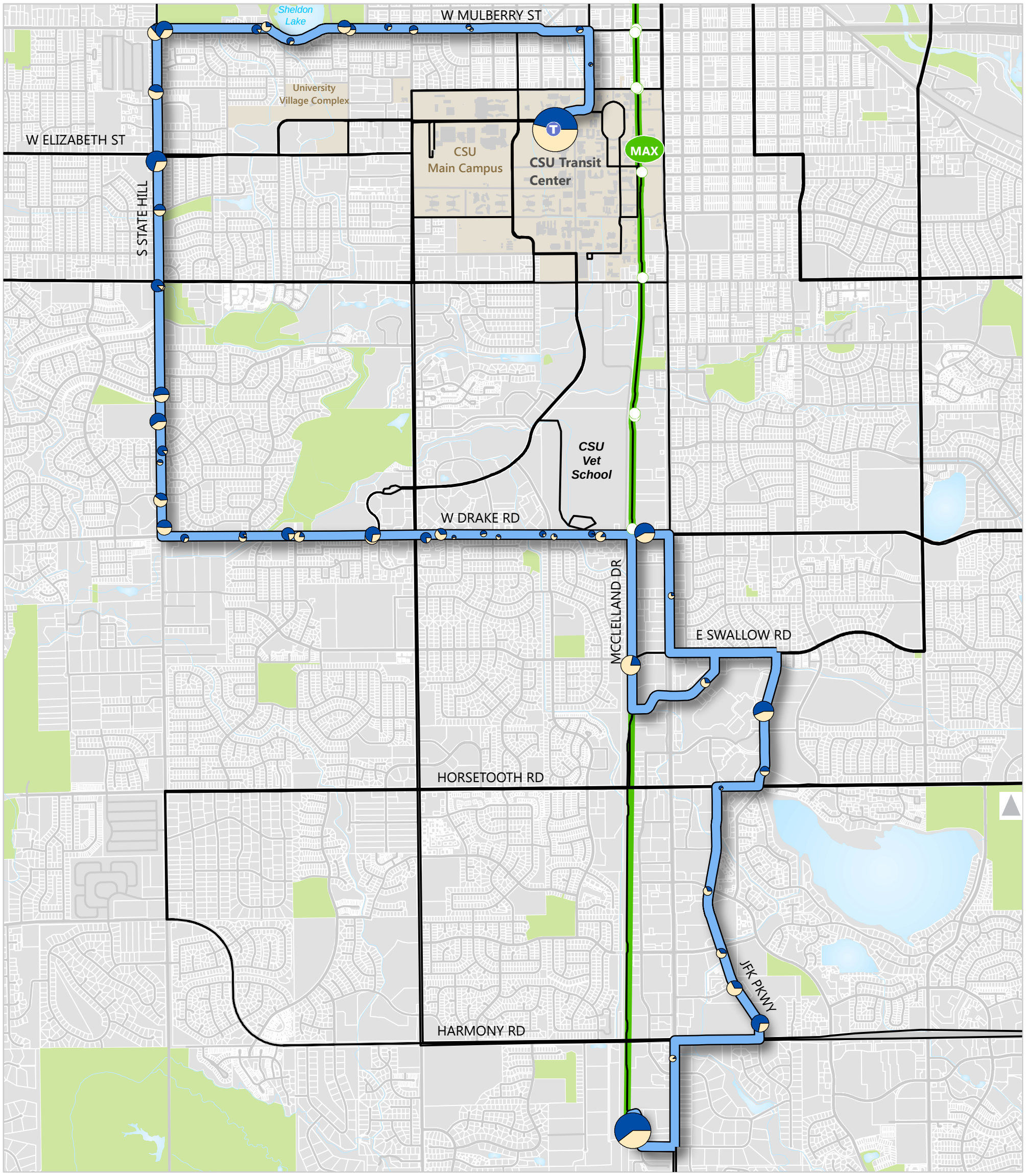
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
2	64.1	61.9	58.5	37.1	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
2	5.1	4.9	4.7	2.8	N/A

ROUTE 6

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan

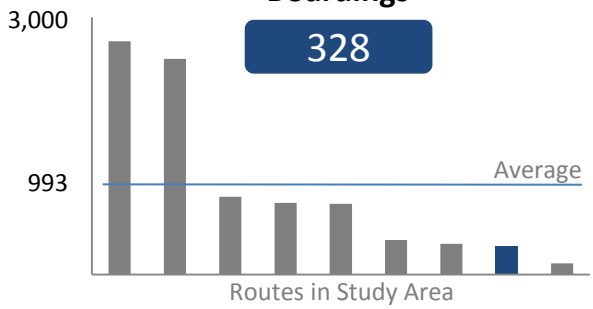


Route 6 Daily Ridership

Route 6

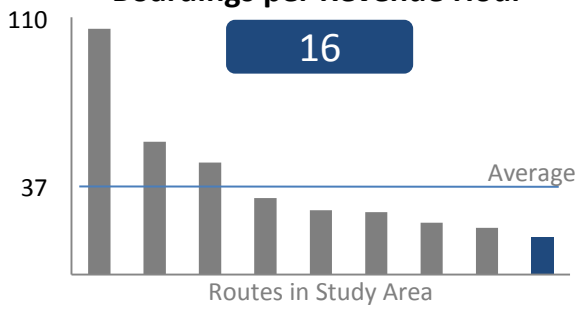
Service every **60 minutes peak, 60 minutes off-peak**
Hours of operation: **6:06 AM - 10:18 PM, Monday - Saturday**

Average Weekday Boardings



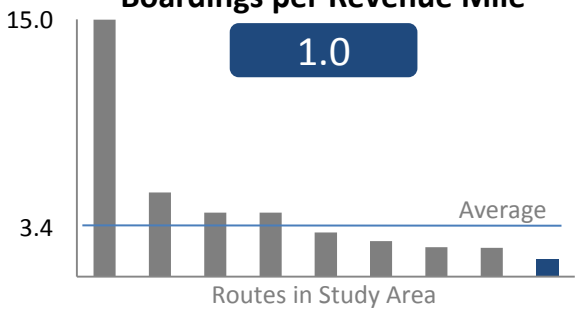
Saturday
229

Average Weekday Boardings per Revenue Hour



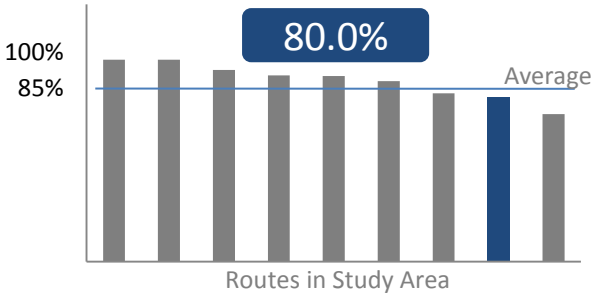
Saturday
11

Average Weekday Boardings per Revenue Mile



Saturday
0.7

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
6	8	10	8	6	N/A

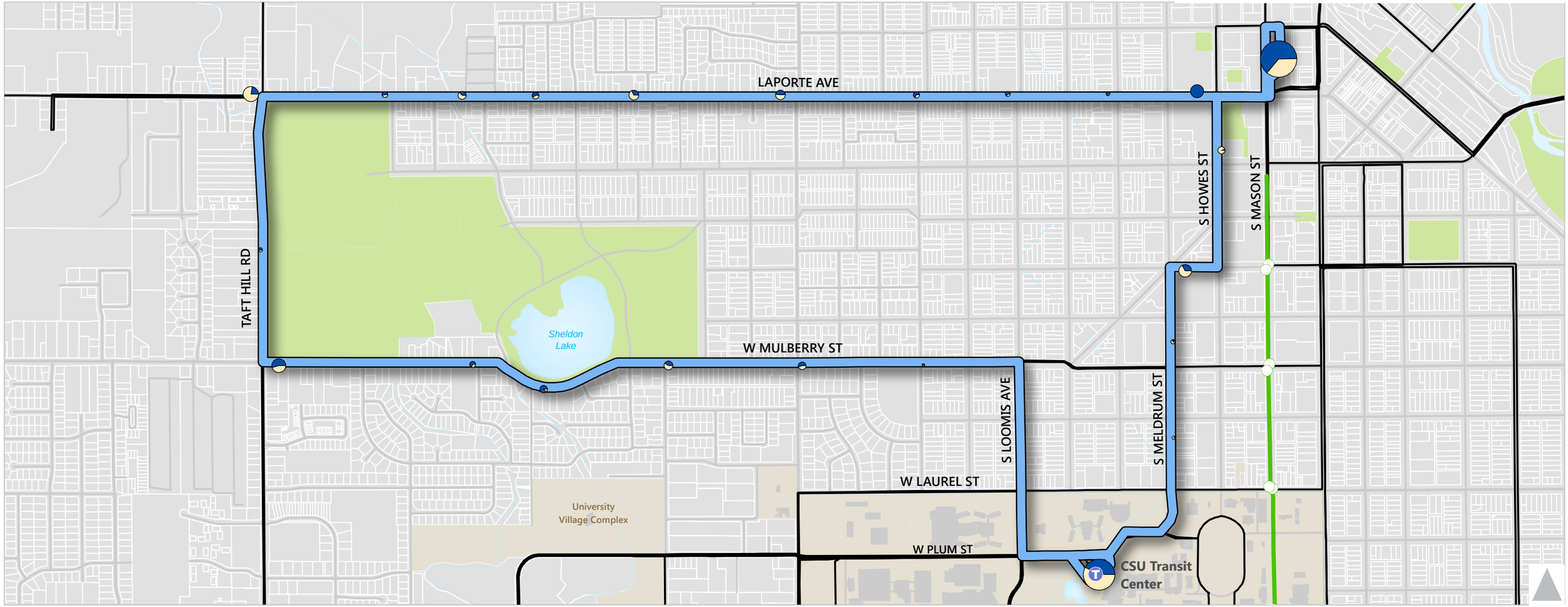
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
6	24.0	20.8	18.8	8.1	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
6	1.6	1.4	1.2	0.5	N/A

ROUTE 10

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan



MAX Stations

Bus Network

Featured Route

MAX Bus Rapid Transit (BRT)

100

50

10

Boardings

Alightings

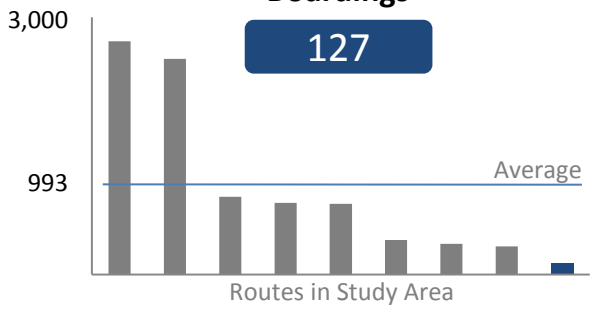
Route 10 Daily Ridership

TMD

Route 10

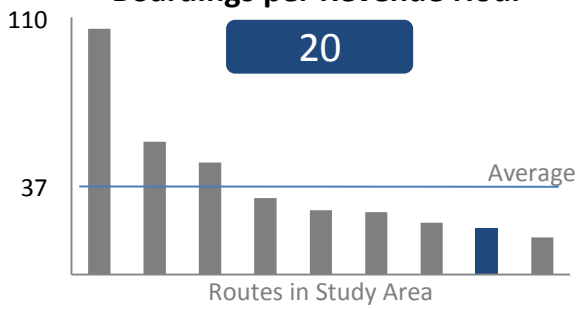
Service every **60 minutes peak, 60 minutes off-peak**
Hours of operation: **6:45 AM - 7:08 PM, Monday - Saturday**

Average Weekday Boardings



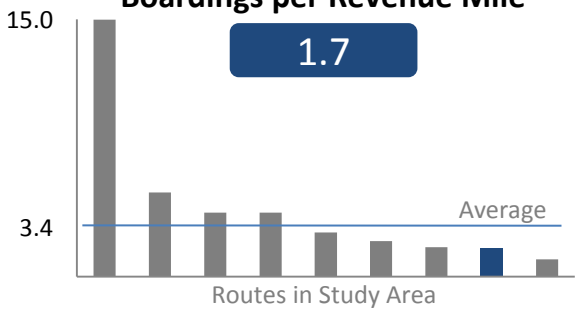
Saturday
6,65

Average Weekday Boardings per Revenue Hour



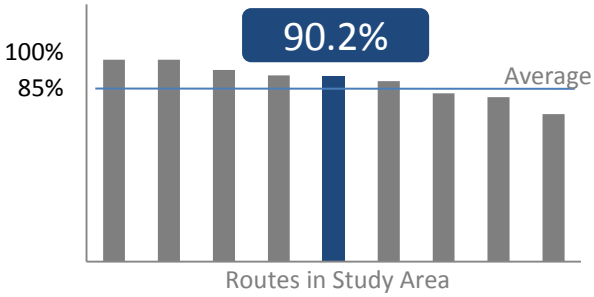
Saturday
10

Average Weekday Boardings per Revenue Mile



Saturday
0.9

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
10	4	5	4	N/A	N/A

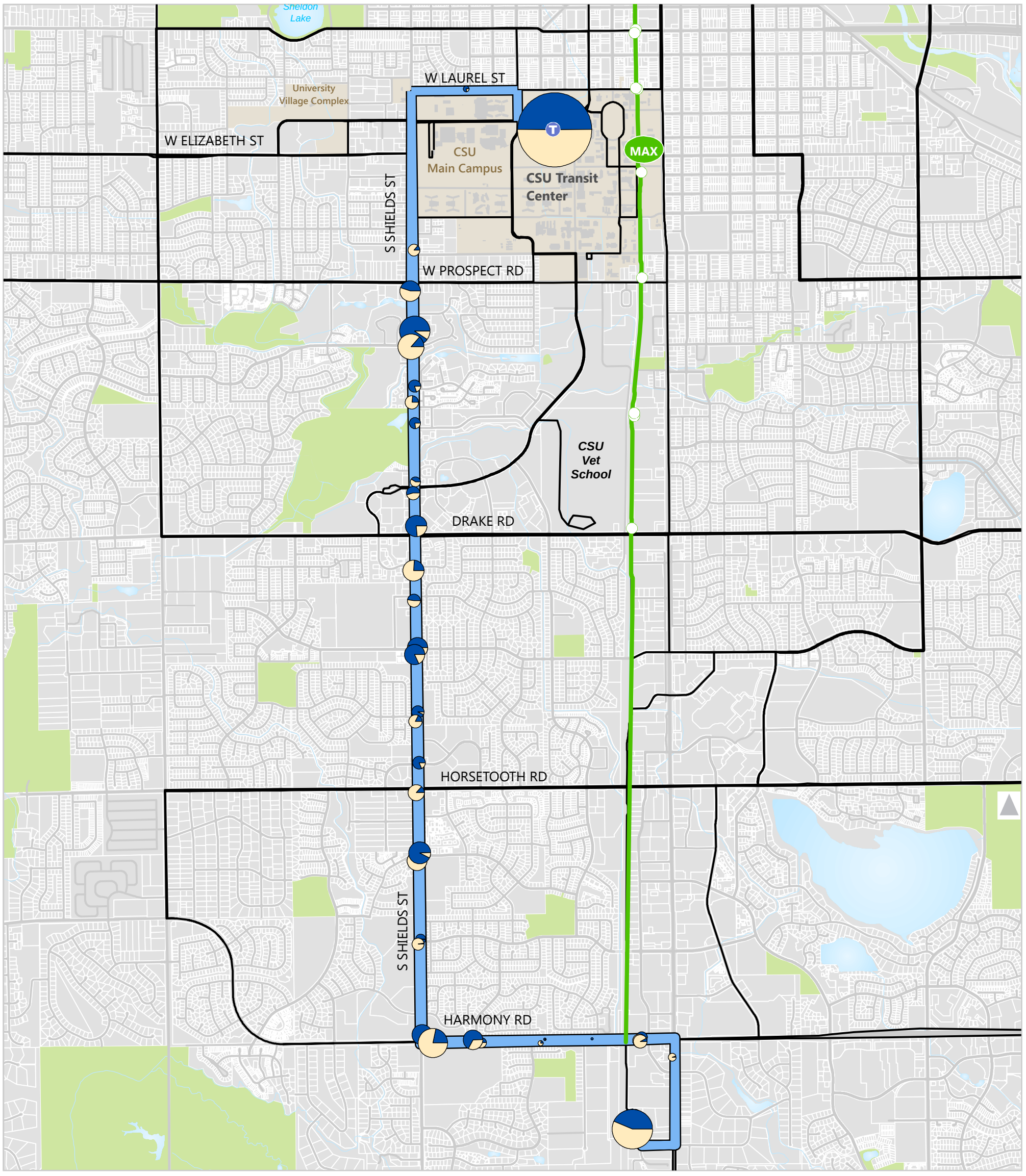
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
10	20.2	20.1	16.1	N/A	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
10	1.7	1.7	1.4	N/A	N/A

ROUTE 19

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan

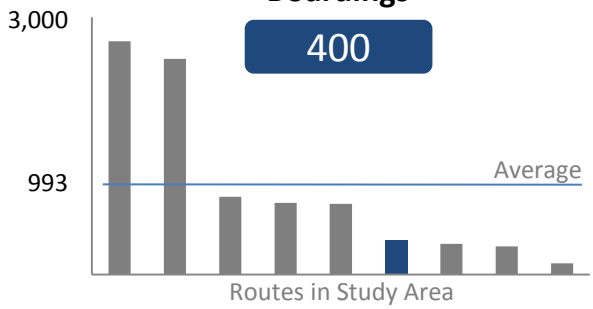


Route 19 Daily Ridership

Route 19

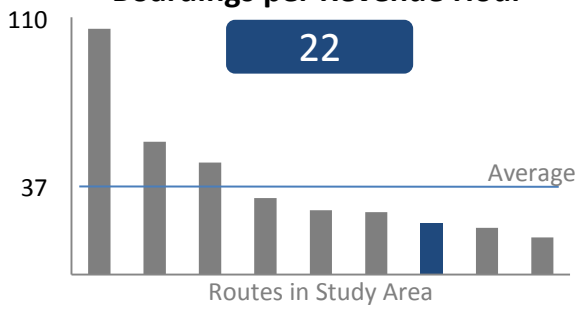
Service every **30 minutes peak, 60 minutes off-peak**
Hours of operation: **6:52 AM - 7:43 PM, Monday - Friday**

Average Weekday Boardings



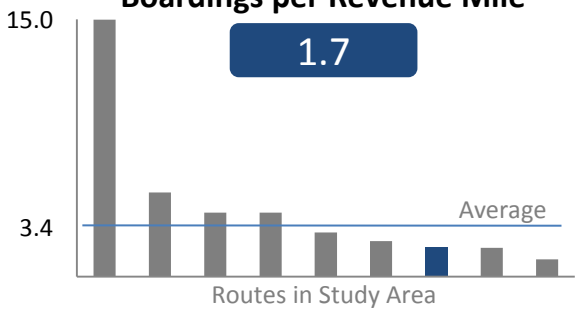
Saturday
N/A

Average Weekday Boardings per Revenue Hour



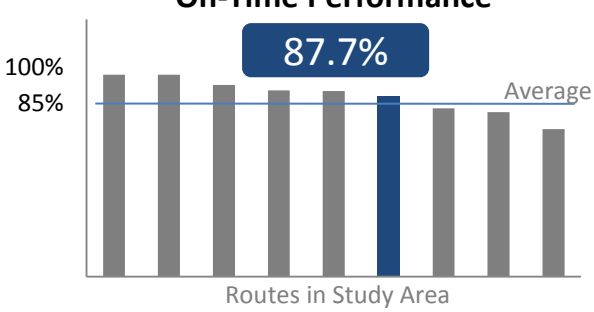
Saturday
N/A

Average Weekday Boardings per Revenue Mile



Saturday
N/A

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
19	14	11	12	1	N/A

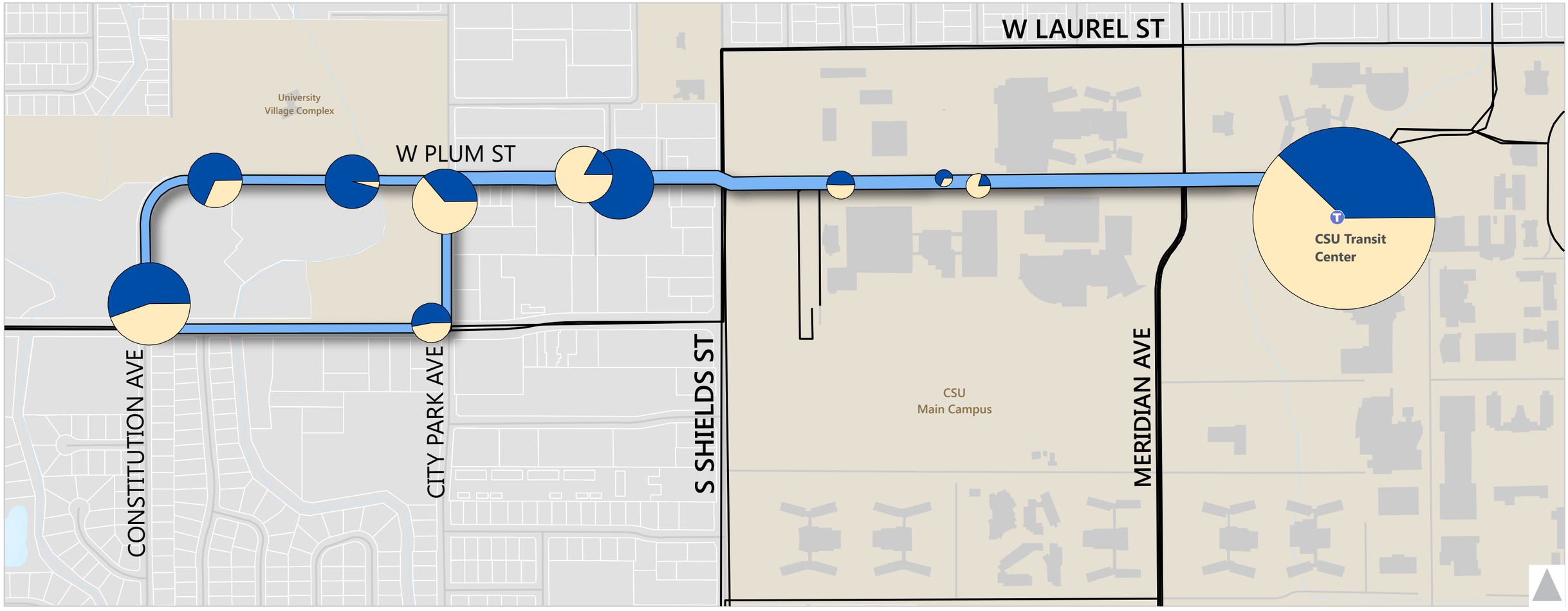
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
19	24.3	28.8	21.6	15.2	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
19	1.9	2.3	1.7	1.2	N/A

ROUTE 31

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan

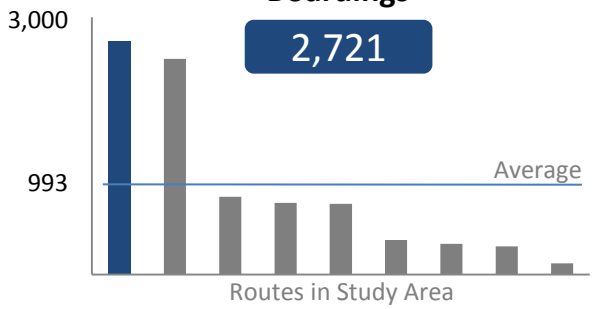


Route 31 Daily Ridership

Route 31

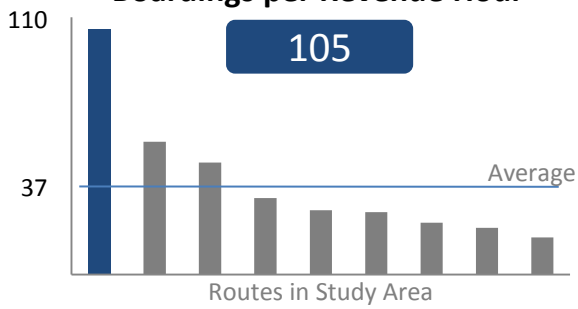
Service every **10 minutes peak, 10 minutes off-peak**
Hours of operation: **6:58 AM - 6:20 PM, Monday - Friday**

Average Weekday Boardings



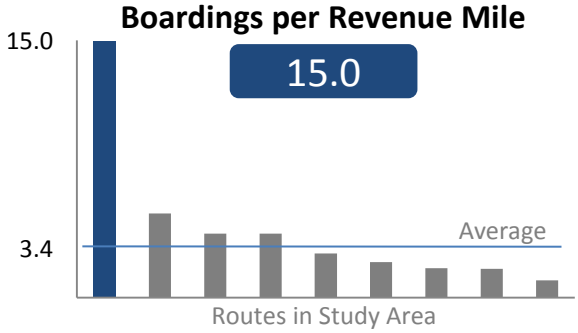
Saturday
N/A

Average Weekday Boardings per Revenue Hour



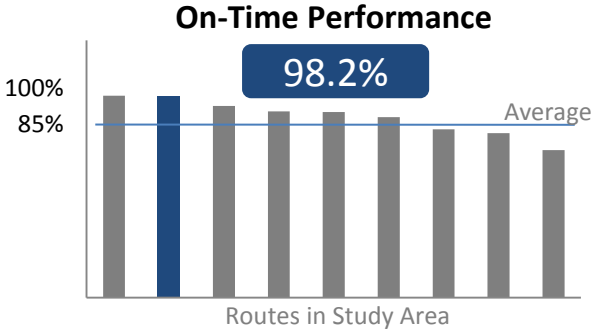
Saturday
N/A

Average Weekday Boardings per Revenue Mile



Saturday
N/A

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	AM Peak	Midday	PM Peak	PM	Late Night
31	24	32	20	N/A	N/A

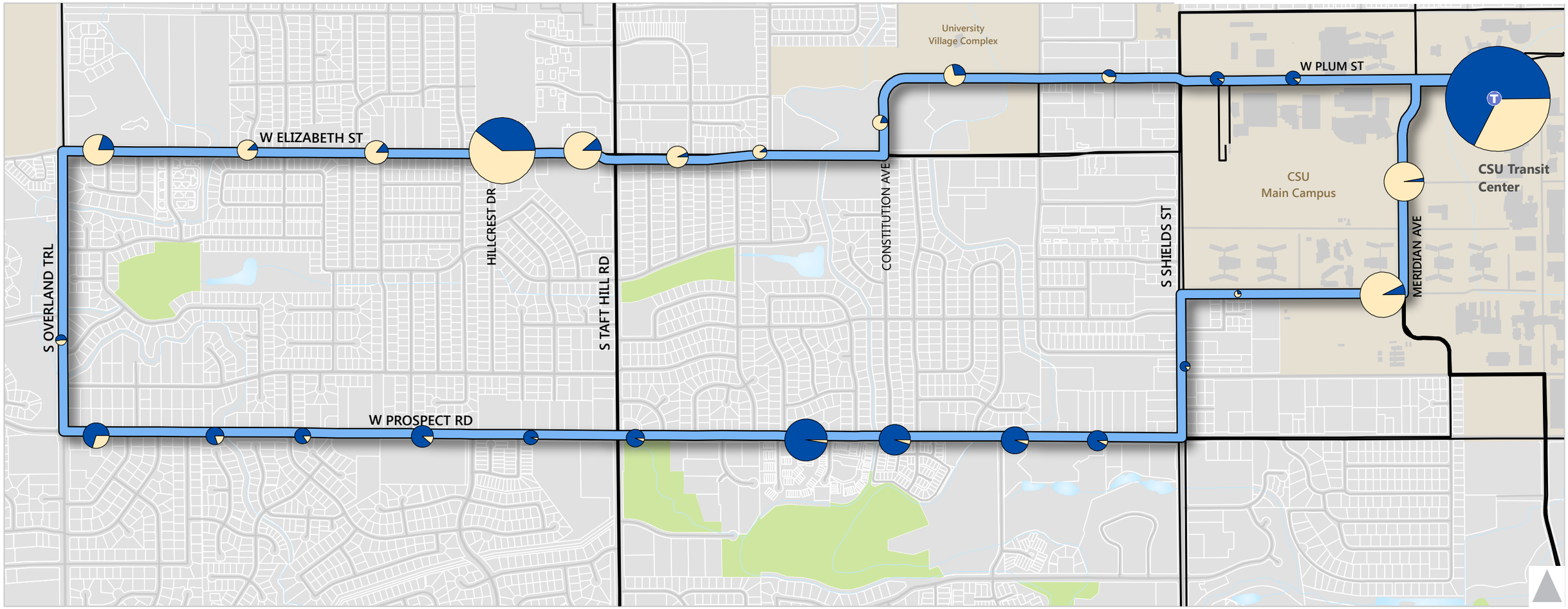
Passengers per Revenue Hour					
Route	AM Peak	Midday	PM Peak	PM	Late Night
31	98.8	118.5	100.0	N/A	N/A

Passengers per Revenue Mile					
Route	AM Peak	Midday	PM Peak	PM	Late Night
31	14.3	17.0	14.3	N/A	N/A

ROUTE 32

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan

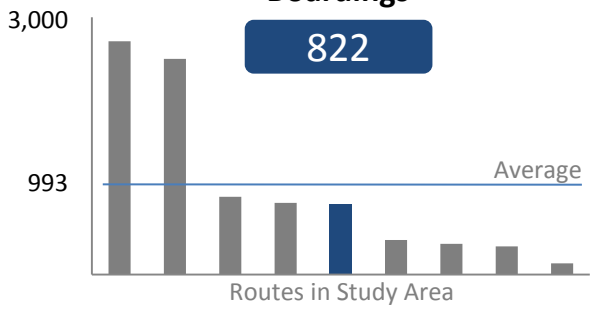


Route 32 Daily Ridership

Route 32

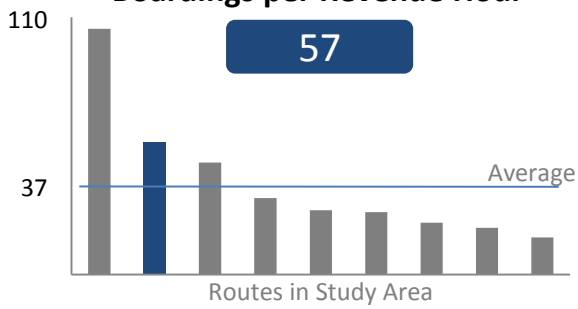
Service every **17/30 minutes peak, 30 minutes off-peak**
Hours of operation: **6:50 AM - 6:40 PM, Monday - Friday**

Average Weekday Boardings



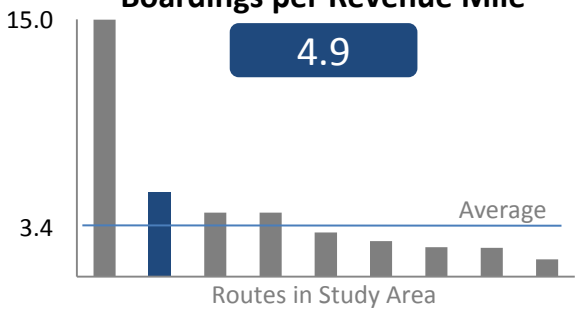
Saturday
N/A

Average Weekday Boardings per Revenue Hour



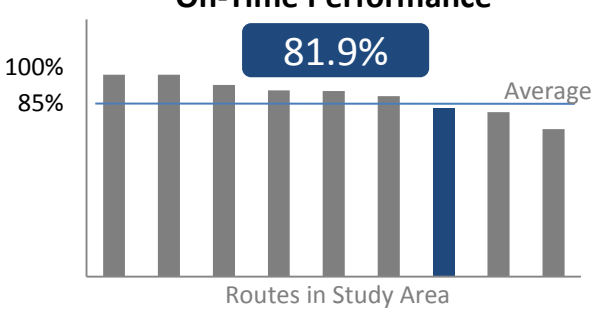
Saturday
N/A

Average Weekday Boardings per Revenue Mile



Saturday
N/A

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
32	11	11	7	N/A	N/A

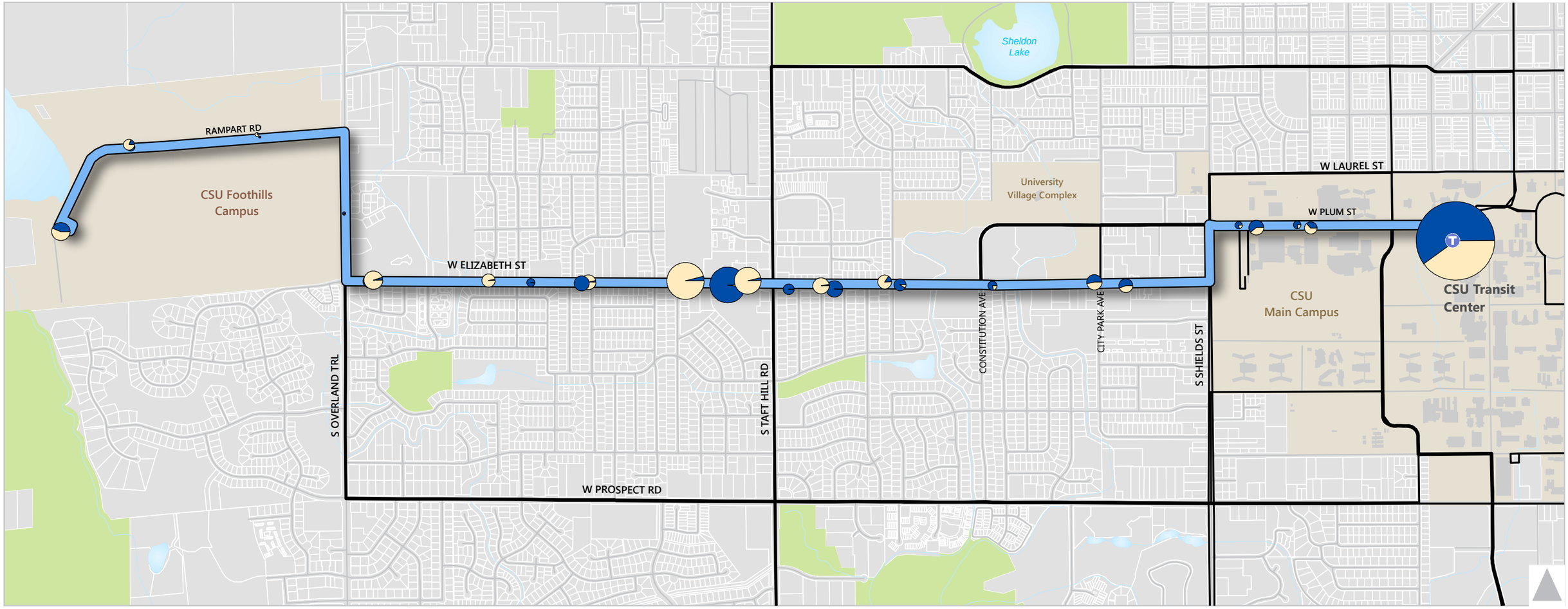
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
32	56.6	66.2	61.0	N/A	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
32	5.0	5.8	5.3	N/A	N/A

ROUTE 33

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan



MAX Stations

Bus Network

Featured Route

MAX Bus Rapid Transit (BRT)

200

100

50

Boardings

Alightings

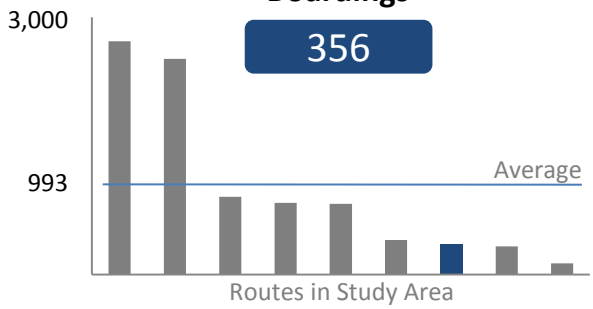
Route 33 Daily Ridership

TMD

Route 33

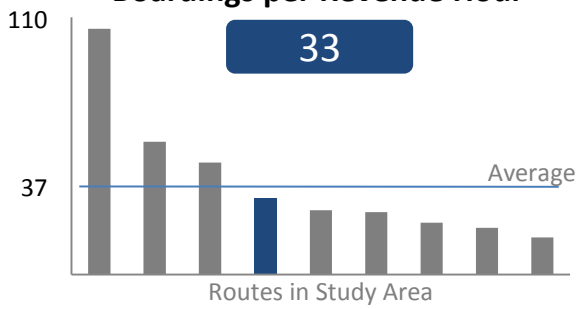
Service every **30 minutes peak, 30 minutes off-peak**
Hours of operation: **6:52 AM - 5:49 PM, Monday - Friday**

Average Weekday Boardings



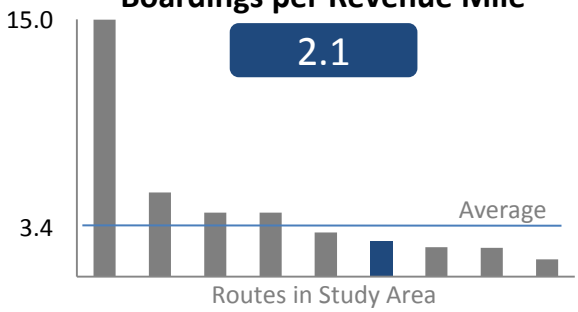
Saturday
N/A

Average Weekday Boardings per Revenue Hour



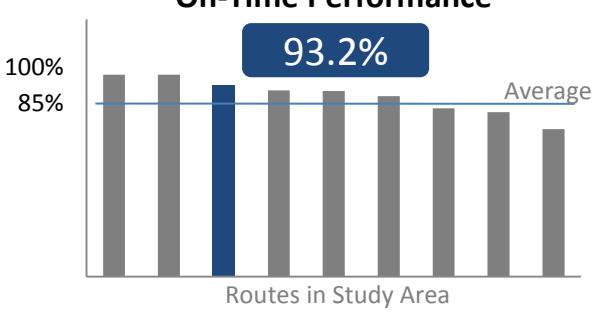
Saturday
N/A

Average Weekday Boardings per Revenue Mile



Saturday
N/A

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
33	13	20	11	N/A	N/A

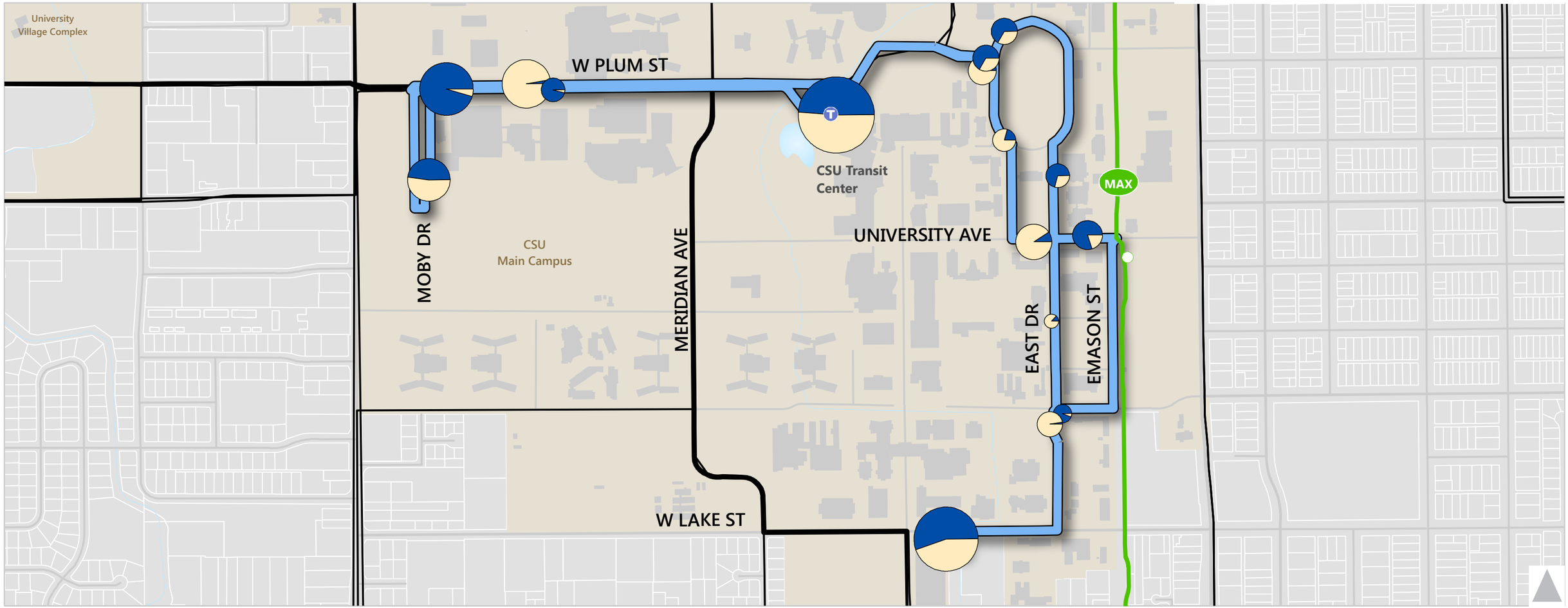
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
33	35.9	35.7	38.9	N/A	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
33	2.3	2.3	2.5	N/A	N/A

HORN

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan



MAX Stations

Bus Network

Featured Route

MAX Bus Rapid Transit (BRT)

200

100

50

Boardings

Alightings

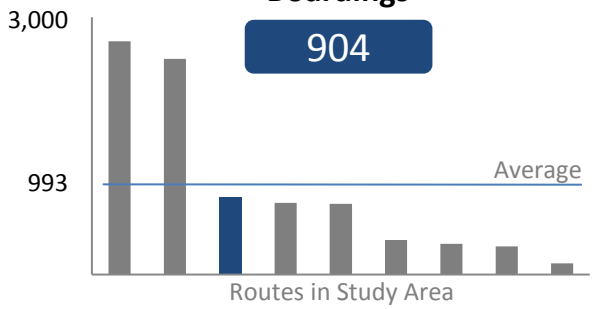
HORN Daily Ridership

TMD

Around the Horn

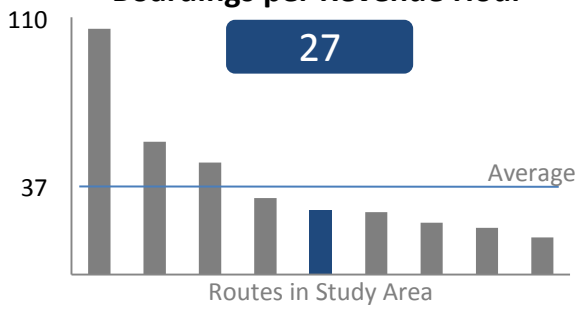
Service every **10 minutes peak, 10 minutes off-peak**
Hours of operation: **6:42 AM - 6:38 PM, Monday - Saturday**

Average Weekday Boardings



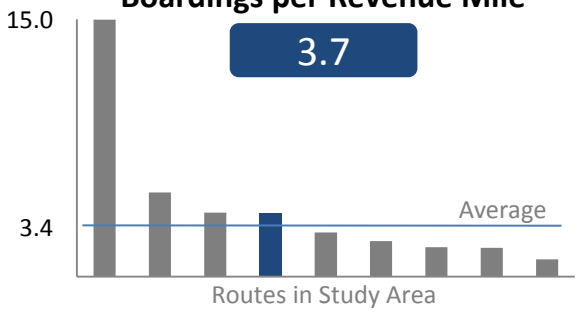
Saturday
114

Average Weekday Boardings per Revenue Hour



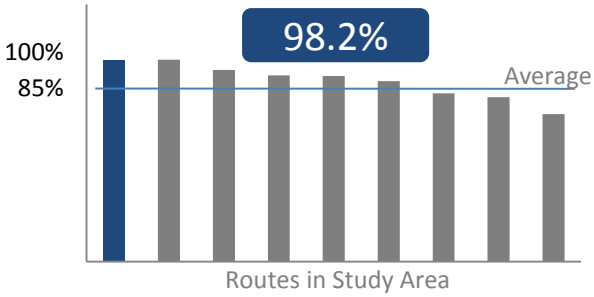
Saturday
10

Average Weekday Boardings per Revenue Mile



Saturday
1.3

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
Horn	38	60	42	N/A	N/A

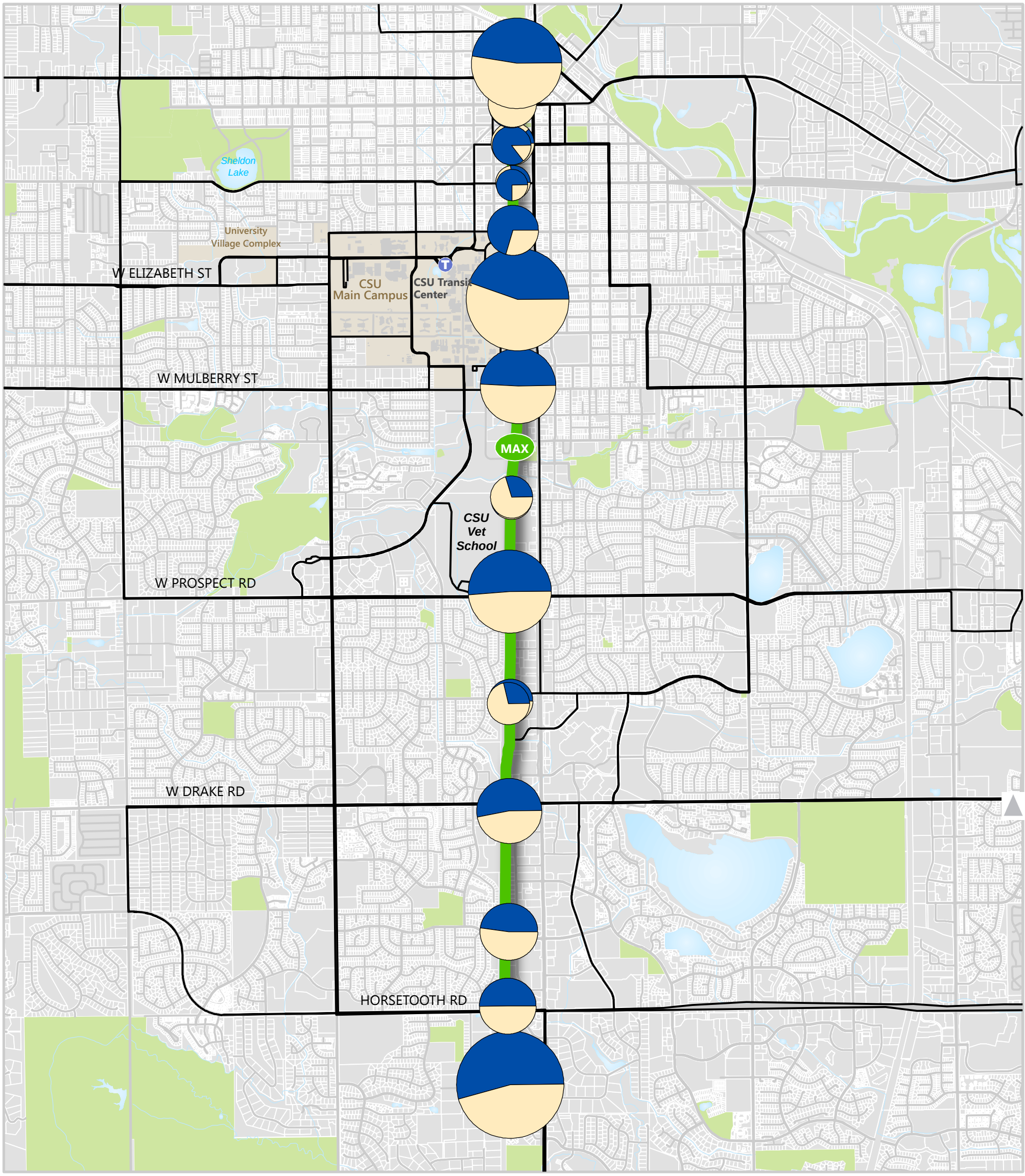
Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
Horn	23.2	28.1	18.0	N/A	N/A

Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
Horn	3.2	3.9	2.4	N/A	N/A

MAX

Daily Ridership by Route

West Elizabeth Enhanced Travel Corridor Plan



MAX Stations

Bus Network

Featured Route

MAX Bus Rapid Transit (BRT)

200

100

50

Boardings

Alightings

HORN Daily Ridership

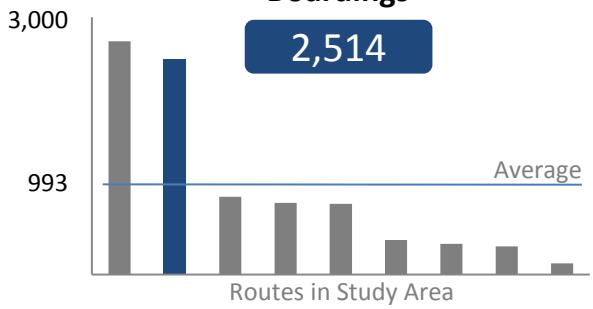
TMD

MAX Bus Rapid Transit

Service every **10 minutes peak, 10 minutes off-peak**

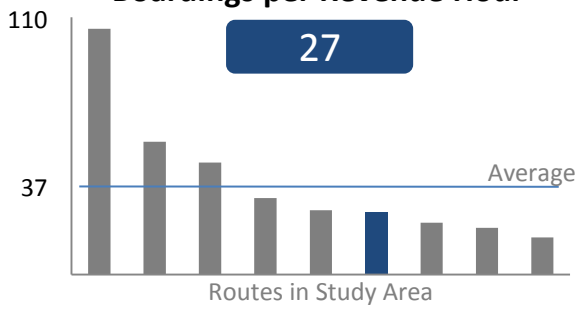
Hours of operation: **5:10 AM - 12:16 AM, Monday - Saturday**

Average Weekday Boardings



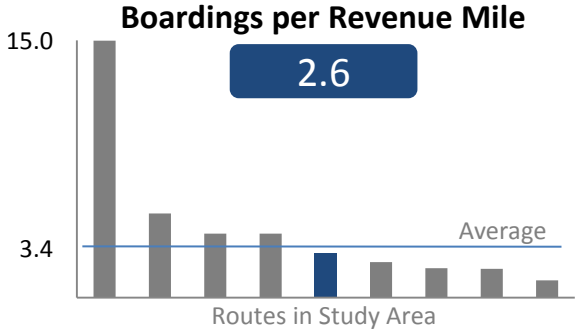
Saturday
2,357

Average Weekday Boardings per Revenue Hour



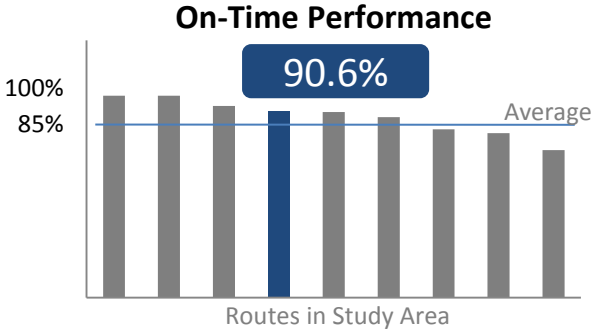
Saturday
26

Average Weekday Boardings per Revenue Mile



Saturday
2.5

Total On-Time Performance



Analysis by Time Period

One-Way Trips					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
MAX	45	60	48	27	10

Passengers per Revenue Hour					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
MAX	21.5	26.7	27.1	13.0	5.7

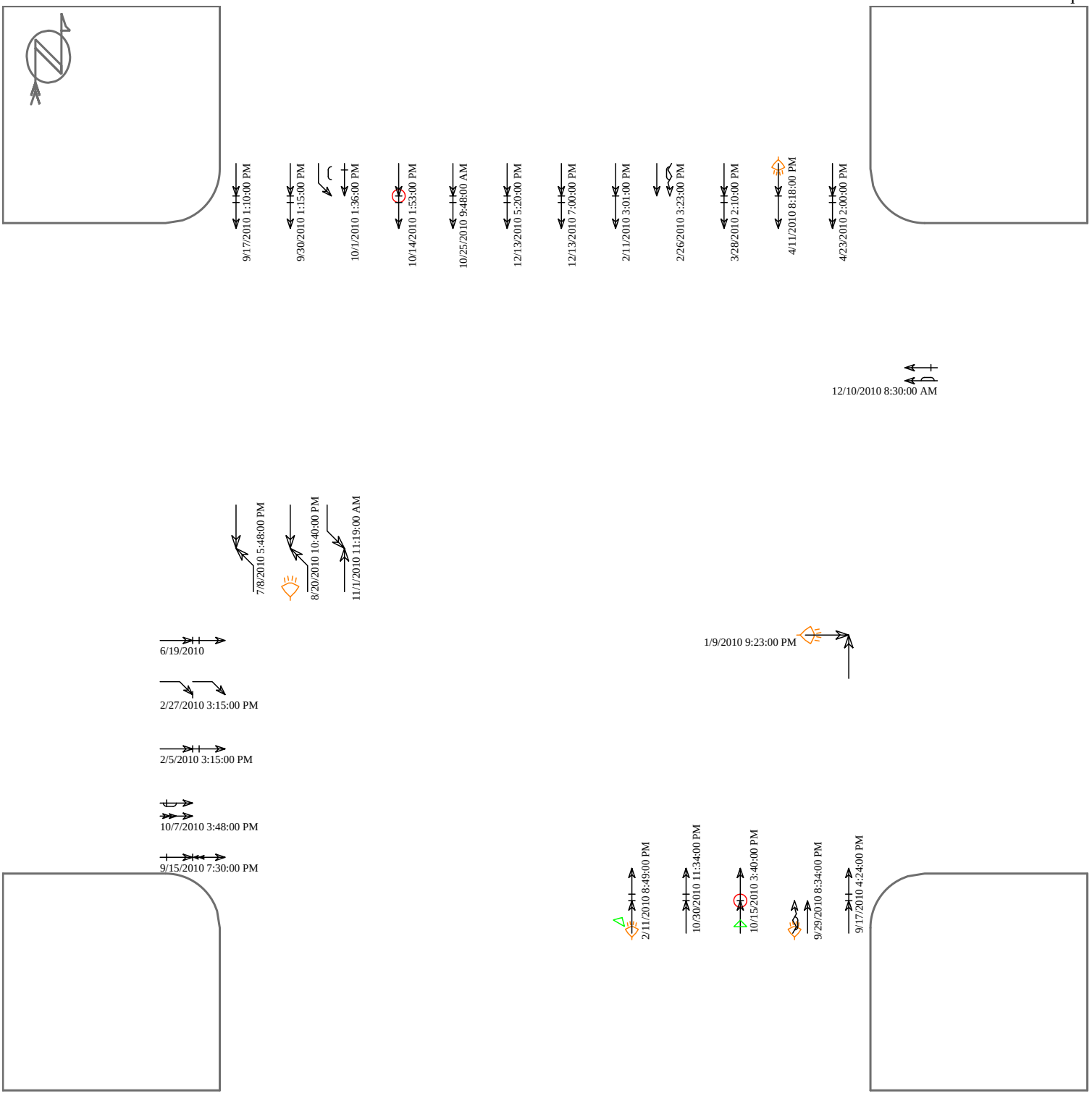
Passengers per Revenue Mile					
Route	**AM Peak**	**Midday**	**PM Peak**	**PM**	**Late Night**
MAX	2.1	2.6	2.7	1.3	0.6

APPENDIX D: CRASH DIAGRAMS

109 SHIELDS AND ELIZABETH
2010

28 Crashes

intersectionquery



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

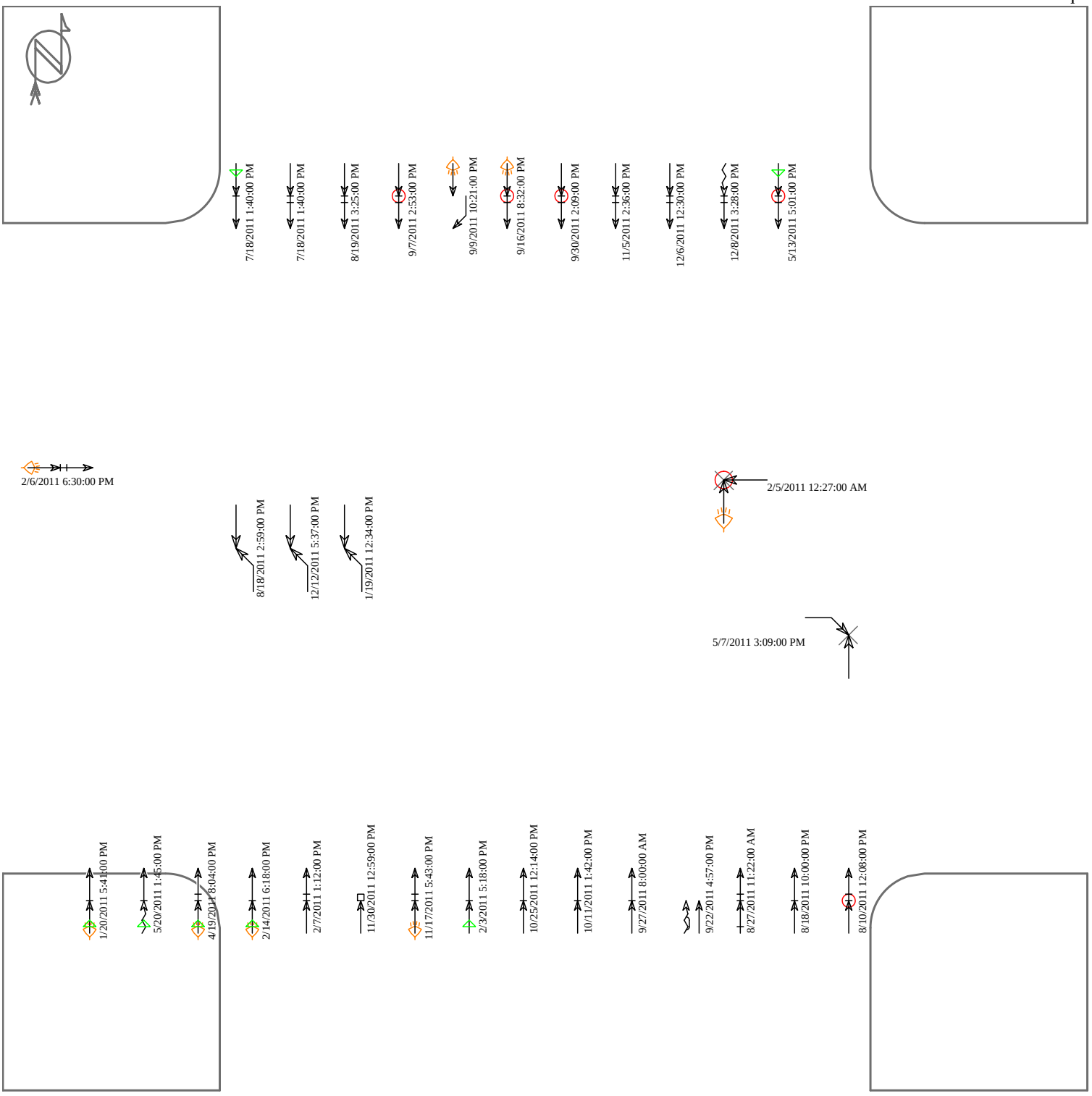
Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

34 Crashes

intersectionquery



(1) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

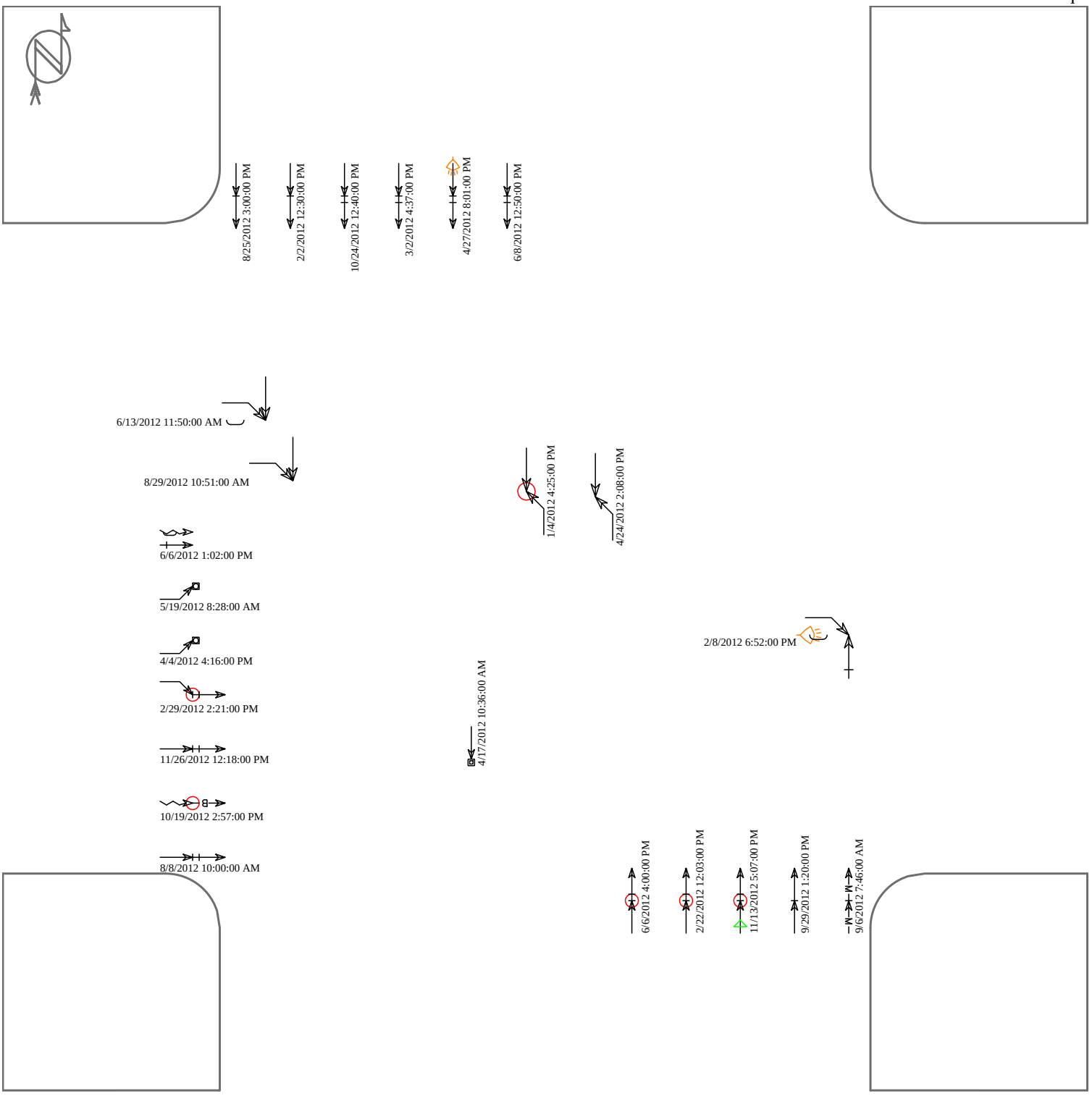
- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

109 SHIELDS AND ELIZABETH
2012

24 Crashes

intersectionquery



(0) crashes could not be placed in this schematic

- Straight
- Stopped
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- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

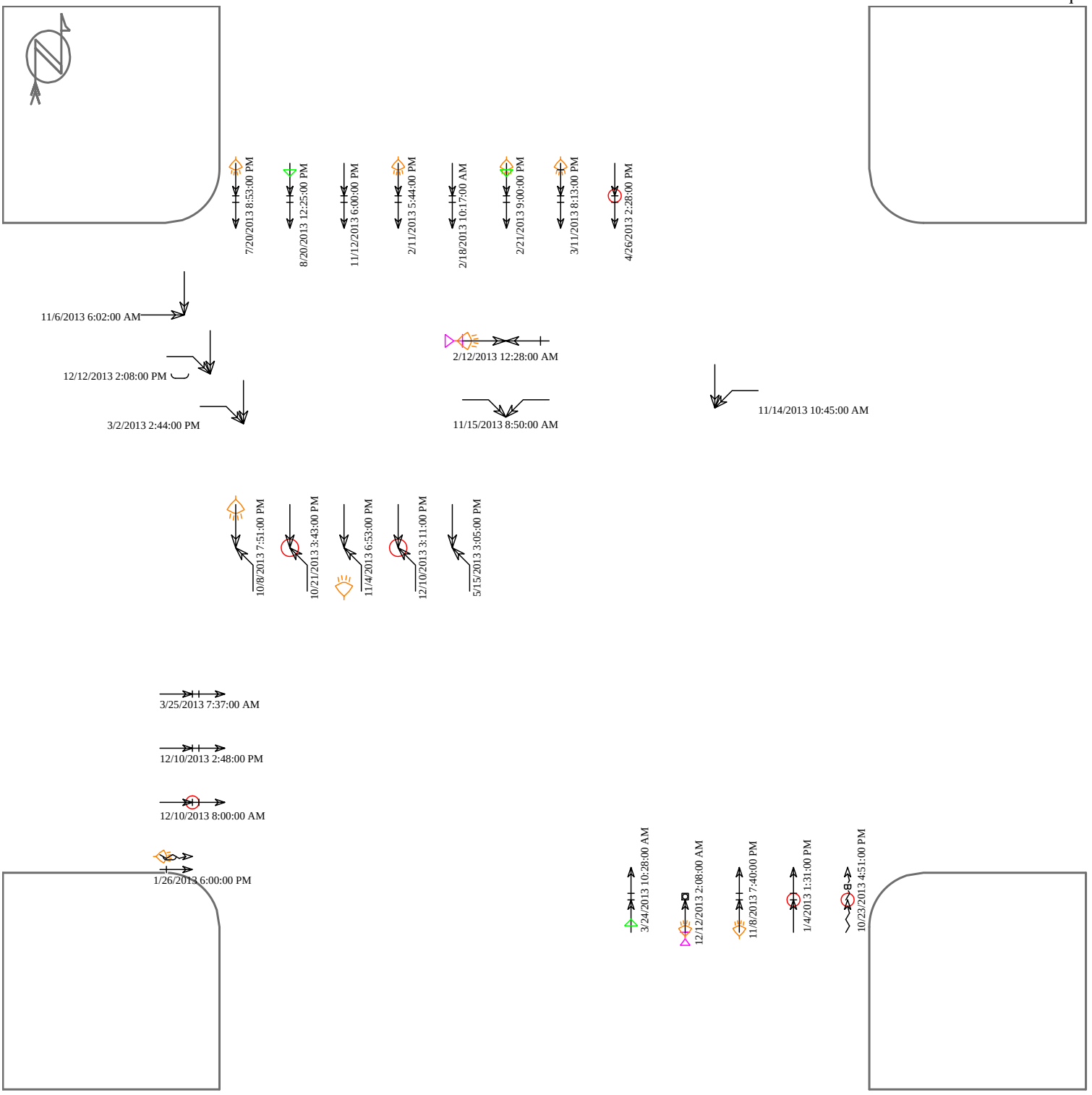
- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

109 SHIELDS AND ELIZABETH
2013

29 Crashes

intersectionquery



(1) crashes could not be placed in this schematic

- Straight
- Stopped
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- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

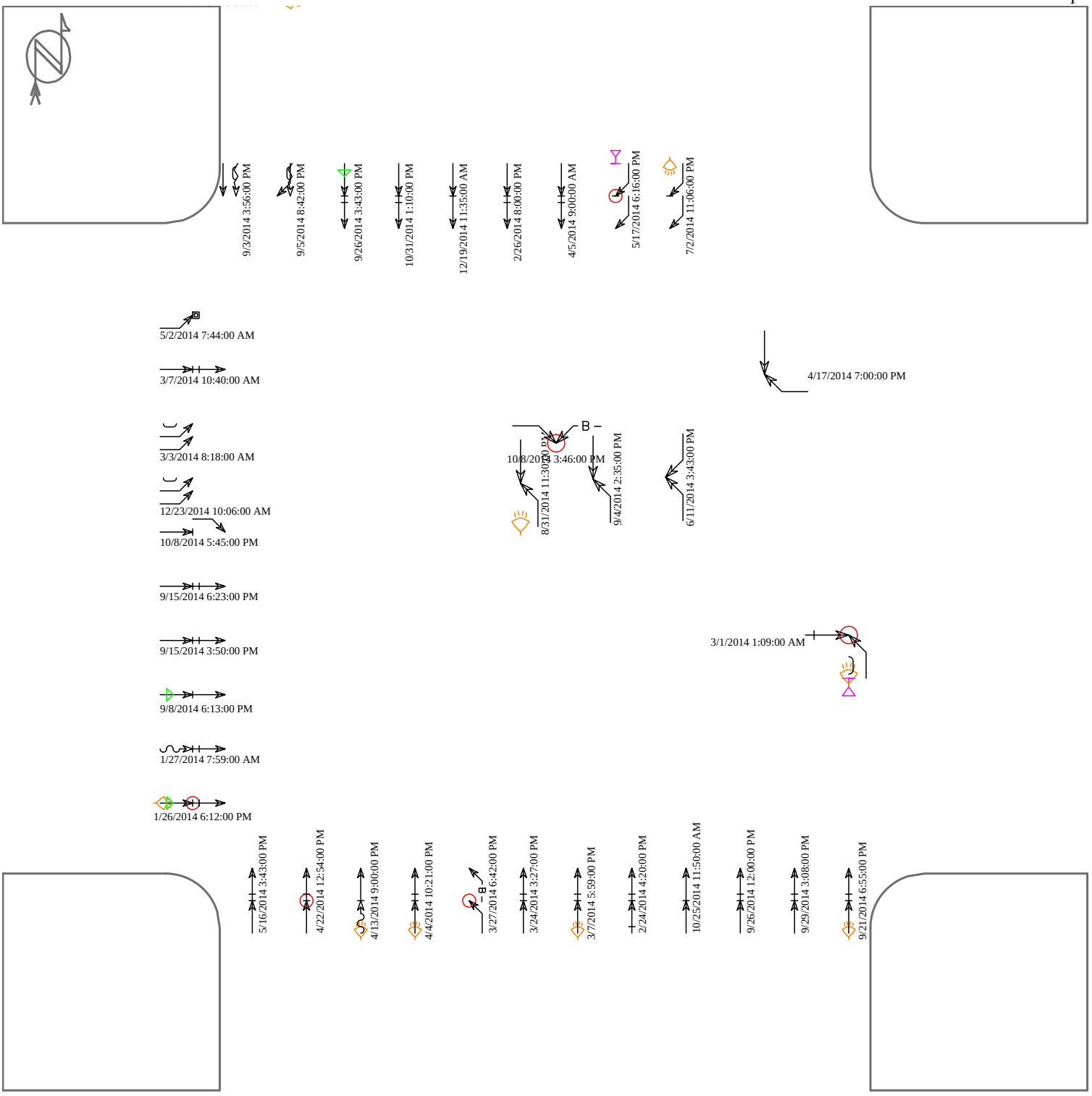
Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

39 Crashes

intersectionquery



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

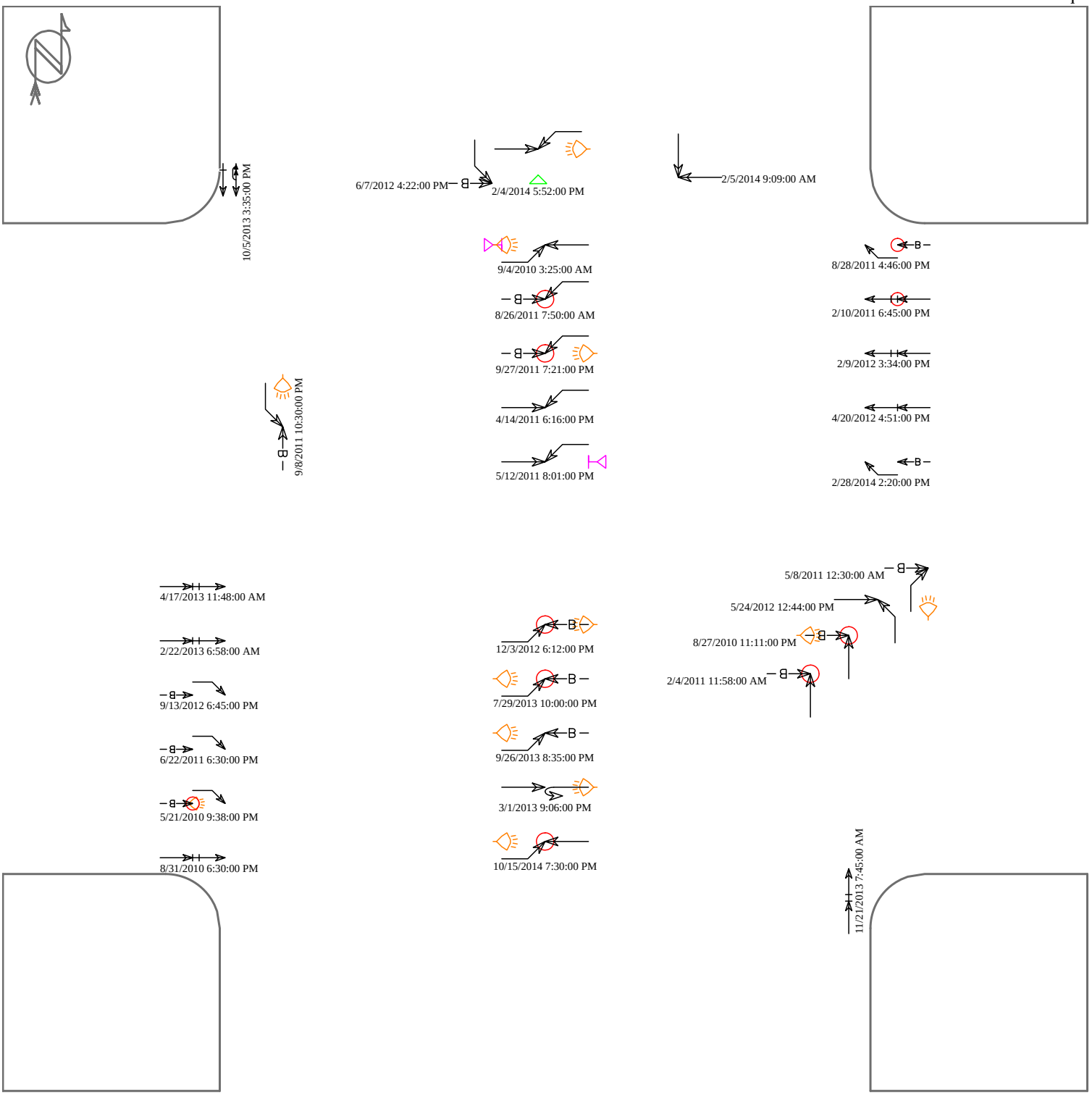
- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

3 CITY PARK AND ELIZABETH
2010 - 2014

32 Crashes

intersectionquery



(1) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

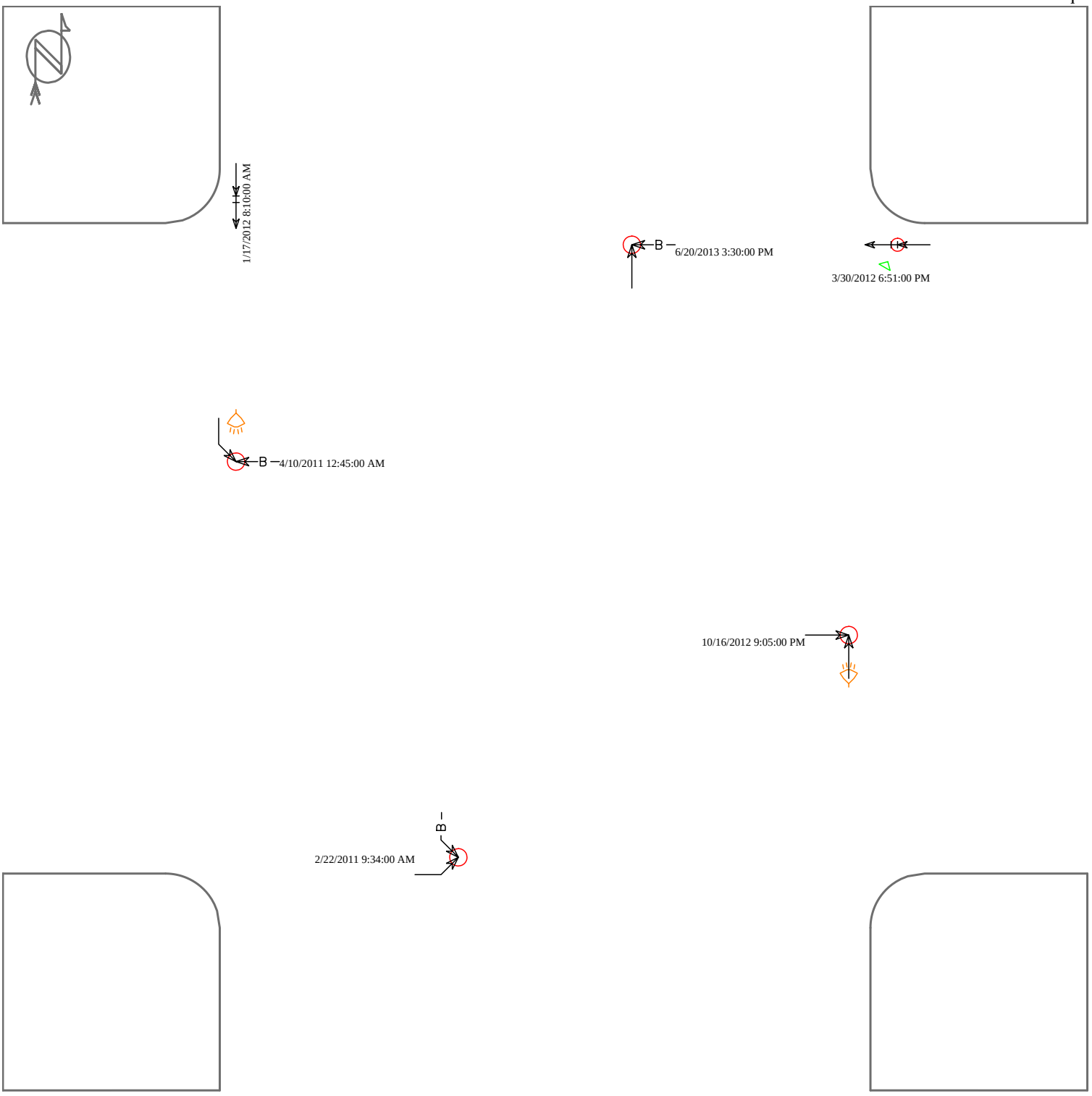
- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

6394 SKYLINE DR AND W ELIZABETH ST
2010 - 2014

6 Crashes

intersectionquery



(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

135 - TAFT HILL AND ELIZABETH
2010 - 2014

71 Crashes

intersectionquery

(0) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

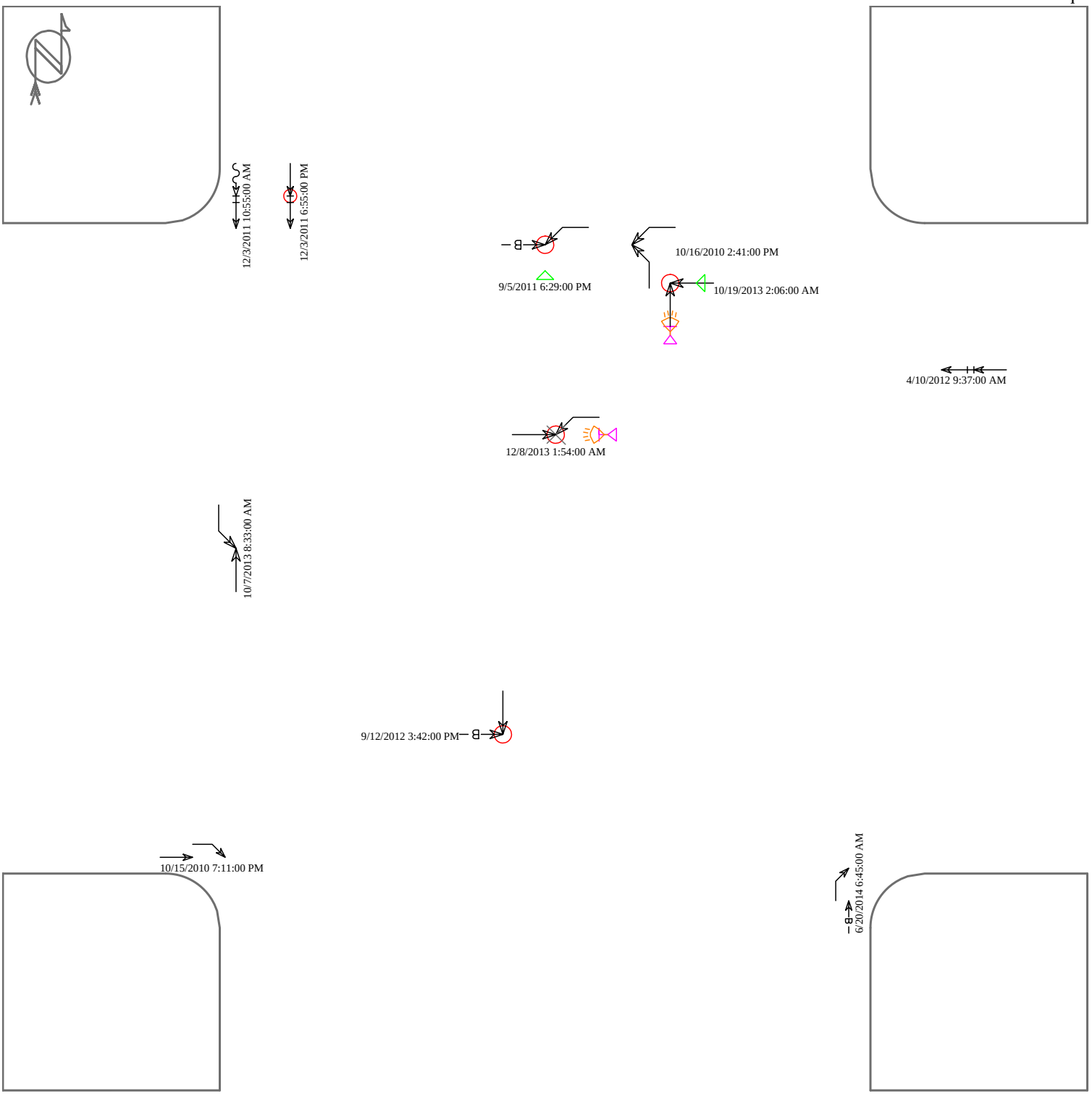
- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

7625 PONDEROSA DR AND W ELIZABETH ST
2010 - 2014

12 Crashes

intersectionquery



(1) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

6385 S OVERLAND TRL AND W ELIZABETH ST
2010 - 2014

17 Crashes

intersectionquery

(1) crashes could not be placed in this schematic

- Straight
- Stopped
- Unknown
- Backing
- Overtaking
- Sideswipe
- Parked
- Erratic
- Out of control
- Right turn
- Left turn
- U-turn
- Pedestrian
- Bicycle
- Injury
- Fatality
- Nighttime
- DUI

Fixed objects:

- General
- Signal
- Tree
- Pole
- Curb
- Animal

- 3rd vehicle
- Extra data

Pd' Programming, Inc. 6/25/2015

APPENDIX E: COMMUNITY ENGAGEMENT DETAILS

City of Fort Collins

Corridor Understanding: Community Engagement Appendix

West Elizabeth Enhanced Travel Corridor Plan

Table of Contents

Introduction

This appendix documents the key outreach activities during Phase 1 (Corridor Understanding) of the West Elizabeth Enhanced Travel Corridor Plan.

Key outreach activities included:

Activity	Date
Surveys (Intercept, Paper, Online)	March-May, 2015
Listening Sessions	April 29 & May 4, 2015
WikiMap	April-May, 2015
Neighborhood Walking, Biking, and Transit Tours	May 11-14, 2015
Open Streets	June 7, 2015

Summaries of these outreach activities, including the key themes heard, are presented in the sections below.

Survey Summaries

BACKGROUND

As part of the community engagement and corridor understanding process three surveys were administered during the spring of 2015 which asked residents to provide responses to a variety of questions related to how they used the West Elizabeth Corridor, what the key issues were, and how the study area might be improved.

Survey Instrument	Date	Responses
Paper Survey #1—CSU Classes	March, 2015	32
Intercept Survey/Paper Survey #2	March 31 & April 10, 2015/ April, 2015	101/45
Online Survey	Mid-April through Mid-May, 2015	274
	Total	**452**

While the content of all three surveys were similar in concept, some of the questions varied and evolved between survey instruments. All questions, including demographic information, were optional. However, most respondents did complete the entire survey, which is helpful for understanding the experience of respondents from different viewpoints.

Paper Survey #1

The first of the surveys to be administered was created and distributed by City staff to students at Colorado State University (CSU). The survey consisted of 7 questions: 4 multiple choice questions, 1 ranking question, and 2 open-ended questions.

Intercept Survey/Paper Survey #2

The second survey was refined by students as part of a class project for the Center for Conservation Leadership through Learning (CLTL). The survey was administered at various locations across the West Elizabeth Corridor, such as the King Soopers shopping center and bus stops. The intercept survey consisted of 11 multiple choice questions. Several of the questions

allowed multiple responses as well as an "Other" option through which participants could provide a write-in response. Students also had the opportunity to take a paper copy of the survey to complete at home and submit later at the CSU Transit Center.

Online Survey

Survey questions from the paper survey were further refined and incorporated into an online survey which was open from mid-April through mid-May and accessed via the West Elizabeth ETC website. The online survey consisted of 11 multiple choice questions and 1 ranking question. Several of the questions allowed for multiple responses as well as an "Other" option with a write-in response. In addition, three questions asked why the user didn't use specific modes (bike, bus, walking) in the corridor more often. These had logic built in that prompted an additional question if a safety-related response was chosen and provide a deeper understanding of safety concerns related to specific modes.

A comparison of the survey questions is shown in the table below. Key topic areas include:

- Background
- Travel Behavior
- Barriers to Active Transportation
- Potential Improvements
- Demographics
- Other Comments

Responses to these questions are summarized in the sections that follow (text and charts). Questions with charts depicting responses are bold and include "**Q#.**," which indicates the chart number.

Question	Paper Survey #1	Intercept Survey / Paper Survey #2	Online Survey
BACKGROUND			
Q1. Using the map above, which of the following apply to you? (Please select all that apply)	✓	✓	✓
If answered "None of the above" in previous question: Why do you not use West Elizabeth Street?			✓
TRAVEL BEHAVIOR			
Frequency in Corridor			
On average, how often do you use the West Elizabeth corridor (between Overland Trail and Shields)?	✓		
Modes Used/Primary Mode			
Q2. Which travel mode(s) do you use in this corridor? (Please select all that apply)		✓	✓
Which travel mode(s) do you typically use in this corridor? Rank the modes as 1 for the most frequent, 2 for next, and so on; only rank the modes you use.	✓		
Q3. Which travel mode do you use most often in this corridor? (Please select one)	*	✓	✓
Corridor Likes			
What do you like about traveling in the West Elizabeth corridor?	✓		
Frequency of Active Transportation			
Q4. On average, how often do you use active transportation (biking, walking, buses) in this Corridor? (Please select one)		✓	✓
BARRIERS TO ACTIVE TRANSPORTATION			
Transit			
Q5. What keeps you from using buses more in this corridor?		✓	✓
If chose "safety concerns" in previous question: What are your specific safety concerns about taking the bus in West Elizabeth corridor? Please provide specific locations/origins/destinations.			✓
Biking			
Q6. What keeps you from biking more in the corridor? (Please select all that		✓	✓

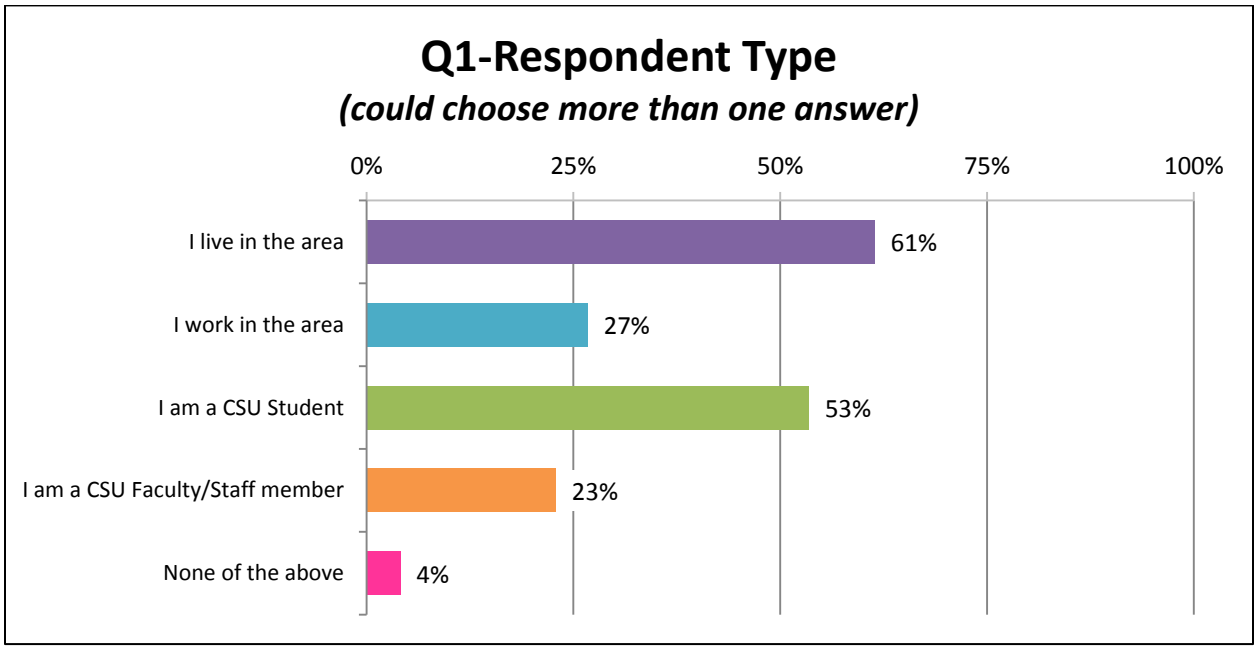
Question	Paper Survey #1	Intercept Survey / Paper Survey #2	Online Survey
apply)			
If chose "safety concerns" in previous question: What are your specific safety concerns about biking in West Elizabeth corridor? Please provide specific locations/origins/destinations.			✓
Walking			
Q7. What keeps you from walking more in this corridor? (Please select all that apply)		✓	✓
If chose "safety concerns" in previous question: What are your specific safety concerns about walking in West Elizabeth corridor? Please provide specific locations/origins/destinations.			✓
POTENTIAL IMPROVEMENTS			
What could be improved?	✓		
Q8. What improvements, if any, would you like to see in this corridor? (Please select all that apply)		✓	
Please rank the potential improvements in this corridor described below. Top priority is ranked "1".			✓
DEMOGRAPHICS			
Gender			
Q9. What is your gender?/With what gender do you identify?	✓	✓	✓
Age			
Q10. What is your age?	✓	✓	✓
Ethnicity			
Q11. With what ethnicity do you identify?		✓	✓
Rent v. Own			
Do you own or rent your residence?			✓
OTHER COMMENTS			
Please share any comments or suggestions related to the West Elizabeth Corridor or the West Elizabeth ETC Plan.			✓

* *Used responses for Rank = 1 from previous question in chart*

WHAT WE HEARD – KEY THEMES

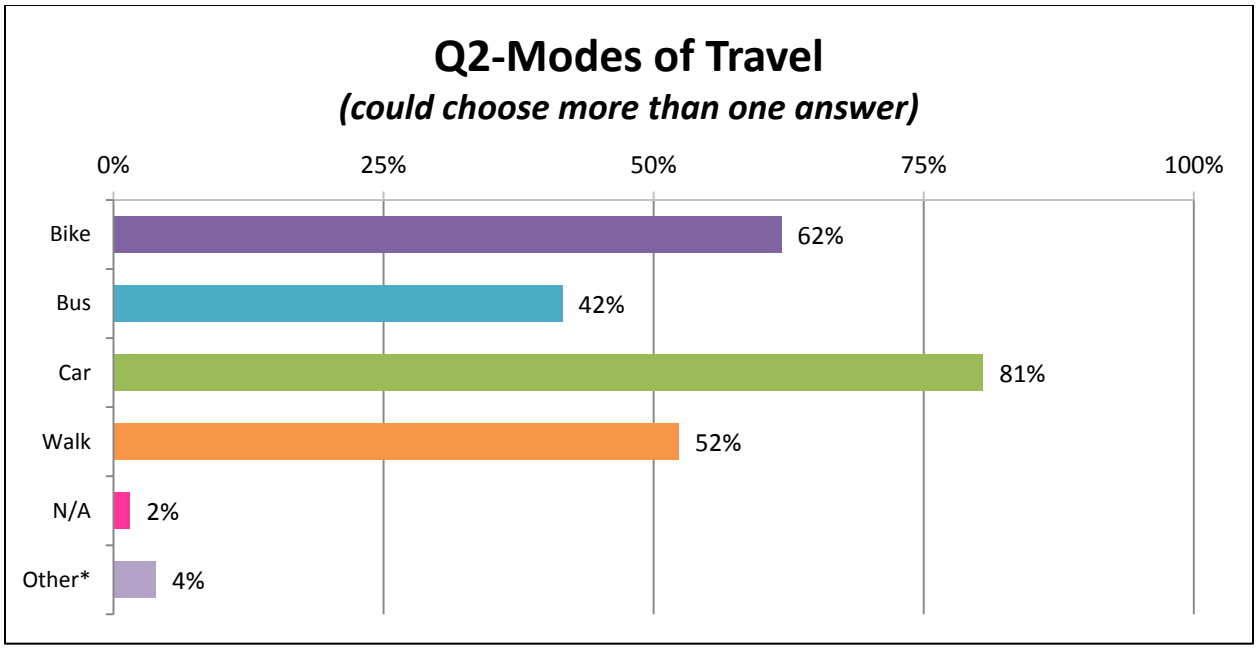
Background

- A total of 452 people participated in various West Elizabeth corridor understanding surveys.
- The majority of respondents lived in the study area (61%), and a high percentage of participants were CSU students (53%).

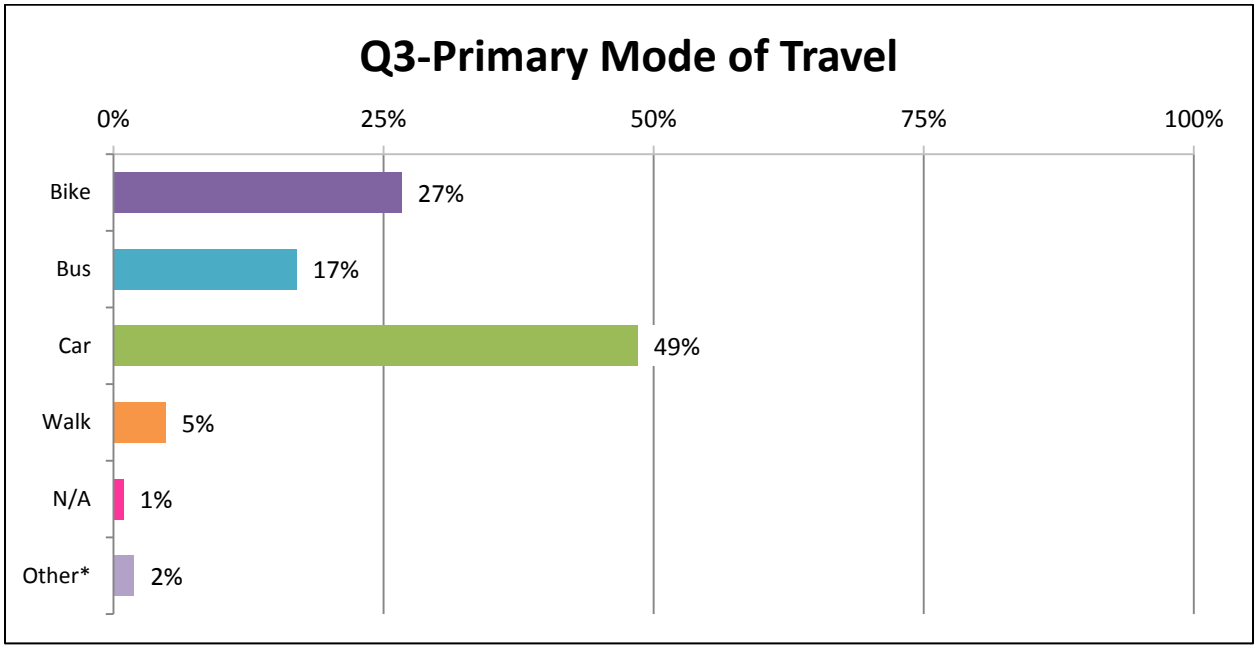


Travel Behavior

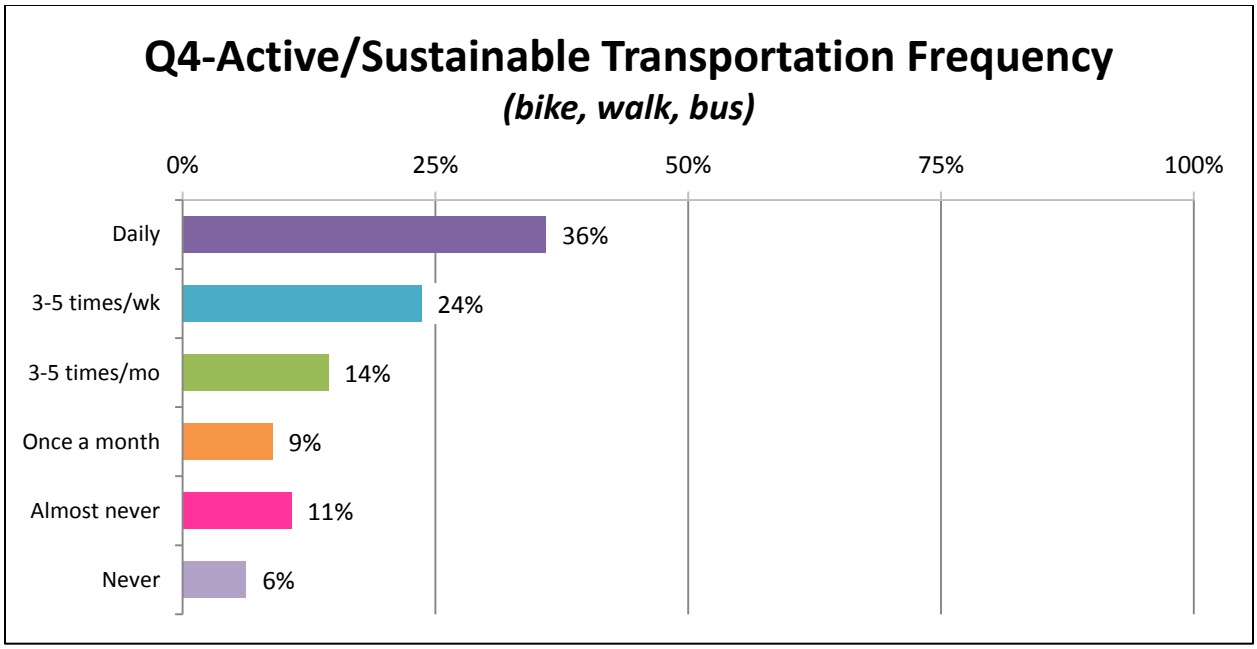
- Over half of the respondents already use multiple modes in the corridor (respondents were able to select all options that applied to them):
  - 81% - Drive
  - 62% - Bike
  - 52% - Walk
- The primary mode currently used is car (49%), followed by bike (27%).
- Over one-third of respondents (36%) use active transportation (biking, walking, buses) on a daily basis, while 17% of respondents never or almost never use active modes.



*Includes longboard/skateboard



*Includes longboard/skateboard

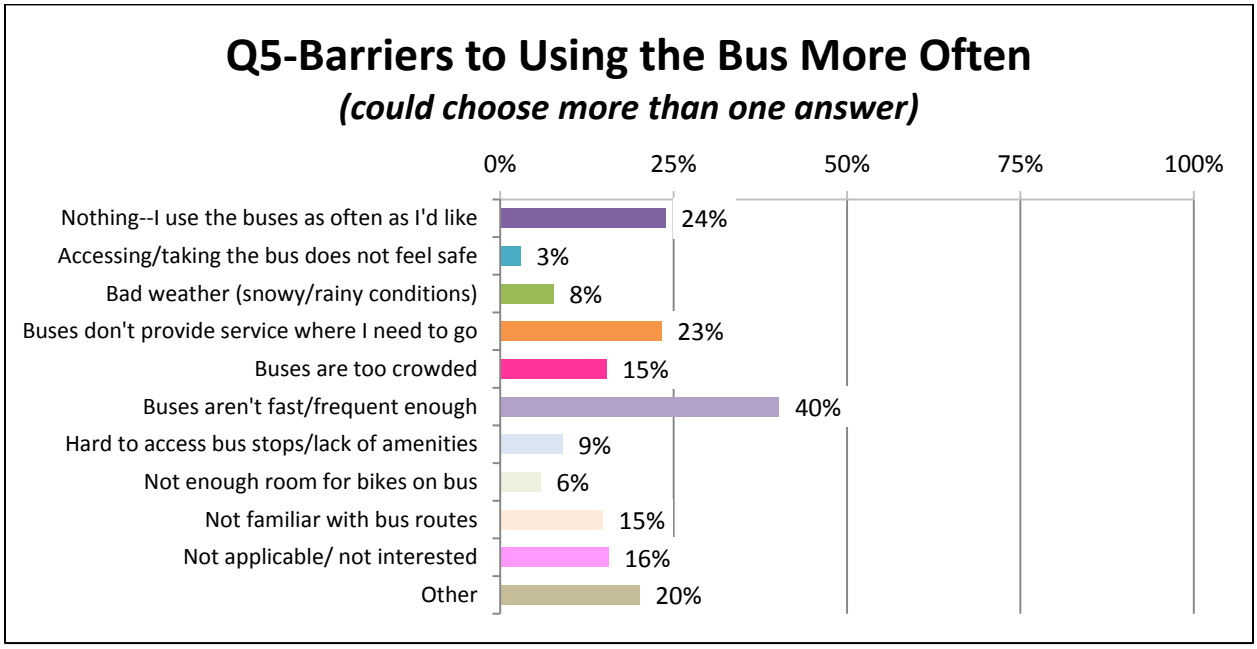


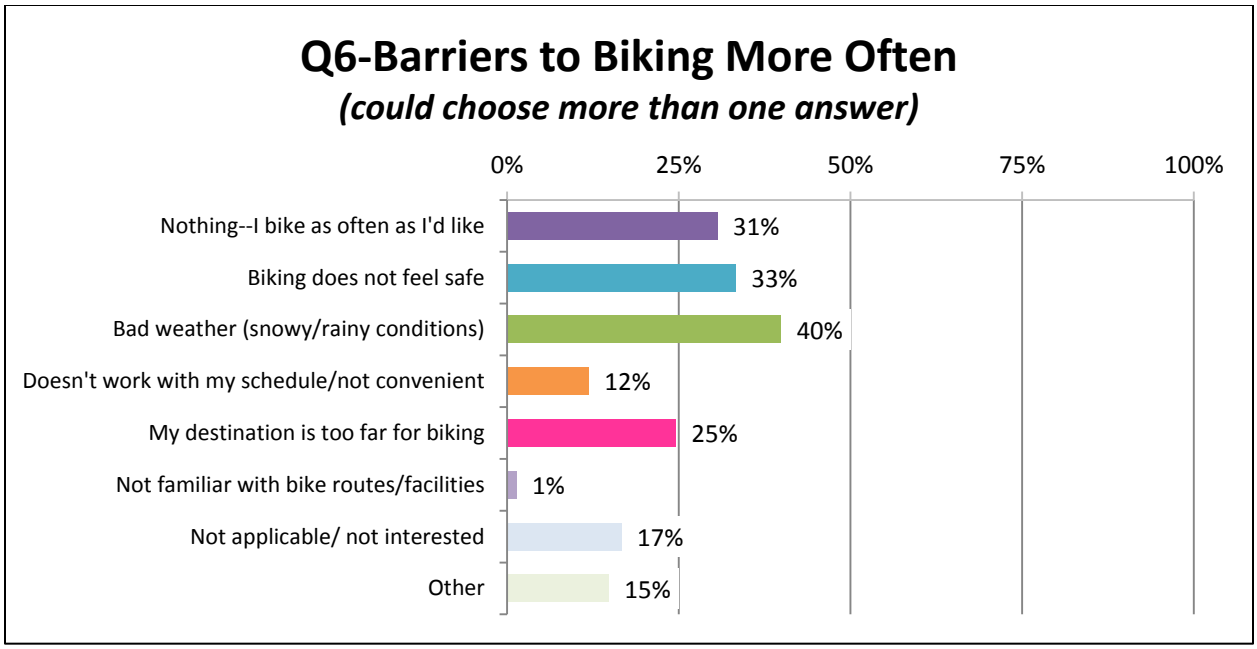
Barriers to Active Transportation

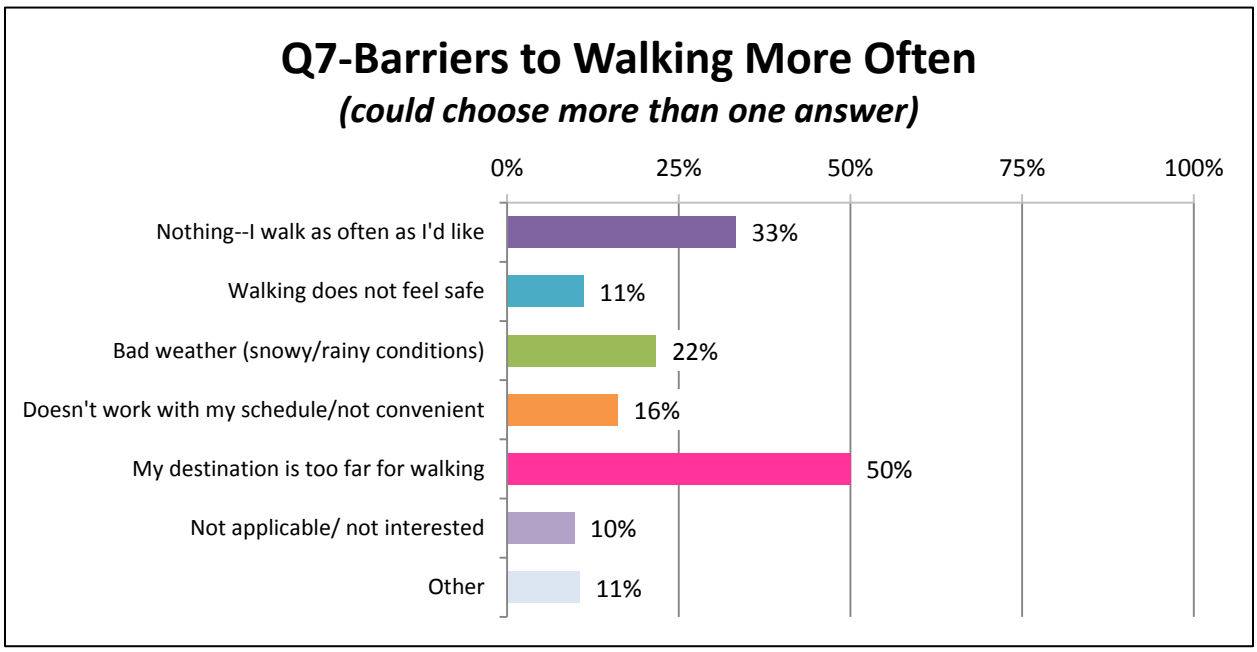
- The top barrier to using the bus more often was that the buses aren't fast or frequent enough (40%).
- Key safety concerns related to taking the bus:
    - Accessing bus service (e.g., not feeling safe walking to/from and waiting at the bus stops in early morning or evening hours when it was dark out)
    - Navigating the corridor to access the bus amidst busy traffic
- Nearly one-third (31%) of respondents don't perceive any barriers to biking in the corridor. Conversely, 40% said bad weather keeps them from biking more, and 33% said biking does not feel safe enough.
- Key safety concerns related to biking:
    - Biking alongside high levels of vehicular traffic
    - Distracted drivers not paying attention to bicyclists on the roadway; several respondents commenting on witnessing or nearly being involved in bicycle/auto accidents

- Quality of bicycle infrastructure in the area (e.g., narrow bicycle lanes, discontinuous and disconnected bicycle lanes, debris in the roadway, and challenging intersections)

- Similarly, one-third (33%) of respondents don't perceive any barriers to walking in the corridor, and 50% said the distance to their destination is too far to walk.
- Key safety concerns related to walking:
  - Nighttime safety (e.g., poor lighting in the area)
  - Perception of lack of protection from traffic along segments of the roadway with discontinuous or missing sidewalks and at intersections





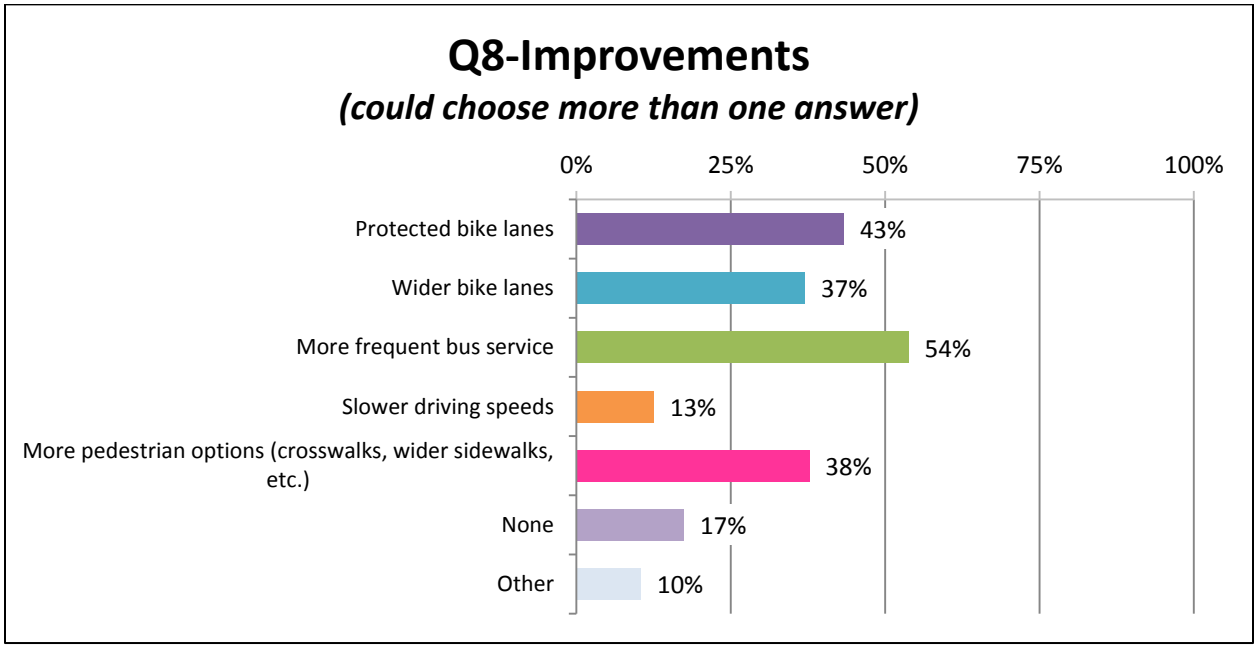


Potential Improvements

- Paper Survey #1 – Key themes:
    - Improved bicycle infrastructure (e.g., protected bike lanes, improved lane design at intersections, and better plowing of bike lanes)
    - Improved pedestrian facilities (e.g., an underpass crossing Shields and improved intersection design and timing)

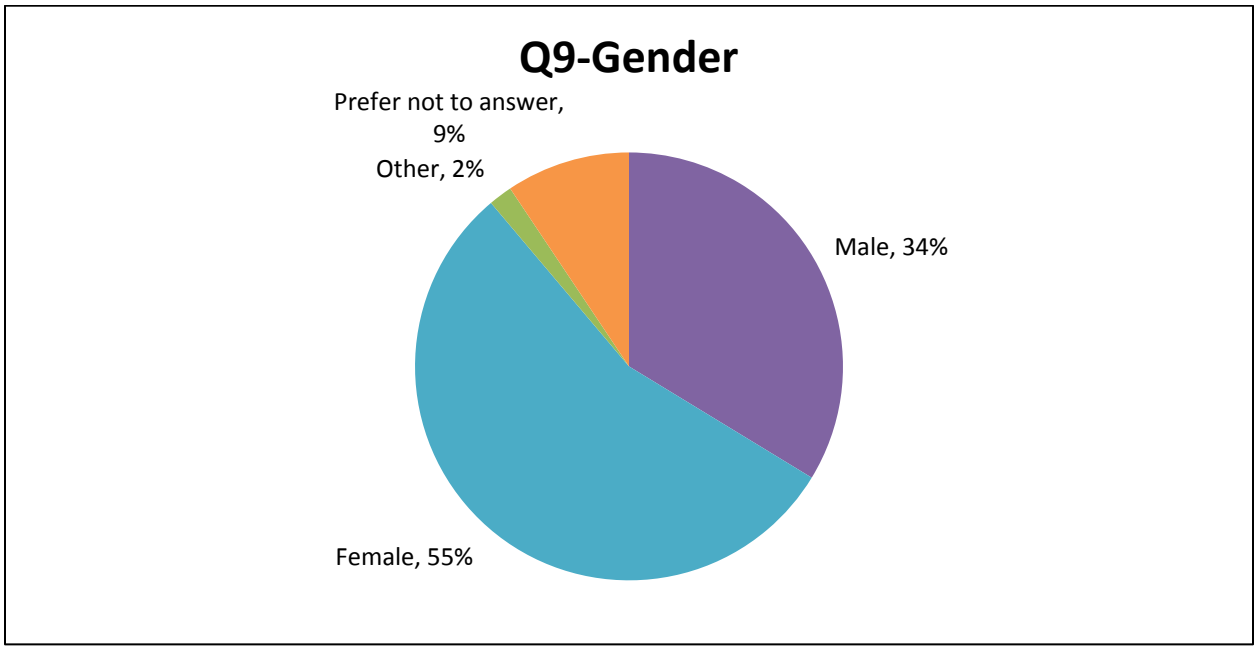
- Additional bus routes, additional space on buses
- Traffic/congestion management

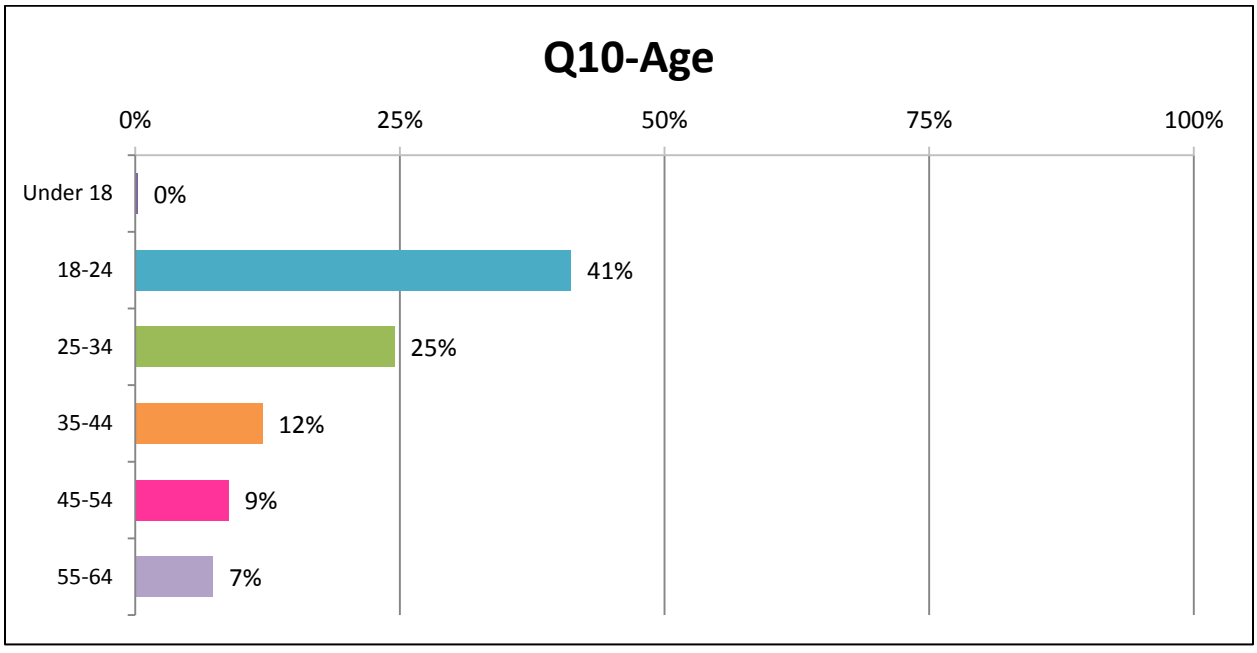
- Intercept Survey/Paper Survey #2 – The most frequently chosen types of improvements supported included:
  - 54% - More frequent bus service
  - 43% - Protected bike lanes
  - 38% - More pedestrian options
  - 37% - Wider bike lanes
- Online survey – Ranking of improvements:
  - #1 – Bike-related improvements (weighted score: 763)
  - #2 – Transit-related improvements (668)
  - #3 – Pedestrian-related improvements (619)
  - #4 – Motor vehicle-related improvements (605)
  - #5 – Urban design-related improvements (489)

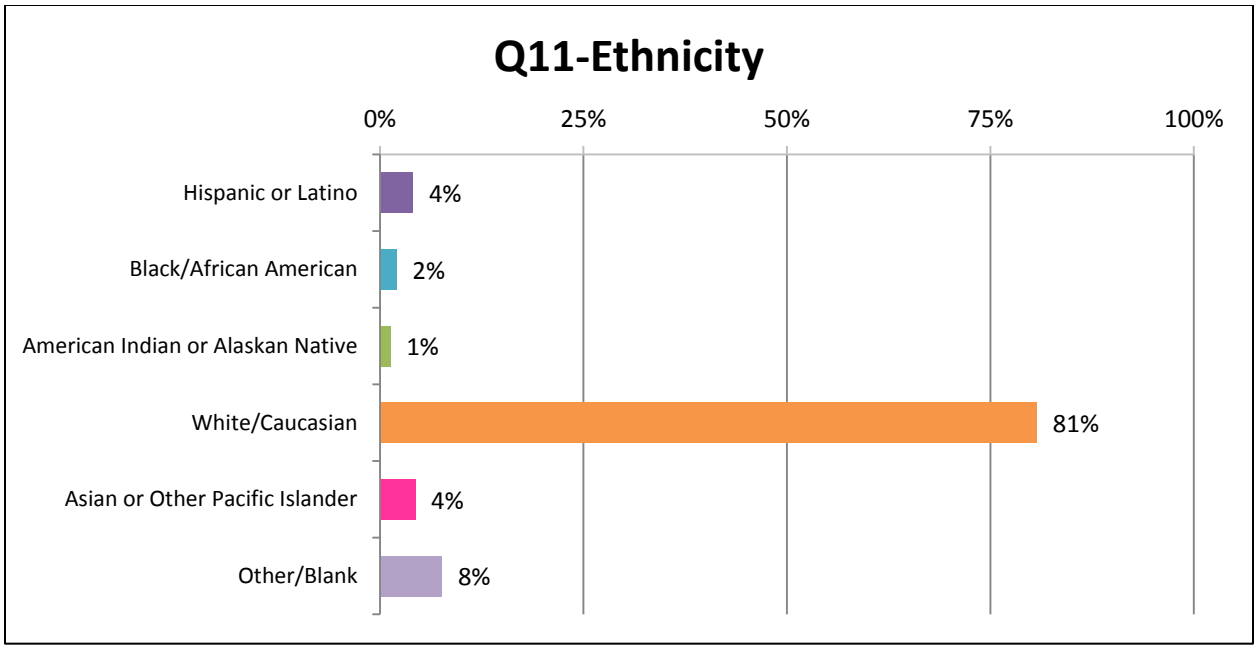


Demographics

- Overall, a majority of survey respondents were female (55%) and between the ages of 18 and 34 (66%) which is generally representative of the study area.







Other Comments

Comments were wide ranging due to the nature of the question; however responses tended to focus on a few key issues similar to comments on other survey questions.

- Suggestions for improved bicycle infrastructure, including protected bike lanes and improved lane design at intersections.
- Improved bus service (e.g., MAX-type bus system on Elizabeth, extended service hours, more bus stops, and better connections to the rest of the city).
- Additional speed enforcement, improved intersection design and signal timing, and suggestions for a traffic light at the King Soopers entrance on West Elizabeth Street.
- Concerns about the increased development and density in the corridor and the impacts that changes to the corridor may have on the surrounding neighborhoods.

West Elizabeth Enhanced Travel Corridor Plan

City of Fort Collins

Listening Session Summary

BACKGROUND

Two listening sessions were held on April 29 and May 4, 2015 to gain insights from the community about the existing conditions and issues surrounding the West Elizabeth Corridor and to help identify potential areas of improvements.

Date	Session	Location	Participants
April 29	6:00 – 8:00 pm	Westminster Presbyterian Church	30
May 4	6:00 – 8:00 pm	Polaris/Lab School	21
		Total	**51**

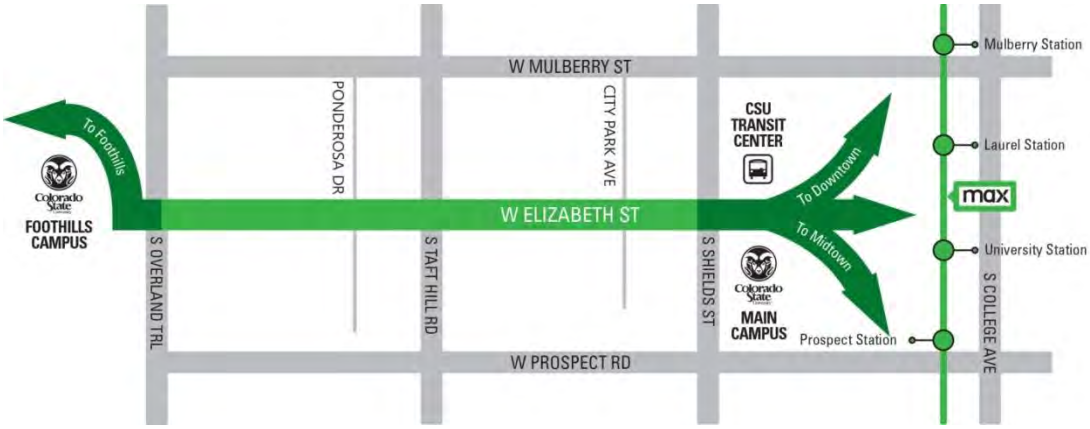
The listening sessions began with an introduction to the West Elizabeth Enhanced Corridor Plan, a description of the community engagement activities conducted thus far, and an overview of the community engagement process moving forward.

Participants were asked to break into groups to discuss different transportation modes in the corridor, including: vehicular, transit, pedestrian, and bicycle. Each group had maps associated with the topic areas and was encouraged to share thoughts, concerns, or questions they had related to the topic. Participants were encouraged to discuss their thoughts with the group and write notes on the maps. Each group had approximately 30 minutes to discuss the topic before moving to one of the other topic areas.

WHAT WE HEARD – KEY THEMES

The project team heard a number of concerns, opportunities, and comments during the discussions and on the comment forms. The following list of key themes summarizes the ideas and comments shared by participants at both listening sessions. Comments are organized by corridor segments according to the map below:

- CSU Foothills Campus/Overland Trail to Ponderosa Drive
- Ponderosa Drive to Taft Hill Road
- Taft Hill Road to City Park Avenue
- City Park Avenue to Shields/CSU Main Campus



Overland Trail to Ponderosa Drive

- Bicycle infrastructure is discontinuous and less prevalent in this western portion of the corridor.
- Pedestrian crossing (across Elizabeth) is difficult and dangerous; we need dedicated crossings.
- I would ride the bus more if there were service on Mulberry Street west of Taft Hill Road.
- Elizabeth Street is bottlenecked beyond Ponderosa Drive; remove the on-street parking.
- Property owners are concerned how they might be affected by changes to the corridor.

Ponderosa Drive to Taft Hill Road

- The intersection at Taft Hill Road and Elizabeth is busy, dangerous, and confusing; there are conflicts between all modes there.
- It is difficult and to cross Elizabeth west of Taft Hill Road. We need a pedestrian crossing near King Soopers (*heard many times*).
- Access conflicts at King Soopers entrance west of Taft Hill Road (also south of Elizabeth Street) – *(this was mentioned several times and is probably the biggest theme of the night)*

Taft Hill Road to City Park Avenue

- City Park Avenue north of Elizabeth is dangerous for bicyclists despite being a major connection to Old Town. Need a low-stress bike network on City Park Avenue.
- The bike lane (westbound) on Elizabeth Street past City Park Avenue is too narrow.
- There is a lot of congestion on City Park Avenue and Plum Street. Too much activity; on-street parking, buses, bicyclists, and pedestrians (*heard several times*).
- There is a lot of cut through traffic on Springfield Drive and City Park Avenue.

City Park Avenue to Shields

- Intersection improvements are needed at Plum Street and Shields for all modes.
- Bike facilities need improvements on Plum Street; this is a high conflict area between buses and bicyclists (*heard several times*).
- Improved bicycle crossings needed at the Shields and Elizabeth Street intersection, currently feels unsafe.
- Although people appreciate the activated crosswalk on Elizabeth Street drivers don't necessarily yield to pedestrians.
- Would like to see detached bicycle and pedestrian facilities; possibly a shared use path.
- There is a lot of congestion in Campus West.
- Students use the neighborhood between City Park Avenue and Constitution Avenue south of Elizabeth Street as a park-n-ride.

Other/General Comments

VEHICULAR

- Lots of access points (driveways) that result in high number of bicycle/vehicular conflicts.
- "Right-sizing" Elizabeth Street and using a vehicular lane for dedicated transit or improved bicycle and pedestrian facilities might be a good option (*heard several times*).
- Better traffic enforcement is needed (*heard several times*).
- Would like to see traffic diverted to adjacent arterials (Mulberry & Prospect) to relieve congestion.
- Speeding is big issue, traffic calming is needed.
- Improved street lighting is needed.

TRANSIT

- Bus stop amenities need improvements (*mentioned several times*).
- Need higher frequency bus service; full buses discourage transit use.
- Students use the study area neighborhoods as a park-n-ride.
- Buses speed in the corridor (*mentioned several times*)
- Need Sunday, weekend, and late evening service.
- Would like the buses to connect to the MAX.
- Buses only cater to students.

PEDESTRIAN

- Sidewalk infrastructure is inconsistent; need continuous walkability along all of West Elizabeth Street and better cohesiveness in the level of infrastructure.
- Sidewalks are narrow, uncomfortable, and challenging for mobility-challenged individuals.
- Infrastructure needs to be better maintained including snow removal.
- Detached sidewalks are preferred.
- Need more pedestrian refuge islands to protect pedestrians when crossing Elizabeth Street.
- Residents are concerned about light pollution from adding additional pedestrian crossings.

BIKING

- Biking behavior in the corridor is impulsive and unpredictable, such as riding the wrong direction in bike lanes and on the sidewalks. There needs to be more education to improve travel behavior.
- Bike lanes are not obvious /intuitive on Elizabeth Street. In some sections it unsure if there is a dedicated bike lane or if it is just the road shoulder (*heard several times*).
- Bike lanes need better snow removal.
- Bikes and buses go the same speed, leapfrog down corridor, this creates multiple conflict points between the two.
- North-south connectivity across the corridor needs improvement.

WikiMap Summary

BACKGROUND

As part of the first phase for the West Elizabeth Enhanced Travel Corridor Plan an online interactive map "WikiMap" was created and available for input. A link to the WikiMap was distributed through the project email distribution list and newsletter as well as available on fcgov.com\westelizabeth from mid-April to mid-May 2015.

The wikimap contained a basemap of the study area on which participants were instructed to provide feedback regarding:

- Problem Locations
- Places I Liked
- Routes I travel

WikiMap Instructions:

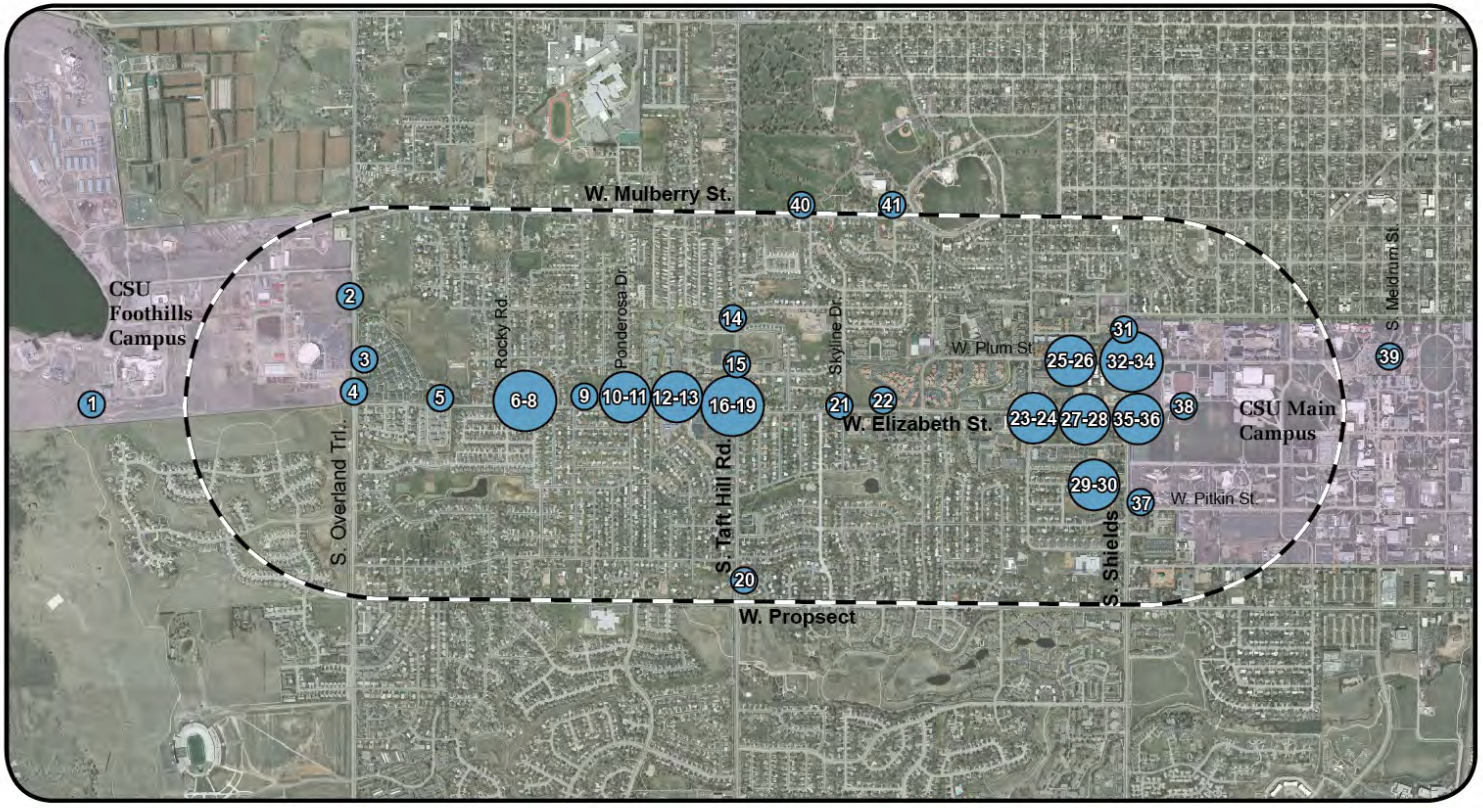
Participants logged 41 "Problem Locations" and comments. Comments generally related to bicycling infrastructure and safety, pedestrian infrastructure and safety, intersection design and signal, and traffic volumes. The comments highlighted some of the challenging interactions between multiple modes. For example, a majority of the comments related to bicycling, such as concern about discontinuous bicycle lanes, were also accompanied by concerns for high levels of vehicular traffic.

There were fewer "Locations I Like" provided by participants; 7 total. The two main themes expressed in the comments where an appreciation for open space, community gardens, and parks and an appreciation for newly resurfaced and striped bicycle lanes.

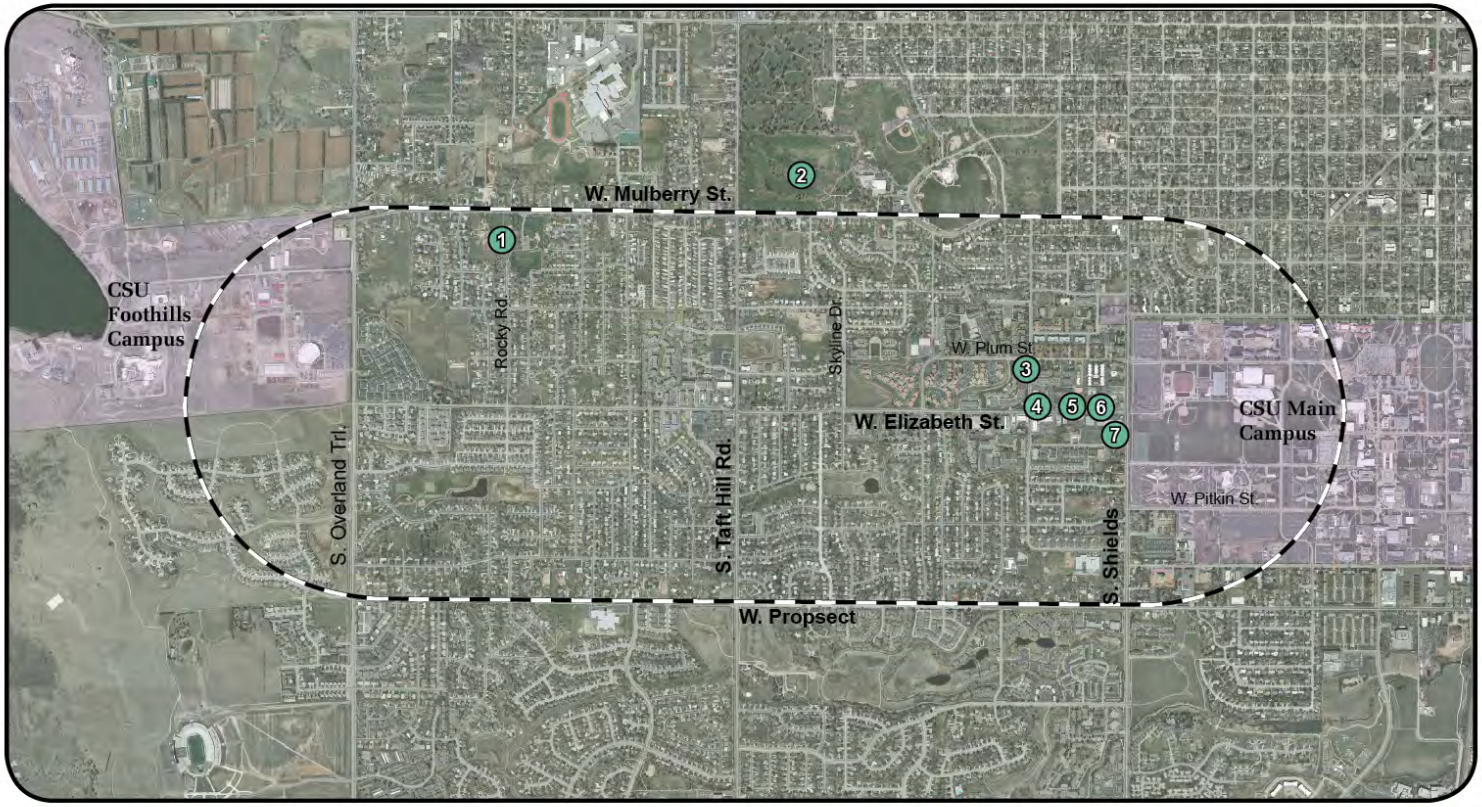
Participants were also able to provide detailed information on how they traveled in the corridor by marking routes they took and indicating the mode(s) used. Of the 27 routes logged, over half of the trips were made by bike. Popular destinations were the CSU Main Campus and the CSU Foothills Campus.

DETAILED RESULTS

WikiMap—Problem Locations



WikiMap—Locations I Like



Legend

- Locations I like
- CSU Campus
- Study Area Boundary

0 0.25 0.5 1 Miles

N

Problem Location Comments:

1. Public transportation does't have service when classes are out of session; this is a problem.
2. No sidewalk
3. Crossing to the Equine Center is challenging.
4. a. Multiple issues at this intersection; fast-moving cars, can't see cars until they are on top of hill, lots of cars turning, no crosswalks across Overland Trail.
   b. Agree, needs a traffic light and turn lanes.
5. Need a bus stop here that should include a clearly marked bench/shelter configuration.
6. a. Bike lane nonexistent - must merge with traffic when biking west. Poorly lit.
   b. Agree, north side of street starting from Ponderosa Drive to Overland Trail needs sidewalks/bike paths and lighting to make it safe for everyone.
7. No bike lane. It just disappears.
8. No comment
9. No bike lane eastbound.

No bike lane eastbound along Elizabeth near Cypress Drive.

10. Cars parked along Elizabeth Street force drivers heading south from Ponderosa Drive to pull very far into Elizabeth Street.
11. Westbound cars on Elizabeth Street turning right onto Ponderosa Drive cross over the bike lane.
12. Congested area with lots of pedestrians trying to cross Elizabeth Street and lots of cars going to/from the grocery store.
13. King Soopers driveway turn lane is so short and so close to Taft Hill Road that drivers routinely swerve around cars turning left at high speeds. I have been nearly hit multiple times there.
14. Unsafe crossing. You must cross to the left side of the road to push the crosswalk button. The button is also not near the sidewalk, so you must dismount and leave your bike and trailer (with kids) to push the button, then get back on your bike and move to the right hand side of the road to cross.
15. Green bike zone on the southwest corner of Plum Street is a problem. The right turn lane (to head south on Shields) crosses the bike lane, which gets heavy traffic. This type of design will result in a careful driver accidentally hitting a distracted biker.
16. a. Congestion/unsafe due to high volume of cars, needs improvement traffic timing, turn lanes, bike and walking space.
    b. This intersection is backed up all directions from 9 am to 5 pm, 6 days a week. The summer is not bad but when the students are here I avoid it as much possible.

Problem Location Comments:

17 This is a problematic intersection, as both Elizabeth Street and Taft Hill Road become very narrow here. I imagine this occurred because of lack of space. Regardless, narrow sidewalks, loss of bike lanes, narrow car lanes, and multiple entrances (King Soopers, Loaf-n-Jug, Domino's, Everyday Gas Station, etc) make this an unsafe and unpleasant area for all modes of transportation.

18 Poor bike lane indication for cyclists traveling west.

19 No comment

20 a. This area on Taft Hill Road, roughly between Lake Street and Stuart Street often contains a high amount of road debris in the bike lanes. I'm not sure exactly what causes so much stuff to pile up in the bike lanes in this area.
b. Crossing Taft Hill Road at Lake Street is difficult and dangerous on a bike and as a pedestrian. The speed limit on Taft Hill Road is high, the two sides of Lake Street don't meet, and it is difficult to view traffic coming from the south because of a short, steep hill. Bikers looking for alternatives to heavy-traveled, high speed-limit, bus route streets like Prospect Road would gravitate to streets like Lake Street, but crossing Taft Hill Road and Shields (on Springfield Drive) is almost as dangerous as taking Prospect.

21 Poorly lit, can't see people approaching on a bike while waiting to make a turn.

22 Poorly lit

23 The pavement in the bike lane is uneven and makes me nervous about catching a wheel. Drivers like to speed off from the stop light at City Park Avenue. Sometimes there is a bus in the bike lane and I have to jump onto the sidewalk.

24 a. Busy intersection that does not feel safe for cyclists, especially younger cyclists accessing Bennett Elementary School.
b. It doesn't seem like cyclists on City Park Avenue are able to set off the automatic sensors to change the light.

25 Could this area be closed for transit and bike only during the day?

26 The construction, closing the sidewalks and bike lanes makes this a nasty mix.

27 High volume of cyclists and mixing zones with auto traffic. This area should have a protected bike lane.

28 Island in the middle of the road.

29 University students crossing Shields from Laurel Street to Prospect creates unsafe conditions for all. A grade-separated crossing for access to CSU Main Campus is critical.

30 High traffic area. Nearly impossible to make a turn north onto Shields Street.

31 No comment

Problem Location Comments:

32 When going westbound on Plum Street across this intersection, cars turning left often can't see you until you are in the intersection because same direction cars (turning left) block the view.

33 Heavy congestion for all modes of transportation. It is going to get worse with the new apartments opening in Fall. Need timed, left turn signal both eastbound and eastbound (turning from Plum Street onto Shields).

34 Walk signal infrequent, and some cars don't pay attention to people in the crosswalk.

35 The light is inconsistent here. It doesn't always sense bikes headed east.

36 Would love to see an over or underpass here or a block north or south. Lots of pedestrians here!

37 Very difficult to cross here.

38 Trail is too narrow.

39 Lack of grid connection between CSU west routes and MAX route. East-west bus routes should be extended.

40 Trying to make a left or right turn off of Crestmore is EXTREMELY dangerous, huge trees block visibility of oncoming cars as well as bikes.

41 No comment

Location I Like Comments:

1 Open park space and community garden.

2 This is a nice park.

3 New bike lanes make this section of City Park Avenue feel safer.

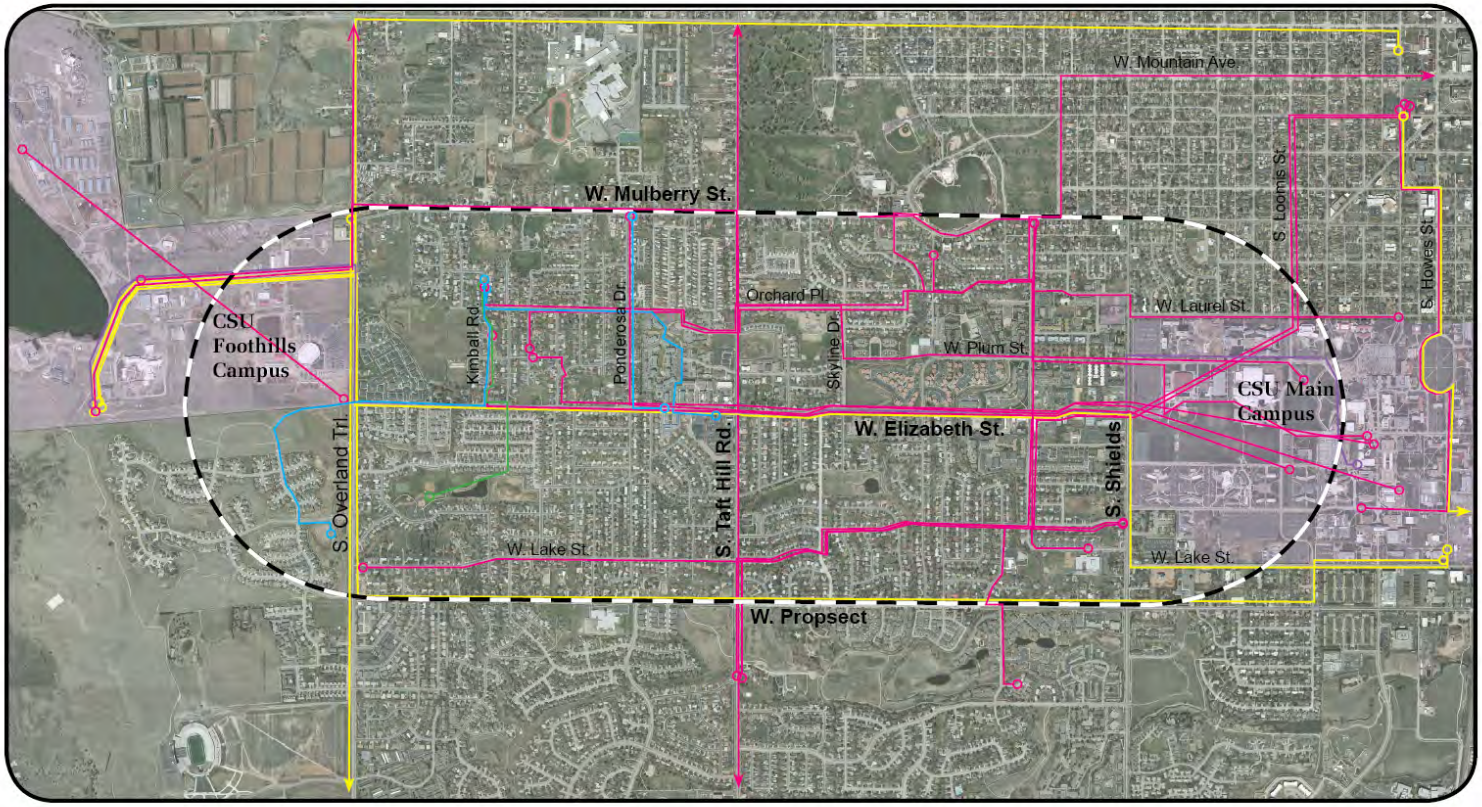
4 I like when I get here on my ride and the bike lane is smooth and wide. Motorists seem to be more aware of cyclists in this area too.

5 Sonic Drive-in

6 No comment

7 Comcast Xfinity office.

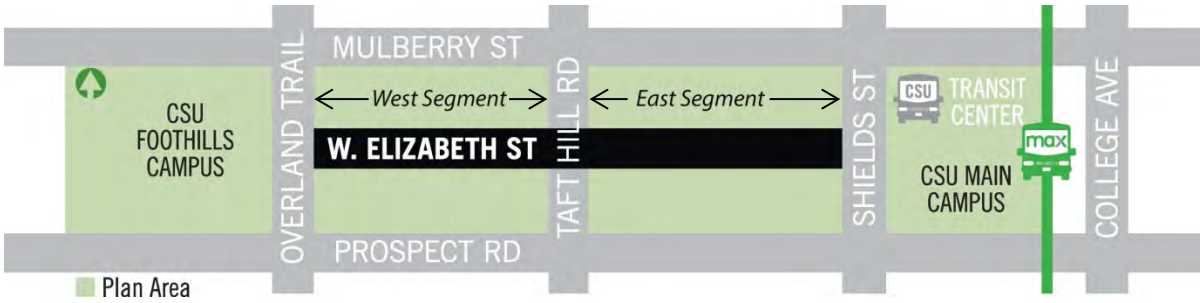
WikiMap—Routes I Travel



Neighborhood Walking, Biking, and Transit Tours Summary

BACKGROUND

Six tours were scheduled during the week of May 11, 2015. The intent of the tours was for City Staff to experience the corridor with locals who live, work and play in the area. Community members were asked to voluntarily lead or participate in the tours and to identify issues and opportunities from their perspectives. The following table provides the dates, focus and attendees of each tour. The tour comments are summarized primarily by the following group of images as well as geographically by the map that follows.



Date	Time	Tour Detail	Participants
5/11/2015	12:30 – 2 p	Tour 1: Bike Tour of West Segment (between Overland Trail and Skyline Drive)	Josh Weinberg, Leader Andrea Weinberg Susannah Wright Emma Belmont, City Staff Amy Lewin, City Staff
5/12/2015	11 a – 12:30 p	Tour 2: Walking Tour of Campus West Shopping Center (between City Park Avenue and Shields Street)	Justie Nicol, Leader Doug Ernest Kathy Nicol Mike Werner Craig Russell, Consultant Emma Belmont, City Staff Rebecca Everette, City Staff Amy Lewin, City Staff
5/14/2015	10 – 11:30 a	Tour 4: Walking and Transit Tour of East Segment (between City Park Avenue and Taft Hill Road)	Terry Schictling, Leader Aaron Fodge, CSU Emma Belmont, City Staff Rebecca Everette, City Staff Amy Lewin, City Staff Kurt Ravenschlag, City Staff
5/14/2015	5:15 – 6:56 p	Tour 5: Walking Tour of West Segment (Between Hillcrest Road and Andrews Peak Drive)	Carron Silva, Leader Bonnie Michael Mike Werner Emma Belmont, City Staff Amy Lewin, City Staff

*Tours 3 and 6 were canceled due to low participation

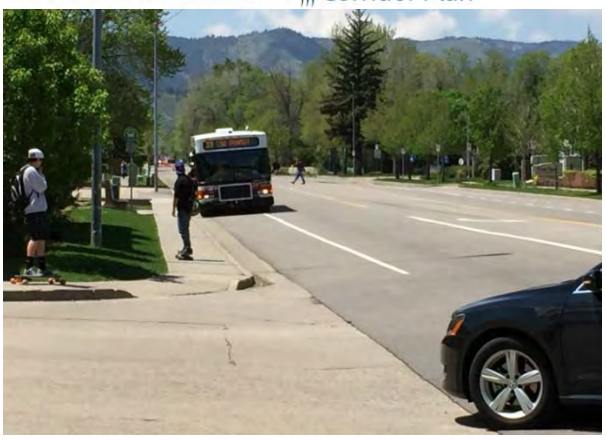
West Elizabeth Enhanced Travel Corridor Plan

WHAT WE HEARD – KEY THEMES

Tour 1: West Segment Biking Tour

Overland and West Elizabeth – residents have difficulty making turning left turn movements from West Elizabeth onto Overland Trail; they would like to see a light added here.

Ponderosa and West Elizabeth Street – residents experience sight distances issues at this intersection because the stop sign is back so far they have to proceed onto West Elizabeth to see oncoming vehicles.



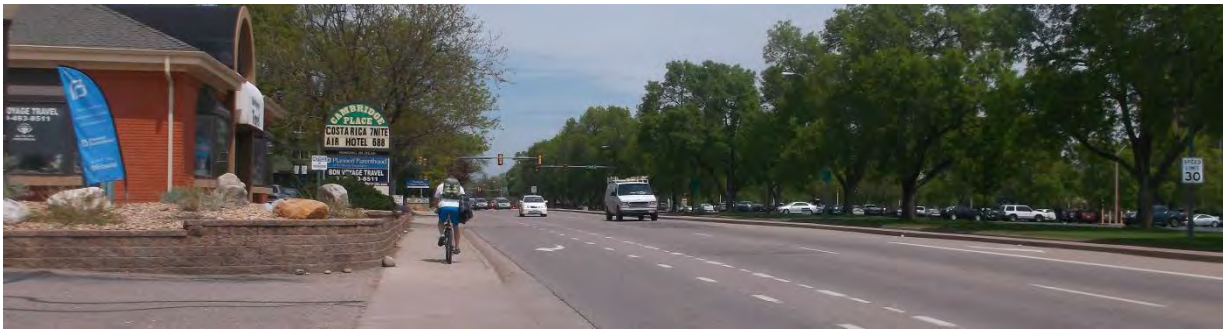
King Soopers Shopping Center at West Elizabeth and Taft Hill - many vehicle, bus pedestrian and bicycle conflicts due to the frequent left-turns into King Soopers.

Common bike path through private development to avoid crossing at Taft Hill and West Elizabeth – signage indicates “Resident Access Only”.

Plum and Taft Hill crossing – frequently used crossing to get to Lab/ Polaris School to the east.

Vehicles crowding the bike lane at Elizabeth and Shields (eastbound travel).

Bike and vehicle interaction as bike transitions through the turn lane into the bike lane at the intersection.

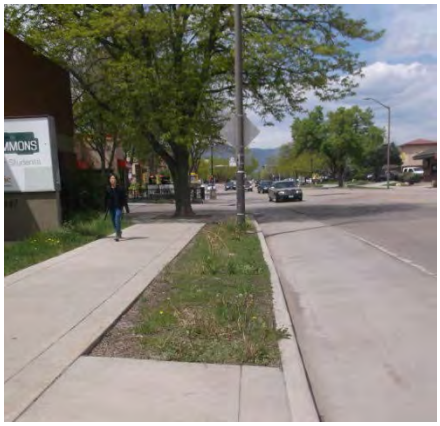


Cyclists using the sidewalk instead of bike lanes. Many bicyclists also ride the wrong way on sidewalks, creating safety concerns.

High volumes of pedestrians crossing Shields at West Elizabeth.

Driveway conflicts with bicyclists, pedestrians, and vehicles and challenges to accessing businesses.

Concern over vehicles sometimes not yielding at designated mid-block crossing.



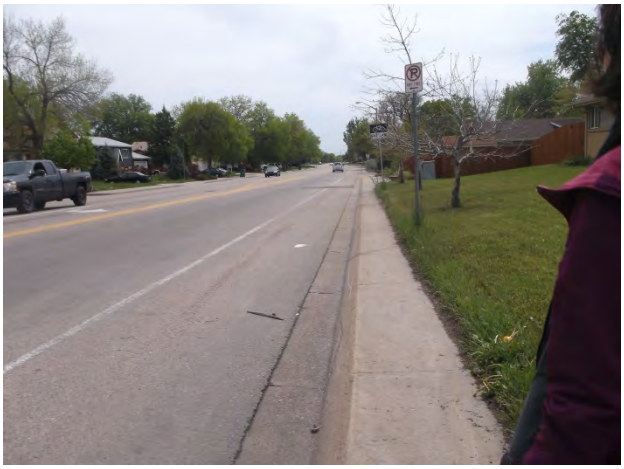
Landscape areas not being maintained.

Need for delivery drop-off for many businesses.

Parking challenges exist in the corridor.

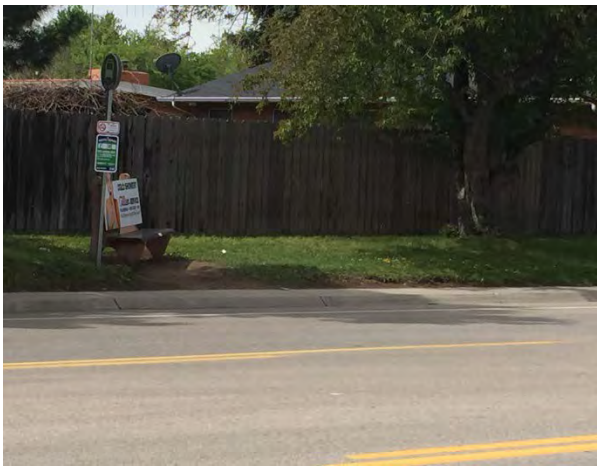
Tour 4: East Segment Walking and Transit Tour (between City Park and Taft Hill)



Accessibility issues exist throughout this corridor – some sidewalks are too narrow and are not compliant with ADA regulations.


Taft Hill and West Elizabeth Intersection – the crosswalk pushbuttons aren't accessible for someone in a mobility device to use. Also, bikes and vehicles extend into the crosswalk and make it challenging to cross.

Many bus stops are inaccessible, have limited or no passenger amentities, or amenities are located in a dirt patch.

There is a lot of transit service in this corridor (Route 2 plus Route 2 trailer bus).

Bike and bus conflict as buses stop in the bike lane to drop off passengers.

Bike traveling on the sidewalk, against traffic.

Tour 5: West Segment Walking Tour (between City Park and Taft Hill)




Ram's Crossing at Ram's Point - this location has a heavily used bus stop, but the sidewalk ends less than 100' west of the stop, making it challenging for residents from the western neighborhoods to access the stop.

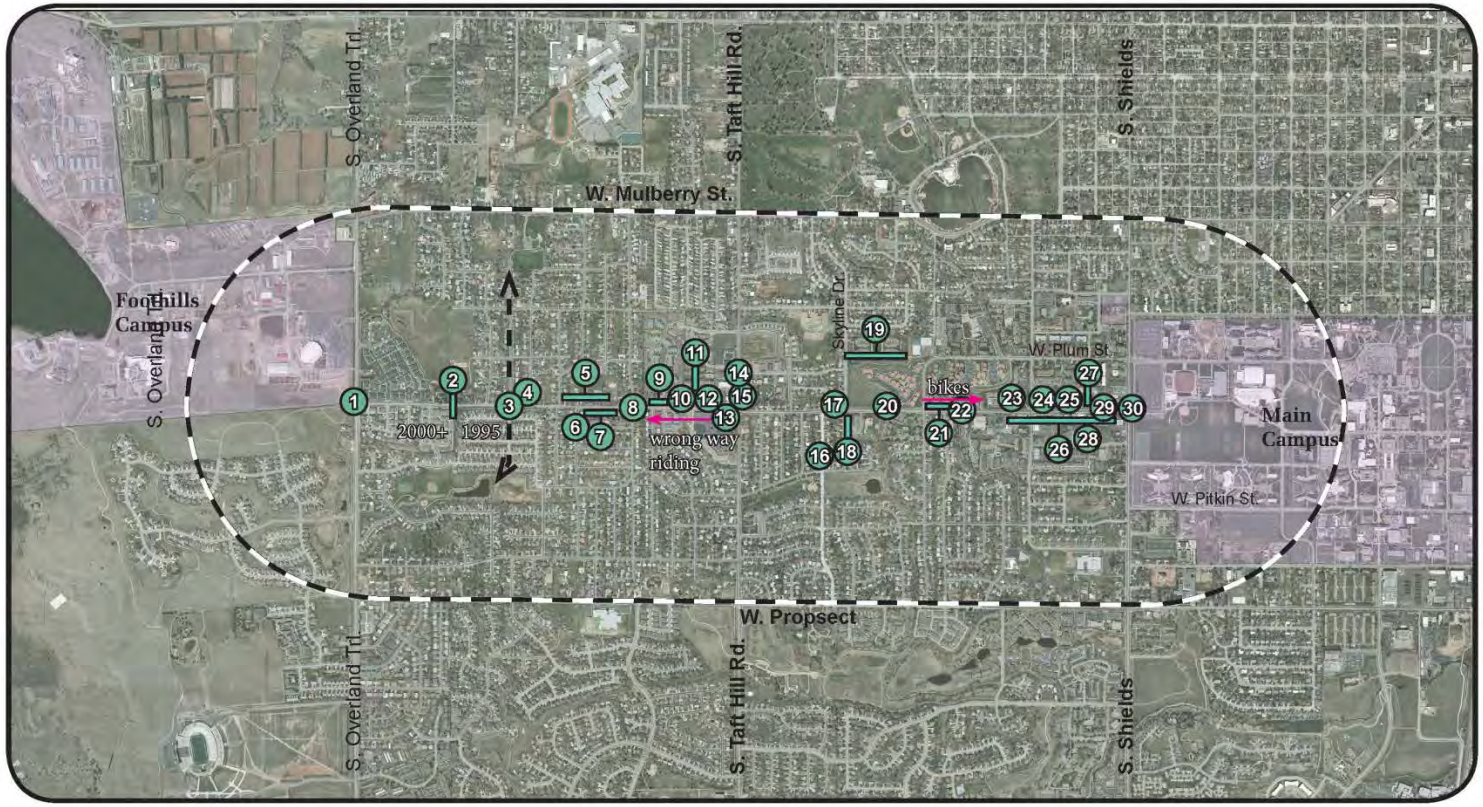

West of Ram's Crossing at Ram's Point the north side of West Elizabeth Street has inconsistent sidewalk facilities.

Properties on the north side of West Elizabeth have drainage issues; many have a ditch and wells very close to the southern edge of their properties. Muddy conditions often occur.

Bus stop on the north side of West Elizabeth Street – a drainage ditch runs directly behind the stop, residents observe littering and noise especially from late-night bus riders getting dropped off.

South side of West Elizabeth Street – sidewalk facilities are better than the north side of the street, but are still inconsistent.

DETAILED RESULTS



Marked Notes:

1. Difficulty getting onto Overland from Elizabeth becasue of traffic
2. Ditch maitenance
3. Potential walk
4. New owners
5. Ditch
6. Plowing challenge
7. Used to be parking prohibited
8. Sight distance issues
9. Parking on turn lane
10. Irrigation ditch
11. Path through private development used to avoid crossing at Taft and Elizabeth
12. No bike rack at bus stop
13. Congestion – lots of conflict due to heavy left turns into King Soopers
14. Crossing to get to Lab and Polaris schools
15. 8:30 - 11:00 and at night – lots of crossings
16. Bike lanes? Or shared bike parking
17. Ramp not accessible
18. Missing sidewalk
19. Ditch corner?
20. Bridge bump and slope
21. Rough sidewalk
22. Bump on bridge
23. Zipcar
24. Didn't shovel
25. Poor shoveling
26. Parking challenges, driveway access challenges. Delivery trucks use center turn lane.
27. Potential for alley improvements
28. Landscape maitenance issues
29. Cars don't always yeild at crosswalks
30. Congested with pedestrians in small space

Other Unmarked Notes:

- Ok with prohibiting parking
- Water rights off Pleasant Valley
- Trash is an issue
- Support of rd. abt.
- Leave shopping carts in front of house/bus stops
- Muddy next to shoulder
- Trash collects in ditches
- D-way sloped high
- Need space between shelter and bus for ramp
- Narrow attached sidewalk not good for wheelchairs, 28"
- 4-way stops, traffic doesn't repair

Open Streets Summary

BACKGROUND

The project team hosted a booth at June's Open Streets event, where they engaged residents in conversation about West Elizabeth Enhanced Travel Corridor Plan.

City staff introduced the project to several citizens and asked if they would like to provide feedback as to the main issues in the corridor and improvements desired for the future. Three posters were presented for input, a "What We've Heard" poster, a "What's Your Big Idea?" poster, and a transit route map of the corridor. Citizens were encouraged to provide their "big vision" for the corridor and write ideas directly on the "What's Your Big Idea?" poster. They were also asked to provide information on origin-destination routes taken in the corridor in order to glean travel behavior and routes.

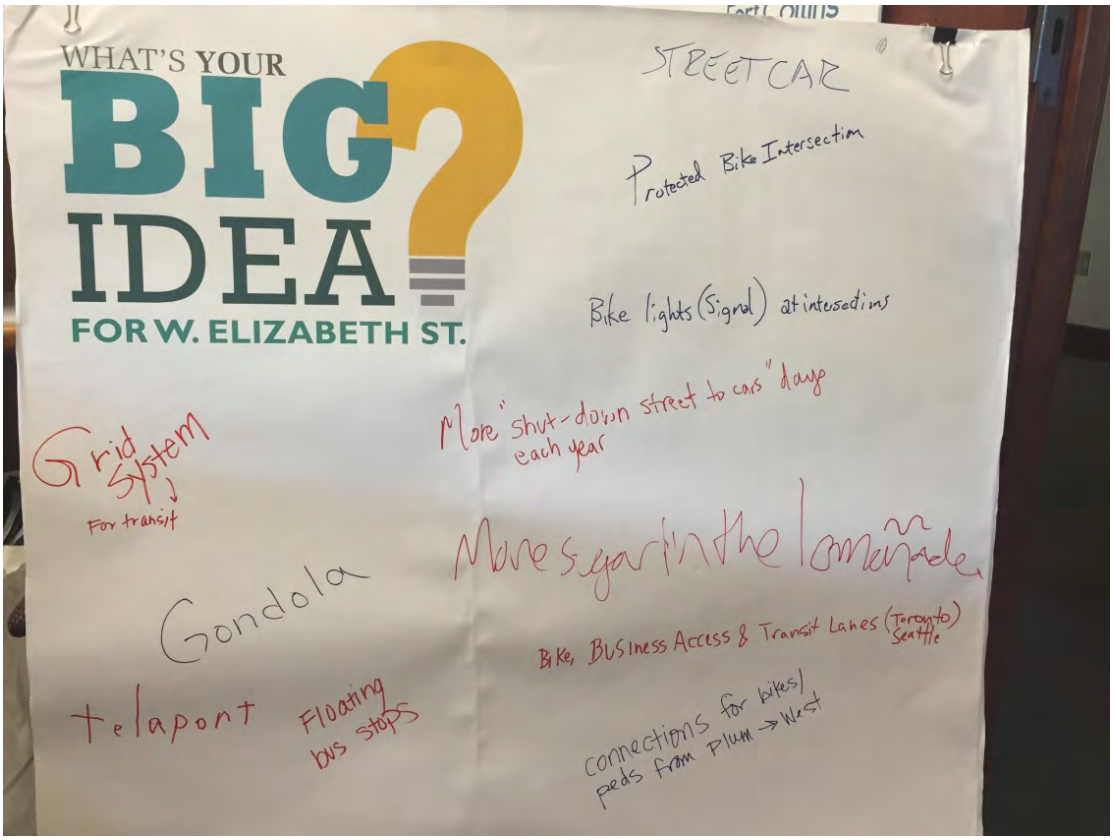
During these conversations many residents provided additional comments and concerns which were documented on sticky notes and added to the transit map in order to provide spatial reference. Three main themes emerged from these conversations:

1. Desire for a MAX-type bus service (referring to MAX's frequency and modern feel) on West Elizabeth Street.
2. Desire for Sunday bus service.
3. Desire for buffered or protected bike lanes in the corridor.

WHAT WE HEARD – KEY THEMES

What's Your Big Idea?

- Grid system for transit
- Protected bike intersection
- Streetcar
- Teleport
- Floating bus stops
- Connections for bikes/pedestrians from Plum heading west
- Bike light (signal) at intersection
- Bike business access & transit lanes (like Toronto & Seattle)
- Gondola
- More sugar in the lemonade



Transit Route Map Comments:

TRANSIT

- I ride to MAX through campus
- Route 31- more frequent and on the weekend
- Straight Prospect route (bus)
- Need at least 15 min service on West Elizabeth Street
- Need 10-ride pack of transit passes back again!
- Express route for further West
- Jitney Coop Model: smaller vehicle, more drivers, more frequency, and independent contractor
    - City sponsored indirect costs: training, insurance, and healthcare
- Route west on Mulberry to Overland Trail. Maybe loop around Elizabeth Street eastbound
- Need later MAX route
    - Through bars closing
- Sunday service
- Need Sunday service MAX- January especially
- MAX would be nice to go to Loveland
- MAX to 81 is tight sometimes
- Hard to get from the Old Town area to the Senior Center

PEDESTRIAN

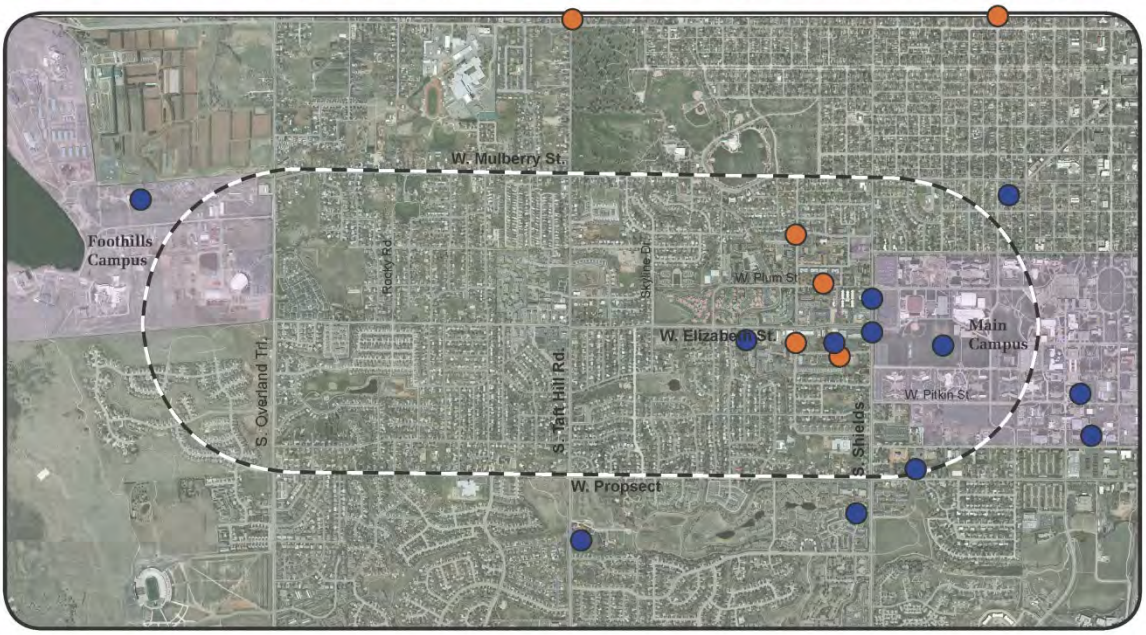
- Pedestrian signal at Shields and Atkins - Concerns for cars not stopping here; seems ambiguous. Install pedestrian signals like what's at Laurel Streets or on West Elizabeth Street.
- Current sidewalks: narrow, missing, broken, misaligned, frost heave
- Safe Routes to School needs to focus on Laporte Avenue

BIKING

- Afraid to bike on West Mulberry Street
- Separated bike lanes (heard comment from several people)
- Increased number of bike lanes
- Laporte Avenue & Overland Trail- bike issues at intersection

West Elizabeth Enhanced Travel Corridor Plan
City of Fort Collins

Open Streets: Origin-Destination Commnets



West Elizabeth Enhanced Travel Corridor Plan

appendix: D
ALTERNATIVES ANALYSIS SUMMARY

FEHR PEERS

MEMORANDUM

Date: February 22, 2016

To: Amy Lewin, Emma Belmont and Rachel Prelog

From: Charlie Alexander, Carly Sieff and Andrew McFadden

Subject: Alternatives Analysis Materials for Technical Advisory Committee

DN15-0488

This technical memorandum summarizes alternatives analysis findings for the West Elizabeth Enhanced Travel Corridor Plan. Fehr & Peers studied the following design approaches as a part of the alternatives analysis:

- Tweak & Tune (transit improvements only)
- Transportation Systems Management
- Traffic Calming
- MAX on West Elizabeth

This technical memorandum includes:

- Design approach evaluation matrix
- MMLOS analysis
- Traffic operations analysis (existing and existing plus design approach analysis; 2040 is forthcoming)

DESIGN APPROACH EVALUATION MATRIX

The following page includes the draft design approach evaluation matrix. This evaluation matrix builds upon the detailed performance measure analysis including multi-modal level of service. In general, the Tweak & Tune design approach only improves conditions for transit; therefore, this alternative still evaluates poorly for the other modes. The Transportation Systems Management evaluates significantly better than the Tweak & Tune design approach; however, many criteria are met at a medium level and some criteria are still only met at a low level. The Traffic Calming design approach improves upon the Transportation Systems Management design approach for all modes of transportation; however, this design approach may be less fiscally responsible than other design approaches and increases congestion for people driving. The MAX on West Elizabeth design approach evaluates similarly to the Traffic Calming design approach; however, this design meets some criteria at a "Low" level including congestion for people driving.

Design Approaches	Criteria (based on a low, medium, high, n/a ranking)													
	Multi-modal									Supports existing economic conditions	Beautiful, vibrant, and attractive public spaces	Well-connected	Fiscal responsibility	Community support
	High frequency transit	Reliable transit	Sufficient transit capacity	Convenient/ efficient bicycling and walking	Bicyclist and pedestrian safety	Complete pedestrian network	Comfort for bicyclists	Vehicular safety	Vehicular efficiency and convenience					
Tweak & Tune Design Approach														
People biking: do nothing				Low	Low		Low		High	Medium		Low	High	Low
People driving: do nothing					Low		Low	Low	Medium	Low	Low	Medium	High	Low
People riding transit: Adjust transit service routes, schedules and frequencies	Medium	Low	Medium						High	Medium	Medium	Low	High	Medium
People walking: do nothing				Low	Low	Low				Low	Low	Low	High	Low
Transportation Systems Management (TSM) Design Approach														
People biking: Complete bike lanes where missing, green bike lanes through intersections, two-stage turn queue boxes where appropriate				High	Medium		Medium		High	Medium		Medium	High	Low
People driving: Access control at key locations: between Shields Street & City Park Avenue, between Taft Hill Road and Hillcrest Drive					High		High	Medium	Medium	Medium	Low	Medium	High	Medium
People riding transit: Adjust transit service routes, schedules and frequencies (same as Tweak & Tune), basic bus stop treatments (shelters, benches, etc.), transit signal priority, transit station at CSU Equine Center	High	Medium	Medium						Medium	High	Medium	Medium	High	Medium
People walking: Complete sidewalk network to minimum ADA width, leading pedestrian intervals				High	High	Medium				Medium	Medium	Medium	High	Medium
Traffic Calming Design Approach														
People biking: One-way cycle tracks on West Elizabeth Street, green bike lanes through intersections, two-stage turn queue boxes where appropriate, pilot protected intersection at West Elizabeth Street/City Park Avenue				Medium	High		High		Low	High		High	Medium	High
People driving: Access control at key locations: between Shields Street & City Park Avenue, between Taft Hill Road and Hillcrest Drive, roundabouts at West Elizabeth Street/Overland Trail and West Elizabeth Street/Ponderosa Drive, dual eastbound left-turn lanes at West Elizabeth Street/Shields Street, medians where feasible					High		High	High	High	Medium	High	High	Medium	High
People riding transit: Implement BRT-style service with articulated buses and stations, transit signal priority, transit station at CSU Equine Center; transit service to focus along West Elizabeth-Constitution-Plum route	High	High	High						Medium	High	High	Medium	Medium	High
People walking: Complete sidewalk network with landscape separation where possible, leading pedestrian intervals				High	High	High				High	High	High	Medium	High
MAX on West Elizabeth Design Approach														
People biking: One-way cycle tracks on West Elizabeth Street, green bike lanes through intersections, two-stage turn queue boxes where appropriate				Medium	High		High		Low	High		High	Medium	High
People driving: Access control at key locations: between Shields Street & City Park Avenue, between Taft Hill Road and Hillcrest Drive, roundabouts at West Elizabeth Street/Overland Trail and West Elizabeth Street/Ponderosa Drive, dual eastbound left-turn lanes at West Elizabeth Street/Shields Street, medians where feasible					High		High	High	High	Medium	High	High	Medium	High
People riding transit: Implement BRT-style service with articulated buses and stations, transit signal priority, transit station at CSU Equine Center; transit service to focus along West Elizabeth route with bus only lanes	High	High	High						Medium	Low	High	Medium	Medium	Medium
People walking: Complete sidewalk network with landscape separation where possible, leading pedestrian intervals				High	High	High				High	High	High	Medium	High

MMLOS ANALYSIS

The following pages include MMLOS analysis for each primary mode of transportation under each design approach: Transportation Systems Management, Traffic Calming and MAX on West Elizabeth design approaches. The Tweak & Tune MMLOS is the same as MMLOS for existing conditions.

In general, the MMLOS for people riding transit, people bicycling and people walking improves for each design approach except for Tweak & Tune.

For people driving, the Transportation Systems Management design approach least affects overall intersection delay. The Traffic Calming and MAX on West Elizabeth design approaches generally increase vehicle delay, particularly at the West Elizabeth Street/Taft Hill Road and West Elizabeth Street/City Park Avenue intersections.

For people riding transit, each design approach comparably improves the MMLOS for transit according to this methodology; however, other considerations affect transit service quality for which this methodology does not have adequate sensitivities.

For people bicycling, the Transportation Systems Management results in a small level of improvement to LTS over the existing condition, particularly where existing missing bike lanes are added. The Traffic Calming and MAX on West Elizabeth design approaches substantially reduce bicyclist LTS on West Elizabeth Street.

For people walking, the Transportation Systems Management results in a small level of improvement over the existing condition, particularly where sidewalks are added where they are currently missing or widened where they are currently very narrow. The Traffic Calming and MAX on West Elizabeth design approaches substantially improve conditions for pedestrians on West Elizabeth Street.

West Elizabeth Enhanced Travel Corridor Plan

EXISTING

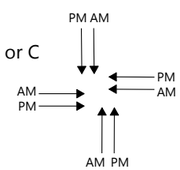
TSM

TRAFFIC CALMING

MAX

Approach LOS

- LOS A, B, or C
- LOS D
- LOS E
- LOS F



Intersection LOS

- LOS A, B, or C
- LOS D
- LOS E
- LOS F

Performance for automobiles is based on approach level of service (LOS), which accounts for vehicle travel speed, and intersection level of service (LOS), which accounts for vehicle delay at intersections. Approach and intersection LOS are based on 2015 traffic volumes and HCM 2010 methodologies.

City Boundary

West Elizabeth Street Study Corridor

EXISTING

TSM

TRAFFIC CALMING

MAX

Transit LOS

- 4 - 6 (Low)
- 7 - 9
- 10 - 12 (Medium)
- 13 - 15
- 16 - 18 (High)

The transit score is based on transit reliability (roadway LOS) and built environment factors including proximate walkways and bikeways and bus stop amenities.

City Boundary

EXISTING

TSM

TRAFFIC CALMING

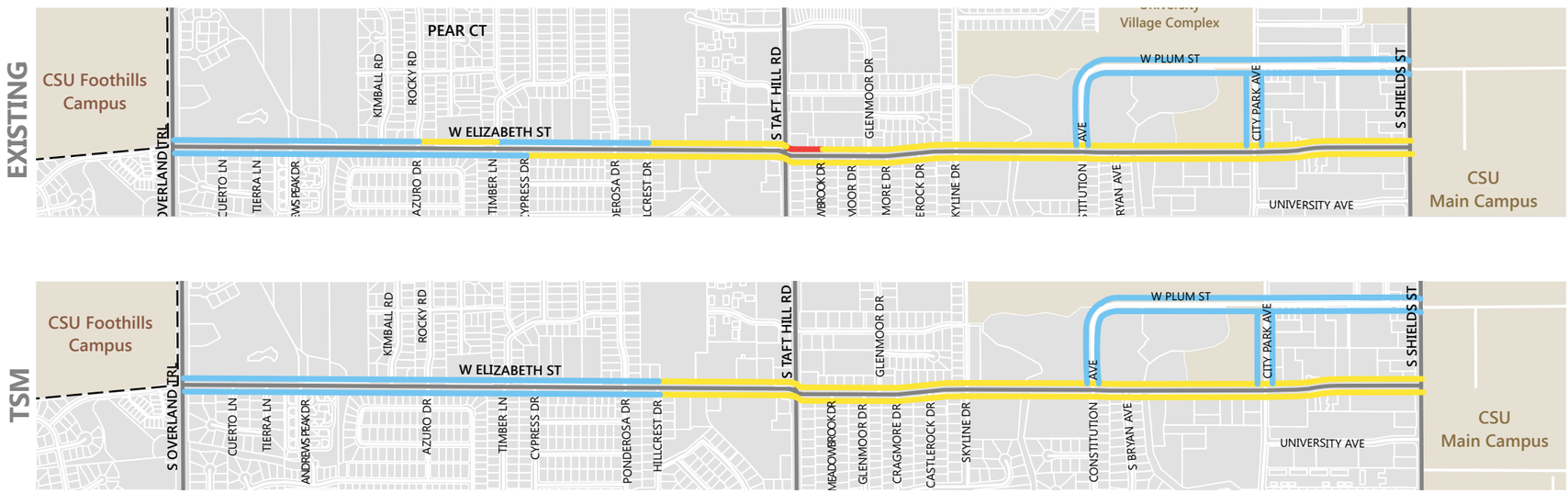
MAX

Pedestrian LOS

- 2 - 5 (Low)
- 6 - 7
- 8 - 10 (Medium)
- 11 - 12
- 13 - 15 (High)

The pedestrian score is based on sidewalk width, buffer width and distance to the nearest crossing.

City Boundary



Bicycle LTS

- 5
- 4
- 3
- 2
- 1

LTS applies the same methodology that is used in the 2014 Bicycle Master Plan. The score from 1-5 represents the level of bicyclist comfort based on traffic volume, speed, number of lanes, and presence and quality of the bikeway.

City Boundary

PEOPLE DRIVING

Table 1 shows the assumed changes to study intersections in each design approach. Table 2 shows the delay and Level of Service (LOS) by intersection for people driving for each design approach assuming existing traffic volumes; Table 3 shows the delay and LOS for people driving for each design approach assuming 2040 traffic volumes.

TABLE 1: ASSUMED CHANGES BY DESIGN APPROACH

Intersection	Existing / Tweak & Tune	Transportation Systems Management	Traffic Calming	MAX on West Elizabeth
West Elizabeth Street/Overland Trail	--	--	1. Replace side-street stop with roundabout	1. Replace side-street stop with roundabout
West Elizabeth Street/ Taft Hill Road	--	1. Add TSP	1. Add TSP 2. Prohibit NB/SB RTOR (for two-stage turn queue boxes) 3. Add exclusive EB/WB cycle track phases 4. Protect EB/WB right-turns	1. Add TSP 2. Prohibit NB/SB RTOR (for two-stage turn queue boxes) 3. Add exclusive EB/WB cycle track phases 4. Protect EB/WB right-turns
West Elizabeth Street/ Constitution Avenue	--	1. Add TSP 2. Prohibit NB/SB RTOR (for two-stage turn queue boxes)	1. Add TSP 2. Prohibit NB/SB RTOR (for two-stage turn queue boxes) 3. Protect EB/WB left-turns	1. Add TSP 2. Prohibit NB/SB RTOR (for two-stage turn queue boxes) 3. Protect EB/WB left-turns 4. Bus-only lanes
West Elizabeth Street/ City Park Avenue	--	1. Prohibit NB/SB RTOR (for two-stage turn queue boxes)	1. Pilot protected intersection with protected EB/WB/NB/SB left-turns	1. Prohibit NB/SB RTOR (for two-stage turn queue boxes) 2. Protect EB/WB left-turns 3. Bus-only lanes
West Elizabeth Street/ Shields Street	--	--	1. Prohibit EB/WB RTOR (for two-stage turn queue boxes) 2. Run EB cycle track and south crosswalk concurrently with P.6; reconfigure EB lanes to 2L, 1T/R, 1R and WB lanes to 1L, 1T, 1R	1. Prohibit EB/WB RTOR (for two-stage turn queue boxes) 2. Run EB cycle track and south crosswalk concurrently with P.6; reconfigure EB lanes to 2L, 1T/R, 1R and WB lanes to 1L, 1T, 1R
Shields Street/Plum Street	--	1. Add TSP	1. Add TSP	1. Add TSP
Shields Street/Laurel Street	--	--	--	--
Shields Street/Lake Street	--	--	--	--
Shields Street/Prospect Road	--	--	--	--

TABLE 2: DELAY / LEVEL OF SERVICE – EXISTING TRAFFIC VOLUMES

Intersection	Existing / Tweak & Tune		Transportation Systems Management		Traffic Calming		MAX on West Elizabeth	
	AM	PM	AM	PM	AM	PM	AM	PM
West Elizabeth Street/Overland Trail (side street stop in Existing and Tweak & Tune; roundabout in Traffic Calming and MAX on West Elizabeth)	3 / A 22 / C (WBL)	3 / A 30 / D (WBL)	4 / A 18 / C (WBL)	4 / A 29 / D (WBL)	4 / A	6 / A	5 / A	6 / A
West Elizabeth Street/Taft Hill Road	21 / C	36 / D	21 / C	37 / D	43 / D	**62 / E**	44 / D	**65 / E**
West Elizabeth Street/Constitution Avenue	6 / A	9 / A	7 / A	10 / A	12 / B	25 / C	10 / B	19 / B
West Elizabeth Street/City Park Avenue	8 / A	15 / B	8 / A	17 / B	17 / B	42 / D	19 / B	47 / D
West Elizabeth Street/Shields Street	18 / B	46 / D	17 / B	47 / D	22 / C	42 / D	22 / C	48 / D
Shields Street/Plum Street	9 / A	14 / B	9 / A	14 / B	8 / A	16 / B	8 / A	16 / B
Shields Street/Laurel Street	12 / B	25 / C	12 / B	26 / C	12 / B	28 / C	11 / B	29 / C
Shields Street/Lake Street	8 / A	11 / B	7 / A	10 / B	9 / A	12 / B	9 / A	11 / B
Shields Street/Prospect Road	**61 / E**	46 / D	**57 / E**	47 / D	49 / D	46 / D	50 / D	47 / D

TABLE 3: DELAY / LEVEL OF SERVICE – 2040 TRAFFIC VOLUMES

Intersection	No Build / Tweak & Tune		Transportation Systems Management		Traffic Calming		MAX on West Elizabeth	
	AM	PM	AM	PM	AM	PM	AM	PM
West Elizabeth Street/Overland Trail (side street stop in Existing and Tweak & Tune; roundabout in Traffic Calming and MAX on West Elizabeth)	3 / A 25 / D (WBL)	4 / A 29 / D (WBL)	5 / A 62 / F (WBT)	4 / A 32 / D (WBL)	6 / A	8 / A	7 / A	8 / A
West Elizabeth Street/Taft Hill Road	33 / C	**58 / E**	30 / C	53 / D	**94 / F**	**93 / F**	**97 / F**	**106 / F**
West Elizabeth Street/Constitution Avenue	6 / A	11 / B	7 / A	11 / A	14 / B	35 / D	12 / B	24 / C
West Elizabeth Street/City Park Avenue	8 / A	23 / C	8 / A	32 / C	16 / B	**58 / E**	21 / C	**83 / F**
West Elizabeth Street/Shields Street	22 / C	**103 / F**	23 / C	**115 / F**	26 / C	**114 / F**	25 / C	**115 / F**
Shields Street/Plum Street	10 / B	47 / D	10 / B	37 / D	8 / A	51 / D	8 / A	45 / D
Shields Street/Laurel Street	14 / B	**97 / F**	14 / B	**98 / F**	14 / B	**114 / F**	14 / B	**112 / F**
Shields Street/Lake Street	10 / A	**80 / E**	9 / A	**79 / E**	11 / B	**57 / E**	10 / B	55 / D
Shields Street/Prospect Road	**135 / F**	**81 / F**	**141 / F**	**106 / F**	**141 / F**	**71 / E**	**144 / F**	**70 / E**

Notable findings from the vehicle level of service analysis are:

- At the West Elizabeth Street/Overland Trail intersection, replacing the existing side-street stop with a roundabout in the Traffic Calming and MAX on West Elizabeth design approaches results in LOS A during both peak hours. The roundabout reduces delay for eastbound and westbound drivers and maintains LOS A for all approaches.
- At the West Elizabeth Street/Taft Hill Road intersection:
    - The addition of Transit Signal Priority (TSP) in the Transportation Systems Management design approach reduces delay for eastbound-westbound transit without significantly affecting overall intersection operations.
    - The addition of exclusive eastbound-westbound cycle track phases in the Traffic Calming and MAX on West Elizabeth design approaches increases overall intersection delay and causes the intersection to operate at LOS E during the PM peak hour. *The exclusive eastbound-westbound cycle track phases, and potential alternatives that would have lesser effect on intersection operations, should be further assessed as a part of the Recommended Design Refinement.*
- At the West Elizabeth Street/Constitution Avenue intersection, modifications in each of the design approaches results in LOS C or better operations during both peak hours.
- At the West Elizabeth Street/City Park Avenue intersection:
    - The addition of a protected intersection in the Traffic Calming design approach, with protected left-turns on all approaches, increases the overall intersection delay and causes the intersection to operate at LOS D during the PM peak hour. *The protected intersection concept needs to be further assessed as a part of the Recommended Design Refinement.*
    - In the MAX on West Elizabeth design approach, the addition of Transit Signal Priority, protected eastbound/westbound left-turns, no right-turn on red on the northbound/southbound approaches and bus only lanes causes the intersection to operate at LOS D during the PM peak hour.
- At the West Elizabeth Street/Shields Street intersection, the proposed lane configuration and operational changes in the Traffic Calming and MAX on West Elizabeth design approaches which run the eastbound cycle track, the north crosswalk and the south crosswalk concurrently with Phase 6 (westbound), do not significantly change overall intersection delay and level of service from the existing condition. *These proposed changes*

need to be further assessed, in addition to other candidate improvements already being proposed by the City, as a part of the Recommended Design Refinement.

- At Shields Street/Plum Street, the addition of Transit Signal Priority (TSP) in each of the design approaches does not significantly change overall delay or LOS.

To obtain 2040 volumes growth rates were obtained from the NFR travel model and were synthesized to obtain growth rates along West Elizabeth Street for the AM (23%) and PM (13%) peak hours and along Shields Street for the AM (18%) and PM (21%) peak hours. A second westbound left turn lane is added to the Shields Street/Mulberry Street intersection and an exclusive westbound right turn bay is added at the intersection of Shields Street/Prospect Road to allow the anticipated growth in traffic to access the study intersections. Prior to the improvements huge queues were seen on these approaches that restricted access to other study intersections.

Notable findings from the 2040 vehicle level of service analysis are:

- In the AM peak hour significant increases in overall intersection delay compared to existing conditions can be seen at West Elizabeth Street/Taft Hill Road and Shields Street/Prospect Road in all scenarios:
    - At West Elizabeth Street/Taft Hill Road delay increases are mainly seen on the eastbound and northbound approaches
    - At Shields Street/Prospect Road delay increases are mainly seen on the eastbound approach.
- In the PM peak hour no build conditions significant increases in delay can be seen at all study intersections along Shields Street and at the West Elizabeth Street/Taft Hill Road intersection with an overall intersection LOS E
    - This delay is spread to lower conflicting volume intersections due to long queues spilling out of turn pockets inhibiting adjacent movements
- The PM Traffic Calming alternative sees similar increases in delay from existing conditions along Shields Street and increased delay at City Park Avenue, Constitution Avenue, and Taft Hill Road over no build conditions similar to that seen under existing conditions volumes. This increased delay results in one to two intersection LOS levels higher in the Traffic Calming alterative compared to the no build conditions.
- The PM MAX alternative intersection operations results are generally consistent with the Traffic Calming alternative except at the West Elizabeth/City Park Avenue intersection where the MAX alternative's delay is significantly higher due to use of 1 eastbound-

westbound through travel lane. Intersection delay discrepancies between the MAX and Traffic Calming alternatives at the West Elizabeth Street/Taft Hill Road and West Elizabeth Street/Constitution Avenue intersections are largely balanced out when taken collectively.

- At the West Elizabeth Street/Shields Street intersection large delay increases are seen in the Transportation Systems Management approach compared to the no build approach for the northbound and eastbound approaches. These increases are largely due to the addition of the LPI at the intersection and southbound delay reductions due to improved southbound progression from changes made at the Shields Street/Plum Street intersection.

Table 4 and Table 5 show vehicle travel times between Overland Trail and Shields Street for each design approach. Table 6 shows person delay for people driving for each design approach.

TABLE 4: VEHICLE TRAVEL TIMES – AM PEAK HOUR

Segment		Existing / Tweak & Tune	Transportation Systems Management	Traffic Calming	MAX on West Elizabeth
Eastbound	Overland Trail to Ponderosa	85	85	87	87
	Ponderosa to Taft Hill	70	70	67	70
	Taft Hill to Constitution	59	60	61	62
	Constitution to City Park	37	36	42	45
	City Park to Shields	68	70	80	84
	Total	**319**	**321**	**337**	**347**
Westbound	Shields to City Park	36	36	41	43
	City Park to Constitution	37	39	41	40
	Constitution to Taft Hill	92	96	90	90
	Taft Hill to Ponderosa	36	37	40	40
	Ponderosa to Overland Trail	107	111	100	100
	Total	**309**	**318**	**312**	**313**

TABLE 5: VEHICLE TRAVEL TIMES – PM PEAK HOUR

Segment		Existing / Tweak & Tune	Transportation Systems Management	Traffic Calming	MAX on West Elizabeth
Eastbound	Overland Trail to Ponderosa	84	85	86	86
	Ponderosa to Taft Hill	76	76	69	70
	Taft Hill to Constitution	62	61	69	69
	Constitution to City Park	39	39	61	64
	City Park to Shields	92	103	80	108
	Total	**352**	**365**	**365**	**397**
Westbound	Shields to City Park	40	40	46	69
	City Park to Constitution	41	43	59	51
	Constitution to Taft Hill	101	104	97	94
	Taft Hill to Ponderosa	39	40	43	43
	Ponderosa to Overland Trail	108	109	98	98
	Total	**329**	**337**	**343**	**356**

TABLE 6: PERSON DELAY FOR PEOPLE DRIVING

Intersection	AM Peak Hour				PM Peak Hour			
	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth
West Elizabeth Street/Overland Trail	50	57	79	83	67	72	119	125
West Elizabeth Street/Taft Hill Road	913	898	1,775	1,798	1,910	2,014	3,171	3,323
West Elizabeth Street/Constitution Avenue	79	95	160	135	232	265	640	502
West Elizabeth Street/City Park Avenue	141	134	297	322	553	549	1,377	1,536
West Elizabeth Street/Shields Street	762	758	962	997	3,096	2,874	2,669	3,148
Shields Street/Plum Street	290	312	259	264	754	798	958	956
Shields Street/Laurel Street	377	394	453	368	1,358	1,413	1,540	1,551
Shields Street/Lake Street	289	299	365	377	588	526	605	584
Shields Street/Prospect Road	3,626	3,395	2,966	3,039	3,620	3,656	3,583	3,652
Sum	**6,528**	**6,343**	**7,316**	**7,384**	**12,178**	**12,166**	**14,661**	**15,377**

Notable findings from the vehicle travel time analysis and person delay analysis for people driving are:

- The maximum increase to vehicle travel times in either peak hour or direction is 45 seconds in the eastbound direction during the PM peak hour. This represents approximately 13 percent of the existing eastbound travel time during the PM Peak hour.
- Overall, the TSM, Traffic Calming and MAX on West Elizabeth design approaches increase east-west travel time on West Elizabeth Street.
- In the AM peak hour, travel times increase in the eastbound direction with the implementation of any design approach. In the AM peak hour westbound travel times remain relatively unchanged in any design approach, likely due to the relatively light westbound traffic volumes in the AM peak hour.
- In the AM peak hour in the eastbound direction, the greatest increases in travel time are between Constitution Drive and City Park Avenue in the Traffic Calming and MAX on West Elizabeth design approaches, likely due to changes at the West Elizabeth Street/City Park Avenue intersection.
- In the AM Peak hour in the eastbound direction between City Park Avenue and Shields Street, the MAX on West Elizabeth Street design approach most significantly increases travel time, likely due to the conversion of the existing travel lanes to bus only lanes.
- In the PM peak hour, the TSM and Traffic Calming design approaches increase east-west travel time by a comparable amount (13 seconds for both design approaches in the eastbound direction peak hour, 8 seconds for the TSM design approach in the westbound direction and 14 seconds for the Traffic Calming design approach in the westbound direction).
- In the PM peak hour in the eastbound direction, the most significant increases in travel time are observed in the Traffic Calming and MAX on West Elizabeth design approaches between Constitution Drive and City Park Avenue, likely due to changes at the West Elizabeth Street/City Park Avenue intersection which add delay for east-west drivers. Increased travel times are also observed on this segment in the westbound direction.
- In the PM peak hour between City Park Avenue and Shields Street the MAX on West Elizabeth design approach's increase to eastbound and westbound travel times are likely due to the conversion of the outside travel lanes to bus-only lanes.
- Overall, the TSM design approach does not significantly affect overall delay for people driving. The Traffic Calming design approach increases overall person delay for people

driving by 12 percent in the AM peak hour and 20 percent in the PM peak hour. The MAX on West Elizabeth design approach increases overall person delay for people driving by 13 percent in the AM peak hour and 26 percent in the PM peak hour.

PEOPLE RIDING TRANSIT

Table 7 shows average transit vehicle delay by intersection for each design approach. Table 8 shows person delay for people riding transit for each design approach.

Notable findings from the transit vehicle delay analysis and person delay analysis for people riding transit are:

- Overall, transit vehicle delay by intersection is difficult to measure accurately between design approaches given the relatively low number of buses on the corridor in any of the alternatives. Additionally, the routing of buses changes between design approaches. As such, there may be variation in alternatives that is not directly explained by infrastructure changes included in a particular design approach.
- In the Traffic Calming and MAX on West Elizabeth design approaches, the benefit of Transit Signal Priority can be seen at the West Elizabeth Street/Taft Hill Road and Shields Street/Plume Street intersections, where eastbound-westbound delay for buses generally decreases.
- Compared to Existing Conditions, each of the design approaches generally reduces overall person delay for people riding transit. The Traffic Calming design approach most significantly reduces overall person delay for people riding transit.

TABLE 7: TRANSIT VEHICLE DELAY BY INTERSECTION

Intersection	Existing / Tweak & Tune		Transportation Systems Management		Traffic Calming		MAX on West Elizabeth	
	AM	PM	AM	PM	AM	PM	AM	PM
West Elizabeth Street/Overland Trail	29	26	53	14	11	17	10	15
West Elizabeth Street/Taft Hill Road	60 EB – 87 WB – 47	80 EB – 83 WB – 70	76 EB – 88 WB – 56	72 EB – 81 WB – 81	52 EB – 69 WB – 47	60 EB – 72 WB – 62	55 EB – 72 WB – 65	57 EB – 84 WB – 59
West Elizabeth Street/Constitution Avenue	17 EB – 29 WB – 10	24 EB – 18 WB – 17	19 EB – 24 WB – 11	34 EB – 39 WB – 18	22 EB – 41 WB – 13	26 EB – 44 WB – 24	20 EB – 30 WB – 14	31 EB – 45 WB – 19
West Elizabeth Street/City Park Avenue	24 EB – 20 WB – 13	50 EB – 30 WB – 15	30	75	26	47	22	37
West Elizabeth Street/Shields Street	32 EB – 47	41 EB – 59	28	52	35	42	24 EB – 67	44 EB – 96
Shields Street/Plum Street	44 EB – 69 WB – 57	61 EB – 107 WB – 81	57 EB – 80 WB – 58	73 EB – 90 WB – 90	43 EB – 63 WB – 50	60 EB – 95 WB – 65	49 EB – 64 WB – 61	63 EB – 89 WB – 73
Shields Street/Laurel Street	35	66	35	59	35	66	34	68
Shields Street/Lake Street	4	11	3	11	4	14	4	12
Shields Street/Prospect Road	33	13	36	11	30	14	29	11

TABLE 8: PERSON DELAY FOR PEOPLE RIDING TRANSIT

Intersection	AM Peak Hour				PM Peak Hour			
	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth
West Elizabeth Street/Overland Trail	5	5	1	1	15	1	1	1
West Elizabeth Street/Taft Hill Road	67	69	59	64	104	115	96	97
West Elizabeth Street/Constitution Avenue	32	29	45	36	70	71	50	53
West Elizabeth Street/City Park Avenue	37	20	16	35	132	113	72	81
West Elizabeth Street/Shields Street	60	18	22	78	20	6	5	66
Shields Street/Plum Street	164	178	140	146	338	382	298	320
Shields Street/Laurel Street	4	4	4	4	30	27	30	31
Shields Street/Lake Street	1	0	1	1	5	5	7	6
Shields Street/Prospect Road	121	122	53	52	26	25	26	29
Sum	**490**	**445**	**342**	**416**	**740**	**745**	**585**	**682**

PEOPLE BICYCLING

Table 9 shows bicyclist delay and LOS by intersection for each design approach. Table 10 shows person delay for people bicycling for each design approach.

Notable findings from the bicyclist delay analysis and person delay analysis for people bicycling are:

- The introduction of protected phases for the protected bike lane crossings at Taft Hill Road and Shields Street generally increase delay for bicyclists; these changes are observed in the Traffic Calming and the MAX on West Elizabeth design approaches at Taft Hill Road in both peak hours and at Shields Street in the AM peak hour.
- At the West Elizabeth Street/City Park Avenue intersection the addition of the protected intersection moderately increases bicyclist delay by six seconds in both the AM and PM peak hours.
- Overall, the design approaches increase person delay for people bicycling.

TABLE 9: BICYCLIST DELAY / LEVEL OF SERVICE

Intersection	Existing / Tweak & Tune		Transportation Systems Management		Traffic Calming		MAX on West Elizabeth	
	AM	PM	AM	PM	AM	PM	AM	PM
West Elizabeth Street/Overland Trail	1 / A 4 / A (WBT)	1 / A 5 / A (WBL)	2 / A 7 / A (WBT)	1 / A 6 / A (WBL)	1 / A	3 / A	1 / A	2 / A
West Elizabeth Street/Taft Hill Road	30 / C	37 / D	28 / C	32 / D	36 / D	39 / D	34 / D	39 / D
West Elizabeth Street/Constitution Avenue	11 / B	9 / A	11 / B	11 / B	10 / B	13 / B	9 / A	15 / B
West Elizabeth Street/City Park Avenue	11 / B	14 / B	11 / B	14 / B	17 / B	20 / C	18 / B	36 / D
West Elizabeth Street/Shields Street	35 / D	39 / D	37 / D	**44 / E**	**47 / E**	39 / D	**47 / E**	40 / D
Shields Street/Plum Street	35 / D	**40 / E**	34 / D	**41 / E**	28 / C	**41 / E**	28 / C	**41 / E**
Shields Street/Laurel Street	14 / B	19 / B	15 / B	24 / C	17 / B	26 / C	17 / B	25 / C
Shields Street/Lake Street	5 / A	19 / B	6 / A	20 / C	7 / A	18 / B	7 / A	18 / B
Shields Street/Prospect Road	29 / C	33 / D	31 / D	32 / D	29 / C	33 / D	26 / C	29 / C

TABLE 10: PERSON DELAY FOR PEOPLE BICYCLING

Intersection	AM Peak Hour				PM Peak Hour			
	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth
West Elizabeth Street/Overland Trail	0	0	0	0	1	1	4	2
West Elizabeth Street/Taft Hill Road	34	32	40	40	59	54	62	61
West Elizabeth Street/Constitution Avenue	12	13	11	10	20	25	27	33
West Elizabeth Street/City Park Avenue	24	25	30	36	36	36	51	103
West Elizabeth Street/Shields Street	91	94	125	124	87	97	85	86
Shields Street/Plum Street	100	98	79	79	109	110	112	112
Shields Street/Laurel Street	9	9	10	9	7	8	9	8
Shields Street/Lake Street	8	8	10	8	8	8	9	7
Shields Street/Prospect Road	40	43	40	39	29	27	30	23
Sum	**318**	**321**	**346**	**345**	**356**	**367**	**388**	**436**

PEOPLE WALKING

Table 11 shows pedestrian delay and LOS by intersection for each design approach. Table 10 shows person delay for people walking for each design approach.

Notable findings from the pedestrian delay analysis and person delay analysis for people walking are:

- Many study intersections already operate at LOS E or LOS F for pedestrians during either the AM or PM peak hour and would continue to do so with implementation of any of the proposed design approaches.
- The Traffic Calming and MAX on West Elizabeth design approaches significantly increase pedestrian delay during bot the AM and PM peak hours due to the introduction of protected left-turn phases that increase cycle length but reduce potential for vehicle/pedestrian conflicts.
- The TSM design approach does not significantly increase overall person delay for people walking. Both the Traffic Calming and MAX on West Elizabeth design approaches increase overall person delay, generally due to the introduction of protected turn phases that increase cycle lengths or increased congestion that increases split times between high-volume pedestrian crossing phases.

TABLE 11: PEDESTRIAN DELAY / LEVEL OF SERVICE

Intersection	Existing / Tweak & Tune		Transportation Systems Management		Traffic Calming		MAX on West Elizabeth	
	AM	PM	AM	PM	AM	PM	AM	PM
West Elizabeth Street/Overland Trail	0 / A	0 / A	0 / A	1 / A	0 / A	0 / A	0 / A	1 / A
West Elizabeth Street/Taft Hill Road	35 / D	**49 / E**	38 / D	**51 / E**	34 / D	**42 / E**	35 / D	**41 / E**
West Elizabeth Street/Constitution Avenue	18 / B	21 / C	22 / C	24 / C	19 / B	23 / C	16 / B	23 / C
West Elizabeth Street/City Park Avenue	20 / C	31 / D	22 / C	30 / D	33 / D	**57 / E**	35 / D	**59 / E**
West Elizabeth Street/Shields Street	**53 / E**	**57 / E**	**51 / E**	**57 / E**	**53 / E**	**55 / E**	**49 / E**	**56 / E**
Shields Street/Plum Street	**51 / E**	**59 / E**	**51 / E**	**57 / E**	**51 / E**	**58 / E**	**51 / E**	**56 / E**
Shields Street/Laurel Street	**46 / E**	**59 / E**	**48 / E**	**59 / E**	**47 / E**	**57 / E**	**49 / E**	**58 / E**
Shields Street/Lake Street	**50 / E**	**44 / E**	**50 / E**	**46 / E**	**46 / E**	**43 / E**	**47 / E**	**42 / E**
Shields Street/Prospect Road	**54 / E**	**67 / F**	**53 / E**	**68 / F**	**70 / F**	**64 / F**	**68 / F**	**64 / F**

TABLE 12: PERSON DELAY FOR PEOPLE WALKING

Intersection	AM Peak Hour				PM Peak Hour			
	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth	Existing / Tweak & Tune	TSM	Traffic Calming	MAX on West Elizabeth
West Elizabeth Street/Overland Trail	-	-	-	-	-	-	-	-
West Elizabeth Street/Taft Hill Road	9	10	9	9	43	44	35	35
West Elizabeth Street/Constitution Avenue	3	3	3	2	14	16	15	15
West Elizabeth Street/City Park Avenue	12	13	19	21	127	122	233	242
West Elizabeth Street/Shields Street	77	73	77	70	155	158	149	149
Shields Street/Plum Street	87	89	87	88	151	150	148	141
Shields Street/Laurel Street	26	26	29	30	61	61	59	60
Shields Street/Lake Street	46	47	42	42	18	19	18	17
Shields Street/Prospect Road	60	58	81	78	83	82	78	77
Sum	**319**	**321**	**348**	**341**	**652**	**652**	**735**	**737**

Detailed technical analysis results are provided in an attached appendix.

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	707	98.3%	3.6	0.8	A	47
	Right Turn	413	395	95.6%	5.2	1.2	A	38
	Subtotal	1,132	1,101	97.3%	4.2	0.8	A	85
SB	Left Turn	130	129	98.8%	20.9	2.7	C	49
	Through	667	670	100.4%	10.4	1.4	B	127
	Right Turn							
	Subtotal	797	798	100.2%	12.2	1.4	B	177
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	121	94.3%	46.9	2.5	D	104
	Through							
	Right Turn	61	61	100.2%	10.1	2.5	B	11
	Subtotal	189	182	96.2%	35.3	2.6	D	115
Total		2,118	2,081	98.3%	11.5	0.6	B	377

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	13	96.9%	6.1	7.5	A	1
	Through	1,064	1,039	97.6%	2.6	1.0	A	50
	Right Turn	37	40	108.9%	2.6	1.5	A	2
	Subtotal	1,114	1,091	98.0%	2.7	1.0	A	53
SB	Left Turn	13	14	103.8%	17.8	14.4	B	4
	Through	764	761	99.6%	5.4	0.8	A	75
	Right Turn	18	18	98.3%	5.6	2.7	A	2
	Subtotal	795	792	99.7%	5.7	0.7	A	81
EB	Left Turn	51	51	100.0%	54.3	9.9	D	51
	Through	25	31	124.4%	59.0	6.4	E	34
	Right Turn	34	34	100.3%	50.8	15.8	D	32
	Subtotal	110	116	105.6%	55.1	7.8	E	116
WB	Left Turn	17	18	105.9%	49.8	24.2	D	16
	Through	18	27	149.4%	42.4	11.6	D	21
	Right Turn	17	16	93.5%	7.9	3.1	A	2
	Subtotal	52	61	116.9%	36.1	10.6	D	40
Total		2,071	2,061	99.5%	8.9	0.7	A	290

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	143	102.4%	24.1	6.9	C	63
	Through	851	827	97.1%	10.9	2.3	B	166
	Right Turn	54	55	101.3%	8.6	1.5	A	9
	Subtotal	1,045	1,025	98.1%	12.6	2.5	B	238
SB	Left Turn	24	23	95.8%	34.1	18.1	C	14
	Through	653	651	99.6%	7.3	1.7	A	87
	Right Turn	138	139	100.9%	2.9	0.4	A	7
	Subtotal	815	813	99.8%	7.5	1.3	A	109
EB	Left Turn	258	262	101.4%	41.9	5.4	D	201
	Through	27	26	95.9%	44.1	18.3	D	21
	Right Turn	296	297	100.2%	32.9	12.1	C	179
	Subtotal	581	584	100.5%	37.8	5.6	D	400
WB	Left Turn	15	13	88.7%	50.4	31.5	D	12
	Through	5	5	108.0%	21.4	25.8	C	2
	Right Turn	5	4	84.0%	10.1	21.5	B	1
	Subtotal	25	23	91.6%	40.7	22.2	D	15
Total		2,466	2,445	99.1%	17.4	2.0	B	762

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,171	99.4%	2.9	0.8	A	63
	Right Turn	154	151	98.0%	3.8	1.1	A	11
	Subtotal	1,332	1,322	99.2%	3.0	0.8	A	73
SB	Left Turn	123	120	97.6%	36.1	12.7	D	80
	Through	768	756	98.4%	5.6	1.6	A	78
	Right Turn							
	Subtotal	891	876	98.3%	10.2	3.7	B	158
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	60	99.0%	49.5	8.6	D	55
	Through							
	Right Turn	37	36	98.4%	4.9	1.0	A	3
	Subtotal	98	97	98.8%	32.4	5.4	C	58
Total		2,321	2,294	98.8%	7.5	1.8	A	289

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	55	98.9%	26.4	5.0	C	27
	Through	946	942	99.6%	20.7	2.9	C	357
	Right Turn	136	130	95.2%	15.8	1.9	B	38
	Subtotal	1,138	1,127	99.0%	20.4	2.6	C	422
SB	Left Turn	145	155	107.2%	33.7	5.2	C	96
	Through	630	606	96.2%	6.6	1.2	A	73
	Right Turn	54	53	97.8%	2.6	0.9	A	3
	Subtotal	829	815	98.3%	11.6	1.4	B	171
EB	Left Turn	241	228	94.8%	154.2	42.7	F	646
	Through	713	732	102.6%	132.7	36.7	F	1,780
	Right Turn	152	151	99.5%	95.9	34.1	F	266
	Subtotal	1,106	1,112	100.5%	132.4	36.8	F	2,692
WB	Left Turn	71	66	92.4%	52.1	8.7	D	63
	Through	233	242	103.7%	41.6	3.4	D	184
	Right Turn	145	149	102.6%	34.4	5.1	C	94
	Subtotal	449	456	101.6%	40.8	2.9	D	341
Total		3,522	3,509	99.6%	60.5	13.5	E	3,626

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	23	95.8%	21.6	3.5	C	9
	Through	33	31	94.2%	19.3	5.8	B	11
	Right Turn	35	36	101.4%	10.2	4.0	B	7
	Subtotal	92	90	97.4%	16.2	3.9	B	27
SB	Left Turn	34	33	95.9%	19.8	6.1	B	12
	Through	32	33	103.4%	19.1	7.1	B	12
	Right Turn	18	23	128.9%	11.9	3.9	B	5
	Subtotal	84	89	105.8%	17.2	4.4	B	28
EB	Left Turn	53	51	96.8%	9.3	4.3	A	9
	Through	441	440	99.8%	5.7	0.9	A	46
	Right Turn	66	65	98.0%	5.2	1.3	A	6
	Subtotal	560	556	99.3%	6.0	1.1	A	61
WB	Left Turn	30	30	101.3%	11.5	5.9	B	6
	Through	160	161	100.7%	5.1	1.7	A	15
	Right Turn	45	43	94.9%	3.6	1.0	A	3
	Subtotal	235	234	99.7%	5.6	1.5	A	24
Total		971	969	99.8%	7.9	1.1	A	141

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	3	110.0%	12.0	13.2	B	1
	Through	4	5	115.0%	17.7	14.4	B	1
	Right Turn	20	21	106.0%	5.7	2.3	A	2
	Subtotal	27	29	107.8%	9.3	4.7	A	4
SB	Left Turn	36	34	95.3%	19.0	6.0	B	12
	Through	9	9	103.3%	21.7	5.5	C	4
	Right Turn	32	36	112.2%	7.8	2.1	A	5
	Subtotal	77	80	103.2%	14.3	3.3	B	21
EB	Left Turn	26	26	100.8%	7.4	5.7	A	4
	Through	499	500	100.1%	4.0	1.3	A	36
	Right Turn	5	6	110.0%	2.0	2.8	A	0
	Subtotal	530	531	100.3%	4.1	1.2	A	40
WB	Left Turn	2	2	80.0%	0.8	1.4	A	0
	Through	150	151	100.5%	4.1	2.8	A	11
	Right Turn	15	21	139.3%	6.9	3.8	A	3
	Subtotal	167	173	103.7%	4.4	2.7	A	14
Total		801	813	101.5%	5.7	1.1	A	79

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	47	91.6%	16.4	2.1	B	14
	Through	739	740	100.2%	18.7	2.0	B	253
	Right Turn	111	108	97.4%	18.4	2.5	B	37
	Subtotal	901	895	99.4%	18.5	1.6	B	304
SB	Left Turn	91	90	98.5%	23.1	6.0	C	38
	Through	547	544	99.5%	13.1	1.8	B	130
	Right Turn	47	48	101.5%	12.3	5.0	B	11
	Subtotal	685	681	99.5%	14.4	2.1	B	179
EB	Left Turn	121	120	99.0%	33.6	5.3	C	74
	Through	239	248	103.8%	40.3	3.0	D	183
	Right Turn	153	154	100.7%	16.8	3.4	B	47
	Subtotal	513	522	101.7%	31.9	2.7	C	304
WB	Left Turn	100	100	99.6%	31.6	8.6	C	58
	Through	109	117	107.3%	30.2	6.5	C	65
	Right Turn	32	31	96.9%	5.5	1.9	A	3
	Subtotal	241	248	102.7%	27.6	4.0	C	126
Total		2,340	2,346	100.3%	21.3	1.6	C	913

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	100.0%	1.2	2.2	A	0
	Through	455	449	98.7%	0.5	0.1	A	4
	Right Turn	69	74	106.7%	0.9	0.2	A	1
	Subtotal	528	527	99.8%	0.6	0.1	A	6
SB	Left Turn	33	34	103.6%	3.3	1.7	A	2
	Through	272	278	102.1%	0.3	0.1	A	2
	Right Turn	10	11	111.0%	0.5	0.2	A	0
	Subtotal	315	323	102.5%	0.7	0.2	A	4
EB	Left Turn	11	13	117.3%	11.3	6.5	B	3
	Through	1	1	110.0%	5.5	12.2	A	0
	Right Turn	1	1	70.0%	1.0	2.1	A	0
	Subtotal	13	15	113.1%	11.3	6.7	B	3
WB	Left Turn	51	52	102.7%	21.6	6.3	C	21
	Through	4	4	105.0%	10.4	10.1	B	1
	Right Turn	65	69	106.5%	12.9	6.6	B	16
	Subtotal	120	126	104.8%	16.5	5.9	C	38
Total		976	990	101.5%	3.4	1.0	A	50

Bicyclists

Vissim Post-Processor Bike AM Peak
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	10	9	92.0%	11.0	11.4	1.8
	Right Turn	5	4	78.0%	0.4	1.0	0.0
	Subtotal	15	13	87.3%	7.3	6.5	1.9
SB	Left Turn	15	12	76.7%	11.7	6.9	2.9
	Through	4	3	62.5%	0.8	1.7	0.1
	Right Turn						
	Subtotal	19	14	73.7%	11.0	7.0	3.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	80.0%	33.7	30.7	2.8
	Through						
	Right Turn						
	Subtotal	5	4	80.0%	33.7	30.7	2.8
Total		39	31	79.7%	13.8	5.7	7.6

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	12	85.7%	5.6	5.9	1.3
	Right Turn	5	4	88.0%	0.4	1.1	0.0
	Subtotal	19	16	86.3%	5.0	5.4	1.3
SB	Left Turn	3	3	83.3%	10.8	19.4	0.5
	Through	5	3	60.0%	0.0	0.0	0.0
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	9	7	72.2%	6.7	11.3	0.5
EB	Left Turn	1	1	130.0%	9.2	17.1	0.2
	Through	140	138	98.2%	39.5	7.7	92.3
	Right Turn	2	2	100.0%	6.5	16.8	0.2
	Subtotal	143	141	98.5%	39.3	7.5	92.6
WB	Left Turn						
	Through	7	4	57.1%	31.0	35.0	3.6
	Right Turn						
	Subtotal	7	4	57.1%	31.0	35.0	3.6
Total		178	168	94.2%	34.3	7.4	98.13

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	60.0%	1.8	5.2	0
	Through	6	12	200.0%	5.6	5.9	0.6
	Right Turn	9	9	95.6%	0.6	0.8	0.1
	Subtotal	16	21	132.5%	4.0	4.0	0.7
SB	Left Turn	4	4	102.5%	23.6	31.4	1.6
	Through	2	0	20.0%	0.0	0.0	0.0
	Right Turn	1	1	70.0%	0.0	0.0	0.0
	Subtotal	7	5	74.3%	23.0	31.7	1.6
EB	Left Turn	8	7	92.5%	41.1	35.0	5.5
	Through	112	114	101.6%	41.9	12.9	78.3
	Right Turn	2	2	95.0%	4.0	5.7	0.1
	Subtotal	122	123	100.9%	41.8	13.2	83.9
WB	Left Turn	3	3	113.3%	43.2	36.3	2.2
	Through	6	5	78.3%	39.0	29.0	3.9
	Right Turn	5	4	76.0%	0.6	1.1	0.0
	Subtotal	14	12	85.0%	35.5	18.3	6.1
Total		159	161	101.5%	35.5	10.2	92.2

Bicyclists

Vissim Post-Processor Bike AM Peak
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	11	12	109.1%	5.0	5.8	0.9
	Right Turn	52	51	98.8%	0.7	0.7	0.6
	Subtotal	63	63	100.6%	1.5	1.1	1.5
SB	Left Turn	1	1	50.0%	0.0	0.0	0.0
	Through	6	5	86.7%	5.3	9.1	0.5
	Right Turn						
	Subtotal	7	6	81.4%	5.3	9.1	0.5
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	87.5%	38.1	25.7	5.1
	Through						
	Right Turn	7	5	70.0%	7.8	8.2	0.9
	Subtotal	15	12	79.3%	28.0	16.1	6.0
Total		85	81	95.3%	5.6	2.9	8.1

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	41	39	95.9%	17.3	8.9	11.8
	Right Turn						
	Subtotal	41	39	95.9%	17.3	8.9	11.8
SB	Left Turn	1	1	100.0%	5.6	11.0	0.1
	Through	13	10	80.0%	4.1	5.9	0.9
	Right Turn						
	Subtotal	14	11	81.4%	5.3	5.8	1.0
EB	Left Turn	22	23	102.7%	64.8	22.7	23.8
	Through	10	10	96.0%	34.3	21.0	5.7
	Right Turn	4	4	95.0%	4.2	7.2	0.3
	Subtotal	36	36	100.0%	53.0	18.6	29.8
WB	Left Turn						
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	1	0	0.0%	0.0	0.0	0.0
Total		92	87	94.2%	29.8	8.5	42.6

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	6	6	98.3%	13.6	12.7	1.4
	Right Turn	21	21	98.6%	3.4	1.4	1.2
	Subtotal	27	27	98.5%	5.9	3.2	2.5
SB	Left Turn	6	7	113.3%	8.3	9.8	0.8
	Through	2	2	105.0%	14.2	17.6	0.5
	Right Turn						
	Subtotal	8	9	111.3%	12.7	10.8	1.3
EB	Left Turn	2	1	65.0%	2.9	5.9	0.1
	Through	93	93	100.4%	12.8	2.2	19.8
	Right Turn	2	2	75.0%	6.5	12.1	0.2
	Subtotal	97	96	99.2%	12.8	2.0	20.1
WB	Left Turn						
	Through	3	2	80.0%	4.0	7.8	0.2
	Right Turn	3	2	63.3%	0.0	0.0	0.0
	Subtotal	6	4	71.7%	4.0	7.8	0.2
Total		138	136	98.6%	11.0	1.5	24.1

Bicyclists

Vissim Post-Processor Bike AM Peak
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	50.0%	3.0	6.9	0
	Through	1	1	60.0%	0.0	0.0	0.0
	Right Turn	5	3	56.0%	2.6	1.8	0.2
	Subtotal	7	4	55.7%	4.4	3.9	0.3
SB	Left Turn	1	1	80.0%	0.0	0.0	0.0
	Through	1	0	40.0%	2.7	8.5	0.0
	Right Turn						
	Subtotal	2	1	60.0%	2.7	8.5	0.0
EB	Left Turn	1	1	120.0%	4.4	8.1	0.1
	Through	62	62	99.4%	11.4	4.4	11.7
	Right Turn						
	Subtotal	63	63	99.7%	11.4	4.4	11.8
WB	Left Turn						
	Through	3	2	76.7%	0.5	1.5	0.0
	Right Turn						
	Subtotal	3	2	76.7%	0.5	1.5	0.0
Total		75	70	93.6%	9.9	3.5	12.2

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	4	3	82.5%	8.0	10.6	0.5
	Right Turn	2	1	60.0%	3.8	11.9	0.1
	Subtotal	6	5	75.0%	9.5	11.6	0.7
SB	Left Turn	2	2	110.0%	6.5	14.6	0.2
	Through	1	1	80.0%	0.2	0.7	0.0
	Right Turn						
	Subtotal	3	3	100.0%	6.7	14.5	0.2
EB	Left Turn						
	Through	57	56	98.4%	35.7	7.4	33.9
	Right Turn						
	Subtotal	57	56	98.4%	35.7	7.4	33.9
WB	Left Turn	2	1	25.0%	4.7	14.8	0.2
	Through						
	Right Turn	1	1	120.0%	0.2	0.6	0.0
	Subtotal	3	2	56.7%	3.2	10.0	0.2
Total		69	65	94.6%	30.7	6.7	35.0

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	12	86.4%	0.0	0.0	0.0
	Right Turn						
	Subtotal	14	12	86.4%	0.0	0.0	0.0
SB	Left Turn						
	Through	5	6	120.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	5	6	120.0%	0.0	0.0	0.0
EB	Left Turn	1	1	70.0%	1.1	1.8	0.0
	Through						
	Right Turn						
	Subtotal	1	1	70.0%	1.1	1.8	0.0
WB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	1	140.0%	3.9	5.1	0.1
	Right Turn	3	0	0.0%	0.0	0.0	0.0
	Subtotal	5	1	28.0%	3.9	5.1	0.1
Total		25	20	80.8%	0.8	1.0	0.1

Pedestrians

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Shields St/W Laurel St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
37	34	91.4%	46.1	10.1	26.0

Shields St/W Plum St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
106	103	97.0%	50.5	5.1	86.6

Shields St/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
90	87	96.9%	52.8	5.7	76.7

Shields St/Lake St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
54	55	102.4%	49.9	12.1	46.0

Shields St/Prospect

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
68	67	98.5%	53.6	7.5	59.9

Ped Crossing/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
1	1	60.0%	0.0	0.0	0.0

City Park Ave/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
36	36	98.9%	20.3	6.3	12.1

Constitution Ave/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
9	9	95.6%	18.0	14.6	2.6

Ped Signal/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
2	3	135.0%	13.5	20.0	0.6

Taft Hill Rd/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
17	16	91.2%	35.3	11.2	9.1

Overland Trail/W Elizabeth St

Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person
Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
2	3	130.0%	0.0	0.0	0.0

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	53.1	5.2	4.2
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	53.1	5.2	4.2
Total		4	120	4	100.0%	35.4	3.5	4.2

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	0.0	0.0	0.0
	Right Turn	3	205	3	100.0%	7.2	8.1	6.1
	Subtotal	5	306	5	100.0%	7.2	8.1	6.1
SB	Left Turn							
	Through	2	19	2	100.0%	16.7	4.1	1.3
	Right Turn							
	Subtotal	2	19	2	100.0%	16.7	4.1	1.3
EB	Left Turn							
	Through	6	490	6	100.0%	69.0	44.8	140.8
	Right Turn							
	Subtotal	6	490	6	100.0%	69.0	44.8	140.8
WB	Left Turn	2	16	2	100.0%	90.7	5.3	6.0
	Through	8	58	8	100.0%	39.5	4.1	9.5
	Right Turn							
	Subtotal	10	74	10	100.0%	56.5	3.1	15.6
Total		23	889	23	100.0%	43.7	8.9	163.8

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	47.7	26.9	20.1
	Right Turn							
	Subtotal	2	101	2	100.0%	47.7	26.9	20.1
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn	2	16	2	100.0%	0.0	0.0	0.0
	Subtotal	4	35	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	205	3	100.0%	47.0	18.9	40.2
	Through							
	Right Turn							
	Subtotal	3	205	3	100.0%	47.0	18.9	40.2
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	341	9	100.0%	31.6	11.6	60.3

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	243	2	100.0%	0.0	0.0	0.0
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	25	2	100.0%	5.2	10.7	0.5
	Subtotal	2	25	2	100.0%	5.2	10.7	0.5
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	268	4	100.0%	3.5	7.1	0.5

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	103	2	100.0%	49.4	8.3	21.2
	Subtotal	2	103	2	100.0%	49.4	8.3	21.2
SB	Left Turn Through Right Turn	2	25	2	100.0%	0.0	0.0	0.0
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	139	2	100.0%	171.5	47.8	99.3
	Subtotal		139					99.3
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	267	4	100.0%	33.0	5.6	120.5

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	154	6	100.0%	30.3	13.7	19.4
	Subtotal	6	154	6	100.0%	30.3	13.7	19.4
EB	Left Turn Through Right Turn	3	201	3	100.0%	20.1	7.8	16.9
	Subtotal	3	201	3	100.0%	20.1	7.8	16.9
WB	Left Turn Through Right Turn	2	16	2	100.0%	13.3	10.1	0.9
	Subtotal	2	16	2	100.0%	13.3	10.1	0.9
Total		11	371	11	100.0%	23.5	8.9	37.2

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	12	2	100.0%	0.0	0.0	0.0
	Subtotal	2	12	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through	3	196	3	100.0%	29.3	7.3	23.9
	Right Turn							
	Subtotal	3	196	3	100.0%	29.3	7.3	23.9
WB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn	6	198	6	100.0%	9.9	0.7	8.2
	Subtotal	8	217	8	100.0%	9.9	0.7	8.2
Total		13	425	13	100.0%	16.6	2.9	32.1

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through	1	38	1	100.0%	18.7	2.0	3.0
	Right Turn							
	Subtotal		38					3.0
SB	Left Turn							
	Through	1	9	1	100.0%	13.1	1.8	0.5
	Right Turn							
	Subtotal		9					0.5
EB	Left Turn							
	Through	4	160	4	100.0%	86.7	15.6	57.8
	Right Turn							
	Subtotal	4	160	4	100.0%	86.7	15.6	57.8
WB	Left Turn							
	Through	4	29	4	97.5%	47.1	15.4	5.7
	Right Turn							
	Subtotal	4	29	4	97.5%	47.1	15.4	5.7
Total		8	236	8	98.8%	60.1	10.6	66.9

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand		Served Volume (vph)		Total Delay (sec/veh)		Total Person Delay (min)
		Volume (vph)	Riders (pp4h)	Average	Percent	Average	Std. Dev.	
NB	Left Turn							
	Through							
	Right Turn	2	26	2	100.0%	0.0	0.0	0.0
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn	2	7	2	100.0%	7.2	4.0	0.2
	Through							
	Right Turn							
	Subtotal	2	7	2	100.0%	7.2	4.0	0.2
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	65	2	100.0%	0.0	0.0	0.0
	Through							
	Right Turn	2	16	2	100.0%	66.0	31.6	4.4
	Subtotal	4	81	4	100.0%	66.0	31.6	4.4
Total		8	114	8	100.0%	29.3	12.8	4.6

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **TSM Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	695	96.6%	4.5	2.1	A	57
	Right Turn	413	397	96.1%	5.8	1.6	A	42
	Subtotal	1,132	1,092	96.4%	5.0	1.8	A	99
SB	Left Turn	130	131	100.5%	21.4	5.7	C	51
	Through	667	666	99.8%	11.0	1.9	B	134
	Right Turn							
	Subtotal	797	797	99.9%	12.8	2.5	B	186
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	122	94.9%	44.5	6.6	D	99
	Through							
	Right Turn	61	61	100.0%	9.6	2.4	A	11
	Subtotal	189	183	96.6%	33.4	6.0	C	110
Total		2,118	2,071	97.8%	11.9	1.3	B	394

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	13	102.3%	8.9	9.1	A	2
	Through	1,064	1,031	96.9%	2.7	0.9	A	50
	Right Turn	37	37	101.1%	2.5	1.2	A	2
	Subtotal	1,114	1,082	97.1%	2.7	0.9	A	54
SB	Left Turn	13	13	100.8%	22.6	10.0	C	5
	Through	764	760	99.5%	6.5	0.9	A	90
	Right Turn	18	17	92.8%	6.9	4.7	A	2
	Subtotal	795	790	99.3%	6.8	0.8	A	97
EB	Left Turn	51	51	99.2%	54.9	12.8	D	51
	Through	25	38	150.0%	58.4	7.6	E	40
	Right Turn	34	34	100.3%	47.0	12.2	D	29
	Subtotal	110	122	111.1%	54.0	8.9	D	120
WB	Left Turn	17	17	98.2%	47.9	17.4	D	15
	Through	18	31	172.8%	42.0	6.3	D	24
	Right Turn	17	16	91.2%	6.8	3.7	A	2
	Subtotal	52	63	121.7%	37.1	8.3	D	41
Total		2,071	2,057	99.3%	9.3	1.1	A	312

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	145	103.6%	22.2	4.9	C	59
	Through	851	831	97.6%	11.1	1.6	B	170
	Right Turn	54	56	103.9%	10.2	3.4	B	11
	Subtotal	1,045	1,032	98.8%	12.6	1.8	B	239
SB	Left Turn	24	22	91.7%	23.7	15.4	C	10
	Through	653	653	100.0%	7.6	1.6	A	91
	Right Turn	138	135	97.8%	2.9	0.6	A	7
	Subtotal	815	810	99.4%	7.4	1.6	A	107
EB	Left Turn	258	248	96.1%	45.5	5.6	D	207
	Through	27	27	98.1%	37.7	11.3	D	18
	Right Turn	296	285	96.2%	32.5	18.5	C	170
	Subtotal	581	559	96.2%	38.7	8.4	D	395
WB	Left Turn	15	14	90.0%	46.5	14.8	D	12
	Through	5	5	108.0%	38.4	29.6	D	4
	Right Turn	5	5	96.0%	10.6	8.4	B	1
	Subtotal	25	24	94.8%	38.3	10.6	D	16
Total		2,466	2,425	98.3%	16.7	1.5	B	758

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **TSM Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,177	99.9%	3.3	0.8	A	72
	Right Turn	154	155	100.9%	4.4	1.4	A	13
	Subtotal	1,332	1,332	100.0%	3.5	0.9	A	85
SB	Left Turn	123	118	96.1%	41.1	6.4	D	89
	Through	768	746	97.1%	5.0	1.1	A	68
	Right Turn							
	Subtotal	891	864	97.0%	9.8	1.8	A	157
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	62	101.8%	47.6	4.2	D	54
	Through							
	Right Turn	37	37	99.7%	4.8	0.8	A	3
	Subtotal	98	99	101.0%	31.8	3.7	C	57
Total		2,321	2,296	98.9%	7.0	1.1	A	299

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	54	96.6%	25.5	8.7	C	25
	Through	946	943	99.7%	21.2	2.7	C	367
	Right Turn	136	129	94.5%	16.1	2.5	B	38
	Subtotal	1,138	1,126	98.9%	20.8	2.5	C	430
SB	Left Turn	145	152	105.0%	33.0	5.5	C	92
	Through	630	602	95.5%	6.9	0.8	A	76
	Right Turn	54	54	99.4%	2.4	1.2	A	2
	Subtotal	829	808	97.5%	11.9	1.4	B	171
EB	Left Turn	241	237	98.2%	141.0	33.3	F	612
	Through	713	730	102.3%	121.0	27.1	F	1,619
	Right Turn	152	149	98.2%	83.6	30.3	F	229
	Subtotal	1,106	1,116	100.9%	120.6	27.9	F	2,460
WB	Left Turn	71	70	98.9%	55.2	7.4	E	71
	Through	233	234	100.6%	40.5	3.6	D	174
	Right Turn	145	151	104.3%	32.2	4.8	C	89
	Subtotal	449	456	101.5%	39.9	3.3	D	335
Total		3,522	3,505	99.5%	56.4	10.5	E	3,395

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	24	99.6%	20.7	2.8	C	9
	Through	33	32	96.4%	19.7	4.6	B	11
	Right Turn	35	34	96.3%	11.2	3.8	B	7
	Subtotal	92	89	97.2%	16.7	3.6	B	27
SB	Left Turn	34	33	97.1%	21.9	5.1	C	13
	Through	32	33	103.1%	20.0	8.5	B	12
	Right Turn	18	21	117.8%	15.0	5.4	B	6
	Subtotal	84	87	103.8%	18.9	4.5	B	31
EB	Left Turn	53	49	91.9%	6.7	2.5	A	6
	Through	441	422	95.7%	5.1	1.2	A	39
	Right Turn	66	66	100.2%	5.3	1.5	A	6
	Subtotal	560	537	95.9%	5.3	1.2	A	52
WB	Left Turn	30	31	103.3%	10.7	5.7	B	6
	Through	160	161	100.4%	5.0	2.2	A	15
	Right Turn	45	43	96.4%	3.7	1.4	A	3
	Subtotal	235	235	100.0%	5.4	2.0	A	24
Total		971	948	97.7%	7.6	1.4	A	134

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	3	103.3%	8.6	13.0	A	0
	Through	4	4	87.5%	18.2	18.8	B	1
	Right Turn	20	20	98.0%	6.1	2.3	A	2
	Subtotal	27	26	97.0%	9.2	5.5	A	4
SB	Left Turn	36	35	95.8%	22.3	5.5	C	14
	Through	9	9	95.6%	24.3	10.0	C	4
	Right Turn	32	40	123.8%	9.0	3.0	A	7
	Subtotal	77	83	107.4%	16.1	2.6	B	24
EB	Left Turn	26	29	110.0%	10.9	3.4	B	6
	Through	499	480	96.3%	5.0	1.8	A	44
	Right Turn	5	5	98.0%	2.8	3.9	A	0
	Subtotal	530	514	97.0%	5.3	1.7	A	50
WB	Left Turn	2	2	100.0%	4.1	5.8	A	0
	Through	150	146	97.3%	5.3	2.2	A	14
	Right Turn	15	21	142.0%	5.9	2.1	A	2
	Subtotal	167	169	101.4%	5.5	2.0	A	17
Total		801	792	98.9%	7.0	1.4	A	95

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	49	95.9%	16.5	3.8	B	15
	Through	739	734	99.3%	18.6	2.4	B	250
	Right Turn	111	106	95.8%	18.1	3.1	B	35
	Subtotal	901	889	98.6%	18.5	2.2	B	300
SB	Left Turn	91	87	95.3%	24.0	7.9	C	38
	Through	547	549	100.4%	12.9	1.5	B	130
	Right Turn	47	46	97.2%	11.8	3.8	B	10
	Subtotal	685	682	99.5%	14.3	2.0	B	178
EB	Left Turn	121	122	100.5%	35.9	3.7	D	80
	Through	239	237	99.2%	39.6	6.0	D	172
	Right Turn	153	153	99.9%	16.2	4.4	B	45
	Subtotal	513	511	99.7%	31.8	3.7	C	298
WB	Left Turn	100	96	95.5%	32.8	10.5	C	57
	Through	109	116	106.1%	29.4	4.6	C	62
	Right Turn	32	33	103.1%	6.0	1.5	A	4
	Subtotal	241	244	101.3%	27.7	5.6	C	123
Total		2,340	2,326	99.4%	21.3	1.9	C	898

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	5	127.5%	1.4	2.2	A	0
	Through	455	448	98.5%	0.5	0.1	A	4
	Right Turn	69	69	99.4%	0.8	0.2	A	1
	Subtotal	528	522	98.8%	0.6	0.1	A	5
SB	Left Turn	33	32	95.8%	2.4	0.8	A	1
	Through	272	275	101.0%	0.4	0.1	A	2
	Right Turn	10	10	95.0%	0.5	0.2	A	0
	Subtotal	315	316	100.3%	0.6	0.2	A	3
EB	Left Turn	11	11	102.7%	13.2	8.1	B	3
	Through	1	7	680.0%	23.6	5.3	C	3
	Right Turn	1	1	110.0%	0.5	1.6	A	0
	Subtotal	13	19	147.7%	19.6	4.3	C	6
WB	Left Turn	51	51	99.4%	18.1	7.4	C	17
	Through	4	10	245.0%	44.2	19.0	E	8
	Right Turn	65	66	100.9%	14.7	6.9	B	18
	Subtotal	120	126	105.1%	17.7	5.9	C	42
Total		976	983	100.7%	3.7	1.1	A	57

Bicyclists

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement **Bike** **AM Peak Hour**
L

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	10	9	86.0%	16.5	12.3	2.8
	Right Turn	5	4	88.0%	0.4	1.0	0.0
	Subtotal	15	13	86.7%	9.9	5.2	2.8
SB	Left Turn	15	11	72.7%	14.0	12.9	3.5
	Through	4	2	57.5%	0.7	1.5	0.0
	Right Turn						
	Subtotal	19	13	69.5%	11.3	10.4	3.6
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	84.0%	35.3	31.6	2.9
	Through						
	Right Turn						
	Subtotal	5	4	84.0%	35.3	31.6	2.9
Total		39	30	77.9%	14.9	7.6	9.3

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	12	87.1%	3.3	5.3	0.8
	Right Turn	5	5	102.0%	0.9	2.0	0.1
	Subtotal	19	17	91.1%	2.6	4.1	0.8
SB	Left Turn	3	2	76.7%	5.8	17.4	0.3
	Through	5	3	68.0%	0.2	0.3	0.0
	Right Turn	1	1	80.0%	0.0	0.0	0.0
	Subtotal	9	7	72.2%	3.2	8.8	0.3
EB	Left Turn	1	1	120.0%	3.8	8.0	0.1
	Through	140	139	98.9%	39.6	3.9	92.4
	Right Turn	2	2	120.0%	7.4	16.9	0.2
	Subtotal	143	142	99.4%	39.0	4.1	92.7
WB	Left Turn						
	Through	7	4	60.0%	34.0	36.3	4.0
	Right Turn						
	Subtotal	7	4	60.0%	34.0	36.3	4.0
Total		178	170	95.6%	34.0	4.9	97.81

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	100.0%	14.5	24.8	0
	Through	6	12	203.3%	3.3	5.3	0.3
	Right Turn	9	10	111.1%	0.2	0.4	0.0
	Subtotal	16	23	145.0%	5.8	7.9	0.6
SB	Left Turn	4	4	110.0%	18.4	26.2	1.2
	Through	2	1	25.0%	0.0	0.0	0.0
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	7	6	84.3%	18.0	26.4	1.2
EB	Left Turn	8	7	92.5%	36.9	30.1	4.9
	Through	112	112	99.6%	43.9	14.5	81.9
	Right Turn	2	2	80.0%	4.7	13.5	0.2
	Subtotal	122	121	98.8%	43.6	14.2	87.0
WB	Left Turn	3	4	116.7%	29.5	29.9	1.5
	Through	6	4	68.3%	36.2	27.7	3.6
	Right Turn	5	4	82.0%	0.2	0.3	0.0
	Subtotal	14	12	83.6%	30.4	16.5	5.1
Total		159	161	101.4%	36.5	12.8	93.9

Bicyclists

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement **Bike** **AM Peak Hour**
L

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	11	12	110.9%	4.9	5.1	0.9
	Right Turn	52	51	98.1%	0.7	0.7	0.6
	Subtotal	63	63	100.3%	1.6	1.0	1.5
SB	Left Turn	1	1	50.0%	0.0	0.0	0.0
	Through	6	5	83.3%	5.3	11.0	0.5
	Right Turn						
	Subtotal	7	6	78.6%	5.3	11.0	0.5
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	6	76.3%	38.0	25.1	5.1
	Through						
	Right Turn	7	6	82.9%	10.3	9.6	1.2
	Subtotal	15	12	79.3%	27.5	15.8	6.3
Total		85	81	94.8%	5.6	2.8	8.3

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	41	40	96.8%	17.0	5.5	11.6
	Right Turn						
	Subtotal	41	40	96.8%	17.0	5.5	11.6
SB	Left Turn	1	1	80.0%	0.0	0.0	0.0
	Through	13	10	74.6%	7.6	5.6	1.6
	Right Turn						
	Subtotal	14	11	75.0%	7.6	5.6	1.6
EB	Left Turn	22	24	106.8%	68.3	12.4	25.0
	Through	10	9	91.0%	22.6	15.8	3.8
	Right Turn	4	4	87.5%	6.9	10.0	0.5
	Subtotal	36	36	100.3%	51.0	9.9	29.3
WB	Left Turn						
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	1	0	0.0%	0.0	0.0	0.0
Total		92	86	93.8%	30.5	5.3	42.5

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	6	6	93.3%	18.8	14.7	1.9
	Right Turn	21	21	99.5%	3.6	1.6	1.3
	Subtotal	27	27	98.1%	7.5	3.2	3.2
SB	Left Turn	6	7	120.0%	14.5	14.5	1.4
	Through	2	2	120.0%	10.3	15.7	0.3
	Right Turn						
	Subtotal	8	10	120.0%	16.8	12.7	1.8
EB	Left Turn	2	1	45.0%	10.2	26.6	0.3
	Through	93	91	98.0%	12.4	3.1	19.3
	Right Turn	2	2	75.0%	2.5	6.9	0.1
	Subtotal	97	94	96.4%	12.7	3.2	19.7
WB	Left Turn						
	Through	3	2	63.3%	2.9	7.4	0.1
	Right Turn	3	3	93.3%	0.0	0.0	0.0
	Subtotal	6	5	78.3%	2.9	7.4	0.1
Total		138	134	97.3%	11.4	1.6	24.8

Bicyclists

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement **Bike** **AM Peak Hour**
L

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	60.0%	0.9	3.0	0.0
	Through	1	0	20.0%	0.0	0.0	0.0
	Right Turn	5	2	46.0%	1.6	1.8	0.1
	Subtotal	7	3	44.3%	2.6	2.9	0.2
SB	Left Turn	1	1	90.0%	0.1	0.3	0.0
	Through	1	1	50.0%	4.2	13.2	0.1
	Right Turn						
	Subtotal	2	1	70.0%	4.3	13.2	0.1
EB	Left Turn	1	1	100.0%	7.3	15.5	0.1
	Through	62	59	95.5%	11.6	3.1	12.0
	Right Turn						
	Subtotal	63	60	95.6%	12.2	3.8	12.1
WB	Left Turn						
	Through	3	2	60.0%	4.6	8.1	0.2
	Right Turn						
	Subtotal	3	2	60.0%	4.6	8.1	0.2
Total		75	67	88.7%	10.9	2.9	12.6

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	4	3	80.0%	9.1	14.2	0.6
	Right Turn	2	1	65.0%	8.0	14.1	0.3
	Subtotal	6	5	75.0%	11.7	11.2	0.9
SB	Left Turn	2	2	105.0%	0.2	0.6	0.0
	Through	1	1	70.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	3	3	93.3%	0.2	0.6	0.0
EB	Left Turn						
	Through	57	54	95.1%	32.3	5.4	30.7
	Right Turn						
	Subtotal	57	54	95.1%	32.3	5.4	30.7
WB	Left Turn	2	1	30.0%	7.8	15.5	0.3
	Through						
	Right Turn	1	1	90.0%	1.5	4.7	0.0
	Subtotal	3	2	50.0%	8.1	13.5	0.3
Total		69	63	91.3%	27.6	4.7	31.9

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	13	93.6%	0.2	0.7	0.1
	Right Turn						
	Subtotal	14	13	93.6%	0.2	0.7	0.1
SB	Left Turn						
	Through	5	5	102.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	5	5	102.0%	0.0	0.0	0.0
EB	Left Turn	1	1	80.0%	0.8	1.8	0.0
	Through						
	Right Turn						
	Subtotal	1	1	80.0%	0.8	1.8	0.0
WB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	2	160.0%	7.0	6.7	0.1
	Right Turn	3	0	0.0%	0.0	0.0	0.0
	Subtotal	5	2	32.0%	7.0	6.7	0.1
Total		25	21	82.4%	1.6	1.7	0.2

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	1	1	90.0%	12.2	24.5	
	Subtotal	1	1	90.0%	12.2	24.5	
SB	Left Turn	8	7	92.5%	46.1	23.0	
	Through						
	Right Turn						
	Subtotal	8	7	92.5%	46.1	23.0	
EB	Left Turn	26	22	85.4%	51.3	8.1	
	Through						
	Right Turn						
	Subtotal	26	22	85.4%	51.3	8.1	
WB	Left Turn						
	Through						
	Right Turn	2	2	115.0%	41.1	40.1	
	Subtotal	2	2	115.0%	41.1	40.1	
Total		37	33	88.6%	48.3	9.0	26.4

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	4	5	115.0%	34.0	40.1	
	Subtotal	4	5	115.0%	34.0	40.1	
SB	East Side	4	4	97.5%	20.3	24.9	
	West Side	20	22	110.5%	41.7	20.3	
	Subtotal	24	26	108.3%	42.4	17.8	
EB	North Side	45	46	101.8%	54.7	8.4	
	South Side	31	28	89.4%	56.4	12.4	
	Subtotal	76	74	96.7%	55.1	7.6	
WB	South Side						
	North Side	2	1	70.0%	17.5	30.4	
	Subtotal	2	1	70.0%	17.5	30.4	
Total		106	106	99.5%	50.9	6.0	89.4

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	80.0%	36.7	47.9	
	East Side	4	4	110.0%	41.4	38.7	
	Subtotal	5	5	104.0%	53.7	34.8	
SB	East Side	2	2	75.0%	43.5	47.3	
	West Side	2	2	95.0%	0.0	0.0	
	Subtotal	4	3	85.0%	43.5	47.3	
EB	North Side	28	25	89.6%	46.3	10.3	
	South Side	51	50	98.6%	54.9	6.1	
	Subtotal	79	75	95.4%	51.2	4.5	
WB	South Side						
	North Side	2	2	80.0%	13.7	30.6	
	Subtotal	2	2	80.0%	13.7	30.6	
Total		90	86	95.1%	51.3	6.2	73.2

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	26	27	103.5%	50.1	18.0	
	Subtotal	26	27	103.5%	50.1	18.0	
SB	East Side						
	West Side						
	Subtotal						
EB	North Side	7	7	100.0%	36.1	30.2	
	South Side						
	Subtotal	7	7	100.0%	36.1	30.2	
WB	South Side						
	North Side	21	23	107.1%	54.4	8.3	
	Subtotal	21	23	107.1%	54.4	8.3	
Total		54	56	104.4%	50.3	9.0	47.3

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	16	16	96.9%	61.0	24.6	
	East Side	26	25	97.3%	56.1	10.0	
	Subtotal	42	41	97.1%	57.0	8.0	
SB	East Side						
	West Side	1	1	100.0%	5.6	14.7	
	Subtotal	1	1	100.0%	5.6	14.7	
EB	North Side	10	9	94.0%	61.7	25.3	
	South Side	11	11	100.9%	45.5	25.2	
	Subtotal	21	21	97.6%	51.5	12.6	
WB	South Side	4	4	105.0%	22.9	25.6	
	North Side						
	Subtotal	4	4	105.0%	22.9	25.6	
Total		68	67	97.8%	52.7	6.1	58.4

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through						
	Right Turn	1	1	80.0%	0.0	0.0	
	Subtotal	1	1	80.0%	0.0	0.0	
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1	1	80.0%	0.0	0.0	0.0

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	9	8	93.3%	30.4	12.7	
	East Side	1	1	80.0%	2.1	4.4	
	Subtotal	10	9	92.0%	28.8	10.8	
SB	East Side	4	5	120.0%	25.2	16.3	
	West Side	4	3	75.0%	15.0	17.4	
	Subtotal	8	8	97.5%	29.1	10.8	
EB	North Side	10	10	97.0%	21.8	10.4	
	South Side	5	5	100.0%	14.7	16.2	
	Subtotal	15	15	98.0%	18.8	9.1	
WB	South Side						
	North Side	3	3	93.3%	5.1	8.9	
	Subtotal	3	3	93.3%	5.1	8.9	
Total		36	35	95.8%	21.8	4.6	12.5

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	110.0%	6.2	13.1	
	Through						
	Right Turn	3	3	113.3%	19.2	18.3	
	Subtotal	4	5	112.5%	19.7	18.3	
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	3	3	93.3%	14.5	19.9	
	Through						
	Right Turn	2	2	115.0%	2.6	8.4	
	Subtotal	5	5	102.0%	17.2	19.5	
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		9	10	106.7%	21.7	13.7	3.5

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through	2	2	105.0%	16.2	18.7	
	Right Turn						
	Subtotal	2	2	105.0%	16.2	18.7	
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2	2	105.0%	16.2	18.7	0.6

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side						
	East Side	3	3	90.0%	28.5	32.0	
	Subtotal	3	3	90.0%	28.5	32.0	
SB	East Side	4	4	100.0%	30.1	35.3	
	West Side	3	3	106.7%	16.0	25.6	
	Subtotal	7	7	102.9%	32.0	27.0	
EB	North Side						
	South Side	6	7	111.7%	48.8	31.9	
	Subtotal	6	7	111.7%	48.8	31.9	
WB	South Side	1	0	0.0%	0.0	0.0	
	North Side						
	Subtotal	1	0	0.0%	0.0	0.0	
Total		17	17	97.6%	37.8	11.7	10.5

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	80.0%	0.0	0.0	
	Through						
	Right Turn						
	Subtotal	1	1	80.0%	0.0	0.0	
SB	Left Turn	1	2	150.0%	0.0	0.0	
	Through						
	Right Turn						
	Subtotal	1	2	150.0%	0.0	0.0	
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2	2	115.0%	0.0	0.0	0.0

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	52.4	3.5	4.1
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	52.4	3.5	4.1
Total		4	120	4	100.0%	34.9	2.3	4.1

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	19	2	100.0%	17.9	4.2	1.4
	Right Turn							
	Subtotal	2	19	2	100.0%	17.9	4.2	1.4
EB	Left Turn							
	Through	11	490	11	100.0%	79.5	11.3	162.3
	Right Turn							
	Subtotal	11	490	11	100.0%	79.5	11.3	162.3
WB	Left Turn							
	Through	12	58	12	100.0%	57.9	18.7	14.0
	Right Turn							
	Subtotal	12	58	12	100.0%	57.9	18.7	14.0
Total		27	668	27	100.0%	57.3	6.6	177.7

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	42.4	20.7	17.8
	Right Turn							
	Subtotal	2	101	2	100.0%	42.4	20.7	17.8
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	120	4	100.0%	28.3	13.8	17.8

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	243	2	100.0%	0.0	0.0	0.0
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	25	2	100.0%	4.3	4.5	0.5
	Subtotal	2	25	2	100.0%	4.3	4.5	0.5
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	268	4	100.0%	2.9	3.0	0.5

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	103	2	100.0%	53.3	8.2	22.9
	Subtotal	2	103	2	100.0%	53.3	8.2	22.9
SB	Left Turn Through Right Turn	2	25	2	100.0%	0.0	0.0	0.0
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	139	2	100.0%	171.5	47.8	99.3
	Subtotal		139					99.3
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	267	4	100.0%	35.5	5.5	122.2

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	154	6	100.0%	30.4	10.8	19.5
	Subtotal	6	154	6	100.0%	30.4	10.8	19.5
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		6	154	6	100.0%	30.4	10.8	19.5

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	12	6	100.0%	19.7	13.9	1.0
	Subtotal	6	12	6	100.0%	19.7	13.9	1.0
EB	Left Turn	5	196	5	100.0%	24.1	6.1	19.7
	Through							
	Right Turn							
	Subtotal	5	196	5	100.0%	24.1	6.1	19.7
WB	Left Turn							
	Through							
	Right Turn	6	198	6	100.0%	10.7	1.3	8.8
	Subtotal	6	198	6	100.0%	10.7	1.3	8.8
Total		17	406	17	100.0%	18.7	5.6	29.5

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	38	1	100.0%	18.6	2.4	2.9
	Right Turn							
	Subtotal		38					2.9
SB	Left Turn							
	Through	1	9	1	100.0%	12.9	1.5	0.5
	Right Turn							
	Subtotal		9					0.5
EB	Left Turn							
	Through	5	160	5	100.0%	88.3	17.8	58.9
	Right Turn							
	Subtotal	5	160	5	100.0%	88.3	17.8	58.9
WB	Left Turn							
	Through	6	29	6	100.0%	55.9	19.2	6.8
	Right Turn							
	Subtotal	6	29	6	100.0%	55.9	19.2	6.8
Total		11	236	11	100.0%	76.2	12.2	69.1

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	26	6	100.0%	24.6	10.7	2.7
	Right Turn							
	Subtotal	6	26	6	100.0%	24.6	10.7	2.7
WB	Left Turn							
	Through	6	7	6	100.0%	71.6	36.3	2.1
	Right Turn							
	Subtotal	6	7	6	100.0%	71.6	36.3	2.1
Total		12	33	12	100.0%	52.7	17.1	4.8

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	706	98.2%	6.0	2.1	A	78
	Right Turn	413	405	98.1%	8.9	2.4	A	66
	Subtotal	1,132	1,111	98.2%	7.1	2.2	A	144
SB	Left Turn	130	132	101.5%	26.5	7.8	C	64
	Through	667	657	98.5%	11.1	1.2	B	134
	Right Turn							
	Subtotal	797	789	99.0%	13.5	2.0	B	198
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	123	96.3%	44.4	5.6	D	100
	Through							
	Right Turn	61	58	94.3%	9.7	1.7	A	10
	Subtotal	189	181	95.7%	33.7	4.5	C	111
Total		2,118	2,081	98.3%	11.6	1.6	B	453

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	13	99.2%	4.4	3.2	A	1
	Through	1,064	1,045	98.2%	1.3	0.3	A	26
	Right Turn	37	38	101.9%	1.4	0.5	A	1
	Subtotal	1,114	1,096	98.4%	1.4	0.3	A	28
SB	Left Turn	13	10	74.6%	15.2	11.6	B	3
	Through	764	756	98.9%	5.5	0.9	A	76
	Right Turn	18	17	96.7%	3.2	2.6	A	1
	Subtotal	795	783	98.5%	5.6	0.9	A	80
EB	Left Turn	51	52	102.0%	51.2	9.4	D	49
	Through	25	37	149.6%	54.5	12.6	D	37
	Right Turn	34	32	93.5%	49.9	10.5	D	29
	Subtotal	110	121	110.2%	51.7	8.6	D	115
WB	Left Turn	17	17	99.4%	37.1	15.6	D	12
	Through	18	30	167.2%	41.8	8.9	D	23
	Right Turn	17	16	92.9%	7.8	4.6	A	2
	Subtotal	52	63	120.8%	33.9	8.5	C	37
Total		2,071	2,063	99.6%	7.8	1.0	A	259

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	143	102.0%	34.4	7.5	C	90
	Through	851	837	98.4%	12.7	2.1	B	194
	Right Turn	54	53	97.6%	11.2	1.8	B	11
	Subtotal	1,045	1,033	98.8%	15.6	2.1	B	295
SB	Left Turn	24	24	97.9%	32.7	14.7	C	14
	Through	653	646	99.0%	9.5	2.2	A	112
	Right Turn	138	135	98.0%	5.2	2.1	A	13
	Subtotal	815	805	98.8%	9.6	1.9	A	139
EB	Left Turn	258	257	99.5%	50.9	5.3	D	240
	Through	27	27	100.4%	49.7	7.0	D	25
	Right Turn	296	298	100.7%	46.1	3.5	D	252
	Subtotal	581	582	100.2%	48.4	3.2	D	516
WB	Left Turn	15	14	95.3%	36.7	25.8	D	10
	Through	5	4	86.0%	27.8	31.3	C	2
	Right Turn	5	5	96.0%	3.1	6.5	A	0
	Subtotal	25	23	93.6%	36.8	20.9	D	12
Total		2,466	2,443	99.1%	21.6	1.2	C	962

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,187	100.8%	3.7	0.9	A	81
	Right Turn	154	148	96.4%	4.7	1.3	A	13
	Subtotal	1,332	1,336	100.3%	3.8	0.9	A	94
SB	Left Turn	123	120	97.8%	45.5	9.0	D	100
	Through	768	754	98.2%	8.1	1.4	A	112
	Right Turn							
	Subtotal	891	875	98.2%	13.3	2.7	B	212
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	63	103.6%	48.3	7.3	D	56
	Through							
	Right Turn	37	35	95.7%	4.8	1.2	A	3
	Subtotal	98	99	100.6%	33.6	5.1	C	59
Total		2,321	2,309	99.5%	8.6	1.4	A	365

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	56	100.5%	24.7	6.5	C	26
	Through	946	941	99.4%	20.5	1.8	C	353
	Right Turn	136	129	95.0%	15.2	3.9	B	36
	Subtotal	1,138	1,126	99.0%	20.0	1.7	C	414
SB	Left Turn	145	149	102.8%	34.6	7.0	C	94
	Through	630	615	97.6%	4.2	1.4	A	48
	Right Turn	54	55	102.6%	1.8	0.4	A	2
	Subtotal	829	819	98.8%	10.0	2.4	B	144
EB	Left Turn	241	244	101.3%	128.8	29.6	F	577
	Through	713	716	100.5%	100.3	18.1	F	1318
	Right Turn	152	153	100.9%	64.5	19.0	E	181
	Subtotal	1,106	1,114	100.7%	101.3	17.9	F	2076
WB	Left Turn	71	69	96.6%	50.6	9.5	D	64
	Through	233	237	101.5%	42.7	1.5	D	185
	Right Turn	145	148	102.3%	30.6	4.1	C	83
	Subtotal	449	454	101.0%	40.0	1.9	D	332
Total		3,522	3,513	99.7%	48.6	6.3	D	2966

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	23	96.7%	30.4	10.9	C	13
	Through	33	32	97.6%	26.9	6.4	C	16
	Right Turn	35	34	97.4%	8.9	3.5	A	6
	Subtotal	92	90	97.3%	21.1	4.6	C	34
SB	Left Turn	34	34	100.0%	39.3	9.1	D	25
	Through	32	31	97.5%	32.1	8.6	C	18
	Right Turn	18	22	123.9%	17.6	4.4	B	7
	Subtotal	84	88	104.2%	30.4	4.5	C	50
EB	Left Turn	53	56	106.2%	44.5	8.6	D	46
	Through	441	436	99.0%	12.6	4.2	B	101
	Right Turn	66	65	98.3%	8.6	4.3	A	10
	Subtotal	560	558	99.6%	15.3	4.1	B	157
WB	Left Turn	30	28	93.0%	35.2	4.3	D	18
	Through	160	158	98.4%	10.9	3.3	B	32
	Right Turn	45	45	100.4%	7.0	5.3	A	6
	Subtotal	235	231	98.1%	13.1	3.3	B	55
Total		971	965	99.4%	16.6	3.1	B	297

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	2	80.0%	11.8	14.3	B	1
	Through	4	4	100.0%	27.2	23.0	C	2
	Right Turn	20	18	89.5%	29.9	10.3	C	10
	Subtotal	27	24	90.0%	27.3	5.6	C	12
SB	Left Turn	36	37	101.4%	26.5	7.4	C	18
	Through	9	8	91.1%	22.1	17.5	C	3
	Right Turn	32	38	119.7%	27.4	6.1	C	19
	Subtotal	77	83	107.8%	27.1	3.9	C	40
EB	Left Turn	26	32	121.9%	40.1	14.2	D	23
	Through	499	497	99.6%	6.5	1.6	A	59
	Right Turn	5	6	114.0%	5.7	11.1	A	1
	Subtotal	530	535	100.9%	8.7	2.2	A	83
WB	Left Turn	2	2	100.0%	11.2	17.1	B	0
	Through	150	145	96.8%	8.0	2.6	A	21
	Right Turn	15	22	146.7%	7.0	1.9	A	3
	Subtotal	167	169	101.3%	8.0	2.3	A	24
Total		801	811	101.3%	12.0	1.7	B	160

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	52	102.0%	34.0	17.3	C	32
	Through	739	720	97.4%	45.2	21.5	D	596
	Right Turn	111	110	99.4%	50.6	24.2	D	102
	Subtotal	901	882	97.9%	45.1	21.4	D	731
SB	Left Turn	91	89	97.4%	29.5	6.1	C	48
	Through	547	544	99.5%	21.8	2.7	C	217
	Right Turn	47	45	95.5%	25.3	7.6	C	21
	Subtotal	685	678	98.9%	23.0	2.8	C	286
EB	Left Turn	121	122	100.5%	70.4	32.2	E	157
	Through	239	244	102.0%	43.6	25.4	D	195
	Right Turn	153	154	100.3%	67.4	41.1	E	190
	Subtotal	513	519	101.1%	57.2	30.0	E	541
WB	Left Turn	100	96	95.6%	80.2	34.1	F	141
	Through	109	113	103.2%	26.1	4.1	C	54
	Right Turn	32	33	102.5%	37.1	9.4	D	22
	Subtotal	241	241	100.0%	49.8	14.4	D	217
Total		2,340	2,320	99.1%	43.1	13.0	D	1775

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	105.0%	1.5	1.7	A	0
	Through	455	460	101.1%	4.6	0.7	A	38
	Right Turn	69	69	100.1%	4.4	1.2	A	6
	Subtotal	528	533	101.0%	4.5	0.8	A	44
SB	Left Turn	33	30	92.1%	2.5	0.7	A	1
	Through	272	282	103.7%	2.6	0.5	A	14
	Right Turn	10	8	75.0%	3.9	3.0	A	1
	Subtotal	315	320	101.6%	2.6	0.5	A	16
EB	Left Turn	11	13	119.1%	2.8	1.6	A	1
	Through	1	7	720.0%	4.4	3.3	A	1
	Right Turn	1	1	60.0%	0.6	1.2	A	0
	Subtotal	13	21	160.8%	3.5	1.6	A	1
WB	Left Turn	51	50	98.0%	8.1	2.5	A	7
	Through	4	10	240.0%	10.6	4.3	B	2
	Right Turn	65	65	99.5%	7.0	2.0	A	8
	Subtotal	120	124	103.6%	7.7	1.9	A	18
Total		976	999	102.3%	4.3	0.5	A	79

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	10	11	111.0%	8.2	9.3	1.4
	Right Turn	5	5	98.0%	0.9	1.3	0.1
	Subtotal	15	16	106.7%	6.4	6.3	1.4
SB	Left Turn	15	10	69.3%	21.8	13.1	5.4
	Through	4	3	62.5%	2.0	4.3	0.1
	Right Turn						
	Subtotal	19	13	67.9%	17.7	9.7	5.6
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	84.0%	40.5	28.7	3.4
	Through						
	Right Turn						
	Subtotal	5	4	84.0%	40.5	28.7	3.4
Total		39	33	84.9%	16.7	6.8	10.4

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	15	103.6%	3.8	5.8	0.9
	Right Turn	5	5	102.0%	2.0	6.3	0.2
	Subtotal	19	20	103.2%	3.3	3.9	1.1
SB	Left Turn						
	Through	5	4	74.0%	0.2	0.5	0.0
	Right Turn	1	1	50.0%	0.0	0.0	0.0
	Subtotal	6	4	70.0%	0.2	0.5	0.0
EB	Left Turn	1	2	150.0%	6.1	18.7	0.1
	Through	140	136	97.1%	31.1	4.5	72.5
	Right Turn	2	2	115.0%	9.3	19.7	0.3
	Subtotal	143	140	97.7%	31.2	4.6	72.9
WB	Left Turn						
	Through	7	4	57.1%	45.4	32.7	5.3
	Right Turn	1	0	0.0%	0.0	0.0	0.0
	Subtotal	8	4	50.0%	45.4	32.7	5.3
Total		176	168	95.2%	28.23	4.9	79.28

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	80.0%	4.0	9.4	0
	Through	6	15	241.7%	5.4	4.7	0.5
	Right Turn	9	9	101.1%	3.8	10.8	0.6
	Subtotal	16	24	152.5%	6.3	7.4	1.2
SB	Left Turn	4	4	110.0%	54.6	43.4	3.6
	Through	2	1	40.0%	2.9	9.1	0.1
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	7	6	88.6%	53.2	40.5	3.7
EB	Left Turn	8	9	116.3%	49.1	26.4	6.5
	Through	112	104	92.4%	58.3	10.7	108.9
	Right Turn	2	2	110.0%	9.6	25.7	0.3
	Subtotal	122	115	94.3%	57.4	11.4	115.8
WB	Left Turn	3	3	86.7%	11.5	27.7	0.6
	Through	6	5	76.7%	30.8	30.9	3.1
	Right Turn	5	4	88.0%	4.5	8.6	0.4
	Subtotal	14	12	82.9%	25.0	17.3	4.0
Total		159	157	98.9%	46.9	9.0	124.7

Vissim Post-Processor **Bicycle AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	11	15	131.8%	5.4	4.7	1.0
	Right Turn	52	50	96.7%	0.3	0.5	0.3
	Subtotal	63	65	102.9%	1.3	0.9	1.3
SB	Left Turn	1	1	130.0%	14.4	33.4	0.2
	Through	6	5	75.0%	4.9	8.1	0.5
	Right Turn						
	Subtotal	7	6	82.9%	16.6	32.7	0.7
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	6	71.3%	47.6	24.5	6.3
	Through						
	Right Turn	7	6	88.6%	14.2	11.1	1.7
	Subtotal	15	12	79.3%	31.9	16.0	8.0
Total		85	83	97.1%	6.5	4.0	10.0

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	41	40	96.8%	14.0	4.9	9.5
	Right Turn						
	Subtotal	41	40	96.8%	14.0	4.9	9.5
SB	Left Turn	1	0	30.0%	5.4	17.0	0.1
	Through	13	10	75.4%	7.2	10.1	1.6
	Right Turn						
	Subtotal	14	10	72.1%	8.1	11.4	1.6
EB	Left Turn	22	22	99.5%	62.9	15.2	23.1
	Through	10	10	97.0%	33.7	26.6	5.6
	Right Turn	4	5	120.0%	6.4	8.8	0.4
	Subtotal	36	36	101.1%	50.2	14.4	29.1
WB	Left Turn						
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	1	0	0.0%	0.0	0.0	0.0
Total		92	86	93.7%	28.9	8.4	40.3

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	6	6	101.7%	16.8	22.3	1.7
	Right Turn	21	22	103.3%	0.3	0.6	0.1
	Subtotal	27	28	103.0%	5.1	7.1	1.8
SB	Left Turn	6	5	90.0%	71.1	62.9	7.1
	Through	2	2	115.0%	44.2	69.9	1.5
	Right Turn						
	Subtotal	8	8	96.3%	77.8	54.7	8.6
EB	Left Turn	2	1	60.0%	0.0	0.0	0.0
	Through	93	96	103.4%	12.4	6.8	19.3
	Right Turn	2	1	60.0%	2.5	7.3	0.1
	Subtotal	97	99	101.6%	12.2	6.4	19.3
WB	Left Turn						
	Through	3	2	66.7%	0.0	0.0	0.0
	Right Turn	3	3	86.7%	0.0	0.0	0.0
	Subtotal	6	5	76.7%	0.0	0.0	0.0
Total		138	139	100.5%	16.5	8.2	29.7

Vissim Post-Processor **Bicycle AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	80.0%	7.9	16.8	0
	Through	1	1	50.0%	0.0	0.0	0.0
	Right Turn	5	3	56.0%	3.0	3.8	0.3
	Subtotal	7	4	58.6%	5.7	7.8	0.4
SB	Left Turn	1	1	110.0%	1.2	3.9	0.0
	Through	1	1	50.0%	15.5	25.2	0.3
	Right Turn						
	Subtotal	2	2	80.0%	16.7	24.7	0.3
EB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	62	66	106.8%	9.7	5.7	10.0
	Right Turn						
	Subtotal	63	66	105.1%	9.7	5.7	10.0
WB	Left Turn						
	Through	3	2	60.0%	3.8	8.0	0.2
	Right Turn						
	Subtotal	3	2	60.0%	3.8	8.0	0.2
Total		75	74	98.3%	10.1	4.1	10.8

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	4	3	72.5%	26.6	23.2	1.8
	Right Turn	2	1	65.0%	16.0	22.8	0.5
	Subtotal	6	4	70.0%	30.2	22.7	2.3
SB	Left Turn	2	3	160.0%	6.9	10.5	0.2
	Through	1	1	80.0%	8.2	18.6	0.1
	Right Turn						
	Subtotal	3	4	133.3%	10.5	13.6	0.4
EB	Left Turn						
	Through	57	60	104.7%	39.2	9.0	37.3
	Right Turn						
	Subtotal	57	60	104.7%	39.2	9.0	37.3
WB	Left Turn	2	1	35.0%	6.9	14.7	0.2
	Through						
	Right Turn	1	1	50.0%	7.0	15.2	0.1
	Subtotal	3	1	40.0%	13.9	18.5	0.3
Total		69	69	100.1%	35.9	7.1	40.3

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	13	90.0%	0.9	1.0	0.2
	Right Turn						
	Subtotal	14	13	90.0%	0.9	1.0	0.2
SB	Left Turn						
	Through	5	4	84.0%	1.5	2.1	0.1
	Right Turn						
	Subtotal	5	4	84.0%	1.5	2.1	0.1
EB	Left Turn	1	1	60.0%	0.1	0.2	0.0
	Through						
	Right Turn						
	Subtotal	1	1	60.0%	0.1	0.2	0.0
WB	Left Turn	1	1	60.0%	0.1	0.4	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn	3	5	163.3%	1.8	2.6	0.1
	Subtotal	5	6	110.0%	1.8	2.6	0.1
Total		25	23	91.6%	1.3	1.0	0.4

Vissim Post-Processor **Crosswalk AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	1	1	120.0%	4.1	10.8	
	Subtotal	1	1	120.0%	4.1	10.8	
SB	Left Turn	8	9	112.5%	42.8	22.1	
	Through						
	Right Turn						
	Subtotal	8	9	112.5%	42.8	22.1	
EB	Left Turn	26	26	100.0%	51.3	8.2	
	Through						
	Right Turn						
	Subtotal	26	26	100.0%	51.3	8.2	
WB	Left Turn						
	Through						
	Right Turn	2	2	90.0%	33.3	38.5	
	Subtotal	2	2	90.0%	33.3	38.5	
Total		37	38	102.7%	46.5	9.3	29.4

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	4	4	90.0%	24.6	37.0	
	Subtotal	4	4	90.0%	24.6	37.0	
SB	East Side	4	3	85.0%	13.8	22.6	
	West Side	20	20	97.5%	53.1	16.2	
	Subtotal	24	23	95.4%	52.3	17.5	
EB	North Side	45	46	101.6%	55.4	14.3	
	South Side	31	29	93.5%	50.3	6.9	
	Subtotal	76	75	98.3%	52.6	8.7	
WB	South Side						
	North Side	2	2	90.0%	20.8	37.5	
	Subtotal	2	2	90.0%	20.8	37.5	
Total		106	103	97.2%	50.6	6.8	86.8

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	90.0%	25.5	44.0	
	East Side	4	4	110.0%	52.6	39.8	
	Subtotal	5	5	106.0%	62.9	37.7	
SB	East Side	2	2	115.0%	32.2	41.7	
	West Side	2	2	95.0%	26.6	42.9	
	Subtotal	4	4	105.0%	51.5	42.6	
EB	North Side	28	28	100.7%	59.5	9.5	
	South Side	51	49	95.5%	48.1	11.5	
	Subtotal	79	77	97.3%	53.2	8.8	
WB	South Side						
	North Side	2	2	75.0%	8.1	17.8	
	Subtotal	2	2	75.0%	8.1	17.8	
Total		90	88	97.7%	52.7	8.9	77.1

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	26	26	100.8%	42.3	15.6	
	Subtotal	26	26	100.8%	42.3	15.6	
SB	East Side						
	West Side						
	Subtotal						
EB	North Side	7	8	108.6%	45.5	27.7	
	South Side						
	Subtotal	7	8	108.6%	45.5	27.7	
WB	South Side						
	North Side	21	21	100.0%	51.9	11.0	
	Subtotal	21	21	100.0%	51.9	11.0	
Total		54	55	101.5%	46.4	9.8	42.4

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	16	16	100.6%	37.9	22.7	
	East Side	26	25	94.2%	110.5	85.0	
	Subtotal	42	41	96.7%	94.4	71.8	
SB	East Side						
	West Side	1	1	80.0%	5.2	16.5	
	Subtotal	1	1	80.0%	5.2	16.5	
EB	North Side	10	11	111.0%	65.4	30.9	
	South Side	11	12	105.5%	53.0	18.3	
	Subtotal	21	23	108.1%	61.2	17.2	
WB	South Side	4	5	125.0%	28.2	29.0	
	North Side						
	Subtotal	4	5	125.0%	28.2	29.0	
Total		68	69	101.6%	70.0	24.4	80.6

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side						
	Subtotal						
SB	East Side						
	West Side	1	1	80.0%	0.0	0.0	
	Subtotal	1	1	80.0%	0.0	0.0	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		1	1	80.0%	0.0	0.0	0.0

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	9	8	83.3%	36.8	24.6	
	East Side	1	1	90.0%	8.5	19.8	
	Subtotal	10	8	84.0%	45.3	17.5	
SB	East Side	4	5	135.0%	26.8	22.6	
	West Side	4	4	90.0%	26.6	28.0	
	Subtotal	8	9	112.5%	35.2	19.4	
EB	North Side	10	10	95.0%	28.3	12.7	
	South Side	5	6	122.0%	21.3	13.8	
	Subtotal	15	16	104.0%	28.4	10.9	
WB	South Side						
	North Side	10	10	95.0%	28.3	12.7	
	Subtotal	3	3	90.0%	19.2	29.5	
Total		36	36	99.2%	32.8	9.8	19.5

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	60.0%	1.9	6.2	
	East Side	3	3	96.7%	23.0	24.8	
	Subtotal	4	4	87.5%	21.9	23.5	
SB	East Side						
	West Side						
	Subtotal						
EB	North Side	3	4	133.3%	12.8	15.3	
	South Side	2	2	90.0%	0.9	3.0	
	Subtotal	5	6	116.0%	13.7	14.7	
WB	South Side						
	North Side						
	Subtotal						
Total		9	9	103.3%	19.1	16.6	3.0

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side						
	Subtotal						
SB	East Side						
		2	2	105.0%	20.3	19.3	
	West Side						
	Subtotal	2	2	105.0%	20.3	19.3	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		2	2	105.0%	20.3	19.3	0.7

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side						
	East Side	3	3	106.7%	19.7	26.4	
	Subtotal	3	3	106.7%	19.7	26.4	
SB	East Side	4	3	75.0%	30.4	32.5	
	West Side	3	3	83.3%	25.3	30.1	
	Subtotal	7	6	78.6%	33.3	22.4	
EB	North Side						
	South Side	6	8	128.3%	34.5	26.8	
	Subtotal	6	8	128.3%	34.5	26.8	
WB	South Side	1	0	0.0%	0.0	0.0	
	North Side						
	Subtotal	1	0	0.0%	0.0	0.0	
Total		17	16	96.5%	34.1	11.3	9.3

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	120.0%	0.0	0.0	
	East Side						
	Subtotal	1	1	120.0%	0.0	0.0	
SB	East Side	1	1	120.0%	0.0	0.0	
	West Side						
	Subtotal	1	1	120.0%	0.0	0.0	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		2	2	120.0%	0.0	0.0	0.0

Vissim Post-Processor **Transit AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	51.9	5.3	4.1
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	51.9	5.3	4.1
Total		4	120	4	100.0%	34.6	3.6	4.1

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	0.3	0.3	0.1
	Right Turn							
	Subtotal	2	101	2	100.0%	0.3	0.3	0.1
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through	11	490	11	100.0%	62.6	5.0	127.7
	Right Turn							
	Subtotal	11	490	11	100.0%	62.6	5.0	127.7
WB	Left Turn							
	Through	12	58	12	102.5%	50.5	5.7	12.2
	Right Turn							
	Subtotal	12	58	12	102.5%	50.5	5.7	12.2
Total		27	668	27	101.1%	43.1	3.7	140.1

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	52.3	27.6	22.0
	Right Turn							
	Subtotal	2	101	2	100.0%	52.3	27.6	22.0
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	120	4	100.0%	34.9	18.4	22.0

Vissim Post-Processor **Transit AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	243	2	100.0%	0.0	0.0	0.0
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	25	2	100.0%	6.6	9.2	0.7
	Subtotal	2	25	2	100.0%	6.6	9.2	0.7
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	268	4	100.0%	4.4	6.1	0.7

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	103	2	100.0%	45.6	6.0	19.6
	Subtotal	2	103	2	100.0%	45.6	6.0	19.6
SB	Left Turn Through Right Turn	2	25	2	100.0%	0.0	0.0	0.0
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	139	2	100.0%	57.5	6.2	33.3
	Subtotal		139					33.3
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	267	4	100.0%	30.4	4.0	52.8

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	154	6	100.0%	25.6	6.4	16.5
	Subtotal	6	154	6	100.0%	25.6	6.4	16.5
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		6	154	6	100.0%	25.6	6.4	16.5

Vissim Post-Processor **Transit AM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	12	6	98.3%	16.8	20.5	0.8
	Subtotal	6	12	6	98.3%	16.8	20.5	0.8
EB	Left Turn	5	196	5	100.0%	41.2	19.9	33.7
	Through							
	Right Turn							
	Subtotal	5	196	5	100.0%	41.2	19.9	33.7
WB	Left Turn							
	Through							
	Right Turn	6	198	6	100.0%	12.8	3.2	10.6
	Subtotal	6	198	6	100.0%	12.8	3.2	10.6
Total		17	406	17	99.4%	22.0	6.6	45.1

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	38	1	100.0%	45.2	21.5	7.2
	Right Turn							
	Subtotal	1	38	0	0.0%	0.0	0.0	7.2
SB	Left Turn							
	Through	1	9	1	100.0%	21.8	2.7	0.8
	Right Turn							
	Subtotal	1	9	0	0.0%	0.0	0.0	0.8
EB	Left Turn							
	Through	5	160	5	100.0%	68.5	17.3	45.7
	Right Turn							
	Subtotal	5	160	5	100.0%	68.5	17.3	45.7
WB	Left Turn							
	Through	6	29	6	100.0%	47.6	15.9	5.8
	Right Turn							
	Subtotal	6	29	6	100.0%	47.6	15.9	5.8
Total		13	236	11	84.6%	51.6	13.1	59.4

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	26	6	100.0%	7.8	5.5	0.8
	Right Turn							
	Subtotal	6	26	6	100.0%	7.8	5.5	0.8
WB	Left Turn							
	Through	6	7	6	100.0%	14.2	11.4	0.4
	Right Turn							
	Subtotal	6	7	6	100.0%	14.2	11.4	0.4
Total		12	33	12	100.0%	11.0	5.8	1.3

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	701	97.5%	3.4	1.3	A	44
	Right Turn	413	404	97.8%	5.8	2.1	A	43
	Subtotal	1,132	1,105	97.6%	4.3	1.6	A	87
SB	Left Turn	130	132	101.5%	18.7	2.1	B	45
	Through	667	656	98.4%	10.4	1.4	B	125
	Right Turn							
	Subtotal	797	788	98.9%	11.8	1.5	B	171
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	123	96.3%	44.4	4.8	D	100
	Through							
	Right Turn	61	59	96.6%	9.5	1.7	A	10
	Subtotal	189	182	96.3%	33.4	3.8	C	111
Total		2,118	2,075	98.0%	11.1	0.7	B	368

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	12	93.8%	5.7	4.9	A	1
	Through	1,064	1,041	97.9%	1.3	0.1	A	25
	Right Turn	37	43	115.9%	1.2	0.4	A	1
	Subtotal	1,114	1,096	98.4%	1.4	0.1	A	27
SB	Left Turn	13	10	76.2%	18.9	14.4	B	3
	Through	764	755	98.9%	5.6	0.9	A	78
	Right Turn	18	17	92.8%	5.1	4.5	A	2
	Subtotal	795	782	98.4%	5.9	1.0	A	83
EB	Left Turn	51	52	101.6%	49.5	9.1	D	47
	Through	25	32	126.8%	56.6	11.1	E	33
	Right Turn	34	33	97.9%	52.5	7.7	D	32
	Subtotal	110	117	106.2%	52.0	7.9	D	112
WB	Left Turn	17	29	169.4%	52.4	7.6	D	28
	Through	18	17	95.6%	31.8	16.8	C	10
	Right Turn	17	17	98.2%	12.6	7.3	B	4
	Subtotal	52	63	120.6%	37.3	6.7	D	42
Total		2,071	2,058	99.4%	8.2	0.8	A	264

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	143	101.9%	36.5	8.0	D	95
	Through	851	836	98.3%	12.7	1.5	B	194
	Right Turn	54	53	98.0%	11.7	2.1	B	11
	Subtotal	1,045	1,032	98.7%	15.9	1.6	B	301
SB	Left Turn	24	23	96.3%	40.1	20.8	D	17
	Through	653	644	98.6%	9.1	2.2	A	107
	Right Turn	138	151	109.1%	5.9	2.1	A	16
	Subtotal	815	817	100.3%	9.6	2.2	A	141
EB	Left Turn	258	259	100.5%	51.8	8.0	D	246
	Through	27	29	107.8%	52.9	12.4	D	28
	Right Turn	296	295	99.7%	49.9	5.5	D	270
	Subtotal	581	583	100.4%	50.9	5.9	D	544
WB	Left Turn	15	15	98.7%	31.6	23.0	C	9
	Through	5	4	84.0%	29.9	32.0	C	2
	Right Turn	5	4	82.0%	3.5	6.4	A	0
	Subtotal	25	23	92.4%	34.1	18.3	C	11
Total		2,466	2,455	99.6%	22.3	2.2	C	997

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,187	100.7%	3.7	0.9	A	80
	Right Turn	154	150	97.1%	4.4	1.3	A	12
	Subtotal	1,332	1,336	100.3%	3.7	0.9	A	92
SB	Left Turn	123	122	99.5%	48.1	9.0	D	108
	Through	768	747	97.3%	8.9	1.5	A	122
	Right Turn							
	Subtotal	891	870	97.6%	14.4	2.7	B	230
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	61	100.7%	46.0	8.6	D	52
	Through							
	Right Turn	37	37	101.1%	4.9	1.3	A	3
	Subtotal	98	99	100.8%	30.0	7.1	C	55
Total		2,321	2,305	99.3%	8.7	1.4	A	377

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	59	105.5%	24.0	8.0	C	26
	Through	946	938	99.2%	19.9	2.5	B	343
	Right Turn	136	131	96.5%	13.8	4.5	B	33
	Subtotal	1,138	1,129	99.2%	19.5	2.3	B	402
SB	Left Turn	145	145	99.9%	32.5	9.1	C	86
	Through	630	610	96.8%	5.2	1.6	A	58
	Right Turn	54	54	99.3%	2.0	0.6	A	2
	Subtotal	829	808	97.5%	10.2	2.7	B	146
EB	Left Turn	241	244	101.0%	131.0	28.1	F	585
	Through	713	717	100.6%	103.4	17.7	F	1360
	Right Turn	152	154	101.4%	71.5	17.9	E	202
	Subtotal	1,106	1,115	100.8%	104.6	17.9	F	2146
WB	Left Turn	71	71	100.3%	51.6	9.5	D	67
	Through	233	235	101.0%	43.4	1.8	D	187
	Right Turn	145	147	101.7%	33.2	5.2	C	90
	Subtotal	449	454	101.1%	41.2	2.4	D	344
Total		3,522	3,506	99.5%	50.2	7.3	D	3039

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	24	101.7%	24.4	5.6	C	11
	Through	33	31	92.4%	26.6	5.2	C	15
	Right Turn	35	35	99.4%	29.4	7.6	C	19
	Subtotal	92	90	97.5%	27.2	4.1	C	45
SB	Left Turn	34	32	94.4%	27.3	5.3	C	16
	Through	32	31	97.5%	25.9	5.9	C	15
	Right Turn	18	15	81.1%	24.9	13.5	C	7
	Subtotal	84	78	92.7%	26.6	4.0	C	38
EB	Left Turn	53	54	101.3%	46.7	8.4	D	46
	Through	441	433	98.3%	16.5	5.0	B	131
	Right Turn	66	66	99.8%	7.6	2.4	A	9
	Subtotal	560	553	98.7%	18.4	5.1	B	186
WB	Left Turn	30	29	97.3%	35.2	6.5	D	19
	Through	160	157	98.4%	10.3	3.2	B	30
	Right Turn	45	47	103.6%	6.0	1.8	A	5
	Subtotal	235	233	99.2%	13.3	3.2	B	54
Total		971	954	98.2%	18.8	3.4	B	322

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **MAX Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	3	83.3%	13.7	13.9	B	1
	Through	4	4	102.5%	18.3	14.0	B	1
	Right Turn	20	18	90.0%	21.9	8.0	C	7
	Subtotal	27	25	91.1%	21.5	8.5	C	9
SB	Left Turn	36	35	97.8%	24.1	5.9	C	16
	Through	9	9	95.6%	17.3	10.3	B	3
	Right Turn	32	33	102.2%	26.5	7.1	C	16
	Subtotal	77	77	99.4%	25.2	4.3	C	34
EB	Left Turn	26	26	98.8%	32.9	7.0	C	16
	Through	499	500	100.2%	6.4	1.4	A	58
	Right Turn	5	6	128.0%	5.6	6.7	A	1
	Subtotal	530	532	100.4%	7.7	1.6	A	75
WB	Left Turn	2	2	95.0%	9.7	12.6	A	0
	Through	150	145	96.7%	5.1	2.0	A	14
	Right Turn	15	21	140.0%	8.6	3.6	A	3
	Subtotal	167	168	100.6%	5.6	1.7	A	17
Total		801	801	100.0%	10.2	1.4	B	135

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	51	100.2%	38.8	20.3	D	36
	Through	739	729	98.7%	44.4	19.8	D	594
	Right Turn	111	111	100.1%	52.2	22.6	D	106
	Subtotal	901	892	99.0%	45.0	20.0	D	736
SB	Left Turn	91	89	98.2%	31.7	7.1	C	52
	Through	547	539	98.6%	21.9	3.3	C	216
	Right Turn	47	44	94.3%	25.4	8.5	C	21
	Subtotal	685	673	98.2%	23.6	3.2	C	289
EB	Left Turn	121	122	100.4%	75.1	30.6	E	167
	Through	239	241	100.9%	44.8	27.5	D	198
	Right Turn	153	153	100.2%	66.3	38.0	E	186
	Subtotal	513	516	100.6%	58.5	30.3	E	551
WB	Left Turn	100	93	93.4%	84.7	38.1	F	145
	Through	109	114	104.2%	25.0	3.7	C	52
	Right Turn	32	34	105.9%	39.1	10.6	D	24
	Subtotal	241	241	100.0%	51.1	15.1	D	221
Total		2,340	2,321	99.2%	43.7	13.2	D	1798

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	105.0%	1.6	1.7	A	0
	Through	455	463	101.8%	4.8	0.7	A	41
	Right Turn	69	66	95.8%	4.3	1.1	A	5
	Subtotal	528	534	101.1%	4.8	0.7	A	46
SB	Left Turn	33	29	89.1%	3.2	0.9	A	2
	Through	272	281	103.2%	2.7	0.4	A	14
	Right Turn	10	7	73.0%	4.6	3.8	A	1
	Subtotal	315	317	100.7%	2.8	0.3	A	16
EB	Left Turn	11	13	116.4%	3.3	1.8	A	1
	Through	1	7	720.0%	5.5	2.9	A	1
	Right Turn	1	1	60.0%	0.4	1.1	A	0
	Subtotal	13	21	158.5%	4.4	1.7	A	2
WB	Left Turn	51	50	98.4%	8.0	1.3	A	7
	Through	4	10	252.5%	9.7	5.9	A	2
	Right Turn	65	65	99.8%	7.9	1.5	A	9
	Subtotal	120	125	104.3%	8.1	1.1	A	19
Total		976	997	102.1%	4.6	0.4	A	83

Bicyclists

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	10	11	109.0%	21.0	15.8	3.5
	Right Turn	5	4	86.0%	1.2	1.6	0.1
	Subtotal	15	15	101.3%	16.5	15.6	3.6
SB	Left Turn	15	11	74.0%	12.5	10.8	3.1
	Through	4	2	57.5%	1.8	3.9	0.1
	Right Turn						
	Subtotal	19	13	70.5%	11.6	10.0	3.3
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	5	4	78.0%	29.3	29.8	2.4
	Through						
	Right Turn						
	Subtotal	5	4	78.0%	29.3	29.8	2.4
Total		39	33	83.3%	16.5	9.9	9.3

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	14	99.3%	3.3	4.8	0.8
	Right Turn	5	6	114.0%	0.5	1.6	0.0
	Subtotal	19	20	103.2%	3.1	4.3	0.8
SB	Left Turn						
	Through	5	3	64.0%	0.1	0.2	0.0
	Right Turn	1	1	70.0%	0.1	0.3	0.0
	Subtotal	6	4	65.0%	0.2	0.4	0.0
EB	Left Turn	1	1	140.0%	9.9	21.6	0.2
	Through	140	136	97.1%	31.5	3.1	73.6
	Right Turn	2	2	115.0%	17.1	28.7	0.6
	Subtotal	143	140	97.7%	31.8	3.4	74.3
WB	Left Turn						
	Through	7	4	55.7%	34.6	33.3	4.0
	Right Turn	1	0	0.0%	0.0	0.0	0.0
	Subtotal	8	4	48.8%	34.6	33.3	4.0
Total		176	167	94.9%	28.23	3.4	79.15

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	80.0%	5.2	13.1	0
	Through	6	14	231.7%	3.7	2.9	0.4
	Right Turn	9	9	96.7%	3.7	10.8	0.5
	Subtotal	16	23	146.3%	5.5	7.2	1.0
SB	Left Turn	4	4	102.5%	58.2	47.9	3.9
	Through	2	1	30.0%	5.8	18.4	0.2
	Right Turn	1	1	100.0%	0.2	0.5	0.0
	Subtotal	7	6	81.4%	59.9	44.0	4.1
EB	Left Turn	8	9	117.5%	46.6	24.3	6.2
	Through	112	104	93.0%	58.2	8.7	108.7
	Right Turn	2	2	120.0%	13.8	27.1	0.5
	Subtotal	122	116	95.1%	57.5	8.2	115.4
WB	Left Turn	3	3	86.7%	15.2	29.6	0.8
	Through	6	4	71.7%	23.7	31.3	2.4
	Right Turn	5	5	94.0%	4.9	8.5	0.4
	Subtotal	14	12	82.9%	22.0	17.4	3.5
Total		159	157	98.6%	46.6	7.1	124.0

Bicyclists

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	11	14	126.4%	3.3	4.8	0.6
	Right Turn	52	50	96.2%	1.0	1.1	0.9
	Subtotal	63	64	101.4%	1.5	1.7	1.5
SB	Left Turn	1	1	120.0%	2.2	7.1	0.0
	Through	6	5	75.0%	5.1	7.2	0.5
	Right Turn						
	Subtotal	7	6	81.4%	7.3	8.8	0.5
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	6	76.3%	37.1	23.2	4.9
	Through						
	Right Turn	7	6	84.3%	10.5	13.3	1.2
	Subtotal	15	12	80.0%	34.3	18.6	6.2
Total		85	82	96.0%	7.4	3.0	8.2

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	41	40	97.1%	18.8	8.9	12.9
	Right Turn						
	Subtotal	41	40	97.1%	18.8	8.9	12.9
SB	Left Turn	1	1	60.0%	5.8	12.7	0.1
	Through	13	10	73.8%	12.3	16.2	2.7
	Right Turn						
	Subtotal	14	10	72.9%	13.3	15.8	2.8
EB	Left Turn	22	21	95.9%	49.8	15.3	18.3
	Through	10	9	94.0%	28.3	27.5	4.7
	Right Turn	4	5	127.5%	6.8	7.6	0.5
	Subtotal	36	36	98.9%	40.8	7.5	23.4
WB	Left Turn						
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	1	0	0.0%	0.0	0.0	0.0
Total		92	86	93.0%	26.4	7.5	39.1

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	6	6	100.0%	34.4	25.3	3.4
	Right Turn	21	22	103.8%	23.9	12.2	8.4
	Subtotal	27	28	103.0%	28.6	8.9	11.8
SB	Left Turn	6	5	81.7%	19.7	23.1	2.0
	Through	2	2	110.0%	4.0	7.3	0.1
	Right Turn						
	Subtotal	8	7	88.8%	17.0	18.5	2.1
EB	Left Turn	2	1	65.0%	9.1	14.1	0.3
	Through	93	94	100.9%	13.4	4.9	20.8
	Right Turn	2	1	55.0%	6.1	19.1	0.2
	Subtotal	97	96	99.2%	13.7	5.0	21.3
WB	Left Turn						
	Through	3	2	80.0%	4.9	10.0	0.2
	Right Turn	3	3	83.3%	3.4	6.7	0.2
	Subtotal	6	5	81.7%	6.1	10.1	0.4
Total		138	136	98.6%	17.8	2.7	35.7

Bicyclists

Vissim Post-Processor **Bicycle** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	70.0%	3.3	10.5	0
	Through	1	1	60.0%	4.9	12.6	0.1
	Right Turn	5	3	58.0%	2.8	3.6	0.2
	Subtotal	7	4	60.0%	5.9	7.7	0.4
SB	Left Turn	1	1	110.0%	1.4	4.4	0.0
	Through	1	0	40.0%	13.9	22.5	0.2
	Right Turn						
	Subtotal	2	2	75.0%	15.3	22.0	0.3
EB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	62	62	99.8%	8.8	5.4	9.1
	Right Turn						
	Subtotal	63	62	98.3%	8.8	5.4	9.1
WB	Left Turn						
	Through	3	2	73.3%	1.8	5.7	0.1
	Right Turn						
	Subtotal	3	2	73.3%	1.8	5.7	0.1
Total		75	70	93.1%	9.3	4.2	9.8

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	4	4	90.0%	15.3	23.6	1.0
	Right Turn	2	1	65.0%	2.1	5.5	0.1
	Subtotal	6	5	81.7%	12.1	15.2	1.1
SB	Left Turn	2	3	135.0%	1.4	4.5	0.0
	Through	1	1	50.0%	3.7	9.6	0.1
	Right Turn						
	Subtotal	3	3	106.7%	3.1	8.0	0.1
EB	Left Turn						
	Through	57	56	98.9%	40.0	5.1	38.0
	Right Turn						
	Subtotal	57	56	98.9%	40.0	5.1	38.0
WB	Left Turn	2	1	30.0%	10.5	33.3	0.4
	Through						
	Right Turn	1	0	40.0%	7.2	22.9	0.1
	Subtotal	3	1	33.3%	17.8	38.2	0.5
Total		69	66	94.9%	33.9	4.1	39.6

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	14	14	100.7%	0.5	0.7	0.1
	Right Turn						
	Subtotal	14	14	100.7%	0.5	0.7	0.1
SB	Left Turn						
	Through	5	4	86.0%	0.3	0.6	0.0
	Right Turn						
	Subtotal	5	4	86.0%	0.3	0.6	0.0
EB	Left Turn	1	1	90.0%	0.1	0.2	0.0
	Through						
	Right Turn						
	Subtotal	1	1	90.0%	0.1	0.2	0.0
WB	Left Turn	1	1	60.0%	0.1	0.2	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn	3	4	136.7%	1.1	1.7	0.1
	Subtotal	5	5	94.0%	1.1	1.7	0.1
Total		25	24	96.0%	0.8	1.0	0.2

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	1	1	100.0%	4.7	12.2	
	Subtotal	1	1	100.0%	4.7	12.2	
SB	Left Turn	8	8	101.3%	32.6	21.5	
	Through						
	Right Turn						
	Subtotal	8	8	101.3%	32.6	21.5	
EB	Left Turn	26	26	99.2%	49.9	13.8	
	Through						
	Right Turn						
	Subtotal	26	26	99.2%	49.9	13.8	
WB	Left Turn						
	Through						
	Right Turn	2	2	105.0%	74.2	157.9	
	Subtotal	2	2	105.0%	74.2	157.9	
Total		37	37	100.0%	48.5	18.7	29.9

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	4	3	85.0%	20.0	34.7	
	Subtotal	4	3	85.0%	20.0	34.7	
SB	East Side	4	4	95.0%	22.2	23.7	
	West Side	20	19	95.0%	56.7	15.5	
	Subtotal	24	23	95.0%	55.4	14.0	
EB	North Side	45	46	101.6%	50.4	4.8	
	South Side	31	30	95.8%	54.3	9.4	
	Subtotal	76	75	99.2%	51.7	5.6	
WB	South Side						
	North Side	2	2	100.0%	29.6	42.2	
	Subtotal	2	2	100.0%	29.6	42.2	
Total		106	104	97.7%	51.1	5.0	88.2

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	90.0%	14.0	31.8	
	East Side	4	4	95.0%	32.3	41.9	
	Subtotal	5	5	94.0%	43.4	43.6	
SB	East Side	2	2	110.0%	29.2	42.0	
	West Side	2	2	90.0%	18.1	38.3	
	Subtotal	4	4	100.0%	40.0	44.8	
EB	North Side	28	27	96.1%	58.2	8.6	
	South Side	51	49	95.5%	45.9	12.9	
	Subtotal	79	76	95.7%	51.0	8.3	
WB	South Side						
	North Side	2	2	85.0%	11.2	19.0	
	Subtotal	2	2	85.0%	11.2	19.0	
Total		90	86	95.6%	49.2	8.9	70.5

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	26	26	100.8%	37.4	8.5	
	Subtotal	26	26	100.8%	37.4	8.5	
SB	East Side						
	West Side						
	Subtotal						
EB	North Side	7	7	95.7%	41.7	35.0	
	South Side						
	Subtotal	7	7	95.7%	41.7	35.0	
WB	South Side						
	North Side	21	21	101.4%	62.0	21.8	
	Subtotal	21	21	101.4%	62.0	21.8	
Total		54	54	100.4%	47.0	5.9	42.5

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	16	16	96.9%	37.0	18.0	
	East Side	26	25	94.2%	124.2	86.3	
	Subtotal	42	40	95.2%	99.7	73.1	
SB	East Side						
	West Side	1	1	90.0%	5.2	16.3	
	Subtotal	1	1	90.0%	5.2	16.3	
EB	North Side	10	11	106.0%	49.4	16.3	
	South Side	11	12	110.0%	53.1	20.6	
	Subtotal	21	23	108.1%	54.4	9.5	
WB	South Side	4	5	122.5%	34.0	30.5	
	North Side						
	Subtotal	4	5	122.5%	34.0	30.5	
Total		68	69	100.7%	68.4	23.5	78.1

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side						
	Subtotal						
SB	East Side						
	West Side	1	1	70.0%	0.0	0.0	
	Subtotal	1	1	70.0%	0.0	0.0	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		1	1	70.0%	0.0	0.0	0.0

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	9	7	82.2%	45.6	23.0	
	East Side	1	1	130.0%	7.2	18.3	
	Subtotal	10	9	87.0%	49.5	17.7	
SB	East Side	4	5	112.5%	24.6	18.5	
	West Side	4	4	92.5%	26.7	26.0	
	Subtotal	8	8	102.5%	31.7	14.7	
EB	North Side	10	10	96.0%	35.0	24.8	
	South Side	5	6	114.0%	12.8	16.7	
	Subtotal	15	15	102.0%	28.3	18.9	
WB	South Side						
	North Side	10	10	96.0%	35.0	24.8	
	Subtotal	3	3	103.3%	19.6	27.1	
Total		36	35	98.1%	34.9	10.9	20.5

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	60.0%	5.1	16.2	
	East Side	3	3	90.0%	19.3	25.1	
	Subtotal	4	3	82.5%	19.4	25.1	
SB	East Side						
	West Side						
	Subtotal						
EB	North Side	3	4	120.0%	6.1	11.6	
	South Side	2	2	95.0%	3.0	8.3	
	Subtotal	5	6	110.0%	9.1	12.8	
WB	South Side						
	North Side						
	Subtotal						
Total		9	9	97.8%	15.9	14.0	2.3

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side						
	Subtotal						
SB	East Side						
		2	2	95.0%	15.4	17.3	
	West Side						
	Subtotal	2	2	95.0%	15.4	17.3	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		2	2	95.0%	15.4	17.3	0.5

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side						
	East Side	3	3	103.3%	21.2	25.7	
	Subtotal	3	3	103.3%	21.2	25.7	
SB	East Side	4	3	85.0%	27.6	33.8	
	West Side	3	3	83.3%	21.2	29.5	
	Subtotal	7	6	84.3%	30.7	24.5	
EB	North Side						
	South Side	6	7	113.3%	40.4	27.4	
	Subtotal	6	7	113.3%	40.4	27.4	
WB	South Side	1	0	0.0%	0.0	0.0	
	North Side						
	Subtotal	1	0	0.0%	0.0	0.0	
Total		17	16	92.9%	34.6	12.1	9.1

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	130.0%	0.0	0.0	
	East Side						
	Subtotal	1	1	130.0%	0.0	0.0	
SB	East Side	1	1	100.0%	0.0	0.0	
	West Side						
	Subtotal	1	1	100.0%	0.0	0.0	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		2	2	115.0%	0.0	0.0	0.0

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	101	2	100.0%	0.0	0.0	0.0
	Subtotal	2	101	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	19	2	100.0%	51.5	5.7	4.1
	Through							
	Right Turn							
	Subtotal	2	19	2	100.0%	51.5	5.7	4.1
Total		4	120	4	100.0%	34.4	3.8	4.1

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	0.5	0.9	0.2
	Right Turn	5	205	5	100.0%	0.0	0.0	0.0
	Subtotal	7	306	7	100.0%	0.5	0.9	0.2
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through	6	490	6	100.0%	64.0	4.8	130.8
	Right Turn							
	Subtotal	6	490	6	100.0%	64.0	4.8	130.8
WB	Left Turn	12	58	12	102.5%	61.2	5.6	14.8
	Through							
	Right Turn							
	Subtotal	12	58	12	102.5%	61.2	5.6	14.8
Total		27	873	27	101.1%	48.7	4.3	145.7

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	101	2	100.0%	48.0	28.6	20.2
	Right Turn							
	Subtotal	2	101	2	100.0%	48.0	28.6	20.2
SB	Left Turn							
	Through	2	19	2	100.0%	0.0	0.0	0.0
	Right Turn	12	16	12	102.5%	4.9	3.3	0.3
	Subtotal	14	35	14	102.1%	4.9	3.3	0.3
EB	Left Turn	5	205	5	100.0%	66.8	26.3	57.0
	Through							
	Right Turn							
	Subtotal	5	205	5	100.0%	66.8	26.3	57.0
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		21	341	21	101.4%	24.0	9.0	77.6

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	243	2	100.0%	0.0	0.0	0.0
	Subtotal	2	243	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	25	2	100.0%	6.6	7.3	0.7
	Subtotal	2	25	2	100.0%	6.6	7.3	0.7
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	268	4	100.0%	4.4	4.9	0.7

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	103	2	100.0%	43.6	5.7	18.7
	Subtotal	2	103	2	100.0%	43.6	5.7	18.7
SB	Left Turn Through Right Turn	2	25	2	100.0%	0.0	0.0	0.0
	Subtotal	2	25	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	139	2	100.0%	57.5	6.2	33.3
	Subtotal		139					33.3
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	267	4	100.0%	29.1	3.8	52.0

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn							
	Subtotal							
EB	Left Turn Through Right Turn	5	355	5	100.0%	22.4	6.8	33.1
	Subtotal	5	355	5	100.0%	22.4	6.8	33.1
WB	Left Turn Through Right Turn	12	16	12	98.3%	21.7	6.2	1.4
	Subtotal	12	16	12	98.3%	21.7	6.2	1.4
Total		17	371	17	98.8%	22.0	4.0	34.5

Transit

Vissim Post-Processor **Transit** **AM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	5	196	5	100.0%	30.1	10.1	24.6
	Right Turn							
	Subtotal	5	196	5	100.0%	30.1	10.1	24.6
WB	Left Turn							
	Through	6	12	6	100.0%	13.1	3.3	0.7
	Right Turn	6	198	6	100.0%	13.5	2.3	11.2
	Subtotal	12	210	12	100.0%	13.4	1.9	11.8
Total		17	406	17	100.0%	18.6	3.0	36.4

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	38	1	100.0%	44.4	19.8	7.0
	Right Turn							
	Subtotal	1	38	0	0.0%	0.0	0.0	7.0
SB	Left Turn							
	Through	1	9	1	100.0%	21.9	3.3	0.8
	Right Turn							
	Subtotal	1	9	0	0.0%	0.0	0.0	0.8
EB	Left Turn							
	Through	5	160	5	100.0%	72.1	25.6	48.1
	Right Turn							
	Subtotal	5	160	5	100.0%	72.1	25.6	48.1
WB	Left Turn							
	Through	6	29	6	100.0%	64.5	29.6	7.8
	Right Turn							
	Subtotal	6	29	6	100.0%	64.5	29.6	7.8
Total		13	236	11	84.6%	54.7	13.0	63.7

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	7	6	100.0%	6.6	3.2	0.2
	Right Turn							
	Subtotal	6	7	6	100.0%	6.6	3.2	0.2
WB	Left Turn							
	Through	6	16	6	100.0%	12.3	7.0	0.8
	Right Turn							
	Subtotal	6	16	6	100.0%	12.3	7.0	0.8
Total		12	23	12	100.0%	9.5	3.7	1.0

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **Existing**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	838	97.7%	8.3	2.7	A	128
	Right Turn	428	412	96.2%	11.6	2.4	B	87
	Subtotal	1,286	1,250	97.2%	9.4	2.4	A	215
SB	Left Turn	99	96	96.7%	52.3	9.1	D	92
	Through	971	920	94.7%	17.5	1.8	B	295
	Right Turn							
	Subtotal	1,070	1,016	94.9%	20.9	1.9	C	387
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	491	98.7%	71.2	15.4	E	640
	Through							
	Right Turn	154	149	96.8%	42.5	15.3	D	116
	Subtotal	651	640	98.2%	64.1	15.1	E	756
Total		3,007	2,905	96.6%	24.8	3.8	C	1358

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	63	90.1%	98.7	82.1	F	114
	Through	1,205	1,175	97.5%	4.7	1.5	A	100
	Right Turn	56	51	91.8%	3.4	2.2	A	3
	Subtotal	1,331	1,290	96.9%	8.8	4.4	A	218
SB	Left Turn	18	19	104.4%	45.3	24.3	D	16
	Through	1,390	1,334	96.0%	8.1	1.9	A	199
	Right Turn	60	59	99.0%	6.9	1.0	A	8
	Subtotal	1,468	1,412	96.2%	8.6	2.0	A	222
EB	Left Turn	59	59	99.7%	77.7	34.3	E	84
	Through	23	25	109.1%	83.2	35.2	F	38
	Right Turn	61	57	93.0%	82.2	31.8	F	85
	Subtotal	143	141	98.3%	79.9	32.2	E	207
WB	Left Turn	56	51	90.4%	74.5	27.1	E	69
	Through	24	27	111.7%	58.2	15.6	E	29
	Right Turn	22	19	87.7%	25.5	9.3	C	9
	Subtotal	102	97	94.8%	60.1	18.1	E	107
Total		3,044	2,939	96.6%	13.6	2.7	B	754

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	250	91.6%	136.7	58.3	F	627
	Through	1,001	971	97.0%	52.4	36.5	D	932
	Right Turn	57	56	97.9%	40.2	36.2	D	41
	Subtotal	1,331	1,277	96.0%	66.8	40.2	E	1601
SB	Left Turn	10	10	95.0%	34.4	30.9	C	6
	Through	1,067	1,015	95.1%	25.1	7.0	C	468
	Right Turn	430	412	95.8%	16.2	4.6	B	122
	Subtotal	1,507	1,436	95.3%	22.7	6.1	C	596
EB	Left Turn	324	316	97.6%	57.3	10.2	E	332
	Through	48	49	101.9%	58.9	14.4	E	53
	Right Turn	379	366	96.5%	63.8	20.6	E	427
	Subtotal	751	731	97.3%	61.0	11.7	E	812
WB	Left Turn	61	61	99.3%	49.8	9.8	D	55
	Through	36	36	100.8%	46.0	7.3	D	31
	Right Turn	6	6	91.7%	9.3	11.1	A	1
	Subtotal	103	102	99.4%	46.8	7.0	D	87
Total		3,692	3,547	96.1%	46.4	15.0	D	3096

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,259	99.3%	2.9	0.8	A	68
	Right Turn	52	51	98.8%	3.1	1.3	A	3
	Subtotal	1,320	1,311	99.3%	2.9	0.8	A	71
SB	Left Turn	92	87	94.9%	37.1	9.4	D	59
	Through	1,360	1,291	94.9%	13.2	6.2	B	312
	Right Turn							
	Subtotal	1,452	1,379	94.9%	14.7	6.6	B	371
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	118	101.0%	55.5	9.3	E	120
	Through							
	Right Turn	157	154	98.1%	9.3	3.5	A	26
	Subtotal	274	272	99.3%	30.0	7.3	C	146
Total		3,046	2,961	97.2%	11.2	3.4	B	588

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	155	96.8%	56.5	10.6	E	160
	Through	908	904	99.6%	35.7	3.8	D	591
	Right Turn	137	134	98.1%	23.9	6.2	C	59
	Subtotal	1,205	1,193	99.0%	37.3	4.8	D	810
SB	Left Turn	218	226	103.7%	54.6	7.5	D	226
	Through	1,080	1,013	93.8%	22.4	5.7	C	416
	Right Turn	179	165	92.2%	14.0	4.5	B	42
	Subtotal	1,477	1,404	95.1%	26.7	4.7	C	685
EB	Left Turn	158	160	101.3%	65.0	12.9	E	191
	Through	396	396	99.9%	40.2	2.6	D	292
	Right Turn	159	157	98.8%	20.8	5.4	C	60
	Subtotal	713	713	100.0%	41.5	4.8	D	543
WB	Left Turn	196	195	99.6%	89.8	15.6	F	321
	Through	637	625	98.1%	78.7	12.3	E	902
	Right Turn	254	243	95.6%	80.6	16.3	F	359
	Subtotal	1,087	1,063	97.8%	81.3	13.3	F	1582
Total		4,482	4,373	97.6%	46.1	3.9	D	3620

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	152	97.8%	46.8	15.9	D	130
	Through	107	101	94.7%	27.4	8.8	C	51
	Right Turn	87	86	99.3%	23.2	9.8	C	37
	Subtotal	349	339	97.2%	35.0	12.2	D	218
SB	Left Turn	73	74	101.1%	20.9	5.5	C	28
	Through	101	99	98.0%	17.2	3.2	B	31
	Right Turn	51	57	112.4%	18.8	3.8	B	20
	Subtotal	225	230	102.3%	18.8	2.7	B	79
EB	Left Turn	61	61	99.3%	17.3	5.0	B	19
	Through	508	504	99.1%	9.0	1.0	A	83
	Right Turn	96	98	101.6%	9.9	2.0	A	18
	Subtotal	665	662	99.5%	9.9	1.1	A	120
WB	Left Turn	89	89	99.9%	28.7	8.5	C	47
	Through	491	463	94.2%	9.2	1.2	A	78
	Right Turn	77	69	89.2%	9.4	2.2	A	12
	Subtotal	657	620	94.4%	11.8	1.6	B	136
Total		1,896	1,851	97.6%	16.6	2.3	B	553

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	3.1	6.8	A	0
	Through	26	23	89.2%	24.5	7.7	C	10
	Right Turn	35	34	98.3%	7.8	2.8	A	5
	Subtotal	63	60	94.4%	13.7	3.9	B	15
SB	Left Turn	36	36	100.0%	23.5	4.4	C	16
	Through	22	23	104.1%	22.9	10.3	C	10
	Right Turn	74	76	103.2%	14.5	5.7	B	20
	Subtotal	132	135	102.5%	18.6	3.4	B	45
EB	Left Turn	47	46	98.3%	20.3	13.5	C	17
	Through	531	527	99.2%	6.1	1.1	A	59
	Right Turn	6	6	105.0%	9.5	9.0	A	1
	Subtotal	584	579	99.2%	7.5	2.0	A	77
WB	Left Turn	39	41	105.4%	6.0	2.2	A	5
	Through	622	583	93.7%	7.3	4.8	A	78
	Right Turn	47	52	110.2%	11.9	9.2	B	11
	Subtotal	708	676	95.4%	7.5	4.7	A	94
Total		1,487	1,450	97.5%	9.0	3.1	A	232

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	133	98.0%	33.9	2.9	C	83
	Through	577	572	99.2%	21.8	3.5	C	229
	Right Turn	129	125	97.2%	19.9	6.7	B	46
	Subtotal	842	831	98.7%	23.4	3.4	C	357
SB	Left Turn	106	107	101.1%	42.8	12.5	D	84
	Through	768	765	99.6%	30.7	5.7	C	431
	Right Turn	84	81	96.5%	29.8	5.3	C	44
	Subtotal	958	953	99.5%	32.1	5.9	C	559
EB	Left Turn	162	157	96.9%	77.3	39.3	E	222
	Through	305	305	99.9%	58.0	31.2	E	324
	Right Turn	121	120	99.2%	37.6	30.8	D	83
	Subtotal	588	582	98.9%	59.7	33.5	E	629
WB	Left Turn	178	164	92.2%	45.1	17.3	D	136
	Through	319	303	95.1%	39.0	10.7	D	217
	Right Turn	77	71	92.6%	8.9	2.7	A	12
	Subtotal	574	539	93.9%	36.7	6.6	D	364
Total		2,962	2,905	98.1%	35.5	7.3	D	1910

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	90.0%	1.6	2.1	A	0
	Through	322	329	102.1%	0.5	0.1	A	3
	Right Turn	83	83	99.8%	1.0	0.2	A	1
	Subtotal	407	413	101.5%	0.6	0.1	A	5
SB	Left Turn	73	75	102.6%	4.5	1.3	A	6
	Through	537	540	100.5%	0.5	0.1	A	5
	Right Turn	7	6	84.3%	0.6	0.5	A	0
	Subtotal	617	621	100.6%	1.1	0.3	A	12
EB	Left Turn	2	2	120.0%	7.4	11.7	A	0
	Through							
	Right Turn	3	4	130.0%	2.6	2.7	A	0
	Subtotal	5	6	126.0%	7.1	10.1	A	1
WB	Left Turn	69	67	96.4%	29.6	7.2	D	36
	Through	5	6	122.0%	14.8	14.1	B	2
	Right Turn	67	64	96.1%	10.3	3.5	B	12
	Subtotal	141	137	97.2%	20.5	5.7	C	50
Total		1,170	1,177	100.6%	3.3	0.9	A	67

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	3	3	100.0%	2.4	3.9	0.1
	Right Turn	5	5	98.0%	0.4	1.0	0.0
	Subtotal	8	8	98.8%	1.4	1.8	0.2
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	5	90.0%	40.9	32.1	4.1
	Through						
	Right Turn	7	7	95.7%	25.5	29.9	3.0
	Subtotal	13	12	93.1%	33.8	17.3	7.1
Total		23	20	87.0%	19.0	12.6	7.2

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	2	200.0%	86.9	152.4	1.4
	Through	7	6	85.7%	1.7	3.6	0.2
	Right Turn	3	1	26.7%	0.0	0.0	0.0
	Subtotal	11	9	80.0%	50.9	66.1	1.6
SB	Left Turn						
	Through	5	3	62.0%	1.0	2.2	0.1
	Right Turn	2	2	120.0%	1.3	2.1	0.0
	Subtotal	7	6	78.6%	1.6	2.1	0.1
EB	Left Turn	1	1	110.0%	25.0	43.4	0.4
	Through	36	35	98.3%	36.3	12.1	21.8
	Right Turn						
	Subtotal	37	37	98.6%	37.7	11.6	22.2
WB	Left Turn	2	2	110.0%	36.7	50.6	1.2
	Through	119	116	97.7%	42.1	10.0	83.4
	Right Turn						
	Subtotal	121	119	97.9%	42.5	10.4	84.6
Total		176	169	96.2%	40.28	7.3	108.61

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	2	1	65.0%	12.3	26.6	0
	Through	9	6	66.7%	6.4	11.7	1.0
	Right Turn	5	4	74.0%	0.4	0.9	0.0
	Subtotal	16	11	68.8%	8.5	12.2	1.4
SB	Left Turn	1	1	90.0%	5.9	18.7	0.1
	Through	3	2	56.7%	0.0	0.0	0.0
	Right Turn	3	3	86.7%	0.6	0.9	0.0
	Subtotal	7	5	74.3%	4.4	12.5	0.1
EB	Left Turn	1	1	80.0%	6.1	19.2	0.1
	Through	12	11	95.0%	51.5	25.1	10.3
	Right Turn	1	1	110.0%	16.5	36.8	0.3
	Subtotal	14	13	95.0%	51.9	26.7	10.7
WB	Left Turn	3	2	76.7%	11.6	25.7	0.6
	Through	102	102	99.7%	43.6	8.6	74.2
	Right Turn	1	1	110.0%	0.1	0.2	0.0
	Subtotal	106	105	99.2%	42.9	8.7	74.7
Total		143	135	94.1%	38.7	6.0	86.9

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	9	6	66.7%	6.4	11.7	1.0
	Right Turn						
	Subtotal	9	6	66.7%	6.4	11.7	1.0
SB	Left Turn						
	Through	7	5	74.3%	9.2	10.8	1.1
	Right Turn						
	Subtotal	7	5	74.3%	9.2	10.8	1.1
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	91.3%	35.5	20.9	4.7
	Through						
	Right Turn	7	6	82.9%	8.8	8.0	1.0
	Subtotal	15	13	87.3%	29.2	11.7	5.8
Total		31	24	78.4%	19.2	7.5	7.8

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	0	0.0%	0.0	0.0	0
	Through	25	21	84.0%	30.3	13.3	12.6
	Right Turn	1	1	140.0%	1.1	1.8	0.0
	Subtotal	27	22	83.0%	28.3	13.1	12.6
SB	Left Turn						
	Through	15	12	81.3%	18.0	12.1	4.5
	Right Turn						
	Subtotal	15	12	81.3%	18.0	12.1	4.5
EB	Left Turn	9	7	76.7%	73.3	33.1	11.0
	Through	2	2	90.0%	13.0	23.0	0.4
	Right Turn						
	Subtotal	11	9	79.1%	72.0	33.4	11.4
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	43	81.7%	32.7	10.7	28.6

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	3	3	83.3%	15.3	21.9	1
	Through	9	9	101.1%	14.8	9.7	2.2
	Right Turn	4	3	82.5%	4.6	8.0	0.3
	Subtotal	16	15	93.1%	16.6	9.8	3.3
SB	Left Turn	5	6	110.0%	18.2	13.7	1.5
	Through	8	7	83.8%	18.9	11.5	2.5
	Right Turn	1	1	70.0%	0.7	1.5	0.0
	Subtotal	14	13	92.1%	19.3	5.0	4.0
EB	Left Turn	1	1	100.0%	8.7	17.8	0.1
	Through	29	29	100.3%	15.6	3.5	7.5
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	31	31	100.3%	16.0	3.1	7.7
WB	Left Turn	10	12	121.0%	27.5	10.3	4.6
	Through	88	85	96.7%	10.7	4.6	15.7
	Right Turn	15	15	100.0%	4.4	3.4	1.1
	Subtotal	113	112	99.3%	11.5	4.0	21.3
Total		174	171	98.3%	13.7	2.8	36.4

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	2	2	95.0%	0.1	0.2	0.0
	Right Turn	2	2	105.0%	0.8	1.7	0.0
	Subtotal	4	4	100.0%	0.7	1.4	0.0
SB	Left Turn	3	3	100.0%	27.6	20.2	1.4
	Through	12	13	105.0%	23.1	17.1	4.6
	Right Turn	11	12	104.5%	2.1	3.7	0.4
	Subtotal	26	27	104.2%	18.3	8.1	6.4
EB	Left Turn	1	1	70.0%	0.8	1.8	0.0
	Through	38	37	98.4%	9.8	5.5	6.2
	Right Turn						
	Subtotal	39	38	97.7%	9.8	5.5	6.3
WB	Left Turn						
	Through	69	67	97.2%	6.4	3.0	7.4
	Right Turn	4	3	80.0%	0.6	1.0	0.0
	Subtotal	73	70	96.3%	6.2	2.8	7.4
Total		142	140	98.2%	9.1	2.4	20.1

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	70.0%	0.0	0.0	0
	Through	2	1	55.0%	2.6	7.8	0.1
	Right Turn	2	1	65.0%	9.9	18.6	0.3
	Subtotal	5	3	62.0%	10.2	15.7	0.4
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	47	45	96.0%	30.8	10.1	24.1
	Right Turn						
	Subtotal	47	45	96.0%	30.8	10.1	24.1
WB	Left Turn						
	Through	47	47	100.0%	44.2	10.0	34.6
	Right Turn	1	1	130.0%	3.3	7.0	0.1
	Subtotal	48	48	100.6%	43.6	10.2	34.7
Total		100	97	96.5%	37.2	6.9	59.2

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	44	44	100.5%	0.6	1.3	0.4
	Right Turn	4	4	102.5%	0.0	0.0	0.0
	Subtotal	48	48	100.6%	0.6	1.3	0.4
SB	Left Turn						
	Through	29	26	87.9%	0.2	0.5	0.1
	Right Turn						
	Subtotal	29	26	87.9%	0.2	0.5	0.1
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	6	63.3%	4.9	5.0	0.7
	Through						
	Right Turn	3	3	103.3%	2.9	4.0	0.1
	Subtotal	12	9	73.3%	5.4	3.1	0.9
Total		89	83	92.8%	1.2	0.9	1.4

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	11	10	90.9%	66.9	35.2	
	Subtotal	11	10	90.9%	66.9	35.2	
SB	Left Turn	1	1	140.0%	18.0	28.3	
	Through						
	Right Turn						
	Subtotal	1	1	140.0%	18.0	28.3	
EB	Left Turn	13	14	105.4%	54.0	21.9	
	Through						
	Right Turn						
	Subtotal	13	14	105.4%	54.0	21.9	
WB	Left Turn						
	Through						
	Right Turn	39	38	97.2%	57.1	12.3	
	Subtotal	39	38	97.2%	57.1	12.3	
Total		64	63	98.4%	58.5	7.7	61.4

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	70.0%	6.4	17.1	
	East Side	14	15	107.9%	61.7	29.1	
	Subtotal	15	16	105.3%	62.8	26.7	
SB	East Side	1	1	100.0%	8.8	27.7	
	West Side	9	10	106.7%	65.5	30.2	
	Subtotal	10	11	106.0%	65.8	30.3	
EB	North Side	24	24	100.0%	57.7	17.1	
	South Side	15	15	102.0%	47.5	21.1	
	Subtotal	39	39	100.8%	54.3	12.8	
WB	South Side	31	31	100.6%	53.6	16.2	
	North Side	62	58	93.1%	57.6	12.7	
	Subtotal	93	89	95.6%	57.3	6.4	
Total		157	155	98.5%	58.6	6.6	151.1

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	5	5	106.0%	38.0	36.5	
	East Side	3	4	120.0%	35.6	39.8	
	Subtotal	8	9	111.3%	50.3	35.6	
SB	East Side	4	4	95.0%	25.2	42.3	
	West Side	4	4	105.0%	41.8	28.1	
	Subtotal	8	8	100.0%	56.7	31.4	
EB	North Side	20	21	104.0%	61.9	9.7	
	South Side	14	13	90.7%	68.3	21.4	
	Subtotal	34	34	98.5%	63.9	12.4	
WB	South Side	68	69	101.5%	54.5	6.6	
	North Side	44	43	97.0%	59.2	7.2	
	Subtotal	112	112	99.7%	56.1	5.6	
Total		162	162	100.1%	57.2	6.3	154.6

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	6	7	113.3%	26.4	35.5	
	Subtotal	6	7	113.3%	26.4	35.5	
SB	East Side	9	10	106.7%	60.2	21.1	
	West Side						
	Subtotal	9	10	106.7%	60.2	21.1	
EB	North Side	5	4	84.0%	30.2	40.7	
	South Side						
	Subtotal	5	4	84.0%	30.2	40.7	
WB	South Side						
	North Side	5	5	94.0%	42.6	27.2	
	Subtotal	5	5	94.0%	42.6	27.2	
Total		25	25	101.2%	43.7	13.8	18.4

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	8	8	101.3%	43.0	27.2	
	East Side	8	9	106.3%	108.5	158.8	
	Subtotal	16	17	103.8%	85.5	69.9	
SB	East Side	21	22	105.7%	50.3	13.6	
	West Side	10	11	110.0%	58.2	26.5	
	Subtotal	31	33	107.1%	56.9	13.0	
EB	North Side	3	3	103.3%	31.0	37.9	
	South Side	6	6	103.3%	40.5	37.3	
	Subtotal	9	9	103.3%	56.5	25.3	
WB	South Side	7	7	92.9%	138.6	245.0	
	North Side	8	9	106.3%	54.9	53.1	
	Subtotal	15	15	100.0%	79.8	38.3	
Total		71	74	104.4%	67.3	19.2	83.1

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	6	6	95.0%	0.0	0.0	
	East Side	2	2	95.0%	0.8	1.7	
	Subtotal	8	8	95.0%	0.2	0.4	
SB	East Side	1	2	160.0%	5.7	9.1	
	West Side	6	6	95.0%	0.0	0.0	
	Subtotal	7	7	104.3%	2.3	3.5	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		15	15	99.3%	1.3	1.9	0.3

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	32	32	100.3%	45.8	24.0	
	East Side	19	20	106.8%	26.8	8.4	
	Subtotal	51	52	102.7%	37.9	13.7	
SB	East Side	42	42	101.0%	38.1	23.1	
	West Side	19	18	93.2%	26.6	7.2	
	Subtotal	61	60	98.5%	35.0	16.0	
EB	North Side	35	35	99.7%	30.1	5.8	
	South Side	37	38	103.5%	23.2	8.0	
	Subtotal	72	73	101.7%	26.9	5.6	
WB	South Side	32	35	108.1%	26.7	4.7	
	North Side	35	35	99.7%	30.1	5.8	
	Subtotal	55	59	107.1%	26.8	4.3	
Total		239	245	102.3%	31.2	3.5	127.2

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	90.0%	5.8	17.5	
	East Side	2	2	120.0%	8.3	13.7	
	Subtotal	3	3	110.0%	9.0	16.6	
SB	East Side	7	7	98.6%	28.1	19.4	
	West Side	1	1	50.0%	6.6	15.8	
	Subtotal	8	7	92.5%	28.2	19.5	
EB	North Side	6	6	103.3%	15.3	15.5	
	South Side	8	8	102.5%	16.3	14.4	
	Subtotal	14	14	102.9%	19.2	10.6	
WB	South Side	6	5	90.0%	13.9	9.5	
	North Side	9	10	110.0%	17.3	13.7	
	Subtotal	15	15	102.0%	17.3	6.5	
Total		40	40	101.0%	20.8	6.1	14.0

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side East Side	1	1	60.0%	5.2	11.1	
	Subtotal	1	1	60.0%	5.2	11.1	
SB	East Side West Side	3	3	100.0%	24.3	21.1	
	Subtotal	3	3	100.0%	24.3	21.1	
EB	North Side South Side						
	Subtotal						
WB	South Side North Side						
	Subtotal						
Total		4	4	90.0%	24.0	15.3	1.4

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side	7	7	98.6%	24.5	27.3	
	East Side	4	5	117.5%	40.2	82.5	
	Subtotal	11	12	105.5%	37.1	58.1	
SB	East Side	3	3	83.3%	20.5	33.5	
	West Side	9	9	104.4%	53.2	46.8	
	Subtotal	12	12	99.2%	63.5	39.5	
EB	North Side	5	4	80.0%	29.3	31.9	
	South Side	8	10	123.8%	37.6	18.5	
	Subtotal	13	14	106.9%	39.9	16.6	
WB	South Side	7	7	97.1%	48.2	20.4	
	North Side	7	7	105.7%	32.8	26.7	
	Subtotal	14	14	101.4%	44.7	13.0	
Total		50	52	103.2%	49.4	22.1	42.5

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	3	2	66.7%	0.0	0.0	
	East Side	2	2	85.0%	0.0	0.0	
	Subtotal	5	4	74.0%	0.0	0.0	
SB	East Side	2	2	110.0%	0.0	0.0	
	West Side	1	1	100.0%	0.0	0.0	
	Subtotal	3	3	106.7%	0.0	0.0	
EB	North Side	2	2	95.0%	2.3	5.2	
	South Side	1	1	120.0%	0.5	1.7	
	Subtotal	3	3	103.3%	2.9	5.2	
WB	South Side						
	North Side	1	1	100.0%	1.6	4.9	
	Subtotal	1	1	100.0%	1.6	4.9	
Total		12	11	91.7%	1.2	2.1	0.2

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	19	2	100.0%	0.0	0.0	0.0
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	98.3	43.0	29.9
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	98.3	43.0	29.9
Total		4	92	4	100.0%	65.5	28.7	29.9

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	0.0	0.0	0.0
	Right Turn	3	62	3	100.0%	3.5	5.3	0.9
	Subtotal	5	80	5	100.0%	3.5	5.3	0.9
SB	Left Turn							
	Through	2	73	2	100.0%	11.6	7.7	3.5
	Right Turn							
	Subtotal	2	73	2	100.0%	11.6	7.7	3.5
EB	Left Turn							
	Through	6	211	6	100.0%	106.7	39.5	93.8
	Right Turn							
	Subtotal	6	211	6	100.0%	106.7	39.5	93.8
WB	Left Turn	2	90	2	100.0%	126.6	48.8	47.5
	Through	8	795	8	100.0%	58.1	24.8	192.5
	Right Turn							
	Subtotal	10	885	10	100.0%	80.9	28.1	240.0
Total		23	1,249	23	100.0%	60.8	15.2	338.2

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	64.4	15.0	4.8
	Right Turn							
	Subtotal	2	18	2	100.0%	64.4	15.0	4.8
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn	2	90	2	100.0%	0.0	0.0	0.0
	Subtotal	4	163	4	100.0%	0.0	0.0	0.0
EB	Left Turn	3	62	3	100.0%	58.6	17.5	15.1
	Through							
	Right Turn							
	Subtotal	3	62	3	100.0%	58.6	17.5	15.1
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		9	243	9	100.0%	41.0	9.9	20.0

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	124	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	75	2	100.0%	15.7	14.9	4.9
	Right Turn							
	Subtotal	2	75	2	100.0%	15.7	14.9	4.9
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	199	4	100.0%	10.5	9.9	4.9

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	26	2	100.0%	19.6	8.3	2.1
	Right Turn							
	Subtotal	2	26	2	100.0%	19.6	8.3	2.1
SB	Left Turn							
	Through	2	75	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	75	2	100.0%	0.0	0.0	0.0
EB	Left Turn	2	99	2	100.0%	57.5	6.2	23.7
	Through							
	Right Turn							
	Subtotal		99					23.7
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	200	4	100.0%	13.1	5.6	25.8

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	365	6	100.0%	77.2	16.7	117.4
	Subtotal	6	365	6	100.0%	77.2	16.7	117.4
EB	Left Turn							
	Through	3	71	3	100.0%	30.1	14.3	8.9
	Right Turn							
	Subtotal	3	71	3	100.0%	30.1	14.3	8.9
WB	Left Turn							
	Through	2	90	2	100.0%	14.9	6.3	5.6
	Right Turn							
	Subtotal	2	90	2	100.0%	14.9	6.3	5.6
Total		11	526	11	100.0%	50.1	7.5	131.9

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	2	199	2	100.0%	45.7	13.1	37.9
	Subtotal	2	199	2	100.0%	45.7	13.1	37.9
EB	Left Turn							
	Through	3	74	3	100.0%	18.0	20.1	5.6
	Right Turn							
	Subtotal	3	74	3	100.0%	18.0	20.1	5.6
WB	Left Turn							
	Through	2	88	2	90.0%	18.4	14.9	6.7
	Right Turn	6	316	6	98.3%	15.0	4.6	19.8
	Subtotal	8	404	8	96.3%	16.9	6.8	26.5
Total		13	677	13	97.7%	24.1	4.7	69.9

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through		14	1	100.0%	21.8	3.5	1.3
	Right Turn							
	Subtotal		14					1.3
SB	Left Turn							
	Through		13	1	100.0%	30.7	5.7	1.7
	Right Turn							
	Subtotal		13					1.7
EB	Left Turn							
	Through	4	71	4	87.5%	83.4	30.8	24.7
	Right Turn							
	Subtotal	4	71	4	87.5%	83.4	30.8	24.7
WB	Left Turn							
	Through	4	261	4	100.0%	70.4	43.3	76.6
	Right Turn							
	Subtotal	4	261	4	100.0%	70.4	43.3	76.6
Total		8	359	8	93.8%	79.7	29.0	104.2

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	59	2	100.0%	2.5	0.8	0.6
	Subtotal	2	59	2	100.0%	2.5	0.8	0.6
SB	Left Turn	2	6	2	100.0%	0.0	0.0	0.0
	Through							
	Right Turn							
	Subtotal	2	6	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	55	2	95.0%	63.2	8.5	14.5
	Through							
	Right Turn	2	7	2	100.0%	0.0	0.0	0.0
	Subtotal	4	62	4	97.5%	63.2	8.5	14.5
Total		8	127	8	98.8%	26.3	3.5	15.1

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	834	97.2%	8.0	2.2	A	123
	Right Turn	428	418	97.7%	10.2	2.1	B	78
	Subtotal	1,286	1,253	97.4%	8.8	2.0	A	201
SB	Left Turn	99	93	94.0%	49.6	7.3	D	85
	Through	971	921	94.8%	18.2	2.4	B	307
	Right Turn							
	Subtotal	1,070	1,014	94.7%	21.0	2.5	C	392
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	489	98.4%	76.5	19.8	E	686
	Through							
	Right Turn	154	150	97.5%	48.7	27.0	D	134
	Subtotal	651	639	98.2%	69.5	21.3	E	820
Total		3,007	2,905	96.6%	26.2	5.8	C	1413

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	64	91.9%	104.8	78.1	F	124
	Through	1,205	1,172	97.3%	4.6	1.1	A	98
	Right Turn	56	50	89.8%	3.6	1.9	A	3
	Subtotal	1,331	1,287	96.7%	9.3	4.3	A	225
SB	Left Turn	18	19	107.8%	50.5	24.5	D	18
	Through	1,390	1,333	95.9%	9.6	3.2	A	235
	Right Turn	60	59	98.8%	8.4	2.2	A	9
	Subtotal	1,468	1,411	96.1%	10.2	3.1	B	262
EB	Left Turn	59	58	98.5%	75.4	16.5	E	80
	Through	23	32	139.1%	82.3	15.1	F	48
	Right Turn	61	56	91.3%	73.0	8.9	E	75
	Subtotal	143	146	102.0%	75.1	10.2	E	203
WB	Left Turn	56	49	87.3%	67.4	23.7	E	60
	Through	24	31	127.5%	67.2	24.0	E	38
	Right Turn	22	20	91.4%	24.4	16.1	C	9
	Subtotal	102	100	97.6%	57.5	19.4	E	107
Total		3,044	2,944	96.7%	14.4	2.9	B	798

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	249	91.1%	117.4	38.9	F	535
	Through	1,001	974	97.3%	45.8	24.8	D	818
	Right Turn	57	55	96.3%	39.1	21.1	D	39
	Subtotal	1,331	1,278	96.0%	60.3	27.5	E	1393
SB	Left Turn	10	10	97.0%	46.5	18.8	D	8
	Through	1,067	1,008	94.4%	22.0	4.6	C	407
	Right Turn	430	411	95.5%	13.5	3.1	B	102
	Subtotal	1,507	1,428	94.8%	19.8	4.0	B	517
EB	Left Turn	324	310	95.7%	67.0	16.8	E	381
	Through	48	49	102.9%	67.3	15.4	E	61
	Right Turn	379	363	95.8%	64.3	17.5	E	428
	Subtotal	751	723	96.2%	66.0	12.2	E	869
WB	Left Turn	61	61	99.8%	49.7	5.6	D	56
	Through	36	36	100.0%	54.7	7.4	D	36
	Right Turn	6	6	98.3%	19.4	14.6	B	2
	Subtotal	103	103	99.8%	49.4	5.2	D	94
Total		3,692	3,531	95.7%	45.6	12.6	D	2874

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **TSM Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,255	99.0%	2.8	0.5	A	63
	Right Turn	52	57	109.0%	2.5	1.3	A	3
	Subtotal	1,320	1,312	99.4%	2.8	0.5	A	66
SB	Left Turn	92	85	92.1%	36.2	7.9	D	56
	Through	1,360	1,286	94.6%	11.1	2.8	B	261
	Right Turn							
	Subtotal	1,452	1,371	94.4%	12.7	2.9	B	317
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	120	102.6%	52.5	8.9	D	116
	Through							
	Right Turn	157	154	98.2%	9.7	3.1	A	27
	Subtotal	274	274	100.0%	29.5	6.1	C	143
Total		3,046	2,957	97.1%	10.1	1.6	B	526

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	154	95.9%	55.1	9.5	E	155
	Through	908	910	100.2%	34.1	2.9	C	569
	Right Turn	137	131	95.5%	24.1	4.2	C	58
	Subtotal	1,205	1,194	99.1%	35.7	3.7	D	782
SB	Left Turn	218	225	103.2%	58.5	12.7	E	241
	Through	1,080	1,006	93.1%	19.1	4.0	B	352
	Right Turn	179	169	94.4%	11.0	2.1	B	34
	Subtotal	1,477	1,399	94.7%	24.5	4.9	C	628
EB	Left Turn	158	155	97.9%	70.0	18.0	E	199
	Through	396	395	99.7%	39.3	4.8	D	285
	Right Turn	159	162	101.8%	20.5	5.0	C	61
	Subtotal	713	712	99.8%	42.5	6.8	D	544
WB	Left Turn	196	192	97.8%	94.1	13.9	F	331
	Through	637	624	98.0%	84.7	20.6	F	970
	Right Turn	254	245	96.3%	89.7	21.8	F	402
	Subtotal	1,087	1,061	97.6%	87.6	19.3	F	1702
Total		4,482	4,366	97.4%	46.7	6.9	D	3656

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	153	98.7%	48.6	17.9	D	136
	Through	107	102	95.7%	31.4	8.8	C	59
	Right Turn	87	88	100.6%	23.6	10.4	C	38
	Subtotal	349	343	98.3%	37.3	13.6	D	233
SB	Left Turn	73	70	95.9%	22.1	5.6	C	28
	Through	101	96	94.8%	17.6	3.0	B	31
	Right Turn	51	53	103.9%	19.5	3.8	B	19
	Subtotal	225	219	97.2%	19.4	2.5	B	78
EB	Left Turn	61	60	98.7%	18.1	4.7	B	20
	Through	508	500	98.3%	8.4	1.2	A	77
	Right Turn	96	95	99.1%	9.5	1.9	A	17
	Subtotal	665	655	98.5%	9.5	1.5	A	113
WB	Left Turn	89	84	94.3%	24.7	6.7	C	38
	Through	491	458	93.4%	8.8	0.9	A	74
	Right Turn	77	71	91.7%	10.0	1.8	A	13
	Subtotal	657	613	93.3%	10.9	1.4	B	125
Total		1,896	1,829	96.5%	16.9	2.4	B	549

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **TSM Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	115.0%	17.2	17.7	B	1
	Through	26	24	92.3%	24.4	5.6	C	11
	Right Turn	35	34	97.1%	7.0	3.4	A	4
	Subtotal	63	60	95.7%	14.9	4.5	B	16
SB	Left Turn	36	36	98.9%	29.4	6.5	C	19
	Through	22	24	106.8%	27.9	7.7	C	12
	Right Turn	74	78	105.5%	18.2	8.9	B	26
	Subtotal	132	137	103.9%	22.6	4.9	C	57
EB	Left Turn	47	53	112.3%	19.6	5.8	B	19
	Through	531	518	97.6%	5.2	1.5	A	50
	Right Turn	6	6	93.3%	3.0	3.5	A	0
	Subtotal	584	577	98.7%	6.6	1.6	A	69
WB	Left Turn	39	40	101.8%	12.3	4.1	B	9
	Through	622	584	93.8%	9.8	4.2	A	105
	Right Turn	47	49	104.0%	10.8	5.5	B	10
	Subtotal	708	672	94.9%	10.1	4.0	B	123
Total		1,487	1,446	97.3%	9.9	2.9	A	265

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	131	96.6%	32.9	5.8	C	79
	Through	577	576	99.9%	23.1	2.7	C	244
	Right Turn	129	128	99.1%	20.5	6.2	C	48
	Subtotal	842	835	99.2%	24.1	2.7	C	371
SB	Left Turn	106	106	99.8%	43.5	11.7	D	84
	Through	768	756	98.4%	30.9	5.3	C	428
	Right Turn	84	84	99.5%	28.5	6.9	C	44
	Subtotal	958	945	98.6%	32.2	5.4	C	556
EB	Left Turn	162	159	98.3%	82.4	62.6	F	241
	Through	305	305	99.8%	60.5	47.5	E	338
	Right Turn	121	120	98.8%	40.8	46.3	D	89
	Subtotal	588	583	99.2%	63.1	53.4	E	668
WB	Left Turn	178	165	92.7%	49.3	20.3	D	149
	Through	319	308	96.4%	45.0	9.7	D	254
	Right Turn	77	71	91.6%	12.3	5.5	B	16
	Subtotal	574	543	94.6%	42.0	11.9	D	419
Total		2,962	2,907	98.1%	37.1	9.5	D	2014

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	80.0%	1.9	3.1	A	0
	Through	322	329	102.1%	0.5	0.1	A	3
	Right Turn	83	84	101.2%	1.0	0.2	A	1
	Subtotal	407	415	101.8%	0.6	0.1	A	5
SB	Left Turn	73	72	97.9%	4.6	0.9	A	6
	Through	537	531	99.0%	0.5	0.1	A	5
	Right Turn	7	5	64.3%	0.6	0.4	A	0
	Subtotal	617	607	98.4%	1.0	0.3	A	11
EB	Left Turn	2	2	115.0%	5.3	9.9	A	0
	Through							
	Right Turn	3	4	133.3%	6.9	8.6	A	1
	Subtotal	5	6	126.0%	7.9	9.1	A	1
WB	Left Turn	69	63	91.0%	28.6	10.5	D	33
	Through	5	5	96.0%	10.9	15.8	B	1
	Right Turn	67	67	100.1%	17.7	2.8	C	22
	Subtotal	141	135	95.5%	23.1	6.0	C	56
Total		1,170	1,163	99.4%	3.6	1.0	A	72

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	3	3	83.3%	13.3	15.1	0.7
	Right Turn	5	5	98.0%	1.3	2.2	0.1
	Subtotal	8	7	92.5%	6.4	6.7	0.8
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	6	91.7%	43.7	29.6	4.4
	Through						
	Right Turn	7	6	90.0%	23.8	21.2	2.8
	Subtotal	13	12	90.8%	41.6	24.2	7.1
Total		23	19	83.5%	24.4	14.5	7.9

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	2	230.0%	45.7	86.5	0.8
	Through	7	6	81.4%	4.2	7.5	0.5
	Right Turn	3	1	20.0%	3.0	9.4	0.1
	Subtotal	11	9	78.2%	41.5	59.7	1.4
SB	Left Turn						
	Through	5	3	64.0%	1.9	2.9	0.2
	Right Turn	2	2	115.0%	3.9	5.3	0.1
	Subtotal	7	6	78.6%	4.4	3.9	0.3
EB	Left Turn	1	1	120.0%	42.2	50.9	0.7
	Through	36	35	95.8%	38.0	11.9	22.8
	Right Turn						
	Subtotal	37	36	96.5%	40.2	13.1	23.5
WB	Left Turn	2	2	90.0%	47.6	48.3	1.6
	Through	119	116	97.7%	41.9	11.2	83.2
	Right Turn						
	Subtotal	121	118	97.6%	42.6	11.6	84.8
Total		176	168	95.4%	40.71	8.4	109.98

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	2	1	50.0%	8.9	12.2	0
	Through	9	6	63.3%	6.3	10.3	0.9
	Right Turn	5	4	86.0%	0.0	0.0	0.0
	Subtotal	16	11	68.8%	8.6	10.8	1.2
SB	Left Turn	1	1	70.0%	13.5	39.1	0.2
	Through	3	2	53.3%	0.5	1.0	0.0
	Right Turn	3	3	86.7%	1.1	3.5	0.1
	Subtotal	7	5	70.0%	14.3	38.9	0.3
EB	Left Turn	1	1	50.0%	9.4	29.8	0.2
	Through	12	12	101.7%	56.0	26.8	11.2
	Right Turn	1	1	80.0%	7.8	21.5	0.1
	Subtotal	14	14	96.4%	50.4	22.1	11.5
WB	Left Turn	3	2	60.0%	17.7	23.8	0.9
	Through	102	104	101.8%	48.7	5.6	82.9
	Right Turn	1	1	80.0%	0.1	0.4	0.0
	Subtotal	106	106	100.4%	48.3	5.4	83.8
Total		143	136	95.0%	43.5	4.1	96.8

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	9	6	63.3%	7.2	12.8	1.1
	Right Turn						
	Subtotal	9	6	63.3%	7.2	12.8	1.1
SB	Left Turn						
	Through	7	5	65.7%	3.5	6.9	0.4
	Right Turn						
	Subtotal	7	5	65.7%	3.5	6.9	0.4
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	86.3%	40.7	30.8	5.4
	Through						
	Right Turn	7	6	88.6%	11.6	11.8	1.3
	Subtotal	15	13	87.3%	32.7	14.8	6.8
Total		31	23	75.5%	20.4	8.0	8.3

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	2	150.0%	20.3	25.4	0.3
	Through	25	21	84.0%	24.7	12.1	10.3
	Right Turn	1	1	100.0%	1.1	1.8	0.0
	Subtotal	27	24	87.0%	25.3	13.5	10.6
SB	Left Turn						
	Through	15	11	74.7%	12.8	11.3	3.2
	Right Turn						
	Subtotal	15	11	74.7%	12.8	11.3	3.2
EB	Left Turn	9	8	84.4%	89.7	33.9	13.5
	Through	2	2	80.0%	6.0	18.8	0.2
	Right Turn						
	Subtotal	11	9	83.6%	87.2	36.5	13.7
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	44	82.8%	32.4	11.0	27.5

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	3	3	103.3%	22.5	20.6	1
	Through	9	9	102.2%	14.9	12.5	2.2
	Right Turn	4	4	97.5%	2.5	3.8	0.2
	Subtotal	16	16	101.3%	15.6	11.9	3.5
SB	Left Turn	5	6	116.0%	13.2	10.2	1.1
	Through	8	7	87.5%	15.2	10.5	2.0
	Right Turn	1	1	60.0%	2.5	5.4	0.0
	Subtotal	14	13	95.7%	16.8	3.8	3.2
EB	Left Turn	1	1	140.0%	8.8	15.3	0.1
	Through	29	28	97.6%	13.4	4.5	6.5
	Right Turn	1	1	100.0%	0.1	0.4	0.0
	Subtotal	31	31	99.0%	13.3	4.9	6.6
WB	Left Turn	10	12	115.0%	37.8	9.1	6.3
	Through	88	88	100.5%	9.8	3.9	14.4
	Right Turn	15	15	96.7%	6.0	6.6	1.5
	Subtotal	113	114	101.2%	12.0	3.8	22.2
Total		174	175	100.4%	13.5	2.8	35.5

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	2	2	85.0%	0.0	0.1	0.0
	Right Turn	2	2	120.0%	1.5	1.9	0.0
	Subtotal	4	4	102.5%	1.5	1.9	0.0
SB	Left Turn	3	3	83.3%	20.3	19.0	1.0
	Through	12	12	101.7%	17.8	11.0	3.6
	Right Turn	11	12	106.4%	1.5	3.1	0.3
	Subtotal	26	26	101.5%	12.3	7.2	4.8
EB	Left Turn	1	1	70.0%	0.0	0.0	0.0
	Through	38	38	101.1%	12.3	5.2	7.8
	Right Turn						
	Subtotal	39	39	100.3%	12.3	5.2	7.8
WB	Left Turn						
	Through	69	69	100.6%	10.4	4.9	11.9
	Right Turn	4	3	77.5%	9.2	17.7	0.6
	Subtotal	73	73	99.3%	10.5	4.7	12.5
Total		142	142	100.1%	11.4	3.6	25.2

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	70.0%	0.0	0.0	0
	Through	2	1	55.0%	1.9	6.1	0.1
	Right Turn	2	2	80.0%	6.1	12.5	0.2
	Subtotal	5	3	68.0%	4.2	8.1	0.3
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	47	48	101.7%	28.8	6.2	22.6
	Right Turn						
	Subtotal	47	48	101.7%	28.8	6.2	22.6
WB	Left Turn						
	Through	47	49	103.4%	39.9	7.4	31.2
	Right Turn	1	1	110.0%	8.3	15.8	0.1
	Subtotal	48	50	103.5%	39.4	7.6	31.4
Total		100	101	100.9%	32.3	5.7	54.2

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	44	44	99.1%	0.1	0.2	0.1
	Right Turn	4	4	105.0%	0.0	0.0	0.0
	Subtotal	48	48	99.6%	0.1	0.2	0.1
SB	Left Turn						
	Through	29	26	88.6%	0.0	0.0	0.0
	Right Turn						
	Subtotal	29	26	88.6%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	6	61.1%	6.3	7.5	0.9
	Through						
	Right Turn	3	3	106.7%	6.4	4.7	0.3
	Subtotal	12	9	72.5%	7.9	5.4	1.3
Total		89	82	92.4%	1.3	1.7	1.4

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	11	10	90.0%	49.7	35.7	
	Subtotal	11	10	90.0%	49.7	35.7	
SB	Left Turn	1	2	180.0%	16.8	30.9	
	Through						
	Right Turn						
	Subtotal	1	2	180.0%	16.8	30.9	
EB	Left Turn	13	12	90.8%	54.2	22.6	
	Through						
	Right Turn						
	Subtotal	13	12	90.8%	54.2	22.6	
WB	Left Turn						
	Through						
	Right Turn	39	39	100.3%	60.5	10.0	
	Subtotal	39	39	100.3%	60.5	10.0	
Total		64	63	97.8%	58.6	8.0	61.1

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	120.0%	3.0	6.4	
	East Side	14	16	110.7%	54.1	27.0	
	Subtotal	15	17	111.3%	54.2	23.2	
SB	East Side	1	1	70.0%	0.0	0.0	
	West Side	9	9	101.1%	63.1	31.3	
	Subtotal	10	10	98.0%	63.1	31.3	
EB	North Side	24	24	100.8%	59.0	17.0	
	South Side	15	15	102.7%	46.8	20.0	
	Subtotal	39	40	101.5%	54.7	12.2	
WB	South Side	31	33	107.7%	53.0	15.8	
	North Side	62	59	95.0%	58.3	12.5	
	Subtotal	93	92	99.2%	56.5	8.0	
Total		157	158	100.9%	56.9	6.9	150.1

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	5	4	80.0%	48.4	37.8	
	East Side	3	3	96.7%	31.6	42.3	
	Subtotal	8	7	86.3%	59.6	33.2	
SB	East Side	4	4	105.0%	56.7	49.1	
	West Side	4	4	105.0%	34.2	37.6	
	Subtotal	8	8	105.0%	68.0	38.6	
EB	North Side	20	21	104.0%	63.3	11.3	
	South Side	14	13	91.4%	64.6	20.0	
	Subtotal	34	34	98.8%	62.8	10.8	
WB	South Side	68	72	106.0%	56.5	6.4	
	North Side	44	45	101.4%	53.8	11.0	
	Subtotal	112	117	104.2%	55.3	6.7	
Total		162	166	102.2%	57.3	6.4	158.1

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	6	7	120.0%	32.2	30.4	
	Subtotal	6	7	120.0%	32.2	30.4	
SB	East Side	9	8	91.1%	41.4	36.2	
	West Side						
	Subtotal	9	8	91.1%	41.4	36.2	
EB	North Side	5	5	92.0%	59.5	42.6	
	South Side						
	Subtotal	5	5	92.0%	59.5	42.6	
WB	South Side						
	North Side	5	5	90.0%	41.4	28.6	
	Subtotal	5	5	90.0%	41.4	28.6	
Total		25	25	98.0%	46.0	14.0	18.8

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	8	8	97.5%	41.0	25.3	
	East Side	8	9	106.3%	86.9	37.3	
	Subtotal	16	16	101.9%	71.4	23.0	
SB	East Side	21	22	104.3%	56.6	16.8	
	West Side	10	12	115.0%	58.0	14.8	
	Subtotal	31	33	107.7%	58.6	10.7	
EB	North Side	3	3	86.7%	37.1	42.5	
	South Side	6	6	98.3%	29.3	29.0	
	Subtotal	9	9	94.4%	44.9	27.2	
WB	South Side	7	7	102.9%	85.8	66.2	
	North Side	8	7	90.0%	50.7	43.3	
	Subtotal	15	14	96.0%	95.9	53.5	
Total		71	73	102.3%	67.5	11.7	81.6

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	6	5	90.0%	0.0	0.0	
	East Side	2	1	60.0%	0.0	0.0	
	Subtotal	8	7	82.5%	0.0	0.0	
SB	East Side	1	2	190.0%	5.5	11.7	
	West Side	6	6	103.3%	0.0	0.0	
	Subtotal	7	8	115.7%	4.1	8.9	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		15	15	98.0%	1.8	3.9	0.5

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	32	31	95.3%	46.0	23.9	
	East Side	19	19	97.4%	20.1	12.8	
	Subtotal	51	49	96.1%	36.7	14.8	
SB	East Side	42	42	100.5%	34.3	23.5	
	West Side	19	19	100.0%	25.4	10.9	
	Subtotal	61	61	100.3%	32.8	16.0	
EB	North Side	35	36	103.4%	29.9	6.3	
	South Side	37	39	105.4%	24.7	4.9	
	Subtotal	72	75	104.4%	27.3	3.7	
WB	South Side	32	33	102.8%	30.3	7.0	
	North Side	35	36	103.4%	29.9	6.3	
	Subtotal	55	58	106.2%	26.5	5.0	
Total		239	244	102.0%	30.1	4.4	122.4

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	80.0%	1.2	3.0	
	East Side	2	2	95.0%	5.6	14.1	
	Subtotal	3	3	90.0%	4.2	10.4	
SB	East Side	7	8	107.1%	25.4	14.3	
	West Side	1	1	50.0%	11.7	21.2	
	Subtotal	8	8	100.0%	26.5	14.9	
EB	North Side	6	7	115.0%	16.5	14.0	
	South Side	8	8	98.8%	19.2	16.4	
	Subtotal	14	15	105.7%	19.1	11.2	
WB	South Side	6	6	93.3%	12.9	12.3	
	North Side	9	9	102.2%	23.4	17.2	
	Subtotal	15	15	98.7%	25.6	12.9	
Total		40	40	100.8%	23.9	3.5	16.1

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side East Side	1	0	40.0%	0.0	0.0	
	Subtotal	1	0	40.0%	0.0	0.0	
SB	East Side West Side	3	4	126.7%	24.2	18.4	
	Subtotal	3	4	126.7%	24.2	18.4	
EB	North Side South Side						
	Subtotal						
WB	South Side North Side						
	Subtotal						
Total		4	4	105.0%	20.7	15.6	1.5

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side	7	8	111.4%	29.4	19.2	
	East Side	4	5	115.0%	44.3	84.0	
	Subtotal	11	12	112.7%	42.0	51.5	
SB	East Side	3	2	56.7%	18.5	31.0	
	West Side	9	9	104.4%	50.4	47.7	
	Subtotal	12	11	92.5%	61.9	40.3	
EB	North Side	5	4	70.0%	41.5	35.4	
	South Side	8	11	135.0%	47.9	20.2	
	Subtotal	13	14	110.0%	49.7	20.4	
WB	South Side	7	7	102.9%	44.5	22.3	
	North Side	7	6	91.4%	38.4	30.5	
	Subtotal	14	14	97.1%	43.0	10.4	
Total		50	51	102.8%	51.1	20.3	43.8

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	3	2	70.0%	0.0	0.0	
	East Side	2	2	80.0%	0.0	0.0	
	Subtotal	5	4	74.0%	0.0	0.0	
SB	East Side	2	3	135.0%	0.0	0.0	
	West Side	1	1	50.0%	0.0	0.0	
	Subtotal	3	3	106.7%	0.0	0.0	
EB	North Side	2	1	70.0%	2.2	5.1	
	South Side	1	2	150.0%	0.5	1.7	
	Subtotal	3	3	96.7%	2.8	5.1	
WB	South Side						
	North Side	1	1	60.0%	2.8	8.5	
	Subtotal	1	1	60.0%	2.8	8.5	
Total		12	10	86.7%	1.4	2.5	0.2

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	19	2	95.0%	0.0	0.0	0.0
	Subtotal	2	19	2	95.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	88.5	32.9	26.9
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	88.5	32.9	26.9
Total		4	92	4	97.5%	59.0	21.9	26.9

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	18	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through	2	73	2	100.0%	13.7	5.5	4.2
	Right Turn							
	Subtotal	2	73	2	100.0%	13.7	5.5	4.2
EB	Left Turn							
	Through	11	211	11	99.1%	89.9	15.4	79.0
	Right Turn							
	Subtotal	11	211	11	99.1%	89.9	15.4	79.0
WB	Left Turn							
	Through	12	795	12	100.0%	90.1	26.5	298.4
	Right Turn							
	Subtotal	12	795	12	100.0%	90.1	26.5	298.4
Total		27	1,097	27	99.6%	73.0	11.1	381.6

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	78.4	37.4	5.9
	Right Turn							
	Subtotal	2	18	2	100.0%	78.4	37.4	5.9
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	73	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	91	4	100.0%	52.3	24.9	5.9

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	124	2	100.0%	0.0	0.0	0.0
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	75	2	100.0%	16.0	12.8	5.0
	Subtotal	2	75	2	100.0%	16.0	12.8	5.0
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	199	4	100.0%	10.6	8.5	5.0

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	26	2	100.0%	16.4	5.1	1.8
	Subtotal	2	26	2	100.0%	16.4	5.1	1.8
SB	Left Turn Through Right Turn	2	75	2	100.0%	0.0	0.0	0.0
	Subtotal	2	75	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	99	2	100.0%	57.5	6.2	23.7
	Subtotal		99					23.7
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	200	4	100.0%	10.9	3.4	25.5

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	365	6	100.0%	74.5	10.6	113.3
	Subtotal	6	365	6	100.0%	74.5	10.6	113.3
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		6	365	6	100.0%	74.5	10.6	113.3

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **TSM Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	199	6	98.3%	43.2	17.4	35.8
	Subtotal	6	199	6	98.3%	43.2	17.4	35.8
EB	Left Turn	5	71	5	100.0%	38.9	14.6	11.5
	Through							
	Right Turn							
	Subtotal	5	71	5	100.0%	38.9	14.6	11.5
WB	Left Turn							
	Through							
	Right Turn	6	316	6	100.0%	18.1	10.5	23.8
	Subtotal	6	316	6	100.0%	18.1	10.5	23.8
Total		17	586	17	99.4%	33.5	7.3	71.2

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	14	1	100.0%	23.1	2.7	1.3
	Right Turn							
	Subtotal	1	14	0	0.0%	0.0	0.0	1.3
SB	Left Turn							
	Through	1	13	1	100.0%	30.9	5.3	1.7
	Right Turn							
	Subtotal	1	13	0	0.0%	0.0	0.0	1.7
EB	Left Turn							
	Through	5	71	5	100.0%	80.5	23.8	23.8
	Right Turn							
	Subtotal	5	71	5	100.0%	80.5	23.8	23.8
WB	Left Turn							
	Through	6	261	6	100.0%	80.8	19.6	87.9
	Right Turn							
	Subtotal	6	261	6	100.0%	80.8	19.6	87.9
Total		13	359	11	84.6%	71.7	14.2	114.7

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	6	6	100.0%	23.6	7.3	0.6
	Right Turn							
	Subtotal	6	6	6	100.0%	23.6	7.3	0.6
WB	Left Turn							
	Through	6	7	0	0.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	6	7	0	0.0%	0.0	0.0	0.0
Total		12	13	6	50.0%	13.5	4.2	0.6

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	835	97.3%	8.8	2.9	A	135
	Right Turn	428	417	97.4%	11.9	3.8	B	91
	Subtotal	1,286	1,252	97.3%	9.9	3.0	A	226
SB	Left Turn	99	94	94.5%	51.1	13.9	D	88
	Through	971	933	96.1%	20.2	4.1	C	345
	Right Turn							
	Subtotal	1,070	1,027	96.0%	23.2	3.5	C	433
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	488	98.2%	81.9	26.2	F	733
	Through							
	Right Turn	154	151	98.1%	53.2	27.9	D	147
	Subtotal	651	639	98.2%	74.5	26.7	E	881
Total		3,007	2,918	97.0%	28.3	6.9	C	1540

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	64	92.0%	206.8	174.7	F	244
	Through	1,205	1,177	97.7%	5.9	4.3	A	127
	Right Turn	56	52	93.6%	5.2	3.2	A	5
	Subtotal	1,331	1,294	97.2%	13.6	8.5	B	376
SB	Left Turn	18	18	98.3%	51.7	24.7	D	17
	Through	1,390	1,341	96.5%	13.4	5.4	B	328
	Right Turn	60	59	97.5%	14.3	8.9	B	15
	Subtotal	1,468	1,417	96.5%	13.8	5.7	B	360
EB	Left Turn	59	58	97.5%	49.9	9.2	D	53
	Through	23	33	141.3%	55.5	12.4	E	33
	Right Turn	61	56	91.0%	49.1	8.0	D	50
	Subtotal	143	146	101.7%	50.8	6.8	D	136
WB	Left Turn	56	49	86.8%	53.5	10.3	D	48
	Through	24	32	131.3%	54.8	14.6	D	32
	Right Turn	22	20	90.0%	19.2	11.5	B	7
	Subtotal	102	100	97.9%	46.0	7.6	D	86
Total		3,044	2,957	97.1%	16.3	4.9	B	958

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	255	93.2%	94.8	25.9	F	442
	Through	1,001	990	98.9%	36.9	15.9	D	669
	Right Turn	57	56	98.2%	27.1	16.5	C	28
	Subtotal	1,331	1,301	97.7%	48.3	17.7	D	1139
SB	Left Turn	10	9	91.0%	44.9	24.4	D	7
	Through	1,067	1,006	94.3%	33.4	8.9	C	616
	Right Turn	430	415	96.4%	23.7	6.5	C	180
	Subtotal	1,507	1,430	94.9%	30.7	7.8	C	804
EB	Left Turn	324	306	94.4%	53.2	9.8	D	298
	Through	48	48	100.8%	49.9	10.9	D	44
	Right Turn	379	366	96.6%	43.9	9.0	D	295
	Subtotal	751	720	95.9%	48.2	8.4	D	637
WB	Left Turn	61	61	100.5%	49.4	8.2	D	56
	Through	36	36	99.7%	45.4	5.8	D	30
	Right Turn	6	6	96.7%	32.7	33.6	C	3
	Subtotal	103	103	100.0%	47.3	4.6	D	89
Total		3,692	3,554	96.3%	41.6	6.8	D	2669

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,266	99.9%	2.9	0.7	A	66
	Right Turn	52	54	103.5%	2.6	1.7	A	3
	Subtotal	1,320	1,320	100.0%	2.8	0.7	A	69
SB	Left Turn	92	87	94.8%	39.0	7.4	D	62
	Through	1,360	1,290	94.8%	14.1	5.3	B	333
	Right Turn							
	Subtotal	1,452	1,377	94.8%	15.7	5.4	B	395
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	119	101.9%	52.2	10.1	D	114
	Through							
	Right Turn	157	155	98.5%	9.5	2.8	A	27
	Subtotal	274	274	100.0%	29.3	7.0	C	141
Total		3,046	2,971	97.5%	11.6	2.8	B	605

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	154	96.2%	47.2	10.6	D	133
	Through	908	909	100.1%	34.2	2.3	C	570
	Right Turn	137	133	97.2%	23.0	4.0	C	56
	Subtotal	1,205	1,196	99.2%	34.7	2.9	C	760
SB	Left Turn	218	228	104.6%	48.4	7.7	D	202
	Through	1,080	1,003	92.8%	21.6	4.4	C	397
	Right Turn	179	168	94.1%	12.9	2.8	B	40
	Subtotal	1,477	1,399	94.7%	24.9	4.3	C	639
EB	Left Turn	158	162	102.2%	67.5	16.4	E	200
	Through	396	393	99.3%	38.6	3.7	D	279
	Right Turn	159	159	100.1%	17.5	2.3	B	51
	Subtotal	713	714	100.1%	41.1	5.9	D	530
WB	Left Turn	196	194	99.1%	92.8	12.8	F	330
	Through	637	619	97.2%	81.6	12.2	F	927
	Right Turn	254	248	97.4%	87.5	16.1	F	397
	Subtotal	1,087	1,061	97.6%	85.2	12.5	F	1654
Total		4,482	4,370	97.5%	45.8	4.4	D	3583

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	144	92.8%	95.4	24.0	F	252
	Through	107	100	93.8%	65.1	21.8	E	120
	Right Turn	87	87	100.3%	56.4	22.7	E	90
	Subtotal	349	332	95.0%	75.4	23.1	E	462
SB	Left Turn	73	68	93.4%	67.0	14.8	E	84
	Through	101	96	95.3%	52.0	17.8	D	92
	Right Turn	51	55	107.3%	35.0	15.5	C	35
	Subtotal	225	219	97.4%	52.1	15.6	D	211
EB	Left Turn	61	57	94.1%	76.3	12.6	E	80
	Through	508	487	95.8%	34.0	6.1	C	304
	Right Turn	96	95	98.6%	25.6	6.8	C	44
	Subtotal	665	639	96.1%	36.2	5.9	D	428
WB	Left Turn	89	85	95.7%	74.7	10.8	E	117
	Through	491	463	94.3%	16.3	1.8	B	139
	Right Turn	77	70	90.3%	16.3	3.8	B	21
	Subtotal	657	618	94.0%	23.9	3.7	C	276
Total		1,896	1,808	95.3%	41.5	4.1	D	1377

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Traffic Calming Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	115.0%	15.8	22.9	B	1
	Through	26	24	93.8%	26.5	6.6	C	12
	Right Turn	35	33	94.0%	22.0	7.2	C	13
	Subtotal	63	60	94.6%	24.5	3.5	C	26
SB	Left Turn	36	36	99.7%	31.9	13.1	C	21
	Through	22	24	107.3%	24.0	15.0	C	10
	Right Turn	74	78	105.7%	23.6	6.1	C	34
	Subtotal	132	138	104.3%	25.6	4.8	C	65
EB	Left Turn	47	51	107.7%	67.8	26.8	E	63
	Through	531	508	95.6%	14.9	4.3	B	139
	Right Turn	6	6	100.0%	9.4	7.2	A	1
	Subtotal	584	564	96.6%	19.9	6.5	B	203
WB	Left Turn	39	40	101.8%	49.4	11.0	D	36
	Through	622	581	93.4%	26.8	5.0	C	286
	Right Turn	47	49	104.5%	26.7	4.3	C	24
	Subtotal	708	670	94.6%	28.1	4.9	C	346
Total		1,487	1,431	96.2%	24.7	1.9	C	640

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	131	96.0%	52.7	18.6	D	126
	Through	577	559	96.8%	50.0	20.5	D	512
	Right Turn	129	127	98.2%	55.3	23.0	E	129
	Subtotal	842	816	96.9%	51.2	20.2	D	767
SB	Left Turn	106	97	91.6%	93.3	14.4	F	166
	Through	768	704	91.7%	86.2	11.2	F	1113
	Right Turn	84	75	89.8%	88.7	8.7	F	123
	Subtotal	958	877	91.5%	87.5	9.8	F	1401
EB	Left Turn	162	160	98.8%	62.5	14.7	E	183
	Through	305	299	98.0%	43.4	10.8	D	238
	Right Turn	121	115	95.4%	69.5	27.1	E	147
	Subtotal	588	574	97.7%	54.2	13.1	D	568
WB	Left Turn	178	160	89.8%	62.6	14.7	E	184
	Through	319	304	95.2%	34.9	8.2	C	194
	Right Turn	77	73	94.2%	43.0	6.6	D	57
	Subtotal	574	536	93.4%	44.6	8.9	D	435
Total		2,962	2,803	94.6%	61.8	5.6	E	3171

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	1	70.0%	3.9	5.4	A	0
	Through	322	326	101.4%	4.8	1.3	A	29
	Right Turn	83	81	97.5%	4.3	0.9	A	6
	Subtotal	407	409	100.4%	4.7	1.1	A	35
SB	Left Turn	73	70	95.8%	6.4	2.5	A	8
	Through	537	538	100.1%	6.0	1.3	A	59
	Right Turn	7	6	78.6%	5.3	3.9	A	1
	Subtotal	617	613	99.4%	6.0	1.3	A	68
EB	Left Turn	2	2	100.0%	2.0	2.8	A	0
	Through							
	Right Turn	3	3	106.7%	4.9	6.8	A	0
	Subtotal	5	5	104.0%	5.0	6.1	A	0
WB	Left Turn	69	61	89.0%	6.2	1.6	A	7
	Through	5	11	226.0%	11.1	3.7	B	2
	Right Turn	67	63	93.6%	5.8	1.5	A	7
	Subtotal	141	135	96.0%	6.4	1.0	A	16
Total		1,170	1,163	99.4%	5.6	0.9	A	119

Bicyclists

Vissim Post-Processor **Bicycle PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	3	3	100.0%	7.5	8.7	0.4
	Right Turn	5	5	100.0%	1.7	2.1	0.1
	Subtotal	8	8	100.0%	5.8	5.4	0.5
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	5	90.0%	53.0	41.2	5.3
	Through						
	Right Turn	7	6	90.0%	27.1	26.5	3.2
	Subtotal	13	12	90.0%	45.6	26.0	8.5
Total		23	20	85.7%	25.8	17.0	9.0

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	2	220.0%	71.5	135.4	1.2
	Through	7	6	88.6%	4.8	6.8	0.6
	Right Turn	3	1	23.3%	0.0	0.0	0.0
	Subtotal	11	9	82.7%	27.1	42.0	1.7
SB	Left Turn						
	Through	5	3	68.0%	3.3	8.6	0.3
	Right Turn	2	2	105.0%	1.2	1.0	0.0
	Subtotal	7	6	78.6%	2.9	4.3	0.3
EB	Left Turn	1	1	120.0%	21.5	38.3	0.4
	Through	36	35	97.2%	41.1	11.0	24.7
	Right Turn						
	Subtotal	37	36	97.8%	41.8	9.6	25.0
WB	Left Turn	2	2	115.0%	32.6	39.0	1.1
	Through	119	116	97.2%	42.2	8.0	83.7
	Right Turn	1	0	0.0%	0.0	0.0	0.0
	Subtotal	122	118	96.7%	42.8	8.1	84.8
Total		177	169	95.4%	40.93	6.8	111.90

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	2	0	0.0%	0.0	0.0	0
	Through	9	6	68.9%	5.9	9.8	0.9
	Right Turn	5	3	68.0%	1.7	5.4	0.1
	Subtotal	16	10	60.0%	5.9	9.5	1.0
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	3	2	60.0%	10.7	21.9	0.5
	Right Turn	3	3	96.7%	0.5	1.4	0.0
	Subtotal	7	5	67.1%	7.9	15.4	0.6
EB	Left Turn	1	1	110.0%	17.4	37.0	0.3
	Through	12	13	110.8%	47.5	20.5	9.5
	Right Turn	1	1	100.0%	0.0	0.0	0.0
	Subtotal	14	15	110.0%	45.4	21.7	9.8
WB	Left Turn	3	2	80.0%	15.7	21.3	0.8
	Through	102	103	100.8%	42.7	5.1	72.6
	Right Turn	1	1	70.0%	0.5	1.5	0.0
	Subtotal	106	106	99.9%	42.2	5.5	73.4
Total		143	136	94.8%	38.5	5.7	84.8

Bicyclists

Vissim Post-Processor **Bicycle PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	9	6	68.9%	4.8	6.8	0.7
	Right Turn						
	Subtotal	9	6	68.9%	4.8	6.8	0.7
SB	Left Turn						
	Through	7	5	75.7%	8.0	10.8	0.9
	Right Turn						
	Subtotal	7	5	75.7%	8.0	10.8	0.9
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	85.0%	48.0	26.5	6.4
	Through						
	Right Turn	7	6	88.6%	7.8	9.9	0.9
	Subtotal	15	13	86.7%	32.1	18.9	7.3
Total		31	25	79.0%	17.9	8.8	9.0

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	0	0.0%	0.0	0.0	0
	Through	25	22	86.4%	30.8	11.6	12.8
	Right Turn	1	1	90.0%	0.5	1.2	0.0
	Subtotal	27	23	83.3%	29.4	10.9	12.9
SB	Left Turn						
	Through	15	12	79.3%	11.9	12.0	3.0
	Right Turn						
	Subtotal	15	12	79.3%	11.9	12.0	3.0
EB	Left Turn	9	7	80.0%	90.3	34.0	13.5
	Through	2	2	85.0%	15.4	24.5	0.5
	Right Turn						
	Subtotal	11	9	80.9%	79.5	32.1	14.1
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	43	81.7%	33.0	9.0	29.9

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	3	3	90.0%	27.0	40.7	1
	Through	9	8	92.2%	14.4	11.6	2.2
	Right Turn	4	4	100.0%	0.7	1.6	0.0
	Subtotal	16	15	93.8%	16.4	14.1	3.6
SB	Left Turn						
	Through	8	7	87.5%	32.3	33.2	4.3
	Right Turn	1	1	90.0%	0.0	0.0	0.0
	Subtotal	9	8	87.8%	31.3	33.0	4.3
EB	Left Turn	1	1	110.0%	29.4	40.1	0.5
	Through	29	29	100.0%	30.9	17.8	15.0
	Right Turn	1	2	180.0%	0.1	0.4	0.0
	Subtotal	31	32	102.9%	32.1	19.1	15.4
WB	Left Turn	10	12	115.0%	67.1	19.4	11.2
	Through	88	88	99.4%	10.6	4.0	15.5
	Right Turn	15	15	96.7%	3.7	4.5	0.9
	Subtotal	113	114	100.4%	15.5	4.1	27.6
Total		169	168	99.6%	20.2	5.0	50.9

Bicyclists

Vissim Post-Processor **Bicycle PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	2	2	75.0%	0.4	1.2	0.0
	Right Turn	2	2	105.0%	4.4	8.5	0.1
	Subtotal	4	4	90.0%	4.6	8.4	0.2
SB	Left Turn	3	4	116.7%	20.4	16.7	1.0
	Through	12	12	97.5%	17.7	11.6	3.5
	Right Turn	11	10	93.6%	11.4	6.3	2.1
	Subtotal	26	26	98.1%	18.2	5.3	6.7
EB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	38	39	102.4%	11.4	7.5	7.2
	Right Turn						
	Subtotal	39	39	99.7%	11.4	7.5	7.2
WB	Left Turn						
	Through	69	69	99.9%	11.0	3.4	12.7
	Right Turn	4	3	85.0%	5.0	9.1	0.3
	Subtotal	73	72	99.0%	11.0	3.3	13.0
Total		142	140	98.8%	13.0	2.4	27.1

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	0	40.0%	0.0	0.0	0
	Through	2	1	60.0%	18.0	26.5	0.6
	Right Turn	2	2	85.0%	14.4	22.8	0.5
	Subtotal	5	3	66.0%	24.1	24.2	1.1
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	47	48	101.9%	36.4	7.3	28.5
	Right Turn						
	Subtotal	47	48	101.9%	36.4	7.3	28.5
WB	Left Turn						
	Through	47	48	101.9%	41.2	5.1	32.2
	Right Turn	1	1	110.0%	9.4	19.8	0.2
	Subtotal	48	49	102.1%	41.4	4.9	32.4
Total		100	100	100.2%	38.6	4.8	62.0

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	44	41	94.1%	1.6	1.1	1.2
	Right Turn	4	5	117.5%	1.0	1.6	0.1
	Subtotal	48	46	96.0%	1.6	1.1	1.2
SB	Left Turn						
	Through	29	25	84.8%	1.4	0.9	0.7
	Right Turn						
	Subtotal	29	25	84.8%	1.4	0.9	0.7
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	8	88.9%	10.3	13.9	1.5
	Through						
	Right Turn	3	3	106.7%	1.1	2.1	0.1
	Subtotal	12	11	93.3%	9.1	11.7	1.6
Total		89	82	92.0%	3.0	2.2	3.5

Vissim Post-Processor **Crosswalk PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through						
	Right Turn	11	10	87.3%	47.4	34.0	
	Subtotal	11	10	87.3%	47.4	34.0	
SB	Left Turn	1	2	160.0%	17.0	31.0	
	Through						
	Right Turn						
	Subtotal	1	2	160.0%	17.0	31.0	
EB	Left Turn	13	13	101.5%	56.1	23.1	
	Through						
	Right Turn						
	Subtotal	13	13	101.5%	56.1	23.1	
WB	Left Turn						
	Through						
	Right Turn	39	38	96.7%	61.3	11.1	
	Subtotal	39	38	96.7%	61.3	11.1	
Total		64	62	97.0%	57.1	7.2	59.1

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	80.0%	1.4	4.6	
	East Side	14	14	98.6%	66.0	28.3	
	Subtotal	15	15	97.3%	67.4	24.7	
SB	East Side	1	1	90.0%	8.9	28.1	
	West Side	9	9	103.3%	75.6	23.2	
	Subtotal	10	10	102.0%	75.9	23.2	
EB	North Side	24	25	105.0%	54.9	14.3	
	South Side	15	14	95.3%	48.7	21.7	
	Subtotal	39	40	101.3%	53.8	12.2	
WB	South Side	31	32	102.3%	56.6	15.8	
	North Side	62	58	94.2%	54.7	12.3	
	Subtotal	93	90	96.9%	55.3	7.8	
Total		157	154	98.3%	57.6	6.1	148.1

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	5	5	94.0%	60.5	38.6	
	East Side	3	3	113.3%	40.3	43.6	
	Subtotal	8	8	101.3%	68.0	34.0	
SB	East Side	4	3	85.0%	50.5	55.8	
	West Side	4	4	90.0%	40.4	37.5	
	Subtotal	8	7	87.5%	80.9	28.0	
EB	North Side	20	21	103.0%	60.7	9.5	
	South Side	14	13	93.6%	59.2	19.9	
	Subtotal	34	34	99.1%	59.2	10.8	
WB	South Side	68	71	104.6%	49.1	8.0	
	North Side	44	43	96.6%	54.6	15.5	
	Subtotal	112	114	101.4%	51.5	5.9	
Total		162	162	100.2%	55.0	4.8	149.0

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	6	6	103.3%	29.2	30.0	
	Subtotal	6	6	103.3%	29.2	30.0	
SB	East Side	9	9	104.4%	46.0	29.0	
	West Side						
	Subtotal	9	9	104.4%	46.0	29.0	
EB	North Side	5	4	80.0%	36.5	44.2	
	South Side						
	Subtotal	5	4	80.0%	36.5	44.2	
WB	South Side						
	North Side	5	6	110.0%	40.2	27.7	
	Subtotal	5	6	110.0%	40.2	27.7	
Total		25	25	100.4%	42.5	14.5	17.8

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	8	8	103.8%	56.3	30.8	
	East Side	8	8	105.0%	102.4	45.3	
	Subtotal	16	17	104.4%	85.2	26.2	
SB	East Side	21	22	104.8%	52.2	17.3	
	West Side	10	11	109.0%	54.3	27.2	
	Subtotal	31	33	106.1%	55.2	10.1	
EB	North Side	3	2	66.7%	43.3	46.6	
	South Side	6	7	110.0%	41.1	31.4	
	Subtotal	9	9	95.6%	48.2	29.3	
WB	South Side	7	6	88.6%	44.2	39.0	
	North Side	8	9	111.3%	66.6	34.8	
	Subtotal	15	15	100.7%	68.4	23.0	
Total		71	73	103.2%	63.4	9.6	77.5

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	6	6	95.0%	0.0	0.0	
	East Side	2	2	90.0%	0.3	0.8	
	Subtotal	8	8	93.8%	0.2	0.8	
SB	East Side	1	2	170.0%	6.3	11.5	
	West Side	6	6	93.3%	0.0	0.0	
	Subtotal	7	7	104.3%	3.0	5.8	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		15	15	98.7%	1.8	3.4	0.5

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	32	32	99.1%	60.1	21.2	
	East Side	19	20	105.8%	60.3	17.4	
	Subtotal	51	52	101.6%	59.3	18.5	
SB	East Side	42	41	97.6%	52.8	15.6	
	West Side	19	17	90.0%	55.2	15.0	
	Subtotal	61	58	95.2%	54.5	5.9	
EB	North Side	35	37	104.6%	59.2	11.2	
	South Side	37	36	98.4%	56.7	8.8	
	Subtotal	72	73	101.4%	58.2	6.8	
WB	South Side	32	34	105.9%	53.2	14.5	
	North Side	35	37	104.6%	59.2	11.2	
	Subtotal	55	60	109.3%	56.5	7.8	
Total		239	243	101.7%	57.4	4.4	232.7

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	110.0%	13.4	22.9	
	East Side	2	3	135.0%	14.1	19.7	
	Subtotal	3	4	126.7%	15.7	21.1	
SB	East Side	7	7	94.3%	32.3	19.1	
	West Side	1	0	40.0%	6.0	16.3	
	Subtotal	8	7	87.5%	31.6	19.0	
EB	North Side	6	5	88.3%	16.7	15.7	
	South Side	8	8	103.8%	12.8	10.1	
	Subtotal	14	14	97.1%	18.9	10.9	
WB	South Side	6	6	93.3%	17.0	15.3	
	North Side	9	10	111.1%	16.2	17.3	
	Subtotal	15	16	104.0%	21.1	12.5	
Total		40	40	100.0%	23.2	4.9	15.5

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	80.0%	10.6	20.8	
	East Side						
	Subtotal	1	1	80.0%	10.6	20.8	
SB	East Side	3	3	90.0%	18.5	25.1	
	West Side						
	Subtotal	3	3	90.0%	18.5	25.1	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		4	4	87.5%	21.6	19.1	1.3

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk PM Peak**
Average Results from 10 Runs **Traffic Calming Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side	7	7	94.3%	27.1	25.4	
	East Side	4	4	87.5%	21.6	27.0	
	Subtotal	11	10	91.8%	30.2	23.1	
SB	East Side	3	3	93.3%	23.6	33.5	
	West Side	9	9	104.4%	39.0	20.8	
	Subtotal	12	12	101.7%	41.5	20.3	
EB	North Side	5	4	78.0%	26.8	35.3	
	South Side	8	10	122.5%	36.5	23.0	
	Subtotal	13	14	105.4%	49.0	14.2	
WB	South Side	7	7	94.3%	38.7	23.1	
	North Side	7	8	112.9%	45.5	22.1	
	Subtotal	14	15	103.6%	43.7	11.8	
Total		50	51	101.0%	41.5	9.2	34.9

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	3	3	83.3%	0.8	2.5	
	East Side	2	2	90.0%	0.0	0.0	
	Subtotal	5	4	86.0%	0.8	2.5	
SB	East Side	2	2	95.0%	0.0	0.0	
	West Side	1	1	100.0%	0.0	0.0	
	Subtotal	3	3	96.7%	0.0	0.0	
EB	North Side	2	2	110.0%	0.0	0.0	
	South Side	1	1	70.0%	0.0	0.0	
	Subtotal	3	3	96.7%	0.0	0.0	
WB	South Side						
	North Side	1	1	120.0%	0.0	0.0	
	Subtotal	1	1	120.0%	0.0	0.0	
Total		12	11	94.2%	0.3	1.0	0.1

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **Traffic Calming**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	19	2	100.0%	0.0	0.0	0.0
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	98.4	43.2	29.9
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	98.4	43.2	29.9
Total		4	92	4	100.0%	65.6	28.8	29.9

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	1.5	1.5	0.1
	Right Turn							
	Subtotal	2	18	2	100.0%	1.5	1.5	0.1
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	73	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through	11	211	11	100.0%	94.9	4.2	83.4
	Right Turn							
	Subtotal	11	211	11	100.0%	94.9	4.2	83.4
WB	Left Turn							
	Through	12	795	12	98.3%	64.9	5.1	214.9
	Right Turn							
	Subtotal	12	795	12	98.3%	64.9	5.1	214.9
Total		27	1,097	27	99.3%	60.0	2.8	298.4

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	62.8	9.0	4.7
	Right Turn							
	Subtotal	2	18	2	100.0%	62.8	9.0	4.7
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	73	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		4	91	4	100.0%	41.8	6.0	4.7

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **Traffic Calming**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	124	2	100.0%	0.0	0.0	0.0
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	75	2	100.0%	21.0	12.6	6.6
	Subtotal	2	75	2	100.0%	21.0	12.6	6.6
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	199	4	100.0%	14.0	8.4	6.6

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	26	2	100.0%	20.5	6.3	2.2
	Subtotal	2	26	2	100.0%	20.5	6.3	2.2
SB	Left Turn Through Right Turn	2	75	2	100.0%	0.0	0.0	0.0
	Subtotal	2	75	2	100.0%	0.0	0.0	0.0
EB	Left Turn Through Right Turn	2	99	2	100.0%	57.5	6.2	23.7
	Subtotal		99					23.7
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	200	4	100.0%	13.6	4.2	25.9

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn	6	365	6	100.0%	47.3	18.4	72.0
	Subtotal	6	365	6	100.0%	47.3	18.4	72.0
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		6	365	6	100.0%	47.3	18.4	72.0

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **Traffic Calming**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn	6	199	6	100.0%	6.6	7.4	5.5
	Subtotal	6	199	6	100.0%	6.6	7.4	5.5
EB	Left Turn	5	74	5	100.0%	44.4	24.7	13.7
	Through							
	Right Turn							
	Subtotal	5	74	5	100.0%	44.4	24.7	13.7
WB	Left Turn							
	Through							
	Right Turn	6	316	6	100.0%	23.6	12.4	31.1
	Subtotal	6	316	6	100.0%	23.6	12.4	31.1
Total		17	589	17	100.0%	25.6	7.1	50.3

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	14	1	100.0%	50.0	20.5	2.9
	Right Turn							
	Subtotal	1	14	1	100.0%	0.0	0.0	2.9
SB	Left Turn							
	Through	1	13	1	100.0%	86.2	11.2	4.7
	Right Turn							
	Subtotal	1	13	1	100.0%	0.0	0.0	4.7
EB	Left Turn							
	Through	5	71	5	100.0%	71.6	16.5	21.2
	Right Turn							
	Subtotal	5	71	5	100.0%	71.6	16.5	21.2
WB	Left Turn							
	Through	6	261	6	100.0%	62.1	25.1	67.6
	Right Turn							
	Subtotal	6	261	6	100.0%	62.1	25.1	67.6
Total		13	359	11	84.6%	59.8	14.4	96.3

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	6	6	100.0%	20.9	14.4	0.5
	Right Turn							
	Subtotal	6	6	6	100.0%	20.9	14.4	0.5
WB	Left Turn							
	Through	6	7	6	100.0%	12.8	5.6	0.4
	Right Turn							
	Subtotal	6	7	6	100.0%	12.8	5.6	0.4
Total		12	13	12	100.0%	17.2	9.0	0.9

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	826	96.3%	8.3	2.2	A	125
	Right Turn	428	415	97.0%	9.5	2.0	A	72
	Subtotal	1,286	1,241	96.5%	8.7	1.9	A	197
SB	Left Turn	99	94	95.4%	49.3	12.7	D	85
	Through	971	938	96.6%	20.9	4.9	C	359
	Right Turn							
	Subtotal	1,070	1,032	96.5%	23.6	4.3	C	444
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	494	99.3%	83.6	26.8	F	757
	Through							
	Right Turn	154	149	96.9%	55.8	29.8	E	153
	Subtotal	651	643	98.7%	76.6	27.6	E	909
Total		3,007	2,916	97.0%	28.6	7.4	C	1551

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	61	86.9%	191.4	105.6	F	213
	Through	1,205	1,167	96.8%	4.1	1.7	A	88
	Right Turn	56	55	98.6%	2.8	1.4	A	3
	Subtotal	1,331	1,283	96.4%	10.7	4.3	B	304
SB	Left Turn	18	17	93.3%	37.6	16.3	D	12
	Through	1,390	1,351	97.2%	16.2	6.2	B	401
	Right Turn	60	57	95.5%	16.2	9.5	B	17
	Subtotal	1,468	1,425	97.1%	16.4	6.3	B	430
EB	Left Turn	59	56	95.4%	51.3	10.3	D	53
	Through	23	28	121.7%	51.4	14.8	D	26
	Right Turn	61	56	92.3%	51.8	7.9	D	53
	Subtotal	143	141	98.3%	51.1	6.4	D	133
WB	Left Turn	56	61	108.0%	57.3	12.5	E	64
	Through	24	20	82.9%	47.9	17.4	D	17
	Right Turn	22	20	88.6%	22.2	10.6	C	8
	Subtotal	102	100	97.9%	48.2	10.4	D	89
Total		3,044	2,948	96.8%	16.4	4.7	B	956

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	259	95.0%	93.2	22.0	F	443
	Through	1,001	980	97.9%	30.5	10.2	C	547
	Right Turn	57	57	100.7%	26.3	13.4	C	28
	Subtotal	1,331	1,297	97.4%	42.3	12.3	D	1018
SB	Left Turn	10	9	94.0%	47.3	28.2	D	8
	Through	1,067	1,008	94.5%	44.1	6.6	D	815
	Right Turn	430	428	99.6%	32.7	5.6	C	256
	Subtotal	1,507	1,446	95.9%	40.8	5.8	D	1080
EB	Left Turn	324	307	94.7%	77.2	11.1	E	434
	Through	48	45	93.3%	78.9	14.2	E	65
	Right Turn	379	357	94.3%	70.9	8.7	E	464
	Subtotal	751	709	94.4%	74.1	9.3	E	964
WB	Left Turn	61	61	99.7%	49.2	10.6	D	55
	Through	36	36	99.7%	43.1	5.9	D	28
	Right Turn	6	6	95.0%	29.0	38.6	C	3
	Subtotal	103	102	99.4%	47.5	7.2	D	86
Total		3,692	3,554	96.2%	48.1	4.7	D	3148

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **MAX Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,264	99.7%	2.7	0.2	A	62
	Right Turn	52	54	103.3%	2.4	1.0	A	2
	Subtotal	1,320	1,318	99.8%	2.7	0.2	A	64
SB	Left Turn	92	90	97.6%	34.0	8.0	C	56
	Through	1,360	1,286	94.6%	13.6	4.0	B	321
	Right Turn							
	Subtotal	1,452	1,376	94.8%	15.0	4.1	B	377
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	121	103.1%	51.4	8.2	D	114
	Through							
	Right Turn	157	154	98.0%	10.4	3.9	B	29
	Subtotal	274	274	100.1%	28.2	5.3	C	143
Total		3,046	2,968	97.4%	11.0	2.1	B	584

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	155	96.7%	52.7	8.0	D	150
	Through	908	906	99.8%	35.4	2.3	D	588
	Right Turn	137	133	97.2%	23.1	3.6	C	56
	Subtotal	1,205	1,194	99.1%	36.4	2.6	D	793
SB	Left Turn	218	226	103.5%	52.8	10.3	D	218
	Through	1,080	1,005	93.1%	21.2	4.6	C	391
	Right Turn	179	171	95.5%	13.3	2.9	B	42
	Subtotal	1,477	1,402	94.9%	25.3	5.4	C	651
EB	Left Turn	158	159	100.7%	68.5	16.5	E	200
	Through	396	395	99.7%	39.6	3.2	D	287
	Right Turn	159	160	100.3%	18.3	2.6	B	53
	Subtotal	713	714	100.1%	41.4	5.8	D	540
WB	Left Turn	196	193	98.7%	93.6	17.0	F	332
	Through	637	623	97.8%	82.5	15.2	F	942
	Right Turn	254	248	97.7%	86.3	18.5	F	393
	Subtotal	1,087	1,065	98.0%	85.6	15.7	F	1667
Total		4,482	4,375	97.6%	46.8	5.5	D	3652

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	147	94.6%	51.2	10.6	D	137
	Through	107	94	87.9%	65.0	14.4	E	112
	Right Turn	87	84	97.0%	64.0	13.9	E	99
	Subtotal	349	325	93.2%	58.5	11.3	E	349
SB	Left Turn	73	71	97.3%	30.4	5.7	C	40
	Through	101	98	97.4%	47.3	10.9	D	85
	Right Turn	51	48	94.5%	26.0	10.9	C	23
	Subtotal	225	218	96.7%	37.7	6.9	D	148
EB	Left Turn	61	57	93.0%	85.8	11.8	F	89
	Through	508	482	94.9%	36.2	5.0	D	320
	Right Turn	96	97	101.1%	13.6	3.5	B	24
	Subtotal	665	636	95.6%	37.3	5.4	D	433
WB	Left Turn	89	86	96.6%	110.2	18.4	F	174
	Through	491	470	95.8%	45.8	16.9	D	395
	Right Turn	77	71	91.9%	28.6	11.2	C	37
	Subtotal	657	627	95.5%	53.3	16.7	D	606
Total		1,896	1,806	95.2%	47.4	7.1	D	1536

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	12.2	18.5	B	0
	Through	26	23	89.6%	19.1	9.3	B	8
	Right Turn	35	33	93.1%	23.2	7.8	C	14
	Subtotal	63	58	91.7%	22.5	5.0	C	22
SB	Left Turn	36	37	102.2%	26.1	8.8	C	18
	Through	22	22	100.5%	28.4	9.3	C	12
	Right Turn	74	76	103.2%	25.2	5.4	C	35
	Subtotal	132	135	102.5%	26.1	3.8	C	64
EB	Left Turn	47	44	94.3%	34.6	7.4	C	28
	Through	531	508	95.6%	14.2	3.3	B	132
	Right Turn	6	7	110.0%	16.1	11.7	B	2
	Subtotal	584	559	95.6%	15.8	3.1	B	162
WB	Left Turn	39	40	103.3%	40.9	6.8	D	30
	Through	622	584	93.9%	19.7	9.3	B	211
	Right Turn	47	51	107.7%	13.7	10.9	B	13
	Subtotal	708	675	95.4%	20.4	9.0	C	254
Total		1,487	1,427	95.9%	19.1	4.6	B	502

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	131	96.0%	54.2	17.2	D	130
	Through	577	563	97.6%	48.6	18.4	D	502
	Right Turn	129	125	96.7%	51.4	17.8	D	118
	Subtotal	842	818	97.2%	50.0	17.7	D	749
SB	Left Turn	106	93	87.9%	104.2	25.6	F	178
	Through	768	712	92.7%	89.3	8.3	F	1165
	Right Turn	84	75	88.9%	92.9	9.8	F	127
	Subtotal	958	880	91.8%	91.6	9.8	F	1470
EB	Left Turn	162	159	98.0%	73.5	24.1	E	214
	Through	305	298	97.7%	52.6	24.0	D	287
	Right Turn	121	118	97.3%	81.0	35.0	F	175
	Subtotal	588	575	97.7%	64.9	26.2	E	676
WB	Left Turn	178	161	90.7%	65.4	14.1	E	193
	Through	319	307	96.2%	31.8	6.5	C	179
	Right Turn	77	72	93.8%	42.1	9.5	D	56
	Subtotal	574	540	94.1%	43.8	7.5	D	428
Total		2,962	2,813	95.0%	64.7	8.3	E	3323

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	5.5	7.1	A	0
	Through	322	327	101.6%	5.2	1.4	A	31
	Right Turn	83	82	98.7%	4.3	0.9	A	6
	Subtotal	407	411	100.9%	5.1	1.2	A	38
SB	Left Turn	73	70	95.9%	6.2	2.7	A	8
	Through	537	542	100.9%	6.2	1.5	A	62
	Right Turn	7	6	82.9%	5.3	5.2	A	1
	Subtotal	617	618	100.1%	6.2	1.5	A	70
EB	Left Turn	2	2	100.0%	2.0	3.6	A	0
	Through							
	Right Turn	3	3	103.3%	6.8	7.8	A	0
	Subtotal	5	5	102.0%	6.4	7.2	A	0
WB	Left Turn	69	63	91.3%	6.0	1.9	A	7
	Through	5	11	220.0%	6.6	3.2	A	1
	Right Turn	67	63	94.6%	7.1	2.1	A	8
	Subtotal	141	137	97.4%	6.6	1.7	A	16
Total		1,170	1,171	100.1%	5.9	0.6	A	125

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	3	3	96.7%	6.0	9.1	0.3
	Right Turn	5	5	90.0%	1.8	3.1	0.1
	Subtotal	8	7	92.5%	5.1	5.7	0.4
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	1	0	0.0%	0.0	0.0	0.0
	Right Turn						
	Subtotal	2	0	0.0%	0.0	0.0	0.0
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	6	6	96.7%	49.8	34.0	5.0
	Through						
	Right Turn	7	6	88.6%	25.6	14.3	3.0
	Subtotal	13	12	92.3%	42.7	19.3	8.0
Total		23	19	84.3%	24.7	12.8	8.4

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	3	300.0%	58.3	122.9	1.0
	Through	7	6	82.9%	6.4	8.6	0.7
	Right Turn	3	1	26.7%	0.0	0.0	0.0
	Subtotal	11	10	87.3%	56.4	119.7	1.7
SB	Left Turn						
	Through	5	4	76.0%	3.7	5.1	0.3
	Right Turn	2	2	105.0%	1.3	1.6	0.0
	Subtotal	7	6	84.3%	3.9	4.1	0.4
EB	Left Turn	1	1	100.0%	21.0	38.6	0.4
	Through	36	35	96.9%	40.9	11.5	24.5
	Right Turn						
	Subtotal	37	36	97.0%	42.1	10.6	24.9
WB	Left Turn	2	2	115.0%	30.1	40.0	1.0
	Through	119	116	97.1%	42.3	8.4	83.9
	Right Turn	1	0	0.0%	0.0	0.0	0.0
	Subtotal	122	118	96.6%	43.0	8.7	84.9
Total		177	169	95.6%	40.97	6.5	111.84

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	2	0	0.0%	0.0	0.0	0
	Through	9	6	64.4%	6.4	8.6	1.0
	Right Turn	5	4	76.0%	0.0	0.0	0.0
	Subtotal	16	10	60.0%	3.0	3.4	1.0
SB	Left Turn	1	0	0.0%	0.0	0.0	0.0
	Through	3	2	63.3%	2.1	4.5	0.1
	Right Turn	3	3	86.7%	0.7	1.5	0.0
	Subtotal	7	5	64.3%	1.6	2.4	0.1
EB	Left Turn	1	1	100.0%	15.4	29.2	0.3
	Through	12	14	117.5%	61.5	21.3	12.3
	Right Turn	1	1	70.0%	4.8	15.1	0.1
	Subtotal	14	16	112.9%	61.0	19.3	12.6
WB	Left Turn	3	2	76.7%	13.4	25.6	0.7
	Through	102	102	100.0%	42.3	5.1	71.9
	Right Turn	1	1	80.0%	0.2	0.5	0.0
	Subtotal	106	105	99.2%	42.0	4.3	72.5
Total		143	135	94.4%	40.0	7.0	86.3

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	9	6	64.4%	2.7	4.6	0.4
	Right Turn						
	Subtotal	9	6	64.4%	2.7	4.6	0.4
SB	Left Turn						
	Through	7	5	70.0%	2.6	4.6	0.3
	Right Turn						
	Subtotal	7	5	70.0%	2.6	4.6	0.3
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	8	7	86.3%	38.0	18.1	5.1
	Through						
	Right Turn	7	6	84.3%	10.3	8.9	1.2
	Subtotal	15	13	85.3%	29.2	11.0	6.3
Total		31	24	75.8%	17.5	8.2	7.0

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	0	0.0%	0.0	0.0	0
	Through	25	22	86.0%	22.8	12.9	9.5
	Right Turn	1	1	140.0%	0.7	1.5	0.0
	Subtotal	27	23	84.8%	21.8	12.8	9.5
SB	Left Turn						
	Through	15	12	76.7%	8.9	8.5	2.2
	Right Turn						
	Subtotal	15	12	76.7%	8.9	8.5	2.2
EB	Left Turn	9	7	82.2%	74.1	41.0	11.1
	Through	2	2	75.0%	19.8	29.5	0.7
	Right Turn						
	Subtotal	11	9	80.9%	75.1	36.3	11.8
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		53	43	81.7%	28.5	11.3	23.5

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	3	3	103.3%	33.3	26.7	2
	Through	9	8	92.2%	51.3	24.2	7.7
	Right Turn	4	4	87.5%	29.3	34.0	2.0
	Subtotal	16	15	93.1%	47.1	20.0	11.3
SB	Left Turn	5	6	128.0%	34.7	32.8	2.9
	Through	8	6	77.5%	38.6	59.1	5.1
	Right Turn	1	1	130.0%	10.1	19.4	0.2
	Subtotal	14	14	99.3%	37.5	25.3	8.2
EB	Left Turn	1	1	90.0%	17.9	37.8	0.3
	Through	29	30	104.8%	24.5	7.6	11.9
	Right Turn	1	2	190.0%	7.3	21.0	0.1
	Subtotal	31	33	107.1%	25.9	10.1	12.3
WB	Left Turn	10	11	113.0%	88.7	34.9	14.8
	Through	88	90	101.9%	31.1	11.2	45.6
	Right Turn	15	14	91.3%	41.4	26.2	10.4
	Subtotal	113	115	101.5%	37.6	11.1	70.8
Total		174	177	101.6%	35.5	9.2	102.6

Vissim Post-Processor **Bicycle** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	2	2	80.0%	4.6	10.0	0.2
	Right Turn	2	2	95.0%	2.6	5.4	0.1
	Subtotal	4	4	87.5%	6.2	9.1	0.2
SB	Left Turn	3	4	136.7%	21.7	15.8	1.1
	Through	12	12	96.7%	21.6	9.6	4.3
	Right Turn	11	10	92.7%	12.3	14.1	2.3
	Subtotal	26	26	99.6%	21.4	10.9	7.7
EB	Left Turn	1	1	70.0%	3.2	10.1	0.1
	Through	38	39	102.6%	9.7	7.8	6.2
	Right Turn						
	Subtotal	39	40	101.8%	10.1	7.9	6.2
WB	Left Turn						
	Through	69	71	102.2%	15.7	5.2	18.0
	Right Turn	4	4	90.0%	11.2	14.7	0.7
	Subtotal	73	74	101.5%	15.9	5.3	18.8
Total		142	143	100.8%	15.3	3.1	32.9

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn	1	1	50.0%	1.7	5.4	0
	Through	2	1	60.0%	14.2	25.4	0.5
	Right Turn	2	2	80.0%	24.7	39.2	0.8
	Subtotal	5	3	66.0%	33.6	35.8	1.3
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	47	47	99.4%	35.3	7.2	27.6
	Right Turn						
	Subtotal	47	47	99.4%	35.3	7.2	27.6
WB	Left Turn						
	Through	47	47	99.4%	40.4	14.0	31.7
	Right Turn	1	1	110.0%	17.6	29.0	0.3
	Subtotal	48	48	99.6%	41.3	13.9	32.0
Total		100	98	97.8%	38.5	8.0	60.9

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn						
	Through	44	42	94.5%	0.8	0.3	0.6
	Right Turn	4	5	122.5%	0.7	1.3	0.0
	Subtotal	48	47	96.9%	0.8	0.3	0.7
SB	Left Turn						
	Through	29	25	87.6%	1.0	0.7	0.5
	Right Turn						
	Subtotal	29	25	87.6%	1.0	0.7	0.5
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	9	8	91.1%	7.6	15.7	1.1
	Through						
	Right Turn	3	3	100.0%	1.1	1.8	0.1
	Subtotal	12	11	93.3%	7.4	15.6	1.2
Total		89	83	93.4%	2.0	2.6	2.3

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	11	10	89.1%	51.9	11.8	
	Subtotal	11	10	89.1%	51.9	11.8	
SB	East Side	1	1	120.0%	13.7	29.5	
	West Side						
	Subtotal	1	1	120.0%	13.7	29.5	
EB	North Side	13	14	106.9%	58.0	23.0	
	South Side						
	Subtotal	13	14	106.9%	58.0	23.0	
WB	South Side						
	North Side	39	38	96.4%	64.5	20.7	
	Subtotal	39	38	96.4%	64.5	20.7	
Total		64	63	97.7%	58.0	9.5	60.5

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	70.0%	7.3	18.7	
	East Side	14	13	95.0%	60.6	30.9	
	Subtotal	15	14	93.3%	62.3	27.7	
SB	East Side	1	1	100.0%	9.0	28.5	
	West Side	9	10	105.6%	65.4	32.4	
	Subtotal	10	11	105.0%	65.7	32.5	
EB	North Side	24	25	103.8%	49.7	14.8	
	South Side	15	14	94.0%	45.3	19.9	
	Subtotal	39	39	100.0%	49.5	11.4	
WB	South Side	31	31	99.0%	52.3	19.2	
	North Side	62	58	93.9%	55.5	12.2	
	Subtotal	93	89	95.6%	55.3	8.0	
Total		157	152	97.1%	55.5	6.9	141.1

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	5	5	104.0%	56.4	34.7	
	East Side	3	3	110.0%	29.7	41.8	
	Subtotal	8	9	106.3%	67.1	30.9	
SB	East Side	4	4	90.0%	54.1	52.9	
	West Side	4	4	107.5%	42.7	35.8	
	Subtotal	8	8	98.8%	79.2	28.2	
EB	North Side	20	19	97.0%	60.2	9.4	
	South Side	14	13	93.6%	62.3	20.0	
	Subtotal	34	33	95.6%	60.1	10.3	
WB	South Side	68	68	100.3%	50.6	9.2	
	North Side	44	42	95.9%	55.5	9.0	
	Subtotal	112	110	98.6%	52.9	4.4	
Total		162	159	98.3%	56.1	3.0	148.9

Intersection 5 **Shields St/Lake St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side						
	East Side	6	5	90.0%	27.4	31.3	
	Subtotal	6	5	90.0%	27.4	31.3	
SB	East Side	9	10	110.0%	47.9	26.1	
	West Side						
	Subtotal	9	10	110.0%	47.9	26.1	
EB	North Side	5	4	80.0%	33.0	45.5	
	South Side						
	Subtotal	5	4	80.0%	33.0	45.5	
WB	South Side						
	North Side	5	5	106.0%	39.4	30.3	
	Subtotal	5	5	106.0%	39.4	30.3	
Total		25	25	98.4%	42.4	14.9	17.4

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	8	8	103.8%	59.8	32.4	
	East Side	8	9	106.3%	96.2	53.0	
	Subtotal	16	17	105.0%	82.9	30.8	
SB	East Side	21	22	103.8%	55.3	17.1	
	West Side	10	10	102.0%	54.2	28.2	
	Subtotal	31	32	103.2%	56.3	10.8	
EB	North Side	3	3	96.7%	47.3	44.4	
	South Side	6	7	111.7%	45.6	30.9	
	Subtotal	9	10	106.7%	54.1	25.1	
WB	South Side	7	6	84.3%	38.6	41.2	
	North Side	8	8	97.5%	62.7	31.1	
	Subtotal	15	14	91.3%	68.5	23.0	
Total		71	72	101.5%	64.4	10.4	77.4

Intersection 7 **Ped Crossing/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	6	6	91.7%	0.0	0.1	
	East Side	2	2	100.0%	0.0	0.0	
	Subtotal	8	8	93.8%	0.0	0.1	
SB	East Side	1	2	160.0%	4.7	8.2	
	West Side	6	5	88.3%	0.1	0.1	
	Subtotal	7	7	98.6%	2.6	4.3	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		15	14	96.0%	1.3	2.2	0.3

Intersection 8 **City Park Ave/W Elizabeth St**

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	32	33	103.4%	56.4	9.6	
	East Side	19	21	111.6%	65.2	18.2	
	Subtotal	51	54	106.5%	61.4	12.2	
SB	East Side	42	43	102.4%	58.3	9.4	
	West Side	19	15	80.5%	61.0	26.5	
	Subtotal	61	58	95.6%	57.8	9.6	
EB	North Side	35	37	105.1%	57.7	9.6	
	South Side	37	38	103.0%	60.9	6.1	
	Subtotal	72	75	104.0%	59.5	5.9	
WB	South Side	32	35	108.8%	57.8	11.9	
	North Side	35	37	105.1%	57.7	9.6	
	Subtotal	55	59	107.8%	58.2	8.8	
Total		239	247	103.3%	58.8	4.2	241.8

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	100.0%	8.6	14.1	
	East Side	2	3	140.0%	24.2	24.8	
	Subtotal	3	4	126.7%	19.6	19.5	
SB	East Side	7	7	97.1%	33.8	18.2	
	West Side	1	1	50.0%	0.0	0.0	
	Subtotal	8	7	91.3%	33.8	18.2	
EB	North Side	6	5	80.0%	5.6	7.5	
	South Side	8	9	108.8%	19.0	12.7	
	Subtotal	14	14	96.4%	18.2	11.4	
WB	South Side	6	6	93.3%	20.3	19.5	
	North Side	9	9	102.2%	14.9	10.9	
	Subtotal	15	15	98.7%	20.4	10.0	
Total		40	39	98.5%	22.6	6.0	14.9

Intersection 10 **Ped Signal/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	1	1	90.0%	13.7	21.3	
	East Side						
	Subtotal	1	1	90.0%	13.7	21.3	
SB	East Side	3	3	90.0%	18.0	24.3	
	West Side						
	Subtotal	3	3	90.0%	18.0	24.3	
EB	North Side						
	South Side						
	Subtotal						
WB	South Side						
	North Side						
	Subtotal						
Total		4	4	90.0%	23.4	17.7	1.4

Intersection 11 **Taft Hill Rd/W Elizabeth St**

		Demand	Served Volume (pph)		Total Delay (sec/person)		Total Person

Vissim Post-Processor **Crosswalk** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Direction	Movement	Volume (pph)	Average	Percent	Average	Std. Dev.	Delay (min)
NB	West Side	7	7	95.7%	19.4	22.0	
	East Side	4	4	95.0%	23.7	30.4	
	Subtotal	11	11	95.5%	30.6	25.0	
SB	East Side	3	3	106.7%	22.6	32.1	
	West Side	9	10	105.6%	45.1	24.8	
	Subtotal	12	13	105.8%	46.9	24.9	
EB	North Side	5	4	82.0%	29.1	34.3	
	South Side	8	9	112.5%	35.1	23.7	
	Subtotal	13	13	100.8%	48.0	16.1	
WB	South Side	7	7	94.3%	32.5	23.2	
	North Side	7	8	117.1%	40.0	26.0	
	Subtotal	14	15	105.7%	39.1	13.6	
Total		50	51	102.2%	40.5	9.3	34.5

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (pph)	Served Volume (pph) Average	Served Volume (pph) Percent	Total Delay (sec/person) Average	Total Delay (sec/person) Std. Dev.	Total Person Delay (min)
NB	West Side	3	3	86.7%	1.3	4.1	
	East Side	2	2	100.0%	0.0	0.0	
	Subtotal	5	5	92.0%	1.3	4.1	
SB	East Side	2	2	90.0%	0.0	0.0	
	West Side	1	1	120.0%	0.0	0.0	
	Subtotal	3	3	100.0%	0.0	0.0	
EB	North Side	2	3	125.0%	0.0	0.0	
	South Side	1	1	60.0%	0.0	0.0	
	Subtotal	3	3	103.3%	0.0	0.0	
WB	South Side						
	North Side	1	1	130.0%	0.0	0.0	
	Subtotal	1	1	130.0%	0.0	0.0	
Total		12	12	100.0%	0.5	1.6	0.1

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 2 **Shields St/W Laurel St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn	2	19	2	100.0%	0.0	0.0	0.0
	Subtotal	2	19	2	100.0%	0.0	0.0	0.0
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	2	73	2	100.0%	101.3	42.1	30.8
	Through							
	Right Turn							
	Subtotal	2	73	2	100.0%	101.3	42.1	30.8
Total		4	92	4	100.0%	67.5	28.1	30.8

Intersection 3 **Shields St/W Plum St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	1.6	1.6	0.1
	Right Turn	5	71	4	84.0%	0.0	0.0	0.0
	Subtotal	7	89	6	88.6%	1.6	1.6	0.1
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn							
	Subtotal	2	73	2	100.0%	0.0	0.0	0.0
EB	Left Turn							
	Through	6	211	6	100.0%	89.0	15.8	78.2
	Right Turn							
	Subtotal	6	211	6	100.0%	89.0	15.8	78.2
WB	Left Turn	12	795	12	99.2%	72.9	9.0	241.6
	Through							
	Right Turn							
	Subtotal	12	795	12	99.2%	72.9	9.0	241.6
Total		27	1,168	26	96.7%	62.8	5.7	320.0

Intersection 4 **Shields St/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	2	18	2	100.0%	64.4	11.8	4.8
	Right Turn							
	Subtotal	2	18	2	100.0%	64.4	11.8	4.8
SB	Left Turn							
	Through	2	73	2	100.0%	0.0	0.0	0.0
	Right Turn	12	455	12	99.2%	17.2	13.7	32.6
	Subtotal	14	528	14	99.3%	17.2	13.7	32.6
EB	Left Turn	5	71	4	84.0%	95.5	22.7	28.3
	Through							
	Right Turn							
	Subtotal	5	71	4	84.0%	95.5	22.7	28.3
WB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
Total		21	617	20	95.7%	44.2	9.0	65.7

Transit

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 5 **Shields St/Lake St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	124	2	100.0%	0.0	0.0	0.0
	Subtotal	2	124	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	75	2	100.0%	18.4	14.0	5.8
	Subtotal	2	75	2	100.0%	18.4	14.0	5.8
EB	Left Turn Through Right Turn							
	Subtotal							
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	199	4	100.0%	12.3	9.4	5.8

Intersection 6 **Shields St/Prospect**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn	2	26	2	100.0%	0.0	0.0	0.0
	Subtotal	2	26	2	100.0%	0.0	0.0	0.0
SB	Left Turn Through Right Turn	2	75	2	95.0%	17.1	32.6	5.4
	Subtotal	2	75	2	95.0%	17.1	32.6	5.4
EB	Left Turn Through Right Turn	2	99	2	100.0%	57.5	6.2	23.7
	Subtotal		99					23.7
WB	Left Turn Through Right Turn							
	Subtotal							
Total		4	200	4	97.5%	11.4	21.7	29.1

Intersection 8 **City Park Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn Through Right Turn							
	Subtotal							
SB	Left Turn Through Right Turn							
	Subtotal							
EB	Left Turn Through Right Turn	5	71	5	100.0%	38.8	20.9	11.5
	Subtotal	5	71	5	100.0%	38.8	20.9	11.5
WB	Left Turn Through Right Turn	12	455	12	99.2%	36.4	12.8	69.1
	Subtotal	12	455	12	99.2%	36.4	12.8	69.1
Total		17	526	17	99.4%	36.5	10.0	80.6

Transit

Vissim Post-Processor **Transit** **PM Peak**
Average Results from 10 Runs **MAX Alt**
Volume and Delay by Movement

Intersection 9 **Constitution Ave/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	5	74	5	100.0%	45.1	10.1	13.9
	Right Turn							
	Subtotal	5	74	5	100.0%	45.1	10.1	13.9
WB	Left Turn							
	Through	6	199	6	100.0%	16.6	4.8	13.7
	Right Turn	6	316	6	100.0%	19.3	10.2	25.4
	Subtotal	12	515	12	100.0%	18.4	6.6	39.1
Total		17	589	17	100.0%	27.7	4.5	53.0

Intersection 11 **Taft Hill Rd/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through	1	14	1	100.0%	48.6	18.4	2.8
	Right Turn							
	Subtotal	1	14	1	100.0%	0.0	0.0	2.8
SB	Left Turn							
	Through	1	13	1	100.0%	89.3	8.3	4.8
	Right Turn							
	Subtotal	1	13	1	100.0%	0.0	0.0	4.8
EB	Left Turn							
	Through	5	71	5	100.0%	84.2	46.5	24.9
	Right Turn							
	Subtotal	5	71	5	100.0%	84.2	46.5	24.9
WB	Left Turn							
	Through	6	261	6	100.0%	59.1	26.5	64.2
	Right Turn							
	Subtotal	6	261	6	100.0%	59.1	26.5	64.2
Total		13	359	11	84.6%	56.9	22.9	96.8

Intersection 12 **Overland Trail/W Elizabeth St**

Direction	Movement	Demand Volume (vph)	Demand Riders (pp4h)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	Total Person Delay (min)
NB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
SB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
EB	Left Turn							
	Through	6	6	6	100.0%	23.2	18.0	0.6
	Right Turn							
	Subtotal	6	6	6	100.0%	23.2	18.0	0.6
WB	Left Turn							
	Through	6	7	6	98.3%	7.2	4.3	0.2
	Right Turn							
	Subtotal	6	7	6	98.3%	7.2	4.3	0.2
Total		12	13	12	99.2%	15.3	8.7	0.8

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040**
Volume and Delay by Movement **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	829	97.5%	8.0	2.8	A	122
	Right Turn	490	471	96.1%	10.5	2.6	B	90
	Subtotal	1,340	1,300	97.0%	8.9	2.7	A	212
SB	Left Turn	155	156	100.9%	34.7	10.8	C	100
	Through	790	783	99.1%	12.1	1.1	B	174
	Right Turn							
	Subtotal	945	939	99.4%	15.8	2.2	B	274
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	146	94.3%	45.1	4.3	D	121
	Through							
	Right Turn	75	70	92.7%	11.4	3.5	B	14
	Subtotal	230	216	93.8%	34.2	4.0	C	135
Total		2,515	2,455	97.6%	13.5	1.6	B	621

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	15	76.5%	11.4	6.8	B	3
	Through	1,260	1,227	97.4%	3.6	1.6	A	81
	Right Turn	45	46	102.0%	3.8	1.8	A	3
	Subtotal	1,325	1,289	97.2%	3.7	1.6	A	88
SB	Left Turn	20	14	68.0%	26.2	24.9	C	7
	Through	905	898	99.2%	5.5	0.7	A	90
	Right Turn	25	20	80.4%	4.3	2.6	A	2
	Subtotal	950	932	98.1%	5.9	0.9	A	98
EB	Left Turn	65	58	89.8%	63.5	17.1	E	68
	Through	30	37	123.7%	67.4	15.9	E	46
	Right Turn	45	40	88.7%	67.0	19.3	E	49
	Subtotal	140	135	96.7%	64.6	14.6	E	163
WB	Left Turn	25	22	88.0%	50.8	25.7	D	20
	Through	25	28	113.2%	34.3	9.6	C	18
	Right Turn	25	20	79.2%	14.4	8.3	B	5
	Subtotal	75	70	93.5%	34.3	9.2	C	43
Total		2,490	2,426	97.4%	10.1	1.4	B	392

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	162	95.5%	32.4	4.7	C	97
	Through	1,005	970	96.5%	11.1	3.1	B	198
	Right Turn	70	62	88.9%	9.7	3.3	A	11
	Subtotal	1,245	1,195	96.0%	14.0	2.4	B	306
SB	Left Turn	30	26	85.7%	53.5	15.1	D	25
	Through	775	769	99.2%	8.2	2.4	A	115
	Right Turn	170	166	97.4%	3.8	0.6	A	12
	Subtotal	975	960	98.5%	8.9	2.0	A	152
EB	Left Turn	315	317	100.6%	48.3	5.6	D	281
	Through	35	36	103.7%	52.2	11.7	D	35
	Right Turn	360	357	99.3%	53.6	25.3	D	351
	Subtotal	710	711	100.1%	51.3	14.2	D	667
WB	Left Turn	20	16	80.5%	37.2	25.9	D	11
	Through	10	6	63.0%	22.2	30.5	C	3
	Right Turn	10	5	50.0%	7.4	10.9	A	1
	Subtotal	40	27	68.5%	37.3	16.7	D	14
Total		2,970	2,893	97.4%	21.7	2.8	C	1,138

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,372	98.3%	5.0	1.0	A	125
	Right Turn	185	175	94.6%	5.7	1.5	A	18
	Subtotal	1,580	1,547	97.9%	5.1	1.0	A	143
SB	Left Turn	150	145	96.7%	50.5	12.1	D	134
	Through	910	901	99.0%	7.0	3.3	A	115
	Right Turn							
	Subtotal	1,060	1,046	98.7%	13.3	4.6	B	249
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	71	94.1%	47.0	8.2	D	61
	Through							
	Right Turn	45	45	99.1%	5.5	1.4	A	4
	Subtotal	120	115	96.0%	31.9	4.8	C	65
Total		2,760	2,708	98.1%	9.8	2.1	A	458

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	68	97.0%	35.0	8.4	D	44
	Through	1,120	1,107	98.8%	27.0	4.7	C	549
	Right Turn	165	155	94.1%	21.9	7.4	C	62
	Subtotal	1,355	1,330	98.1%	26.8	4.9	C	655
SB	Left Turn	175	178	101.4%	41.5	6.5	D	135
	Through	745	728	97.8%	7.9	2.2	A	106
	Right Turn	65	63	96.2%	4.7	1.5	A	5
	Subtotal	985	968	98.3%	14.2	2.3	B	247
EB	Left Turn	285	264	92.6%	381.2	56.8	F	1,845
	Through	845	792	93.8%	375.3	55.3	F	5,451
	Right Turn	180	165	91.7%	342.7	56.5	F	1,037
	Subtotal	1,310	1,221	93.2%	372.4	55.3	F	8,332
WB	Left Turn	85	83	97.1%	63.5	17.4	E	96
	Through	275	274	99.5%	3.0	1.4	A	15
	Right Turn	175	174	99.1%	19.1	3.3	B	61
	Subtotal	535	530	99.0%	18.0	4.4	B	172
Total		4,185	4,049	96.8%	135.2	17.3	F	9,405

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	27	89.3%	20.5	3.9	C	10
	Through	45	40	88.7%	19.4	4.4	B	14
	Right Turn	45	44	98.0%	10.1	4.3	B	8
	Subtotal	120	111	92.3%	15.7	2.5	B	32
SB	Left Turn	45	40	89.8%	22.8	6.1	C	17
	Through	40	39	98.3%	18.7	4.2	B	13
	Right Turn	25	26	102.8%	15.7	5.5	B	7
	Subtotal	110	105	95.8%	19.3	2.5	B	38
EB	Left Turn	70	65	92.1%	7.3	1.9	A	9
	Through	545	532	97.6%	5.9	0.6	A	58
	Right Turn	85	82	96.4%	6.0	1.7	A	9
	Subtotal	700	678	96.9%	6.1	0.6	A	75
WB	Left Turn	40	34	86.0%	16.1	4.0	B	10
	Through	200	180	90.2%	5.9	1.3	A	19
	Right Turn	60	52	86.7%	4.0	1.3	A	4
	Subtotal	300	267	88.9%	6.8	1.2	A	33
Total		1,230	1,161	94.4%	8.3	0.6	A	179

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	60.0%	7.2	10.0	A	0
	Through	5	6	114.0%	15.1	9.0	B	2
	Right Turn	25	24	94.0%	5.7	1.3	A	2
	Subtotal	35	32	92.0%	8.2	3.4	A	4
SB	Left Turn	45	42	93.6%	20.6	4.1	C	16
	Through	15	11	72.7%	21.5	8.8	C	4
	Right Turn	40	40	99.0%	7.4	1.0	A	5
	Subtotal	100	93	92.6%	14.7	2.7	B	26
EB	Left Turn	35	28	79.7%	4.3	1.9	A	2
	Through	615	609	99.1%	4.2	1.2	A	47
	Right Turn	10	6	60.0%	4.5	5.6	A	0
	Subtotal	660	643	97.4%	4.3	1.2	A	50
WB	Left Turn	5	2	44.0%	2.7	3.4	A	0
	Through	185	170	91.8%	2.7	0.6	A	9
	Right Turn	20	22	108.0%	6.0	2.2	A	2
	Subtotal	210	194	92.2%	3.2	0.6	A	11
Total		1,005	962	95.7%	5.6	1.1	A	91

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	65	99.7%	26.7	10.0	C	32
	Through	910	898	98.7%	30.7	11.4	C	505
	Right Turn	140	137	97.6%	31.7	10.3	C	79
	Subtotal	1,115	1,099	98.6%	30.6	11.0	C	616
SB	Left Turn	115	111	96.2%	32.6	4.3	C	66
	Through	675	675	100.0%	17.2	2.2	B	213
	Right Turn	60	53	88.0%	17.1	4.2	B	17
	Subtotal	850	838	98.6%	19.2	2.3	B	296
EB	Left Turn	150	151	100.5%	52.2	18.1	D	144
	Through	295	291	98.8%	59.8	15.8	E	320
	Right Turn	190	192	100.9%	37.1	16.3	D	130
	Subtotal	635	634	99.8%	51.2	16.5	D	594
WB	Left Turn	125	111	88.4%	43.3	15.0	D	88
	Through	135	130	96.1%	30.0	4.0	C	71
	Right Turn	40	37	92.8%	7.0	2.1	A	5
	Subtotal	300	277	92.5%	32.1	6.8	C	164
Total		2,900	2,849	98.2%	32.5	6.7	C	1,670

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	5	98.0%	3.4	2.3	A	0
	Through	560	560	100.1%	0.6	0.1	A	6
	Right Turn	85	88	103.5%	0.9	0.1	A	2
	Subtotal	650	653	100.5%	0.7	0.1	A	8
SB	Left Turn	45	41	90.2%	6.3	2.3	A	5
	Through	335	338	100.8%	0.5	0.2	A	3
	Right Turn	15	10	63.3%	0.5	0.2	A	0
	Subtotal	395	388	98.2%	1.1	0.3	A	8
EB	Left Turn	15	13	89.3%	20.4	7.4	C	5
	Through	5	1	18.0%	5.7	13.2	A	0
	Right Turn	5	1	20.0%	0.5	1.6	A	0
	Subtotal	25	15	61.2%	20.0	7.1	C	5
WB	Left Turn	65	62	95.1%	25.0	16.0	D	28
	Through	5	5	100.0%	15.1	9.2	C	1
	Right Turn	80	81	101.1%	19.7	12.7	C	29
	Subtotal	150	148	98.5%	22.2	13.7	C	59
Total		1,220	1,204	98.7%	3.3	1.3	A	80

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	929	89.3%	22.7	11.7	C	387
	Right Turn	520	461	88.6%	25.0	8.7	C	211
	Subtotal	1,560	1,390	89.1%	23.5	10.6	C	598
SB	Left Turn	120	110	92.0%	134.9	43.4	F	273
	Through	1,175	1,121	95.4%	78.3	27.3	E	1608
	Right Turn							
	Subtotal	1,295	1,231	95.1%	83.1	28.5	F	1881
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	489	80.8%	445.1	179.8	F	3987
	Through							
	Right Turn	190	160	84.1%	267.8	144.2	F	785
	Subtotal	795	648	81.6%	403.5	178.5	F	4771
Total		3,650	3,269	89.6%	97.4	21.3	F	7250

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	73	85.6%	110.5	62.7	F	147
	Through	1,460	1,314	90.0%	17.7	14.6	B	427
	Right Turn	70	59	83.9%	14.8	13.0	B	16
	Subtotal	1,615	1,445	89.5%	22.8	15.3	C	590
SB	Left Turn	25	19	77.2%	102.2	27.6	F	36
	Through	1,685	1,506	89.4%	41.6	6.5	D	1149
	Right Turn	75	65	86.9%	41.5	8.6	D	50
	Subtotal	1,785	1,591	89.1%	42.4	6.6	D	1234
EB	Left Turn	75	65	86.9%	274.0	134.3	F	328
	Through	30	29	97.7%	274.6	127.3	F	147
	Right Turn	75	66	88.1%	282.5	133.3	F	342
	Subtotal	180	161	89.2%	278.2	131.9	F	817
WB	Left Turn	70	60	85.3%	97.0	44.9	F	106
	Through	30	34	111.7%	95.2	52.2	F	58
	Right Turn	30	22	73.3%	49.7	34.2	D	20
	Subtotal	130	115	88.6%	87.2	42.6	F	185
Total		3,710	3,312	89.3%	46.8	8.6	D	2827

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	273	85.3%	291.5	60.9	F	1459
	Through	1,215	1,095	90.1%	181.0	33.2	F	3633
	Right Turn	70	62	88.6%	154.5	30.0	F	176
	Subtotal	1,605	1,430	89.1%	199.7	38.3	F	5268
SB	Left Turn	15	12	82.0%	82.1	45.1	F	19
	Through	1,295	1,141	88.1%	50.3	8.8	D	1052
	Right Turn	505	462	91.4%	23.8	3.6	C	201
	Subtotal	1,815	1,615	89.0%	43.2	6.3	D	1271
EB	Left Turn	380	353	92.9%	70.7	18.5	E	457
	Through	55	55	99.3%	73.2	20.1	E	73
	Right Turn	445	403	90.5%	49.2	13.8	D	363
	Subtotal	880	810	92.1%	60.3	11.7	E	894
WB	Left Turn	75	71	95.1%	53.2	8.7	D	70
	Through	45	45	99.6%	46.6	9.7	D	38
	Right Turn	10	6	58.0%	17.1	12.2	B	2
	Subtotal	130	122	93.8%	49.3	7.3	D	110
Total		4,430	3,977	89.8%	102.5	10.6	F	7543

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,452	94.6%	29.5	17.0	C	786
	Right Turn	65	58	88.6%	23.8	12.6	C	25
	Subtotal	1,600	1,509	94.3%	29.3	16.8	C	811
SB	Left Turn	115	93	80.9%	199.8	45.1	F	341
	Through	1,650	1,397	84.7%	128.5	31.6	F	3292
	Right Turn							
	Subtotal	1,765	1,490	84.4%	133.6	31.2	F	3633
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	141	97.3%	69.6	13.4	E	180
	Through							
	Right Turn	190	183	96.2%	54.7	31.0	D	183
	Subtotal	335	324	96.7%	61.8	21.6	E	363
Total		3,700	3,323	89.8%	79.6	15.9	E	4807

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	182	93.3%	144.0	42.4	F	480
	Through	1,100	1,056	96.0%	124.1	53.3	F	2403
	Right Turn	170	155	91.1%	106.4	54.6	F	302
	Subtotal	1,465	1,393	95.1%	125.3	51.3	F	3185
SB	Left Turn	265	242	91.4%	83.8	20.7	F	372
	Through	1,310	1,102	84.1%	39.5	4.7	D	798
	Right Turn	220	181	82.1%	24.5	3.3	C	81
	Subtotal	1,795	1,525	85.0%	45.2	5.9	D	1251
EB	Left Turn	195	183	93.9%	74.2	15.1	E	249
	Through	480	478	99.6%	41.9	3.9	D	368
	Right Turn	195	195	100.1%	22.4	4.4	C	80
	Subtotal	870	857	98.4%	43.8	4.3	D	697
WB	Left Turn	240	228	94.8%	110.6	31.7	F	461
	Through	775	751	96.9%	96.7	38.3	F	1331
	Right Turn	310	289	93.2%	110.5	70.8	F	585
	Subtotal	1,325	1,267	95.6%	102.3	42.2	F	2377
Total		5,455	5,042	92.4%	80.6	22.4	F	7510

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	167	92.7%	74.2	39.6	E	227
	Through	125	114	91.0%	57.6	38.9	E	120
	Right Turn	100	96	96.2%	51.8	35.1	D	91
	Subtotal	405	377	93.0%	63.2	38.6	E	438
SB	Left Turn	85	79	93.3%	23.8	8.6	C	35
	Through	115	109	94.9%	18.4	4.9	B	37
	Right Turn	60	61	101.5%	18.0	4.9	B	20
	Subtotal	260	249	95.9%	20.0	4.9	C	91
EB	Left Turn	70	64	91.9%	20.7	4.7	C	24
	Through	575	563	97.9%	8.5	0.8	A	88
	Right Turn	110	106	96.3%	9.2	1.7	A	18
	Subtotal	755	733	97.1%	9.6	0.6	A	130
WB	Left Turn	105	97	92.8%	38.3	13.5	D	68
	Through	555	523	94.2%	10.0	0.9	B	96
	Right Turn	90	74	82.4%	10.5	2.0	B	14
	Subtotal	750	695	92.6%	14.4	3.1	B	179
Total		2,170	2,053	94.6%	23.3	7.7	C	838

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	40.0%	5.1	11.8	A	0
	Through	30	25	83.0%	21.3	7.6	C	10
	Right Turn	40	36	90.0%	7.6	2.2	A	5
	Subtotal	75	63	83.9%	13.2	3.8	B	15
SB	Left Turn	45	42	92.4%	18.4	4.0	B	14
	Through	25	25	101.6%	23.4	5.5	C	11
	Right Turn	85	85	99.5%	14.9	7.4	B	23
	Subtotal	155	152	97.8%	17.1	4.1	B	48
EB	Left Turn	55	51	92.7%	36.1	23.7	D	34
	Through	605	582	96.2%	7.0	1.5	A	75
	Right Turn	10	6	58.0%	8.9	9.2	A	1
	Subtotal	670	639	95.4%	9.4	3.0	A	110
WB	Left Turn	45	43	94.9%	8.9	3.1	A	7
	Through	705	661	93.7%	10.4	5.9	B	125
	Right Turn	55	57	102.7%	12.1	10.0	B	12
	Subtotal	805	760	94.4%	10.4	5.7	B	145
Total		1,705	1,613	94.6%	10.8	4.0	B	317

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	150	96.9%	42.8	16.0	D	118
	Through	655	656	100.1%	27.1	5.4	C	326
	Right Turn	150	145	96.4%	24.1	5.4	C	64
	Subtotal	960	951	99.0%	29.3	7.0	C	507
SB	Left Turn	120	116	96.4%	75.6	16.1	E	160
	Through	870	844	97.0%	59.5	11.3	E	920
	Right Turn	95	85	89.1%	56.8	12.2	E	88
	Subtotal	1,085	1,044	96.3%	61.1	11.1	E	1169
EB	Left Turn	185	177	95.6%	143.1	90.2	F	464
	Through	345	332	96.2%	101.3	67.3	F	616
	Right Turn	140	131	93.4%	80.7	66.2	F	194
	Subtotal	670	639	95.4%	108.8	73.4	F	1274
WB	Left Turn	205	191	93.0%	66.9	22.2	E	234
	Through	365	340	93.1%	51.3	25.7	D	320
	Right Turn	90	80	88.3%	20.3	15.5	C	30
	Subtotal	660	610	92.4%	51.6	22.5	D	583
Total		3,375	3,244	96.1%	57.7	12.5	E	3533

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	56.0%	4.1	3.9	A	0
	Through	365	362	99.3%	0.5	0.2	A	4
	Right Turn	95	98	103.5%	0.9	0.2	A	2
	Subtotal	465	464	99.7%	0.7	0.2	A	5
SB	Left Turn	85	86	101.4%	5.2	1.6	A	8
	Through	610	603	98.9%	0.6	0.1	A	7
	Right Turn	10	8	78.0%	0.7	0.5	A	0
	Subtotal	705	697	98.9%	1.2	0.2	A	15
EB	Left Turn	5	3	54.0%	9.1	12.3	A	0
	Through							
	Right Turn	5	4	76.0%	3.7	2.6	A	0
	Subtotal	10	7	65.0%	8.6	6.8	A	1
WB	Left Turn	80	74	92.4%	29.3	6.4	D	40
	Through	10	6	56.0%	28.1	13.6	D	3
	Right Turn	80	72	90.0%	14.5	1.7	B	19
	Subtotal	170	152	89.1%	22.8	3.8	C	62
Total		1,350	1,319	97.7%	3.6	0.7	A	83

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 TSM Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	828	97.4%	5.1	2.0	A	78
	Right Turn	490	469	95.6%	8.0	1.5	A	69
	Subtotal	1,340	1,297	96.8%	6.2	1.5	A	146
SB	Left Turn	155	158	101.7%	30.0	5.4	C	87
	Through	790	789	99.9%	12.9	1.5	B	187
	Right Turn							
	Subtotal	945	947	100.2%	16.1	2.1	B	273
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	144	93.1%	47.4	6.0	D	125
	Through							
	Right Turn	75	72	95.3%	11.6	2.2	B	15
	Subtotal	230	216	93.8%	35.9	3.7	D	141
Total		2,515	2,459	97.8%	14.0	1.6	B	560

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	15	72.5%	13.1	12.2	B	3
	Through	1,260	1,216	96.5%	4.7	1.8	A	104
	Right Turn	45	46	101.3%	3.8	2.0	A	3
	Subtotal	1,325	1,276	96.3%	4.8	1.8	A	111
SB	Left Turn	20	14	70.0%	38.0	25.1	D	10
	Through	905	901	99.6%	6.9	1.4	A	114
	Right Turn	25	22	88.0%	5.4	2.9	A	2
	Subtotal	950	937	98.6%	7.4	1.4	A	126
EB	Left Turn	65	64	98.8%	57.9	15.1	E	68
	Through	30	38	125.7%	67.0	13.1	E	46
	Right Turn	45	40	88.7%	62.9	15.7	E	46
	Subtotal	140	142	101.3%	61.5	13.1	E	160
WB	Left Turn	25	19	76.0%	45.9	20.3	D	16
	Through	25	33	130.4%	45.7	10.5	D	27
	Right Turn	25	21	85.2%	14.2	5.4	B	6
	Subtotal	75	73	97.2%	36.3	10.1	D	49
Total		2,490	2,428	97.5%	10.4	1.1	B	446

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	165	97.1%	36.1	9.8	D	109
	Through	1,005	964	95.9%	12.1	3.1	B	213
	Right Turn	70	65	92.6%	11.6	5.3	B	14
	Subtotal	1,245	1,194	95.9%	15.4	3.5	B	336
SB	Left Turn	30	26	86.3%	42.4	19.8	D	20
	Through	775	774	99.8%	8.9	2.0	A	126
	Right Turn	170	159	93.6%	3.4	0.8	A	10
	Subtotal	975	959	98.3%	9.0	1.5	A	156
EB	Left Turn	315	313	99.2%	49.4	9.9	D	283
	Through	35	33	93.7%	60.3	28.2	E	36
	Right Turn	360	359	99.7%	59.7	33.5	E	393
	Subtotal	710	704	99.2%	55.2	22.1	E	712
WB	Left Turn	20	17	83.5%	41.5	26.0	D	13
	Through	10	5	52.0%	18.8	25.4	B	2
	Right Turn	10	6	55.0%	5.5	9.1	A	1
	Subtotal	40	27	68.5%	38.3	10.1	D	15
Total		2,970	2,884	97.1%	22.9	4.9	C	1,219

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 TSM Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,378	98.8%	4.2	1.0	A	107
	Right Turn	185	180	97.0%	5.4	1.3	A	18
	Subtotal	1,580	1,557	98.6%	4.4	1.1	A	125
SB	Left Turn	150	142	94.3%	55.9	10.9	E	145
	Through	910	910	100.0%	6.9	1.8	A	116
	Right Turn							
	Subtotal	1,060	1,051	99.2%	14.2	3.9	B	261
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	74	98.1%	43.2	9.8	D	58
	Through							
	Right Turn	45	43	95.3%	4.4	0.6	A	3
	Subtotal	120	117	97.1%	29.3	8.8	C	62
Total		2,760	2,725	98.7%	9.0	2.1	A	447

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	63	90.4%	32.1	10.1	C	37
	Through	1,120	1,116	99.6%	30.4	5.6	C	621
	Right Turn	165	151	91.8%	22.3	6.8	C	62
	Subtotal	1,355	1,330	98.2%	29.7	5.4	C	721
SB	Left Turn	175	178	101.6%	51.3	14.8	D	167
	Through	745	734	98.5%	9.1	1.7	A	122
	Right Turn	65	69	105.4%	2.6	0.6	A	3
	Subtotal	985	980	99.5%	16.3	3.6	B	293
EB	Left Turn	285	263	92.1%	404.1	41.8	F	1,945
	Through	845	789	93.4%	390.4	40.2	F	5,647
	Right Turn	180	165	91.5%	355.0	40.3	F	1,072
	Subtotal	1,310	1,216	92.8%	389.4	39.8	F	8,664
WB	Left Turn	85	83	97.5%	60.9	14.1	E	93
	Through	275	276	100.5%	43.1	3.6	D	218
	Right Turn	175	173	98.9%	18.1	2.3	B	57
	Subtotal	535	532	99.5%	38.1	3.2	D	368
Total		4,185	4,059	97.0%	140.5	9.1	F	10,046

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	30	100.3%	19.1	2.7	B	11
	Through	45	42	92.9%	19.7	5.5	B	15
	Right Turn	45	42	94.2%	11.5	4.0	B	9
	Subtotal	120	114	95.3%	16.4	3.7	B	35
SB	Left Turn	45	42	93.3%	20.9	3.5	C	16
	Through	40	37	93.3%	20.6	5.4	C	14
	Right Turn	25	26	105.2%	15.2	6.9	B	7
	Subtotal	110	106	96.0%	19.3	3.2	B	38
EB	Left Turn	70	68	97.1%	7.3	3.8	A	9
	Through	545	527	96.6%	5.7	1.5	A	55
	Right Turn	85	82	95.9%	6.2	1.5	A	9
	Subtotal	700	676	96.6%	6.0	1.5	A	74
WB	Left Turn	40	35	86.8%	13.4	4.0	B	9
	Through	200	182	90.9%	5.2	1.0	A	17
	Right Turn	60	50	83.0%	3.3	1.0	A	3
	Subtotal	300	266	88.8%	6.0	1.4	A	29
Total		1,230	1,162	94.5%	8.1	1.2	A	175

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040 TSM Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	64.0%	5.8	9.2	A	0
	Through	5	5	96.0%	13.4	10.8	B	1
	Right Turn	25	24	95.2%	6.5	2.8	A	3
	Subtotal	35	32	90.9%	9.6	4.1	A	4
SB	Left Turn	45	43	95.6%	23.0	2.6	C	18
	Through	15	10	67.3%	19.6	7.8	B	4
	Right Turn	40	46	113.8%	7.5	1.3	A	6
	Subtotal	100	99	98.6%	15.8	1.7	B	28
EB	Left Turn	35	39	111.1%	11.1	3.3	B	8
	Through	615	607	98.8%	5.2	1.1	A	58
	Right Turn	10	6	59.0%	3.1	3.7	A	0
	Subtotal	660	652	98.8%	5.5	1.1	A	66
WB	Left Turn	5	3	60.0%	5.7	8.4	A	0
	Through	185	174	93.8%	6.6	0.9	A	21
	Right Turn	20	23	113.0%	6.5	2.6	A	3
	Subtotal	210	199	94.8%	6.6	1.0	A	24
Total		1,005	982	97.7%	7.4	1.0	A	123

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	62	94.8%	24.4	6.0	C	28
	Through	910	914	100.5%	27.4	7.8	C	460
	Right Turn	140	133	95.0%	27.2	7.9	C	66
	Subtotal	1,115	1,109	99.5%	27.3	7.5	C	554
SB	Left Turn	115	109	94.8%	33.5	5.1	C	67
	Through	675	674	99.8%	17.8	2.0	B	220
	Right Turn	60	57	95.5%	16.9	5.9	B	18
	Subtotal	850	840	98.8%	19.8	1.9	B	305
EB	Left Turn	150	151	100.7%	45.8	11.3	D	127
	Through	295	295	100.0%	54.2	10.8	D	293
	Right Turn	190	194	102.1%	32.0	8.5	C	114
	Subtotal	635	640	100.8%	45.6	10.1	D	534
WB	Left Turn	125	117	93.5%	45.2	22.2	D	97
	Through	135	136	100.7%	31.5	5.3	C	78
	Right Turn	40	40	99.5%	6.2	2.0	A	5
	Subtotal	300	293	97.5%	34.1	12.0	C	180
Total		2,900	2,882	99.4%	30.2	5.2	C	1,572

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	4	86.0%	2.4	2.9	A	0
	Through	560	569	101.6%	0.7	0.1	A	7
	Right Turn	85	85	99.4%	1.0	0.2	A	2
	Subtotal	650	658	101.2%	0.8	0.1	A	9
SB	Left Turn	45	40	89.6%	8.0	2.7	A	6
	Through	335	339	101.2%	0.4	0.1	A	2
	Right Turn	15	11	70.0%	0.3	0.3	A	0
	Subtotal	395	390	98.7%	1.2	0.4	A	8
EB	Left Turn	15	14	94.7%	21.2	11.3	C	6
	Through	5	7	142.0%	29.2	8.5	D	4
	Right Turn	5	1	24.0%	4.4	8.8	A	0
	Subtotal	25	23	90.0%	23.9	7.2	C	9
WB	Left Turn	65	58	89.2%	31.4	13.7	D	33
	Through	5	11	222.0%	61.6	22.5	F	13
	Right Turn	80	78	97.6%	22.5	17.0	C	32
	Subtotal	150	147	98.1%	29.7	14.2	D	78
Total		1,220	1,217	99.8%	4.7	1.4	A	105

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 TSM Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	908	87.3%	17.0	4.4	B	283
	Right Turn	520	452	86.9%	22.7	5.2	C	188
	Subtotal	1,560	1,360	87.2%	18.9	4.6	B	471
SB	Left Turn	120	104	86.9%	170.2	70.3	F	325
	Through	1,175	1,125	95.7%	75.4	25.2	E	1555
	Right Turn							
	Subtotal	1,295	1,229	94.9%	83.8	29.7	F	1880
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	511	84.5%	407.3	177.7	F	3818
	Through							
	Right Turn	190	161	84.5%	221.3	120.1	F	651
	Subtotal	795	672	84.5%	364.0	170.5	F	4469
Total		3,650	3,261	89.3%	98.1	15.7	F	6821

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	72	84.9%	87.9	30.2	F	116
	Through	1,460	1,273	87.2%	12.3	9.9	B	288
	Right Turn	70	55	79.0%	12.6	9.8	B	13
	Subtotal	1,615	1,401	86.7%	16.5	10.5	B	417
SB	Left Turn	25	20	79.2%	87.9	40.6	F	32
	Through	1,685	1,534	91.1%	36.8	5.6	D	1036
	Right Turn	75	67	89.3%	39.7	6.8	D	49
	Subtotal	1,785	1,621	90.8%	37.5	5.7	D	1116
EB	Left Turn	75	68	90.3%	171.1	68.6	F	212
	Through	30	38	125.3%	176.5	58.8	F	122
	Right Turn	75	66	88.0%	170.6	73.5	F	206
	Subtotal	180	171	95.2%	170.6	67.5	F	540
WB	Left Turn	70	57	81.0%	58.4	16.3	E	61
	Through	30	39	131.3%	59.3	13.8	E	43
	Right Turn	30	22	74.3%	23.8	10.5	C	10
	Subtotal	130	118	91.1%	53.9	9.9	D	113
Total		3,710	3,311	89.3%	37.3	7.9	D	2187

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	255	79.6%	326.9	44.9	F	1527
	Through	1,215	1,064	87.6%	205.1	23.3	F	4003
	Right Turn	70	60	85.9%	182.7	23.5	F	201
	Subtotal	1,605	1,379	85.9%	225.4	27.8	F	5731
SB	Left Turn	15	12	78.7%	58.5	34.8	E	13
	Through	1,295	1,159	89.5%	42.8	7.5	D	910
	Right Turn	505	471	93.2%	26.5	4.4	C	229
	Subtotal	1,815	1,641	90.4%	38.4	5.6	D	1151
EB	Left Turn	380	332	87.4%	91.4	22.6	F	557
	Through	55	52	94.0%	92.6	20.5	F	88
	Right Turn	445	374	84.0%	107.9	11.5	F	739
	Subtotal	880	758	86.1%	100.5	10.5	F	1383
WB	Left Turn	75	73	96.8%	55.4	9.2	E	74
	Through	45	43	95.8%	49.9	11.7	D	39
	Right Turn	10	6	63.0%	23.8	26.3	C	3
	Subtotal	130	122	93.8%	52.3	7.4	D	116
Total		4,430	3,900	88.0%	115.0	9.5	F	8381

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 TSM Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,405	91.5%	38.1	14.9	D	980
	Right Turn	65	59	90.5%	31.5	13.1	C	34
	Subtotal	1,600	1,464	91.5%	37.8	14.8	D	1014
SB	Left Turn	115	87	75.5%	184.5	49.3	F	294
	Through	1,650	1,404	85.1%	110.8	50.3	F	2853
	Right Turn							
	Subtotal	1,765	1,491	84.5%	115.7	49.5	F	3147
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	142	98.1%	89.8	41.3	F	234
	Through							
	Right Turn	190	180	94.6%	78.2	53.9	E	258
	Subtotal	335	322	96.1%	84.1	48.0	F	492
Total		3,700	3,277	88.6%	78.8	25.4	E	4653

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	170	87.3%	232.0	73.9	F	724
	Through	1,100	1,008	91.6%	218.9	74.7	F	4044
	Right Turn	170	143	84.1%	190.7	67.5	F	500
	Subtotal	1,465	1,321	90.2%	217.8	73.3	F	5268
SB	Left Turn	265	239	90.2%	75.3	19.4	E	330
	Through	1,310	1,109	84.6%	33.4	8.7	C	679
	Right Turn	220	187	85.1%	20.2	6.9	C	69
	Subtotal	1,795	1,535	85.5%	38.5	9.3	D	1079
EB	Left Turn	195	187	95.7%	85.3	14.5	F	292
	Through	480	477	99.4%	43.5	5.0	D	381
	Right Turn	195	197	100.8%	23.7	4.1	C	85
	Subtotal	870	861	98.9%	47.6	4.9	D	758
WB	Left Turn	240	228	95.2%	121.5	40.3	F	509
	Through	775	726	93.7%	118.2	48.3	F	1573
	Right Turn	310	287	92.5%	157.3	85.0	F	827
	Subtotal	1,325	1,241	93.7%	127.9	54.3	F	2909
Total		5,455	4,957	90.9%	105.5	24.3	F	10014

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	171	94.7%	87.8	65.6	F	274
	Through	125	112	89.4%	82.5	95.2	F	169
	Right Turn	100	93	93.1%	78.5	82.9	E	134
	Subtotal	405	375	92.7%	84.2	78.5	F	577
SB	Left Turn	85	80	94.4%	32.4	22.6	C	48
	Through	115	106	91.8%	18.0	4.2	B	35
	Right Turn	60	62	102.7%	18.5	5.3	B	21
	Subtotal	260	247	95.2%	22.5	8.3	C	103
EB	Left Turn	70	66	94.4%	34.6	37.0	C	42
	Through	575	564	98.1%	27.0	42.2	C	279
	Right Turn	110	106	95.9%	20.2	30.9	C	39
	Subtotal	755	736	97.4%	26.6	40.1	C	360
WB	Left Turn	105	89	84.5%	77.4	116.6	E	126
	Through	555	513	92.3%	9.6	1.1	A	90
	Right Turn	90	74	81.7%	9.7	1.9	A	13
	Subtotal	750	675	90.0%	14.3	4.6	B	229
Total		2,170	2,033	93.7%	31.7	25.0	C	1269

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	46.0%	2.4	5.0	A	0
	Through	30	23	75.3%	24.2	6.7	C	10
	Right Turn	40	35	88.3%	8.0	3.5	A	5
	Subtotal	75	60	80.3%	14.9	5.7	B	15
SB	Left Turn	45	42	93.3%	25.6	2.7	C	20
	Through	25	27	108.0%	25.3	4.8	C	13
	Right Turn	85	85	100.2%	15.8	4.3	B	25
	Subtotal	155	154	99.5%	20.2	2.8	C	57
EB	Left Turn	55	58	105.5%	18.3	7.0	B	19
	Through	605	591	97.7%	6.7	1.1	A	72
	Right Turn	10	7	66.0%	5.5	5.2	A	1
	Subtotal	670	655	97.8%	7.8	1.4	A	92
WB	Left Turn	45	45	99.8%	12.1	4.4	B	10
	Through	705	652	92.5%	11.5	2.9	B	138
	Right Turn	55	55	99.3%	12.6	4.3	B	13
	Subtotal	805	752	93.4%	11.7	2.8	B	161
Total		1,705	1,621	95.1%	11.1	2.1	B	325

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	151	97.5%	40.1	8.4	D	111
	Through	655	646	98.6%	26.9	3.3	C	318
	Right Turn	150	147	97.9%	25.8	4.2	C	69
	Subtotal	960	944	98.3%	28.8	3.9	C	499
SB	Left Turn	120	118	98.1%	75.5	16.8	E	163
	Through	870	843	96.9%	56.9	11.8	E	880
	Right Turn	95	84	88.2%	54.4	14.9	D	84
	Subtotal	1,085	1,045	96.3%	58.8	12.3	E	1127
EB	Left Turn	185	177	95.5%	106.8	78.4	F	346
	Through	345	342	99.2%	77.7	55.5	E	488
	Right Turn	140	132	94.5%	55.9	51.6	E	136
	Subtotal	670	651	97.2%	81.5	61.5	F	969
WB	Left Turn	205	187	91.1%	79.7	49.9	E	273
	Through	365	335	91.7%	49.1	16.2	D	301
	Right Turn	90	81	89.4%	14.9	9.5	B	22
	Subtotal	660	602	91.2%	53.3	22.7	D	596
Total		3,375	3,242	96.0%	52.7	12.3	D	3190

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	54.0%	4.1	4.0	A	0
	Through	365	360	98.5%	0.5	0.1	A	4
	Right Turn	95	96	100.5%	1.0	0.1	A	2
	Subtotal	465	458	98.4%	0.7	0.1	A	6
SB	Left Turn	85	80	93.6%	5.4	1.4	A	8
	Through	610	605	99.1%	0.6	0.2	A	7
	Right Turn	10	8	75.0%	0.6	0.4	A	0
	Subtotal	705	692	98.1%	1.2	0.3	A	15
EB	Left Turn	5	2	46.0%	4.9	8.8	A	0
	Through							
	Right Turn	5	4	76.0%	2.5	2.6	A	0
	Subtotal	10	6	61.0%	6.2	7.2	A	0
WB	Left Turn	80	70	87.1%	32.4	6.1	D	41
	Through	10	6	57.0%	24.2	27.9	C	3
	Right Turn	80	73	90.8%	14.7	2.9	B	20
	Subtotal	170	148	87.1%	23.2	3.9	C	64
Total		1,350	1,304	96.6%	3.6	0.5	A	84

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	822	96.7%	6.3	2.7	A	95
	Right Turn	490	464	94.6%	8.3	2.3	A	70
	Subtotal	1,340	1,285	95.9%	7.0	2.3	A	165
SB	Left Turn	155	160	103.0%	30.9	5.4	C	90
	Through	790	781	98.8%	13.2	2.2	B	190
	Right Turn							
	Subtotal	945	940	99.5%	16.4	2.5	B	280
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	145	93.6%	45.4	5.6	D	121
	Through							
	Right Turn	75	70	92.8%	11.8	3.3	B	15
	Subtotal	230	215	93.3%	34.7	4.1	C	136
Total		2,515	2,440	97.0%	14.4	1.8	B	581

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	16	81.5%	15.8	7.2	B	5
	Through	1,260	1,204	95.5%	1.6	0.4	A	35
	Right Turn	45	48	106.7%	2.3	0.8	A	2
	Subtotal	1,325	1,268	95.7%	1.8	0.4	A	42
SB	Left Turn	20	13	66.5%	21.0	15.4	C	5
	Through	905	895	98.9%	5.7	1.2	A	94
	Right Turn	25	21	83.2%	3.5	2.8	A	1
	Subtotal	950	929	97.8%	6.0	1.3	A	101
EB	Left Turn	65	65	100.2%	55.4	8.8	E	66
	Through	30	44	145.3%	49.4	9.5	D	39
	Right Turn	45	44	98.7%	50.2	11.8	D	41
	Subtotal	140	153	109.4%	52.6	8.9	D	146
WB	Left Turn	25	20	79.6%	38.4	14.7	D	14
	Through	25	33	133.6%	37.1	10.7	D	23
	Right Turn	25	20	78.4%	13.2	5.6	B	5
	Subtotal	75	73	97.2%	32.0	8.1	C	41
Total		2,490	2,423	97.3%	8.4	1.0	A	330

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	163	95.6%	49.2	13.3	D	147
	Through	1,005	964	95.9%	15.3	2.4	B	270
	Right Turn	70	62	88.7%	11.9	3.0	B	14
	Subtotal	1,245	1,188	95.4%	19.8	3.5	B	430
SB	Left Turn	30	26	85.7%	54.9	14.9	D	26
	Through	775	770	99.4%	10.8	1.8	B	153
	Right Turn	170	162	95.5%	5.6	2.0	A	17
	Subtotal	975	958	98.3%	11.2	1.8	B	196
EB	Left Turn	315	298	94.7%	59.3	9.4	E	324
	Through	35	30	84.6%	57.6	13.4	E	31
	Right Turn	360	348	96.5%	50.1	7.5	D	319
	Subtotal	710	675	95.1%	54.6	7.7	D	675
WB	Left Turn	20	18	89.0%	38.7	26.1	D	13
	Through	10	5	49.0%	15.8	25.6	B	1
	Right Turn	10	5	48.0%	17.3	25.4	B	2
	Subtotal	40	28	68.8%	41.4	18.6	D	16
Total		2,970	2,849	95.9%	25.5	2.2	C	1316

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,373	98.4%	4.3	1.2	A	109
	Right Turn	185	177	95.4%	5.4	1.7	A	18
	Subtotal	1,580	1,550	98.1%	4.5	1.2	A	127
SB	Left Turn	150	139	92.5%	61.9	10.8	E	157
	Through	910	898	98.6%	10.1	2.6	B	166
	Right Turn							
	Subtotal	1,060	1,036	97.8%	17.8	4.5	B	323
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	74	98.5%	44.8	9.5	D	61
	Through							
	Right Turn	45	44	96.7%	5.5	2.3	A	4
	Subtotal	120	117	97.8%	29.9	7.1	C	65
Total		2,760	2,703	97.9%	10.5	2.3	B	515

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	66	94.3%	37.3	7.3	D	45
	Through	1,120	1,108	98.9%	32.3	7.3	C	656
	Right Turn	165	157	95.0%	22.7	6.2	C	65
	Subtotal	1,355	1,330	98.2%	31.6	6.9	C	767
SB	Left Turn	175	174	99.1%	44.7	10.2	D	142
	Through	745	723	97.1%	5.5	0.9	A	74
	Right Turn	65	68	104.3%	1.8	0.5	A	2
	Subtotal	985	964	97.9%	12.6	2.8	B	218
EB	Left Turn	285	266	93.3%	406.2	31.3	F	1980
	Through	845	788	93.3%	391.3	33.2	F	5654
	Right Turn	180	170	94.6%	355.0	38.8	F	1108
	Subtotal	1,310	1,224	93.5%	390.1	31.9	F	8743
WB	Left Turn	85	82	96.6%	52.8	6.0	D	79
	Through	275	279	101.6%	41.5	3.9	D	212
	Right Turn	175	171	97.8%	18.7	3.3	B	59
	Subtotal	535	533	99.6%	36.1	2.8	D	351
Total		4,185	4,052	96.8%	141.4	11.1	F	10078

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	28	93.0%	34.6	11.9	C	18
	Through	45	39	86.4%	28.6	8.5	C	20
	Right Turn	45	42	94.0%	11.1	5.6	B	9
	Subtotal	120	109	90.9%	22.6	8.3	C	47
SB	Left Turn	45	18	39.6%	37.8	11.6	D	12
	Through	40	0	0.0%	0.0	0.0	A	0
	Right Turn	25	89	356.0%	6.6	1.3	A	11
	Subtotal	110	107	97.1%	12.3	2.9	B	23
EB	Left Turn	70	66	94.3%	47.6	5.3	D	58
	Through	545	531	97.3%	13.9	2.9	B	135
	Right Turn	85	77	90.7%	11.9	4.5	B	17
	Subtotal	700	674	96.2%	16.8	3.0	B	209
WB	Left Turn	40	34	84.5%	39.5	10.9	D	24
	Through	200	183	91.6%	10.9	3.5	B	37
	Right Turn	60	50	82.5%	6.4	3.8	A	6
	Subtotal	300	267	88.8%	13.9	3.7	B	67
Total		1,230	1,156	94.0%	16.3	2.9	B	346

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 Traffic Calming Alt**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	56.0%	10.4	17.5	B	1
	Through	5	6	118.0%	12.1	16.1	B	1
	Right Turn	25	25	100.4%	29.6	11.9	C	14
	Subtotal	35	34	96.6%	29.4	10.0	C	15
SB	Left Turn	45	44	97.1%	26.9	6.8	C	22
	Through	15	10	68.0%	22.6	22.5	C	4
	Right Turn	40	42	105.0%	27.3	6.6	C	21
	Subtotal	100	96	95.9%	27.6	4.8	C	47
EB	Left Turn	35	37	105.7%	61.7	37.2	E	42
	Through	615	602	97.8%	10.3	9.1	B	114
	Right Turn	10	6	63.0%	10.2	17.8	B	1
	Subtotal	660	645	97.7%	13.2	11.9	B	157
WB	Left Turn	5	3	64.0%	17.6	24.1	B	1
	Through	185	153	82.9%	6.9	2.3	A	19
	Right Turn	20	36	179.5%	6.2	2.2	A	4
	Subtotal	210	193	91.7%	7.2	2.2	A	25
Total		1,005	967	96.2%	13.6	8.1	B	243

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	60	92.9%	70.3	9.9	E	78
	Through	910	866	95.1%	87.4	10.0	F	1386
	Right Turn	140	126	90.2%	91.0	10.6	F	211
	Subtotal	1,115	1,052	94.4%	86.9	9.4	F	1675
SB	Left Turn	115	110	95.9%	39.6	7.7	D	80
	Through	675	676	100.1%	24.0	2.4	C	297
	Right Turn	60	59	97.7%	26.3	6.3	C	28
	Subtotal	850	845	99.4%	26.3	2.5	C	406
EB	Left Turn	150	148	98.7%	220.8	78.9	F	599
	Through	295	293	99.2%	168.7	70.8	F	905
	Right Turn	190	188	99.1%	209.8	68.5	F	724
	Subtotal	635	629	99.1%	193.7	71.8	F	2229
WB	Left Turn	125	102	81.7%	124.4	39.3	F	233
	Through	135	124	92.1%	32.6	11.4	C	74
	Right Turn	40	36	91.0%	34.0	8.2	C	23
	Subtotal	300	263	87.6%	70.3	21.8	E	330
Total		2,900	2,789	96.2%	93.7	14.9	F	4639

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	4	78.0%	5.1	4.1	A	0
	Through	560	564	100.8%	6.4	1.5	A	66
	Right Turn	85	86	100.7%	6.0	1.9	A	9
	Subtotal	650	654	100.6%	6.3	1.5	A	76
SB	Left Turn	45	38	83.3%	4.3	1.5	A	3
	Through	335	345	102.9%	3.8	0.8	A	24
	Right Turn	15	12	76.7%	3.4	3.1	A	1
	Subtotal	395	394	99.7%	3.8	0.7	A	28
EB	Left Turn	15	14	91.3%	5.3	3.6	A	1
	Through	5	7	144.0%	7.3	4.3	A	1
	Right Turn	5	1	16.0%	2.7	4.3	A	0
	Subtotal	25	22	86.8%	6.4	1.8	A	2
WB	Left Turn	65	56	86.2%	10.7	3.0	B	11
	Through	5	11	216.0%	13.1	4.6	B	3
	Right Turn	80	74	92.1%	12.4	5.2	B	17
	Subtotal	150	141	93.7%	11.6	3.8	B	30
Total		1,220	1,210	99.2%	6.2	1.0	A	136

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040 Traffic Calming Alt**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	938	90.1%	23.2	9.1	C	398
	Right Turn	520	459	88.2%	28.3	9.3	C	238
	Subtotal	1,560	1,396	89.5%	24.8	9.0	C	636
SB	Left Turn	120	97	80.7%	265.3	79.3	F	471
	Through	1,175	998	84.9%	168.5	16.4	F	3081
	Right Turn							
	Subtotal	1,295	1,094	84.5%	176.6	19.7	F	3552
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	561	92.8%	239.5	115.1	F	2465
	Through							
	Right Turn	190	173	91.2%	130.3	94.2	F	414
	Subtotal	795	735	92.4%	212.5	107.1	F	2878
Total		3,650	3,225	88.4%	113.5	23.2	F	7066

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	72	84.4%	92.6	19.2	F	122
	Through	1,460	1,315	90.0%	12.7	13.0	B	307
	Right Turn	70	54	76.9%	11.8	14.2	B	12
	Subtotal	1,615	1,440	89.2%	16.4	12.5	B	440
SB	Left Turn	25	21	82.8%	92.1	36.5	F	35
	Through	1,685	1,461	86.7%	43.9	4.0	D	1175
	Right Turn	75	65	86.7%	41.9	8.8	D	50
	Subtotal	1,785	1,546	86.6%	44.3	4.0	D	1259
EB	Left Turn	75	64	85.7%	385.3	126.8	F	454
	Through	30	32	106.3%	389.6	117.9	F	228
	Right Turn	75	61	81.1%	391.2	120.4	F	436
	Subtotal	180	157	87.2%	390.3	122.1	F	1118
WB	Left Turn	70	58	82.4%	114.5	78.9	F	121
	Through	30	36	119.7%	95.8	68.0	F	63
	Right Turn	30	24	80.0%	70.3	40.4	E	31
	Subtotal	130	118	90.5%	99.6	67.3	F	215
Total		3,710	3,261	87.9%	50.5	6.2	D	3033

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	280	87.6%	271.9	62.4	F	1397
	Through	1,215	1,108	91.2%	179.5	40.2	F	3646
	Right Turn	70	65	92.9%	157.6	36.2	F	188
	Subtotal	1,605	1,453	90.5%	196.1	44.6	F	5230
SB	Left Turn	15	10	68.0%	73.9	43.4	E	14
	Through	1,295	1,097	84.7%	60.3	5.5	E	1212
	Right Turn	505	449	89.0%	41.7	4.3	D	344
	Subtotal	1,815	1,557	85.8%	55.3	4.4	E	1570
EB	Left Turn	380	331	87.1%	96.4	18.1	F	585
	Through	55	52	94.4%	91.1	17.8	F	87
	Right Turn	445	401	90.1%	86.0	23.0	F	633
	Subtotal	880	784	89.1%	90.8	19.7	F	1304
WB	Left Turn	75	71	94.9%	52.9	9.1	D	69
	Through	45	45	99.1%	45.9	9.4	D	37
	Right Turn	10	6	61.0%	50.6	41.2	D	6
	Subtotal	130	122	93.8%	50.8	6.9	D	112
Total		4,430	3,916	88.4%	113.6	13.6	F	8216

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,476	96.2%	28.1	16.9	C	761
	Right Turn	65	61	94.5%	20.6	12.4	C	23
	Subtotal	1,600	1,538	96.1%	27.8	16.6	C	785
SB	Left Turn	115	87	75.8%	142.1	39.8	F	227
	Through	1,650	1,385	83.9%	80.6	39.9	F	2045
	Right Turn							
	Subtotal	1,765	1,472	83.4%	84.7	39.5	F	2273
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	143	98.9%	72.7	26.6	E	191
	Through							
	Right Turn	190	182	95.7%	57.1	40.6	E	190
	Subtotal	335	325	97.1%	64.4	33.3	E	381
Total		3,700	3,335	90.1%	56.6	17.3	E	3438

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	178	91.1%	118.3	41.1	F	386
	Through	1,100	1,070	97.3%	85.9	32.7	F	1685
	Right Turn	170	154	90.6%	65.9	30.0	E	186
	Subtotal	1,465	1,402	95.7%	88.0	32.4	F	2257
SB	Left Turn	265	238	89.8%	80.9	11.5	F	353
	Through	1,310	1,096	83.7%	38.4	6.2	D	772
	Right Turn	220	184	83.5%	23.6	5.5	C	79
	Subtotal	1,795	1,518	84.6%	43.8	6.6	D	1205
EB	Left Turn	195	189	96.7%	82.5	14.5	F	285
	Through	480	475	98.9%	43.4	4.7	D	378
	Right Turn	195	197	100.9%	22.8	3.4	C	82
	Subtotal	870	860	98.8%	46.7	4.6	D	745
WB	Left Turn	240	232	96.7%	115.8	42.9	F	493
	Through	775	747	96.4%	99.7	50.9	F	1365
	Right Turn	310	292	94.1%	113.8	86.3	F	609
	Subtotal	1,325	1,271	95.9%	105.7	56.4	F	2467
Total		5,455	5,051	92.6%	71.3	20.2	E	6673

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	160	89.1%	144.8	45.4	F	426
	Through	125	110	88.3%	108.4	39.8	F	219
	Right Turn	100	96	95.9%	100.2	43.3	F	176
	Subtotal	405	367	90.5%	121.6	43.2	F	821
SB	Left Turn	85	79	92.9%	76.0	19.1	E	110
	Through	115	108	93.6%	62.3	19.4	E	123
	Right Turn	60	62	103.3%	51.5	23.3	D	58
	Subtotal	260	249	95.6%	64.1	19.5	E	291
EB	Left Turn	70	65	92.4%	88.3	16.4	F	105
	Through	575	547	95.1%	46.4	10.5	D	466
	Right Turn	110	111	100.5%	39.0	12.6	D	79
	Subtotal	755	722	95.7%	49.3	10.4	D	649
WB	Left Turn	105	94	89.3%	81.8	13.8	F	141
	Through	555	515	92.8%	19.5	1.5	B	184
	Right Turn	90	76	84.0%	20.2	3.3	C	28
	Subtotal	750	685	91.3%	28.1	3.5	C	353
Total		2,170	2,022	93.2%	57.9	7.4	E	2114

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040 Traffic Calming Alt**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	52.0%	7.0	13.2	A	0
	Through	30	24	78.3%	23.8	12.2	C	10
	Right Turn	40	37	92.3%	25.4	5.3	C	17
	Subtotal	75	63	84.0%	24.0	3.1	C	28
SB	Left Turn	45	41	91.6%	25.5	5.1	C	19
	Through	25	27	107.2%	25.4	10.0	C	12
	Right Turn	85	88	103.8%	26.9	6.1	C	44
	Subtotal	155	156	100.8%	26.8	2.9	C	75
EB	Left Turn	55	54	98.9%	93.3	39.4	F	93
	Through	605	578	95.6%	30.8	16.7	C	326
	Right Turn	10	7	66.0%	9.9	14.8	A	1
	Subtotal	670	639	95.4%	35.7	18.5	D	421
WB	Left Turn	45	44	98.2%	62.9	13.9	E	51
	Through	705	649	92.1%	35.7	9.4	D	425
	Right Turn	55	55	100.0%	34.5	8.9	C	35
	Subtotal	805	748	93.0%	37.2	9.0	D	510
Total		1,705	1,607	94.2%	35.2	8.7	D	1034

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	147	95.0%	66.6	17.0	E	180
	Through	655	650	99.2%	42.7	6.7	D	508
	Right Turn	150	144	95.7%	45.0	7.7	D	119
	Subtotal	960	940	98.0%	46.5	7.2	D	807
SB	Left Turn	120	116	96.6%	122.3	25.9	F	260
	Through	870	828	95.2%	96.5	18.7	F	1465
	Right Turn	95	86	90.0%	98.2	23.1	F	154
	Subtotal	1,085	1,029	94.9%	99.5	19.6	F	1879
EB	Left Turn	185	172	92.8%	189.3	62.3	F	596
	Through	345	337	97.7%	141.3	58.8	F	873
	Right Turn	140	130	92.5%	172.7	56.8	F	410
	Subtotal	670	638	95.3%	161.9	59.4	F	1879
WB	Left Turn	205	177	86.1%	123.2	27.2	F	399
	Through	365	334	91.5%	74.6	28.2	E	457
	Right Turn	90	80	89.0%	86.0	24.4	F	126
	Subtotal	660	591	89.5%	91.4	25.7	F	982
Total		3,375	3,199	94.8%	93.4	14.1	F	5547

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	52.0%	2.7	2.4	A	0
	Through	365	366	100.4%	6.0	0.7	A	40
	Right Turn	95	95	99.6%	5.4	0.7	A	9
	Subtotal	465	464	99.7%	5.9	0.7	A	50
SB	Left Turn	85	81	94.8%	9.4	2.6	A	14
	Through	610	615	100.9%	9.0	2.9	A	102
	Right Turn	10	7	66.0%	8.7	5.4	A	1
	Subtotal	705	703	99.7%	9.1	2.8	A	117
EB	Left Turn	5	3	54.0%	2.7	4.5	A	0
	Through							
	Right Turn	5	4	76.0%	5.1	8.4	A	0
	Subtotal	10	7	65.0%	6.3	8.1	A	0
WB	Left Turn	80	69	86.8%	7.4	2.5	A	9
	Through	10	12	123.0%	9.7	4.7	A	2
	Right Turn	80	71	88.8%	7.9	1.5	A	10
	Subtotal	170	153	89.8%	7.8	1.7	A	22
Total		1,350	1,325	98.2%	7.8	1.5	A	189

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040 MAX Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	819	96.4%	9.3	2.7	A	140
	Right Turn	490	461	94.1%	11.1	1.7	B	94
	Subtotal	1,340	1,280	95.5%	9.9	2.3	A	234
SB	Left Turn	155	159	102.5%	32.4	6.2	C	94
	Through	790	781	98.8%	12.2	1.2	B	175
	Right Turn							
	Subtotal	945	940	99.4%	15.5	1.9	B	269
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	142	91.9%	45.0	6.4	D	117
	Through							
	Right Turn	75	72	95.6%	11.9	2.5	B	16
	Subtotal	230	214	93.1%	33.7	4.0	C	133
Total		2,515	2,434	96.8%	14.0	1.8	B	636

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	13	67.0%	12.8	6.8	B	3
	Through	1,260	1,197	95.0%	1.5	0.3	A	33
	Right Turn	45	48	105.8%	1.8	0.7	A	2
	Subtotal	1,325	1,258	95.0%	1.6	0.4	A	37
SB	Left Turn	20	15	74.5%	29.2	13.0	C	8
	Through	905	890	98.4%	5.6	1.2	A	91
	Right Turn	25	21	82.4%	3.3	2.6	A	1
	Subtotal	950	926	97.4%	5.9	1.1	A	100
EB	Left Turn	65	62	95.2%	55.5	11.0	E	63
	Through	30	36	118.3%	50.3	13.4	D	33
	Right Turn	45	40	88.7%	50.4	6.1	D	37
	Subtotal	140	137	98.1%	52.6	9.4	D	133
WB	Left Turn	25	32	127.2%	50.3	7.1	D	29
	Through	25	20	79.2%	34.1	18.9	C	12
	Right Turn	25	21	83.6%	14.4	5.5	B	6
	Subtotal	75	73	96.7%	36.3	6.1	D	47
Total		2,490	2,394	96.1%	8.3	1.2	A	317

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	162	95.2%	46.5	13.7	D	138
	Through	1,005	965	96.0%	15.4	3.2	B	273
	Right Turn	70	63	90.3%	10.8	4.1	B	13
	Subtotal	1,245	1,190	95.6%	19.3	3.6	B	423
SB	Left Turn	30	25	82.3%	49.9	14.8	D	23
	Through	775	769	99.2%	10.0	1.7	B	141
	Right Turn	170	169	99.4%	5.7	1.2	A	18
	Subtotal	975	962	98.7%	10.4	1.6	B	181
EB	Left Turn	315	294	93.4%	58.3	8.4	E	314
	Through	35	31	89.1%	60.0	13.4	E	34
	Right Turn	360	335	93.2%	52.6	7.3	D	324
	Subtotal	710	661	93.1%	55.7	7.4	E	672
WB	Left Turn	20	17	86.5%	35.5	25.5	D	11
	Through	10	5	52.0%	15.8	25.7	B	2
	Right Turn	10	5	51.0%	17.0	25.1	B	2
	Subtotal	40	28	69.0%	40.2	17.2	D	14
Total		2,970	2,841	95.7%	25.2	2.6	C	1291

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040 MAX Alt**
Volume and Delay by Movement **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,374	98.5%	4.6	1.2	A	116
	Right Turn	185	181	97.8%	6.1	1.4	A	20
	Subtotal	1,580	1,555	98.4%	4.8	1.2	A	136
SB	Left Turn	150	137	91.5%	61.1	19.4	E	154
	Through	910	885	97.2%	9.3	2.9	A	151
	Right Turn							
	Subtotal	1,060	1,022	96.4%	17.1	6.3	B	305
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	72	96.5%	43.9	10.1	D	58
	Through							
	Right Turn	45	44	98.7%	5.3	1.5	A	4
	Subtotal	120	117	97.3%	30.3	8.2	C	63
Total		2,760	2,693	97.6%	10.3	2.9	B	503

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	65	93.1%	33.6	9.0	C	40
	Through	1,120	1,109	99.0%	27.1	3.6	C	551
	Right Turn	165	156	94.3%	21.9	6.7	C	63
	Subtotal	1,355	1,330	98.1%	26.8	3.9	C	654
SB	Left Turn	175	170	97.3%	47.1	10.7	D	147
	Through	745	718	96.4%	5.3	1.6	A	70
	Right Turn	65	68	104.3%	2.1	0.8	A	3
	Subtotal	985	956	97.0%	12.6	3.5	B	219
EB	Left Turn	285	265	92.9%	415.8	30.5	F	2018
	Through	845	785	92.9%	399.9	36.4	F	5752
	Right Turn	180	171	95.1%	364.3	34.0	F	1143
	Subtotal	1,310	1,220	93.2%	398.6	34.2	F	8913
WB	Left Turn	85	81	94.9%	60.2	10.5	E	89
	Through	275	276	100.3%	41.2	3.9	D	208
	Right Turn	175	175	100.2%	19.3	2.1	B	62
	Subtotal	535	532	99.4%	37.1	3.7	D	359
Total		4,185	4,038	96.5%	143.8	9.9	F	10145

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	28	93.0%	18.6	9.9	B	10
	Through	45	40	89.8%	30.3	6.5	C	22
	Right Turn	45	44	97.3%	31.4	5.9	C	25
	Subtotal	120	112	93.4%	28.4	3.4	C	57
SB	Left Turn	45	50	111.1%	18.3	3.5	B	17
	Through	40	0	0.0%	0.0	0.0	A	0
	Right Turn	25	51	205.2%	28.9	5.4	C	27
	Subtotal	110	101	92.1%	23.6	3.6	C	44
EB	Left Turn	70	69	99.0%	51.0	9.7	D	65
	Through	545	522	95.8%	18.9	4.9	B	181
	Right Turn	85	78	92.0%	10.4	5.4	B	15
	Subtotal	700	670	95.7%	21.2	4.4	C	260
WB	Left Turn	40	34	85.3%	40.5	12.0	D	25
	Through	200	176	88.1%	14.2	2.9	B	46
	Right Turn	60	51	85.5%	5.5	1.5	A	5
	Subtotal	300	262	87.2%	16.6	3.4	B	76
Total		1,230	1,145	93.1%	21.1	2.7	C	438

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	64.0%	15.9	13.1	B	1
	Through	5	6	110.0%	14.9	19.5	B	2
	Right Turn	25	24	97.6%	23.0	10.0	C	10
	Subtotal	35	33	94.6%	20.6	7.8	C	13
SB	Left Turn	45	43	94.4%	25.3	5.9	C	20
	Through	15	10	68.0%	21.7	11.0	C	4
	Right Turn	40	38	95.8%	24.9	4.9	C	17
	Subtotal	100	91	91.0%	24.8	4.7	C	41
EB	Left Turn	35	33	93.7%	35.8	9.3	D	22
	Through	615	603	98.0%	9.1	2.0	A	100
	Right Turn	10	6	64.0%	8.1	10.7	A	1
	Subtotal	660	642	97.2%	10.8	2.2	B	123
WB	Left Turn	5	3	58.0%	20.7	18.0	C	1
	Through	185	163	88.1%	5.6	1.6	A	17
	Right Turn	20	20	102.0%	7.1	1.4	A	3
	Subtotal	210	186	88.7%	6.4	1.7	A	21
Total		1,005	952	94.7%	12.3	1.5	B	198

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	60	91.8%	79.6	11.5	E	87
	Through	910	872	95.8%	90.3	9.8	F	1444
	Right Turn	140	126	89.6%	94.3	11.0	F	217
	Subtotal	1,115	1,057	94.8%	90.2	9.8	F	1748
SB	Left Turn	115	113	98.3%	40.6	8.9	D	84
	Through	675	681	100.9%	25.3	3.6	C	316
	Right Turn	60	58	96.5%	27.3	5.4	C	29
	Subtotal	850	852	100.3%	27.6	3.6	C	429
EB	Left Turn	150	145	96.5%	226.9	70.3	F	602
	Through	295	292	98.8%	185.5	70.4	F	991
	Right Turn	190	185	97.6%	208.9	73.6	F	710
	Subtotal	635	622	97.9%	203.1	70.0	F	2304
WB	Left Turn	125	104	83.0%	129.6	50.2	F	247
	Through	135	124	92.1%	30.9	8.0	C	70
	Right Turn	40	35	88.5%	36.3	10.9	D	24
	Subtotal	300	264	87.9%	71.3	20.6	E	340
Total		2,900	2,795	96.4%	97.1	16.1	F	4822

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	4	88.0%	5.6	5.4	A	0
	Through	560	566	101.1%	7.0	1.8	A	73
	Right Turn	85	83	97.9%	6.3	1.8	A	10
	Subtotal	650	654	100.6%	6.9	1.8	A	83
SB	Left Turn	45	41	91.1%	4.2	0.8	A	3
	Through	335	345	102.8%	4.1	0.9	A	26
	Right Turn	15	11	72.0%	1.7	1.5	A	0
	Subtotal	395	396	100.3%	4.1	0.8	A	29
EB	Left Turn	15	13	86.7%	5.0	2.0	A	1
	Through	5	7	136.0%	6.5	3.6	A	1
	Right Turn	5	1	22.0%	2.1	5.1	A	0
	Subtotal	25	21	83.6%	6.0	1.9	A	2
WB	Left Turn	65	59	90.5%	11.0	2.7	B	12
	Through	5	12	230.0%	13.9	6.1	B	3
	Right Turn	80	72	89.6%	11.2	4.7	B	15
	Subtotal	150	142	94.7%	11.4	3.4	B	30
Total		1,220	1,213	99.4%	6.5	1.0	A	144

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040 MAX Alt**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	916	88.1%	24.7	12.5	C	414
	Right Turn	520	459	88.3%	23.2	10.2	C	196
	Subtotal	1,560	1,375	88.2%	24.3	11.5	C	610
SB	Left Turn	120	97	81.0%	246.5	79.0	F	439
	Through	1,175	1,020	86.8%	158.3	15.7	F	2961
	Right Turn							
	Subtotal	1,295	1,118	86.3%	165.8	18.0	F	3400
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	553	91.3%	244.6	148.1	F	2478
	Through							
	Right Turn	190	173	90.8%	142.2	76.7	F	450
	Subtotal	795	725	91.2%	220.9	130.9	F	2928
Total		3,650	3,218	88.2%	112.1	21.6	F	6938

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	73	85.3%	108.3	49.4	F	144
	Through	1,460	1,293	88.6%	11.8	13.2	B	281
	Right Turn	70	59	84.4%	10.1	13.1	B	11
	Subtotal	1,615	1,425	88.2%	17.2	13.2	B	436
SB	Left Turn	25	21	82.0%	75.8	24.4	E	28
	Through	1,685	1,468	87.1%	43.0	8.2	D	1158
	Right Turn	75	68	90.4%	42.5	12.7	D	53
	Subtotal	1,785	1,556	87.2%	43.4	8.1	D	1239
EB	Left Turn	75	66	87.3%	281.5	156.2	F	338
	Through	30	31	104.7%	276.5	152.7	F	159
	Right Turn	75	63	84.0%	286.1	135.1	F	330
	Subtotal	180	160	88.8%	282.4	143.8	F	828
WB	Left Turn	70	70	99.6%	104.5	47.6	F	134
	Through	30	25	84.7%	96.8	86.4	F	45
	Right Turn	30	23	78.0%	48.3	32.3	D	21
	Subtotal	130	119	91.2%	92.3	47.1	F	199
Total		3,710	3,259	87.8%	45.3	8.3	D	2702

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	273	85.4%	280.7	69.6	F	1406
	Through	1,215	1,117	91.9%	176.1	40.8	F	3606
	Right Turn	70	66	94.9%	156.0	36.1	F	190
	Subtotal	1,605	1,456	90.7%	194.4	45.9	F	5202
SB	Left Turn	15	11	72.7%	82.5	22.0	F	16
	Through	1,295	1,109	85.6%	58.5	4.5	E	1190
	Right Turn	505	465	92.1%	46.7	14.1	D	398
	Subtotal	1,815	1,585	87.3%	55.3	6.8	E	1604
EB	Left Turn	380	307	80.8%	111.9	8.4	F	630
	Through	55	50	91.1%	102.2	11.2	F	94
	Right Turn	445	367	82.5%	103.1	10.4	F	693
	Subtotal	880	724	82.3%	106.6	6.6	F	1417
WB	Left Turn	75	72	95.6%	53.2	9.6	D	70
	Through	45	44	97.8%	44.9	11.7	D	36
	Right Turn	10	6	64.0%	61.7	38.8	E	7
	Subtotal	130	122	93.9%	50.5	8.9	D	113
Total		4,430	3,887	87.7%	115.6	17.3	F	8337

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,473	96.0%	30.8	16.7	C	832
	Right Turn	65	64	98.5%	24.5	14.4	C	29
	Subtotal	1,600	1,537	96.1%	30.5	16.5	C	861
SB	Left Turn	115	89	77.7%	137.1	55.9	F	225
	Through	1,650	1,372	83.2%	71.9	51.9	E	1809
	Right Turn							
	Subtotal	1,765	1,462	82.8%	76.2	52.1	E	2034
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	141	96.9%	72.9	19.8	E	188
	Through							
	Right Turn	190	184	97.1%	54.2	31.7	D	183
	Subtotal	335	325	97.0%	62.8	25.1	E	371
Total		3,700	3,323	89.8%	54.6	26.4	D	3266

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	179	91.9%	118.7	43.2	F	390
	Through	1,100	1,069	97.2%	99.7	48.6	F	1953
	Right Turn	170	154	90.7%	83.0	46.8	F	235
	Subtotal	1,465	1,402	95.7%	100.5	47.0	F	2577
SB	Left Turn	265	238	89.8%	72.1	14.2	E	315
	Through	1,310	1,084	82.7%	33.6	8.0	C	668
	Right Turn	220	181	82.1%	22.5	6.2	C	75
	Subtotal	1,795	1,503	83.7%	38.6	7.5	D	1057
EB	Left Turn	195	190	97.3%	86.3	19.9	F	300
	Through	480	474	98.7%	40.9	3.5	D	355
	Right Turn	195	195	100.0%	22.5	4.0	C	80
	Subtotal	870	859	98.7%	46.1	5.7	D	736
WB	Left Turn	240	229	95.4%	100.7	36.8	F	423
	Through	775	748	96.5%	88.7	41.8	F	1216
	Right Turn	310	295	95.0%	92.9	65.2	F	502
	Subtotal	1,325	1,271	95.9%	91.7	45.0	F	2141
Total		5,455	5,035	92.3%	69.7	21.8	E	6511

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	161	89.2%	152.7	59.6	F	450
	Through	125	102	81.8%	157.1	59.2	F	295
	Right Turn	100	90	90.0%	165.1	70.6	F	272
	Subtotal	405	353	87.1%	157.8	62.0	F	1017
SB	Left Turn	85	76	89.8%	56.7	17.0	E	79
	Through	115	106	91.9%	59.5	13.4	E	115
	Right Turn	60	57	95.3%	47.6	11.7	D	50
	Subtotal	260	239	92.0%	56.2	12.9	E	245
EB	Left Turn	70	61	87.6%	128.0	20.3	F	144
	Through	575	534	92.8%	82.8	19.2	F	811
	Right Turn	110	102	92.6%	53.9	14.0	D	101
	Subtotal	755	697	92.3%	82.2	19.0	F	1055
WB	Left Turn	105	95	90.3%	118.0	40.0	F	205
	Through	555	509	91.7%	50.6	34.3	D	472
	Right Turn	90	71	79.1%	36.1	28.2	D	47
	Subtotal	750	675	90.0%	58.0	34.6	E	724
Total		2,170	1,964	90.5%	83.2	14.2	F	3041

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	52.0%	8.2	12.8	A	0
	Through	30	27	89.0%	24.6	6.1	C	12
	Right Turn	40	35	87.0%	25.4	6.4	C	16
	Subtotal	75	64	85.5%	24.9	5.7	C	29
SB	Left Turn	45	45	99.3%	24.8	5.2	C	20
	Through	25	27	106.8%	25.2	8.7	C	12
	Right Turn	85	81	95.4%	26.4	3.7	C	39
	Subtotal	155	153	98.4%	25.9	1.8	C	72
EB	Left Turn	55	52	94.0%	41.0	9.9	D	39
	Through	605	573	94.6%	13.7	1.0	B	143
	Right Turn	10	7	67.0%	7.8	7.3	A	1
	Subtotal	670	631	94.2%	15.8	1.3	B	183
WB	Left Turn	45	44	96.7%	52.2	17.5	D	42
	Through	705	642	91.1%	29.3	14.4	C	345
	Right Turn	55	54	98.5%	24.8	18.3	C	25
	Subtotal	805	740	91.9%	30.1	14.7	C	411
Total		1,705	1,587	93.1%	23.8	7.4	C	695

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	150	96.5%	72.5	27.9	E	199
	Through	655	637	97.3%	45.3	13.0	D	530
	Right Turn	150	143	95.5%	48.3	13.1	D	127
	Subtotal	960	930	96.9%	49.9	14.7	D	855
SB	Left Turn	120	114	94.8%	126.7	23.0	F	264
	Through	870	823	94.6%	101.4	21.3	F	1530
	Right Turn	95	85	89.5%	100.7	21.3	F	157
	Subtotal	1,085	1,022	94.1%	104.0	21.1	F	1951
EB	Left Turn	185	168	90.9%	238.0	76.6	F	733
	Through	345	324	93.9%	193.3	73.0	F	1149
	Right Turn	140	126	89.6%	221.4	76.2	F	509
	Subtotal	670	618	92.2%	212.1	74.2	F	2392
WB	Left Turn	205	173	84.6%	134.4	68.9	F	427
	Through	365	321	88.1%	85.2	58.4	F	502
	Right Turn	90	81	89.8%	88.8	53.6	F	132
	Subtotal	660	576	87.2%	101.4	60.2	F	1061
Total		3,375	3,145	93.2%	106.3	16.9	F	6259

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

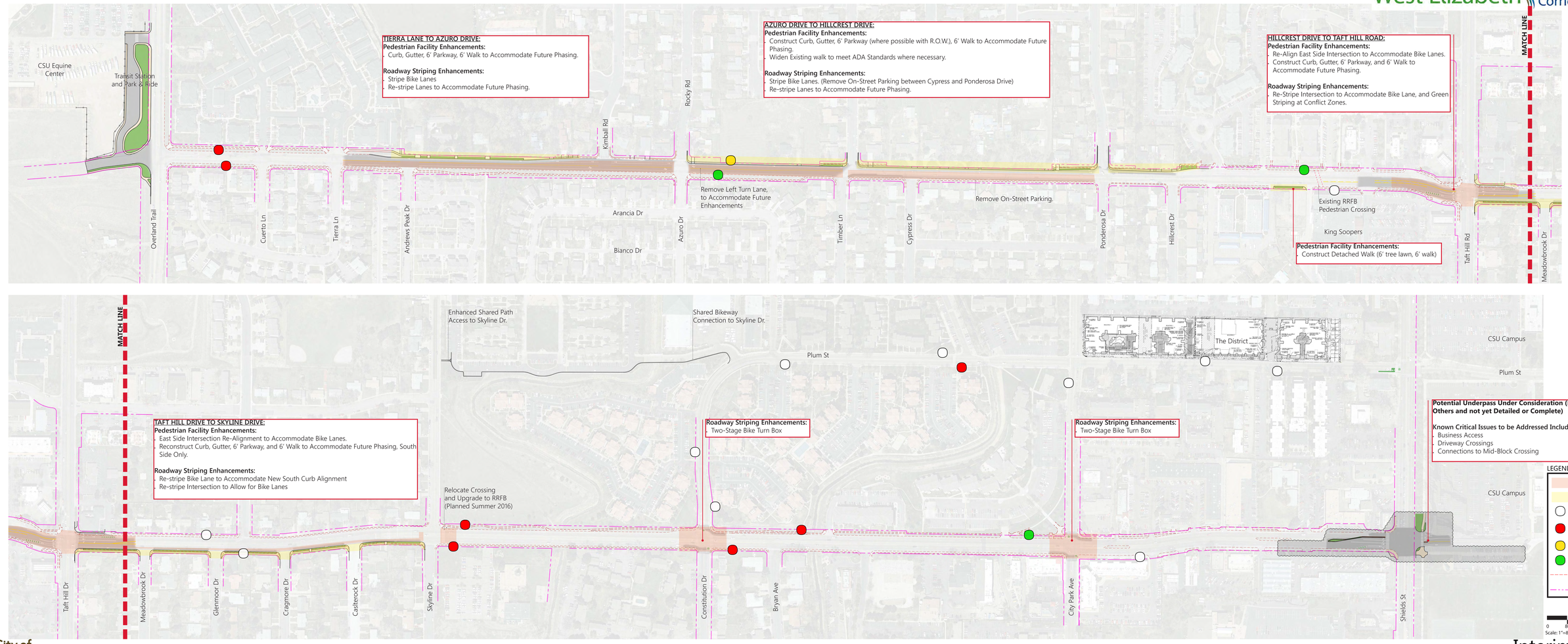
Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	40.0%	1.8	2.3	A	0
	Through	365	362	99.0%	5.9	0.9	A	39
	Right Turn	95	95	99.6%	5.0	1.0	A	9
	Subtotal	465	458	98.5%	5.7	0.9	A	48
SB	Left Turn	85	79	92.7%	9.2	2.8	A	13
	Through	610	613	100.6%	9.2	2.9	A	104
	Right Turn	10	8	82.0%	11.4	5.8	B	2
	Subtotal	705	700	99.3%	9.3	2.8	A	119
EB	Left Turn	5	3	52.0%	2.5	5.5	A	0
	Through							
	Right Turn	5	4	84.0%	6.2	8.8	A	0
	Subtotal	10	7	68.0%	7.0	8.8	A	1
WB	Left Turn	80	67	83.3%	7.2	2.5	A	9
	Through	10	12	115.0%	8.5	4.6	A	2
	Right Turn	80	69	86.4%	6.9	2.5	A	9
	Subtotal	170	147	86.6%	7.4	1.6	A	19
Total		1,350	1,313	97.2%	7.8	1.4	A	187

appendix: E
CONCEPTUAL DESIGNS OF RECOMMENDED DESIGN & INTERIM DESIGN

West Elizabeth Enhanced Travel Corridor Plan

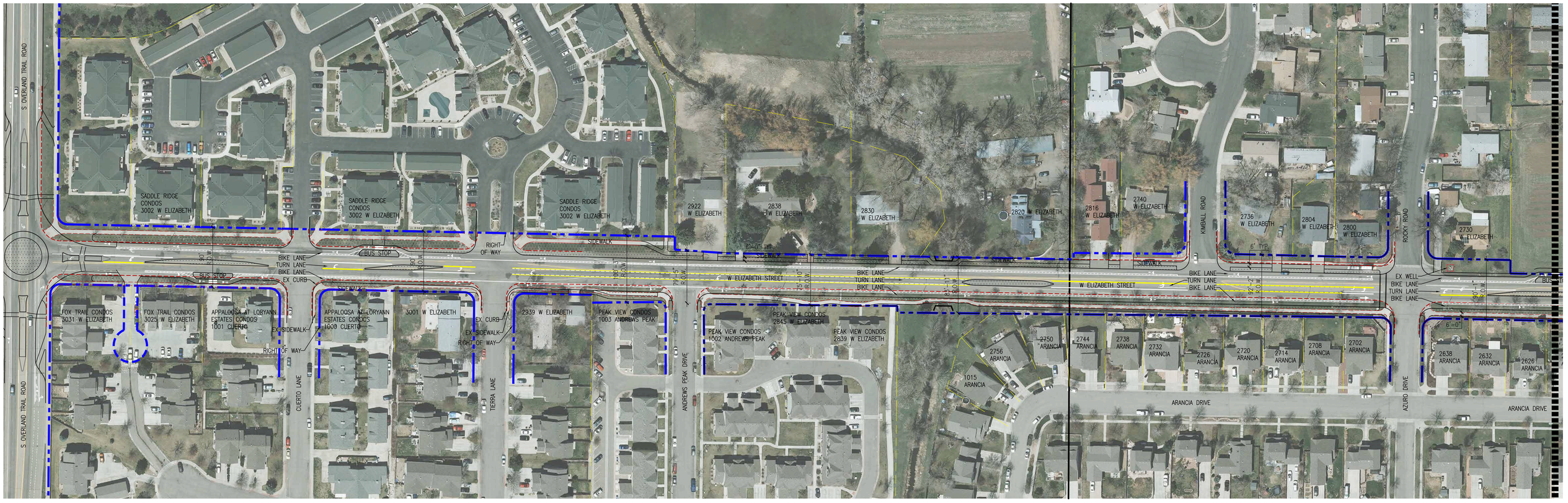
City of Fort Collins

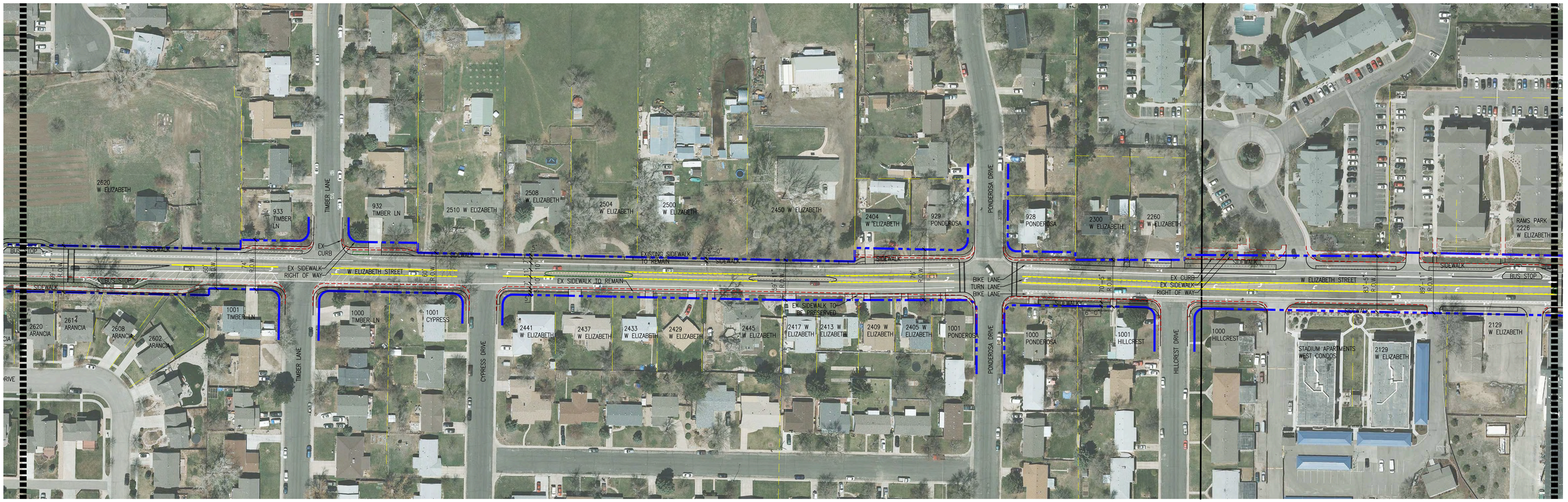
Recommended Design
West Elizabeth Enhanced Travel Corridor



City of Fort Collins

Interim Design
West Elizabeth Enhanced Travel Corridor



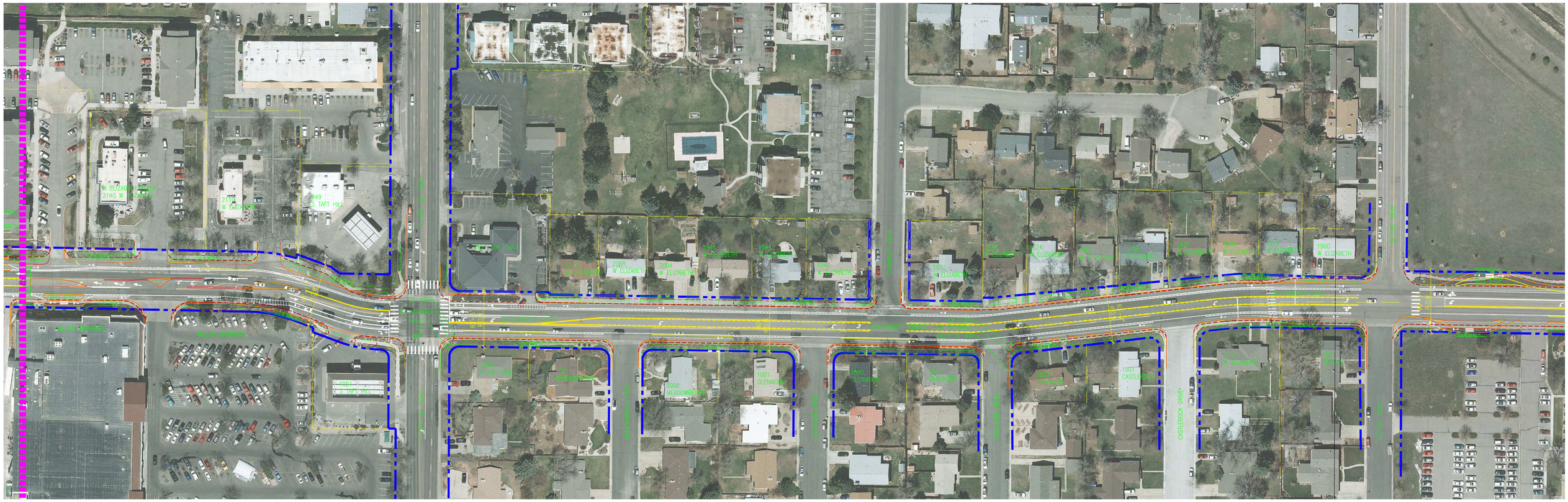


SITE LEGEND

- RIGHT OF WAY (ROW)
- EXISTING CURB
- EXISTING SIDEWALK
- PROPOSED TREE LAWN/MEDIAN
- TURN LANE
- BIKE LANE

50' 0 25' 50' 100'

NORTH

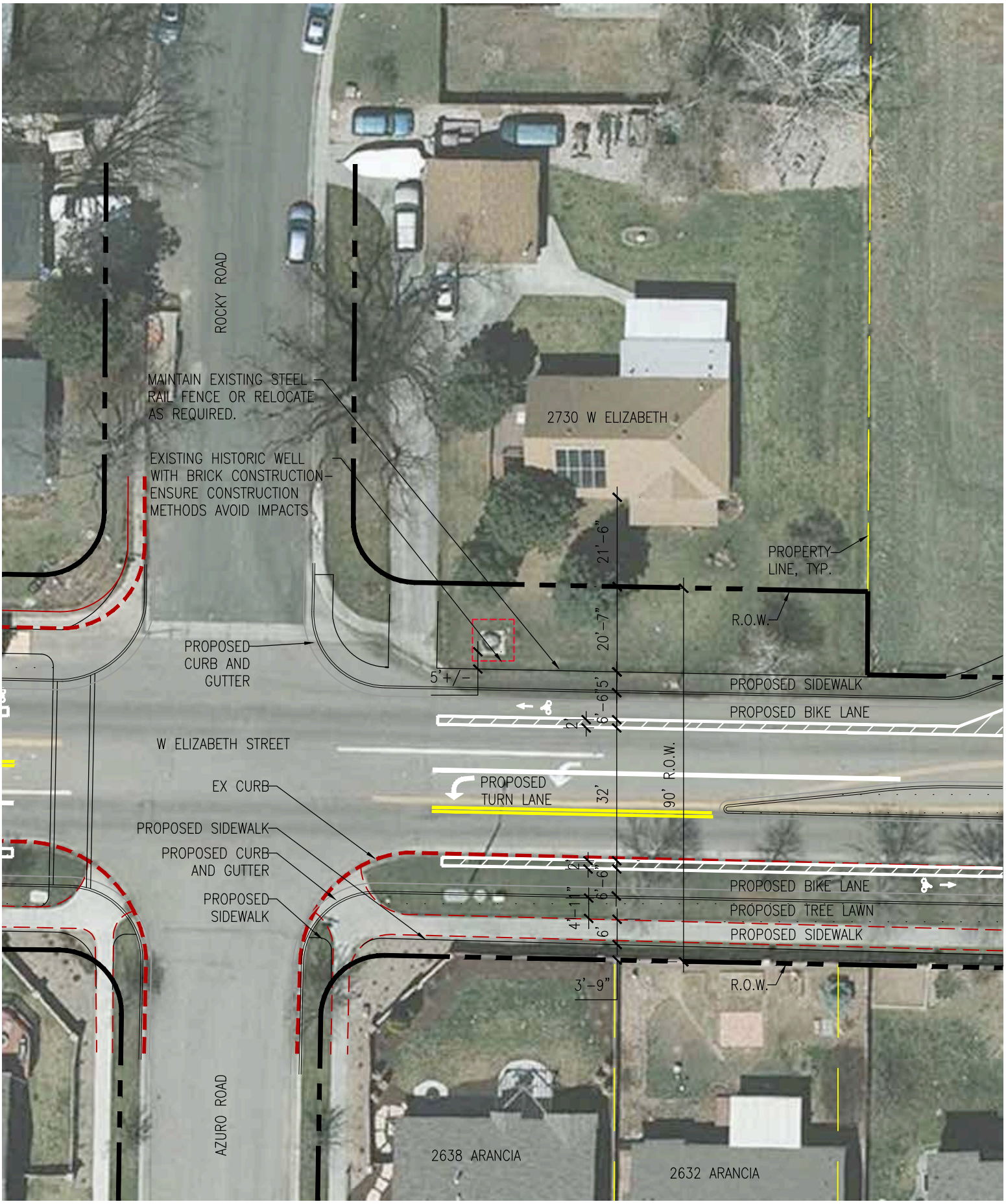


SITE LEGEND

- RIGHT OF WAY (ROW)
- EXISTING CURB
- EXISTING SIDEWALK
- PROPOSED TREE LAWN/MEDIAN
- TURN LANE
- BIKE LANE

50' 0 25' 50' 100'

NORTH



NOTE:
1. ALL DIMENSIONS ARE APPROXIMATE

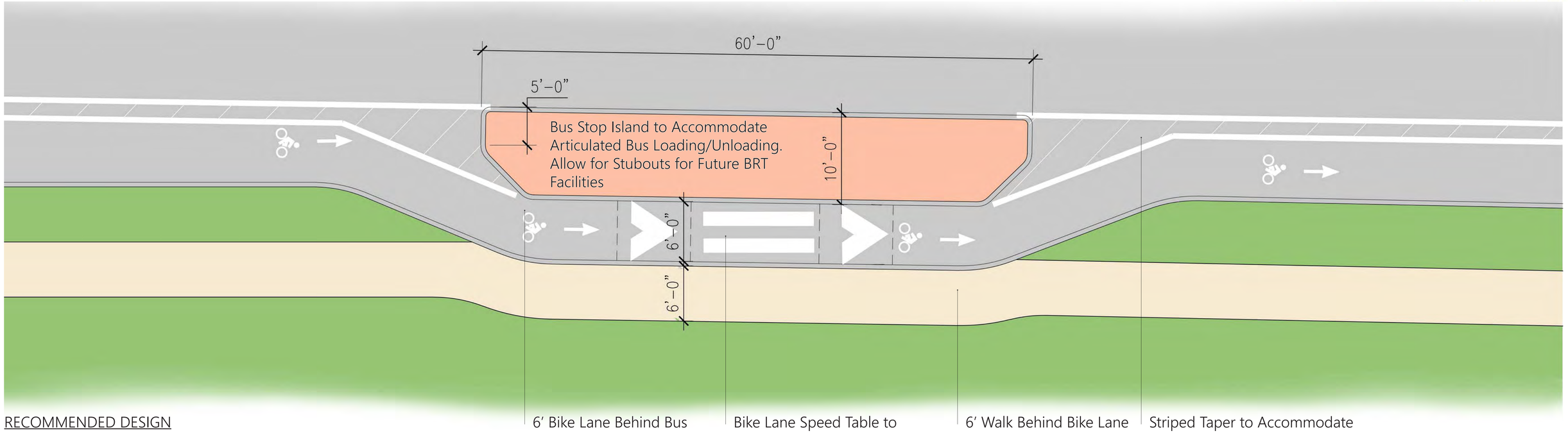
30' 0 15' 30' 60'

NORTH

NOTE:
1. ALL DIMENSIONS ARE APPROXIMATE

30' 0 15' 30' 60'

NORTH



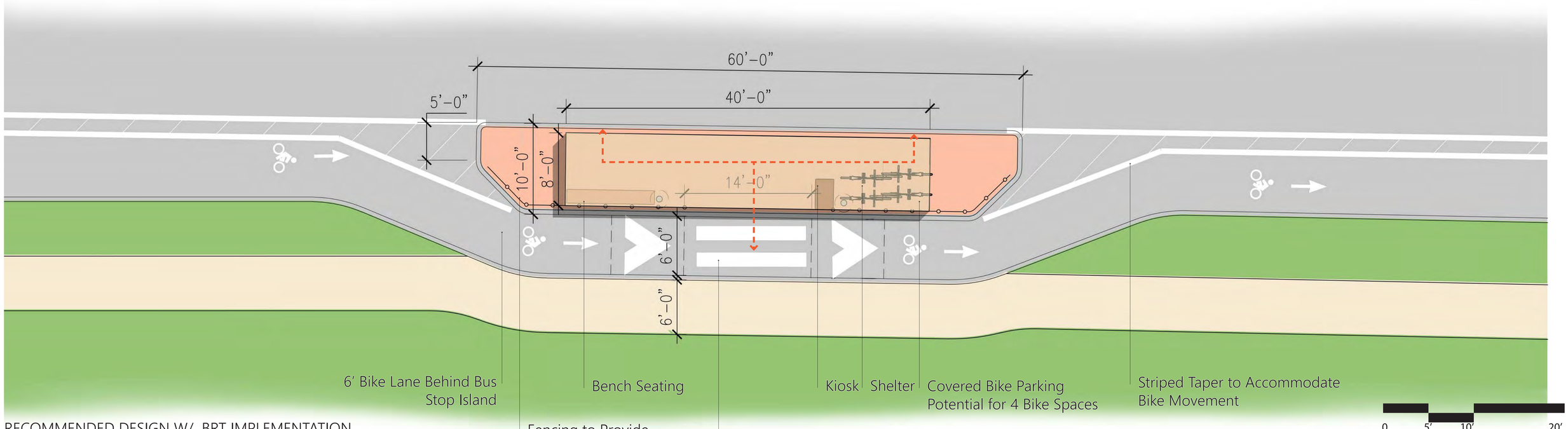
RECOMMENDED DESIGN

6’ Bike Lane Behind Bus Stop Island

Bike Lane Speed Table to Accommodate ADA Access

6’ Walk Behind Bike Lane

Striped Taper to Accommodate Bike Movement



RECOMMENDED DESIGN W/ BRT IMPLEMENTATION

6’ Bike Lane Behind Bus Stop Island

Fencing to Provide Separation From Bike Lane

Bench Seating

Bike Lane Speed Table to Accommodate ADA Access

Kiosk

Shelter

Covered Bike Parking Potential for 4 Bike Spaces

Striped Taper to Accommodate Bike Movement

0 5’ 10’ 20’

Scale: 1”=5’

City of Fort Collins

Typical Bus Stop Island Design Enlargement
West Elizabeth Enhanced Travel Corridor

0 40′ 80′ 120′

Scale: 1″=40′

City of Fort Collins

CSU Transit Center

West Elizabeth Enhanced Travel Corridor

West Elizabeth Enhanced Travel Corridor Plan

Project Summary Handout

Transit

Existing Conditions:

- Highest ridership corridor – about 5,000 riders a day
- Overcrowded buses, people left behind
- Not enough amenities
- Not enough service (late-night, weekend, summer)

Identified Needs:

- Inability to support existing travel demands and anticipated growth
- Inadequate transit service
- Challenge connecting between modes

How the Vision is Addressed:

- **Unique and adaptable** – transit service is customized to demand, implemented in stages
- **Safe and comfortable** – convenient, easily accessed stops with enhanced amenities
- **Prioritize public transportation** – premium transit that minimizes delay

Proposed Phasing:

Proposed for 2016

- Tweaks to existing routes
  - Makes routes easier to understand
  - Adds service to high demand locations

Interim Improvements

- New connection from West Elizabeth to Downtown/MAX
- Transit stop improvements
- Transit Signal Priority (TSP) improves transit reliability
- Foothills Campus transit turnaround and Park-n-Ride

Recommended Design

- High-frequency transit service on West Elizabeth and Plum
- Enhanced transit stops and amenities
- New Foothills Campus internal shuttle route
- Connection to MAX via Prospect Road Route

What if Campus West Redevelops?

- Bus Rapid Transit (BRT) – like transit service (or future technology)
  - High-frequency service focused on West Elizabeth through Campus West
  - Branded service/vehicles (MAX-like)
  - Off-board fare payment
- Direct connection to MAX

Biking

Existing Conditions:

- High number of cyclists – over 2,000 per day in Campus West
- High number of crashes
- Challenging intersections
- Lots of driveway conflicts in Campus West
- Inconsistent facilities in west segment

Identified Needs:

- Inability to support existing travel demands and anticipated growth
- Uncomfortable and inconsistent bicycle facilities and safety concerns
- Challenge connecting between modes

How the Vision is Addressed:

- **Unique and adaptable** – bike facilities are phased in over time
- **Safe and comfortable, encourage active transportation** –protected/buffered lanes, protected intersection, intersection treatments
- **Interconnectivity** – bike racks at stops, bike share

Proposed Phasing:

Proposed for 2016

- Skyline N/S crossing relocated east of Skyline

Interim Improvements

- Completion of bike lanes
- Intersection improvements (e.g., bike lanes continue through intersections, signal timing improvements)

Recommended Design

- One-way protected, buffered bike lanes
- Intersection treatments (green paint and two-stage turn boxes)
- Pilot protected intersection at City Park/West Elizabeth
- N/S crossing improvements at Rocky/Azuro, Ponderosa, Constitution, and Skyline
- Bus stop islands with bike passing lane

What if Campus West Redevelops?

- Protected bike lanes are extended through Campus West
- Conflict points are reduced as access points consolidate with redevelopment

Project Summary Handout

West Elizabeth Enhanced Travel Corridor Plan

Walking

Existing Conditions:

- High numbers of pedestrians – over 100 crossing during peak hours at signalized intersections in Campus West
- Inconsistent facilities, lack of sidewalks
- Not comfortable
- Many segments not ADA compliant (~36%)
- Hard to cross Elizabeth north/south

Identified Needs:

- Inability to support existing travel demands and anticipated growth
- Uncomfortable and incomplete pedestrian facilities and safety concerns
- Challenge connecting between modes

How the Vision is Addressed:

- **Unique and adaptable** – sidewalks vary depending on the context of corridor
- **Safe and comfortable** – new N/S crossings are planned throughout corridor
- **Interconnectivity** – amenities are provided at bus stops for pedestrians
- **Beautiful and vibrant** – complete sidewalk network and tree lawns

Proposed Phasing:

Proposed for 2016	Interim Improvements	Recommended Design	What if Campus West Redevelops?
▪ Skyline N/S crossing relocated east of Skyline	▪ Completion of sidewalk network on West Elizabeth to comply with ADA guidance ▪ Intersection treatments to address access to signal push buttons and upgraded curb ramps	▪ Enhanced sidewalk network with detached sidewalks and landscaped parkways (where feasible) ▪ New and/or enhanced crossings (upgrades to Campus West mid-block crossing, new crossing at Woodbridge Senior Housing, Ponderosa and Rocky/Azuro)	▪ Conflict points reduced as access points consolidate with redevelopment

Driving

Existing Conditions:

- Traffic varies from 4,400 in the west to over 18,000 per day in the east
- Perceived speeding, especially in the western segments
- Challenging to make left turns
- Conflicts with pedestrians and bicyclists
- Sight distance issues

Identified Needs:

- Inability to support existing travel demands and anticipated growth
- Vehicular mobility, safety and access concerns
- Challenge connecting between modes

How the Vision is Addressed:

- **Unique and adaptable** – street design varies depending on traffic volumes
- **Safe and comfortable** – medians, parkways, pedestrian crossings, and roundabout calm traffic and reduce conflict points
- **Interconnectivity** – park-n-ride and potential future parking district increases motorist options

Proposed Phasing:

Proposed for 2016	Interim Improvements	Recommended Design	What if Campus West Redevelops?
▪ No proposed changes	▪ Completion of bike lanes throughout the corridor will help reduce conflicts between cyclists and motorists	▪ Four travel lanes in busiest segments of corridor ▪ Center turn lanes through majority of corridor ▪ Medians in select locations to help calm traffic ▪ Access management around Campus West, at Taft Hill ▪ Roundabout at Overland Trail eases turning movements and calms traffic	▪ Conflict points reduced as access points consolidate with redevelopment ▪ Potential shared parking district

Updated: 7/20/2016

appendix: F
RESPONDING TO THE PROJECT NEED

Responding to the Project Need

The Recommended Design responds specifically to the project Vision and statement of Project Need:

- **Inability to support existing travel demands and anticipated growth,** which will exacerbate existing deficiencies in transit service, pedestrian facilities, bicycle facilities and vehicle safety.

  The transit operations strategy provides efficient routing and high frequency service, this will significantly increase bus capacity to reduce or eliminate instances of leaving passengers behind.

- **Inadequate transit service** due primarily to insufficient system connectivity, low and inconsistent route frequencies, poor reliability, lack of capacity to serve current and future demands, and lack of patron stop amenities.

  The transit operations strategy will improve connectivity by providing a year-round, one seat ride from West Elizabeth Street to Downtown Fort Collins. In addition to increasing bus capacity, frequent service will ensure that passengers do not need to consult a schedule prior to their trip. Transit Signal Priority and bus stop islands will improve bus reliability. Lastly, bus stop islands will feature basic amenities such as signage, benches, shelters and bike racks.

- **Uncomfortable and inconsistent bicycle facilities and safety concerns** due to incomplete bike lanes and inadequate intersection treatments. There is also higher than expected rates of bicycle- and vehicle-related crashes in several locations.

  The Recommended Design will provide a complete network of protected bike lanes or buffered bike lanes along West Elizabeth Street from Shields Street to Overland Trail. A variety of innovative intersection treatments will improve ease of turning as well as safety, including green colored pavement, two-stage turn queue boxes and the City's first pilot of a protected intersection. These improvements are specifically targeted at locations with high crash histories.

- **Uncomfortable and incomplete pedestrian facilities and safety concerns** due to inconsistent and missing sidewalks, as well as sidewalks that are not ADA-compliant; in addition, there are limited north/south crossing opportunities and pedestrians experience significant delays crossing West Elizabeth Street.

  The Recommended Design will provide a complete, ADA-compliant sidewalk network along West Elizabeth Street between Shields Street and Overland Trail. This will significantly improve comfort for people walking along West Elizabeth Street. Additionally, two existing crossings of West Elizabeth Street will be upgraded, one new crossing will be provided, and at least two additional crossings can be accommodated once demand justifies their installation.

- **Vehicular mobility, safety and access concerns** exist due to intersection and driveway turning conflicts, as well as queue spillback (traffic backed up at a left-turn lane, for example) at some signalized intersections.

  The Recommended Design maintains reasonable travel times for people driving and provides several safety improvements for people driving, including access management in Campus West and west of Taft Hill Road and a roundabout at Overland Trail.

- **Challenge connecting between modes for trips in the corridor** including inadequate pedestrian and bicycle facilities to and at transit stops and parking challenges in the corridor.

  By completing and improving sidewalks and bike lanes and by implementing a robust transit operations strategy, people biking, riding transit and walking will be able to more seamlessly connect between modes. The Park-n-Ride at the CSU Foothills Campus Equine Center will improve connectivity between driving and transit. Connectivity between bicycling and other modes will be improved with bike share stations on the corridor and bike racks at bus stops to facilitate bicycle-transit trips.

appendix: G
TRAFFIC OPERATIONS CALCULATIONS

MEMORANDUM

Date: June 22, 2016

To: Amy Lewin, Emma Belmont and Rachel Prelog

From: Charlie Alexander

Subject: Traffic Operations Analysis for West Elizabeth Enhanced Travel Corridor Plan

DN15-0488

This technical memorandum summarizes the findings of the traffic operations analysis for the West Elizabeth Enhanced Travel Corridor Plan.

EXISTING & EXISTING + RECOMMENDED DESIGN

Table 1 shows results of AM and PM peak hour analysis for Existing Conditions and Existing Plus Recommended Design conditions at study intersections affected by the Recommended Design: West Elizabeth Street/Overland Trail, West Elizabeth Street/Taft Hill Road, West Elizabeth Street/Constitution Avenue, West Elizabeth/City Park Avenue, West Elizabeth Street/Shields Street and Plum Street/Shields Street.

TABLE 1: DELAY / LEVEL OF SERVICE – EXISTING TRAFFIC VOLUMES

Intersection	Existing		Existing + Recommended Design	
	AM	PM	AM	PM
West Elizabeth Street/Overland Trail	3 / A 22 / C (WBL)	3 / A 30 / D (WBL)	5 / A	7 / A
West Elizabeth Street/Taft Hill Road	21 / C	36 / D	22 / C	42 / D
West Elizabeth Street/Constitution Avenue	6 / A	9 / A	10 / B	17 / B
West Elizabeth Street/City Park Avenue	8 / A	17 / B	14 / B	25 / C
West Elizabeth Street/Shields Street	17 / B	46 / D	13 / B	42 / D
Shields Street/Plum Street	9 / A	14 / B	12 / B	18 / B

Key findings from the Existing Plus Recommended Design analysis are:

- At West Elizabeth Street/Overland Trail, average delay increases by two seconds in the AM peak hour and four seconds in the PM peak hour; however, level of service for westbound left-turning vehicles improves to LOS B during both peak hours.
- At West Elizabeth Street/Taft Hill Road, average delay increases by one second in the AM peak hour and six seconds in the PM peak hour due to the introduction of Transit Signal Priority.
- At West Elizabeth Street/Constitution Avenue, average delay increases by four seconds in the AM peak hour and eight seconds in the PM peak hour due to the introduction of Transit Signal Priority and the restriction of northbound and southbound right-turn on red for two-stage turn queue boxes.
- At West Elizabeth Street/City Park Avenue, average delay increases by six seconds in the AM peak hour and eight seconds in the PM peak hour due to the introduction of Transit

Signal Priority and eastbound/westbound protected-only left-turns due to the protected intersection.

- At West Elizabeth Street/Shields Street, average delay decreases in both the AM and PM peak hour due to changes in eastbound/westbound lane configurations, the removal of the crosswalk across the intersection's north leg and the re-optimization of green time away from the westbound phase to other phases. VISSIM analysis is showing that eastbound right-turning vehicles operations are significantly affected by the presence of pedestrians in the intersection's south crosswalk. The VISSIM model currently assumes only at-grade improvements from the IGA project (no undercrossing); therefore, pedestrian volumes from the north crosswalk were re-assigned to the south crosswalk. Implementing improvements that reduce the number of pedestrians in the south crosswalk would likely result in an even more substantial improvement to level of service at this intersection.
- At Plum Street/Shields Street, average delay increases by three seconds in the AM peak hour and four seconds in the PM peak hour due to the introduction of Transit Signal Priority.

2040 & 2040 + RECOMMENDED DESIGN

Table 2 shows results of AM and PM peak hour analysis for 2040 Conditions and 2040 Plus Recommended Design conditions at study intersections affected by the Recommended Design

TABLE 1: DELAY / LEVEL OF SERVICE – 2040 TRAFFIC VOLUMES

Intersection	2040		2040 + Recommended Design	
	AM	PM	AM	PM
West Elizabeth Street/Overland Trail	3 / A 25 / D (WBL)	4 / A 29 / D (WBL)	8 / A	9 / A
West Elizabeth Street/Taft Hill Road	33 / C	**58 / E**	32 / C	54 / D
West Elizabeth Street/Constitution Avenue	6 / A	11 / B	12 / B	19 / B
West Elizabeth Street/City Park Avenue	8 / A	23 / C	15 / B	34 / C
West Elizabeth Street/Shields Street	22 / C	**>80 / F**	17 / B	>**80 / F**
Shields Street/Plum Street	10 / B	47 / D	12 / B	45 / D

The 2040 Plus Recommended Design analysis indicates that changes to delay due to the project in 2040 are similar to changes to delay due to the project in existing conditions. At intersections with a relatively low level of congestion (West Elizabeth Street/Overland Trail, West Elizabeth Street/Constitution Avenue and West Elizabeth Street/City Park Avenue), delay generally increases between five and 11 seconds without causing unacceptable conditions (LOS D or worse). At congested intersections (West Elizabeth Street/Taft Hill Road, West Elizabeth Street/Shields Street and Shields Street/Plum Street., the Recommended Design does not have a significant impact as LOS is generally unchanged.

Detailed technical calculations are attached as an appendix.

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	707	98.3%	3.6	0.8	A	47
	Right Turn	413	395	95.6%	5.2	1.2	A	38
	Subtotal	1,132	1,101	97.3%	4.2	0.8	A	85
SB	Left Turn	130	129	98.8%	20.9	2.7	C	49
	Through	667	670	100.4%	10.4	1.4	B	127
	Right Turn							
	Subtotal	797	798	100.2%	12.2	1.4	B	177
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	121	94.3%	46.9	2.5	D	104
	Through							
	Right Turn	61	61	100.2%	10.1	2.5	B	11
	Subtotal	189	182	96.2%	35.3	2.6	D	115
Total		2,118	2,081	98.3%	11.5	0.6	B	377

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	13	96.9%	6.1	7.5	A	1
	Through	1,064	1,039	97.6%	2.6	1.0	A	50
	Right Turn	37	40	108.9%	2.6	1.5	A	2
	Subtotal	1,114	1,091	98.0%	2.7	1.0	A	53
SB	Left Turn	13	14	103.8%	17.8	14.4	B	4
	Through	764	761	99.6%	5.4	0.8	A	75
	Right Turn	18	18	98.3%	5.6	2.7	A	2
	Subtotal	795	792	99.7%	5.7	0.7	A	81
EB	Left Turn	51	51	100.0%	54.3	9.9	D	51
	Through	25	31	124.4%	59.0	6.4	E	34
	Right Turn	34	34	100.3%	50.8	15.8	D	32
	Subtotal	110	116	105.6%	55.1	7.8	E	116
WB	Left Turn	17	18	105.9%	49.8	24.2	D	16
	Through	18	27	149.4%	42.4	11.6	D	21
	Right Turn	17	16	93.5%	7.9	3.1	A	2
	Subtotal	52	61	116.9%	36.1	10.6	D	40
Total		2,071	2,061	99.5%	8.9	0.7	A	290

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	143	102.4%	24.1	6.9	C	63
	Through	851	827	97.1%	10.9	2.3	B	166
	Right Turn	54	55	101.3%	8.6	1.5	A	9
	Subtotal	1,045	1,025	98.1%	12.6	2.5	B	238
SB	Left Turn	24	23	95.8%	34.1	18.1	C	14
	Through	653	651	99.6%	7.3	1.7	A	87
	Right Turn	138	139	100.9%	2.9	0.4	A	7
	Subtotal	815	813	99.8%	7.5	1.3	A	109
EB	Left Turn	258	262	101.4%	41.9	5.4	D	201
	Through	27	26	95.9%	44.1	18.3	D	21
	Right Turn	296	297	100.2%	32.9	12.1	C	179
	Subtotal	581	584	100.5%	37.8	5.6	D	400
WB	Left Turn	15	13	88.7%	50.4	31.5	D	12
	Through	5	5	108.0%	21.4	25.8	C	2
	Right Turn	5	4	84.0%	10.1	21.5	B	1
	Subtotal	25	23	91.6%	40.7	22.2	D	15
Total		2,466	2,445	99.1%	17.4	2.0	B	762

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,171	99.4%	2.9	0.8	A	63
	Right Turn	154	151	98.0%	3.8	1.1	A	11
	Subtotal	1,332	1,322	99.2%	3.0	0.8	A	73
SB	Left Turn	123	120	97.6%	36.1	12.7	D	80
	Through	768	756	98.4%	5.6	1.6	A	78
	Right Turn							
	Subtotal	891	876	98.3%	10.2	3.7	B	158
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	60	99.0%	49.5	8.6	D	55
	Through							
	Right Turn	37	36	98.4%	4.9	1.0	A	3
	Subtotal	98	97	98.8%	32.4	5.4	C	58
Total		2,321	2,294	98.8%	7.5	1.8	A	289

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	55	98.9%	26.4	5.0	C	27
	Through	946	942	99.6%	20.7	2.9	C	357
	Right Turn	136	130	95.2%	15.8	1.9	B	38
	Subtotal	1,138	1,127	99.0%	20.4	2.6	C	422
SB	Left Turn	145	155	107.2%	33.7	5.2	C	96
	Through	630	606	96.2%	6.6	1.2	A	73
	Right Turn	54	53	97.8%	2.6	0.9	A	3
	Subtotal	829	815	98.3%	11.6	1.4	B	171
EB	Left Turn	241	228	94.8%	154.2	42.7	F	646
	Through	713	732	102.6%	132.7	36.7	F	1,780
	Right Turn	152	151	99.5%	95.9	34.1	F	266
	Subtotal	1,106	1,112	100.5%	132.4	36.8	F	2,692
WB	Left Turn	71	66	92.4%	52.1	8.7	D	63
	Through	233	242	103.7%	41.6	3.4	D	184
	Right Turn	145	149	102.6%	34.4	5.1	C	94
	Subtotal	449	456	101.6%	40.8	2.9	D	341
Total		3,522	3,509	99.6%	60.5	13.5	E	3,626

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	23	95.8%	21.6	3.5	C	9
	Through	33	31	94.2%	19.3	5.8	B	11
	Right Turn	35	36	101.4%	10.2	4.0	B	7
	Subtotal	92	90	97.4%	16.2	3.9	B	27
SB	Left Turn	34	33	95.9%	19.8	6.1	B	12
	Through	32	33	103.4%	19.1	7.1	B	12
	Right Turn	18	23	128.9%	11.9	3.9	B	5
	Subtotal	84	89	105.8%	17.2	4.4	B	28
EB	Left Turn	53	51	96.8%	9.3	4.3	A	9
	Through	441	440	99.8%	5.7	0.9	A	46
	Right Turn	66	65	98.0%	5.2	1.3	A	6
	Subtotal	560	556	99.3%	6.0	1.1	A	61
WB	Left Turn	30	30	101.3%	11.5	5.9	B	6
	Through	160	161	100.7%	5.1	1.7	A	15
	Right Turn	45	43	94.9%	3.6	1.0	A	3
	Subtotal	235	234	99.7%	5.6	1.5	A	24
Total		971	969	99.8%	7.9	1.1	A	141

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	3	110.0%	12.0	13.2	B	1
	Through	4	5	115.0%	17.7	14.4	B	1
	Right Turn	20	21	106.0%	5.7	2.3	A	2
	Subtotal	27	29	107.8%	9.3	4.7	A	4
SB	Left Turn	36	34	95.3%	19.0	6.0	B	12
	Through	9	9	103.3%	21.7	5.5	C	4
	Right Turn	32	36	112.2%	7.8	2.1	A	5
	Subtotal	77	80	103.2%	14.3	3.3	B	21
EB	Left Turn	26	26	100.8%	7.4	5.7	A	4
	Through	499	500	100.1%	4.0	1.3	A	36
	Right Turn	5	6	110.0%	2.0	2.8	A	0
	Subtotal	530	531	100.3%	4.1	1.2	A	40
WB	Left Turn	2	2	80.0%	0.8	1.4	A	0
	Through	150	151	100.5%	4.1	2.8	A	11
	Right Turn	15	21	139.3%	6.9	3.8	A	3
	Subtotal	167	173	103.7%	4.4	2.7	A	14
Total		801	813	101.5%	5.7	1.1	A	79

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	47	91.6%	16.4	2.1	B	14
	Through	739	740	100.2%	18.7	2.0	B	253
	Right Turn	111	108	97.4%	18.4	2.5	B	37
	Subtotal	901	895	99.4%	18.5	1.6	B	304
SB	Left Turn	91	90	98.5%	23.1	6.0	C	38
	Through	547	544	99.5%	13.1	1.8	B	130
	Right Turn	47	48	101.5%	12.3	5.0	B	11
	Subtotal	685	681	99.5%	14.4	2.1	B	179
EB	Left Turn	121	120	99.0%	33.6	5.3	C	74
	Through	239	248	103.8%	40.3	3.0	D	183
	Right Turn	153	154	100.7%	16.8	3.4	B	47
	Subtotal	513	522	101.7%	31.9	2.7	C	304
WB	Left Turn	100	100	99.6%	31.6	8.6	C	58
	Through	109	117	107.3%	30.2	6.5	C	65
	Right Turn	32	31	96.9%	5.5	1.9	A	3
	Subtotal	241	248	102.7%	27.6	4.0	C	126
Total		2,340	2,346	100.3%	21.3	1.6	C	913

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	100.0%	1.2	2.2	A	0
	Through	455	449	98.7%	0.5	0.1	A	4
	Right Turn	69	74	106.7%	0.9	0.2	A	1
	Subtotal	528	527	99.8%	0.6	0.1	A	6
SB	Left Turn	33	34	103.6%	3.3	1.7	A	2
	Through	272	278	102.1%	0.3	0.1	A	2
	Right Turn	10	11	111.0%	0.5	0.2	A	0
	Subtotal	315	323	102.5%	0.7	0.2	A	4
EB	Left Turn	11	13	117.3%	11.3	6.5	B	3
	Through	1	1	110.0%	5.5	12.2	A	0
	Right Turn	1	1	70.0%	1.0	2.1	A	0
	Subtotal	13	15	113.1%	11.3	6.7	B	3
WB	Left Turn	51	52	102.7%	21.6	6.3	C	21
	Through	4	4	105.0%	10.4	10.1	B	1
	Right Turn	65	69	106.5%	12.9	6.6	B	16
	Subtotal	120	126	104.8%	16.5	5.9	C	38
Total		976	990	101.5%	3.4	1.0	A	50

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **Existing**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	838	97.7%	8.3	2.7	A	128
	Right Turn	428	412	96.2%	11.6	2.4	B	87
	Subtotal	1,286	1,250	97.2%	9.4	2.4	A	215
SB	Left Turn	99	96	96.7%	52.3	9.1	D	92
	Through	971	920	94.7%	17.5	1.8	B	295
	Right Turn							
	Subtotal	1,070	1,016	94.9%	20.9	1.9	C	387
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	491	98.7%	71.2	15.4	E	640
	Through							
	Right Turn	154	149	96.8%	42.5	15.3	D	116
	Subtotal	651	640	98.2%	64.1	15.1	E	756
Total		3,007	2,905	96.6%	24.8	3.8	C	1358

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	63	90.1%	98.7	82.1	F	114
	Through	1,205	1,175	97.5%	4.7	1.5	A	100
	Right Turn	56	51	91.8%	3.4	2.2	A	3
	Subtotal	1,331	1,290	96.9%	8.8	4.4	A	218
SB	Left Turn	18	19	104.4%	45.3	24.3	D	16
	Through	1,390	1,334	96.0%	8.1	1.9	A	199
	Right Turn	60	59	99.0%	6.9	1.0	A	8
	Subtotal	1,468	1,412	96.2%	8.6	2.0	A	222
EB	Left Turn	59	59	99.7%	77.7	34.3	E	84
	Through	23	25	109.1%	83.2	35.2	F	38
	Right Turn	61	57	93.0%	82.2	31.8	F	85
	Subtotal	143	141	98.3%	79.9	32.2	E	207
WB	Left Turn	56	51	90.4%	74.5	27.1	E	69
	Through	24	27	111.7%	58.2	15.6	E	29
	Right Turn	22	19	87.7%	25.5	9.3	C	9
	Subtotal	102	97	94.8%	60.1	18.1	E	107
Total		3,044	2,939	96.6%	13.6	2.7	B	754

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	250	91.6%	136.7	58.3	F	627
	Through	1,001	971	97.0%	52.4	36.5	D	932
	Right Turn	57	56	97.9%	40.2	36.2	D	41
	Subtotal	1,331	1,277	96.0%	66.8	40.2	E	1601
SB	Left Turn	10	10	95.0%	34.4	30.9	C	6
	Through	1,067	1,015	95.1%	25.1	7.0	C	468
	Right Turn	430	412	95.8%	16.2	4.6	B	122
	Subtotal	1,507	1,436	95.3%	22.7	6.1	C	596
EB	Left Turn	324	316	97.6%	57.3	10.2	E	332
	Through	48	49	101.9%	58.9	14.4	E	53
	Right Turn	379	366	96.5%	63.8	20.6	E	427
	Subtotal	751	731	97.3%	61.0	11.7	E	812
WB	Left Turn	61	61	99.3%	49.8	9.8	D	55
	Through	36	36	100.8%	46.0	7.3	D	31
	Right Turn	6	6	91.7%	9.3	11.1	A	1
	Subtotal	103	102	99.4%	46.8	7.0	D	87
Total		3,692	3,547	96.1%	46.4	15.0	D	3096

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,259	99.3%	2.9	0.8	A	68
	Right Turn	52	51	98.8%	3.1	1.3	A	3
	Subtotal	1,320	1,311	99.3%	2.9	0.8	A	71
SB	Left Turn	92	87	94.9%	37.1	9.4	D	59
	Through	1,360	1,291	94.9%	13.2	6.2	B	312
	Right Turn							
	Subtotal	1,452	1,379	94.9%	14.7	6.6	B	371
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	118	101.0%	55.5	9.3	E	120
	Through							
	Right Turn	157	154	98.1%	9.3	3.5	A	26
	Subtotal	274	272	99.3%	30.0	7.3	C	146
Total		3,046	2,961	97.2%	11.2	3.4	B	588

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	155	96.8%	56.5	10.6	E	160
	Through	908	904	99.6%	35.7	3.8	D	591
	Right Turn	137	134	98.1%	23.9	6.2	C	59
	Subtotal	1,205	1,193	99.0%	37.3	4.8	D	810
SB	Left Turn	218	226	103.7%	54.6	7.5	D	226
	Through	1,080	1,013	93.8%	22.4	5.7	C	416
	Right Turn	179	165	92.2%	14.0	4.5	B	42
	Subtotal	1,477	1,404	95.1%	26.7	4.7	C	685
EB	Left Turn	158	160	101.3%	65.0	12.9	E	191
	Through	396	396	99.9%	40.2	2.6	D	292
	Right Turn	159	157	98.8%	20.8	5.4	C	60
	Subtotal	713	713	100.0%	41.5	4.8	D	543
WB	Left Turn	196	195	99.6%	89.8	15.6	F	321
	Through	637	625	98.1%	78.7	12.3	E	902
	Right Turn	254	243	95.6%	80.6	16.3	F	359
	Subtotal	1,087	1,063	97.8%	81.3	13.3	F	1582
Total		4,482	4,373	97.6%	46.1	3.9	D	3620

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	152	97.8%	46.8	15.9	D	130
	Through	107	101	94.7%	27.4	8.8	C	51
	Right Turn	87	86	99.3%	23.2	9.8	C	37
	Subtotal	349	339	97.2%	35.0	12.2	D	218
SB	Left Turn	73	74	101.1%	20.9	5.5	C	28
	Through	101	99	98.0%	17.2	3.2	B	31
	Right Turn	51	57	112.4%	18.8	3.8	B	20
	Subtotal	225	230	102.3%	18.8	2.7	B	79
EB	Left Turn	61	61	99.3%	17.3	5.0	B	19
	Through	508	504	99.1%	9.0	1.0	A	83
	Right Turn	96	98	101.6%	9.9	2.0	A	18
	Subtotal	665	662	99.5%	9.9	1.1	A	120
WB	Left Turn	89	89	99.9%	28.7	8.5	C	47
	Through	491	463	94.2%	9.2	1.2	A	78
	Right Turn	77	69	89.2%	9.4	2.2	A	12
	Subtotal	657	620	94.4%	11.8	1.6	B	136
Total		1,896	1,851	97.6%	16.6	2.3	B	553

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **Existing**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	3.1	6.8	A	0
	Through	26	23	89.2%	24.5	7.7	C	10
	Right Turn	35	34	98.3%	7.8	2.8	A	5
	Subtotal	63	60	94.4%	13.7	3.9	B	15
SB	Left Turn	36	36	100.0%	23.5	4.4	C	16
	Through	22	23	104.1%	22.9	10.3	C	10
	Right Turn	74	76	103.2%	14.5	5.7	B	20
	Subtotal	132	135	102.5%	18.6	3.4	B	45
EB	Left Turn	47	46	98.3%	20.3	13.5	C	17
	Through	531	527	99.2%	6.1	1.1	A	59
	Right Turn	6	6	105.0%	9.5	9.0	A	1
	Subtotal	584	579	99.2%	7.5	2.0	A	77
WB	Left Turn	39	41	105.4%	6.0	2.2	A	5
	Through	622	583	93.7%	7.3	4.8	A	78
	Right Turn	47	52	110.2%	11.9	9.2	B	11
	Subtotal	708	676	95.4%	7.5	4.7	A	94
Total		1,487	1,450	97.5%	9.0	3.1	A	232

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	133	98.0%	33.9	2.9	C	83
	Through	577	572	99.2%	21.8	3.5	C	229
	Right Turn	129	125	97.2%	19.9	6.7	B	46
	Subtotal	842	831	98.7%	23.4	3.4	C	357
SB	Left Turn	106	107	101.1%	42.8	12.5	D	84
	Through	768	765	99.6%	30.7	5.7	C	431
	Right Turn	84	81	96.5%	29.8	5.3	C	44
	Subtotal	958	953	99.5%	32.1	5.9	C	559
EB	Left Turn	162	157	96.9%	77.3	39.3	E	222
	Through	305	305	99.9%	58.0	31.2	E	324
	Right Turn	121	120	99.2%	37.6	30.8	D	83
	Subtotal	588	582	98.9%	59.7	33.5	E	629
WB	Left Turn	178	164	92.2%	45.1	17.3	D	136
	Through	319	303	95.1%	39.0	10.7	D	217
	Right Turn	77	71	92.6%	8.9	2.7	A	12
	Subtotal	574	539	93.9%	36.7	6.6	D	364
Total		2,962	2,905	98.1%	35.5	7.3	D	1910

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	90.0%	1.6	2.1	A	0
	Through	322	329	102.1%	0.5	0.1	A	3
	Right Turn	83	83	99.8%	1.0	0.2	A	1
	Subtotal	407	413	101.5%	0.6	0.1	A	5
SB	Left Turn	73	75	102.6%	4.5	1.3	A	6
	Through	537	540	100.5%	0.5	0.1	A	5
	Right Turn	7	6	84.3%	0.6	0.5	A	0
	Subtotal	617	621	100.6%	1.1	0.3	A	12
EB	Left Turn	2	2	120.0%	7.4	11.7	A	0
	Through							
	Right Turn	3	4	130.0%	2.6	2.7	A	0
	Subtotal	5	6	126.0%	7.1	10.1	A	1
WB	Left Turn	69	67	96.4%	29.6	7.2	D	36
	Through	5	6	122.0%	14.8	14.1	B	2
	Right Turn	67	64	96.1%	10.3	3.5	B	12
	Subtotal	141	137	97.2%	20.5	5.7	C	50
Total		1,170	1,177	100.6%	3.3	0.9	A	67

Vissim Post-Processor | **W Elizabeth St**
Average Results from 11 Runs | **Recommended Design**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	719	701	97.5%	5.0	1.2	A	64
	Right Turn	413	395	95.7%	7.8	2.6	A	57
	Subtotal	1,132	1,096	96.8%	6.0	1.4	A	120
SB	Left Turn	130	133	102.2%	21.4	6.0	C	52
	Through	667	653	97.9%	10.2	1.5	B	122
	Right Turn							
	Subtotal	797	786	98.6%	12.1	2.4	B	174
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	128	121	94.5%	45.8	4.0	D	102
	Through							
	Right Turn	61	60	98.2%	10.3	2.1	B	11
	Subtotal	189	181	95.7%	34.6	3.1	C	113
Total		2,118	2,063	97.4%	12.2	1.4	B	407

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	13	12	93.8%	17.9	10.7	B	4
	Through	1,064	1,032	97.0%	9.2	1.1	A	174
	Right Turn	37	41	111.1%	8.8	4.4	A	7
	Subtotal	1,114	1,086	97.4%	9.3	1.1	A	185
SB	Left Turn	13	11	84.6%	15.9	14.9	B	3
	Through	764	748	97.9%	7.0	1.6	A	96
	Right Turn	18	18	97.2%	7.7	5.8	A	2
	Subtotal	795	777	97.7%	7.2	1.6	A	102
EB	Left Turn	51	50	98.6%	54.4	9.2	D	50
	Through	25	31	123.6%	39.4	9.1	D	22
	Right Turn	34	33	97.4%	45.1	13.4	D	27
	Subtotal	110	114	103.9%	48.8	6.2	D	100
WB	Left Turn	17	23	132.4%	38.7	18.7	D	16
	Through	18	23	127.8%	29.1	17.4	C	12
	Right Turn	17	17	98.2%	8.9	5.1	A	3
	Subtotal	52	62	119.6%	27.2	11.0	C	31
Total		2,071	2,039	98.4%	12.1	1.2	B	417

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	140	145	103.2%	22.4	2.9	C	59
	Through	851	823	96.7%	7.2	2.5	A	109
	Right Turn	54	54	99.1%	6.7	3.6	A	7
	Subtotal	1,045	1,021	97.7%	9.3	2.3	A	175
SB	Left Turn	24	23	96.7%	18.8	6.1	B	8
	Through	653	641	98.1%	7.5	3.3	A	88
	Right Turn	138	140	101.4%	3.2	0.6	A	8
	Subtotal	815	804	98.7%	7.1	2.7	A	105
EB	Left Turn	258	254	98.6%	43.8	6.5	D	204
	Through	27	26	96.3%	28.8	17.0	C	14
	Right Turn	296	297	100.4%	14.1	2.5	B	77
	Subtotal	581	578	99.4%	27.7	3.3	C	295
WB	Left Turn	15	14	96.0%	60.0	15.1	E	16
	Through	5	5	106.0%	27.5	25.5	C	3
	Right Turn	5	4	78.0%	52.5	38.2	D	4
	Subtotal	25	24	94.4%	54.8	10.9	D	22
Total		2,466	2,426	98.4%	13.4	1.9	B	597

Vissim Post-Processor | **W Elizabeth St**
Average Results from 11 Runs | **Recommended Design**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,178	1,174	99.7%	3.7	0.8	A	80
	Right Turn	154	149	97.0%	4.3	1.2	A	12
	Subtotal	1,332	1,324	99.4%	3.8	0.7	A	92
SB	Left Turn	123	120	97.8%	45.5	6.9	D	100
	Through	768	753	98.0%	5.8	1.5	A	80
	Right Turn							
	Subtotal	891	873	98.0%	11.4	2.8	B	180
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	61	63	102.6%	47.6	7.3	D	55
	Through							
	Right Turn	37	36	97.6%	5.5	1.1	A	4
	Subtotal	98	99	100.7%	32.5	6.3	C	58
Total		2,321	2,296	98.9%	7.8	1.2	A	330

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	56	59	105.9%	22.9	5.7	C	25
	Through	946	933	98.6%	21.1	2.0	C	361
	Right Turn	136	134	98.4%	14.6	3.8	B	36
	Subtotal	1,138	1,126	98.9%	20.4	1.7	C	422
SB	Left Turn	145	149	102.4%	33.0	6.9	C	90
	Through	630	609	96.7%	8.2	1.6	A	92
	Right Turn	54	57	105.9%	2.6	0.8	A	3
	Subtotal	829	815	98.3%	12.8	1.8	B	185
EB	Left Turn	241	241	100.2%	134.3	27.4	F	594
	Through	713	717	100.6%	111.5	16.5	F	1466
	Right Turn	152	155	102.0%	75.6	18.1	E	215
	Subtotal	1,106	1,114	100.7%	111.5	19.1	F	2275
WB	Left Turn	71	70	98.6%	48.6	10.1	D	62
	Through	233	234	100.6%	41.9	2.9	D	180
	Right Turn	145	148	101.8%	31.8	6.4	C	86
	Subtotal	449	452	100.6%	39.7	2.8	D	328
Total		3,522	3,506	99.6%	53.6	6.8	D	3209

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	24	22	91.7%	34.8	19.8	C	14
	Through	33	31	94.8%	23.6	5.5	C	14
	Right Turn	35	37	106.3%	9.5	4.8	A	6
	Subtotal	92	91	98.4%	20.2	4.5	C	34
SB	Left Turn	34	33	97.1%	30.7	13.4	C	19
	Through	32	33	104.4%	26.3	6.7	C	16
	Right Turn	18	23	126.1%	10.2	3.7	B	4
	Subtotal	84	89	106.1%	22.9	5.1	C	39
EB	Left Turn	53	56	105.1%	40.0	3.7	D	41
	Through	441	440	99.9%	10.8	1.7	B	87
	Right Turn	66	64	97.1%	9.1	1.8	A	11
	Subtotal	560	560	100.0%	13.5	1.7	B	139
WB	Left Turn	30	29	97.3%	35.5	11.7	D	19
	Through	160	160	100.1%	7.9	2.1	A	23
	Right Turn	45	46	101.3%	6.4	2.5	A	5
	Subtotal	235	235	100.0%	10.7	2.2	B	48
Total		971	975	100.4%	14.2	1.7	B	259

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	3	2	63.3%	18.6	20.2	B	1
	Through	4	5	117.5%	15.9	16.3	B	1
	Right Turn	20	18	91.0%	20.5	8.2	C	7
	Subtotal	27	25	91.9%	21.6	8.7	C	9
SB	Left Turn	36	35	96.4%	27.0	9.0	C	17
	Through	9	8	93.3%	20.8	15.3	C	3
	Right Turn	32	32	100.3%	24.7	4.4	C	15
	Subtotal	77	75	97.7%	25.1	4.0	C	35
EB	Left Turn	26	27	102.3%	8.8	3.8	A	4
	Through	499	503	100.7%	8.6	1.7	A	80
	Right Turn	5	6	126.0%	4.0	5.1	A	0
	Subtotal	530	536	101.0%	8.6	1.7	A	84
WB	Left Turn	2	2	80.0%	1.5	2.2	A	0
	Through	150	148	98.6%	3.6	1.4	A	10
	Right Turn	15	20	130.0%	7.5	3.1	A	3
	Subtotal	167	169	101.2%	4.0	1.4	A	13
Total		801	805	100.4%	10.4	1.6	B	141

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	51	52	102.2%	15.5	3.7	B	15
	Through	739	721	97.5%	18.3	3.4	B	241
	Right Turn	111	112	100.8%	15.7	4.9	B	32
	Subtotal	901	885	98.2%	17.9	3.3	B	289
SB	Left Turn	91	88	96.6%	22.3	4.8	C	36
	Through	547	557	101.9%	13.1	1.7	B	134
	Right Turn	47	44	94.5%	10.7	4.0	B	9
	Subtotal	685	690	100.7%	14.1	1.5	B	179
EB	Left Turn	121	118	97.4%	40.3	6.8	D	87
	Through	239	244	102.1%	43.4	8.1	D	194
	Right Turn	153	158	103.3%	18.1	6.4	B	52
	Subtotal	513	520	101.3%	35.5	6.5	D	333
WB	Left Turn	100	98	97.6%	33.6	8.2	C	60
	Through	109	111	101.5%	31.9	9.6	C	65
	Right Turn	32	30	94.7%	5.5	1.3	A	3
	Subtotal	241	239	99.0%	29.8	7.8	C	128
Total		2,340	2,332	99.7%	22.1	2.7	C	929

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	4	4	95.0%	1.7	1.9	A	0
	Through	455	460	101.0%	4.4	0.9	A	37
	Right Turn	69	69	99.4%	4.1	1.3	A	5
	Subtotal	528	532	100.7%	4.3	1.0	A	42
SB	Left Turn	33	30	91.2%	3.4	1.4	A	2
	Through	272	285	104.9%	2.9	0.4	A	15
	Right Turn	10	7	74.0%	3.5	2.5	A	0
	Subtotal	315	323	102.5%	2.9	0.4	A	18
EB	Left Turn	11	12	112.7%	4.4	2.7	A	1
	Through	1	7	740.0%	4.9	3.6	A	1
	Right Turn	1	1	50.0%	0.6	1.2	A	0
	Subtotal	13	20	156.2%	4.5	2.5	A	2
WB	Left Turn	51	49	96.7%	14.7	5.4	B	13
	Through	4	10	247.5%	29.2	7.8	D	5
	Right Turn	65	63	96.5%	16.1	6.8	C	19
	Subtotal	120	122	101.6%	16.6	4.8	C	37
Total		976	997	102.2%	5.4	0.8	A	98

Vissim Post-Processor **W Elizabeth St**
Average Results from 10 Runs **Recommended Design**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	858	836	97.4%	13.9	5.1	B	213
	Right Turn	428	424	99.0%	15.4	4.0	B	120
	Subtotal	1,286	1,260	97.9%	14.4	4.7	B	333
SB	Left Turn	99	98	98.8%	51.3	8.4	D	92
	Through	971	929	95.7%	22.9	9.4	C	390
	Right Turn							
	Subtotal	1,070	1,027	95.9%	25.8	8.6	C	482
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	497	494	99.4%	83.2	24.9	F	754
	Through							
	Right Turn	154	149	96.6%	56.1	29.6	E	153
	Subtotal	651	643	98.8%	76.5	26.3	E	907
Total		3,007	2,929	97.4%	31.8	5.8	C	1721

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	64	91.1%	116.1	101.6	F	136
	Through	1,205	1,184	98.2%	12.3	2.5	B	268
	Right Turn	56	55	98.8%	12.4	3.6	B	13
	Subtotal	1,331	1,303	97.9%	17.4	6.0	B	416
SB	Left Turn	18	21	113.9%	35.0	12.4	C	13
	Through	1,390	1,342	96.5%	13.7	5.2	B	337
	Right Turn	60	61	101.2%	11.1	6.4	B	12
	Subtotal	1,468	1,423	96.9%	13.9	5.2	B	362
EB	Left Turn	59	59	99.3%	56.2	8.4	E	60
	Through	23	27	117.8%	42.0	16.2	D	21
	Right Turn	61	56	92.1%	54.5	12.6	D	56
	Subtotal	143	142	99.2%	53.2	8.6	D	137
WB	Left Turn	56	54	97.1%	55.7	18.6	E	56
	Through	24	27	111.3%	34.1	22.1	C	17
	Right Turn	22	20	89.1%	16.3	11.7	B	6
	Subtotal	102	101	98.7%	42.3	10.8	D	78
Total		3,044	2,969	97.5%	18.4	4.0	B	994

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	273	254	92.9%	78.8	22.4	E	366
	Through	1,001	987	98.6%	27.4	10.7	C	497
	Right Turn	57	59	103.0%	22.2	9.5	C	24
	Subtotal	1,331	1,299	97.6%	37.5	13.0	D	887
SB	Left Turn	10	11	106.0%	44.6	19.3	D	9
	Through	1,067	1,015	95.1%	27.2	7.8	C	506
	Right Turn	430	415	96.5%	16.5	4.9	B	126
	Subtotal	1,507	1,441	95.6%	24.3	6.9	C	641
EB	Left Turn	324	314	97.0%	51.8	7.0	D	298
	Through	48	47	98.3%	53.6	16.4	D	46
	Right Turn	379	338	89.1%	114.8	17.8	F	710
	Subtotal	751	699	93.1%	81.8	8.9	F	1055
WB	Left Turn	61	59	96.6%	99.5	31.3	F	107
	Through	36	37	102.8%	88.1	26.8	F	60
	Right Turn	6	5	75.0%	53.1	60.1	D	4
	Subtotal	103	100	97.5%	94.8	27.2	F	172
Total		3,692	3,539	95.9%	42.3	6.3	D	2754

Vissim Post-Processor | **W Elizabeth St**
Average Results from 10 Runs | **Recommended Design**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,268	1,271	100.2%	2.9	0.4	A	67
	Right Turn	52	56	107.7%	3.3	2.6	A	3
	Subtotal	1,320	1,327	100.5%	2.9	0.4	A	70
SB	Left Turn	92	85	92.0%	38.5	8.2	D	60
	Through	1,360	1,265	93.0%	14.8	3.1	B	342
	Right Turn							
	Subtotal	1,452	1,350	93.0%	16.2	3.1	B	402
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	117	120	102.4%	53.4	9.5	D	117
	Through							
	Right Turn	157	154	98.2%	10.5	3.6	B	30
	Subtotal	274	274	100.0%	30.2	7.6	C	147
Total		3,046	2,951	96.9%	11.9	1.8	B	619

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	160	153	95.6%	48.1	13.7	D	135
	Through	908	912	100.4%	33.7	4.7	C	563
	Right Turn	137	132	96.1%	23.1	6.2	C	56
	Subtotal	1,205	1,197	99.3%	34.6	6.1	C	754
SB	Left Turn	218	221	101.2%	52.3	7.1	D	212
	Through	1,080	993	91.9%	19.9	4.5	B	363
	Right Turn	179	163	91.3%	12.3	2.9	B	37
	Subtotal	1,477	1,377	93.2%	24.2	3.6	C	612
EB	Left Turn	158	160	101.5%	68.5	15.9	E	201
	Through	396	394	99.4%	40.4	4.0	D	292
	Right Turn	159	158	99.1%	20.3	4.7	C	59
	Subtotal	713	712	99.8%	42.7	5.6	D	552
WB	Left Turn	196	191	97.4%	106.3	33.1	F	372
	Through	637	613	96.2%	100.7	33.6	F	1131
	Right Turn	254	250	98.6%	103.6	33.4	F	475
	Subtotal	1,087	1,054	97.0%	102.5	33.2	F	1978
Total		4,482	4,339	96.8%	50.2	9.2	D	3896

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	158	101.7%	45.1	15.7	D	130
	Through	107	100	93.5%	28.3	9.1	C	52
	Right Turn	87	86	99.1%	20.9	6.7	C	33
	Subtotal	349	344	98.5%	34.2	11.9	C	215
SB	Left Turn	73	70	95.3%	25.8	5.4	C	33
	Through	101	99	98.0%	19.5	4.6	B	35
	Right Turn	51	56	109.8%	14.2	3.6	B	15
	Subtotal	225	225	99.8%	20.0	3.7	C	83
EB	Left Turn	61	56	91.3%	43.0	7.3	D	44
	Through	508	499	98.3%	24.7	5.5	C	226
	Right Turn	96	92	96.1%	19.6	6.8	B	33
	Subtotal	665	647	97.4%	25.6	5.1	C	303
WB	Left Turn	89	91	102.1%	36.8	7.7	D	61
	Through	491	470	95.7%	16.2	1.6	B	139
	Right Turn	77	66	86.1%	16.4	2.3	B	20
	Subtotal	657	627	95.4%	19.1	1.8	B	221
Total		1,896	1,843	97.2%	24.5	3.7	C	821

Vissim Post-Processor | **W Elizabeth St**
Average Results from 10 Runs | **Recommended Design**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	105.0%	9.7	20.5	A	0
	Through	26	23	88.8%	16.6	6.5	B	7
	Right Turn	35	31	88.0%	21.3	7.1	C	12
	Subtotal	63	56	88.9%	19.7	6.2	B	19
SB	Left Turn	36	36	100.0%	27.2	6.4	C	18
	Through	22	26	117.3%	21.8	6.2	C	10
	Right Turn	74	74	99.6%	24.2	4.4	C	33
	Subtotal	132	136	102.7%	25.0	3.7	C	61
EB	Left Turn	47	50	105.5%	25.1	6.9	C	23
	Through	531	520	97.9%	15.9	3.1	B	151
	Right Turn	6	6	106.7%	14.8	15.6	B	2
	Subtotal	584	576	98.6%	16.6	3.1	B	176
WB	Left Turn	39	41	104.4%	23.4	8.9	C	17
	Through	622	598	96.1%	14.8	3.0	B	162
	Right Turn	47	52	110.0%	14.6	4.1	B	14
	Subtotal	708	690	97.5%	15.2	3.1	B	193
Total		1,487	1,458	98.0%	16.9	2.1	B	449

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	136	132	97.1%	35.1	5.4	D	85
	Through	577	574	99.5%	24.5	4.5	C	258
	Right Turn	129	124	95.7%	21.1	5.6	C	48
	Subtotal	842	830	98.6%	25.7	4.3	C	391
SB	Left Turn	106	104	98.1%	51.9	12.8	D	99
	Through	768	755	98.4%	41.7	10.4	D	577
	Right Turn	84	80	95.5%	38.3	11.3	D	56
	Subtotal	958	940	98.1%	42.5	10.4	D	732
EB	Left Turn	162	160	99.0%	79.3	41.1	E	233
	Through	305	306	100.4%	62.4	34.8	E	350
	Right Turn	121	117	97.0%	45.0	32.7	D	97
	Subtotal	588	584	99.3%	63.9	36.7	E	680
WB	Left Turn	178	170	95.2%	54.3	16.1	D	169
	Through	319	307	96.3%	45.0	10.4	D	253
	Right Turn	77	74	95.7%	14.0	8.0	B	19
	Subtotal	574	550	95.9%	43.8	11.8	D	441
Total		2,962	2,904	98.0%	42.2	10.8	D	2244

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	2	2	95.0%	2.1	3.4	A	0
	Through	322	324	100.5%	4.6	1.2	A	27
	Right Turn	83	83	100.0%	4.5	1.0	A	7
	Subtotal	407	408	100.3%	4.6	1.1	A	34
SB	Left Turn	73	72	98.8%	7.5	3.3	A	10
	Through	537	541	100.7%	7.2	2.2	A	71
	Right Turn	7	7	94.3%	7.8	5.0	A	1
	Subtotal	617	620	100.4%	7.2	2.2	A	82
EB	Left Turn	2	2	100.0%	3.8	4.2	A	0
	Through							
	Right Turn	3	3	103.3%	8.0	11.8	A	0
	Subtotal	5	5	102.0%	6.9	6.6	A	1
WB	Left Turn	69	62	89.7%	12.3	3.1	B	14
	Through	5	11	226.0%	23.8	6.1	C	5
	Right Turn	67	64	95.1%	13.9	5.0	B	16
	Subtotal	141	137	97.1%	14.3	3.0	B	35
Total		1,170	1,170	100.0%	7.2	1.2	A	152

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040**
Volume and Delay by Movement **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	829	97.5%	8.0	2.8	A	122
	Right Turn	490	471	96.1%	10.5	2.6	B	90
	Subtotal	1,340	1,300	97.0%	8.9	2.7	A	212
SB	Left Turn	155	156	100.9%	34.7	10.8	C	100
	Through	790	783	99.1%	12.1	1.1	B	174
	Right Turn							
	Subtotal	945	939	99.4%	15.8	2.2	B	274
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	146	94.3%	45.1	4.3	D	121
	Through							
	Right Turn	75	70	92.7%	11.4	3.5	B	14
	Subtotal	230	216	93.8%	34.2	4.0	C	135
Total		2,515	2,455	97.6%	13.5	1.6	B	621

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	15	76.5%	11.4	6.8	B	3
	Through	1,260	1,227	97.4%	3.6	1.6	A	81
	Right Turn	45	46	102.0%	3.8	1.8	A	3
	Subtotal	1,325	1,289	97.2%	3.7	1.6	A	88
SB	Left Turn	20	14	68.0%	26.2	24.9	C	7
	Through	905	898	99.2%	5.5	0.7	A	90
	Right Turn	25	20	80.4%	4.3	2.6	A	2
	Subtotal	950	932	98.1%	5.9	0.9	A	98
EB	Left Turn	65	58	89.8%	63.5	17.1	E	68
	Through	30	37	123.7%	67.4	15.9	E	46
	Right Turn	45	40	88.7%	67.0	19.3	E	49
	Subtotal	140	135	96.7%	64.6	14.6	E	163
WB	Left Turn	25	22	88.0%	50.8	25.7	D	20
	Through	25	28	113.2%	34.3	9.6	C	18
	Right Turn	25	20	79.2%	14.4	8.3	B	5
	Subtotal	75	70	93.5%	34.3	9.2	C	43
Total		2,490	2,426	97.4%	10.1	1.4	B	392

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	162	95.5%	32.4	4.7	C	97
	Through	1,005	970	96.5%	11.1	3.1	B	198
	Right Turn	70	62	88.9%	9.7	3.3	A	11
	Subtotal	1,245	1,195	96.0%	14.0	2.4	B	306
SB	Left Turn	30	26	85.7%	53.5	15.1	D	25
	Through	775	769	99.2%	8.2	2.4	A	115
	Right Turn	170	166	97.4%	3.8	0.6	A	12
	Subtotal	975	960	98.5%	8.9	2.0	A	152
EB	Left Turn	315	317	100.6%	48.3	5.6	D	281
	Through	35	36	103.7%	52.2	11.7	D	35
	Right Turn	360	357	99.3%	53.6	25.3	D	351
	Subtotal	710	711	100.1%	51.3	14.2	D	667
WB	Left Turn	20	16	80.5%	37.2	25.9	D	11
	Through	10	6	63.0%	22.2	30.5	C	3
	Right Turn	10	5	50.0%	7.4	10.9	A	1
	Subtotal	40	27	68.5%	37.3	16.7	D	14
Total		2,970	2,893	97.4%	21.7	2.8	C	1,138

Vissim Post-Processor | **WCAP W Elizabeth St**
Average Results from 10 Runs | **2040**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,372	98.3%	5.0	1.0	A	125
	Right Turn	185	175	94.6%	5.7	1.5	A	18
	Subtotal	1,580	1,547	97.9%	5.1	1.0	A	143
SB	Left Turn	150	145	96.7%	50.5	12.1	D	134
	Through	910	901	99.0%	7.0	3.3	A	115
	Right Turn							
	Subtotal	1,060	1,046	98.7%	13.3	4.6	B	249
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	71	94.1%	47.0	8.2	D	61
	Through							
	Right Turn	45	45	99.1%	5.5	1.4	A	4
	Subtotal	120	115	96.0%	31.9	4.8	C	65
Total		2,760	2,708	98.1%	9.8	2.1	A	458

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	68	97.0%	35.0	8.4	D	44
	Through	1,120	1,107	98.8%	27.0	4.7	C	549
	Right Turn	165	155	94.1%	21.9	7.4	C	62
	Subtotal	1,355	1,330	98.1%	26.8	4.9	C	655
SB	Left Turn	175	178	101.4%	41.5	6.5	D	135
	Through	745	728	97.8%	7.9	2.2	A	106
	Right Turn	65	63	96.2%	4.7	1.5	A	5
	Subtotal	985	968	98.3%	14.2	2.3	B	247
EB	Left Turn	285	264	92.6%	381.2	56.8	F	1,845
	Through	845	792	93.8%	375.3	55.3	F	5,451
	Right Turn	180	165	91.7%	342.7	56.5	F	1,037
	Subtotal	1,310	1,221	93.2%	372.4	55.3	F	8,332
WB	Left Turn	85	83	97.1%	63.5	17.4	E	96
	Through	275	274	99.5%	3.0	1.4	A	15
	Right Turn	175	174	99.1%	19.1	3.3	B	61
	Subtotal	535	530	99.0%	18.0	4.4	B	172
Total		4,185	4,049	96.8%	135.2	17.3	F	9,405

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	27	89.3%	20.5	3.9	C	10
	Through	45	40	88.7%	19.4	4.4	B	14
	Right Turn	45	44	98.0%	10.1	4.3	B	8
	Subtotal	120	111	92.3%	15.7	2.5	B	32
SB	Left Turn	45	40	89.8%	22.8	6.1	C	17
	Through	40	39	98.3%	18.7	4.2	B	13
	Right Turn	25	26	102.8%	15.7	5.5	B	7
	Subtotal	110	105	95.8%	19.3	2.5	B	38
EB	Left Turn	70	65	92.1%	7.3	1.9	A	9
	Through	545	532	97.6%	5.9	0.6	A	58
	Right Turn	85	82	96.4%	6.0	1.7	A	9
	Subtotal	700	678	96.9%	6.1	0.6	A	75
WB	Left Turn	40	34	86.0%	16.1	4.0	B	10
	Through	200	180	90.2%	5.9	1.3	A	19
	Right Turn	60	52	86.7%	4.0	1.3	A	4
	Subtotal	300	267	88.9%	6.8	1.2	A	33
Total		1,230	1,161	94.4%	8.3	0.6	A	179

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	60.0%	7.2	10.0	A	0
	Through	5	6	114.0%	15.1	9.0	B	2
	Right Turn	25	24	94.0%	5.7	1.3	A	2
	Subtotal	35	32	92.0%	8.2	3.4	A	4
SB	Left Turn	45	42	93.6%	20.6	4.1	C	16
	Through	15	11	72.7%	21.5	8.8	C	4
	Right Turn	40	40	99.0%	7.4	1.0	A	5
	Subtotal	100	93	92.6%	14.7	2.7	B	26
EB	Left Turn	35	28	79.7%	4.3	1.9	A	2
	Through	615	609	99.1%	4.2	1.2	A	47
	Right Turn	10	6	60.0%	4.5	5.6	A	0
	Subtotal	660	643	97.4%	4.3	1.2	A	50
WB	Left Turn	5	2	44.0%	2.7	3.4	A	0
	Through	185	170	91.8%	2.7	0.6	A	9
	Right Turn	20	22	108.0%	6.0	2.2	A	2
	Subtotal	210	194	92.2%	3.2	0.6	A	11
Total		1,005	962	95.7%	5.6	1.1	A	91

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	65	99.7%	26.7	10.0	C	32
	Through	910	898	98.7%	30.7	11.4	C	505
	Right Turn	140	137	97.6%	31.7	10.3	C	79
	Subtotal	1,115	1,099	98.6%	30.6	11.0	C	616
SB	Left Turn	115	111	96.2%	32.6	4.3	C	66
	Through	675	675	100.0%	17.2	2.2	B	213
	Right Turn	60	53	88.0%	17.1	4.2	B	17
	Subtotal	850	838	98.6%	19.2	2.3	B	296
EB	Left Turn	150	151	100.5%	52.2	18.1	D	144
	Through	295	291	98.8%	59.8	15.8	E	320
	Right Turn	190	192	100.9%	37.1	16.3	D	130
	Subtotal	635	634	99.8%	51.2	16.5	D	594
WB	Left Turn	125	111	88.4%	43.3	15.0	D	88
	Through	135	130	96.1%	30.0	4.0	C	71
	Right Turn	40	37	92.8%	7.0	2.1	A	5
	Subtotal	300	277	92.5%	32.1	6.8	C	164
Total		2,900	2,849	98.2%	32.5	6.7	C	1,670

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	5	98.0%	3.4	2.3	A	0
	Through	560	560	100.1%	0.6	0.1	A	6
	Right Turn	85	88	103.5%	0.9	0.1	A	2
	Subtotal	650	653	100.5%	0.7	0.1	A	8
SB	Left Turn	45	41	90.2%	6.3	2.3	A	5
	Through	335	338	100.8%	0.5	0.2	A	3
	Right Turn	15	10	63.3%	0.5	0.2	A	0
	Subtotal	395	388	98.2%	1.1	0.3	A	8
EB	Left Turn	15	13	89.3%	20.4	7.4	C	5
	Through	5	1	18.0%	5.7	13.2	A	0
	Right Turn	5	1	20.0%	0.5	1.6	A	0
	Subtotal	25	15	61.2%	20.0	7.1	C	5
WB	Left Turn	65	62	95.1%	25.0	16.0	D	28
	Through	5	5	100.0%	15.1	9.2	C	1
	Right Turn	80	81	101.1%	19.7	12.7	C	29
	Subtotal	150	148	98.5%	22.2	13.7	C	59
Total		1,220	1,204	98.7%	3.3	1.3	A	80

Vissim Post-Processor **WCAP W Elizabeth St**
Average Results from 10 Runs **2040**
Volume and Delay by Movement **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	929	89.3%	22.7	11.7	C	387
	Right Turn	520	461	88.6%	25.0	8.7	C	211
	Subtotal	1,560	1,390	89.1%	23.5	10.6	C	598
SB	Left Turn	120	110	92.0%	134.9	43.4	F	273
	Through	1,175	1,121	95.4%	78.3	27.3	E	1608
	Right Turn							
	Subtotal	1,295	1,231	95.1%	83.1	28.5	F	1881
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	489	80.8%	445.1	179.8	F	3987
	Through							
	Right Turn	190	160	84.1%	267.8	144.2	F	785
	Subtotal	795	648	81.6%	403.5	178.5	F	4771
Total		3,650	3,269	89.6%	97.4	21.3	F	7250

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	73	85.6%	110.5	62.7	F	147
	Through	1,460	1,314	90.0%	17.7	14.6	B	427
	Right Turn	70	59	83.9%	14.8	13.0	B	16
	Subtotal	1,615	1,445	89.5%	22.8	15.3	C	590
SB	Left Turn	25	19	77.2%	102.2	27.6	F	36
	Through	1,685	1,506	89.4%	41.6	6.5	D	1149
	Right Turn	75	65	86.9%	41.5	8.6	D	50
	Subtotal	1,785	1,591	89.1%	42.4	6.6	D	1234
EB	Left Turn	75	65	86.9%	274.0	134.3	F	328
	Through	30	29	97.7%	274.6	127.3	F	147
	Right Turn	75	66	88.1%	282.5	133.3	F	342
	Subtotal	180	161	89.2%	278.2	131.9	F	817
WB	Left Turn	70	60	85.3%	97.0	44.9	F	106
	Through	30	34	111.7%	95.2	52.2	F	58
	Right Turn	30	22	73.3%	49.7	34.2	D	20
	Subtotal	130	115	88.6%	87.2	42.6	F	185
Total		3,710	3,312	89.3%	46.8	8.6	D	2827

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	273	85.3%	291.5	60.9	F	1459
	Through	1,215	1,095	90.1%	181.0	33.2	F	3633
	Right Turn	70	62	88.6%	154.5	30.0	F	176
	Subtotal	1,605	1,430	89.1%	199.7	38.3	F	5268
SB	Left Turn	15	12	82.0%	82.1	45.1	F	19
	Through	1,295	1,141	88.1%	50.3	8.8	D	1052
	Right Turn	505	462	91.4%	23.8	3.6	C	201
	Subtotal	1,815	1,615	89.0%	43.2	6.3	D	1271
EB	Left Turn	380	353	92.9%	70.7	18.5	E	457
	Through	55	55	99.3%	73.2	20.1	E	73
	Right Turn	445	403	90.5%	49.2	13.8	D	363
	Subtotal	880	810	92.1%	60.3	11.7	E	894
WB	Left Turn	75	71	95.1%	53.2	8.7	D	70
	Through	45	45	99.6%	46.6	9.7	D	38
	Right Turn	10	6	58.0%	17.1	12.2	B	2
	Subtotal	130	122	93.8%	49.3	7.3	D	110
Total		4,430	3,977	89.8%	102.5	10.6	F	7543

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,452	94.6%	29.5	17.0	C	786
	Right Turn	65	58	88.6%	23.8	12.6	C	25
	Subtotal	1,600	1,509	94.3%	29.3	16.8	C	811
SB	Left Turn	115	93	80.9%	199.8	45.1	F	341
	Through	1,650	1,397	84.7%	128.5	31.6	F	3292
	Right Turn							
	Subtotal	1,765	1,490	84.4%	133.6	31.2	F	3633
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	141	97.3%	69.6	13.4	E	180
	Through							
	Right Turn	190	183	96.2%	54.7	31.0	D	183
	Subtotal	335	324	96.7%	61.8	21.6	E	363
Total		3,700	3,323	89.8%	79.6	15.9	E	4807

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	182	93.3%	144.0	42.4	F	480
	Through	1,100	1,056	96.0%	124.1	53.3	F	2403
	Right Turn	170	155	91.1%	106.4	54.6	F	302
	Subtotal	1,465	1,393	95.1%	125.3	51.3	F	3185
SB	Left Turn	265	242	91.4%	83.8	20.7	F	372
	Through	1,310	1,102	84.1%	39.5	4.7	D	798
	Right Turn	220	181	82.1%	24.5	3.3	C	81
	Subtotal	1,795	1,525	85.0%	45.2	5.9	D	1251
EB	Left Turn	195	183	93.9%	74.2	15.1	E	249
	Through	480	478	99.6%	41.9	3.9	D	368
	Right Turn	195	195	100.1%	22.4	4.4	C	80
	Subtotal	870	857	98.4%	43.8	4.3	D	697
WB	Left Turn	240	228	94.8%	110.6	31.7	F	461
	Through	775	751	96.9%	96.7	38.3	F	1331
	Right Turn	310	289	93.2%	110.5	70.8	F	585
	Subtotal	1,325	1,267	95.6%	102.3	42.2	F	2377
Total		5,455	5,042	92.4%	80.6	22.4	F	7510

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	167	92.7%	74.2	39.6	E	227
	Through	125	114	91.0%	57.6	38.9	E	120
	Right Turn	100	96	96.2%	51.8	35.1	D	91
	Subtotal	405	377	93.0%	63.2	38.6	E	438
SB	Left Turn	85	79	93.3%	23.8	8.6	C	35
	Through	115	109	94.9%	18.4	4.9	B	37
	Right Turn	60	61	101.5%	18.0	4.9	B	20
	Subtotal	260	249	95.9%	20.0	4.9	C	91
EB	Left Turn	70	64	91.9%	20.7	4.7	C	24
	Through	575	563	97.9%	8.5	0.8	A	88
	Right Turn	110	106	96.3%	9.2	1.7	A	18
	Subtotal	755	733	97.1%	9.6	0.6	A	130
WB	Left Turn	105	97	92.8%	38.3	13.5	D	68
	Through	555	523	94.2%	10.0	0.9	B	96
	Right Turn	90	74	82.4%	10.5	2.0	B	14
	Subtotal	750	695	92.6%	14.4	3.1	B	179
Total		2,170	2,053	94.6%	23.3	7.7	C	838

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	40.0%	5.1	11.8	A	0
	Through	30	25	83.0%	21.3	7.6	C	10
	Right Turn	40	36	90.0%	7.6	2.2	A	5
	Subtotal	75	63	83.9%	13.2	3.8	B	15
SB	Left Turn	45	42	92.4%	18.4	4.0	B	14
	Through	25	25	101.6%	23.4	5.5	C	11
	Right Turn	85	85	99.5%	14.9	7.4	B	23
	Subtotal	155	152	97.8%	17.1	4.1	B	48
EB	Left Turn	55	51	92.7%	36.1	23.7	D	34
	Through	605	582	96.2%	7.0	1.5	A	75
	Right Turn	10	6	58.0%	8.9	9.2	A	1
	Subtotal	670	639	95.4%	9.4	3.0	A	110
WB	Left Turn	45	43	94.9%	8.9	3.1	A	7
	Through	705	661	93.7%	10.4	5.9	B	125
	Right Turn	55	57	102.7%	12.1	10.0	B	12
	Subtotal	805	760	94.4%	10.4	5.7	B	145
Total		1,705	1,613	94.6%	10.8	4.0	B	317

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	150	96.9%	42.8	16.0	D	118
	Through	655	656	100.1%	27.1	5.4	C	326
	Right Turn	150	145	96.4%	24.1	5.4	C	64
	Subtotal	960	951	99.0%	29.3	7.0	C	507
SB	Left Turn	120	116	96.4%	75.6	16.1	E	160
	Through	870	844	97.0%	59.5	11.3	E	920
	Right Turn	95	85	89.1%	56.8	12.2	E	88
	Subtotal	1,085	1,044	96.3%	61.1	11.1	E	1169
EB	Left Turn	185	177	95.6%	143.1	90.2	F	464
	Through	345	332	96.2%	101.3	67.3	F	616
	Right Turn	140	131	93.4%	80.7	66.2	F	194
	Subtotal	670	639	95.4%	108.8	73.4	F	1274
WB	Left Turn	205	191	93.0%	66.9	22.2	E	234
	Through	365	340	93.1%	51.3	25.7	D	320
	Right Turn	90	80	88.3%	20.3	15.5	C	30
	Subtotal	660	610	92.4%	51.6	22.5	D	583
Total		3,375	3,244	96.1%	57.7	12.5	E	3533

Intersection 12 **Overland Trail/W Elizabeth St** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	3	56.0%	4.1	3.9	A	0
	Through	365	362	99.3%	0.5	0.2	A	4
	Right Turn	95	98	103.5%	0.9	0.2	A	2
	Subtotal	465	464	99.7%	0.7	0.2	A	5
SB	Left Turn	85	86	101.4%	5.2	1.6	A	8
	Through	610	603	98.9%	0.6	0.1	A	7
	Right Turn	10	8	78.0%	0.7	0.5	A	0
	Subtotal	705	697	98.9%	1.2	0.2	A	15
EB	Left Turn	5	3	54.0%	9.1	12.3	A	0
	Through							
	Right Turn	5	4	76.0%	3.7	2.6	A	0
	Subtotal	10	7	65.0%	8.6	6.8	A	1
WB	Left Turn	80	74	92.4%	29.3	6.4	D	40
	Through	10	6	56.0%	28.1	13.6	D	3
	Right Turn	80	72	90.0%	14.5	1.7	B	19
	Subtotal	170	152	89.1%	22.8	3.8	C	62
Total		1,350	1,319	97.7%	3.6	0.7	A	83

Vissim Post-Processor | **W Elizabeth St**
Average Results from 11 Runs | **2040 Recommended Design**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	850	820	96.5%	6.7	1.5	A	100
	Right Turn	490	464	94.7%	10.2	1.9	B	87
	Subtotal	1,340	1,284	95.9%	8.0	1.6	A	187
SB	Left Turn	155	155	100.1%	30.8	6.5	C	88
	Through	790	769	97.4%	13.0	1.3	B	183
	Right Turn							
	Subtotal	945	924	97.8%	16.1	2.0	B	271
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	155	143	92.5%	45.4	5.8	D	119
	Through							
	Right Turn	75	71	94.3%	11.9	3.3	B	15
	Subtotal	230	214	93.0%	34.6	4.5	C	135
Total		2,515	2,423	96.3%	14.7	1.5	B	592

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	20	15	75.5%	20.9	11.9	C	6
	Through	1,260	1,208	95.9%	10.5	1.9	B	232
	Right Turn	45	47	104.7%	9.0	2.3	A	8
	Subtotal	1,325	1,271	95.9%	10.5	1.8	B	246
SB	Left Turn	20	13	66.5%	22.1	22.0	C	5
	Through	905	883	97.5%	6.2	1.0	A	100
	Right Turn	25	20	78.8%	6.9	3.6	A	3
	Subtotal	950	916	96.4%	6.6	1.0	A	108
EB	Left Turn	65	59	90.8%	50.2	7.5	D	54
	Through	30	35	116.7%	40.9	8.5	D	26
	Right Turn	45	40	89.8%	46.7	11.3	D	35
	Subtotal	140	134	96.0%	47.0	5.1	D	115
WB	Left Turn	25	26	103.2%	41.3	21.1	D	20
	Through	25	26	104.4%	25.5	16.1	C	12
	Right Turn	25	20	80.0%	12.3	6.8	B	5
	Subtotal	75	72	95.9%	28.4	9.0	C	36
Total		2,490	2,393	96.1%	12.4	1.5	B	505

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	170	165	97.1%	32.3	7.1	C	98
	Through	1,005	953	94.8%	10.3	3.2	B	180
	Right Turn	70	63	90.6%	8.3	2.7	A	10
	Subtotal	1,245	1,181	94.9%	13.4	3.1	B	287
SB	Left Turn	30	27	90.3%	30.6	13.4	C	15
	Through	775	754	97.3%	9.6	4.4	A	133
	Right Turn	170	166	97.8%	3.8	1.0	A	12
	Subtotal	975	947	97.2%	9.4	3.4	A	160
EB	Left Turn	315	311	98.7%	44.1	6.6	D	252
	Through	35	31	89.1%	44.8	14.5	D	26
	Right Turn	360	367	101.8%	18.8	4.1	B	126
	Subtotal	710	709	99.8%	31.3	4.4	C	404
WB	Left Turn	20	17	87.0%	53.6	32.0	D	17
	Through	10	6	60.0%	31.0	41.0	C	3
	Right Turn	10	5	45.0%	16.0	26.6	B	1
	Subtotal	40	28	69.8%	57.3	13.4	E	22
Total		2,970	2,865	96.5%	16.9	1.7	B	872

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,395	1,368	98.0%	4.4	1.4	A	110
	Right Turn	185	174	94.1%	5.4	1.5	A	17
	Subtotal	1,580	1,542	97.6%	4.5	1.4	A	128
SB	Left Turn	150	142	94.3%	50.6	13.0	D	131
	Through	910	905	99.5%	7.3	2.4	A	121
	Right Turn							
	Subtotal	1,060	1,047	98.7%	13.0	4.4	B	252
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	75	75	99.6%	45.2	6.8	D	62
	Through							
	Right Turn	45	42	94.2%	6.0	1.8	A	5
	Subtotal	120	117	97.6%	30.2	6.1	C	67
Total		2,760	2,706	98.0%	8.9	2.2	A	446

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	70	69	98.4%	38.6	12.5	D	49
	Through	1,120	1,103	98.5%	35.8	11.3	D	724
	Right Turn	165	156	94.8%	31.4	11.5	C	90
	Subtotal	1,355	1,328	98.0%	35.4	11.2	D	863
SB	Left Turn	175	177	101.1%	46.6	11.0	D	151
	Through	745	731	98.1%	11.3	2.9	B	152
	Right Turn	65	68	104.2%	3.3	0.8	A	4
	Subtotal	985	976	99.1%	17.5	3.9	B	307
EB	Left Turn	285	263	92.2%	261.0	31.7	F	1257
	Through	845	780	92.3%	223.4	20.1	F	3194
	Right Turn	180	167	92.8%	179.0	13.8	F	548
	Subtotal	1,310	1,210	92.4%	226.3	18.1	F	4999
WB	Left Turn	85	84	98.7%	55.4	8.7	E	85
	Through	275	277	100.8%	40.4	2.2	D	205
	Right Turn	175	172	98.1%	33.9	5.8	C	107
	Subtotal	535	533	99.6%	40.5	1.9	D	397
Total		4,185	4,047	96.7%	91.1	5.1	F	6567

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	30	27	91.0%	29.8	9.8	C	15
	Through	45	39	85.6%	25.7	6.9	C	18
	Right Turn	45	45	98.9%	9.2	4.3	A	7
	Subtotal	120	110	91.9%	20.1	2.9	C	41
SB	Left Turn	45	41	90.9%	26.6	5.7	C	20
	Through	40	41	101.3%	24.6	5.7	C	18
	Right Turn	25	28	112.0%	11.0	3.6	B	6
	Subtotal	110	109	99.5%	22.0	4.5	C	44
EB	Left Turn	70	68	97.3%	38.7	3.7	D	48
	Through	545	541	99.3%	12.5	2.0	B	124
	Right Turn	85	80	93.5%	9.6	1.4	A	14
	Subtotal	700	689	98.4%	14.9	2.3	B	186
WB	Left Turn	40	34	83.8%	36.1	9.0	D	22
	Through	200	187	93.3%	8.2	2.2	A	28
	Right Turn	60	54	89.2%	6.3	2.9	A	6
	Subtotal	300	274	91.2%	11.4	1.9	B	56
Total		1,230	1,182	96.1%	15.3	1.6	B	327

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	44.0%	6.5	9.7	A	0
	Through	5	6	128.0%	14.8	15.8	B	2
	Right Turn	25	23	90.4%	24.2	9.5	C	10
	Subtotal	35	31	89.1%	23.0	5.2	C	12
SB	Left Turn	45	44	96.9%	27.4	6.7	C	22
	Through	15	10	68.7%	28.0	8.9	C	5
	Right Turn	40	39	97.0%	23.8	5.3	C	17
	Subtotal	100	93	92.7%	26.0	4.6	C	44
EB	Left Turn	35	33	93.4%	10.6	5.6	B	6
	Through	615	617	100.4%	10.8	1.5	B	122
	Right Turn	10	7	67.0%	7.5	9.3	A	1
	Subtotal	660	657	99.5%	10.9	1.4	B	130
WB	Left Turn	5	2	44.0%	6.2	11.0	A	0
	Through	185	174	93.8%	3.5	1.3	A	11
	Right Turn	20	23	116.0%	5.0	1.2	A	2
	Subtotal	210	199	94.7%	3.8	0.9	A	14
Total		1,005	980	97.5%	12.0	1.5	B	199

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	65	64	98.6%	27.2	9.4	C	32
	Through	910	892	98.0%	29.1	10.6	C	475
	Right Turn	140	136	97.3%	29.2	13.6	C	73
	Subtotal	1,115	1,092	97.9%	29.0	10.7	C	580
SB	Left Turn	115	110	95.7%	33.2	4.0	C	67
	Through	675	684	101.3%	18.0	2.4	B	225
	Right Turn	60	55	92.3%	15.7	3.2	B	16
	Subtotal	850	849	99.9%	19.7	1.9	B	308
EB	Left Turn	150	148	98.5%	57.1	13.4	E	155
	Through	295	298	101.0%	58.1	13.5	E	317
	Right Turn	190	197	103.7%	38.3	13.1	D	138
	Subtotal	635	643	101.2%	52.1	12.9	D	610
WB	Left Turn	125	117	93.3%	54.6	18.5	D	117
	Through	135	131	97.3%	28.8	2.6	C	69
	Right Turn	40	36	89.8%	5.5	2.0	A	4
	Subtotal	300	284	94.6%	36.4	8.3	D	190
Total		2,900	2,868	98.9%	32.4	5.9	C	1688

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	4	76.0%	5.6	5.4	A	0
	Through	560	565	100.8%	6.5	1.4	A	67
	Right Turn	85	87	102.1%	5.8	1.2	A	9
	Subtotal	650	655	100.8%	6.5	1.3	A	77
SB	Left Turn	45	36	80.4%	4.0	1.0	A	3
	Through	335	349	104.2%	4.0	0.9	A	25
	Right Turn	15	10	67.3%	2.7	2.3	A	1
	Subtotal	395	396	100.1%	3.9	0.8	A	28
EB	Left Turn	15	14	92.7%	4.0	2.3	A	1
	Through	5	8	150.0%	11.1	3.3	B	2
	Right Turn	5	1	14.0%	1.8	4.1	A	0
	Subtotal	25	22	88.4%	7.4	1.5	A	3
WB	Left Turn	65	62	94.6%	23.8	6.0	C	27
	Through	5	11	210.0%	29.1	10.2	D	6
	Right Turn	80	76	95.0%	21.2	5.5	C	29
	Subtotal	150	148	98.7%	23.1	4.9	C	62
Total		1,220	1,221	100.1%	7.8	0.9	A	170

Vissim Post-Processor | **W Elizabeth St**
Average Results from 10 Runs | **2040 Recommended Design**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 2 **Shields St/W Laurel St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,040	891	85.6%	21.2	11.6	C	346
	Right Turn	520	450	86.4%	23.0	7.8	C	189
	Subtotal	1,560	1,340	85.9%	21.8	10.0	C	536
SB	Left Turn	120	105	87.2%	107.0	34.7	F	205
	Through	1,175	1,060	90.2%	64.2	26.8	E	1247
	Right Turn							
	Subtotal	1,295	1,164	89.9%	67.6	26.5	E	1452
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	605	529	87.5%	261.4	46.1	F	2536
	Through							
	Right Turn	190	160	84.3%	246.7	45.4	F	724
	Subtotal	795	689	86.7%	256.6	40.1	F	3261
Total		3,650	3,194	87.5%	83.1	16.6	F	5248

Intersection 3 **Shields St/W Plum St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	85	53	61.9%	785.9	444.0	F	758
	Through	1,460	1,253	85.8%	40.7	21.4	D	936
	Right Turn	70	58	83.4%	27.5	12.4	C	29
	Subtotal	1,615	1,364	84.5%	58.3	23.3	E	1724
SB	Left Turn	25	21	84.8%	140.0	80.1	F	54
	Through	1,685	1,488	88.3%	29.4	10.8	C	801
	Right Turn	75	66	87.9%	25.1	13.5	C	30
	Subtotal	1,785	1,575	88.2%	31.0	11.3	C	886
EB	Left Turn	75	66	87.5%	74.0	14.0	E	89
	Through	30	32	107.0%	61.2	18.5	E	36
	Right Turn	75	70	93.3%	62.1	6.0	E	80
	Subtotal	180	168	93.2%	67.0	8.7	E	205
WB	Left Turn	70	66	93.7%	63.9	22.4	E	77
	Through	30	32	106.3%	37.0	13.6	D	22
	Right Turn	30	23	78.0%	32.6	16.6	C	14
	Subtotal	130	121	93.0%	51.3	18.7	D	112
Total		3,710	3,228	87.0%	45.0	13.1	D	2927

Intersection 4 **Shields St/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	320	274	85.7%	264.7	52.9	F	1331
	Through	1,215	1,057	87.0%	176.8	47.1	F	3425
	Right Turn	70	64	91.3%	151.4	47.1	F	177
	Subtotal	1,605	1,395	86.9%	192.0	45.8	F	4933
SB	Left Turn	15	11	76.0%	75.7	36.1	E	16
	Through	1,295	1,130	87.2%	47.1	11.5	D	975
	Right Turn	505	465	92.1%	32.4	7.0	C	276
	Subtotal	1,815	1,606	88.5%	42.8	9.7	D	1267
EB	Left Turn	380	333	87.5%	70.7	9.3	E	431
	Through	55	48	86.7%	68.0	24.5	E	59
	Right Turn	445	368	82.8%	108.3	31.9	F	731
	Subtotal	880	749	85.1%	88.7	16.0	F	1222
WB	Left Turn	75	70	93.5%	109.6	47.3	F	141
	Through	45	43	94.9%	108.7	57.7	F	85
	Right Turn	10	6	61.0%	56.1	54.0	E	6
	Subtotal	130	119	91.5%	108.4	49.5	F	232
Total		4,430	3,869	87.3%	104.2	17.7	F	7654

Intersection 5 **Shields St/Lake St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn							
	Through	1,535	1,416	92.2%	19.5	14.1	B	505
	Right Turn	65	60	92.3%	15.0	11.6	B	16
	Subtotal	1,600	1,476	92.3%	19.3	14.0	B	522
SB	Left Turn	115	97	84.4%	133.8	41.1	F	238
	Through	1,650	1,382	83.8%	79.6	39.4	E	2018
	Right Turn							
	Subtotal	1,765	1,480	83.8%	83.3	39.2	F	2256
EB	Left Turn							
	Through							
	Right Turn							
	Subtotal							
WB	Left Turn	145	143	98.6%	61.6	5.4	E	161
	Through							
	Right Turn	190	185	97.5%	29.4	17.5	C	100
	Subtotal	335	328	97.9%	44.8	10.8	D	261
Total		3,700	3,284	88.7%	50.8	18.0	D	3039

Intersection 6 **Shields St/Prospect** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	195	183	93.7%	107.9	32.3	F	362
	Through	1,100	1,056	96.0%	82.2	15.0	F	1593
	Right Turn	170	158	92.9%	67.1	14.5	E	194
	Subtotal	1,465	1,397	95.4%	84.1	16.5	F	2149
SB	Left Turn	265	242	91.2%	83.8	19.4	F	371
	Through	1,310	1,094	83.5%	39.1	6.7	D	784
	Right Turn	220	184	83.7%	25.4	4.4	C	86
	Subtotal	1,795	1,520	84.7%	45.1	7.7	D	1241
EB	Left Turn	195	184	94.4%	82.5	12.6	F	278
	Through	480	477	99.3%	40.4	4.0	D	353
	Right Turn	195	197	101.1%	20.6	2.9	C	74
	Subtotal	870	858	98.6%	44.5	4.5	D	706
WB	Left Turn	240	192	80.1%	237.1	17.7	F	836
	Through	775	626	80.8%	253.6	29.8	F	2912
	Right Turn	310	244	78.6%	261.7	29.1	F	1170
	Subtotal	1,325	1,063	80.2%	252.4	26.9	F	4918
Total		5,455	4,838	88.7%	101.2	6.0	F	9013

Intersection 8 **City Park Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	180	163	90.7%	68.1	29.8	E	204
	Through	125	111	88.4%	44.8	23.0	D	91
	Right Turn	100	100	100.0%	42.1	22.8	D	77
	Subtotal	405	374	92.3%	54.8	24.5	D	372
SB	Left Turn	85	77	90.2%	29.1	13.0	C	41
	Through	115	117	101.5%	20.8	3.9	C	45
	Right Turn	60	62	103.7%	16.9	2.2	B	19
	Subtotal	260	256	98.3%	22.5	4.6	C	105
EB	Left Turn	70	63	90.4%	58.2	19.3	E	68
	Through	575	541	94.1%	41.6	19.7	D	413
	Right Turn	110	104	94.9%	37.0	14.4	D	71
	Subtotal	755	709	93.9%	42.4	18.6	D	552
WB	Left Turn	105	95	90.7%	39.5	4.0	D	69
	Through	555	523	94.3%	16.4	1.2	B	158
	Right Turn	90	77	85.6%	14.2	4.3	B	20
	Subtotal	750	695	92.7%	19.3	1.5	B	247
Total		2,170	2,034	93.7%	34.1	8.1	C	1275

Intersection 9 **Constitution Ave/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	44.0%	7.7	13.9	A	0
	Through	30	26	86.7%	22.0	11.4	C	10
	Right Turn	40	37	93.5%	24.4	10.8	C	17
	Subtotal	75	66	87.5%	24.1	10.3	C	28
SB	Left Turn	45	41	91.1%	28.8	5.2	C	22
	Through	25	26	102.4%	26.5	8.1	C	12
	Right Turn	85	82	96.6%	24.9	8.3	C	37
	Subtotal	155	149	95.9%	26.4	5.6	C	72
EB	Left Turn	55	52	94.5%	27.2	5.5	C	26
	Through	605	569	94.0%	15.7	4.1	B	164
	Right Turn	10	8	77.0%	11.8	10.9	B	2
	Subtotal	670	629	93.8%	16.6	4.0	B	191
WB	Left Turn	45	42	93.8%	28.1	7.7	C	22
	Through	705	660	93.6%	18.9	3.8	B	228
	Right Turn	55	60	109.1%	17.7	3.9	B	19
	Subtotal	805	762	94.7%	19.3	3.6	B	269
Total		1,705	1,605	94.1%	18.9	2.4	B	560

Intersection 11 **Taft Hill Rd/W Elizabeth St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	155	150	97.0%	39.8	7.3	D	110
	Through	655	648	98.9%	26.9	4.6	C	319
	Right Turn	150	143	95.5%	25.0	7.9	C	66
	Subtotal	960	941	98.1%	28.6	4.4	C	494
SB	Left Turn	120	112	93.3%	68.4	5.6	E	140
	Through	870	830	95.4%	56.6	5.4	E	861
	Right Turn	95	91	95.3%	55.2	8.9	E	92
	Subtotal	1,085	1,033	95.2%	57.7	4.9	E	1093
EB	Left Turn	185	184	99.2%	114.8	71.1	F	386
	Through	345	331	96.0%	89.9	61.3	F	546
	Right Turn	140	131	93.4%	70.4	56.5	E	169
	Subtotal	670	645	96.3%	93.2	62.5	F	1101
WB	Left Turn	205	184	89.7%	58.7	14.2	E	198
	Through	365	335	91.8%	47.6	10.5	D	292
	Right Turn	90	81	90.1%	24.3	18.1	C	36
	Subtotal	660	600	90.9%	48.1	10.7	D	526
Total		3,375	3,220	95.4%	53.8	12.7	D	3214

Intersection 12 **Overland Trail/W Elizabeth St** **Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS	Total Person Delay (min)
NB	Left Turn	5	2	48.0%	2.7	3.7	A	0
	Through	365	368	100.7%	6.1	1.2	A	41
	Right Turn	95	93	97.5%	5.2	1.0	A	9
	Subtotal	465	463	99.5%	5.9	1.1	A	50
SB	Left Turn	85	78	92.2%	10.2	2.0	B	15
	Through	610	615	100.8%	10.1	2.5	B	114
	Right Turn	10	7	70.0%	9.9	6.2	A	1
	Subtotal	705	700	99.3%	10.1	2.3	B	130
EB	Left Turn	5	2	48.0%	6.4	9.7	A	0
	Through							
	Right Turn	5	4	74.0%	5.2	6.2	A	0
	Subtotal	10	6	61.0%	7.7	7.5	A	1
WB	Left Turn	80	71	88.6%	13.2	3.8	B	17
	Through	10	11	112.0%	30.3	8.6	D	6
	Right Turn	80	71	88.8%	13.0	4.1	B	17
	Subtotal	170	153	90.1%	14.4	2.7	B	40
Total		1,350	1,322	97.9%	9.2	1.2	A	221

West Elizabeth Enhanced Travel Corridor Plan

appendix: H
COST ESTIMATES SUMMARY AND METHODOLOGY

Table A: Estimated Unit Costs

Treatment Type	Unit	Cost Per Unit (1)	Contingency for Conceptual Estimate (15%)	Engineering Cost (20%)	Inspection (10%)	Mobilzation and Insurance (5%)	Maintenance and Protection of Traffic (10%)	Total Cost
Intersection Treatments								
Enhanced Intersection with Roundabout (135' diameter)	L.S.	$ 750,000	$ 112,500	$ 150,000	$ 75,000	$ 37,500	$ 75,000	$ 1,200,000
Enhanced Intersection with Small Modern Roundabout (100' diameter)	L.S.	$ 250,000	$ 37,500	$ 50,000	$ 25,000	$ 12,500	$ 25,000	$ 400,000
Improved Intersection with Two Stage Bike Turn Lane and Striping	L.S.	$ 200,000	$ 30,000	$ 40,000	$ 20,000	$ 10,000	$ 20,000	$ 320,000
Improved Intersection with Striping/Pedestrian Ramps (Local)	L.S.	$ 40,030	$ 6,005	$ 8,006	$ 4,003	$ 2,002	$ 4,003	$ 64,048
Improved Intersection with Striping/Pedestrian Ramps (Collector)	L.S.	$ 52,245	$ 7,837	$ 10,449	$ 5,225	$ 2,612	$ 5,225	$ 83,592
Improved Intersection with Striping/Pedestrian Ramps (Arterial)	L.S.	$ 66,045	$ 9,907	$ 13,209	$ 6,605	$ 3,302	$ 6,605	$ 105,672
Improved Intersection with Striping/Pedestrian Ramps (T-Intersection-Local)	L.S.	$ 21,645	$ 3,247	$ 4,329	$ 2,165	$ 1,082	$ 2,165	$ 34,632
Intersection Realignment	L.S.	$ 220,000	$ 33,000	$ 44,000	$ 22,000	$ 11,000	$ 22,000	$ 352,000
Driveway Reconstruction	L.S.	$ 1,200	$ 180	$ 240	$ 120	$ 60	$ 120	$ 1,920
Access Improvements	L.S.	$ 1,500	$ 225	$ 300	$ 150	$ 75	$ 150	$ 2,400
Bike Treatments (See Also Pedestrian Treatments "Shared Path")								
6' Protected Bike Lane including "raised curb"	L.F.	$ 225	$ 34	$ 45	$ 23	$ 11	$ 23	$ 360
6' Bike Lane with 2' Stripped Buffer	L.F.	$ 30	$ 5	$ 6	$ 3	$ 2	$ 3	$ 48
Pedestrian Treatments								
6' Detached Sidewalk including Landscaping	L.F.	$ 100	$ 15	$ 20	$ 10	$ 5	$ 10	$ 160
6' Attached Sidewalk	L.F.	$ 37	$ 6	$ 7	$ 4	$ 2	$ 4	$ 59
Shared Path including "raised curb"	L.F.	$ 250	$ 38	$ 50	$ 25	$ 13	$ 25	$ 400
Mid-Block Pedestrian Crossing	L.S.	$ 40,000	$ 6,000	$ 8,000	$ 4,000	$ 2,000	$ 4,000	$ 64,000
Signalized Pedestrian Crossing	L.S.	$ 80,000	$ 12,000	$ 16,000	$ 8,000	$ 4,000	$ 8,000	$ 128,000
Roadway Treatments								
Planted Medians	L.F.	$ 400	$ 60	$ 80	$ 40	$ 20	$ 40	$ 640
Striping	L.F.	$ 5	$ 1	$ 1	$ 1	$ 0	$ 1	$ 8
Roadway and Drainage Improvements								
1 1/2" Mill and Overlay	L.F.	$ 163	$ 24	$ 33	$ 16	$ 8	$ 16	$ 261
Curb & Gutter	L.F.	$ 35	$ 5	$ 7	$ 4	$ 2	$ 4	$ 56
Drainage Improvements and Stormwater Management	L.F.	$ 80	$ 12	$ 16	$ 8	$ 4	$ 8	$ 128
Ditch Crossing Improvements (replace existing structure and widen crossing)	L.S.	$ 150,000	$ 22,500	$ 30,000	$ 15,000	$ 7,500	$ 15,000	$ 240,000
Transit Improvements								
Bus Stop Enhancements	L.S.	$ 9,000	$ 1,350	$ 1,800	$ 900	$ 450	$ 900	$ 14,400

Table B: Estimated Unit Costs - Phase 2

			Street Segments		
Length of Segment Excluding Main Intersections (Linear Feet)	***3700***	***1320***	***2480***	***2760***	***3450***
Treatment Type	**Overland Trail to Ponderosa Dr. (Includes Overland Intersection)**	**Ponderosa Dr. to Taft Hill Rd. (includes Ponderosa Intersection)**	**Taft Hill Rd. to Constitution Dr. (Includes Taft Hill Intersection)**	**Constitution Dr. to Shields St. (includes Constitution and Shields Intersections)**	**Plum Street**
Intersection Treatments					
Enhanced Intersection with Roundabout					
Enhanced Intersection with Small Modern Roundabout					
Improved Intersection with Two Stage Bike Turn Lane and Striping					
Improved Intersection with Striping/Pedestrian Ramps (Local)	1	1		2	
Improved Intersection with Striping/Pedestrian Ramps (Collector)					
Improved Intersection with Striping/Pedestrian Ramps (Arterial)					
Improved Intersection with Striping/Pedestrian Ramps (T-Intersection)			4		
Intersection Realignment			1		
Driveway Reconstruction					
Access Improvements (Except SF Home Driveway)					
Bike Treatments (See Also Pedestrian Treatments "Shared Path")					
6' Protected Bike Lane including "raised curb"					
6' Bike Lane with 2' Stripped Buffer					
Pedestrian Treatments					
6' Detached Sidewalk including Landscaping	1000	800	1400		
6' Attached Sidewalk	1600	200			
Shared Path including "raised curb"					
Mid-Block Pedestrian Crossing					
Signalized Pedestrian Crossing					
Roadway Treatments					
Planted Median					
Stripping	2700		1000		
Roadway and Drainage Improvements					
1 1/2" Mill and Overlay					
Curb & Gutter	2600	1000	1400		
Drainage Improvements and Stormwater Management			1400		
Ditch Crossing Improvements					
Transit Improvements					
Bus Stop Enhancements	2		2	2	5
Total Cost per Street Segment	**$ 514,768**	**$ 259,888**	**$ 1,008,928**	**$ 156,896**	**$ 72,000**

Total Cost of Phase 2 Improvements	**$**	**2,012,480**
Low Probable Cost	$	1,408,736
High Probable Cost	$	2,616,224
Cost per Mile of Project (~2.6 miles)	**$**	**774,031**
Low Probable Cost	$	541,822
High Probable Cost	$	1,006,240

Assumptions:

Conceptual cost estimates were completed for the recommended traffic calming measures in order to provide a magnitude of cost. It is important to point out that the estimates were not completed based on topographic survey and preliminay or final engineering drawings, which would be required for accurate costing and implementation. Quantities and unit costs were extracted from conceptual plan drawings in order to define the basic limits of work for the estimates, but are limited in accuracy due to the plan format and detail. All of the conceptual traffic calming measures are assumed to be completed within the existing legal right-of-way and that roadway improvements can be contained within the existing paved secton. It is also assumed that the roadway cross-sections and profiles do not need to be modified and that drainage is currently adequate to serve the proposed section.

Table C: Estimated Unit Costs - Phase 3

	Street Segments				
Length of Segment Excluding Main Intersections (Linear Feet)	***3700***	***1320***	***2480***	***2760***	***3450***
Treatment Type	**Overland Trail to Ponderosa Dr. (Includes Overland Intersection)**	**Ponderosa Dr. to Taft Hill Rd. (includes Ponderosa Intersection)**	**Taft Hill Rd. to Constitution Dr. (Includes Taft Hill Intersection)**	**Constitution Dr. to Shields St. (includes Constitution and Shields Intersections)**	**Plum Street**
Intersection Treatments					
Enhanced Intersection with Roundabout	1				
Enhanced Intersection with Small Modern Roundabout		1			
Improved Intersection with Two Stage Bike Turn Lane and Striping			1	2	
Improved Intersection with Striping/Pedestrian Ramps (Local)	1				1
Improved Intersection with Striping/Pedestrian Ramps (Collector)			1		
Improved Intersection with Striping/Pedestrian Ramps (Arterial)				1	1
Improved Intersection with Striping/Pedestrian Ramps (T-Intersection)	7	1	5	1	
Intersection Realignment	1		1		
Driveway Reconstruction	22	4	14		
Access Improvements (Except SF Home Driveway)	3	9	3	19	9
Bike Treatments (See Also Pedestrian Treatments "Shared Path")					
6' Protected Bike Lane including "raised curb"		1220	3000	3145	
6' Bike Lane with 2' Stripped Buffer	7400	1735	1360		6400
Pedestrian Treatments					
6' Detached Sidewalk including Landscaping	3840	1220	4320	2800	
6' Attached Sidewalk					2200
Shared Path including "raised curb"			200	2240	
Mid-Block Pedestrian Crossing		1			
Signalized Pedestrian Crossing				2	
Roadway Treatments					
Planted Median	860		860	600	
Stripping	3840	1420	2570	2700	
Roadway and Drainage Improvements					
1 1/2" Mill and Overlay	3800	1420	2570	2800	
Curb & Gutter	7600	2840	5140	2700	
Drainage Improvements and Stormwater Management	3700	1420	2570	2700	
Ditch Crossing Improvements			1	1	1
Transit Improvements					
Bus Stop Enhancements	6	1			
Total Cost per Street Segment	**$ 5,435,272**	**$ 1,982,488**	**$ 4,977,328**	**$ 5,430,744**	**$ 868,760**

Total Cost of Phase 3 Improvements	**$**	**18,694,592**
Low Probable Cost	$	13,086,214
High Probable Cost	$	24,302,970
Cost per Mile of Project (~2.6 miles)	**$**	**7,190,228**
Low Probable Cost	$	5,033,159
High Probable Cost	$	9,347,296

Assumptions:

Conceptual cost estimates were completed for the recommended traffic calming measures in order to provide a magnitude of cost. It is important to point out that the estimates were not completed based on topographic survey and preliminay or final engineering drawings, which would be required for accurate costing and implementation. Quantities and unit costs were extracted from conceptual plan drawings in order to define the basic limits of work for the estimates, but are limited in accuracy due to the plan format and detail. All of the conceptual traffic calming measures are assumed to be completed within the existing legal right-of-way and that roadway improvements can be contained within the existing paved secton. It is also assumed that the roadway cross-sections and profiles do not need to be modified and that drainage is currently adequate to serve the proposed section.

Existing Study Area Transit Service

Route	Route Length, round-trip (mi)	Peak Frequency (hr)	Peak Hours	Peak Span	Off-Peak Frequency (hr)	Off-Peak Hours	Off-Peak Span	Running Speed (MPH)	Running Time (Min)	Recovery Time (Min) at 25%
2	6.7	0.500	6 AM - 10 PM	16	0.000	N/A	0	18	22.5	5.6
31	2.6	0.167	7 AM - 7 PM	12	0.000	N/A	0	13	11.9	3.0
32	6.5	0.500	7 AM - 7 PM	12	0.000	N/A	0	16	24.2	6.1
33	7.8	0.500	7 AM - 6 PM	11	0.000	N/A	0	18	25.8	6.5
HORN	6.0	0.167	7 AM - 7 PM	12	0.000	N/A	0	16	22.7	5.7

Interim Design Transit Service

Route	Route Length, round-trip (mi)	Peak Frequency (hr)	Peak Hours	Peak Span	Off-Peak Frequency (hr)	Off-Peak Hours	Off-Peak Span	Running Speed (MPH)	Running Time (Min)	Recovery Time at 15% (Min)
2	7.4	0.500	7 AM - 7 PM	12	0.000	N/A	0	18	24.7	3.7
3	8.0	0.250	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	18	26.7	4.0
31	2.6	0.167	7 AM - 7 PM	12	0.000	N/A	0	13	12	1.8
HORN	6.3	0.167	6:30 AM - 5 PM	10.5	0.333	5 PM - 8 PM	3	16	23.6	3.5
Foothills Campus Shuttle	11.1	1.000	7 AM - 7 PM	12	0.000	N/A	0	16	41.6	6.2

Recommended Design Transit Service

Route	Route Length, round-trip (mi)	Peak Frequency (hr)	Peak Hours	Peak Span	Off-Peak Frequency (hr)	Off-Peak Hours	Off-Peak Span	Running Speed (MPH)	Running Time (Min)	Recovery Time at 15% (Min)
2	7.4	0.250	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	18	24.7	3.7
3	8.0	0.167	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	18	26.7	4.0
31	2.6	0.083	7 AM - 5 PM	10	0.167	5 PM - 7 PM	2	13	12	1.8
HORN	6.5	0.167	6:30 AM - 5 PM	10.5	0.333	5 PM - 8 PM	3	16	24.4	3.7
Foothills Campus Shuttle	5.0	0.500	7 AM - 7 PM	12	0.500	N/A	0	16	18.8	2.8

Planning for Redevelopment Transit Service

Route	Route Length, round-trip (mi)	Peak Frequency (hr)	Peak Hours	Peak Span	Off-Peak Frequency (hr)	Off-Peak Hours	Off-Peak Span	Running Speed (MPH)	Running Time (Min)	Recovery Time at 15% (Min)
Standard Service										
2	7.4	0.250	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	18	24.7	3.7
31	2.6	0.083	7 AM - 5 PM	10	0.167	5 PM - 7 PM	2	13	12	1.8
HORN	6.5	0.167	6:30 AM - 5 PM	10.5	0.333	5 PM - 8 PM	3	16	24.4	3.7
Foothills Campus Shuttle	5	0.500	7 AM - 7 PM	12	0.500	N/A	0	16	18.8	2.8
BRT										
BRT EB	3.1	0.167	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	16	11.6	1.7
BRT WB	3.1	0.167	7 AM - 7 PM	12	0.500	7 PM - 10 PM	3	16	11.6	1.7

Existing

Cycle Time (Min)	Adj. Cycle Time (Min)	**Peak Veh. Req.**	Off-Peak Veh. Req.	**Weekday Revenue Miles**	Peak Revenue Hours	Off-Peak Revenue Hours	**Weekday Revenue Hours**	**Annual Revenue Hours (x256)**	**Annual Revenue Miles (x256)**
28.1	30	**1**		**216**	16		**16**		
14.9	15	**2**		**185**	24		**24**		
30.3	30	**1**		**155**	12		**12**		
32.3	30	**1**		**171**	11		**11**		
28.4	30	**3**		**435**	36		**36**		
		8		**1,162**	99		**99**	25,344	297,472

Interim Design

Cycle Time (Min)	Adj. Cycle Time (Min)	**Peak Veh. Req.**	Off-Peak Veh. Req.	**Weekday Revenue Miles**	Peak Revenue Hours	Off-Peak Revenue Hours	**Weekday Revenue Hours**	**Annual Revenue Hours (x256)**	**Annual Revenue Miles (x256)**
28.4	30	**1**		**178**	12	0	**12**		
30.7	30	**2**	1	**432**	24	3	**27**		
13.8	15	**2**		**187**	24	0	**24**		
27.1	30	**3**	2	**454**	31.5	6	**38**		
47.8	60	**1**		**133**	12	0	**12**		
		9	3	**1,384**	103.5	9	**113**		
	Delta over existing	**1**		**222**			**14**	3,456	56,832

Recommended Design

Cycle Time (Min)	Adj. Cycle Time (Min)	**Peak Veh. Req.**	Off-Peak Veh. Req.	**Weekday Revenue Miles**	Peak Revenue Hours	Off-Peak Revenue Hours	**Weekday Revenue Hours**	**Annual Revenue Hours (x256)**	**Annual Revenue Miles (x256)**
28.4	30	**2**	1	**400**	24	3	**27**		
30.7	30	**3**	1	**624**	36	3	**39**		
13.8	15	**3**	2	**343**	30	4	**34**		
28.1	30	**3**	2	**468**	31.5	6	**38**		
21.6	30	**1**	1	**120**	12	0	**12**		
		12	7	**1,955**	133.5	16	**150**		
	Delta over existing	**4**		**793**			**51**	12,928	203,008

Planning for Redevelopment

Cycle Time (Min)	Adj. Cycle Time (Min)	**Peak Veh. Req.**	Off-Peak Veh. Req.	**Weekday Revenue Miles**	Peak Revenue Hours	Off-Peak Revenue Hours	**Weekday Revenue Hours**	**Annual Revenue Hours (x256)**	**Annual Revenue Miles (x256)**
28.4	30	**2**	1	**400**	24	3	**27**		
13.8	15	**3**	2	**343**	30	4	**34**		
28.1	30	**3**	2	**468**	31.5	6	**37.5**		
21.6	30	**1**	1	**120**	12	0	**12**		
				1331	97.5	13	**110.5**		
	Delta over existing			**169**			**11.5**	2,944	43,264
13.3	15	**2**	1	**241**	24	3	**27**		
13.3	15	**2**	1	**241**	24	3	**27**		
	Delta over existing	**4**		**482**	**48**	**6**	**54**	13,824	123,392

COST CALCULATIONS - West Elizabeth P2 Interim 07/19/2016

Assumptions

Fixed Route Operations	2015	2016	2017	2018	2019	2020
Cost of Maintenance per Revenue Mile	$ 1.37	$ 1.40	$ 1.43	$ 1.46	$ 1.48	$ 1.51
Cost of Fuel per Revenue Mile (7.5% Increase)	$ 0.74	$ 0.76	$ 0.77	$ 0.79	$ 0.80	$ 0.82
Cost of Insurance & Medical per Revenue Mile	$ 0.13	$ 0.14	$ 0.14	$ 0.14	$ 0.15	$ 0.15
Cost of Personnel per Revenue Hour	$ 34.84	$ 35.89	$ 36.96	$ 38.07	$ 39.21	$ 40.39
Associated Dial A Ride -Cost (# of trips) per Rev Mile	$ 0.81	$ 0.89	$ 0.98	$ 1.07	$ 1.17	$ 1.28
Offsetting Fixed Route Fares per Revenue Mile	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)
Offsetting DAR Fares per Rev Mile	$ (0.05)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.09)	$ (0.10)
Support Services - Per Revenue Mile Cost	$ 2.43	$ 2.48	$ 2.54	$ 2.59	$ 2.65	$ 2.70
Support Services - Per Revenue Hour Cost	$ 31.67	$ 32.34	$ 33.03	$ 33.73	$ 34.45	$ 35.18
Colorado State University Expense per Service Hour	$ 73.50	$ 74.97	$ 76.47	$ 78.00	$ 79.56	$ 81.15
Operating Expense per Service Hour - support	$ 100.80	$ 103.42	$ 106.11	$ 108.87	$ 111.69	$ 114.60
Operating Expense per Service Hour - no support	$ 72.00	$ 73.87	$ 75.79	$ 77.76	$ 79.78	$ 81.86
					97.6	

Templates for Pricing Service

	Enter Value	
Revenue Hours	3,456	*increment above existing service levels
Revenue Miles	56,832	*increment above existing service levels
Associated DAR	0	
Dispatch	0	

Without Overhead	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour	$ 120,411	$ 124,024	$ 127,745	$ 131,578	$ 135,525	$ 139,591
Cost Per Revenue Mile	$ 127,720	$ 130,275	$ 132,880	$ 135,538	$ 138,249	$ 141,014
Cost for Dispatch Only	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)
Total Cost	**$ 225,399**	**$ 231,566**	**$ 237,892**	**$ 244,383**	**$ 251,041**	**$ 257,872**

With Overhead - Miles and Hours	2015	2016	2017	2018	2019	2020
Revenue Hours	$ 120,411	$ 124,024	$ 127,745	$ 131,578	$ 135,525	$ 139,591
Revenue Miles	$ 127,720	$ 130,275	$ 132,880	$ 135,538	$ 138,249	$ 141,014
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Support Services	$ 126,686	$ 129,382	$ 132,135	$ 134,948	$ 137,820	$ 140,753
Offsetting Fares (Fixed & DAR)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)
Total Cost	**$ 352,085**	**$ 360,948**	**$ 370,028**	**$ 379,330**	**$ 388,861**	**$ 398,625**

With Overhead, Hours Only	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Overhead	$ 348,365	$ 357,419	$ 366,708	$ 376,238	$ 386,017	$ 396,049
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)	$ (22,733)
Total Cost	**$ 325,632**	**$ 334,686**	**$ 343,975**	**$ 353,506**	**$ 363,284**	**$ 373,316**

CSU Funded Service	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Limited Overhead	$ 254,016	$ 259,096	$ 264,278	$ 269,564	$ 274,955	$ 280,454
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	**$ 254,016**	**$ 259,096**	**$ 264,278**	**$ 269,564**	**$ 274,955**	**$ 280,454**

COST CALCULATIONS - West Elizabeth P3 Recommended Design 07/19/2016

Assumptions

Fixed Route Operations	2015	2016	2017	2018	2019	2020
Cost of Maintenance per Revenue Mile	$ 1.37	$ 1.40	$ 1.43	$ 1.46	$ 1.48	$ 1.51
Cost of Fuel per Revenue Mile (7.5% Increase)	$ 0.74	$ 0.76	$ 0.77	$ 0.79	$ 0.80	$ 0.82
Cost of Insurance & Medical per Revenue Mile	$ 0.13	$ 0.14	$ 0.14	$ 0.14	$ 0.15	$ 0.15
Cost of Personnel per Revenue Hour	$ 34.84	$ 35.89	$ 36.96	$ 38.07	$ 39.21	$ 40.39
Associated Dial A Ride -Cost (# of trips) per Rev Mile	$ 0.81	$ 0.89	$ 0.98	$ 1.07	$ 1.17	$ 1.28
Offsetting Fixed Route Fares per Revenue Mile	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)
Offsetting DAR Fares per Rev Mile	$ (0.05)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.09)	$ (0.10)
Support Services - Per Revenue Mile Cost	$ 2.43	$ 2.48	$ 2.54	$ 2.59	$ 2.65	$ 2.70
Support Services - Per Revenue Hour Cost	$ 31.67	$ 32.34	$ 33.03	$ 33.73	$ 34.45	$ 35.18
Colorado State University Expense per Service Hour	$ 73.50	$ 74.97	$ 76.47	$ 78.00	$ 79.56	$ 81.15
Operating Expense per Service Hour - support	$ 100.80	$ 103.42	$ 106.11	$ 108.87	$ 111.69	$ 114.60
Operating Expense per Service Hour - no support	$ 72.00	$ 73.87	$ 75.79	$ 77.76	$ 79.78	$ 81.86
					97.6	

Templates for Pricing Service

	Enter Value	
Revenue Hours	12,928	*increment above existing service levels
Revenue Miles	203,008	*increment above existing service levels
Associated DAR	0	
Dispatch	0	

Without Overhead	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour	$ 450,428	$ 463,942	$ 477,861	$ 492,198	$ 506,964	$ 522,174
Cost Per Revenue Mile	$ 456,226	$ 465,351	$ 474,658	$ 484,151	$ 493,834	$ 503,711
Cost for Dispatch Only	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)
Total Cost	**$ 825,451**	**$ 848,089**	**$ 871,315**	**$ 895,145**	**$ 919,595**	**$ 944,682**

With Overhead - Miles and Hours	2015	2016	2017	2018	2019	2020
Revenue Hours	$ 450,428	$ 463,942	$ 477,861	$ 492,198	$ 506,964	$ 522,174
Revenue Miles	$ 456,226	$ 465,351	$ 474,658	$ 484,151	$ 493,834	$ 503,711
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Support Services	$ 459,914	$ 469,703	$ 479,699	$ 489,908	$ 500,335	$ 510,983
Offsetting Fares (Fixed & DAR)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)
Total Cost	**$ 1,285,366**	**$1,317,792**	**$1,351,014**	**$1,385,053**	**$1,419,930**	**$1,455,665**

With Overhead, Hours Only	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Overhead	$ 1,303,142	$1,337,011	$1,371,759	$1,407,410	$1,443,988	$1,481,517
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)	$ (81,203)
Total Cost	**$ 1,221,939**	**$1,255,807**	**$1,290,556**	**$1,326,207**	**$1,362,785**	**$1,400,314**

CSU Funded Service	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Limited Overhead	$ 950,208	$ 969,212	$ 988,596	$1,008,368	$1,028,536	$1,049,106
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	**$ 950,208**	**$ 969,212**	**$ 988,596**	**$1,008,368**	**$1,028,536**	**$1,049,106**

COST CALCULATIONS - West Elizabeth P4 Redevelopment (Standard Service) 07/19/2016

Assumptions

Fixed Route Operations	2015	2016	2017	2018	2019	2020
Cost of Maintenance per Revenue Mile	$ 1.37	$ 1.40	$ 1.43	$ 1.46	$ 1.48	$ 1.51
Cost of Fuel per Revenue Mile (7.5% Increase)	$ 0.74	$ 0.76	$ 0.77	$ 0.79	$ 0.80	$ 0.82
Cost of Insurance & Medical per Revenue Mile	$ 0.13	$ 0.14	$ 0.14	$ 0.14	$ 0.15	$ 0.15
Cost of Personnel per Revenue Hour	$ 34.84	$ 35.89	$ 36.96	$ 38.07	$ 39.21	$ 40.39
Associated Dial A Ride -Cost (# of trips) per Rev Mile	$ 0.81	$ 0.89	$ 0.98	$ 1.07	$ 1.17	$ 1.28
Offsetting Fixed Route Fares per Revenue Mile	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)
Offsetting DAR Fares per Rev Mile	$ (0.05)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.09)	$ (0.10)
Support Services - Per Revenue Mile Cost	$ 2.43	$ 2.48	$ 2.54	$ 2.59	$ 2.65	$ 2.70
Support Services - Per Revenue Hour Cost	$ 31.67	$ 32.34	$ 33.03	$ 33.73	$ 34.45	$ 35.18
Colorado State University Expense per Service Hour	$ 73.50	$ 74.97	$ 76.47	$ 78.00	$ 79.56	$ 81.15
Operating Expense per Service Hour - support	$ 100.80	$ 103.42	$ 106.11	$ 108.87	$ 111.69	$ 114.60
Operating Expense per Service Hour - no support	$ 72.00	$ 73.87	$ 75.79	$ 77.76	$ 79.78	$ 81.86
					97.6	

Templates for Pricing Service

	Enter Value	
Revenue Hours	2,944	*increment above existing service levels
Revenue Miles	43,264	*increment above existing service levels
Associated DAR	0	
Dispatch	0	

Without Overhead	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour	$ 102,573	$ 105,650	$ 108,820	$ 112,085	$ 115,447	$ 118,911
Cost Per Revenue Mile	$ 97,229	$ 99,173	$ 101,157	$ 103,180	$ 105,243	$ 107,348
Cost for Dispatch Only	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)
Total Cost	**$ 182,496**	**$ 187,518**	**$ 192,671**	**$ 197,959**	**$ 203,385**	**$ 208,954**

With Overhead - Miles and Hours	2015	2016	2017	2018	2019	2020
Revenue Hours	$ 102,573	$ 105,650	$ 108,820	$ 112,085	$ 115,447	$ 118,911
Revenue Miles	$ 97,229	$ 99,173	$ 101,157	$ 103,180	$ 105,243	$ 107,348
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Support Services	$ 100,407	$ 102,544	$ 104,726	$ 106,955	$ 109,231	$ 111,556
Offsetting Fares (Fixed & DAR)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)
Total Cost	**$ 282,902**	**$ 290,061**	**$ 297,397**	**$ 304,914**	**$ 312,616**	**$ 320,509**

With Overhead, Hours Only	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Overhead	$ 296,755	$ 304,468	$ 312,381	$ 320,499	$ 328,829	$ 337,375
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)	$ (17,306)
Total Cost	**$ 279,450**	**$ 287,162**	**$ 295,075**	**$ 303,194**	**$ 311,523**	**$ 320,070**

CSU Funded Service	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Limited Overhead	$ 216,384	$ 220,712	$ 225,126	$ 229,628	$ 234,221	$ 238,905
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	**$ 216,384**	**$ 220,712**	**$ 225,126**	**$ 229,628**	**$ 234,221**	**$ 238,905**

COST CALCULATIONS - West Elizabeth P4 Redevelopment (BRT) 07/19/2016

Assumptions

Fixed Route Operations	2015	2016	2017	2018	2019	2020
Cost of Maintenance per Revenue Mile	$ 1.37	$ 1.40	$ 1.43	$ 1.46	$ 1.48	$ 1.51
Cost of Fuel per Revenue Mile (7.5% Increase)	$ 0.74	$ 0.76	$ 0.77	$ 0.79	$ 0.80	$ 0.82
Cost of Insurance & Medical per Revenue Mile	$ 0.13	$ 0.14	$ 0.14	$ 0.14	$ 0.15	$ 0.15
Cost of Personnel per Revenue Hour	$ 34.84	$ 35.89	$ 36.96	$ 38.07	$ 39.21	$ 40.39
Associated Dial A Ride -Cost (# of trips) per Rev Mile	$ 0.81	$ 0.89	$ 0.98	$ 1.07	$ 1.17	$ 1.28
Offsetting Fixed Route Fares per Revenue Mile	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)	$ (0.40)
Offsetting DAR Fares per Rev Mile	$ (0.05)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.09)	$ (0.10)
Support Services - Per Revenue Mile Cost	$ 2.43	$ 2.48	$ 2.54	$ 2.59	$ 2.65	$ 2.70
Support Services - Per Revenue Hour Cost	$ 31.67	$ 32.34	$ 33.03	$ 33.73	$ 34.45	$ 35.18
Colorado State University Expense per Service Hour	$ 73.50	$ 74.97	$ 76.47	$ 78.00	$ 79.56	$ 81.15
Operating Expense per Service Hour - support	$ 100.80	$ 103.42	$ 106.11	$ 108.87	$ 111.69	$ 114.60
Operating Expense per Service Hour - no support	$ 72.00	$ 73.87	$ 75.79	$ 77.76	$ 79.78	$ 81.86
					97.6	

Templates for Pricing Service

	Enter Value	
Revenue Hours	13,824	*increment above existing service levels
Revenue Miles	123,392	*increment above existing service levels
Associated DAR	0	
Dispatch	0	

Without Overhead	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour	$ 481,646	$ 496,096	$ 510,980	$ 526,310	$ 542,100	$ 558,364
Cost Per Revenue Mile	$ 277,303	$ 282,849	$ 288,506	$ 294,276	$ 300,161	$ 306,165
Cost for Dispatch Only	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)
Total Cost	**$ 709,592**	**$ 729,588**	**$ 750,129**	**$ 771,229**	**$ 792,905**	**$ 815,172**

With Overhead - Miles and Hours	2015	2016	2017	2018	2019	2020
Revenue Hours	$ 481,646	$ 496,096	$ 510,980	$ 526,310	$ 542,100	$ 558,364
Revenue Miles	$ 277,303	$ 282,849	$ 288,506	$ 294,276	$ 300,161	$ 306,165
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Cost for Support Services	$ 355,118	$ 362,676	$ 370,394	$ 378,277	$ 386,328	$ 394,550
Offsetting Fares (Fixed & DAR)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)
Total Cost	**$ 1,064,710**	**$1,092,264**	**$1,120,523**	**$1,149,507**	**$1,179,233**	**$1,209,722**

With Overhead, Hours Only	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Overhead	$ 1,393,459	$1,429,675	$1,466,831	$1,504,954	$1,544,067	$1,584,196
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Offsetting Fares (Fixed & DAR)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)	$ (49,357)
Total Cost	**$ 1,344,102**	**$1,380,318**	**$1,417,474**	**$1,455,597**	**$1,494,710**	**$1,534,839**

CSU Funded Service	2015	2016	2017	2018	2019	2020
Cost Per Revenue Hour with Limited Overhead	$ 1,016,064	$1,036,385	$1,057,113	$1,078,255	$1,099,820	$1,121,817
Cost for Associated DAR	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	**$ 1,016,064**	**$1,036,385**	**$1,057,113**	**$1,078,255**	**$1,099,820**	**$1,121,817**

appendix: 1
MAINTENANCE CONSIDERATIONS

INTRODUCTION

The following section highlights maintenance considerations and responsibilities for the improvements to the streets proposed in the West Elizabeth ETC Plan. Topics include:

- Tree Lawn/Median Maintenance
- Snow Removal
- Street Sweeping
- Sidewalk/Curb/Gutter Maintenance

TREE LAWN/MEDIAN MAINTENANCE

- Responsibility: If tree lawns and median plantings are part of a City capital project, maintenance of tree lawn (plantings between the sidewalk and the curb/edge of the roadway) and medians is the responsibility of the City of Fort Collins
- Estimated Cost: $0.20 per square foot per year
- Related Policies/Programs: City of Fort Collins Streetscape Standards
- Notes:
    - Concerns may be reported to Neighborhood Services at 970-416-2200 or Access Fort Collins at fcgov.com/accessfortcollins.

SNOW REMOVAL

SIDEWALKS

- Responsibility: Snow removal on sidewalks along property frontage is the responsibility of the resident/property owner or HOA. Standard practice of the City of Fort Collins is to do sidewalk snow removal adjacent to arterial roads that are plowed, as shown on the sidewalk clearing map at http://www.fcgov.com/streets/maps/snowmaps/sidewalk_removal_type.html. With the capital improvements proposed in the West Elizabeth ETC Plan, the sidewalks on the north side of West Elizabeth between Andrews Peak Drive and Hillcrest Drive would be added to the City's sidewalk clearing map.
- Estimated Cost: $4,000 per mile per year
- Related Policies/Programs: City code requires clearing of public sidewalks of snow and ice within 24 hours of accumulation (i.e., end of the snow event).
- Notes:
    - If a sidewalk that is designated on the map as regularly cleared by the City has not been cleared within 24 hours of the end of accumulation (i.e., end of the snow event), please contact the Streets Department at 970-221-6615.
    - Concerns may be reported to the Nuisance Hotline at 970-416-2200 or Access Fort Collins at fcgov.com/accessfortcollins.

  - The City's Adopt-A-Neighbor program matches volunteers with elderly or disabled residents who are physically unable to clear snow and ice from their public sidewalks and cannot afford to hire someone. Residents needing assistance must apply to be matched with a volunteer in advance at fcgov.com/neighborhoodservices/adopt.php or by calling 970-224-6046.

BIKE LANES

- Responsibility: snow removal is the responsibility of the City of Fort Collins. Conventional/buffered bike lanes typically are cleared with plowing of the roadway; protected bike lanes require special equipment and additional labor.
- Estimated Cost:
  - Conventional/buffered bike lane: $3,970 per mile per year per direction
  - Protected bike lane: $50,000 per mile per year per direction
- Related Policies/Programs: Streets department Snow Plowing: http://www.fcgov.com/streets/snow-additional.php
- Notes:
  - Concerns may be reported to the City's Streets Department at 970-221-6615 or Access Fort Collins at fcgov.com/accessfortcollins.

BUS STOPS

- Responsibility: City of Fort Collins/Transfort
- Estimated Cost:
  - Bus Rapid Transit Station: $1,000 per station per year
- Notes:
  - Concerns may be reported to Transfort at 970-221-6620 or Access Fort Collins at fcgov.com/accessfortcollins.

STREET SWEEPING

- Responsibility: City of Fort Collins
- Estimated Cost:
  - Conventional/buffered bike lane: $900 per mile per year
  - Protected bike lane: $4,900 per mile per year
- Related Policies/Programs: Streets department Street Sweeping: http://www.fcgov.com/streets/sweeping.php
- Notes:
  - Concerns may be reported to the City's Streets Department at 970-221-6615 or Access Fort Collins at fcgov.com/accessfortcollins.

SIDEWALK/CURB/GUTTER MAINTENANCE

- Responsibility: City of Fort Collins
- Estimated Cost: $5,000 per mile per year (plus additional cost if curbing used for protected bike lanes)
- Related Policies/Programs: Street Maintenance Program (SMP), Pedestrian Improvement Program
- Notes:
    - This maintenance is usually not needed until several years after initial construction

West Elizabeth Enhanced Travel Corridor Plan

appendix: J
FINAL DESIGN CONSIDERATIONS

INTRODUCTION

During plan development, City staff worked with various private property owners to identify existing conditions and understand interests/concerns specific to their properties. This appendix is intended to document the discussions and provide a starting point for considerations for final design. It is not intended to represent ALL issues for consideration, and others may be added in the future. This appendix includes the following elements:

- Wells
- Drainage and Irrigation Ditches
- Driveways and Parking
- Existing Fences
- Sight Distance
- Trees
- Sidewalks and Tree Lawns
- Noise
- Temporary Construction Easements
- Maintenance

WELLS

Several historic wells exist throughout the west segment of the corridor, the majority of which are on private property and are not expected to be impacted by the Recommended Design. One well has been identified as being within the public right-of-way (ROW) and is documented in more detail than others that are not expected to be impacted in any way by the Recommended Design. The final design should take note of these wells and strive to avoid potential impacts to their structures. The following images depict the various wells identified throughout the conceptual design phase.

Well within public right-of-way (ROW)

2730 West Elizabeth Street - Well

- Well owner name: Peter Rhoades, 2730 West Elizabeth Street
- Registered in 2005, constructed (hand-dug and brick-lined) in 1932
- Because it was constructed prior to well permits being required it is considered "grandfathered" by the Colorado Division of Water Resources.
- The well platform is approximately 5' and is located within the public right-of-way (ROW) approximately 11' from the property line (north of well) and approximately 11' from the edge of the existing pavement (south of well).

- The final design should be done in a way to avoid damage to the well structure (likely extremely sensitive due to the hand-dug nature); owner requested that final design concrete work stay 5' from the well and that pre, during and post inspections be performed by an inspector who is selected by the property owner.

Wells outside of the public ROW

The Recommended Design work is not expected to impact these wells as they are outside of the public ROW; however, they are documented here for future reference.

2510 West Elizabeth - Well

2504 West Elizabeth - Well

2450 West Elizabeth - Well

Other addresses with well permits from the Colorado Division of Water Resources (wells not visible from the street):

- 2830 West Elizabeth
- 2740 West Elizabeth
- 2736 West Elizabeth
- 2621 West Elizabeth

DRAINAGE AND IRRIGATION DITCHES

At least one (and possibly more) drainage and/or irrigation ditch runs east/west along the north side of West Elizabeth Street between approximately Kimball Road and Ponderosa Drive. These are located on private property and are not anticipated to be impacted by the Recommended Design. The following images were taken of the existing facilities in the area:

Drainage and irrigation ditches between Kimball and Ponderosa

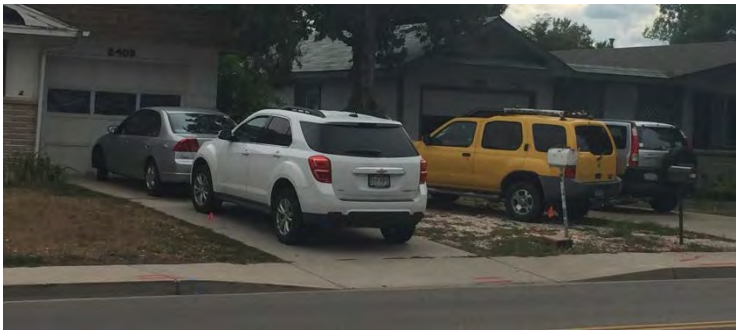


Drainage improvements will be made as part of the West Elizabeth project in a manner consistent with all City and State regulations. These facilities will be built within the public ROW to handle both conveyance and water quality treatment requirements of all additional runoff that will be generated by this project. Whenever possible, sustainable green infrastructure methods will be used to convey and treat such runoff. Additionally, areas that are currently draining into the ROW will be accommodated to prevent any flooding hazards and to treat and minimize any pollution from that runoff to the maximum extent practicable and in compliance with the City's Municipal Separated Sewer System (MS4) permit issued by the State of Colorado.

DRIVEWAYS AND PARKING

Currently many driveways have access on West Elizabeth Street. The Recommended Design was developed to minimize impacts to driveways as much as possible. For example, protected barriers for bike lanes are not included in areas where they would impede driveways and driveway length is preserved (or lengthened in several cases) in the majority of locations. Many driveways throughout the corridor are long enough to accommodate double stacking of vehicles as shown in the photos. During final design, the City's Engineering Department will work with property owners on an individual basis to ensure driveways are viable. If needed, some of the possible improvements that can be made to private property owner driveways include: increasing a single drive-cut to a double (increasing the parking area in front of one's home) and/or possibly shifting a driveway off of West Elizabeth to a lower volume side street (if feasible).

Example between Cypress and Ponderosa



Example between Taft Hill and Skyline

The north side of West Elizabeth between Taft Hill and Skyline is one area where driveways may be reduced by a few feet; all other driveway lengths in the corridor are either preserved or lengthened.

EXISTING FENCES

Several properties have front yard fences that are actually located within the City ROW. During final design, the City will meet with individual property owners to find a mutually agreeable solution for fence location. The City will work with owners to either relocate or reconstruct fences, at the cost of the project. Per current City code, fences shall be located at least 2' behind the ROW line or at least 2' behind the back of sidewalk; in some cases variances to the City's fence code may be required.

SIGHT DISTANCE

The corridor has several side streets that have limited sight distance for turning onto West Elizabeth, Ponderosa being one of the most commonly mentioned and shown below. In addition, some comments have been noted that trees depicted in the Recommended Design drawings may, upon growth, become sight distance challenges. During final design, the Larimer County Urban Area Street Standards (LCUASS) sight distance analysis will be considered when tree placement is finalized.

South facing vehicle turning left on to West Elizabeth from Ponderosa

TREES

There are many mature trees in the West Elizabeth corridor and it is the City's intent to preserve and support the tree canopy. During final design, the City's Engineering Department will work with the City's Forestry Department to limit the impact to existing trees, and where tree removal is necessary, mitigation trees will be planted in the area per City Code. In cases where existing mature trees are within the LCUASS sight distance triangle, a case by case evaluation of potential mitigation will be made that balances public safety and tree preservation.

Existing mature tree at 2510 West Elizabeth

Existing tree berm at 2450 West Elizabeth

Existing tree at 2738 West Elizabeth and existing tree lawn on south side of Elizabeth near Azuro

SIDEWALKS AND TREE LAWNS

The Americans with Disabilities Act (ADA) requires sidewalks to be a minimum of 4' wide with a 5' passing zone at least every 200'. The City's typical standard is to provide 6' sidewalks on arterial streets like West Elizabeth Street based on extensive research completed on the pedestrian environment and overall community character as part of the development of the Land Use Code in 1997. The research included a visual preference survey to help identify the desired pedestrian environment. This survey overwhelmingly revealed that citizens prefer detached sidewalks (in which a tree lawn separates the sidewalk from the roadway) to sidewalks attached to the street curb. Staff carefully considered the minimum preferred

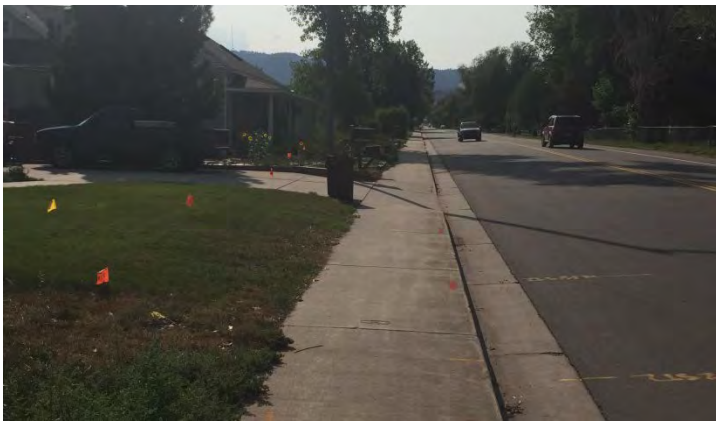
dimensions for the tree lawn, thinking about comfortable separation for people walking in a defined sidewalk's space, long-term tree health, long-term protection of concrete flatwork from tree root heaving, and the ability to irrigate turf grass.

Staff also evaluated sidewalk widths by taking neutral people out on different width sidewalks. The experience showed that 4.5' is the absolute minimum width that two people can walk together and deemed this width appropriate for local residential streets. On collector and arterial streets with more potential activity, 5-7' sidewalks were preferred as a way to increase pedestrian comfort and to provide enough room for people passing each other and bikes occasionally using sidewalks due to higher traffic volumes.

The Recommended Design proposes a combination of 5' and 6' sidewalks throughout the west segment of the corridor. Five-foot sidewalks are proposed in locations where ROW is limited and/or specific site constraints exist, whereas 6' sidewalks are proposed in areas where adequate ROW exists. A context-sensitive approach will be applied during final design. For example, some 6' sidewalks may be reduced to 5' to help preserve existing mature trees or wells.

Existing sidewalks are narrow and incomplete as noted in the project's Corridor Understanding Report. The images below show some of the existing sidewalk conditions.

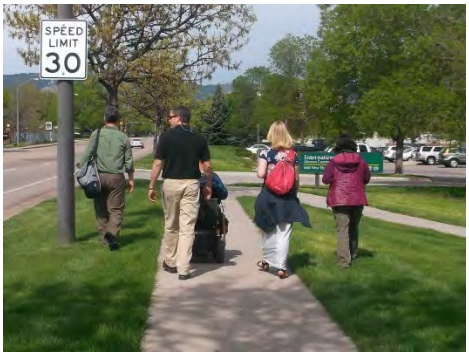
Existing sidewalks



West of Ponderosa (5')

West of Ponderosa (3.5')

West of Skyway (5')



West of City Park (5')

East of Skyway (3.5')

NOISE

Property owners have indicated that they regularly experience high levels of noise from the traffic on West Elizabeth Street. The Recommended Design does not increase speed limits in the area, but rather intends to increase the compliance with the existing speed limit of 30 MPH. Some of the design elements intended to reduce speeds include: narrowing of travel lanes, adding central landscaped medians and landscaped parkways in areas where spaces allows, and adding new pedestrian crossings and bus stop islands. These design elements have been proven to help slow traffic and are appropriate for an arterial street like West Elizabeth Street. Additionally, in most cases travel lanes are proposed to be further away from homes than the current travel lanes which may help reduce traffic noise by a small amount.

Other approaches to reducing sound that may be considered include: Transfort's transition to Compressed Natural Gas (CNG) buses, which are quieter than common diesel engines; and the potential for taller fences and potential shrub landscaping.

TEMPORARY CONSTRUCTION EASEMENTS

During final design, the City will meet with individual property owner's to determine if Temporary Construction Easements (TCEs) are needed to complete the work. TCEs are often needed for improvements such as relocating fences, reconstructing landscaping, and constructing sidewalks/driveway aprons. A TCE is a "rented" space used during construction to provide access for the Contractor. The property owner is financially compensated for the use of the space and the TCE agreement expires at the end of construction.

MAINTENANCE CONSIDERATIONS

The Recommended Design includes many elements that are new to many of the property owners in the West Elizabeth Corridor and as such there have been many questions about maintenance responsibilities and how they will change over time. This information is documented in Appendix I.