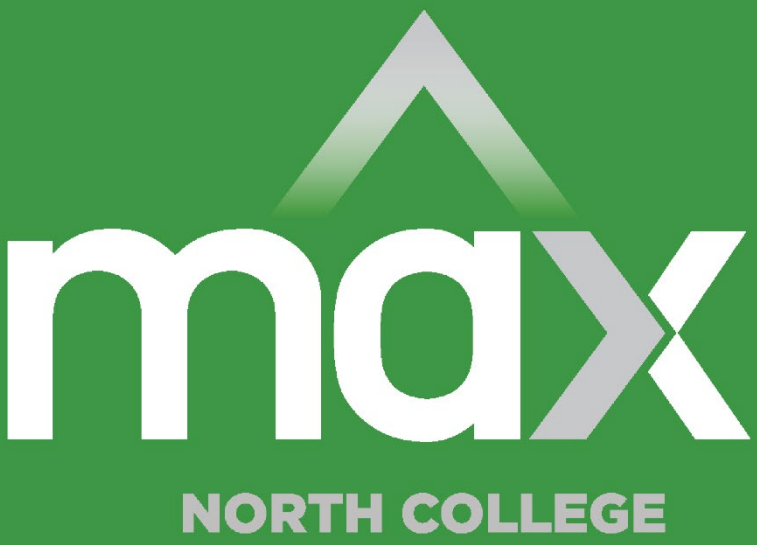
NORTH COLLEGE MAX BRT

EXISTING CONDITIONS REPORT

SEPTEMBER 2022



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APPENDICES

OVERVIEW AND CONTEXT

PROJECT CONTEXT AND GOALS

Previous planning efforts, including the 2019 Transit Master Plan, identified the North College corridor as a future MAX bus rapid transit (BRT) corridor. The North College MAX BRT Plan aims to document existing conditions on the North College corridor and create a plan for future MAX service that attracts new riders to the service while providing a higher level of service for existing users and promoting equity in the area. The North College MAX Plan will look into:

- Transit service planning for future MAX service on the North College corridor
- An analysis of multimodal transportation planning and operations
- Station area planning for future MAX stations
- Transit oriented development (TOD) and economic development considerations along the North College corridor
- Considerations of the impact of proposed projects on critical subjects like equity and sustainability
- Cost estimates and potential funding sources and phasing for implementation of recommendations

This report includes an assessment of existing transportation conditions along the North College corridor. In addition to this existing conditions report, an environmental review and a land use analysis were conducted as part of the North College MAX BRT Plan. These reports are included as Appendix C and Appendix D of this report.

EXISTING CONDITIONS OVERVIEW AND TAKEAWAYS

In summary, the existing conditions analysis found that apart from unscheduled events, congestion and delay along North College is minimal and is not expected to grow to unacceptable levels. However, the existing infrastructure on the corridor can be stressful for people walking or biking and those two user groups are overrepresented in the number of crashes that result in injury compared to their involvement in the total number of crashes.

Existing transit ridership is strong on the routes serving the North College corridor (Routes 8 and 81), but currently the highest ridership stops are those off of the corridor, particularly stops located near community services. The ridership profile for Routes 8 and 81 differs from ridership across the system with far fewer CSU students or youth riders and significantly greater numbers of older adults and people with disabilities.

This existing conditions analysis, along with community and stakeholder input, will be used to develop recommendations for the North College corridor. Recommendations will address how to provide MAX service on the corridor while still providing a high level of service to existing transit users who depend on Routes 8 and 81 currently. Recommendations will also address the existing stress levels of bicycle and pedestrian infrastructure as well as projects to improve overall safety on the corridor.

REVIEW OF EXISTING PLANS

The North College MAX BRT Plan builds off of previous studies that have been conducted on the North College corridor. This section documents previous planning and project work that has occurred on the corridor, what recommendations came out of these plans, and what recommendations have been implemented for each. This section includes summaries of the following plans:

- Our Climate Future (2021)
- Housing Strategic Plan (2021)
- Fort Collins Transportation Master Plan (2019)
- Fort Collins Transit Master Plan (2019)
- Fort Collins City Plan (2019)
- Fort Collins Multimodal Index (2019)
- Fort Collins Capital Improvement Plans & Programs
- Fort Collins Bicycle Master Plan (2014)
- North College Infrastructure Funding Plan (2010)
- North College corridor Plan (2007)
- CDOT Access Control Plan (2005)

OUR CLIMATE FUTURE (2021)

Our Climate Future documents Fort Collins' environmental goals, including a goal to reduce greenhouse gas emissions. Improved transit service, including Bus Rapid Transit, relates to Big Move 4 – Convenient Transportation Choices.

HOUSING STRATEGIC PLAN (2021)

The Housing Strategic Plan envisions that everyone in Fort Collins will have healthy, stable housing they can afford. Affordability is a core goal of the plan, which includes a variety of strategies and priorities for housing relevant to future development in the North College area.

FORT COLLINS TRANSPORTATION MASTER PLAN (2019)

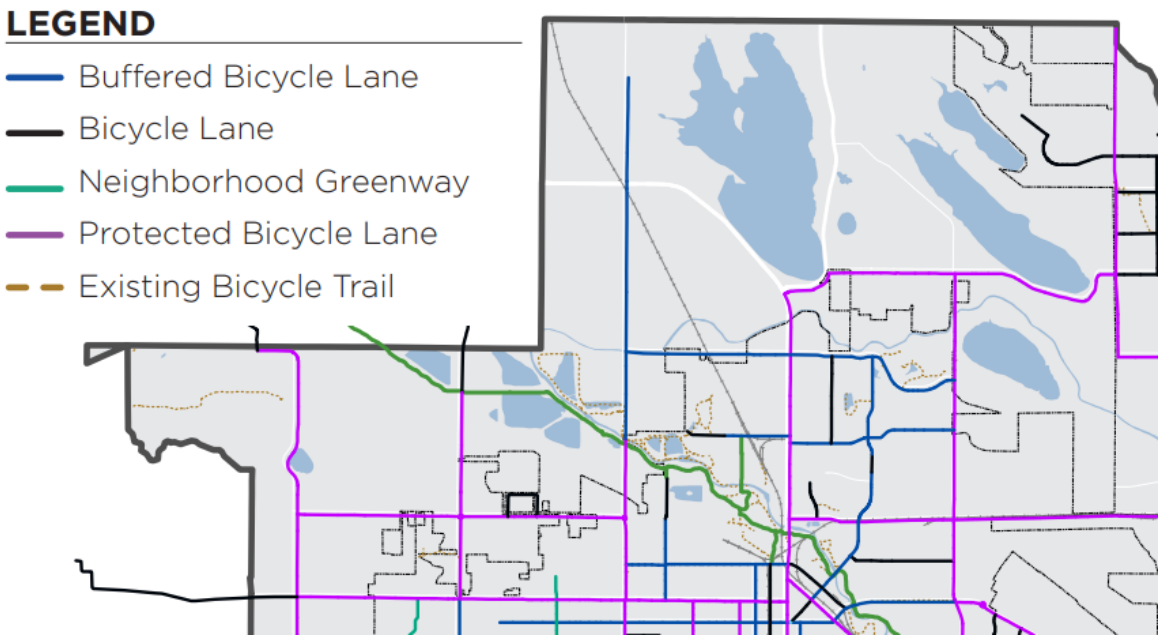
The 2019 Transportation Master Plan developed general recommendations for the Fort Collins transportation system that apply to the North College corridor:

- Realign local routes to provide more direct, reliable service, with higher frequencies and better connect to the high frequency network
- Mobility innovation zones should be connected into the BRT and high-frequency network at strategically spaced mobility hubs that can serve as multimodal transfer points between transit, bicycles, cars, scooters, shuttles, on-demand and other mobility services
- Convert city transit fleet to EVs in the near term and AVs in the long term
- Several major capital improvements will be needed, notably an expansion of the existing transit-maintenance base, an expanded or new Downtown Transit Center, and new mobility hubs
- More frequency proposed in denser areas that correspond with Pedestrian Priority Areas

- Disability rights experts to help guide transit project selection and program implementation

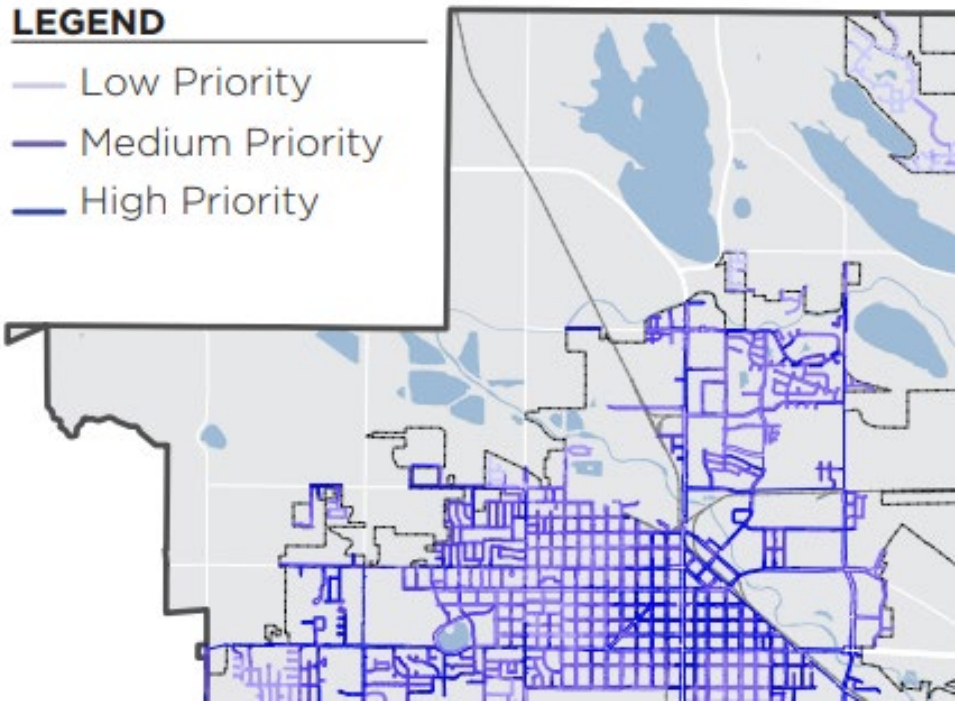
The 2019 Transportation Master Plan presented the 2014 Bicycle Master Plan. Near the North College corridor, buffered bike lanes are proposed on Willox Lane and Willow Street. The plan also extends the proposed protected bike lane on College Avenue south through the core of Fort Collins. The city set a goal of building one protected bike lane per year for the five years following the plan. **Figure 1** displays the Future Bicycle Network around the North College corridor created in the Transportation Master Plan

Figure 1: Future Bicycle Network (2019 Transportation Master Plan)



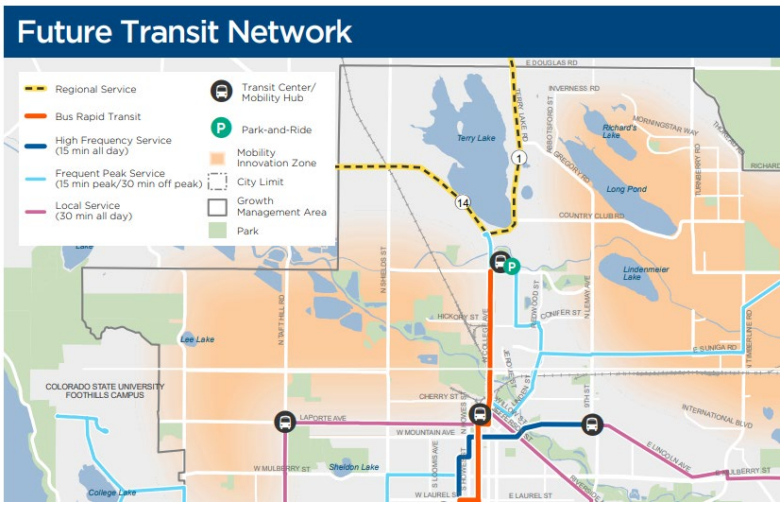
The Transportation Master Plan also determined the majority of sidewalks along the North College corridor to be high priority for sidewalk maintenance and filling gaps in the pedestrian network. **Figure 2** displays the priority level of sidewalks near the North College corridor.

Figure 2: Sidewalk Prioritization (2019 Transportation Master Plan)



FORT COLLINS TRANSIT MASTER PLAN (2019)

In 2019, in conjunction with City Plan, the city's comprehensive plan, and Transportation Master Plan, the Transit Master Plan was adopted. The Transit Master Plan identifies North College Avenue as a future BRT corridor with mobility hubs at the Downtown Transit Center and at Willox Lane. The mobility hub at Willox Lane is also planned to have a Park-n-Ride lot or garage. Additionally, the nearby route to the east of North College (currently the east side of Routes 8 and 81) is planned to be a frequent peak service route. The Transit Master Plan identifies mobility innovation zones both east and west of the study area which could potentially be served with micro-transit.



FORT COLLINS CITY PLAN (2019)

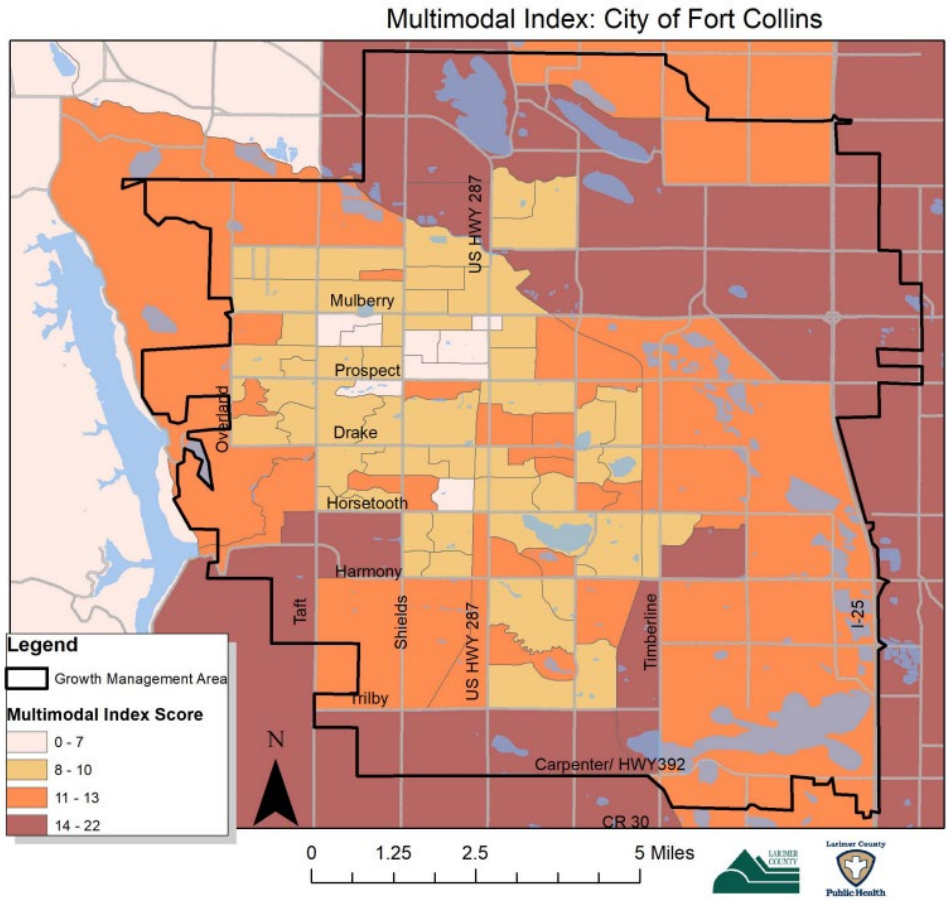
The 2019 Fort Collins City Plan highlighted key projects and priorities along the North College corridor. The transportation elements of these projects were expanded upon in greater detail in the Transportation Master Plan developed at the same time. The following list highlights the projects planned for the corridor:

- Infill of surface parking in areas served by BRT/high frequency transit.
- TOD in areas served by BRT/high frequency transit.
- Encouragement of health and human services providers to locate in areas served by high frequency transit.
- Provide fast and reliable transit service throughout the transit system, but with an additional emphasis on high frequency routes through the use of various design and operating strategies, including bulb-outs, signal priority, bus-only lanes, access to mobility hubs and streamlining of route patterns to minimize deviations and appropriately spaced bus stops.
- Modernize and expand transit infrastructure with customer mobility, comfort and security first in mind. This includes improvements to bus stops/shelters; expanded and upgraded transit centers with elements such as adequate lighting, ADA accessibility and protection from the elements; and on- and off-board security and cameras. Maintain transit infrastructure per the Transfort Bus Stop Design Guidelines and update the document as needed.

FORT COLLINS MULTIMODAL INDEX (2019)

In 2019 a Multimodal Index was developed to identify areas of the city with the fewest transportation options. While the southern half of the North College corridor was identified as having a good amount of transportation options available, the northern half of the corridor was determined to have the fewest options. **Figure 3** displays a map of the multimodal index across the City of Fort Collins as well as an explanation of the index.

Figure 3: Multimodal Index



FORT COLLINS CAPITAL IMPROVEMENT PLANS AND PROGRAMS

The following is a list of upcoming or recently completed projects from the city's Capital Improvement Plan:

- The Linden Street Renovation Project will transform the section of Linden between Jefferson Street and Walnut Street into a convertible street that can be closed to traffic and turned into a pedestrian gathering space during events.
- The city recently completed the design and construction of improvements to Willow Street between College Avenue and Linden Street.
- The Transfort Bus Fleet Replacement will replace diesel buses with electric buses over the next decade.
- The North Mason Stormwater Improvements listed in 2022 Capital Projects Map will complete a final stormwater design and water and sanitary sewer design, including a stormwater drainage outfall just north of Hickory Street to the Poudre River and pond.
- Transfort is exploring potential locations for a north transit operations center to buildout the Transit Master Plan.

FORT COLLINS BICYCLE MASTER PLAN (2014)

The 2014 Fort Collins Bicycle Master Plan proposed a protected bike lane for the length of the North College corridor. The protected bike lane would intersect buffered bike lanes at Hickory Street, Conifer Street, and Cherry Street. The protected bike lane would also intersect the East Poudre Trail. The plan also proposed a two-way sidepath segment on North College Avenue between Hickory Street and Conifer Street and bike share stations along the corridor at Bristlecone Drive, Cherry Street, and Maple Street. The intersections of North College Avenue with Hickory Street and Conifer Street were listed as priority intersections in the plan. Wide shoulders on North College avenue exist currently and function as bike lanes but are too uncomfortable for the majority of people biking. As of Fall 2022, the city is completing an update to the 2014 Bicycle Master Plan that will expand it into an Active Modes Plan.

NORTH COLLEGE INFRASTRUCTURE FUNDING PLAN (2010)

In 2010 the City of Fort Collins adopted the North College Infrastructure Funding Plan to implement planned improvements along the North College corridor. This plan committed to a variety of projects along the corridor including:

- Street edge improvements:
    - Bike lanes
    - Curb and gutter improvements
    - Landscaping
    - Sidewalks
    - Streetscape enhancements
    - Driveway access

- Access improvements
- Roadway realignments:
    - Vine Street
    - Hickory Street and Conifer Street
- A new east-west arterial (Suniga Road)
- Pavement improvements
- Storm drainage facilities

Many of these projects have been completed since the 2010 plan. The following list calls out the projects from this plan that have not yet been completed:

- Realignment of Conifer Street to create a new four-legged intersection with Hickory Street
- Various street edge and roadway improvements:
    - North College Avenue (Larimer Weld Canal to State Highway 1)
    - Vine Drive (North College Avenue to Linden Street)
    - Willox Lane (North College Avenue to Union Pacific Railroad Tracks)
- Improve and extend Mason Street from Alpine Street to Hickory Street
- Storm drainage facility improvements

NORTH COLLEGE CORRIDOR PLAN (2007)

In 2007 the City of Fort Collins adopted the North College corridor Plan. This plan put forth the following goals and recommendations for the corridor:

- North College is to become more walkable and bikeable by developing cross streets into commercial areas and using corridors to draw users into these more visually interesting and inviting areas.
- Integrate “semi-industrial” design touches throughout the corridor.
- Capitalize on the river corridor as an attractive connection with downtown, eliminating perceptions of an edge and a separation.
- Realign Vine Drive 0.25 miles to the north and widen to manage higher traffic volumes.
- Redesign the two “T” intersections of Hickory Street and Conifer Street.

CDOT ACCESS CONTROL PLAN (2005)

The 2005 CDOT Access Control Plan laid out the future vehicle access and operations projects along the North College corridor. **Table 1** includes the most relevant improvements from that plan and which improvements have been implemented since that plan.

Table 1: Improvements from CDOT Access Control Plan

Location on North College Avenue	Improvements	Status
Jefferson Street	Second southbound left turn lane Signalization for right turns	Not completed
Bristlecone Drive	New traffic signal	Not completed
Suniga Road	New traffic signal	Not completed
Cherry Street/Willow Street	Widen eastbound Cherry Street and westbound Willow Street so that an exclusive through lane can be provided on Cherry Street	**Completed**
Hickory Street/Conifer Street	Reconstruct "T" intersections to create one four-legged intersection (two through lanes and two left turn lanes are recommended for the Hickory and Conifer Street approaches to the intersection)	Not completed
Willox Lane	Exclusive westbound right turn lane at Willox Lane	**Completed**
State Highway 1	Protected left turn for westbound traffic at State Highway 1	**Completed**

APPLICATION TO THE NORTH COLLEGE MAX PLAN

The priorities and recommendations from these previous plans will help inform the North College MAX Plan by providing context for the future vision of the corridor, an understanding of already implemented and soon to be implemented improvements, as well as how the corridor has changed since the adoption of these plans. The North College MAX Plan will take into consideration the previous planning and implementation done on the corridor and will bring that context into the plan's final recommendations.

PHYSICAL INFRASTRUCTURE

This section details the existing transportation facilities along the corridor, including travel lanes, sidewalks, multi-use paths, and bike lanes. This section includes an inventory of the different cross sections found along North College Avenue and Level of Traffic Stress analyses of the bicycle and pedestrian facilities along the corridor.

TYPICAL STREET CROSS-SECTIONS

Figure 4 - Figure 10 display the typical cross sections for each block along the corridor starting from Laporte Avenue and heading north to Terry Lake Road.

Notes: tree lawns or amenity zones with tree grates are shown in the cross-sections but are inconsistently present on the corridor. Sidewalks also function as shared-use paths where width allows.

Figure 4: Cross Section - Laporte Avenue to Jefferson Street

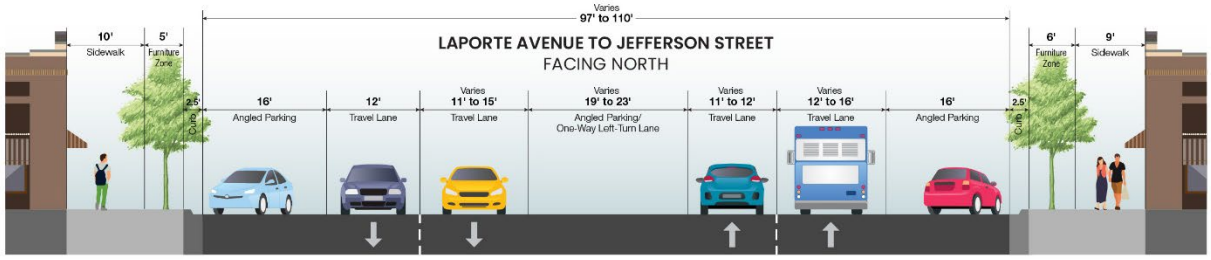


Figure 5: Cross Section: Jefferson Street to Cherry Street

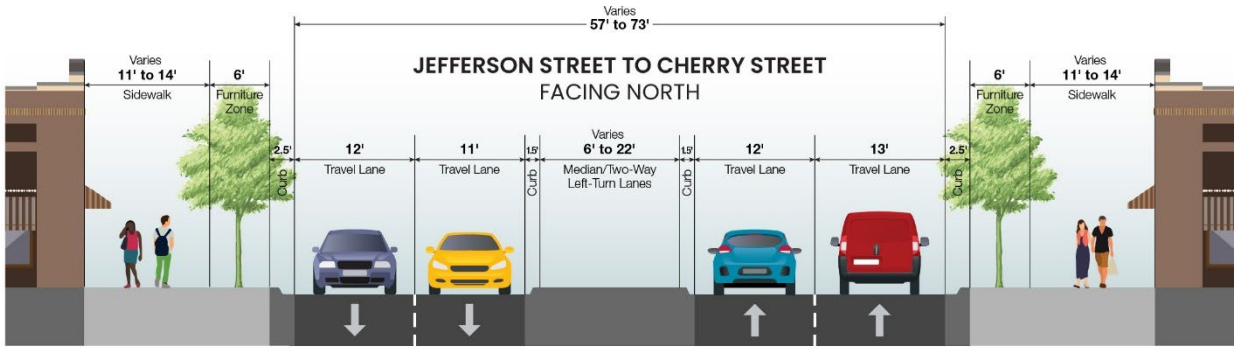


Figure 6: Cross Section: Cherry Street to East Vine Drive

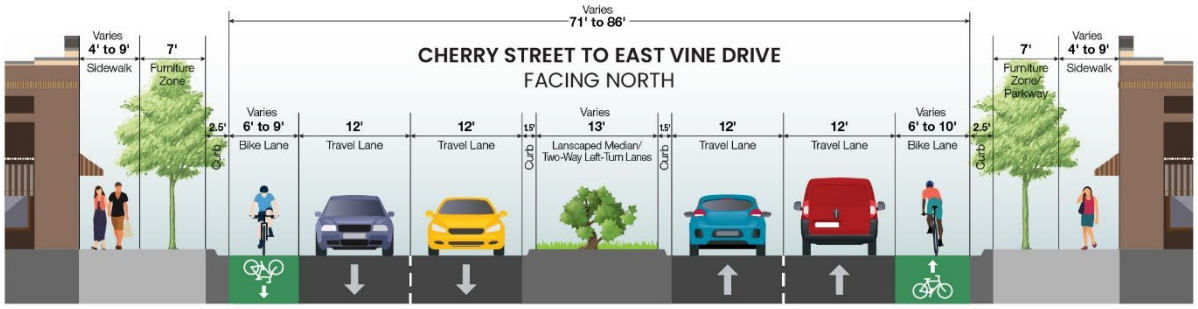


Figure 7: Cross Section: East Vine Drive to Conifer Street

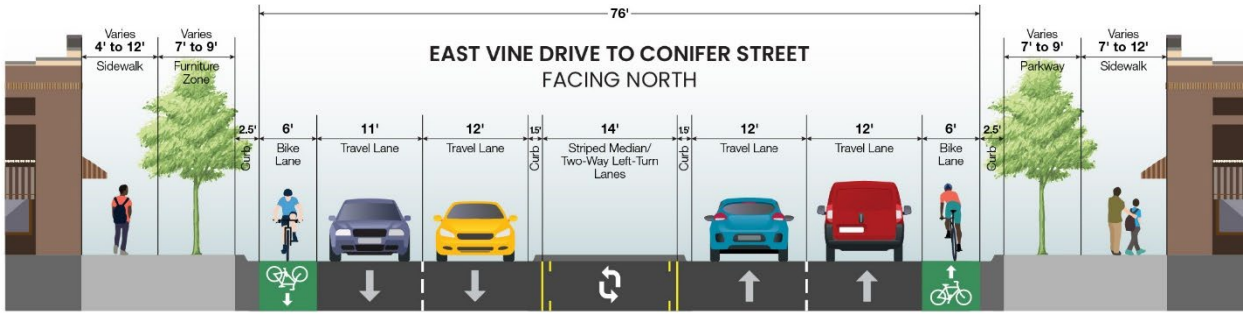


Figure 8: Cross Section: Conifer Street to Bristlecone Drive

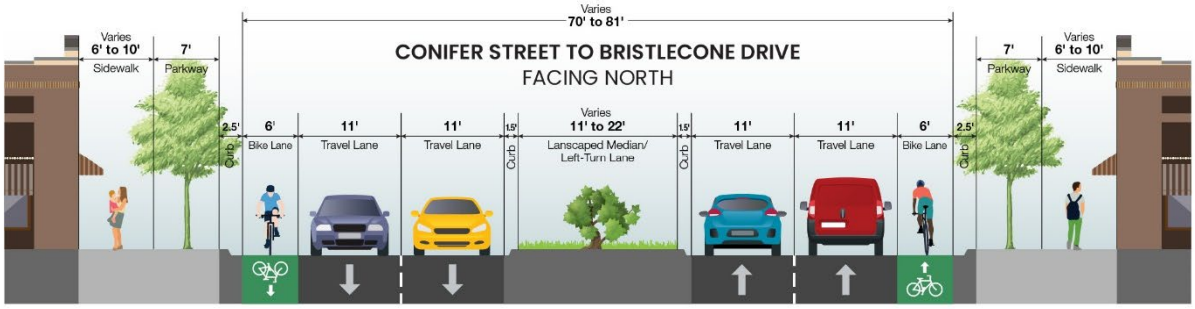


Figure 9: Cross Section: Bristlecone Drive to East Willox Lane

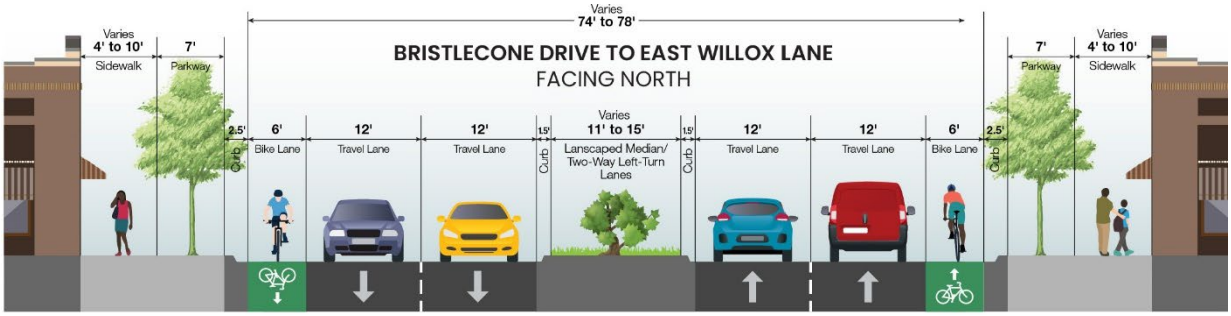
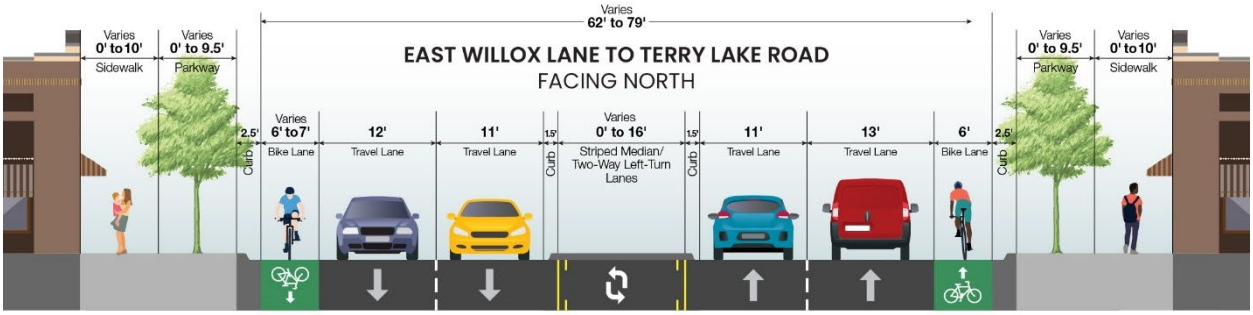


Figure 10: Cross Section: East Willox Lane to Terry Lake Road

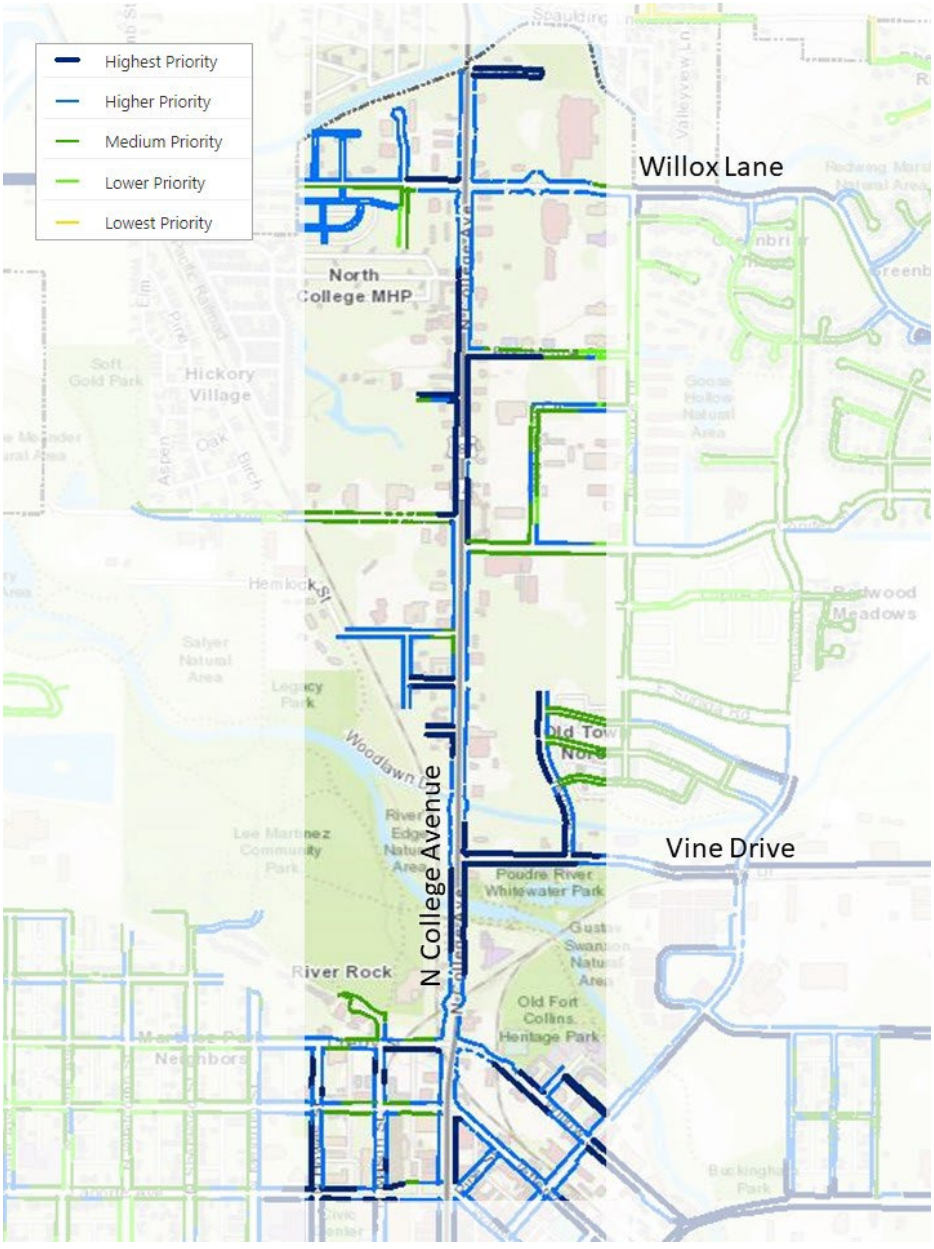


PEDESTRIAN INFRASTRUCTURE

EXISTING FACILITIES

There are sidewalks along the length of the corridor within city limits. Most of the sidewalks along the corridor are detached with either a landscaped buffer or an urban buffer or furniture zone made of impervious surfaces with some trees, light fixtures, and benches. Some of the sidewalks are attached sidewalks particularly as the sidewalks approach intersections. **Figure 11** displays a map of the sidewalks along North College symbolized by their priority for rehabilitation maintenance according to the Transportation Master Plan. All sidewalk segments on the corridor are considered high or highest priority for rehabilitation maintenance, except for one segment on the west side of the corridor which is considered medium priority.

Figure 11: Existing Sidewalks Symbolized by Priority for Improvement



PEDESTRIAN LEVEL OF TRAFFIC STRESS

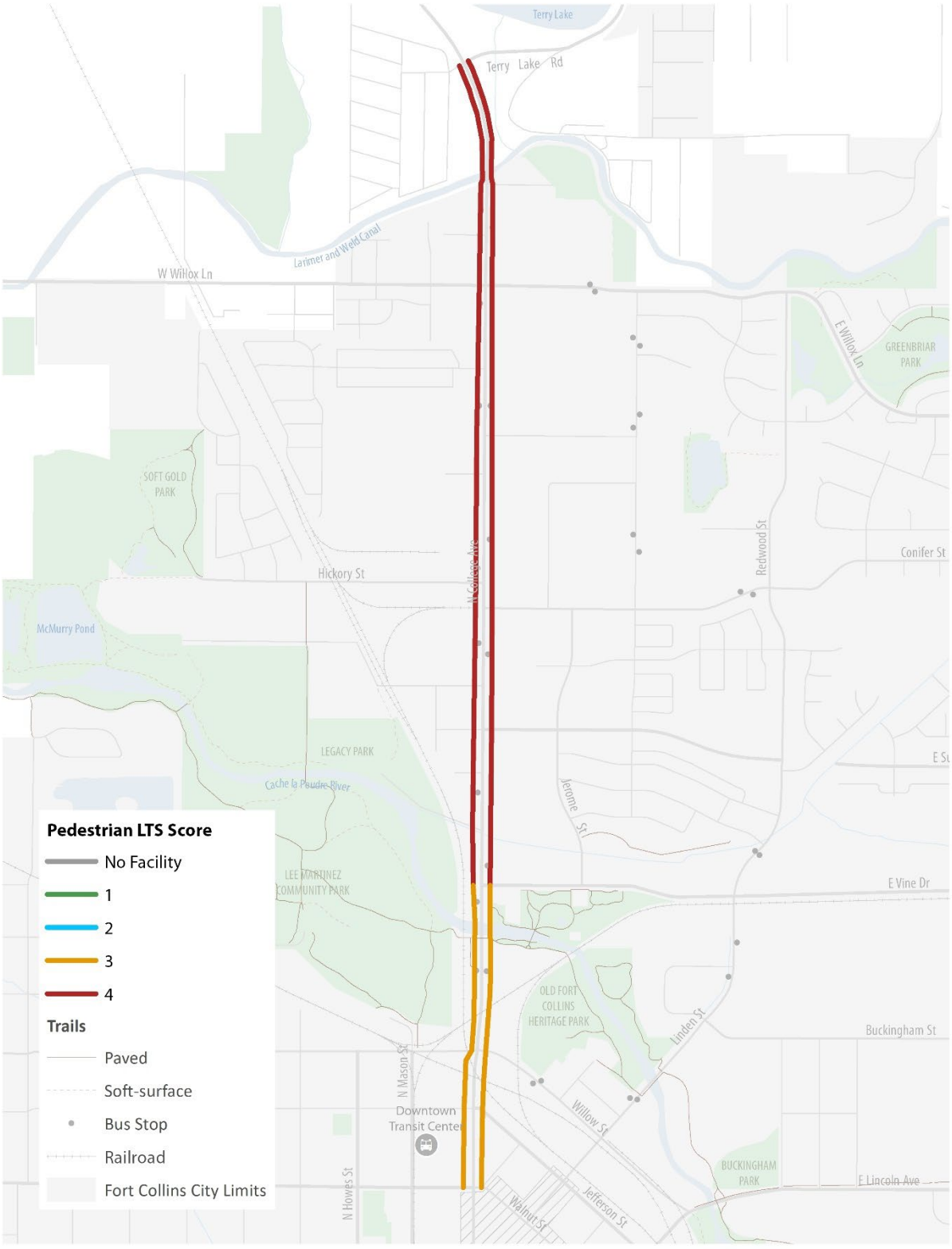
A pedestrian Level of Traffic Stress analysis was conducted along North College to understand the comfort level of the pedestrian facilities located on the corridor. The Level of Traffic Stress (LTS) methodology was developed to help guide jurisdictions to account for key comfort considerations when planning, designing, and evaluating their bicycle and pedestrian networks. This tool is developed based on research and best practices for measures of comfort including Mekuria, Furth, and Nixon's development of the original Level of Traffic Stress (2012) and NACTO Urban Streets Guide and safety research. Based on this research, this analysis incorporates a few key inputs that can serve as a proxy for understanding pedestrian comfort and safety based on best practices and data that is available. The Level of Traffic Stress (LTS) score for pedestrians along streets uses a 1 to 4 scale. This scoring system is conveyed in terms of comfort levels. Scores of 1 and 2 are considered low-stress and high comfort and scores of 3 to 4 are considered high-stress and low comfort:

- **LTS 1**: Highly comfortable and easily navigable for pedestrians of all ages, including seniors or school-aged children walking unaccompanied to school. These streets provide an ideal "pedestrian-friendly" environment.
- **LTS 2**: Generally comfortable for many pedestrians, but parents may not feel comfortable with children walking alone. Seniors may have concerns about the walking environment and take more caution. These streets may be part of a "pedestrian-friendly" environment where it intersects with a more auto-oriented roadway or other environmental constraints.
- **LTS 3**: Walking is uncomfortable but possible. Minimum sidewalk and crossing facilities may be present, but barriers are present that make the walking experience uninviting and uncomfortable.
- **LTS 4**: Walking is a barrier and is very uncomfortable or even impossible. Streets have limited or no accommodation for pedestrians.

Different LTS levels are associated with different types of people walking who may have different thresholds for what makes a comfortable walking environment. Generally for a pedestrian facility to be comfortable for people of all ages and abilities the facility should have an LTS score of 1 or 2.

Figure 12 displays the results of the Pedestrian Level of Stress analysis for the pedestrian infrastructure on North College Avenue. The pedestrian facilities on the corridor received a score of 4 from Highway 1 south to Vine Drive and a score of 3 from Vine Drive south to Walnut Street. The greatest determinant of the high LTS scores on the corridor was the posted speed limit on North College Avenue which is 40 MPH from Highway 1 to Vine Drive and 35 MPH from Vine Drive to Walnut Street. Additional factors that contributed to high LTS scores were variable sidewalk and buffer widths, the number of travel lanes, and long distances between crosswalks. It is almost half a mile between crosswalks from Willox Lane to Hickory Street.

Figure 12: Level of Traffic Stress of Pedestrian Facilities

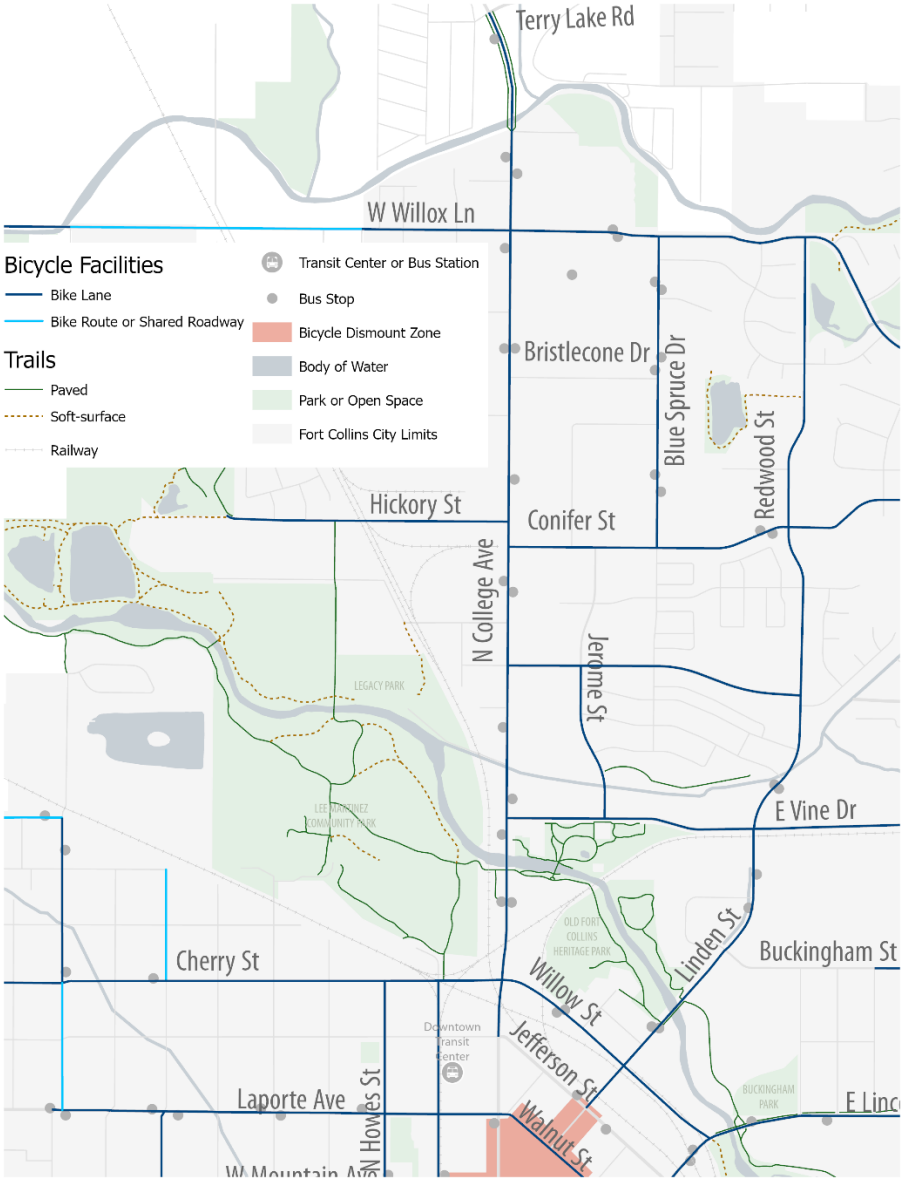


BICYCLE INFRASTRUCTURE

EXISTING BICYCLE FACILITIES

There either bike lanes or wide shoulders on most of North College Avenue from Highway 1 to Maple Street. There are also side paths on both sides of North College Avenue with varying widths. According to the Federal Highway Administration multi-use paths (pathways shared by pedestrians and people biking) are recommended to be a minimum of 10-feet wide. Many of the sidepaths on North College Avenue are 10-feet wide or more, but some are not this wide. For this assessment sidepaths less than 10-feet wide were not considered bicycle facilities. **Figure 13** displays the existing on-street bicycle facilities in the study area.

Figure 13: Existing On-street Bicycle Facilities



BICYCLE LEVEL OF TRAFFIC STRESS ANALYSIS

A bicycle Level of Traffic Stress (LTS) analysis was conducted for both the on-street and off-street bicycle facilities along North College Avenue. This analysis used the criteria developed in the Fort Collins Bicycle Plan (2014) for determining the LTS score of different bicycle facilities. **Figure 14** displays the City of Fort Collins' Bicycle Level of Traffic Stress criteria.

Figure 14: City of Fort Collins Level of Traffic Stress Criteria

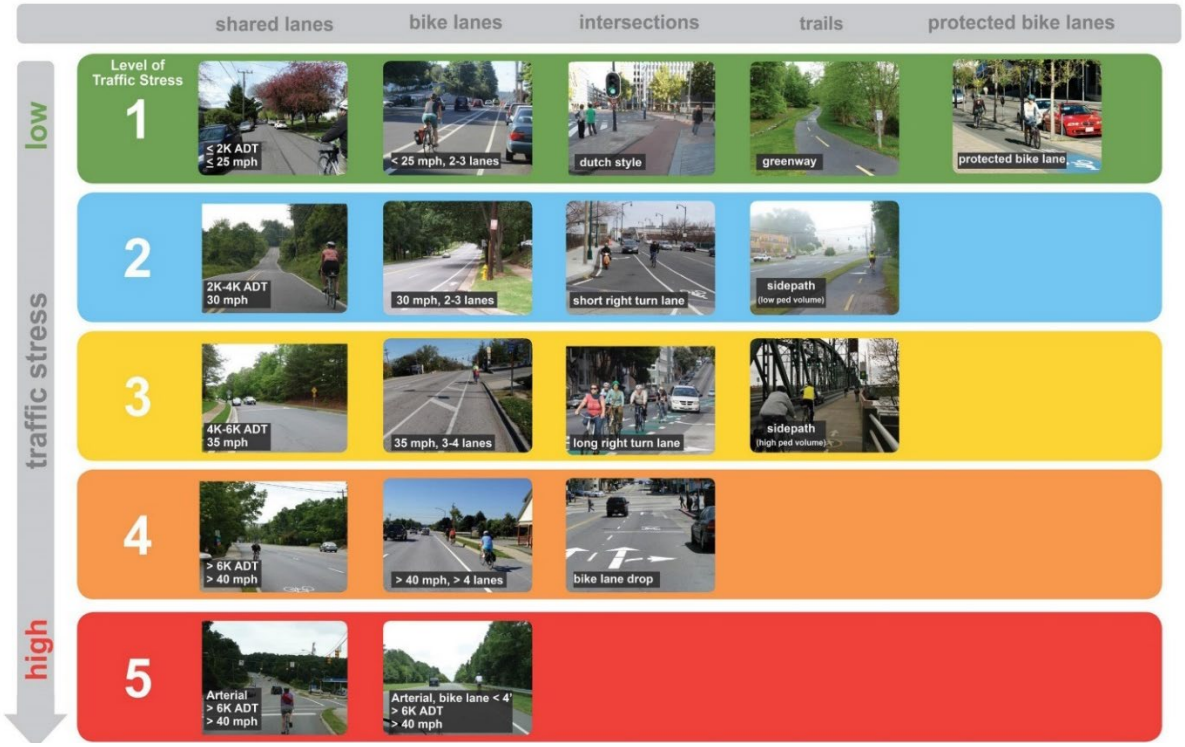


Figure 15 displays the results of the LTS analysis for on-street bicycle facilities along North College Avenue (bike lanes and shoulders). All of the on-street bike lanes on the corridor were found to be high stress (LTS 5). The one LTS 1 section on the on-street facilities is a place where the on-street bike lane becomes a grade separated bike lane for a short distance.

Figure 16 displays the results of the LTS analysis for off-street bicycle facilities (sidepaths). For this analysis only sidepaths with a width of 10 feet or wider were considered bicycle facilities. If there was a sidepath that was less than 10-feet wide this is displayed as "no facility" on the map. The off-street sidepaths on the corridor provide a lower stress option from the on-street bike lanes and were determined to be LTS 2 in some sections due to the low pedestrian volumes at those locations. The City of Fort Collins' Bicycle Level of Stress Criteria does not include factors such as frequency of curb cuts for sidepaths or frequencies of crossing opportunities. The North College corridor has frequent driveways along sections and long stretches where there are no controlled crossings of North College Avenue. These factors may make the actual level of stress for people bicycling on the sidepaths higher than the map indicates.

Figure 15: Level of Traffic Stress of On-Street Bicycle Facilities

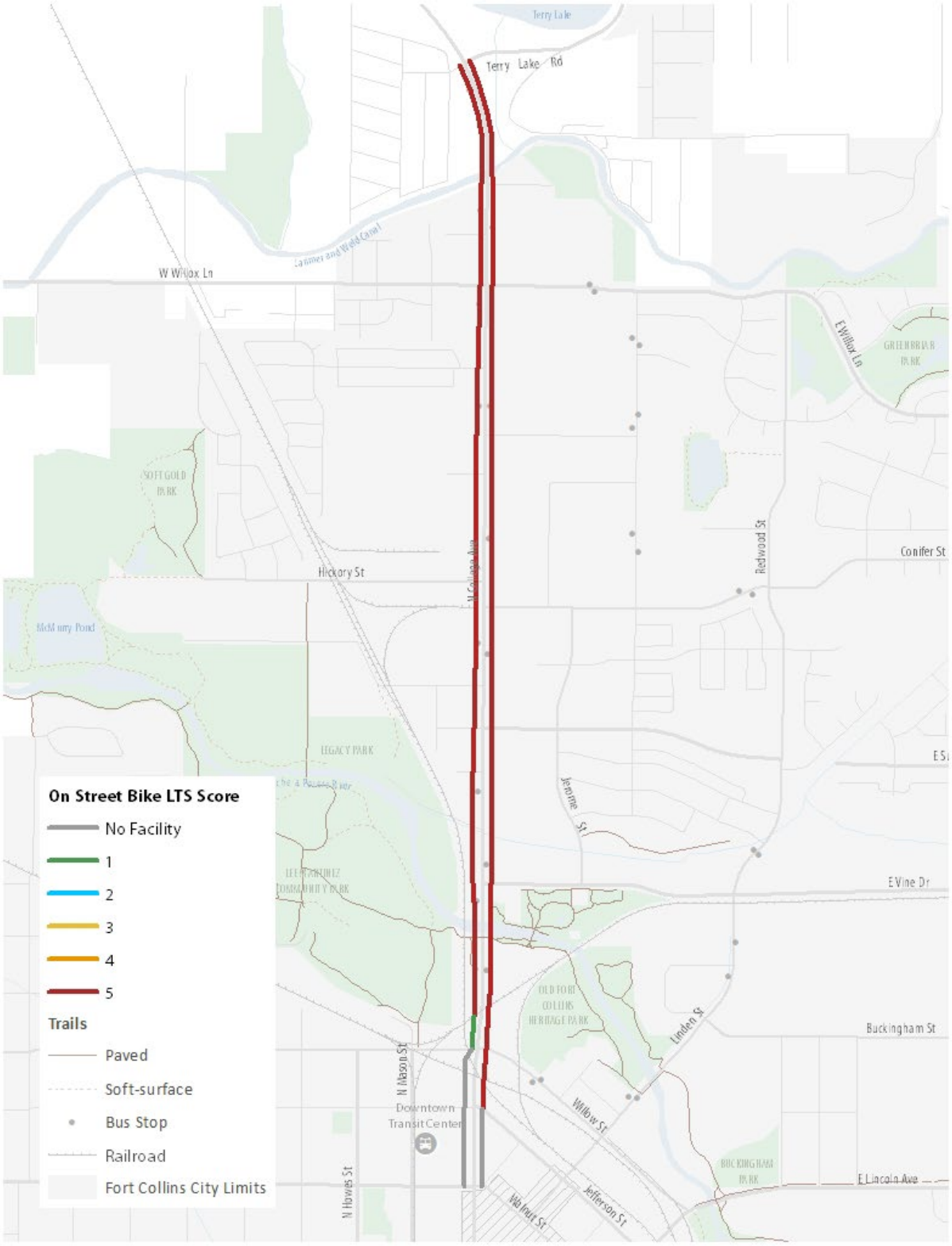
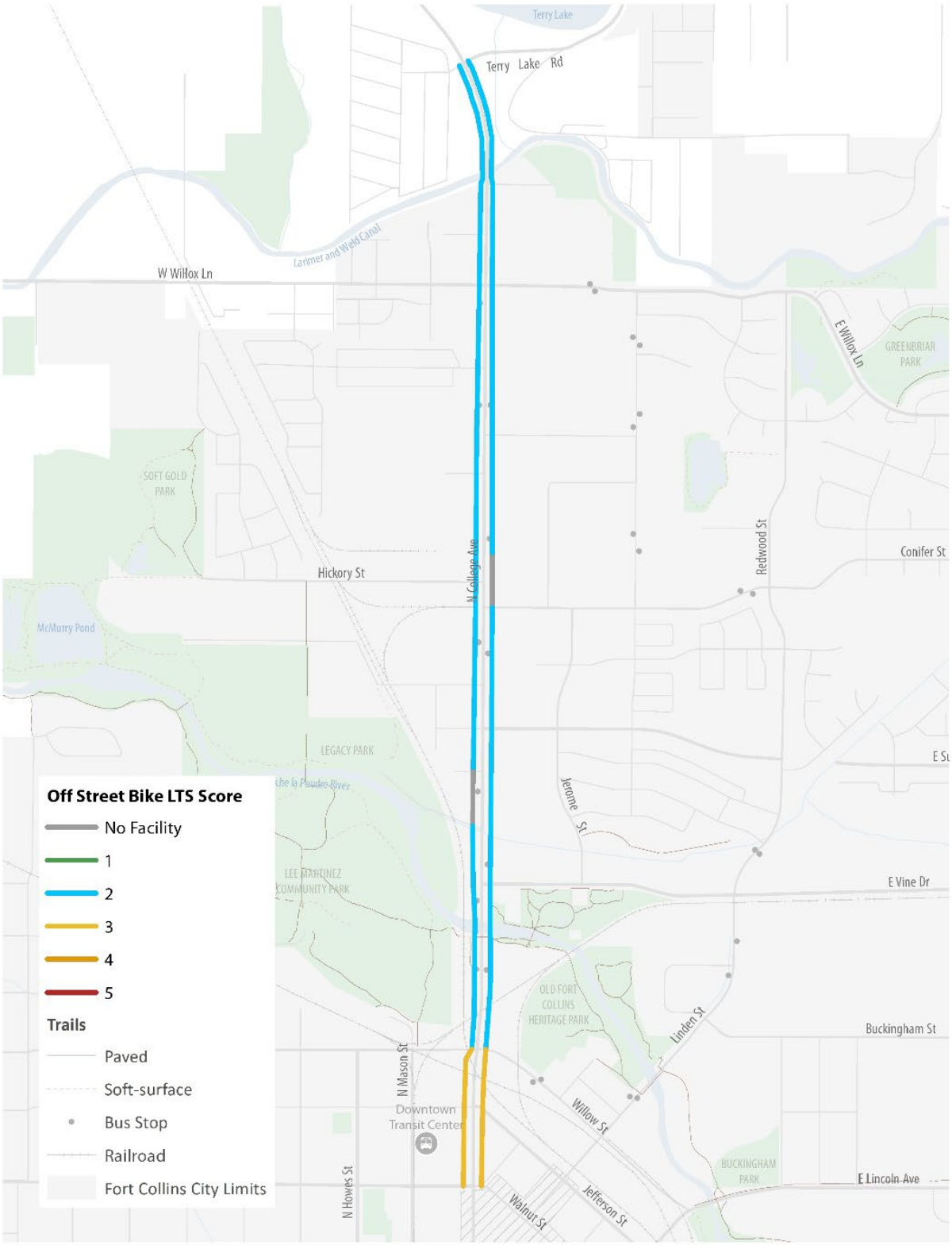


Figure 16: Level of Traffic Stress of Off-Street Bicycle Facilities



PUBLIC SPACE & PLACEMAKING

EXISTING CHARACTER & PLACEMAKING ELEMENTS

Site features found along the North College corridor consist of recently upgraded site components such as stone wayfinding signage, pedestrian lighting, sandstone seat walls, special pavement at major and minor intersections, native and low-water planting schemes, as well as weathered steel and buff/red sandstone bridge structures. These elements bring a distinctive quality to the corridor and inform the future character and identity.

Several site features are inconsistent in comparison to the renovations and emerging character. Designed elements of the Gateway Bridge leading from Old Town into the North College corridor remains dissociated from the adjacent updated character features. Existing bus stops are inconsistent throughout the corridor, with little to no seating or shade provided.

The overall character of North College highlights both traditional, historic, and rustic elements. The strong presence of Weathered Steel (Corten) and Buff/Red Sandstone elements bring a cohesive aesthetic identity to the corridor. Low-water and native planting schemes tie the area to the surrounding environment and help maintain a sense of nature in the city. **Figure 17** displays examples of the types of design elements found on the North College corridor.

Figure 17: Existing Character Elements

Site elements that have been updated include the stone wayfinding signage, special pavement, lighting elements, sandstone seat walls, and a consistent planting palette. These elements (shown in **Figure 18**) set the precedent for the area's character moving forward.

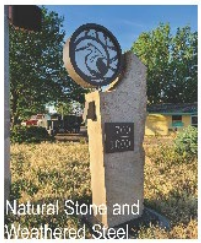
Figure 18: Emerging Character Elements

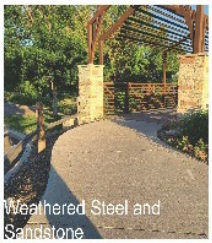


Paving


Tree Grates


Seat Walls

Bike Racks



Wayfinding


Bridge Character

Lighting

Older design elements remain throughout the corridor in areas that have not yet been updated. These inconsistent conditions (shown in **Figure 19**) make the corridor feel disjointed and divided. These elements should be updated to compliment the corridor's improved streetscape renovations and character.

Figure 19: Older Character Elements


Gateway Bridge

Bench Seating



Bike Rack

OPEN SPACE & TRAILS

Existing open space and trail network provide recreation, access to nature, and multi-modal transportation. Lee Martinez Park, The Poudre Trail System, Soft Gold Park, Old Fort Collins Heritage Park, and Poudre River Whitewater Park are the most notable open space gathering destinations. There are several privately-owned open space areas as well as city-owned and operated natural areas. A majority of the parks and natural areas in North Fort Collins primarily follow the river and lake canal corridors. There is a general lack of trail connectivity to many of the adjacent neighborhoods. Improving the trail network between the adjoining neighborhoods and the existing trails/open space is essential to strengthening the North College area's vitality and community identity.

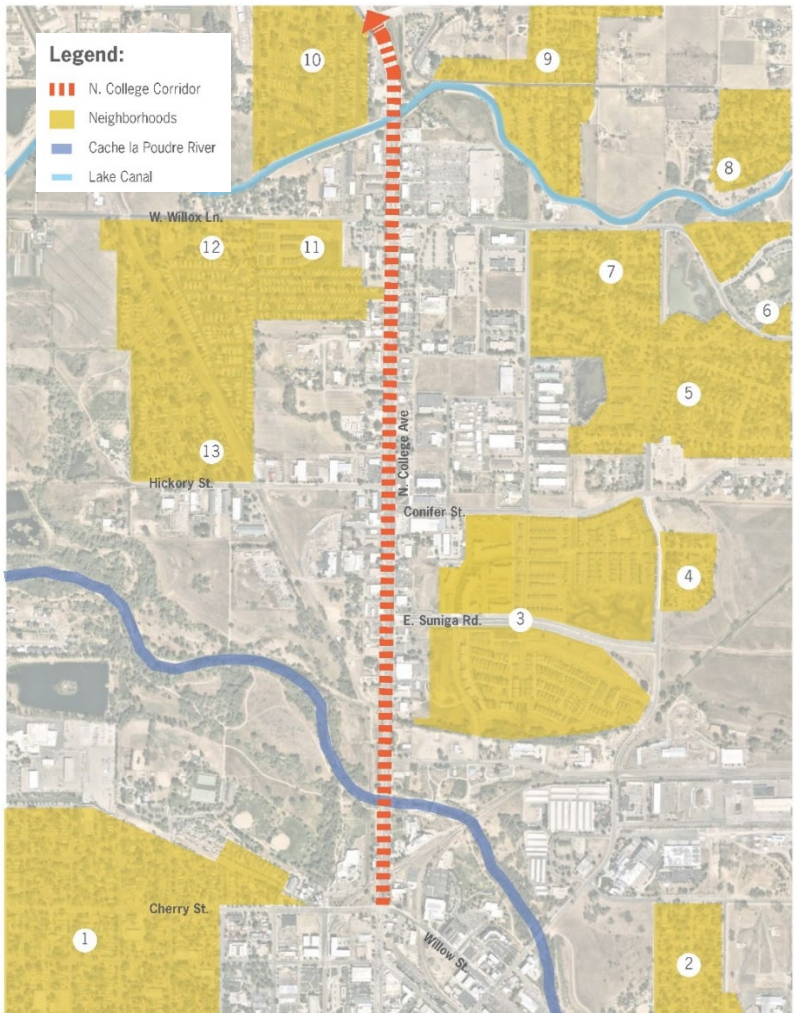
NEIGHBORHOODS

The North College corridor is an ethnically and demographically diverse area supporting a mix of housing types and affordability. Established mobile-home communities, new single and multi-family housing developments, and established subdivisions make up the area's main neighborhoods. **Figure 20** displays a map of the different neighborhoods located along the corridor.

Neighborhoods:

1. Martinez Park
2. Buckingham
3. Old Town North
4. Redwood Meadows
5. Evergreen
6. Greenbriar Park
7. Greenbriar Village
8. Pheasant Ridge
9. Country Club and associated subdivisions
10. Poudre Valley Mobile Home
11. Revive
12. North College Mobile Home
13. Hickory Village Mobile Home

Figure 20: North College corridor Neighborhoods



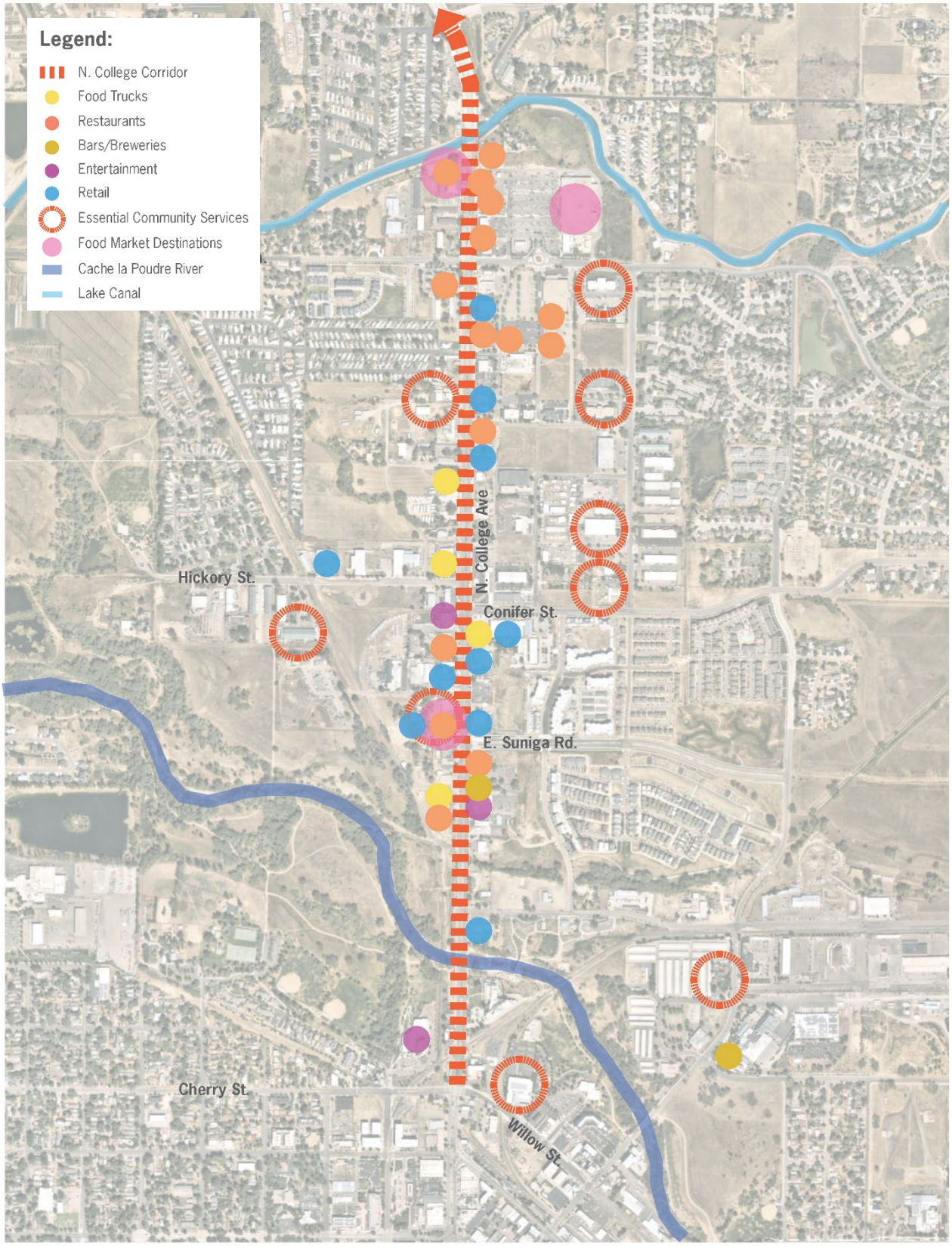
KEY DESTINATIONS

A variety of destinations and services exist along the North College corridor including food trucks, restaurants, entertainment, retail, essential community services, and food markets.

- **Food Trucks**
  There are four main resident food trucks along the corridor.
- **Restaurants**
  There are about 15 restaurants along North College.
- **Bars/Breweries**
  There is only one bar along the corridor. The New Belgium Brewery is about half a mile away from North College.
- **Entertainment**
  Chippers College Lanes, Lyric Cinema, and the Museum of Discovery are the leading entertainment businesses.
- **Retail**
  There are several auto-parts and auto-repair shops, feed supply stores, JAX Outdoor Gear, a clothing consignment shop, an antique furniture shop, a bike co-op, and two pawn shops that exist along the corridor.
- **Essential Community Services**
  La Familia, Salud Family Health Centers, Larimer County Health & Human Services, The Murphy Center for Hope, Food Bank for Larimer County, and the Northside Azlan Community Center, WIC, Catholic Charities of Larimer County, Launch.
- **Food Markets**
  King Soopers and three local markets exist on the corridor.

The locations of these key destinations are shown on the map in **Figure 21**.

Figure 21: Key Destinations on the North College corridor



KEY FEATURES OF SUCCESSFUL BRT STATIONS

Good design plays a key role in making BRT service inviting and elevating the experience of taking transit. There are a few key themes that are important to integrate into a successful BRT station:

1. Universal accessibility (including multi-lingual information)
2. Amenities (trash receptacles, benches/bike racks, wi-fi, etc.)
3. Security systems (internal and external lighting, security cameras, security call boxes, on-board security, etc.)
4. Station-vehicle interaction
5. Ample station capacity
6. Infrastructure such as shelters and accompanying buildings
7. Maintenance of stations
8. Public art

Figure 22: Images of Design Elements of Successful BRT Stations

CONCEPTUAL PLACEMAKING ELEMENTS

Unified placemaking elements can make the North College corridor feel more cohesive and give the corridor a distinct sense of place. This section presents images of three distinct styles, one of which could serve as inspiration for a future cohesive design theme for the corridor. The three styles displayed in this section are rustic modern with traditional elements, contemporary with natural elements, urban modern with wood elements.

RUSTIC MODERN WITH TRADITIONAL ELEMENTS




Bus Shelter Inspiration



Tree Grates

Bike Racks

Planters


Paving



Bench Seating



Trash Receptacles

Boulders


Lighting

Wayfinding

CONTEMPORARY WITH NATURAL ELEMENTS

Bus Shelter Inspiration

Tree Grates

Bike Racks

Planters

Paving

Bench Seating

Trash Receptacles

Boulders

Lighting

Wayfinding

URBAN MODERN WITH WOOD ELEMENTS

Bus Shelter Inspiration

Tree Grates

Bike Racks

Planters

Paving

Bench Seating

Trash Receptacles

Boulders

Lighting

Wayfinding

TRANSPORTATION DATA ANALYSIS

VEHICLE COUNTS AND LEVEL OF SERVICE ANALYSIS

The transportation operations analysis addressed signalized intersection operations using the procedures and methodologies contained in the Highway Capacity Manual (HCM) 6th Edition (2017, Transportation Research Board) for the weekday AM, PM, and midday peak hour traffic operations. Study intersection operations were evaluated using level of service calculations as analyzed in the Synchro software. To measure and describe the operational status of the local roadway network and corresponding intersections, transportation engineers and planners commonly use a grading system called level of service (LOS) put forth by the Transportation Research Board's HCM. LOS characterizes the operational conditions of an intersection's traffic flow; ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed the design capacity, resulting in long queues and delays). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Traffic conditions with LOS E or F are generally considered unacceptable and represent significant travel delay, increased crash potential, and inefficient motor vehicle operation.

Figure 23 details the count volumes that were collected along the corridor and the lane configurations at each of these intersections. These volumes were used to calculate the existing LOS for each intersection. Most of the traffic counts used in this analysis were collected in January and February of 2018 with the exception of the intersection of North College Avenue and Highway 1 where counts were collected in June of 2019.

Table 2 displays the estimated level of service for each intersection as well as the average delay (seconds/vehicle). Under existing conditions all intersections on North College Avenue within the study area operate acceptably in both the AM and PM peak hours as well as midday.

Figure 23: 2020 Peak Hour Vehicle Volumes and Lane Configurations

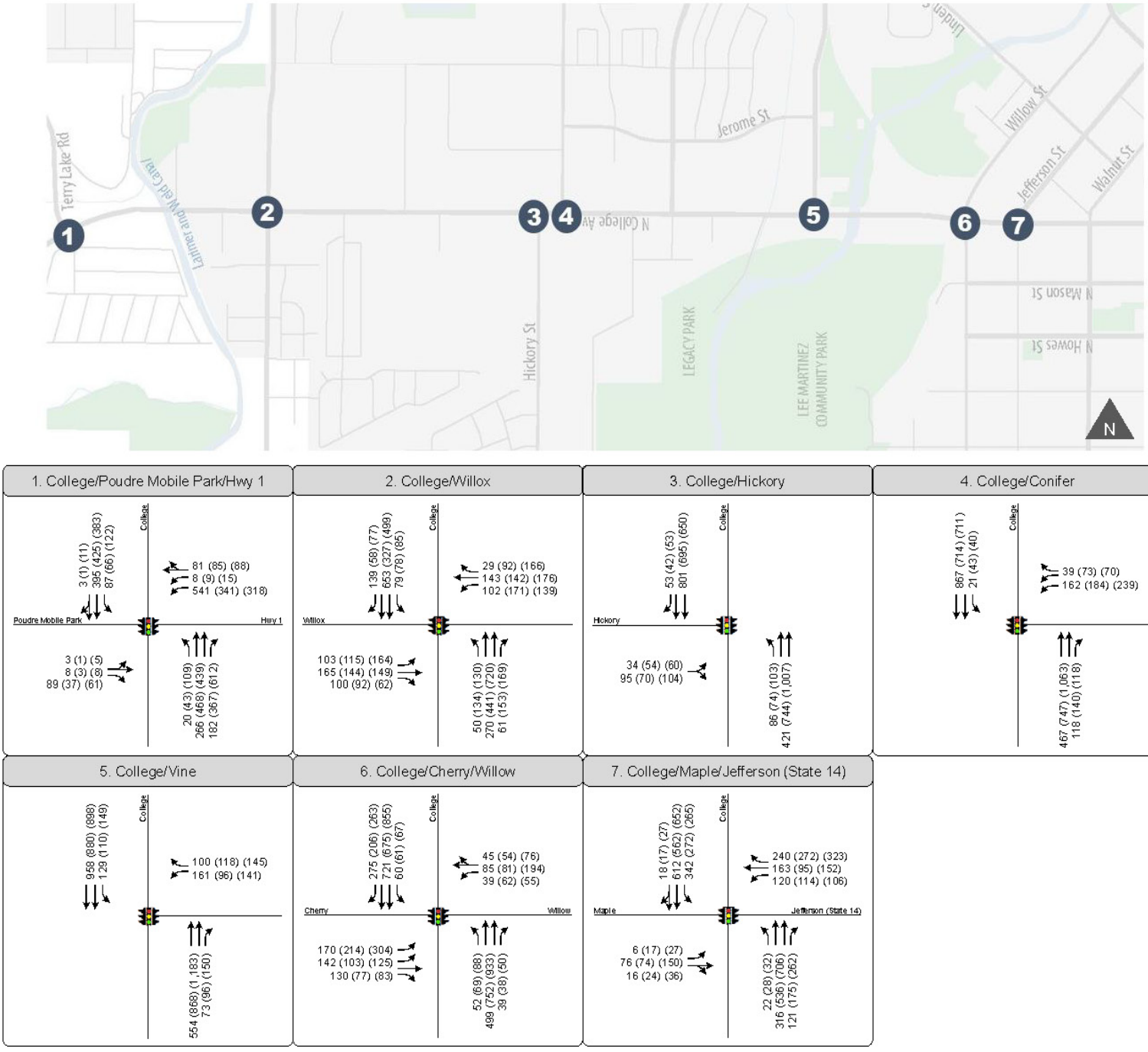


Table 2: Level of Service of Intersections Under Existing Conditions

Intersection	Control	Existing					
		AM		Midday		PM	
		Overall		Overall		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS
College Avenue & Poudre Mobile Park/Hwy 1	Signal	20	B	12	B	17	B
College Avenue & Willox Lane	Signal	18	B	21	C	28	C
College Avenue & Hickory Street	Signal	5	A	5	A	5	A
College Avenue & Conifer Street	Signal	5	A	5	A	7	A
College Avenue & Vine Drive	Signal	6	A	11	B	12	B
College Avenue & Cherry Street/Willow Street	Signal	19	B	12	B	12	B
College Avenue & Maple Street/Jefferson Street	Signal	12	B	14	B	16	B

PEDESTRIAN AND BICYCLE COUNTS

Pedestrian and bicycle counts were collected in September and October 2021.

Table 3 displays the peak hour volumes of pedestrians at each intersection by direction of travel of the pedestrian. Overall the corridor has a low amount of pedestrian traffic during the peak hours with the exception on the intersections at the southern end of the corridor in Downtown (College Avenue & Cherry Street, College Avenue & Maple Street).

Table 3: 2021 Peak Hour Pedestrian Volumes

Intersection	AM				Midday				PM			
	NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
College Avenue & Poudre Mobile Park/Hwy 1	0	0	0	0	0	0	0	0	1	0	0	0
College Avenue & Willox Lane	0	0	1	1	1	2	1	5	5	0	4	1
College Avenue & Hickory Street	3	1	3	0	1	3	2	1	1	0	1	2
College Avenue & Conifer Street	1	6	5	2	3	6	0	1	5	4	2	3
College Avenue & Vine Drive	0	0	0	0	2	1	4	1	2	2	3	2
College Avenue & Cherry Street/Willow Street	4	2	5	1	6	11	3	5	7	6	8	3
College Avenue & Maple Street/Jefferson Street	7	9	5	6	9	16	14	12	11	10	9	10

Error! Reference source not found. shows the peak hour bicycle volumes and lane configurations at each of the intersections where traffic counts were collected. Overall bicycle volumes were low along the corridor during peak hours.

Table 4: 2021 Peak Hour Bicycle Volumes

Intersection	AM				Midday				PM			
	NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
College Avenue & Poudre Mobile Park/Hwy 1	3	0	1	1	1	0	0	1	2	0	0	0
College Avenue & Willox Lane	0	2	1	1	0	0	2	2	6	0	3	2
College Avenue & Hickory Street	1	2	1	0	2	4	0	0	1	2	4	0
College Avenue & Conifer Street	0	3	0	0	3	0	0	1	2	1	0	2
College Avenue & Vine Drive	3	0	0	0	2	3	0	0	10	2	0	1
College Avenue & Cherry Street/Willow Street	0	0	5	3	2	2	4	6	1	0	17	7
College Avenue & Maple Street/Jefferson Street	0	1	0	0	0	0	1	1	1	1	1	0

IMPACT OF UNSCHEDULED EVENTS

Travel time data available for the North College corridor indicates that while there is some congestion during peak hours, it does not on average cause significant delays.

Willox Lane to Vine Drive travel times:

Southbound

- AM Peak - 1.65 min (36 mph)
- PM Peak - 1.79 min (34 mph)

Northbound

- AM Peak - 1.67 min (36 mph)
- PM Peak - 1.74 min (34 mph)

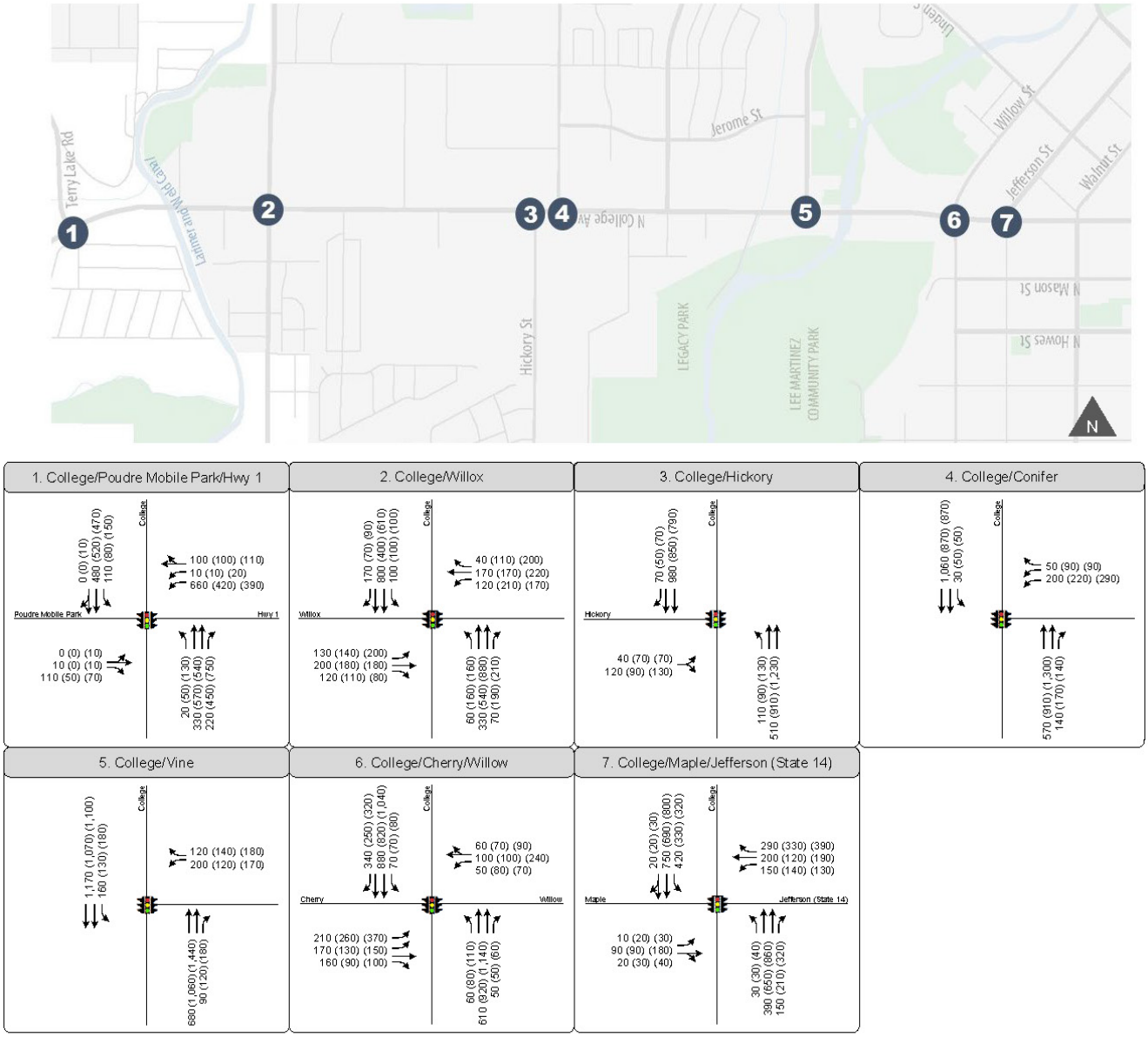
However unscheduled delays such as train crossings and closures of I-25 have significant impacts on the travel reliability of the corridor. Local news stories have also indicated that as the trains that pass through Fort Collins are getting longer the delays vehicles experience increase too.

FUTURE TRAFFIC CONDITIONS

The NFRMPO Traffic Model estimates that in 2045 traffic volumes on North College Avenue will increase by about 22% from existing levels. To model this growth the existing traffic counts for the corridor were grown by 22% and an intersection level of service (LOS) analysis was conducted. Volumes for all movements were increased by 22% and rounded to the nearest 10 to test a conservative estimate for future conditions. It is possible that the future volumes on North College would increase at a faster rate than the volumes on the side streets. **Figure 24** displays the estimated volumes for 2045 on existing lane configurations.

Table 5 shows the results of the LOS analysis. The analysis found that all intersections continue to operate acceptably under 2045 conditions.

Figure 24: 2045 Peak Hour Vehicle Volumes and Lane Configurations



AM (MD) (PM) Peak Hour Traffic Volume

Table 5: 2045 Intersection Level of Service Results

Intersection	Control	Existing					
		AM		Midday		PM	
		Overall		Overall		Overall	
		Delay	LOS	Delay	LOS	Delay	LOS
College Avenue & Poudre Mobile Park/Hwy 1	Signal	22	C	13	B	21	C
College Avenue & Willox Lane	Signal	20	B	23	C	31	C
College Avenue & Hickory Street	Signal	5	A	5	A	5	A
College Avenue & Conifer Street	Signal	5	A	5	A	7	A
College Avenue & Vine Drive	Signal	6	A	21	C	10	A
College Avenue & Cherry Street/Willow Street	Signal	21	C	14	B	28	C
College Avenue & Maple Street/Jefferson Street	Signal	14	B	18	B	22	C

CRASH ANALYSIS

CORRIDOR-WIDE THEMES

The crash data evaluated in this section spans the years 2017-2020. During this four-year period there were no fatal crashes on North College Avenue within the study area (from Laporte Avenue to Highway 1). The overall crash rate per year on the corridor was about 91 crashes/year. The rate of crashes resulting in injuries was about 8 crashes/year.

Figure 25 illustrates the share of total crashes that resulted in injuries on the corridor from 2017 to 2020. **Figure 26** displays a chart of crashes by time of day which shows there was not a time of day where significantly more injury crashes occurred when compared to overall crashes.

Figure 25: Share of Corridor Crashes Resulting in Injuries (2017-2020)

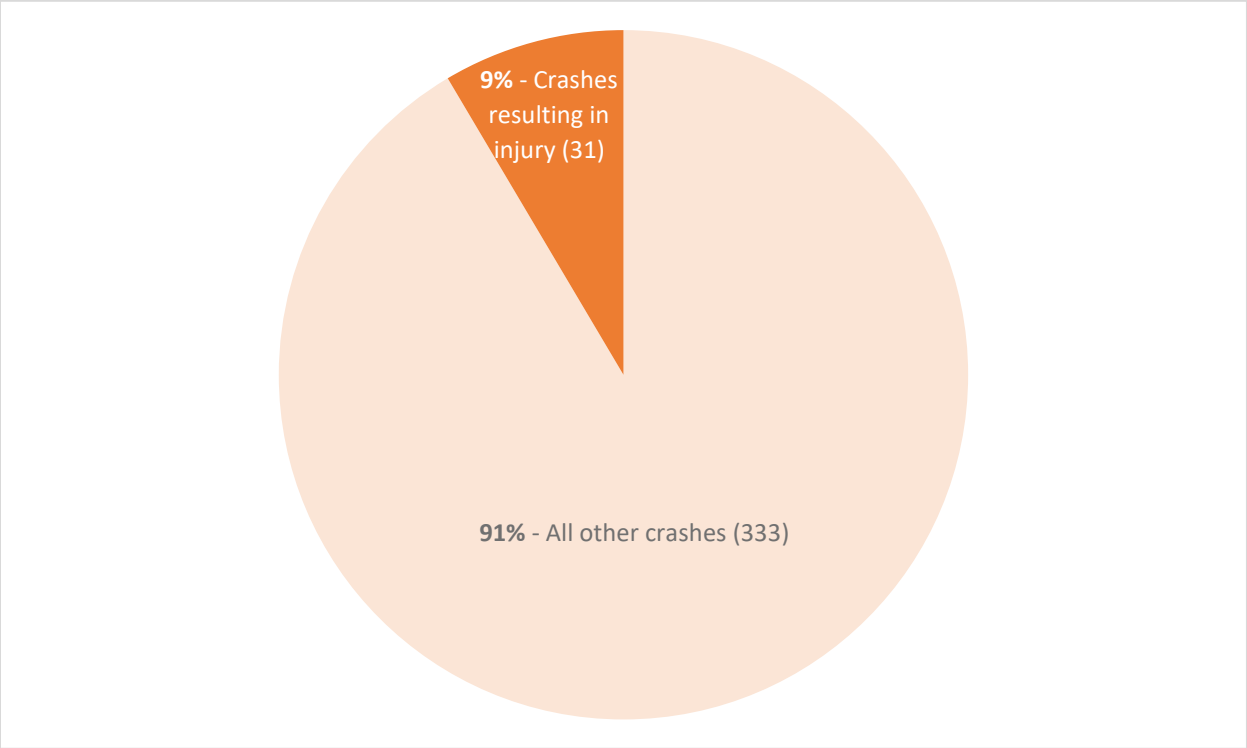


Figure 26: Corridor Crashes by Time of Day

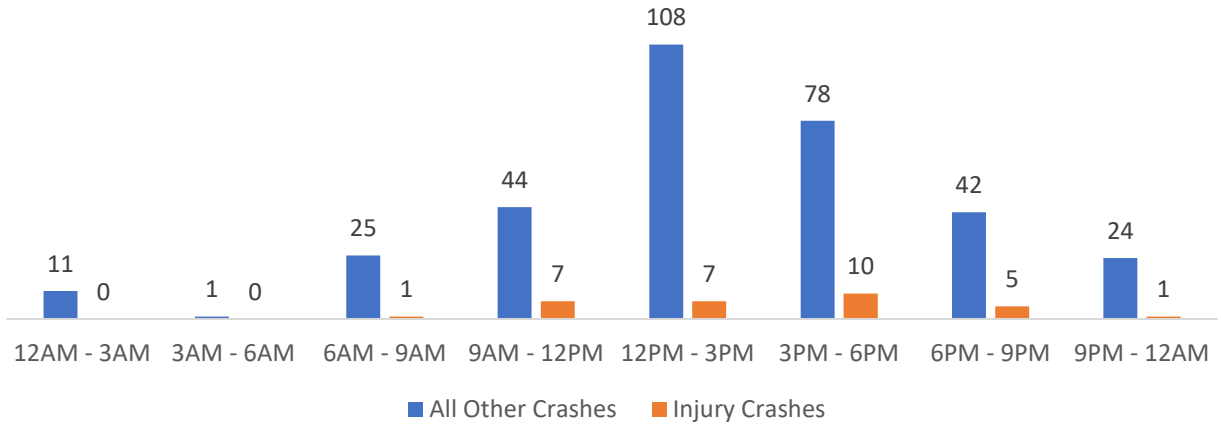


Figure 27 is a chart of the top harmful events for all crashes along the corridor. Rear end crashes were the greatest share of crashes followed by right angle crashes. **Figure 28** lists the top harmful events for crashes resulting in injuries on the corridor. It stands out that bicycle and pedestrian crashes are overrepresented in crashes resulting in injuries when compared to overall crashes. Parking related crashes and side swipe crashes, significant shares of overall crashes, were not in the top harmful events for injury crashes.

Figure 27: Top Harmful Events Corridor Wide

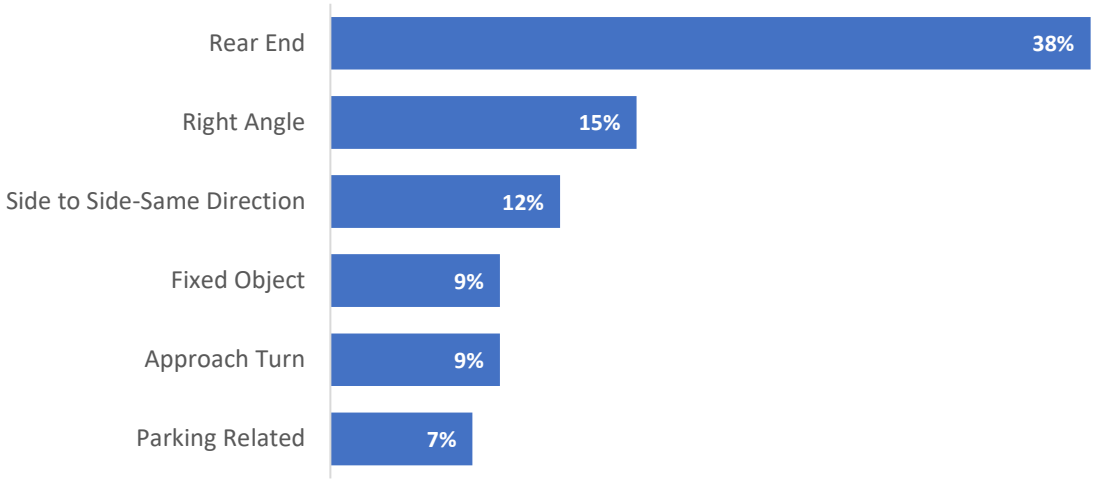


Figure 28: Top Harmful Events for Injury Crashes Corridor Wide

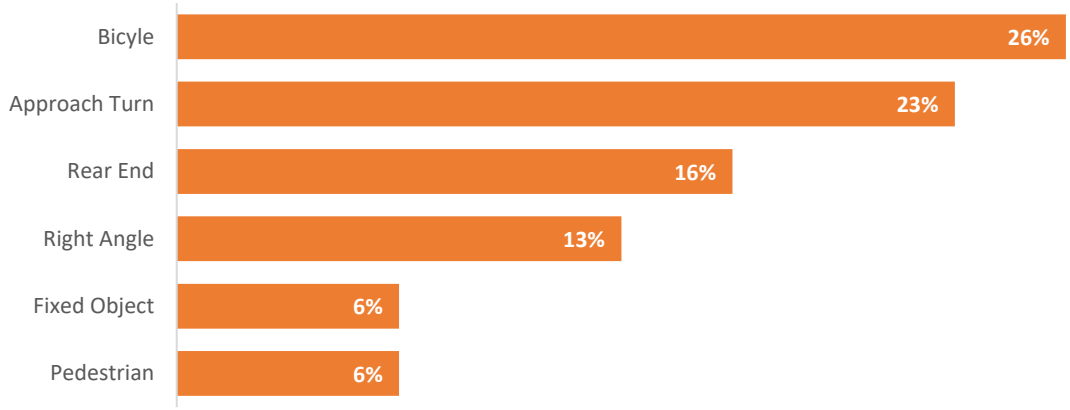
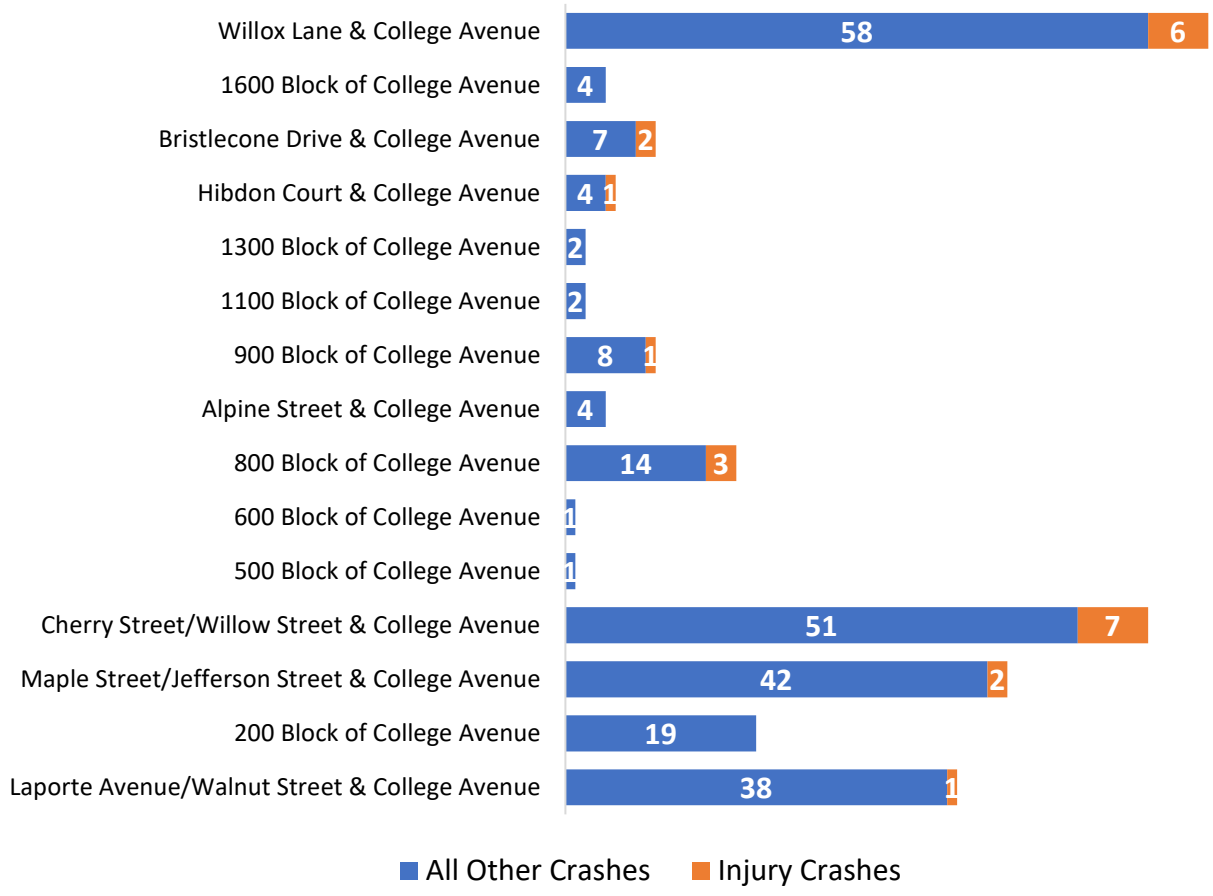


Figure 29 documents the number of crashes at each location along the North College corridor that has more than two crashes over the four years of crash data. The top five highest crash locations were at the intersections of Willox Lane, Cherry Street, Maple Street, Vine Drive, and Laporte Avenue (listed from greatest number of crashes to least).

Figure 29: Locations of Crashes on the Corridor (Crashes with Three or More Crashes)



INTERSECTION AND BLOCK SPECIFIC CRASH ANALYSIS

LAPORTE AVENUE/WALNUT STREET & NORTH COLLEGE AVENUE

Laporte Avenue/Walnut Street & North College Avenue is a signalized intersection at the south end of the study area. From 2017-2020 there were 39 crashes at this intersection, one resulted in injury. The one injury crash was a rear end collision between two vehicles caused by careless driving. This crash resulted in a non-incapacitating injury.

Figure 30 displays an aerial image of this intersection. **Table 6** displays the control type of each of the left turn movements in the intersection. **Figure 31** displays the top harmful events and **Figure 32** displays the top driver actions across the crashes at this intersection.

Figure 30: Aerial of Laporte Avenue/Walnut Street & North College Avenue

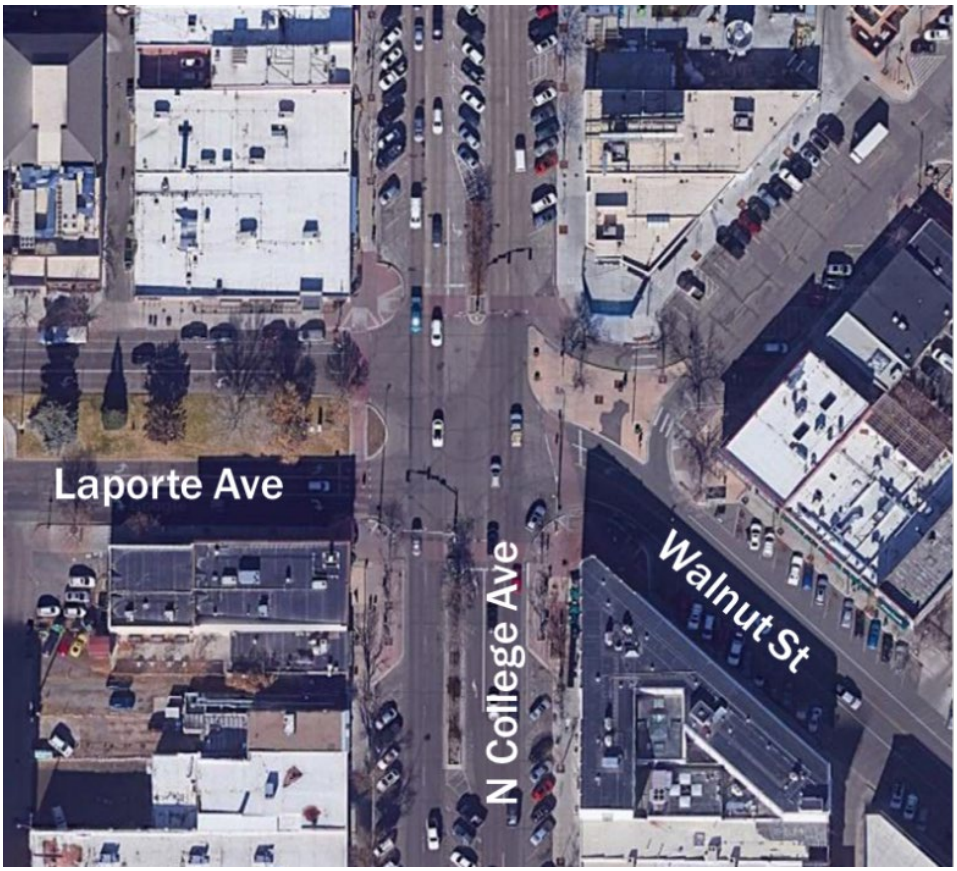


Table 6: Turning Movement Controls at Laporte Avenue/Walnut Street & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
Permitted & Protected	Permitted & Protected	Permitted	Permitted

Figure 31: Top Harmful Events at Laporte Avenue/Walnut Street & North College Avenue

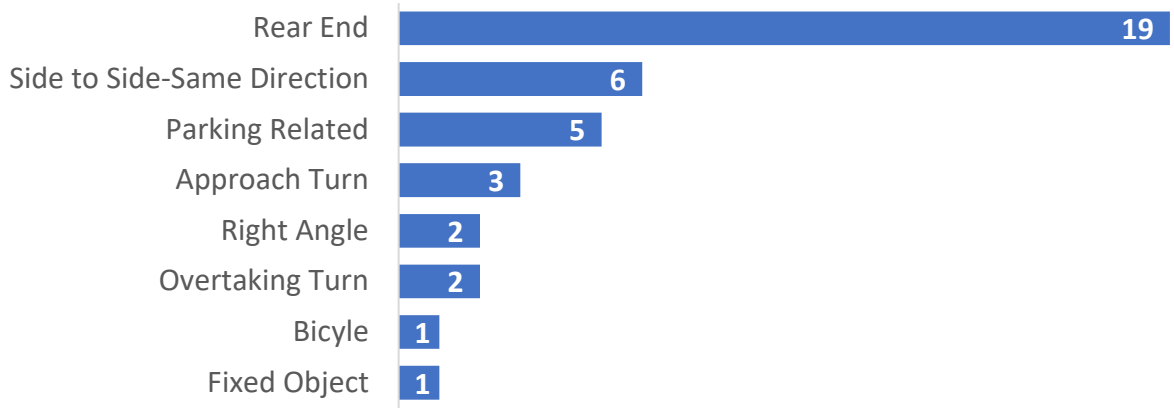
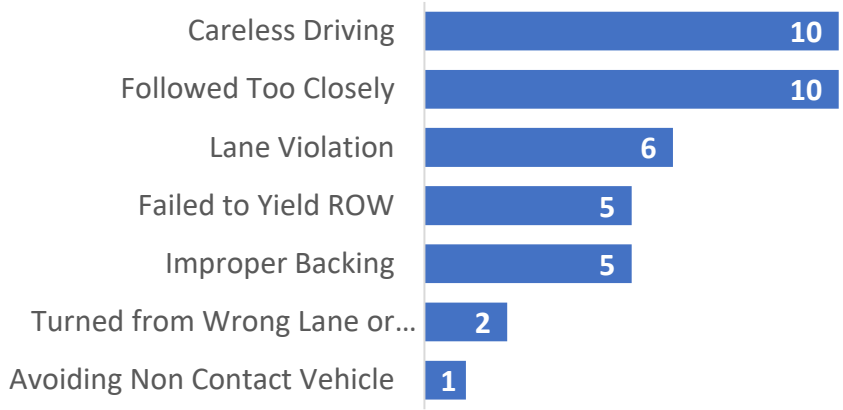


Figure 32: Top Driver Actions at Laporte Avenue/Walnut Street & North College Avenue



200 BLOCK OF NORTH COLLEGE AVENUE

The 200 Block of North College Avenue is located between Laporte Avenue and Maple Street. From 2017-2020 there were 19 crashes along this segment, none resulted in injury.

Figure 33 displays an aerial image of this block. **Figure 34** displays the top harmful events and **Figure 35** displays the top driver actions across the crashes along this block.

Figure 33: Aerial of the 200 Block of North College Avenue

Figure 34: Top Harmful Events along the 200 Block of North College Avenue

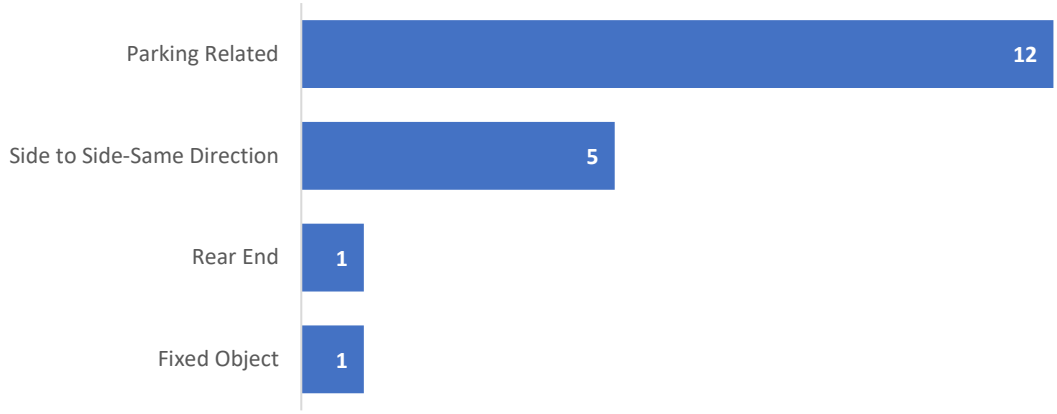
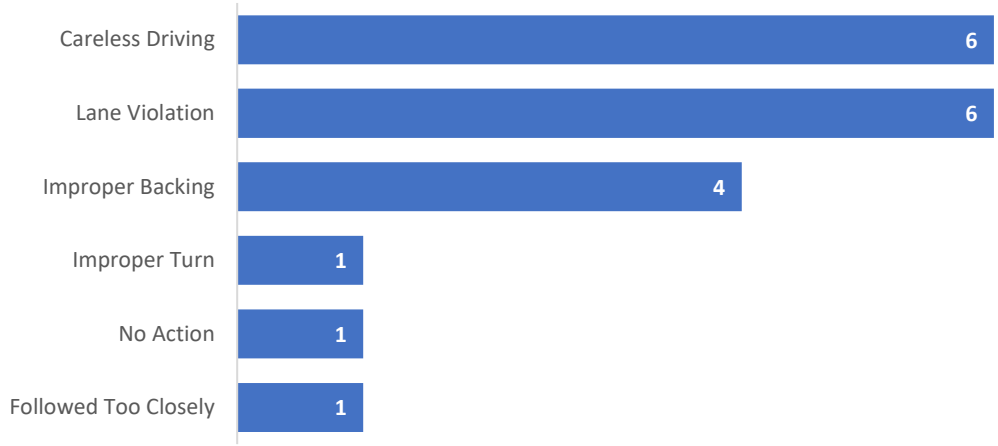


Figure 35: Top Driver Actions along the 200 Block of North College Avenue



MAPLE STREET/JEFFERSON STREET & NORTH COLLEGE AVENUE

Maple Street/Jefferson Street & North College Avenue is a signalized intersection. From 2017-2020 there were 44 crashes at this intersection, two resulted in injury. Both of the crashes that resulted in injuries involved a vehicle hitting a person bicycling. One of the crashes was caused by a driver failing to yield right-of-way and hitting a person bicycling. This crash resulted in non-incapacitating injuries. The second injury crash occurred when a driver that was determined to be driving carelessly hit a person bicycling. The crash resulted in incapacitating injuries.

Figure 36 displays an aerial image of this intersection. **Table 7** displays the control type of each of the left turn movements in the intersection. **Figure 37** displays the top harmful events and **Figure 38** displays the top driver actions across the crashes at this intersection.

Figure 36: Aerial of Maple Street/Jefferson Street & North College Avenue

Table 7: Turning Movement Controls at Maple Street/Jefferson Street & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
Permitted & Protected	Permitted & Protected	Permitted	Permitted

Figure 37: Top Harmful Events at Maple Street/Jefferson Street & North College Avenue

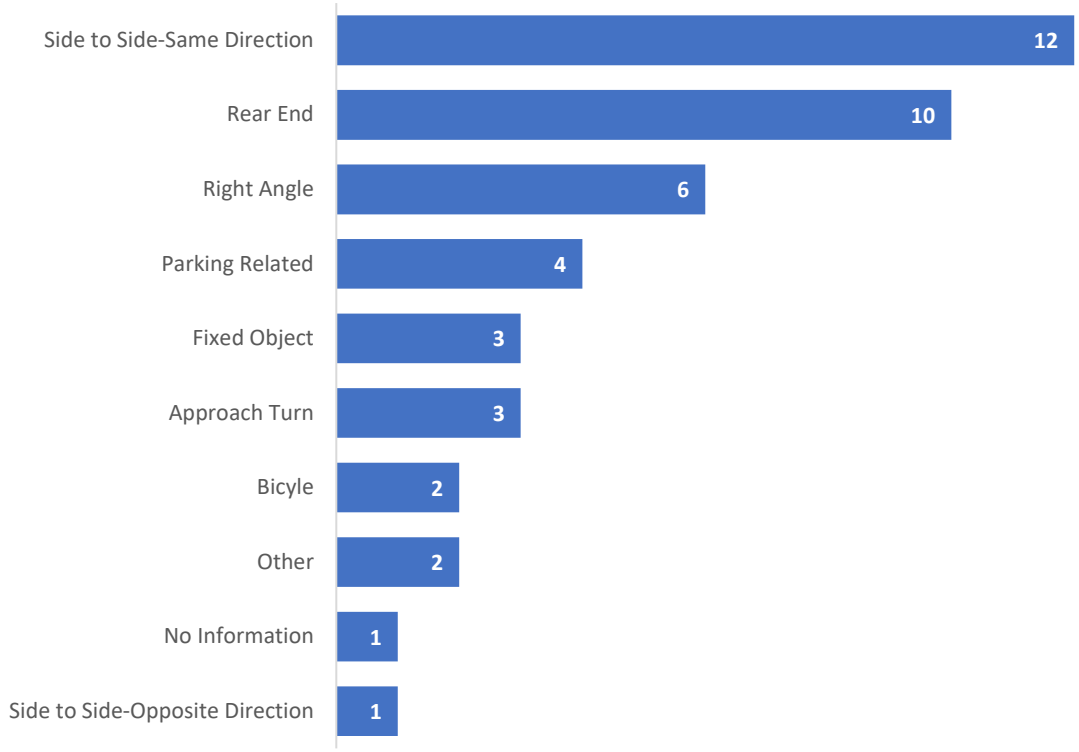
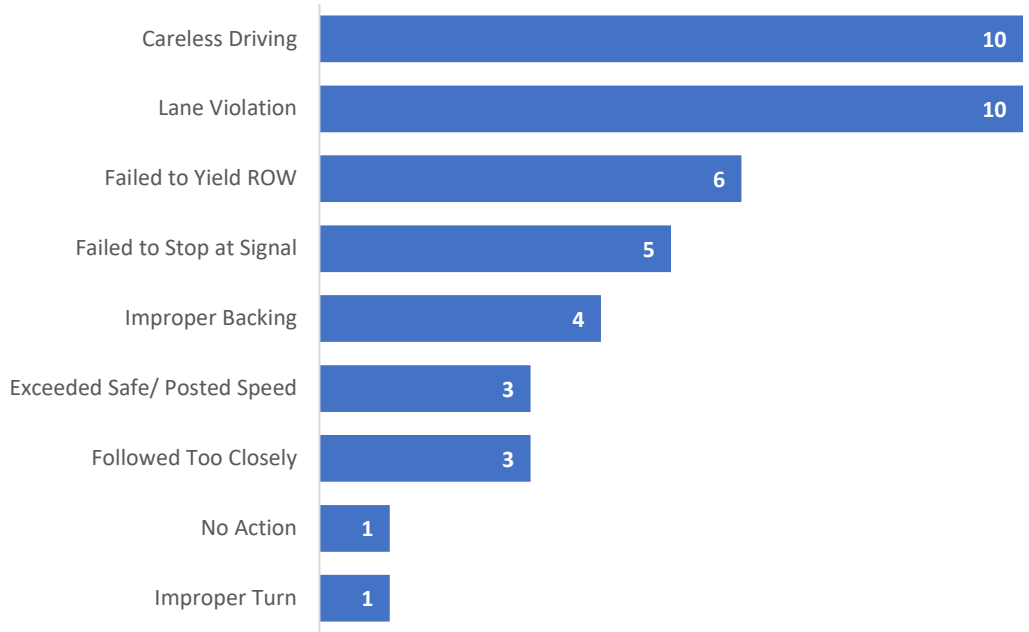


Figure 38: Top Driver Actions at Maple Street/Jefferson Street & North College Avenue



CHERRY STREET/WILLOW STREET & NORTH COLLEGE AVENUE

Cherry Street/Willow Street & North College Avenue is a signalized intersection at the south end of the study area. From 2017-2020 there were 58 crashes at this intersection, seven resulted in injury. One of the pedestrian crashes and one of the bicycle crashes on this corridor resulted in injuries. The pedestrian involved crash resulted in an incapacitating injury. Of the five remaining injury crashes, two were approach turn crashes, two were right angle crashes, and one was a rear-end crash. All five crashes resulted in non-incapacitating injuries

Figure 39 displays an aerial image of this intersection. **Table 8** displays the control type of each of the left turn movements in the intersection. **Figure 40** displays the top harmful events and **Figure 41** displays the top driver actions across the crashes at this intersection.

Figure 39: Aerial of Cherry Street/Willow Street & North College Avenue

Table 8: Turning Movement Controls at Cherry Street/Willow Street & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
Permitted & Protected	Permitted & Protected	Permitted & Protected	Permitted & Protected

Figure 40: Top Harmful Events at Cherry Street/Willow Street & North College Avenue

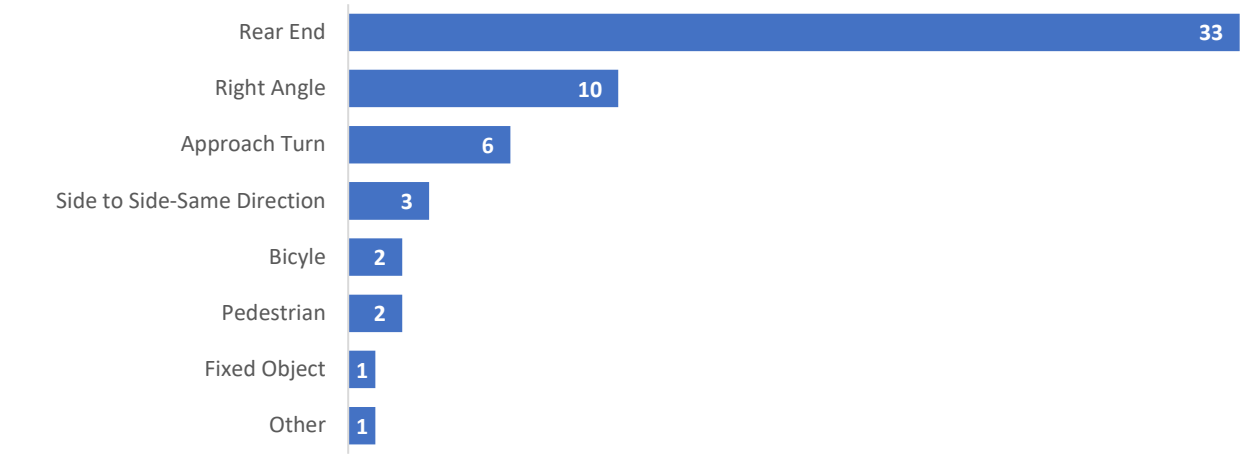
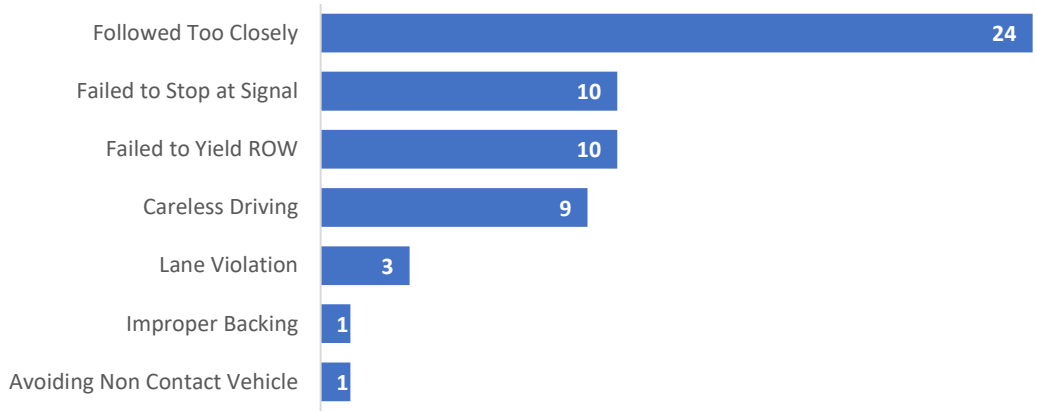


Figure 41: Top Driver Actions at Cherry Street/Willow Street & North College Avenue



400 BLOCK OF NORTH COLLEGE AVENUE

The 400 Block of North College Avenue is located between Cherry Street and Vine Drive. From 2017-2020 there were 6 crashes along this segment, none resulted in injury.

Figure 42 displays an aerial image of this block. **Figure 43** displays the top harmful events and **Figure 44** displays the top driver actions across the crashes along this block.

Figure 42: Aerial of the 400 Block of North College Avenue

Figure 43: Top Harmful Events along the 400 Block of North College Avenue

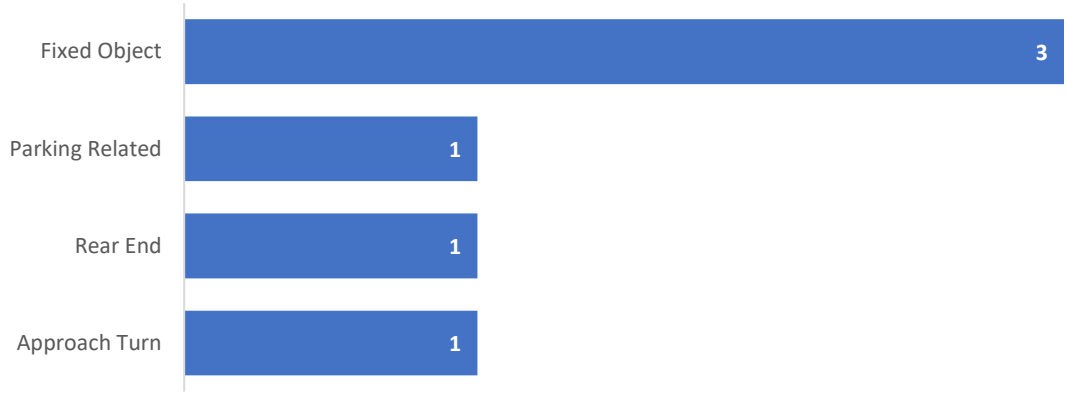


Figure 44: Top Driver Actions along the 400 Block of North College Avenue

VINE DRIVE & NORTH COLLEGE AVENUE

Vine Drive & North College Avenue is a signalized intersection at the south end of the study area. From 2017-2020 there were 40 crashes at this intersection, five resulted in injury. One of the crashes involving a person bicycling resulted in an incapacitating injury. Of the other four injury crashes, two were approach turn crashes, one was a rear end crash, and one was a fixed object crash where a vehicle hit a guardrail. One of the approach turn crashes resulted in an incapacitating injury.

Figure 45 displays an aerial image of this intersection. **Table 9** displays the control type of each of the left turn movements in the intersection. **Figure 46** displays the top harmful events and **Figure 47** displays the top driver actions across the crashes at this intersection.

Figure 45: Aerial of Vine Drive & North College Avenue

Table 9: Turning Movement Controls at Vine Drive & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
N/A	Permitted & Protected	N/A	Permitted

Figure 46: Top Harmful Events at Vine Drive & North College Avenue

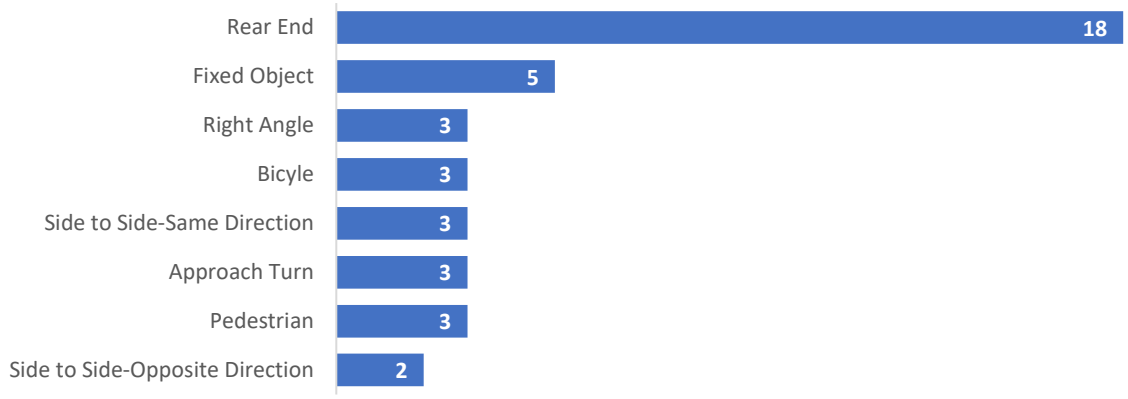
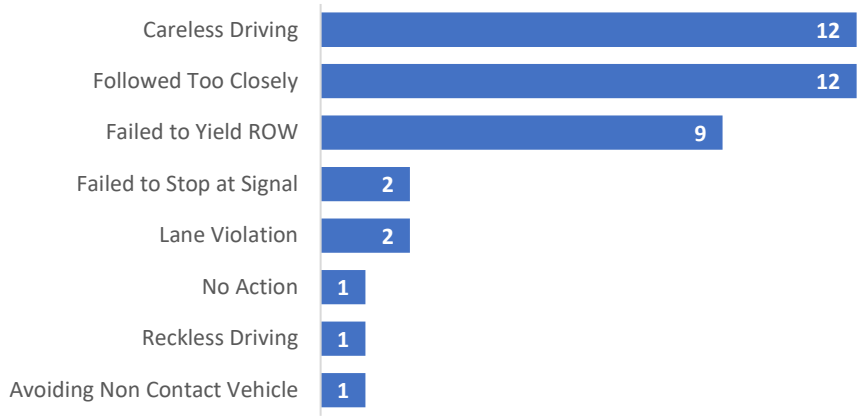


Figure 47: Top Driver Actions at Vine Drive & North College Avenue



800 BLOCK OF NORTH COLLEGE AVENUE

The 800 Block of North College Avenue is located between Vine Drive and Alpine Street. From 2017-2020 there were 17 crashes along this segment, three resulted in injury. One of crashes involving a person bicycling resulted in a non-incapacitating injury. Of the other two injury crashes one was a right-angle crash and the other was an overtaking turn crash. Both resulted in non-incapacitating injuries.

Figure 48 displays an aerial image of this block. **Figure 49** displays the top harmful events and **Figure 50** displays the top driver actions across the crashes along this block.

Figure 48: Aerial of the 800 Block of North College Avenue

Figure 49: Top Harmful Events along the 800 Block of North College Avenue

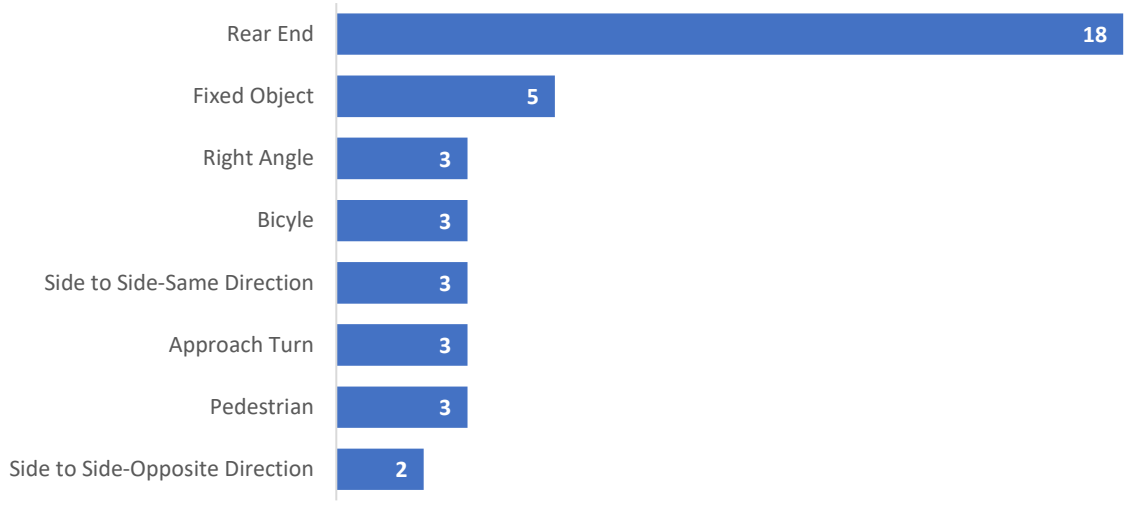
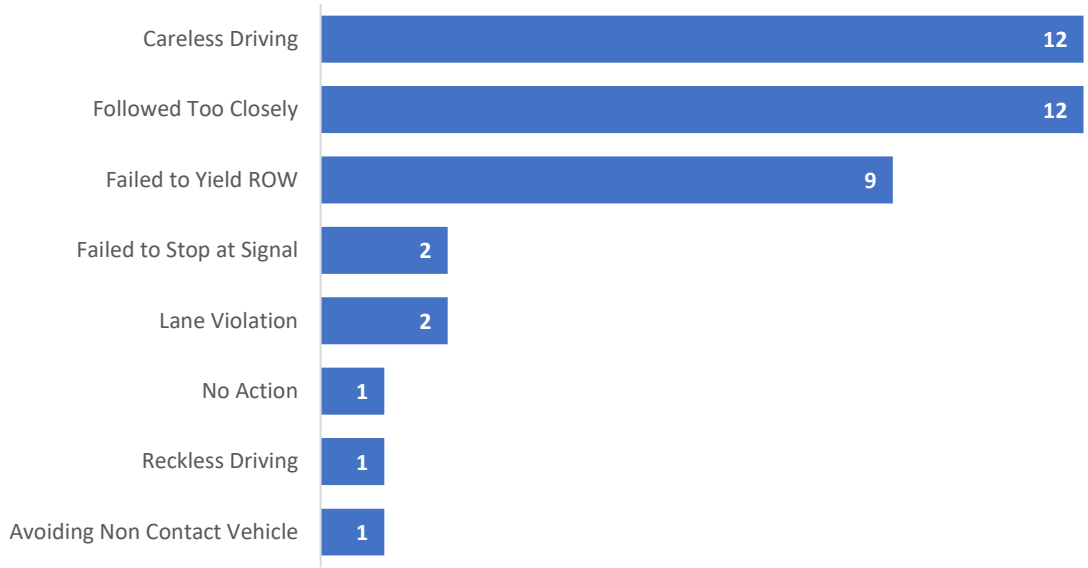


Figure 50: Top Driver Actions along the 800 Block of North College Avenue



ALPINE STREET & NORTH COLLEGE AVENUE

Alpine Street & North College Avenue is an intersection with a stop sign on Alpine Street. From 2017-2020 there were 4 crashes at this intersection, none resulted in injury.

Figure 51 displays an aerial image of this intersection. **Figure 52** displays the top harmful events and **Figure 53** displays the top driver actions across the crashes at this intersection.

Figure 51: Aerial of Alpine Street & North College Avenue

Figure 52: Top Harmful Events at Alpine Street & North College Avenue

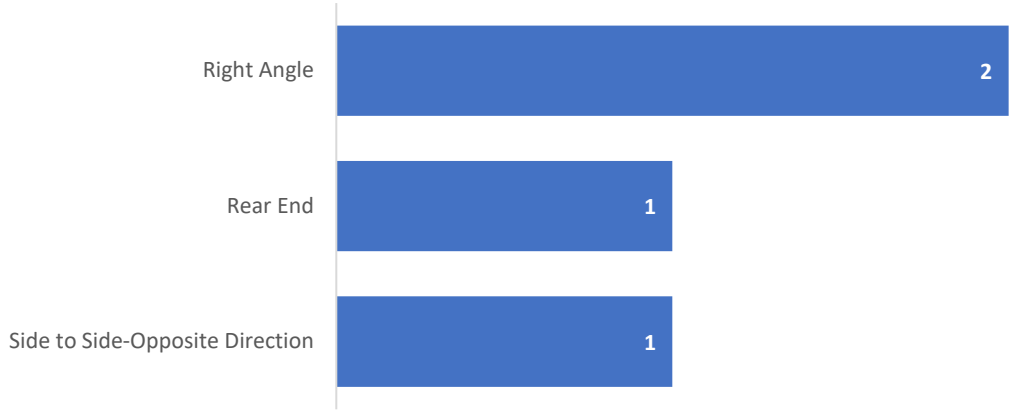


Figure 53: Top Driver Actions at Alpine Street & North College Avenue

900 BLOCK OF NORTH COLLEGE AVENUE

The 900 Block of North College Avenue is located between Alpine Street and Suniga Road. From 2017-2020 there were 9 crashes along this segment, one of these resulted in injury. The injury crash at this location was caused by a vehicle executing a lane violation and hitting a person bicycling. This crash resulted in a non-capacitating injury.

Figure 54 displays an aerial image of this block. **Figure 55** displays the top harmful events and **Figure 56** displays the top driver actions across the crashes along this block.

Figure 54: Aerial of the 900 Block of North College Avenue

Figure 55: Top Harmful Events along the 900 Block of North College Avenue

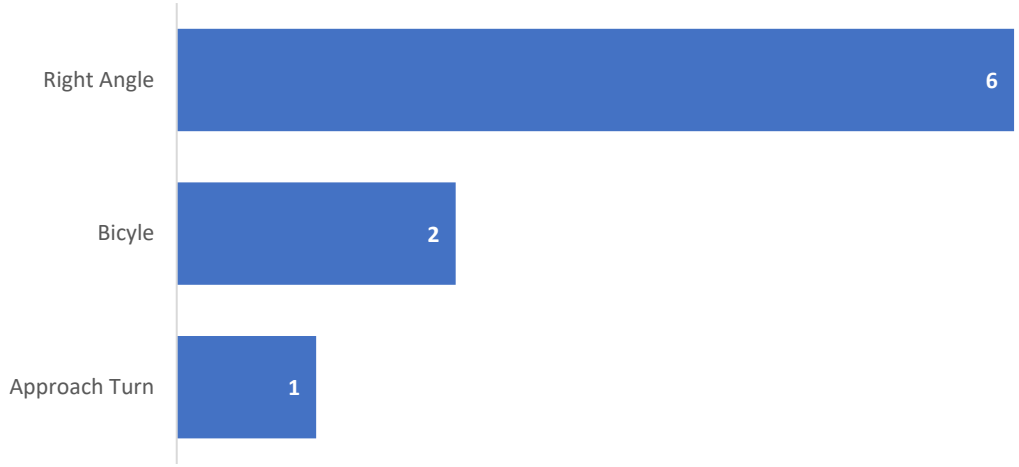
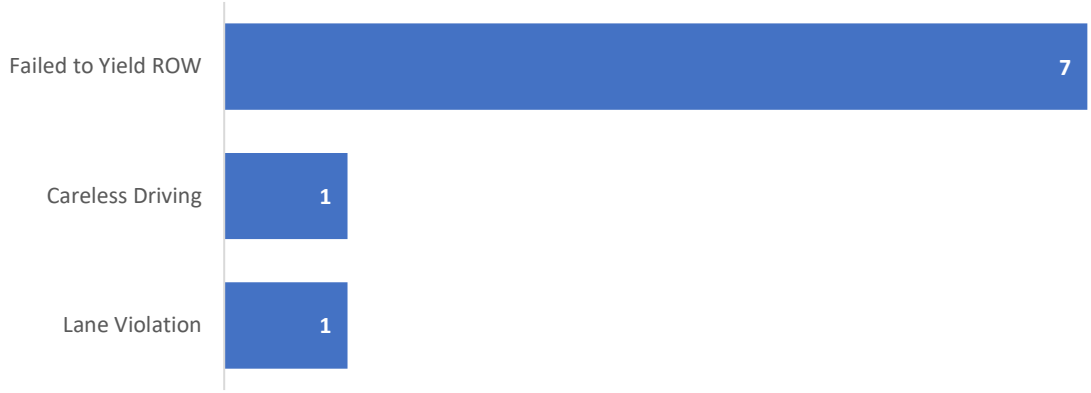


Figure 56: Top Driver Actions along the 900 Block of North College Avenue



1200 BLOCK OF NORTH COLLEGE AVENUE

The 1200 Block of North College Avenue is located between Suniga Road and Conifer Street. From 2017-2020 there were 5 crashes along this segment, one of these resulted in injury. The injury crash at this location was a parking related crash and involved a large rock or boulder. This crash resulted in a non-incapacitating injury.

Figure 57 displays an aerial image of this block. **Figure 58** displays the top harmful events and **Figure 59** displays the top driver actions across the crashes along this block.

Figure 57: Aerial of the 1200 Block of North College Avenue

Figure 58: Top Harmful Events along the 1200 Block of North College Avenue

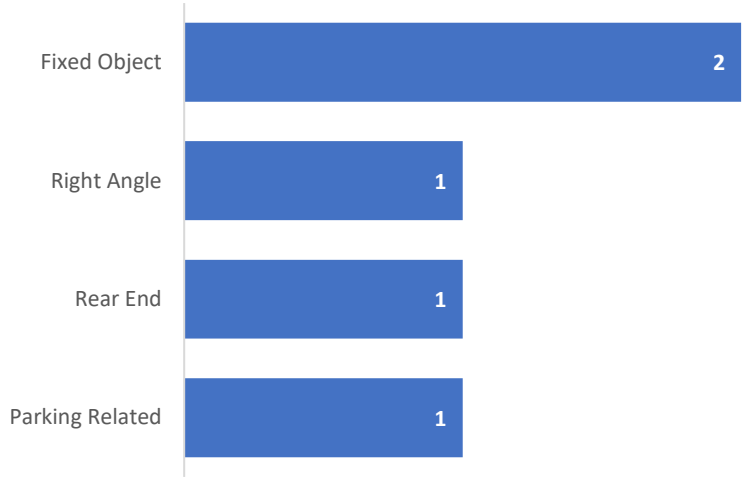
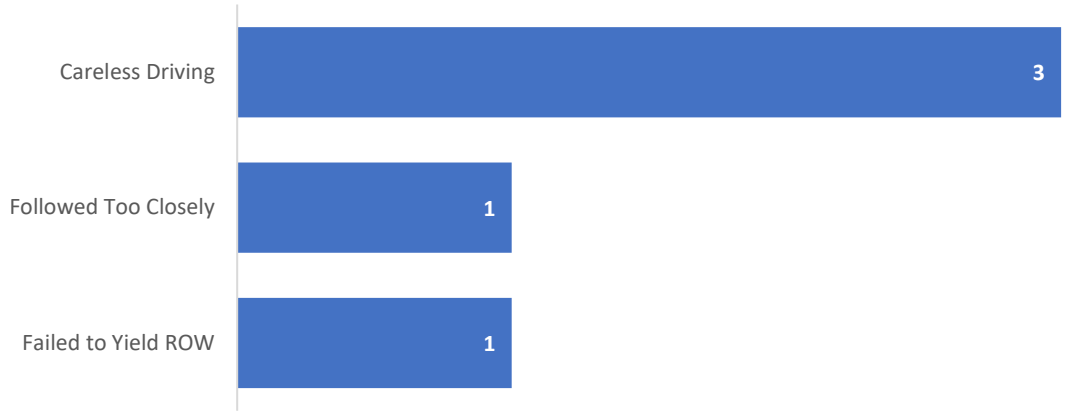


Figure 59: Top Driver Actions along the 1200 Block of North College Avenue



CONIFER STREET/HICKORY STREET & NORTH COLLEGE AVENUE

Conifer Street/Hickory Street & North College Avenue are two signalized "T" intersections. From 2017-2020 there were 23 crashes at this intersection, one resulted in injury. The injury crash at this location was a head-on collision that resulted in a non-incapacitating injury.

Figure 60 displays an aerial image of this intersection. **Table 10** displays the control type of each of the left turn movements in the intersection. **Figure 61** displays the top harmful events and **Figure 62** displays the top driver actions across the crashes at this intersection.

Figure 60: Aerial of Conifer Street/Hickory Street & North College Avenue

Table 10: Turning Movement Controls at Conifer Street/Hickory Street & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
Permitted & Protected	Permitted	Permitted	Permitted & Protected

Figure 61: Top Harmful Events at Conifer Street/Hickory Street & North College Avenue

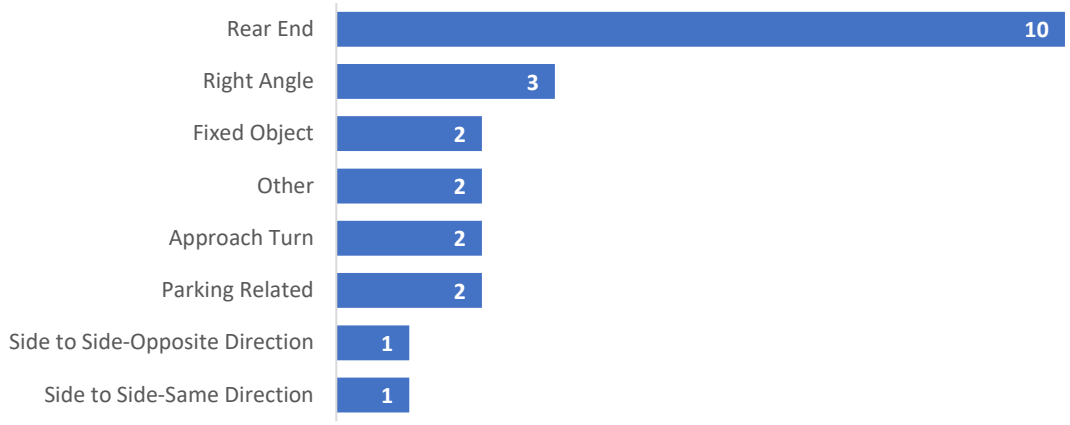
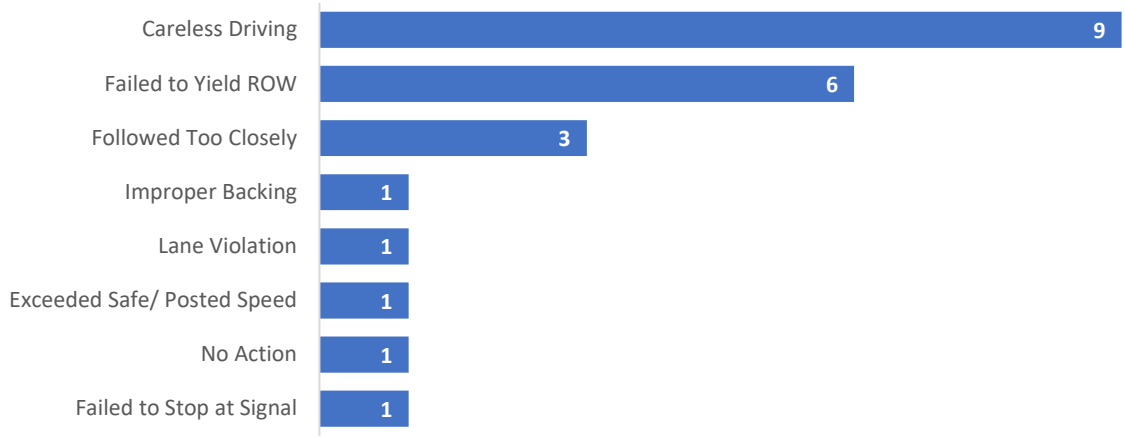


Figure 62: Top Driver Actions at Conifer Street/Hickory Street & North College Avenue



HIBDON COURT & NORTH COLLEGE AVENUE

Hibdon Court & North College Avenue is a stop-controlled intersection with a stop sign on Hibdon Court. From 2017-2020 there were 5 crashes at this intersection, one resulted in injury. The injury crash at this location was right angle crash that resulted in a non-incapacitating injury.

Figure 63 displays an aerial image of this intersection. **Figure 64** displays the top harmful events and **Figure 65** displays the top driver actions across the crashes at this intersection.

Figure 63: Aerial of Hibdon Court & North College Avenue

Figure 64: Top Harmful Events at Hibdon Court & North College Avenue

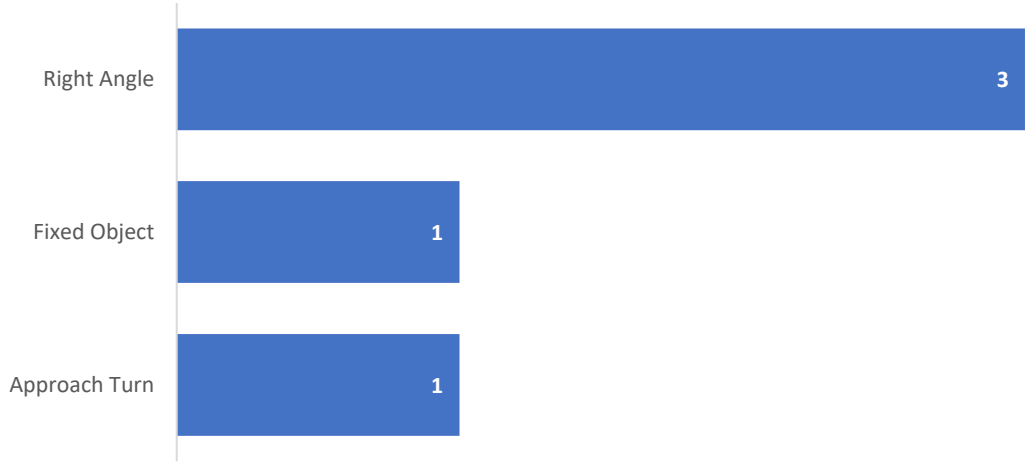
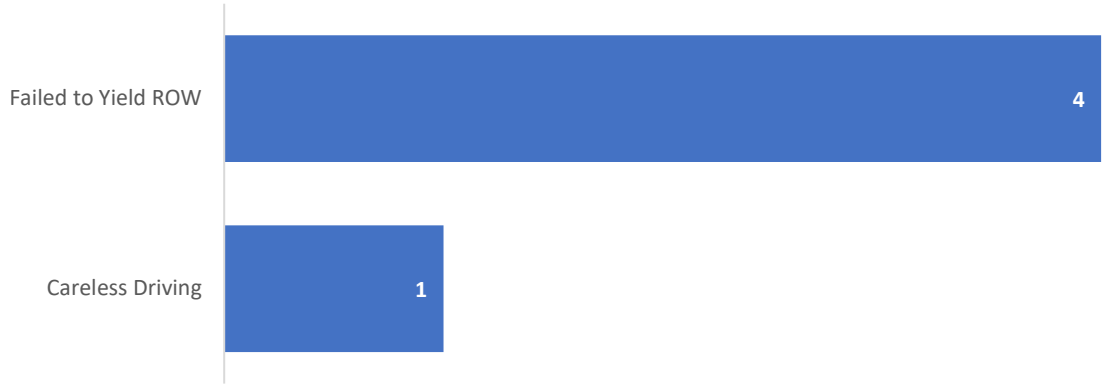


Figure 65: Top Driver Actions at Hibdon Court & North College Avenue



BRISTLECONE DRIVE & NORTH COLLEGE AVENUE

Bristlecone Drive & North College Avenue is a stop-controlled intersection with a stop sign on Bristlecone Drive. From 2017-2020 there were 9 crashes at this intersection, two resulted in injury. The crash involving a person bicycling resulted in an incapacitating injury. The second injury crash was an approach turn crash that resulted in a non-incapacitating injury.

Figure 66 displays an aerial image of this intersection. **Figure 67** displays the top harmful events and **Figure 68** displays the top driver actions across the crashes at this intersection.

Figure 66: Aerial of Bristlecone Drive & North College Avenue

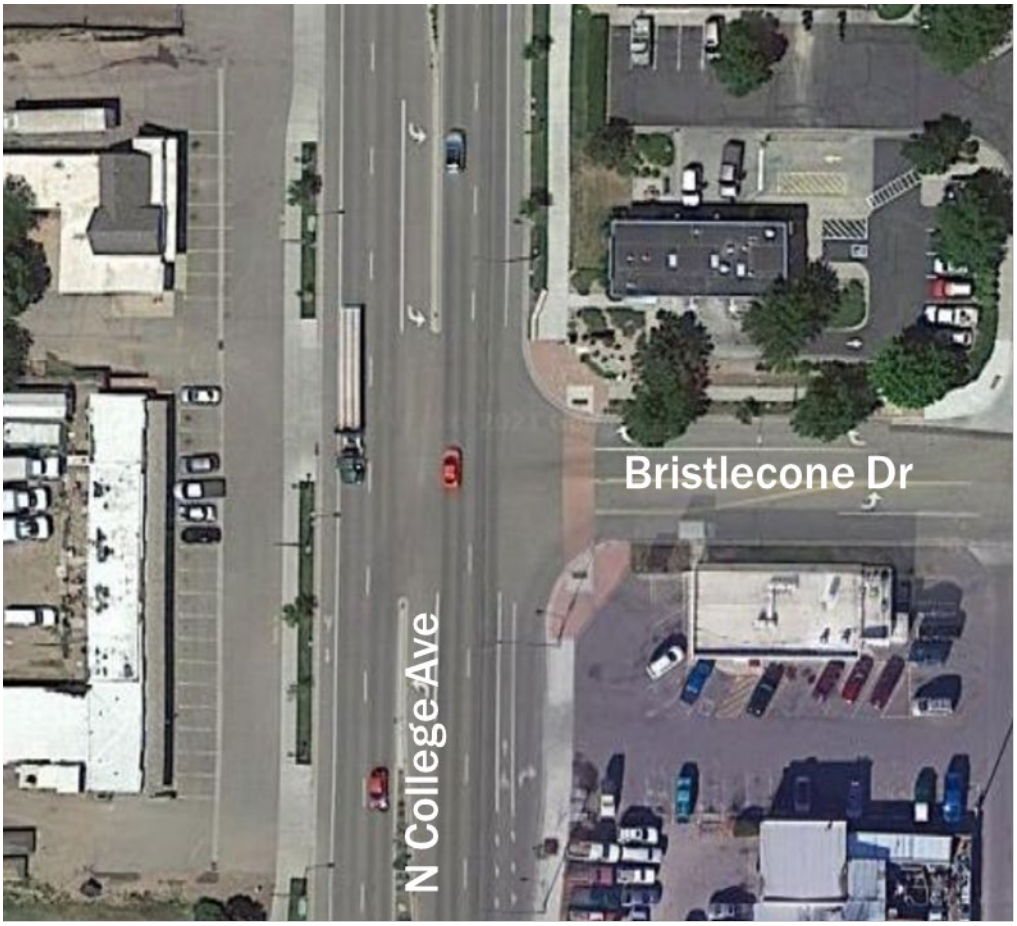


Figure 67: Top Harmful Events at Bristlecone Drive & North College Avenue

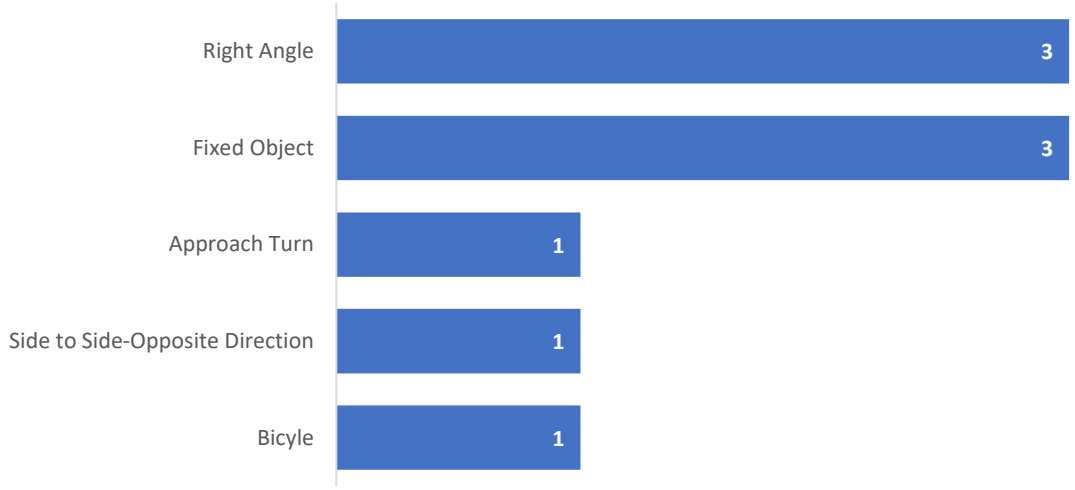
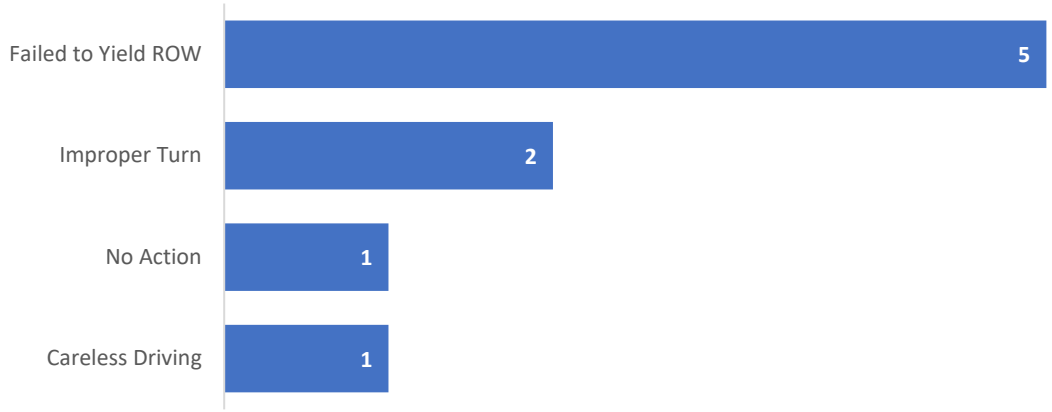


Figure 68: Top Driver Actions at Bristlecone Drive & North College Avenue



1600 BLOCK OF NORTH COLLEGE AVENUE

The 1600 Block of North College Avenue is located between Bristlecone Drive and Willox Lane. From 2017-2020 there were 4 crashes along this segment, none of these resulted in injury.

Figure 69 displays an aerial image of this block. **Figure 70** displays the top harmful events and **Figure 71** displays the top driver actions across the crashes along this block.

Figure 69: Aerial of the 1600 Block of North College Avenue

Figure 70: Top Harmful Events along the 1600 Block of North College Avenue

Figure 71: Top Driver Actions along the 1600 Block of North College Avenue

Willox Lane & North College Avenue

Willox Lane & North College Avenue is a signalized intersection at the north end of the study area. From 2017-2020 there were 64 crashes at this intersection, six resulted in injury. One of the pedestrian crashes and one of the bicycle crashes at this intersection resulted in non-incapacitating injuries. Of the four remaining injury crashes, two were approach turn crashes, one was a rear-end crash, and one was a fixed object crash where a vehicle hit a barricade. All four crashes resulted in non-incapacitating injuries.

Figure 72 displays an aerial image of this intersection. **Table 11** displays the control type of each of the left turn movements in the intersection. **Figure 73** displays the top harmful events and **Figure 74** displays the top driver actions across the crashes at this intersection.

Figure 72: Aerial of Willox Lane & North College Avenue

Table 11: Turning Movement Controls at Willox Lane & North College Avenue

Northbound Left Turn	Southbound Left Turn	Eastbound Left Turn	Westbound Left Turn
Permitted & Protected	Permitted & Protected	Permitted & Protected	Permitted & Protected

Figure 73: Top Harmful Events at Willox Lane & North College Avenue

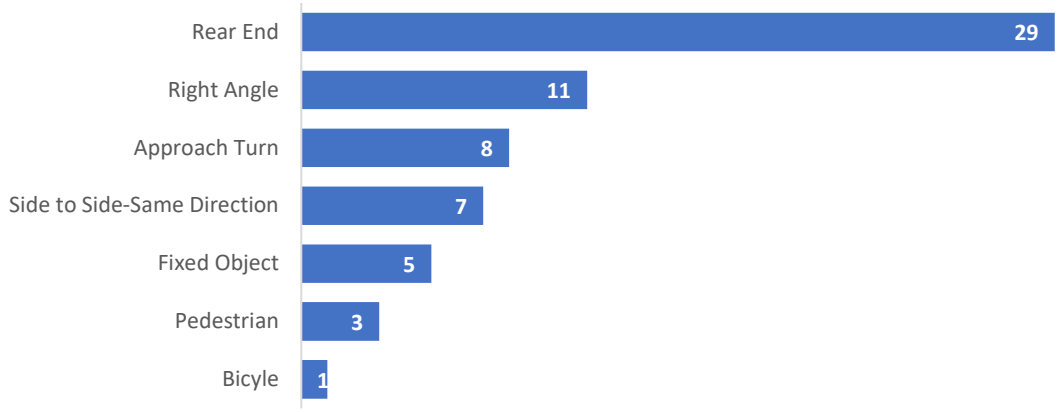
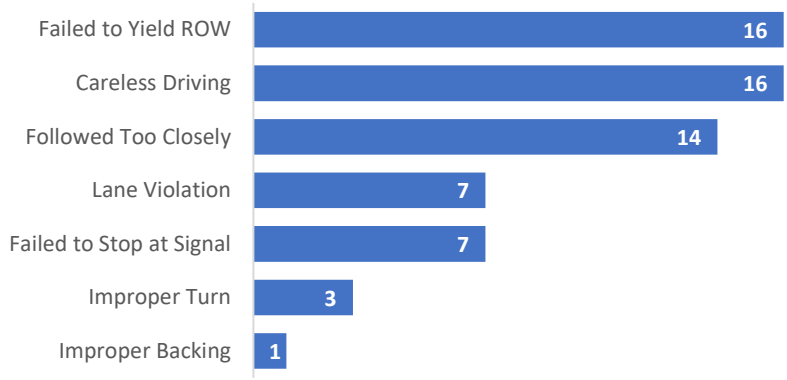


Figure 74: Top Driver Actions at Willox Lane & North College Avenue



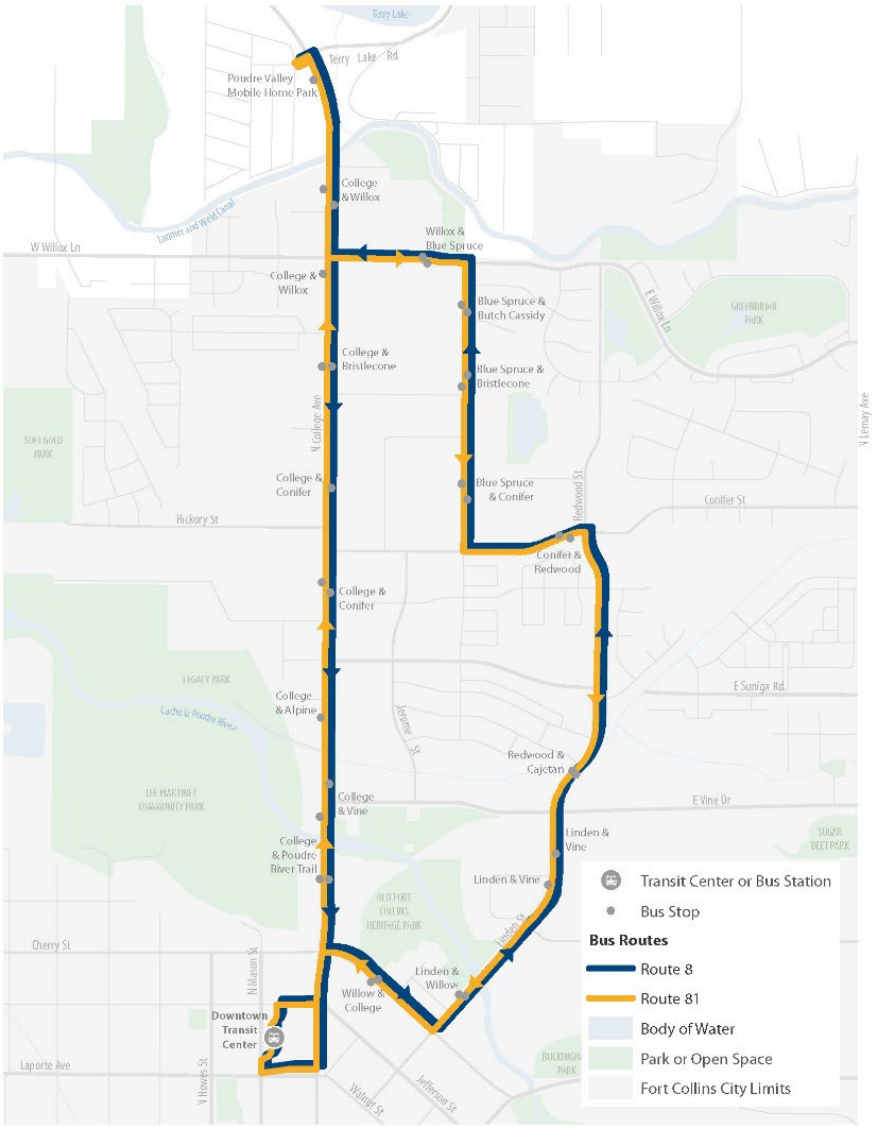
TRANSIT OPERATIONAL ANALYSIS

Within the North College corridor, two routes operating as one-way loops that essentially combine as one single route serve stops along North College Avenue, as well as Blue Spruce Drive, Conifer Street, and Redwood Street.

ROUTE OVERVIEW

Routes 8 and 81 are parallel routes that run loops in opposite directions. Route 8 runs in a counterclockwise loop while Route 81 runs in a clockwise loop. These two routes provide transit service for the North College corridor and the areas east of North College Avenue including to many community services located east of North College Avenue. **Figure 75** displays a map of Routes 8 and 81 as well as the locations of the bus stops along these routes.

Figure 75: Map of Routes 8 and 81



CURRENT SERVICE

The service characteristics of Routes 8 and 81 are shown in **Table 12**. The major service difference between the two routes is that the Route 8 operates seven days per week, while the Route 81 only operates on weekdays. Route 8 also operates later evening service on weekdays. Although the frequency of each route is 30-minutes, when both routes are running the effective frequency for can be close to 15-minutes if you are going from one end of the corridor to the other and therefore can take either route to reach your destination in about the same amount of time.

Table 12: Service Characteristics by Route

Service Characteristics	Route 8	Route 81
Days of Service	Monday – Sunday, 365 days/year	Monday – Friday, 255 days/year
Span of Service	6:22 AM – 10:38 PM Monday-Saturday; 8:22 AM – 7:11 PM Sundays	6:37 AM – 6:54 PM Weekdays only
Frequency	30 minutes	30 minutes
Roundtrip Route Runtime (DTC – DTC)	19 minutes	20 minutes
Number of Roundtrips/Weekday	33	25
Annual Ridership (2019)	213,058	88,436

Source: Transfort

PERFORMANCE ANALYSIS

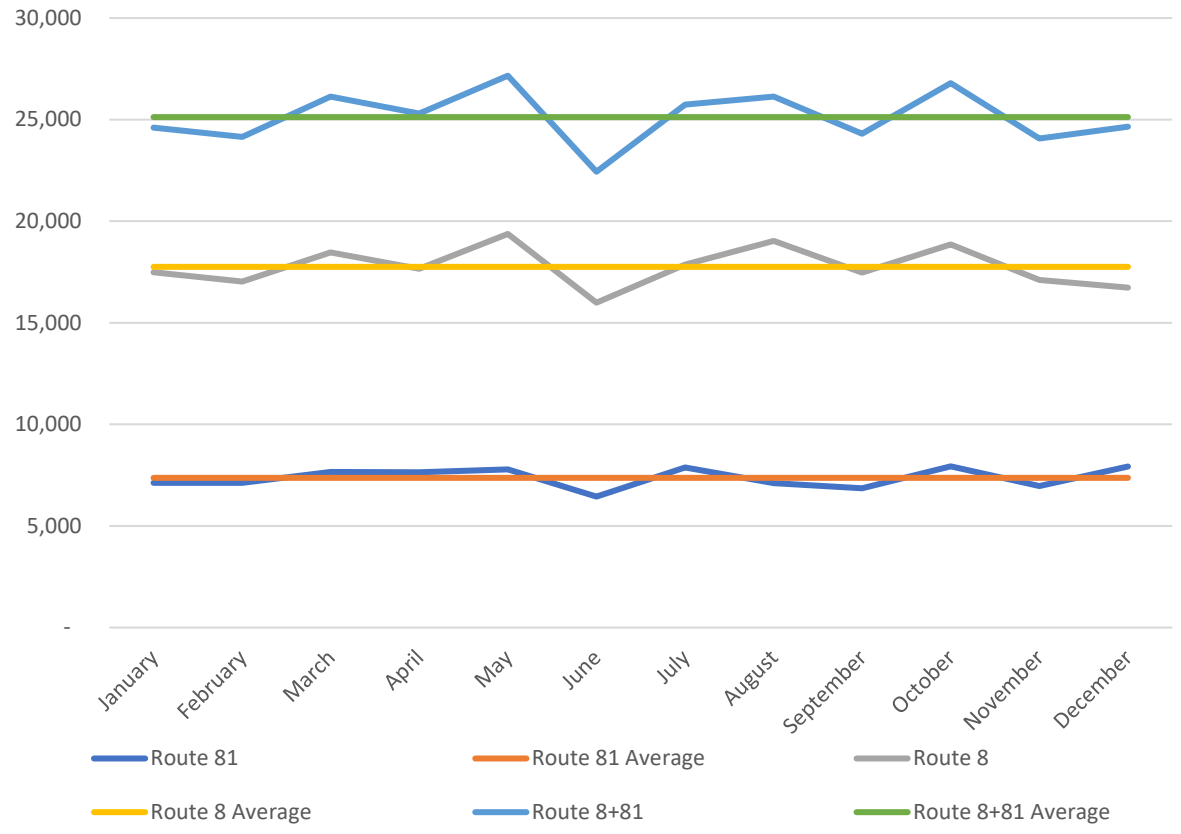
As previously discussed, Routes 8 and 81 are essentially the same route with opposite loop directions. For this reason, performance analysis presented in this section shows individual and combined performance of Routes 8 and 81.

RIDERSHIP

By Month

Ridership, or one-way boardings, by month for 2019 is shown in **Figure 76** and indicates that average ridership is 7,370 for Route 8, 17,755 for Route 81, and 25,125 for Routes 8 and 81 combined.

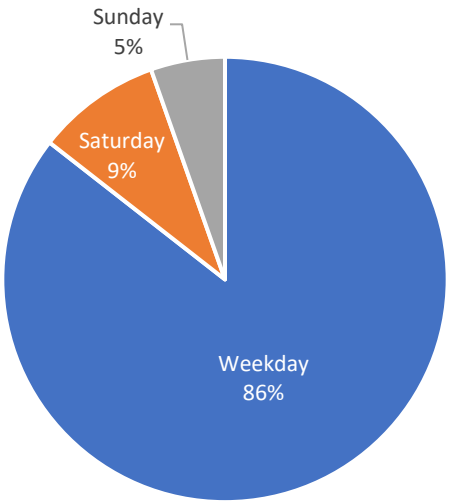
Figure 76: Average Monthly Ridership



By Day of Week

Ridership by day of week is shown in **Figure 77** and indicates that while the majority of ridership occurs on weekdays, weekend ridership at 14% in total is sizeable.

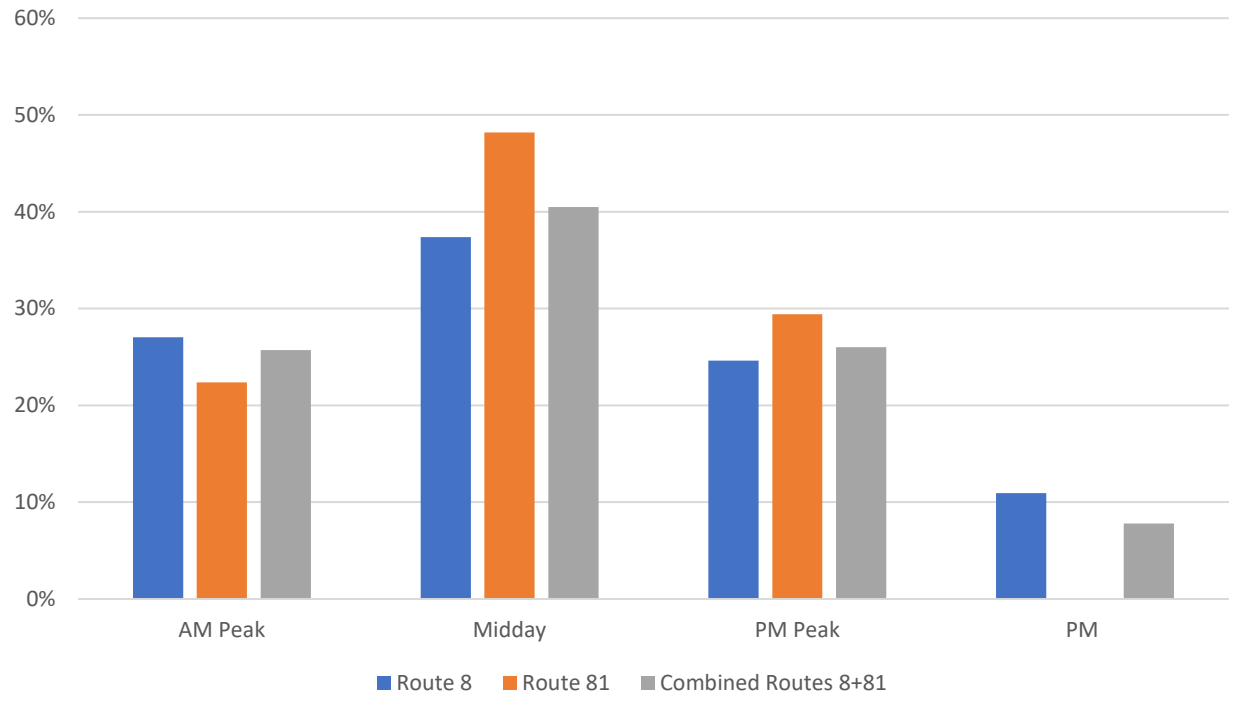
Figure 77: Share of Ridership by Day of the Week



By Time of Day

As shown in **Figure 78,** the majority of ridership on Routes 8 and 81 occurs during the midday, with less ridership in the AM and PM peak periods. This indicates that Routes 8 and 81 do not have significant commuter or student ridership, as is more common for other Transfort routes, and that most riders are likely using these routes to access services during the midday.

Figure 78: Share of Ridership by Route and Time of Day



For reference, Transfort time periods are defined as:

- AM Peak = 6:00 AM until 10:00 AM
- Midday = 10:00 AM until 3:00 PM
- PM Peak = 3:00 PM until 7:00 PM
- PM = 7:00 PM until 11:00 PM

RIDERSHIP PERFORMANCE

Ridership performance for Routes 8 and 81 is presented in this section in comparison to systemwide performance and local route performance (Transfort defines local routes as those that are oriented towards general public, non-CSU, within Fort Collins; non-local routes include those serving CSU, MAX, and the FLEX regional route). For most of this section 2019 data is used in order to show pre-COVID-19 conditions.

Table 13, **Figure 79,** and **Figure 80** show performance characteristics for Routes 8 and 81 in comparison to the entire Transfort system, as well as just the local routes. For Routes 8 and 81 together, productivity (per hour and per mile) and weekday boardings are higher than the local routes and systemwide averages.

Table 13: Performance Characteristics

	Boardings per Hour		Boardings per Mile		Average Weekday Boardings	
Routes	**2019 Boardings per Hour**	**Compared to System Average**	**2019 Boardings per Mile**	**Compared to System Average**	**2019 Average Weekday Boardings**	**% of total system**
Route 8	38.0	113%	3.7	137%	649	85%
Route 81	28.4	84%	2.8	104%	347	46%
Routes 8 + 81 Combined	34.6	103%	3.4	126%	996	131%
All Local Routes	23.0	68%	1.9	70%	365	48%
SYSTEMWIDE AVERAGES	**33.7**	**100%**	**2.7**	**100%**	**762**	**100%**

Figure 79: Average Weekday Boardings by Route (2019)

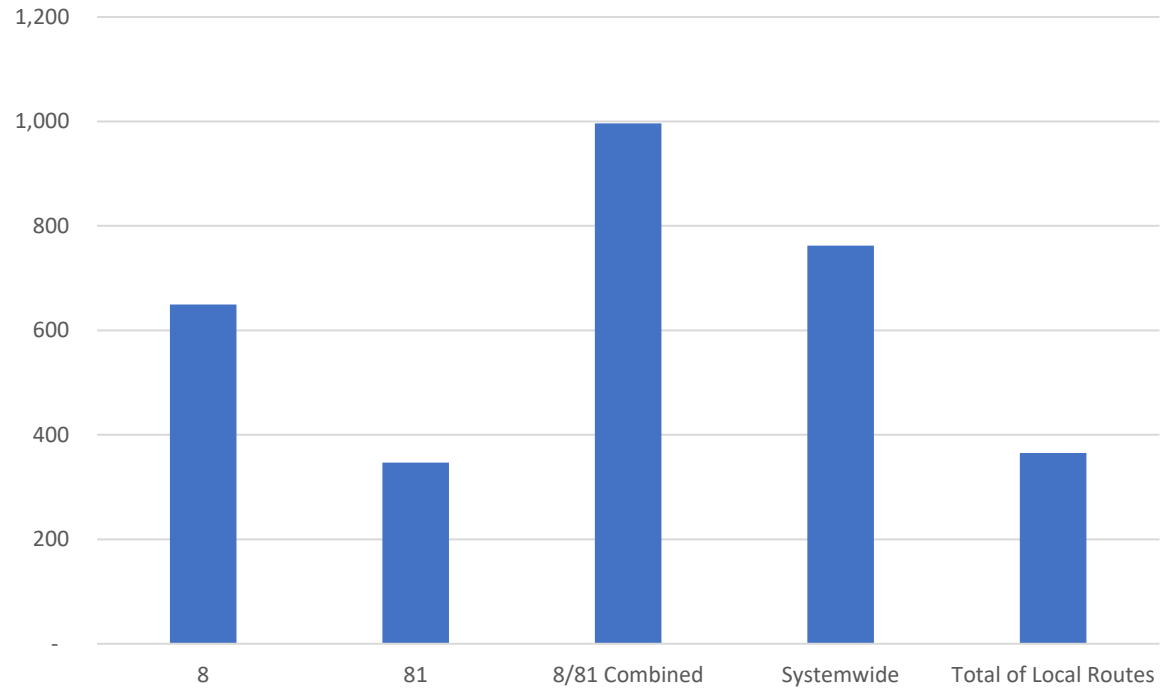
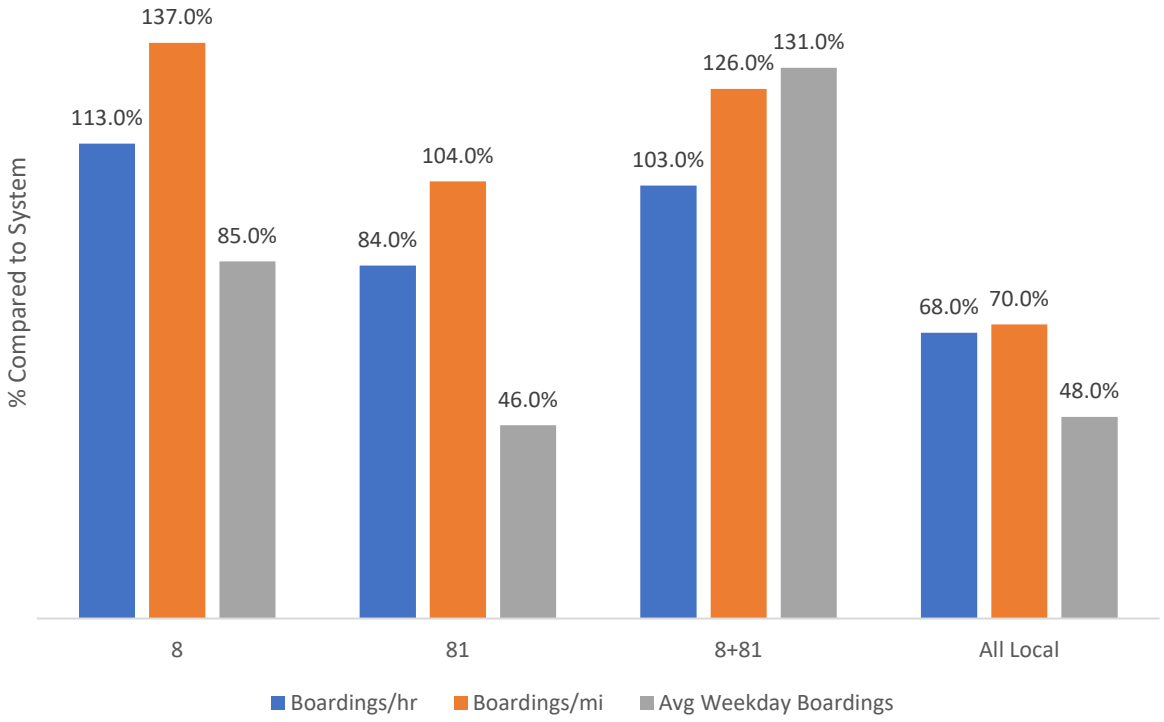


Figure 80: Chart of Operational Performance Compared to Systemwide



RIDERSHIP COMPARED TO SERVICE SUPPLIED

To understand how many vehicle service hours and vehicle service miles are supplied relative to ridership, a comparison of the pro rata percentage of ridership, hours, and miles for each route is shown in **Table 14** and **Source:** Transfort

. If all three percentages are equal, this indicates a route that produces equivalent ridership for the service hours and service miles provided. More effective routes, in terms of ridership per hour and per mile, deliver a higher percentage of ridership in comparison to their service hours or miles. Less effective routes deliver a lower percentage of ridership in comparison to their service hours or miles. Vehicle service hours and miles refer to the time and miles that each individual bus is active on a published route schedule. These metrics do not include the time and miles getting to and from the beginning and end of a route, driver breaks, training, or other non-published route service time and miles.

Table 14: Ridership Compared to Service Supplied

	Ridership		Vehicle Service Hours		Vehicle Service Miles	
Routes	**Total 2019 Ridership**	**% of total system**	**Total 2019 Hours**	**% of total system**	**Total 2019 Miles**	**% of total system**
Route 8	213,058	4.8%	5,602	4.2%	57,053	3.5%
Route 81	88,436	2.0%	3,119	2.4%	31,864	1.9%
Routes 8 + 81 Total	301,494	6.8%	8,721	6.6%	88,917	5.4%
All Local Routes	1,409,507	31.6%	61,223	46.3%	755,690	45.9%
SYSTEMWIDE	**4,464,039**	**100%**	**132,288**	**100%**	**1,646,487**	**100%**

Source: Transfort

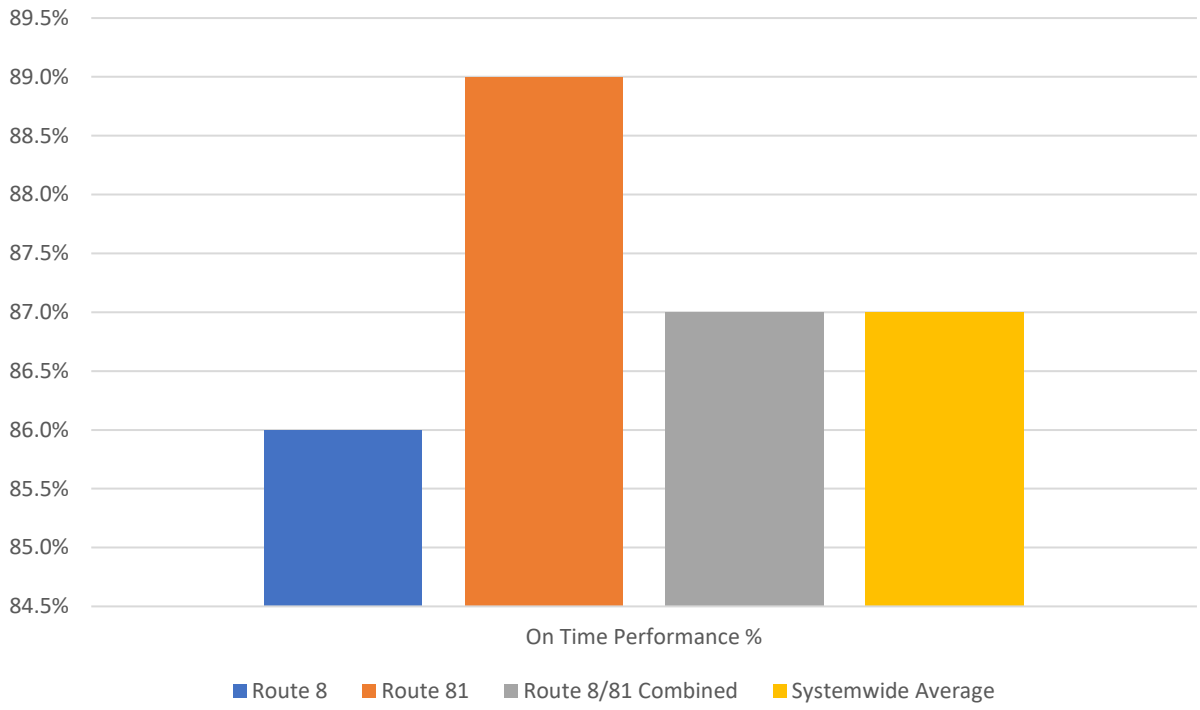
A review of **Table 14** shows that:

- Route 8 produces more ridership for its service supplied in hours and miles.
- Route 81 produces less ridership for hours supplied but similar ridership for miles supplied.
- Routes 8 and 81 combined produce slightly more ridership in comparison to hours supplied and more ridership in comparison to miles supplied.
- In comparison to systemwide totals, all local routes combined produce significantly less ridership for the service hours and service miles supplied – this is due to the heavily used CSU routes and MAX producing high levels of ridership that contribute more ridership than hours and miles supplied.

ONTIME PERFORMANCE

Figure 81 shows the on-time performance of Routes 8 and 81, which is the same as the system-wide average for the combined route performance.

Figure 81: Chart of On-time Performance



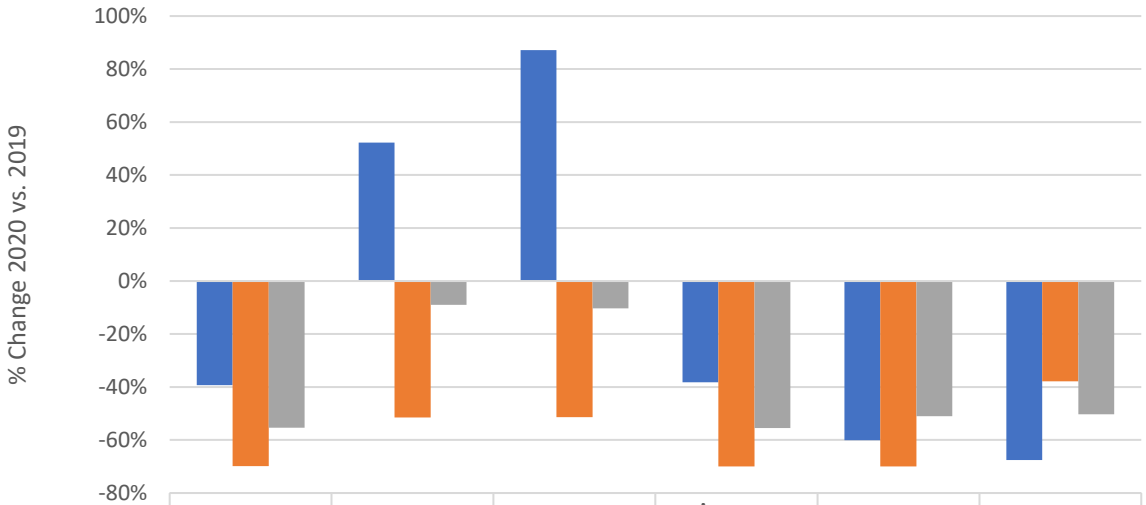
IMPACT OF COVID-19

2019 vs. 2020

The COVID-19 pandemic reduced transit ridership across the country and Transfort was no exception. **Figure 82** shows the precipitous drop in ridership that happened in 2020 in comparison to 2019. In total, systemwide ridership for 2020 was 70% lower in comparison to 2019; however, it is notable that ridership on Routes 8 and 81 was only 39% lower, which could point to high transit dependence of Routes 8 and 81 riders who still needed to use the bus to access services in the North College Avenue area. It is also notable that Transfort had to add 52% more vehicle revenue hours and 87% more vehicle miles systemwide in 2020 in comparison to 2019 – according to Transfort staff, this was due to public health bus capacity restrictions combined with ridership that remained high. Transfort put extra buses in place throughout the day to accommodate the continued ridership demand while staying within the capacity restrictions.

With ongoing capacity restrictions, health guidance on avoiding crowds and smaller spaces, and continuing public pandemic fears, it is likely that the lower ridership numbers will continue throughout 2021 and 2022 – a full recovery back to 2019 ridership levels may take years.

Figure 82: Comparison of operational metrics (2019 vs. 2020)



	Ridership	Revenue Hours	Revenue Miles	Average Weekday Boardings	Boardings per Revenue Hour	Boardings per Revenue Mile
Routes 8+81	-39%	52%	87%	-38%	-60%	-68%
Systemwide	-70%	-51%	-51%	-70%	-70%	-38%
Local Routes	-55%	-9%	-10%	-56%	-51%	-50%

STOP LEVEL ANALYSIS

RIDERSHIP BY STOP

Figure 83 displays a map of ridership on Routes 8 and 81 by stop. The stops with the greatest ridership for these routes are located east of North College Avenue and are located near existing community services.

Figure 84 displays a map of Routes 8 and 81 and the locations of nearby community services for reference. **Figure 85** shows a chart of the ridership data by stop with boardings versus alightings separated.

Figure 83: Map of Ridership by Stop

Note: Ridership by stop data is the total ridership over a 24-month period from 2019 through 2020. The numbers displayed are the sum of boardings and alightings over this period.

Figure 84: Map of Community Services Located Near Routes 8 and 81

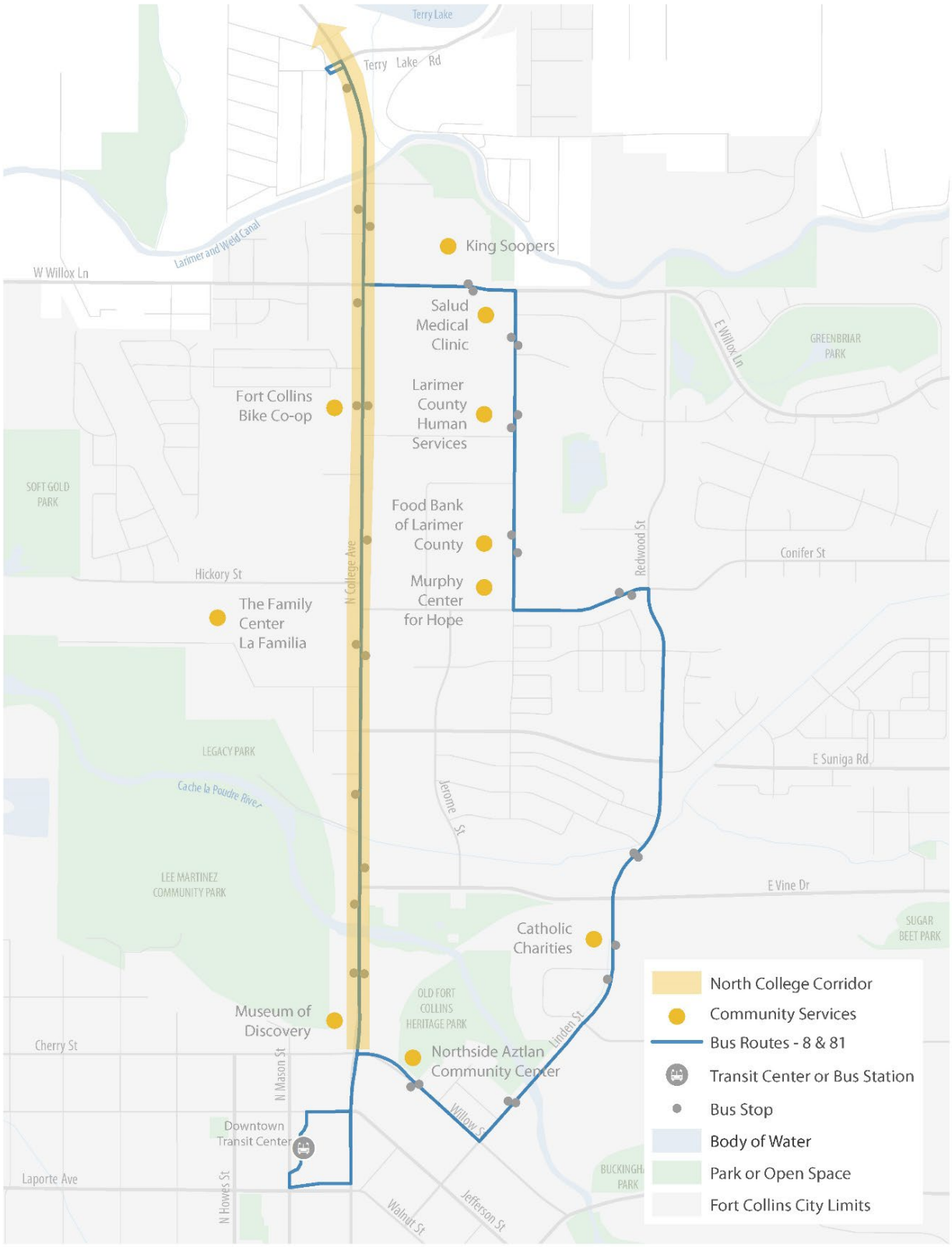
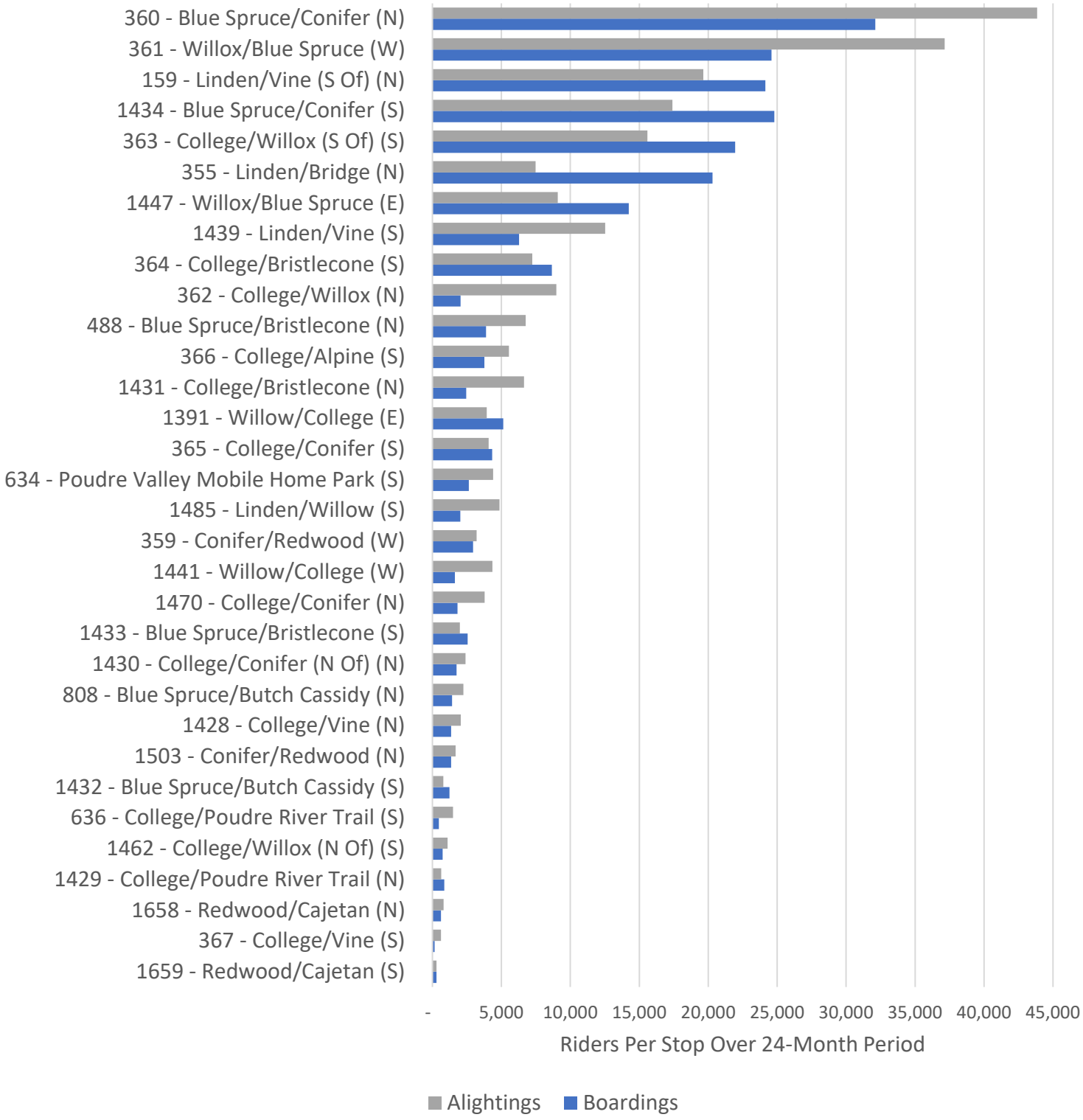


Figure 85: Ridership by Stop (2019-2020)



Note: Ridership by stop data is the total ridership over a 24-month period from 2019 through 2020.

ON-STREET FACILITIES

BUS STOPS AND AMENITIES

As shown in Table 15, the bus stops along North College Avenue have varying bus stop passenger amenities. Most stops have signage, a bench, and an ADA landing pad that is connected to sidewalk infrastructure. Most stops require the bus to stop in the bike lane with only three stops having dedicated bus pull-outs that allow the bus to fully get out of the travel lanes. Only three stops have bus shelters and only one stop has a bike rack.

Table 15: Ammenities at Each Bus Stop

Stop	Signage	Bench	ADA Landing Pad	Bus Pull-out	Shelter	Bike Rack	Trash Can
1429 – College and Poudre River Trail	✓		✓				
1428 – College and Vine	✓		✓				
1470 – College and Conifer	✓	✓	✓				
1430 – College and N. of Conifer	✓	✓	✓				
1431 – College and Bristlecone	✓	✓	✓				
362 – College and Willox	✓		✓	✓			
634 – Poudre Valley Mobile Home Park	✓	✓	✓	✓	✓		
1462 – College and N. of Willox	✓		✓	✓			
363 – College and S. of Willox	✓	✓	✓		✓		✓
364 – College and Bristlecone	✓	✓	✓				
365 – College and Conifer	✓	✓	✓				
366 – College and Alpine	✓	✓	✓				
636 – College and Poudre River Trail	✓	✓	✓		✓	✓	✓

Figure 86: Image of a Typical Bus Stop on the Corridor

CURRENT NORTH TURN-AROUND

Both Routes 8 and 81 currently turn around in the Poudre Valley Mobile Home Park (PVMHP) parking lot. This is a challenging turn around for several reasons including that it is a relatively tight turn around requiring limited room for driver error; it mixes buses with vehicles going in many different directions within the PVMHP entrance without clear pavement markings; there is no bus stop within the PVMHP entrance – the stop is on College Avenue, south of the PVMHP; and there is relatively low ridership from the stop on North College Avenue, south of the PVMHP.

Figure 87: Current Route 8 and 81 Turn-around at Poudre Valley Mobile Home Park

RIDERSHIP PROFILE AND TRAVEL MARKETS

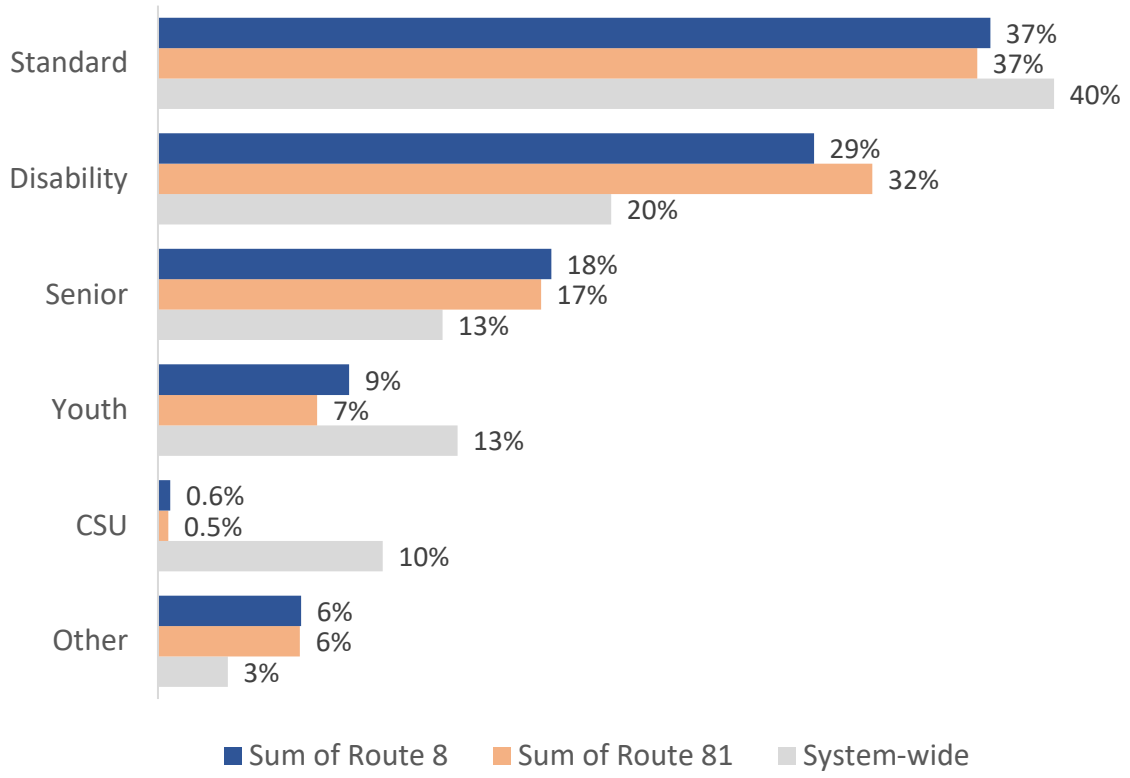
This chapter details the existing and potential future travel markets, based on recent surveys, existing rider characteristics, and identified new markets.

CURRENT RIDERS

FARE TYPES

The fare types used to ride Routes 8 and 81 differ noticeably from the Transfort system as a whole. **Figure 88** details the breakdown of fare types used on Routes 8 and 81 when compared to the averages for the entire Transfort system. A smaller share of riders pay standard (non-discounted fares), youth fares, and CSU affiliated fares on Routes 8 and 81 when compared to the system average. On Routes 8 and 81, a larger share of ridership pays discounted fares for seniors or people with a disability when compared to the system as a whole.

Figure 88: Comparison of Share of Fare Type



Data from 2019 annual farebox reporting.

PASSENGER SURVEY

Transfort has conducted several on-board surveys of their riders in recent years. The most comprehensive survey was the system-wide on-board survey conducted in 2017. In addition, Transfort conducted a survey of MAX and HORN riders in 2019 and another survey of a selection of routes, including Route 8, in 2018. This section displays results from the 2017 survey and includes any relevant

takeaways from the 2018 and 2019 surveys as well. A survey was also completed in 2021 but was not available for inclusion into this report.

Top Issues Identified

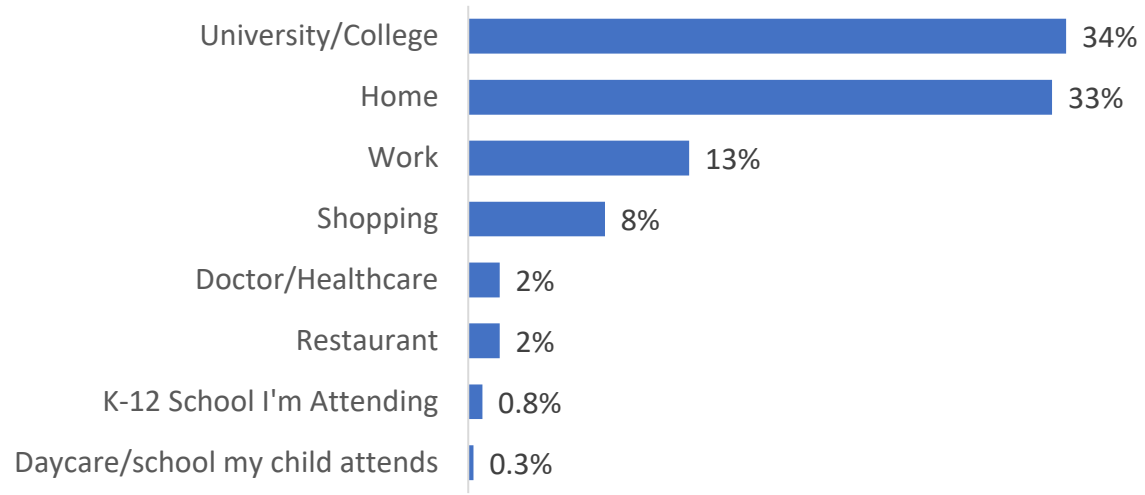
Across all three surveys (2017, 2018, and 2019) a few key issues were consistently noted as either needing improvement or reasons people do not take the bus more often. Across all of the surveys people identified they would like to see:

1. Increased frequency of buses (including on the MAX Route)
2. More routes and bus stops closer to their destinations
3. Extended operating hours (particularly late-night service)
4. Improved travel times and on-time performance
5. Fewer or more seamless transfers

Additional Data from Passenger Surveys

The results of the 2017 system-wide survey showed the most common destination for people riding the bus was a university or college. Home was the second most common destination. **Figure 89** shows the survey results for respondents' bus trip destinations. Considering less than 1% of Routes 8 and 81 riders pay CSU fares, compared to 10% system-wide, it is expected that the share of riders accessing a university or college on these routes is also significantly lower.

Figure 89: Survey Results for Trip Destination

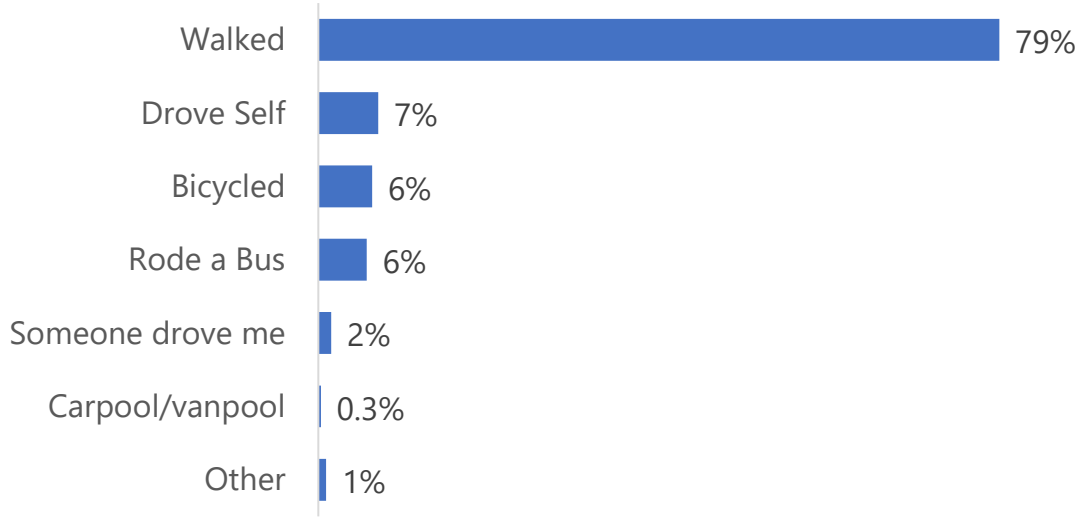


Data from Transfort 2017 Transit Passenger Survey

Across all of the surveys, the most common way that people accessed the bus, and got from the bus to their destination, was by walking. Walking was chosen by respondents more than ten times more than the other modes. **Figure 90** and

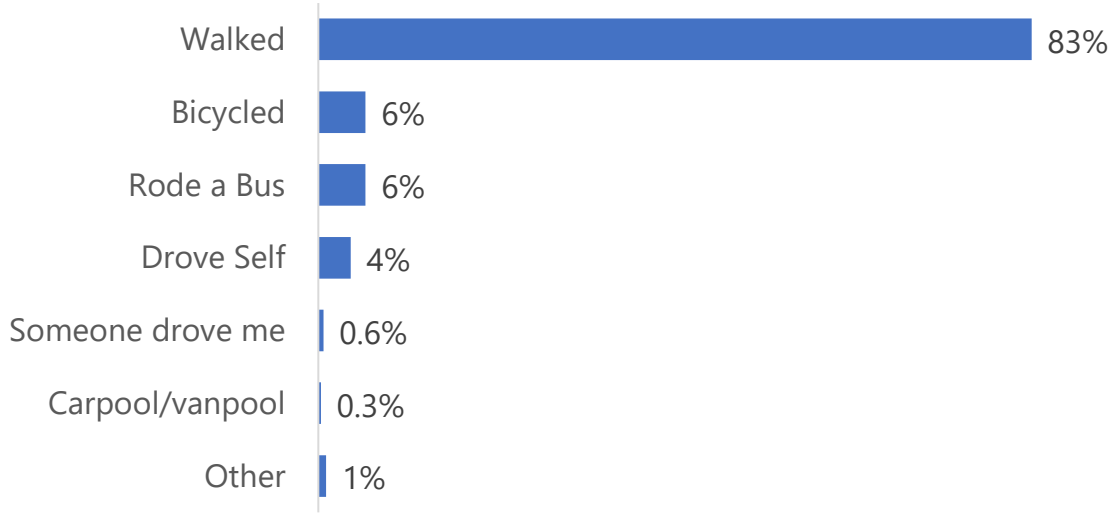
Figure 91 display the results of how riders accessed the bus and their final destinations.

Figure 90: Methods of Reaching the Bus Stop



Data from Transfort 2017 Transit Passenger Survey

Figure 91: Methods of Reaching Final Destination

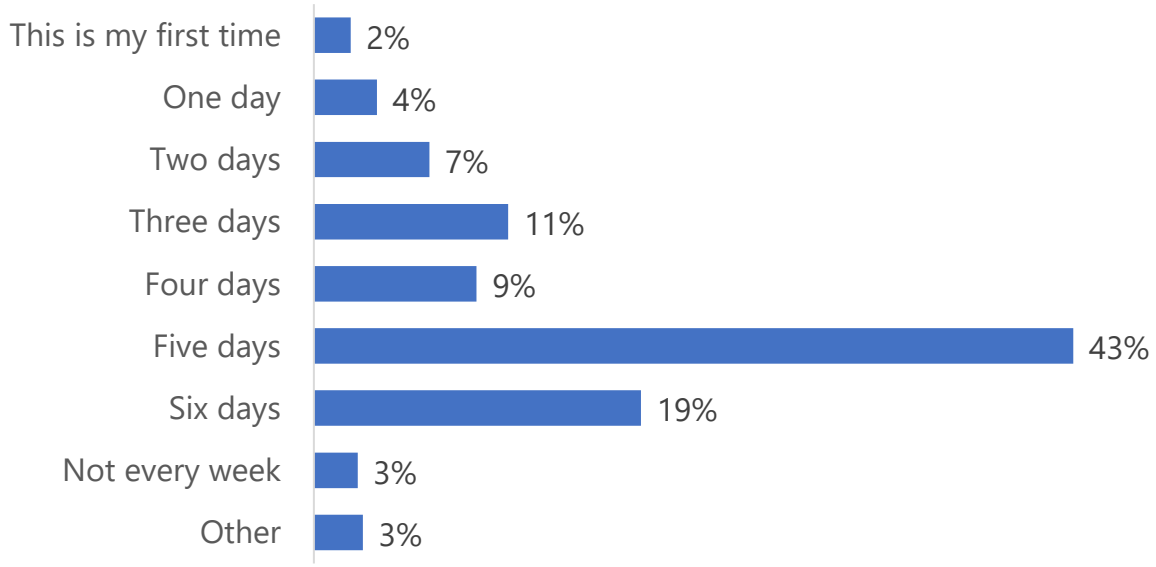


Data from Transfort 2017 Transit Passenger Survey

Respondents were also asked if their trip required transferring to another bus. Of survey respondents who needed to transfer to another bus for their trip, 3% said they needed to transfer to Route 8 and 5% responded they needed to transfer to Route 81. The route the greatest share of riders transferring to it was the MAX with 29% of respondents who were making transfers. Of riders transferring from MAX (from the 2019 MAX survey) only 2% were transferring to Route 8 and less than 1% transferring to Route 81.

Based on survey responses, the majority of Transfort riders in 2017 (67%) rode the bus five days a week or more. Only 2% of survey respondents were riding the bus for the first time. **Figure 92** shows how many days per week survey respondents rode the bus. This trend was also reported in the 2018 and 2019 surveys.

Figure 92: Number of Bus Rides Weekly



Data from Transfort 2017 Transit Passenger Survey

EXISTING TRAVEL MARKETS

Based on available travel market data and analysis, the existing travel markets include:

- People accessing social and human services along the Linden Street and Blue Spruce Drive corridors
- People who have a disability or use a mobility assistance device
- People who may rely on the bus as their primary transportation mode and have continued to ride the bus even during the pandemic
- People who may not be able to pay the cash fare or purchase a bus pass
- Older adults

It should be noted that individual riders may fall into two or more of these travel market categories. Compared to most other Transfort routes that have significant youth and CSU student ridership, the North College corridor existing travel markets do not include nearly as many youth or CSU riders.

Consideration of Student Housing in North College Area

The Outpost Fort Collins is a college student housing complex located at 530 Lupine Drive, within a half-mile of the North College corridor. The Outpost operates its own student shuttle to get residents from The Outpost to the CSU campus.

The shuttle operates Monday through Friday from 7:00 AM until 6:00 PM during the regular CSU school year and is operated through a service contract with Green Way Shuttles. One shuttle bus is operated between The Outpost and CSU with departures every 30 minutes in each direction.

While exact ridership numbers are not kept, The Outpost staff estimate that daily ridership is between 150 and 200.

TRANSIT ACCESS AND BARRIERS

The existing 8 and 81 Routes provide reliable and frequent transit access to the North College study area and provide connectivity to the Downtown Transit Center, where transfers can be made to Routes 5, 9, 10, 14, 18, 92, FLEX, MAX, and Bustang.

The identified access barriers include limited convenient access to southeast and southwest Fort Collins, where many retail, commercial, and health services are located; a direct and convenient connection to the CSU campus that does not require a transfer; and time-efficient trips to destinations east and west of downtown Fort Collins (current trips require significantly longer travel times than comparable car travel times).

FUTURE TRAVEL MARKETS

As the North College area continues to grow, develop, and redevelop, it is likely that new travel markets will develop including:

- ✓ CSU students living in the North College area and needing to get to/from campus.
- ✓ Commuters living in the North College area and needing to access jobs.
- ✓ People wanting to access existing and new businesses within the North College area including restaurants, retail shops, grocery stores, and car repair shops.
- ✓ Commuters coming from points further north and wanting to park and ride from the northern end of the North College corridor in order to get to jobs downtown or at CSU.

APPENDIX A

PEAK HOUR TRAFFIC COUNTS

City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

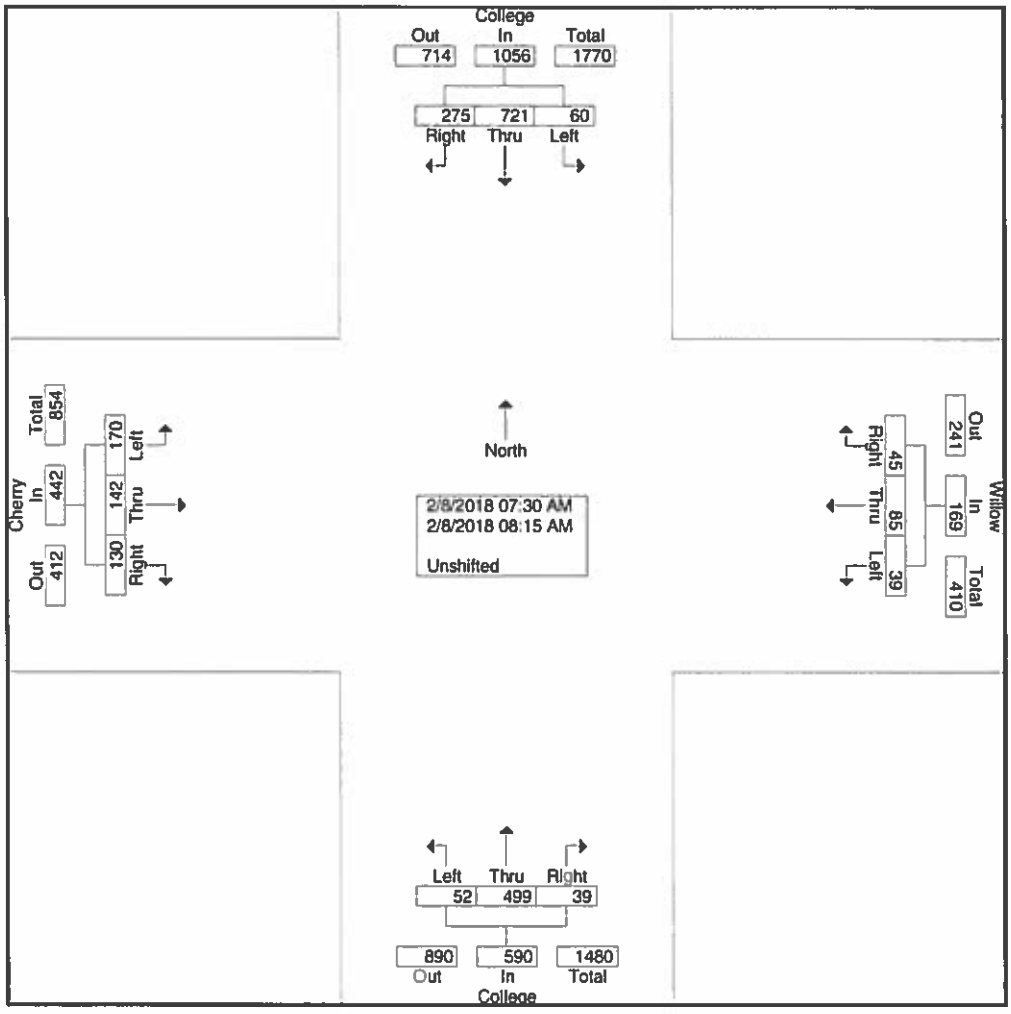
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Cherry/Willow
Time: AM
ICU Number: 40

File Name : College & Cherry-Willow 2-8-18
Site Code : 00000040
Start Date : 2/8/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willow Westbound				College Northbound				Cherry Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:30 AM	74	184	11	269	7	17	10	34	4	116	9	129	33	34	36	103	535
07:45 AM	83	188	19	290	18	26	8	52	11	139	14	164	51	40	70	161	667
Total	157	372	30	559	25	43	18	86	15	255	23	293	84	74	106	264	1202
08:00 AM	53	188	12	253	10	19	10	39	13	127	18	158	25	31	31	87	537
08:15 AM	65	161	18	244	10	23	11	44	11	117	11	139	21	37	33	91	518
Grand Total	275	721	60	1056	45	85	39	169	39	499	52	590	130	142	170	442	2257
Apprch %	26	68.3	5.7		26.6	50.3	23.1		6.6	84.6	8.8		29.4	32.1	38.5		
Total %	12.2	31.9	2.7	46.8	2	3.8	1.7	7.5	1.7	22.1	2.3	26.1	5.8	6.3	7.5	19.6	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

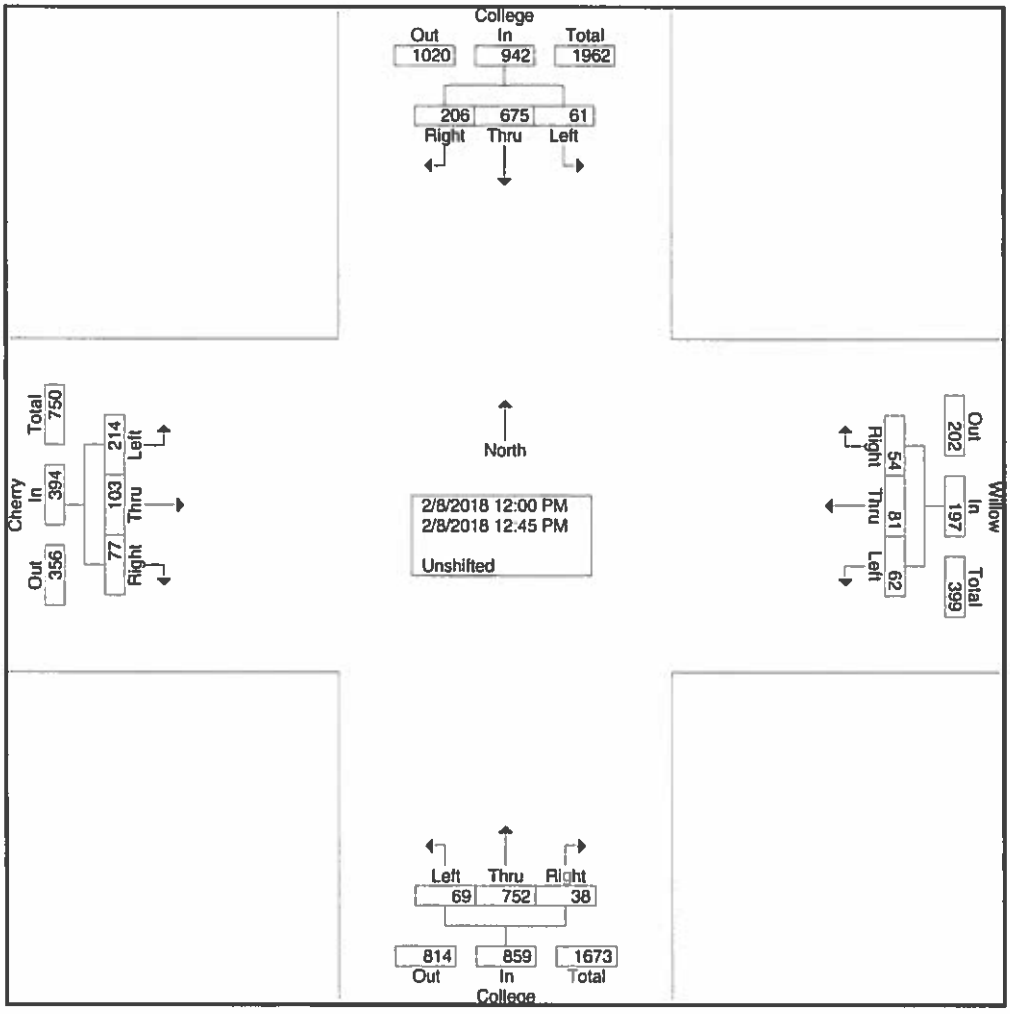
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Cherry/Willow
Time: NN
ICU Number: 40

File Name : College & Cherry-Willow 2-8-18
Site Code : 00000040
Start Date : 2/8/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willow Westbound				College Northbound				Cherry Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
12:00 PM	53	185	18	256	17	21	16	54	7	185	17	209	18	20	60	98	617
12:15 PM	47	167	8	222	12	23	14	49	10	207	17	234	18	34	53	105	610
12:30 PM	45	148	14	207	13	20	17	50	10	181	17	208	20	25	49	94	559
12:45 PM	61	175	21	257	12	17	15	44	11	179	18	208	21	24	52	97	606
Total	206	675	61	942	54	81	62	197	38	752	69	859	77	103	214	394	2392
Grand Total	206	675	61	942	54	81	62	197	38	752	69	859	77	103	214	394	2392
Apprch %	21.9	71.7	6.5		27.4	41.1	31.5		4.4	87.5	8		19.5	26.1	54.3		
Total %	8.6	28.2	2.6	39.4	2.3	3.4	2.6	8.2	1.6	31.4	2.9	35.9	3.2	4.3	8.9	16.5	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

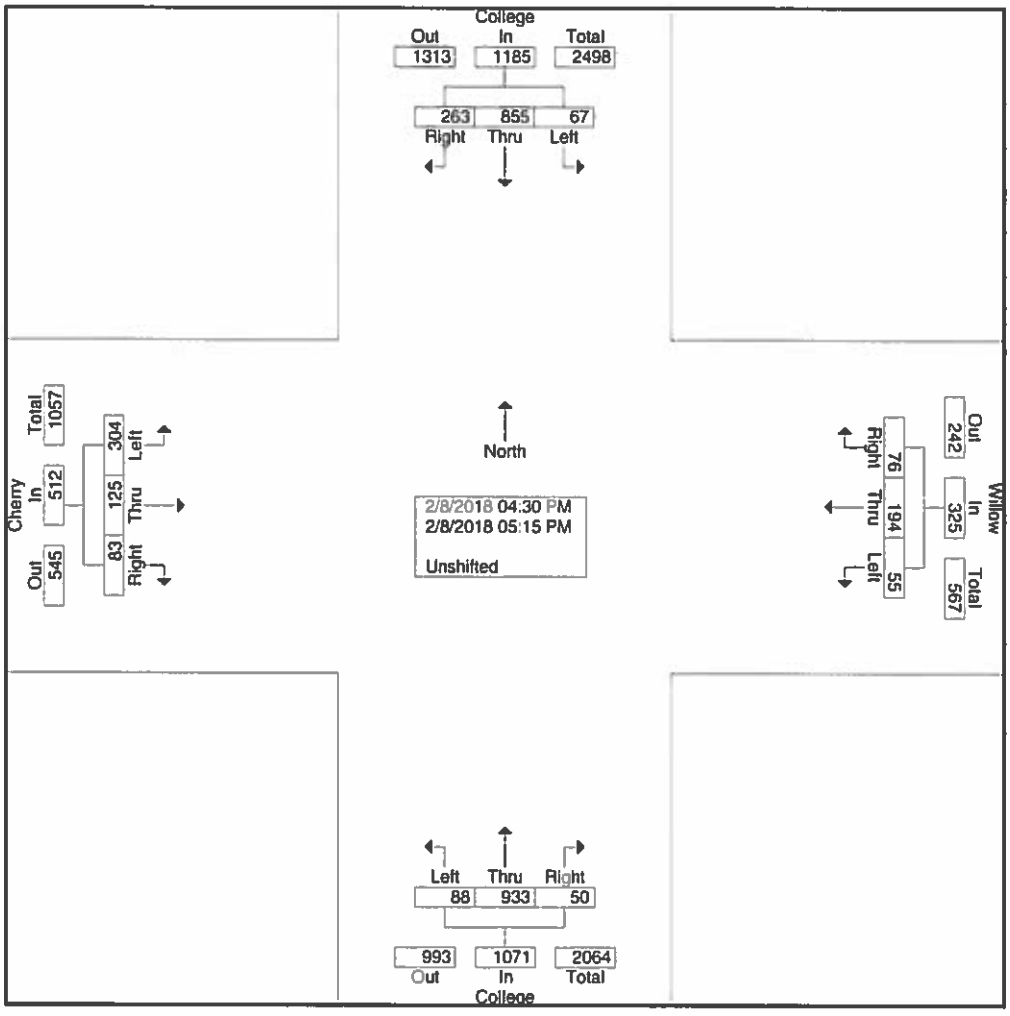
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Cherry/Willow
Time: PM
ICU Number: 40

File Name : College & Cherry-Willow 2-8-18
Site Code : 00000040
Start Date : 2/8/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willow Westbound				College Northbound				Cherry Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:30 PM	62	190	21	273	17	42	15	74	5	206	22	233	17	22	77	116	696
04:45 PM	66	221	18	305	20	45	18	83	18	256	17	291	19	36	52	107	786
Total	128	411	39	578	37	87	33	157	23	462	39	524	36	58	129	223	1482
05:00 PM	68	231	14	313	14	68	17	99	17	228	24	269	28	38	98	164	845
05:15 PM	67	213	14	294	25	39	5	69	10	243	25	278	19	29	77	125	766
Grand Total	263	855	67	1185	76	194	55	325	50	933	88	1071	83	125	304	512	3093
Apprch %	22.2	72.2	5.7		23.4	59.7	16.9		4.7	87.1	8.2		16.2	24.4	59.4		
Total %	8.5	27.6	2.2	38.3	2.5	6.3	1.8	10.5	1.6	30.2	2.8	34.6	2.7	4	9.8	16.6	



City of Fort Collins Traffic Operations

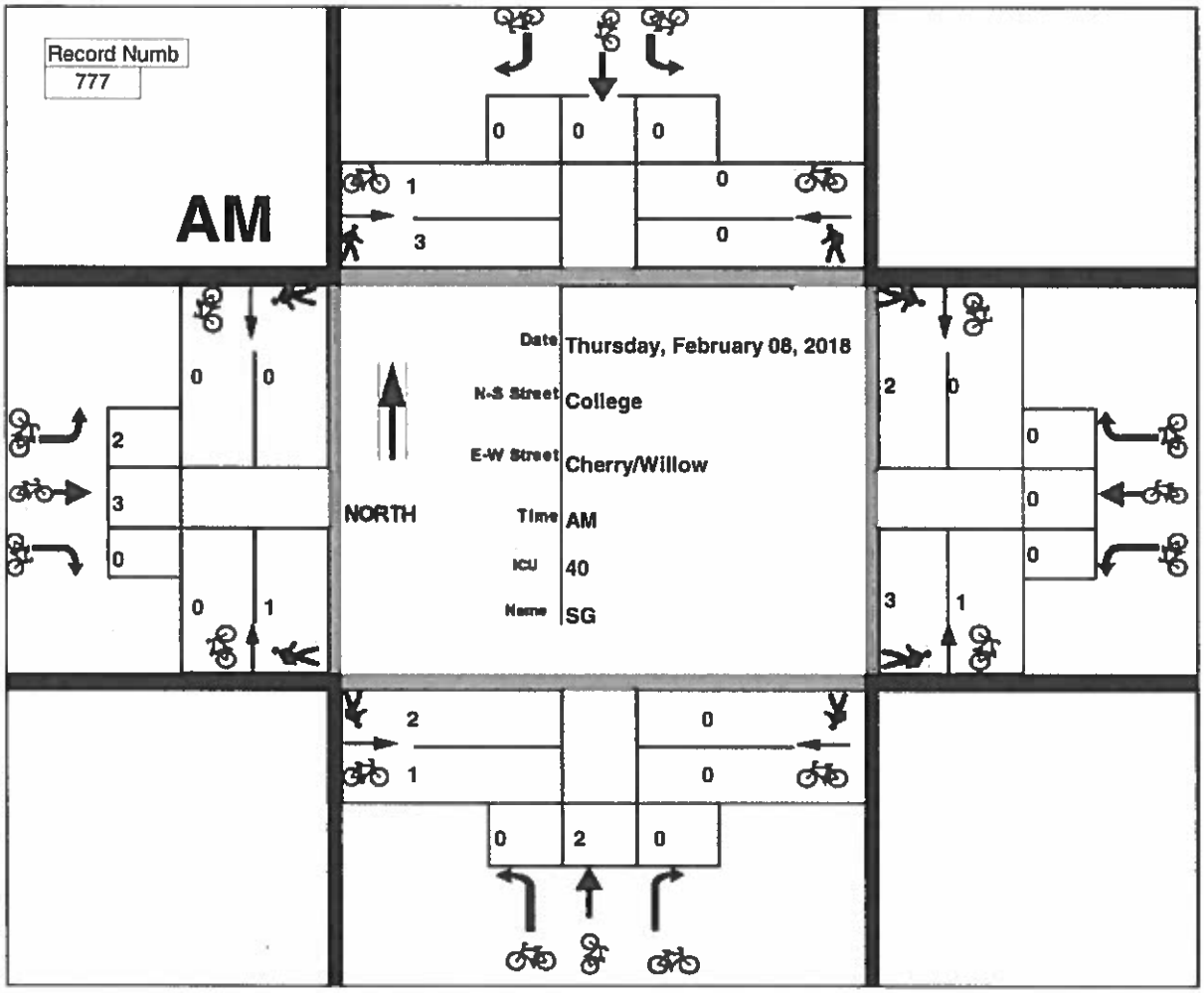
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Cherry/Willow
Time: PHF
ICU Number: 40

File Name : College & Cherry-Willow 2-8-18
Site Code : 00000040
Start Date : 2/8/2018
Page No : 1

	College Southbound				Willow Westbound				College Northbound				Cherry Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	74	184	11	269	7	17	10	34	4	116	9	129	33	34	36	103	535
07:45 AM	83	188	19	290	18	26	8	52	11	139	14	164	51	40	70	161	667
08:00 AM	53	188	12	253	10	19	10	39	13	127	18	158	25	31	31	87	537
08:15 AM	65	161	18	244	10	23	11	44	11	117	11	139	21	37	33	91	518
Total Volume	275	721	60	1056	45	85	39	169	39	499	52	590	130	142	170	442	2257
% App. Total	26	68.3	5.7		26.6	50.3	23.1		6.6	84.6	8.8		29.4	32.1	38.5		
PHF	.828	.959	.789	.910	.625	.817	.886	.813	.750	.897	.722	.899	.637	.888	.607	.686	.846
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	53	185	18	256	17	21	16	54	7	185	17	209	18	20	60	98	617
12:15 PM	47	167	8	222	12	23	14	49	10	207	17	234	18	34	53	105	610
12:30 PM	45	148	14	207	13	20	17	50	10	181	17	208	20	25	49	94	559
12:45 PM	61	175	21	257	12	17	15	44	11	179	18	208	21	24	52	97	606
Total Volume	206	675	61	942	54	81	62	197	38	752	69	859	77	103	214	394	2392
% App. Total	21.9	71.7	6.5		27.4	41.1	31.5		4.4	87.5	8		19.5	26.1	54.3		
PHF	.844	.912	.726	.916	.794	.880	.912	.912	.864	.908	.958	.918	.917	.757	.892	.938	.969
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	62	190	21	273	17	42	15	74	5	206	22	233	17	22	77	116	696
04:45 PM	66	221	18	305	20	45	18	83	18	256	17	291	19	36	52	107	786
05:00 PM	68	231	14	313	14	68	17	99	17	228	24	269	28	38	98	164	845
05:15 PM	67	213	14	294	25	39	5	69	10	243	25	278	19	29	77	125	766
Total Volume	263	855	67	1185	76	194	55	325	50	933	88	1071	83	125	304	512	3093
% App. Total	22.2	72.2	5.7		23.4	59.7	16.9		4.7	87.1	8.2		16.2	24.4	59.4		
PHF	.967	.925	.798	.946	.760	.713	.764	.821	.694	.911	.880	.920	.741	.822	.776	.780	.915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NORTH
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Thursday, February 08, 2018
N-S Street
College
E-W Street
Cherry/Willow
Time
AM
ICU
40
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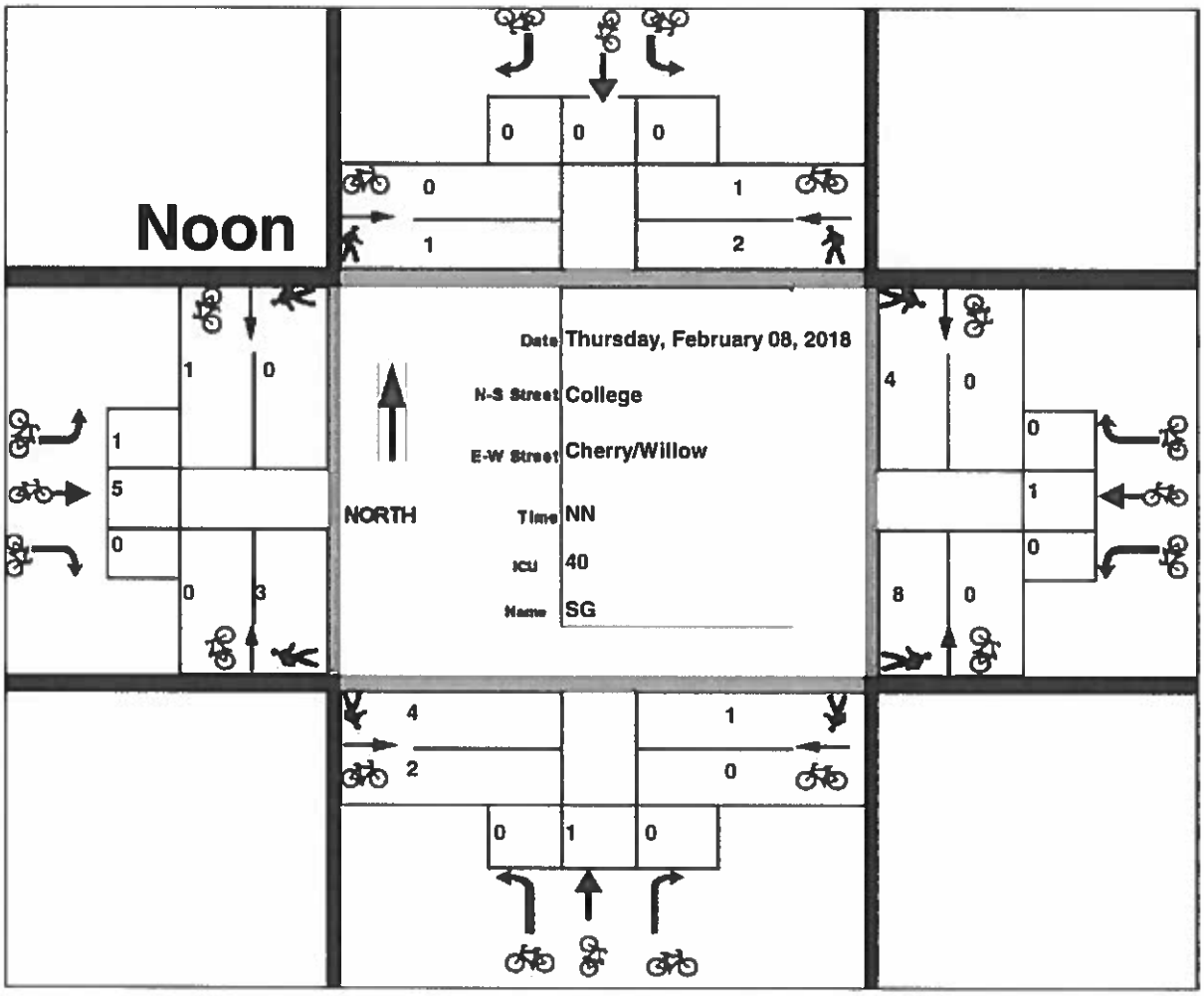
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Date Thursday, February 08, 2018
N-S Street College
E-W Street Cherry/Willow
NORTH
Time NN
ICU 40
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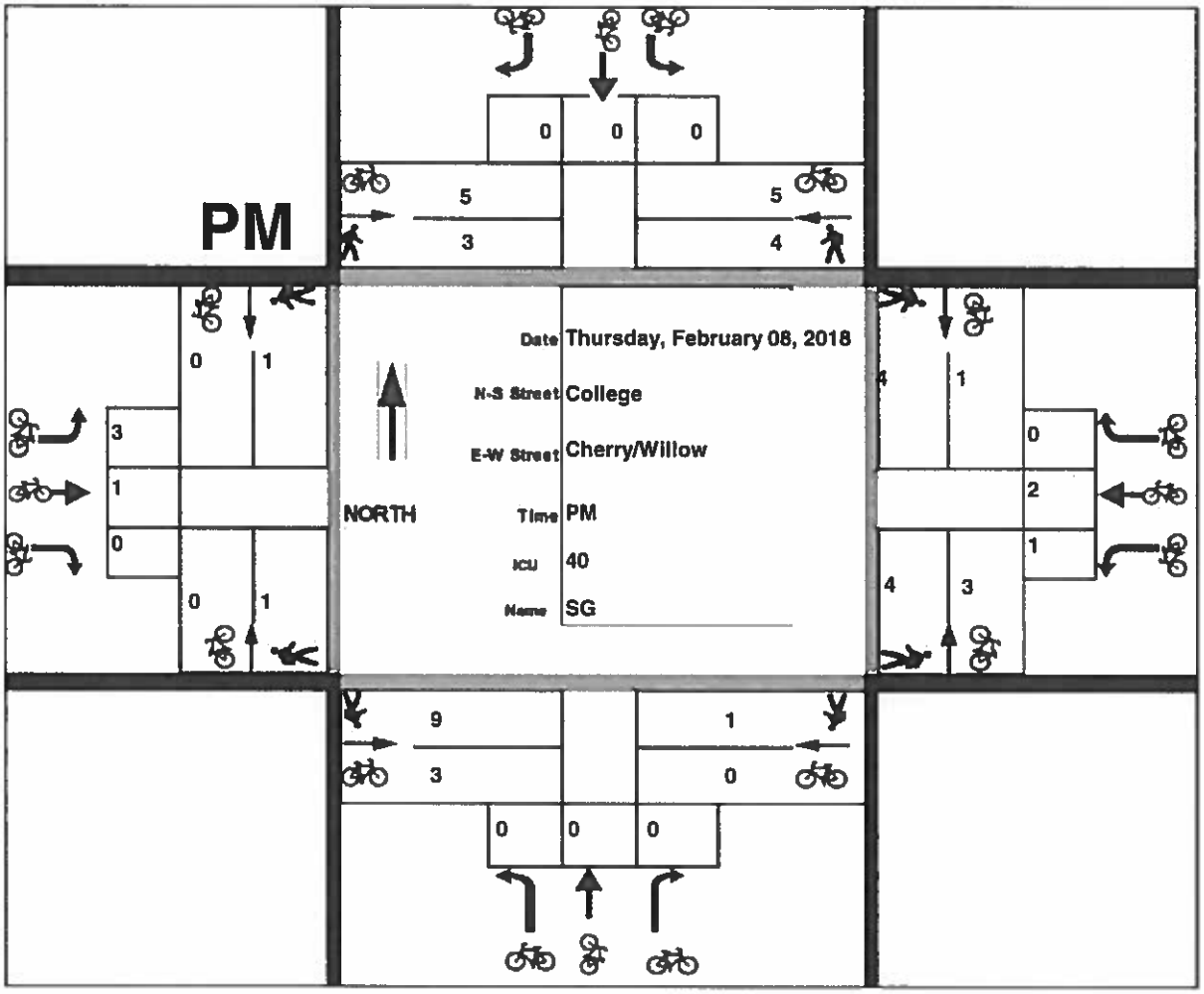
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N-S Street College
E-W Street Cherry/Willow
NORTH
Time PM
ICU 40
Name SG

City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

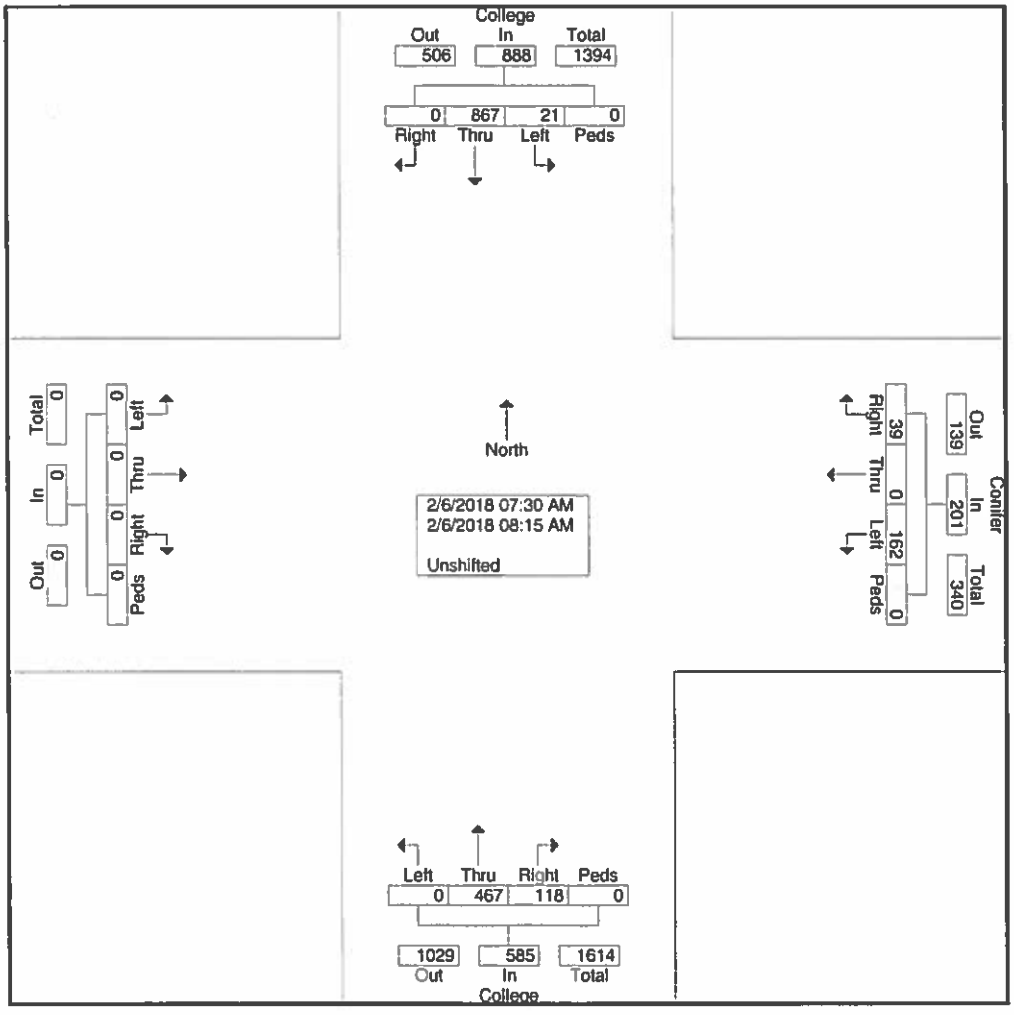
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Conifer
Time: AM
ICU Number: 74

File Name : College & Conifer 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound					Conifer Westbound					College Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:30 AM	0	256	5	0	261	8	0	48	0	56	28	113	0	0	141	0	0	0	0	0	458
07:45 AM	0	237	8	0	245	15	0	38	0	53	42	144	0	0	186	0	0	0	0	0	484
Total	0	493	13	0	506	23	0	86	0	109	70	257	0	0	327	0	0	0	0	0	942
08:00 AM	0	187	6	0	193	9	0	35	0	44	24	107	0	0	131	0	0	0	0	0	368
08:15 AM	0	187	2	0	189	7	0	41	0	48	24	103	0	0	127	0	0	0	0	0	364
Grand Total	0	867	21	0	888	39	0	162	0	201	118	467	0	0	585	0	0	0	0	0	1674
Apprch %	0	97.6	2.4	0		19.4	0	80.6	0		20.2	79.8	0	0		0	0	0	0		
Total %	0	51.8	1.3	0	53	2.3	0	9.7	0	12	7	27.9	0	0	34.9	0	0	0	0	0	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

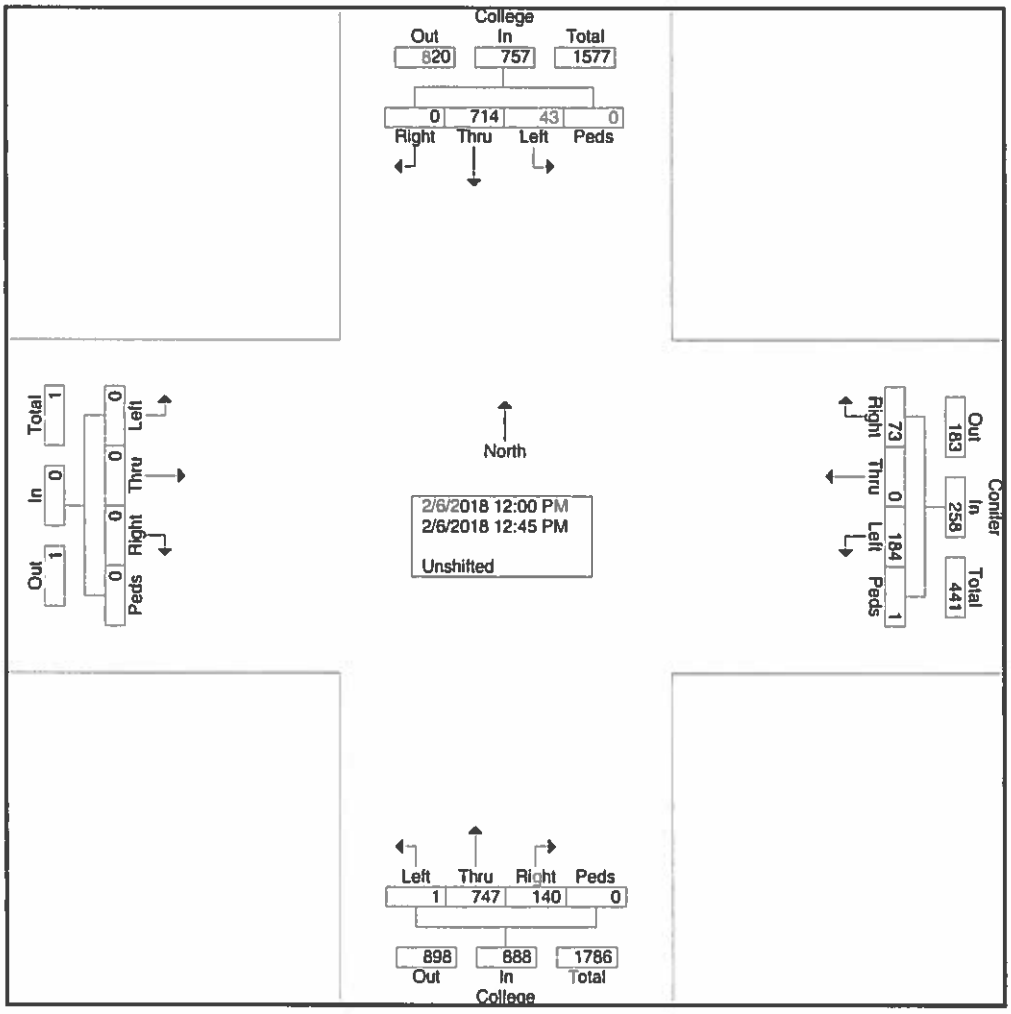
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Conifer
Time: NN
ICU Number: 74

File Name : College & Conifer 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound					Conifer Westbound					College Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
12:00 PM	0	189	11	0	200	22	0	57	1	80	44	209	1	0	254	0	0	0	0	0	534
12:15 PM	0	190	10	0	200	16	0	31	0	47	31	179	0	0	210	0	0	0	0	0	457
12:30 PM	0	176	10	0	186	14	0	52	0	66	29	169	0	0	198	0	0	0	0	0	450
12:45 PM	0	159	12	0	171	21	0	44	0	65	36	190	0	0	226	0	0	0	0	0	462
Total	0	714	43	0	757	73	0	184	1	258	140	747	1	0	888	0	0	0	0	0	1903
Grand Total	0	714	43	0	757	73	0	184	1	258	140	747	1	0	888	0	0	0	0	0	1903
Apprch %	0	94.3	5.7	0		28.3	0	71.3	0.4		15.8	84.1	0.1	0		0	0	0	0		
Total %	0	37.5	2.3	0	39.8	3.8	0	9.7	0.1	13.6	7.4	39.3	0.1	0	46.7	0	0	0	0	0	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

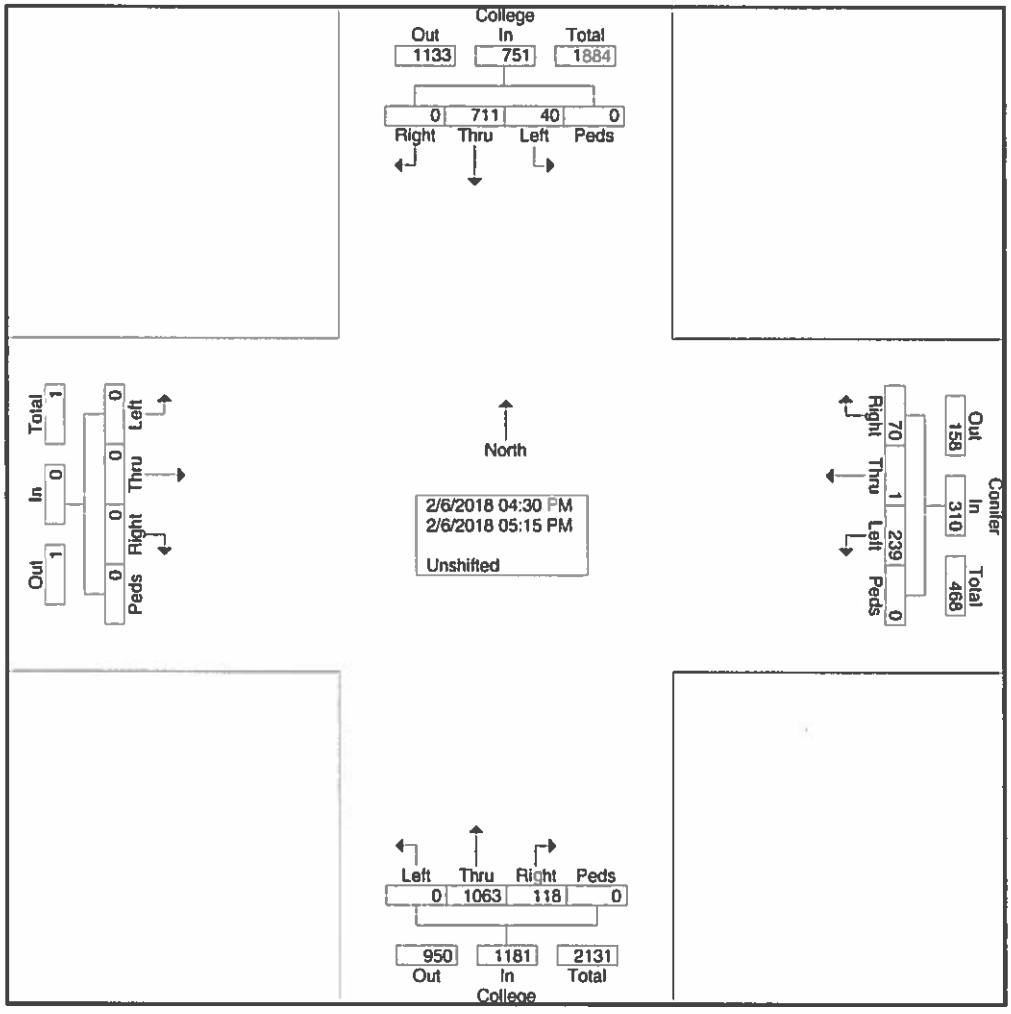
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Conifer
Time: PM
ICU Number: 74

File Name : College & Conifer 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound					Conifer Westbound					College Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:30 PM	0	191	13	0	204	17	0	71	0	88	26	233	0	0	259	0	0	0	0	0	551
04:45 PM	0	173	6	0	179	13	0	45	0	58	27	247	0	0	274	0	0	0	0	0	511
Total	0	364	19	0	383	30	0	116	0	146	53	480	0	0	533	0	0	0	0	0	1062
05:00 PM	0	179	15	0	194	16	1	62	0	79	39	295	0	0	334	0	0	0	0	0	607
05:15 PM	0	168	6	0	174	24	0	61	0	85	26	288	0	0	314	0	0	0	0	0	573
Grand Total	0	711	40	0	751	70	1	239	0	310	118	1063	0	0	1181	0	0	0	0	0	2242
Apprch %	0	94.7	5.3	0		22.6	0.3	77.1	0		10	90	0	0		0	0	0	0		
Total %	0	31.7	1.8	0	33.5	3.1	0	10.7	0	13.8	5.3	47.4	0	0	52.7	0	0	0	0	0	



City of Fort Collins Traffic Operations

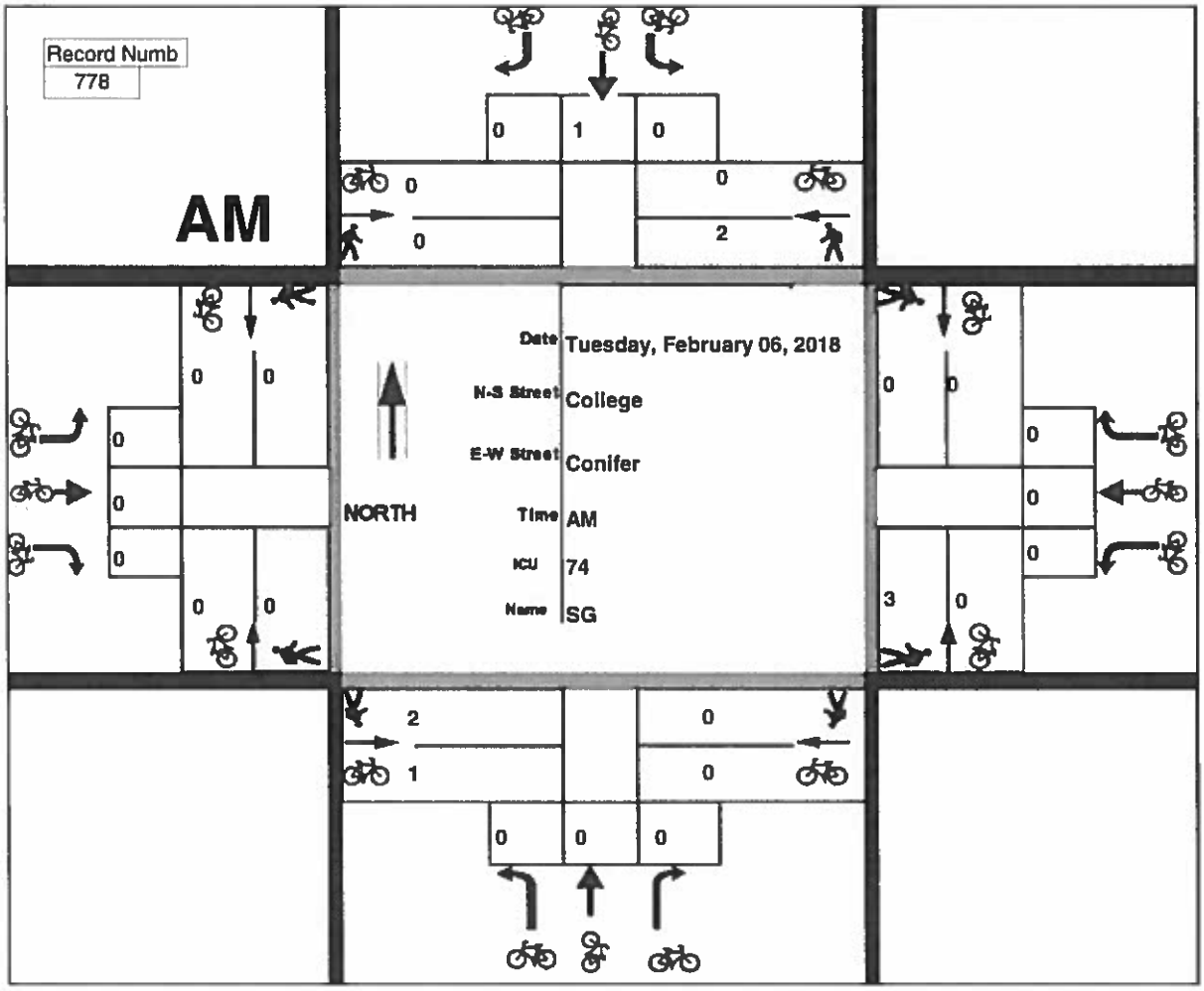
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Conifer
Time: PHF
ICU Number: 74

File Name : College & Conifer 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

	College Southbound					Conifer Westbound					College Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	256	5	0	261	8	0	48	0	56	28	113	0	0	141	0	0	0	0	0	458
07:45 AM	0	237	8	0	245	15	0	38	0	53	42	144	0	0	186	0	0	0	0	0	484
08:00 AM	0	187	6	0	193	9	0	35	0	44	24	107	0	0	131	0	0	0	0	0	368
08:15 AM	0	187	2	0	189	7	0	41	0	48	24	103	0	0	127	0	0	0	0	0	364
Total Volume	0	867	21	0	888	39	0	162	0	201	118	467	0	0	585	0	0	0	0	0	1674
% App. Total	0	97.6	2.4	0		19.4	0	80.6	0		20.2	79.8	0	0		0	0	0	0		
PHF	.000	.847	.656	.000	.851	.650	.000	.844	.000	.897	.702	.811	.000	.000	.786	.000	.000	.000	.000	.000	.865
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	189	11	0	200	22	0	57	1	80	44	209	1	0	254	0	0	0	0	0	534
12:15 PM	0	190	10	0	200	16	0	31	0	47	31	179	0	0	210	0	0	0	0	0	457
12:30 PM	0	176	10	0	186	14	0	52	0	66	29	169	0	0	198	0	0	0	0	0	450
12:45 PM	0	159	12	0	171	21	0	44	0	65	36	190	0	0	226	0	0	0	0	0	462
Total Volume	0	714	43	0	757	73	0	184	1	258	140	747	1	0	888	0	0	0	0	0	1903
% App. Total	0	94.3	5.7	0		28.3	0	71.3	0.4		15.8	84.1	0.1	0		0	0	0	0		
PHF	.000	.939	.896	.000	.946	.830	.000	.807	.250	.806	.795	.894	.250	.000	.874	.000	.000	.000	.000	.000	.891
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	191	13	0	204	17	0	71	0	88	26	233	0	0	259	0	0	0	0	0	551
04:45 PM	0	173	6	0	179	13	0	45	0	58	27	247	0	0	274	0	0	0	0	0	511
05:00 PM	0	179	15	0	194	16	1	62	0	79	39	295	0	0	334	0	0	0	0	0	607
05:15 PM	0	168	6	0	174	24	0	61	0	85	26	288	0	0	314	0	0	0	0	0	573
Total Volume	0	711	40	0	751	70	1	239	0	310	118	1063	0	0	1181	0	0	0	0	0	2242
% App. Total	0	94.7	5.3	0		22.6	0.3	77.1	0		10	90	0	0		0	0	0	0		
PHF	.000	.931	.667	.000	.920	.729	.250	.842	.000	.881	.756	.901	.000	.000	.884	.000	.000	.000	.000	.000	.923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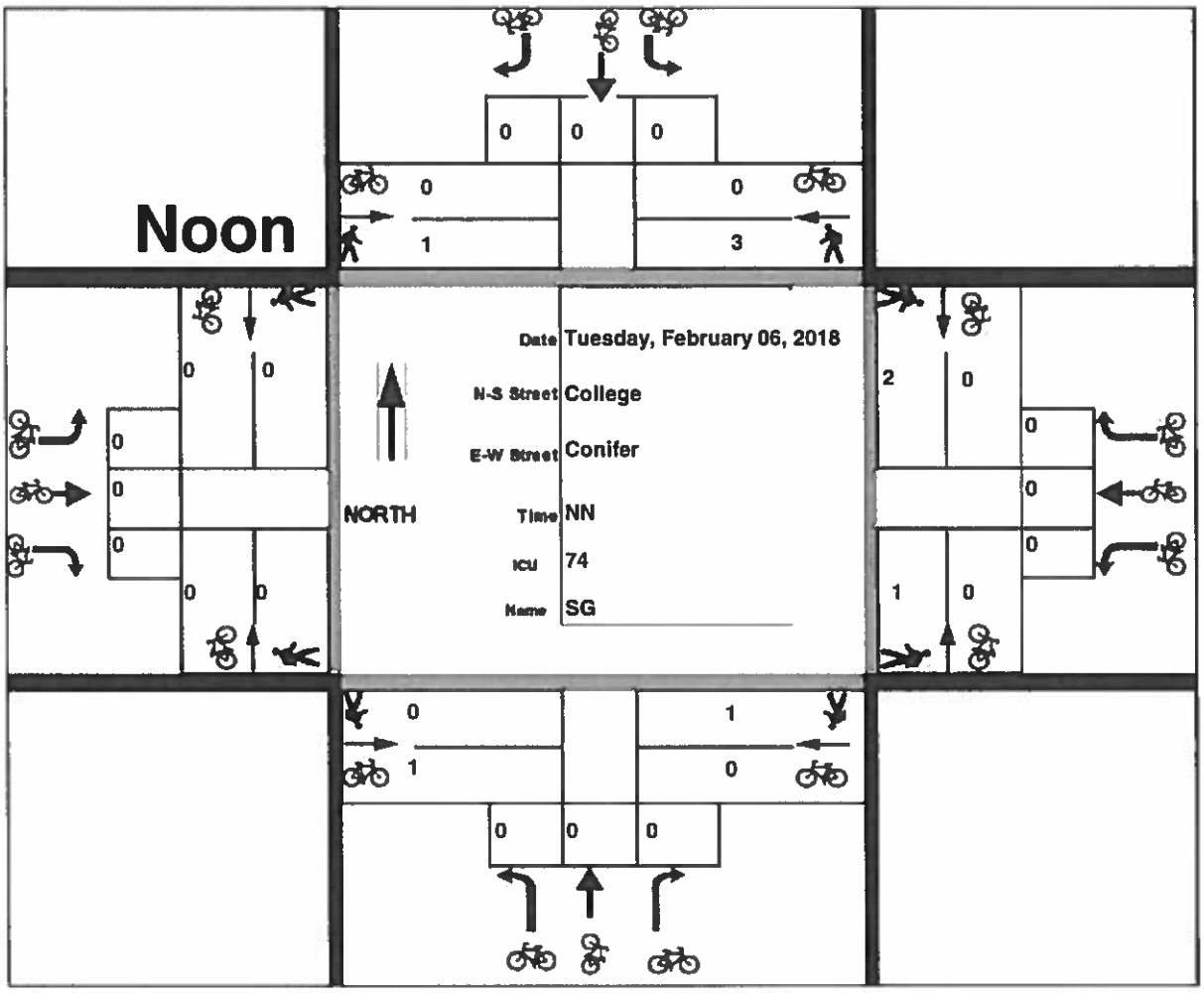
Date
Tuesday, February 06, 2018
N-S Street
College
E-W Street
Conifer
NORTH
Time
AM
ICU
74
Name
SG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Date Tuesday, February 06, 2018
N-S Street College
E-W Street Conifer
NORTH
Time NN
ICU 74
Name SG
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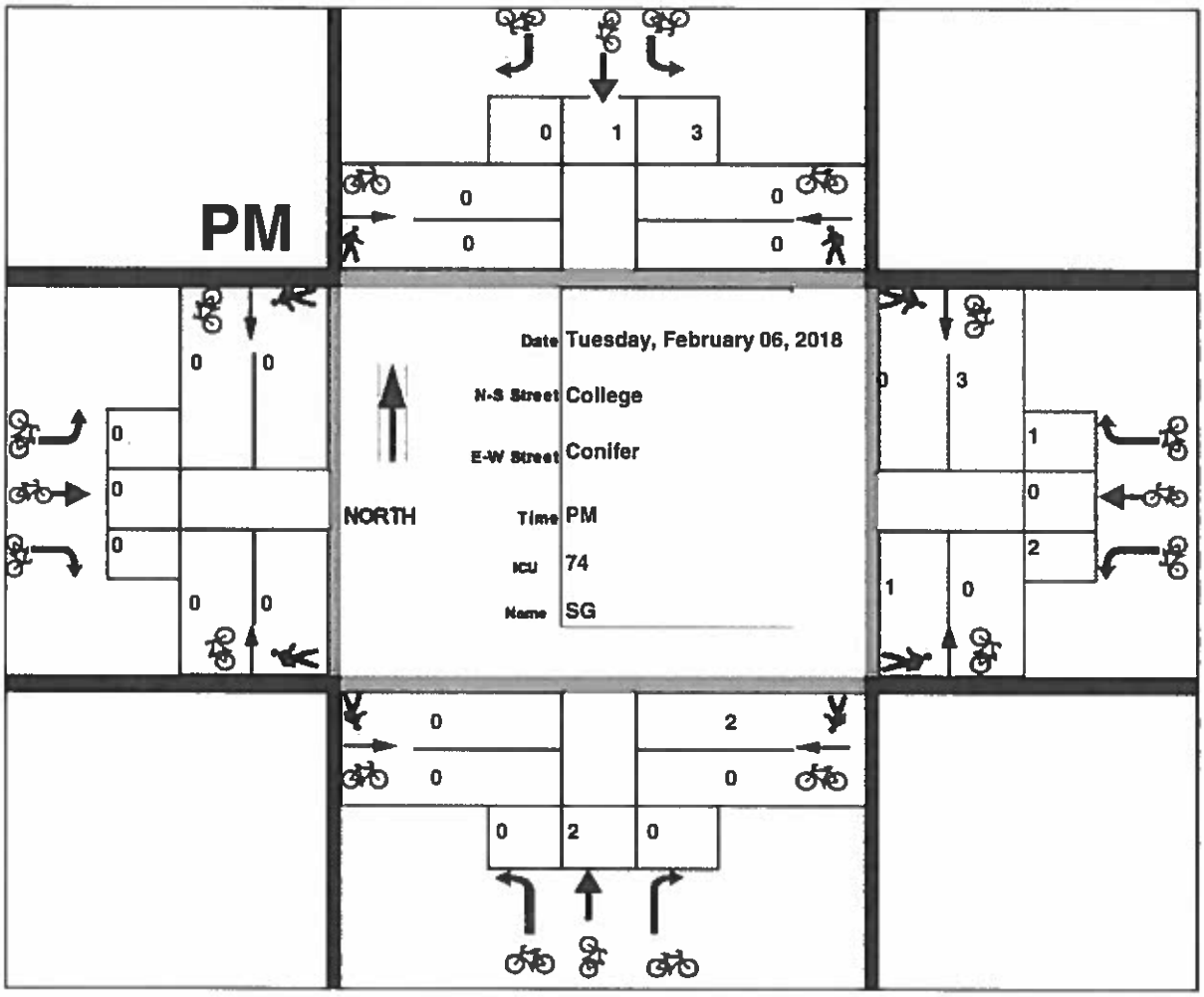
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0 0
0 0
0 3
1
0
2
1 0
0 2 0
Date Tuesday, February 06, 2018
N-S Street College
E-W Street Conifer
NORTH
Time PM
ICU 74
Name SG

City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

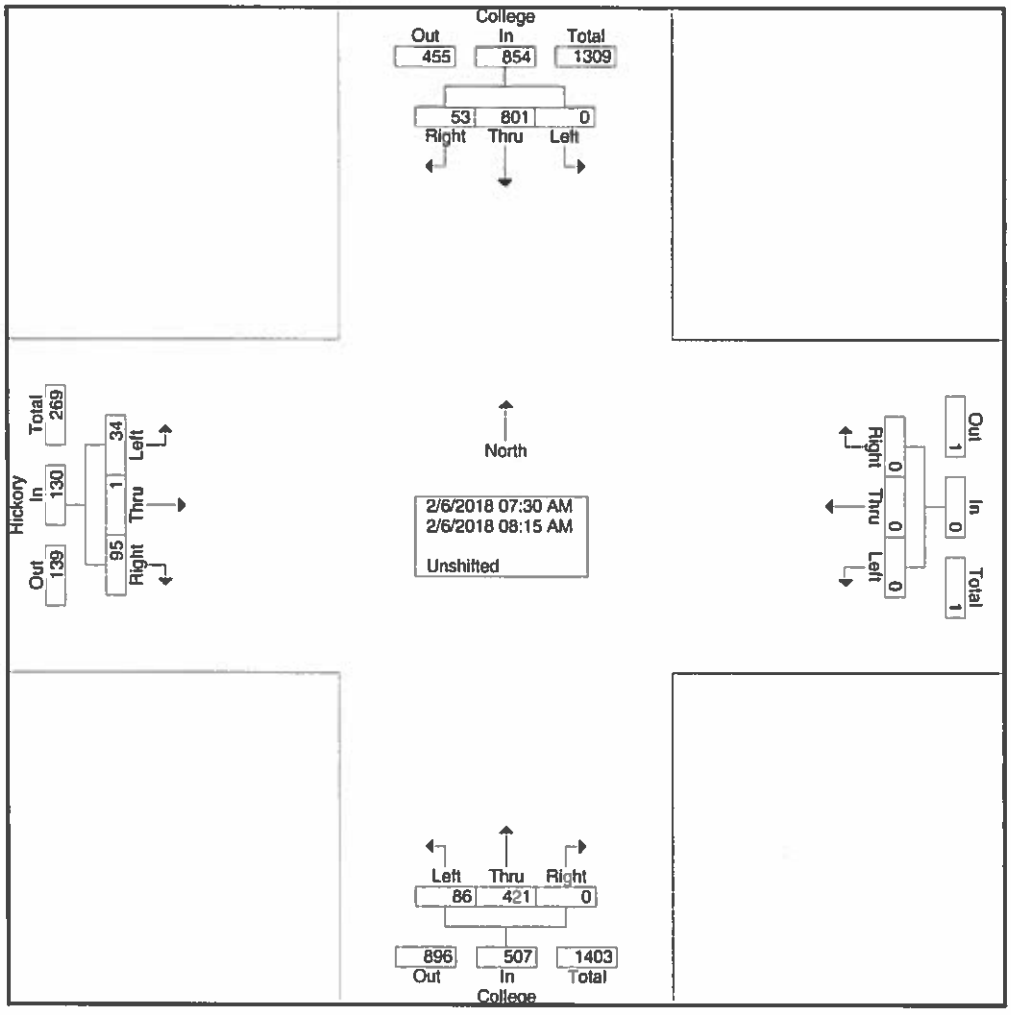
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Hickory
Time: AM
ICU Number: 74

File Name : College & Hickory 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Westbound				College Northbound				Hickory Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:30 AM	14	240	0	254	0	0	0	0	0	105	24	129	24	0	5	29	412
07:45 AM	14	233	0	247	0	0	0	0	0	121	24	145	23	1	12	36	428
Total	28	473	0	501	0	0	0	0	0	226	48	274	47	1	17	65	840
08:00 AM	14	160	0	174	0	0	0	0	0	98	21	119	28	0	10	38	331
08:15 AM	11	168	0	179	0	0	0	0	0	97	17	114	20	0	7	27	320
Grand Total	53	801	0	854	0	0	0	0	0	421	86	507	95	1	34	130	1491
Apprch %	6.2	93.8	0		0	0	0		0	83	17		73.1	0.8	26.2		
Total %	3.6	53.7	0	57.3	0	0	0	0	0	28.2	5.8	34	6.4	0.1	2.3	8.7	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

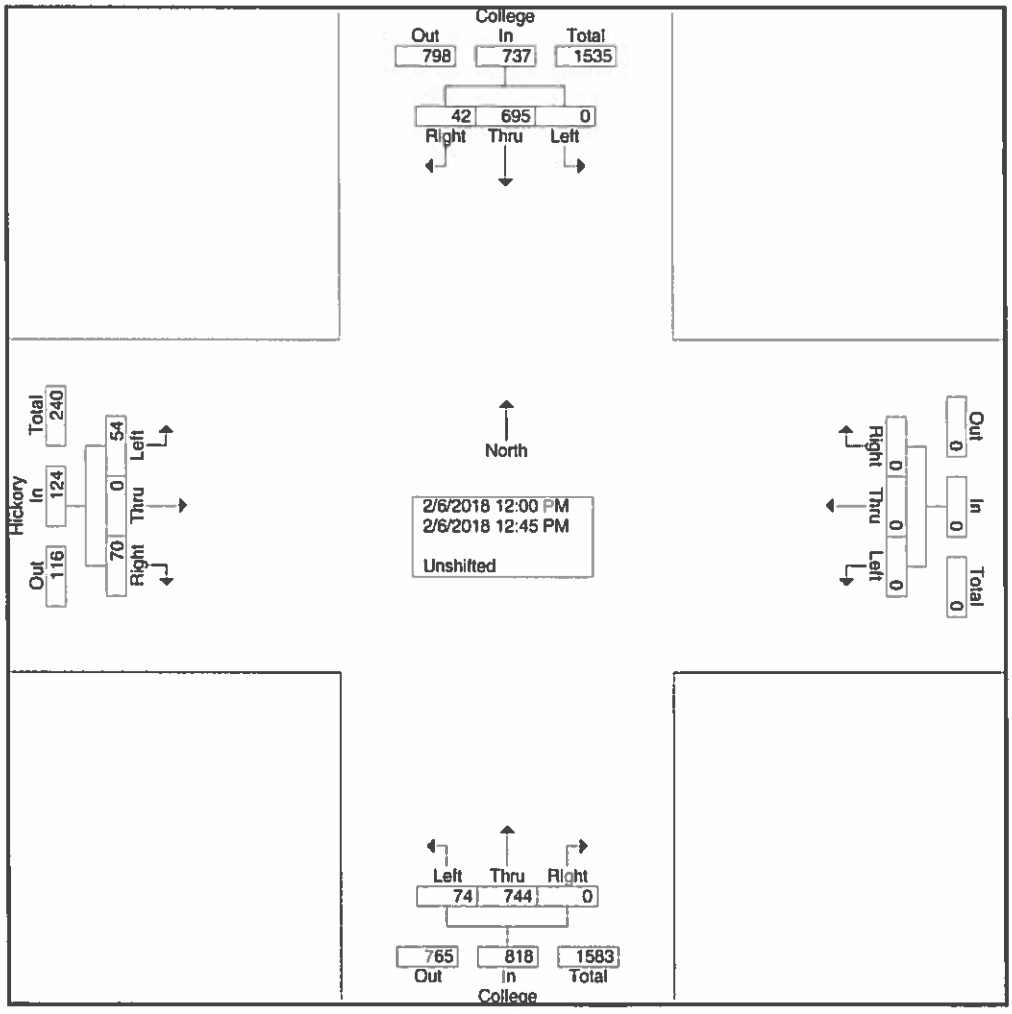
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Hickory
Time: NN
ICU Number: 74

File Name : College & Hickory 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Westbound				College Northbound				Hickory Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
12:00 PM	13	171	0	184	0	0	0	0	0	222	15	237	27	0	15	42	463
12:15 PM	11	177	0	188	0	0	0	0	0	185	17	202	20	0	16	36	426
12:30 PM	10	167	0	177	0	0	0	0	0	149	19	168	10	0	10	20	365
12:45 PM	8	180	0	188	0	0	0	0	0	188	23	211	13	0	13	26	425
Total	42	695	0	737	0	0	0	0	0	744	74	818	70	0	54	124	1679
Grand Total	42	695	0	737	0	0	0	0	0	744	74	818	70	0	54	124	1679
Apprch %	5.7	94.3	0		0	0	0		0	91	9		56.5	0	43.5		
Total %	2.5	41.4	0	43.9	0	0	0	0	0	44.3	4.4	48.7	4.2	0	3.2	7.4	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

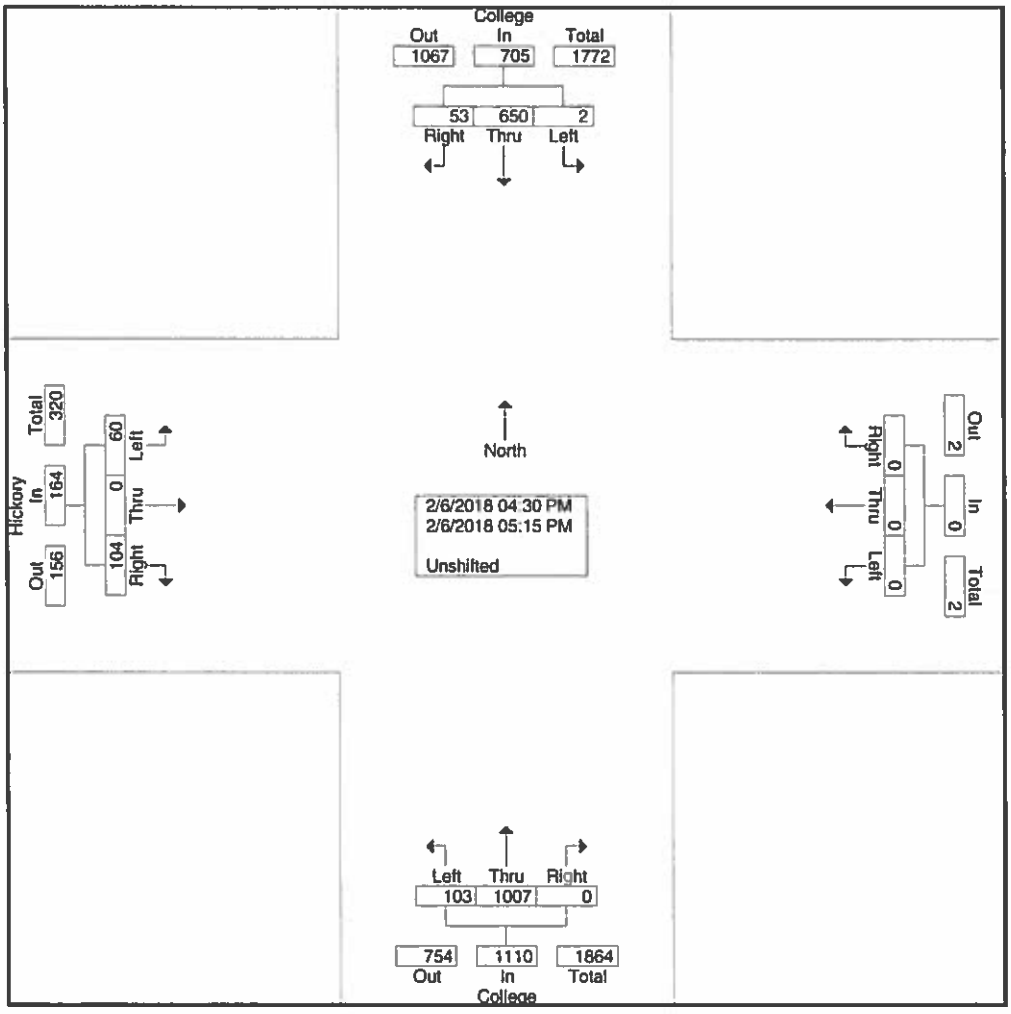
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Hickory
Time: PM
ICU Number: 74

File Name : College & Hickory 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Westbound				College Northbound				Hickory Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:30 PM	14	170	1	185	0	0	0	0	0	217	19	236	30	0	15	45	466
04:45 PM	13	160	1	174	0	0	0	0	0	242	29	271	21	0	13	34	479
Total	27	330	2	359	0	0	0	0	0	459	48	507	51	0	28	79	945
05:00 PM	9	150	0	159	0	0	0	0	0	265	23	288	34	0	17	51	498
05:15 PM	17	170	0	187	0	0	0	0	0	283	32	315	19	0	15	34	536
Grand Total	53	650	2	705	0	0	0	0	0	1007	103	1110	104	0	60	164	1979
Apprch %	7.5	92.2	0.3		0	0	0		0	90.7	9.3		63.4	0	36.6		
Total %	2.7	32.8	0.1	35.6	0	0	0	0	0	50.9	5.2	56.1	5.3	0	3	8.3	



City of Fort Collins Traffic Operations

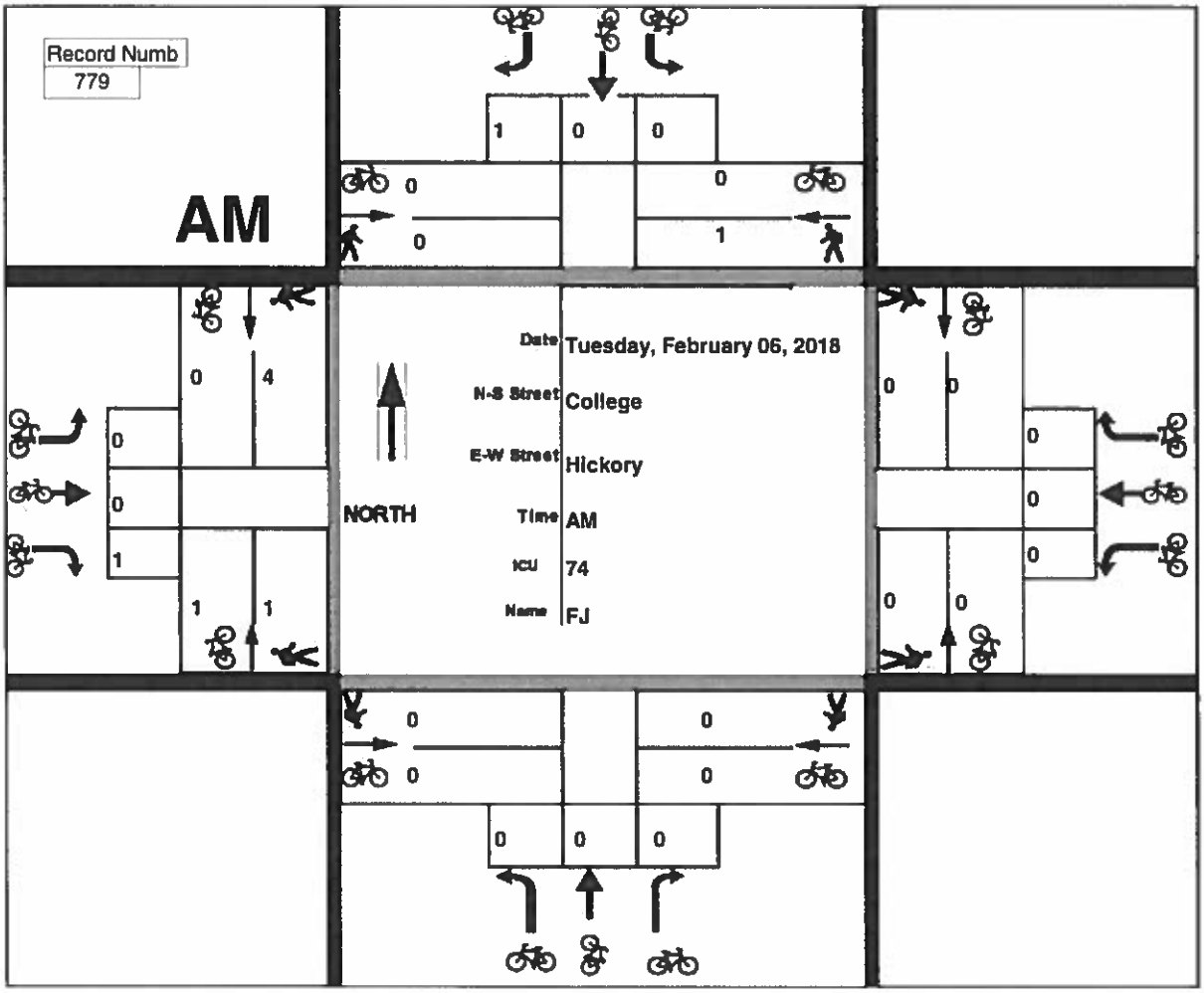
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

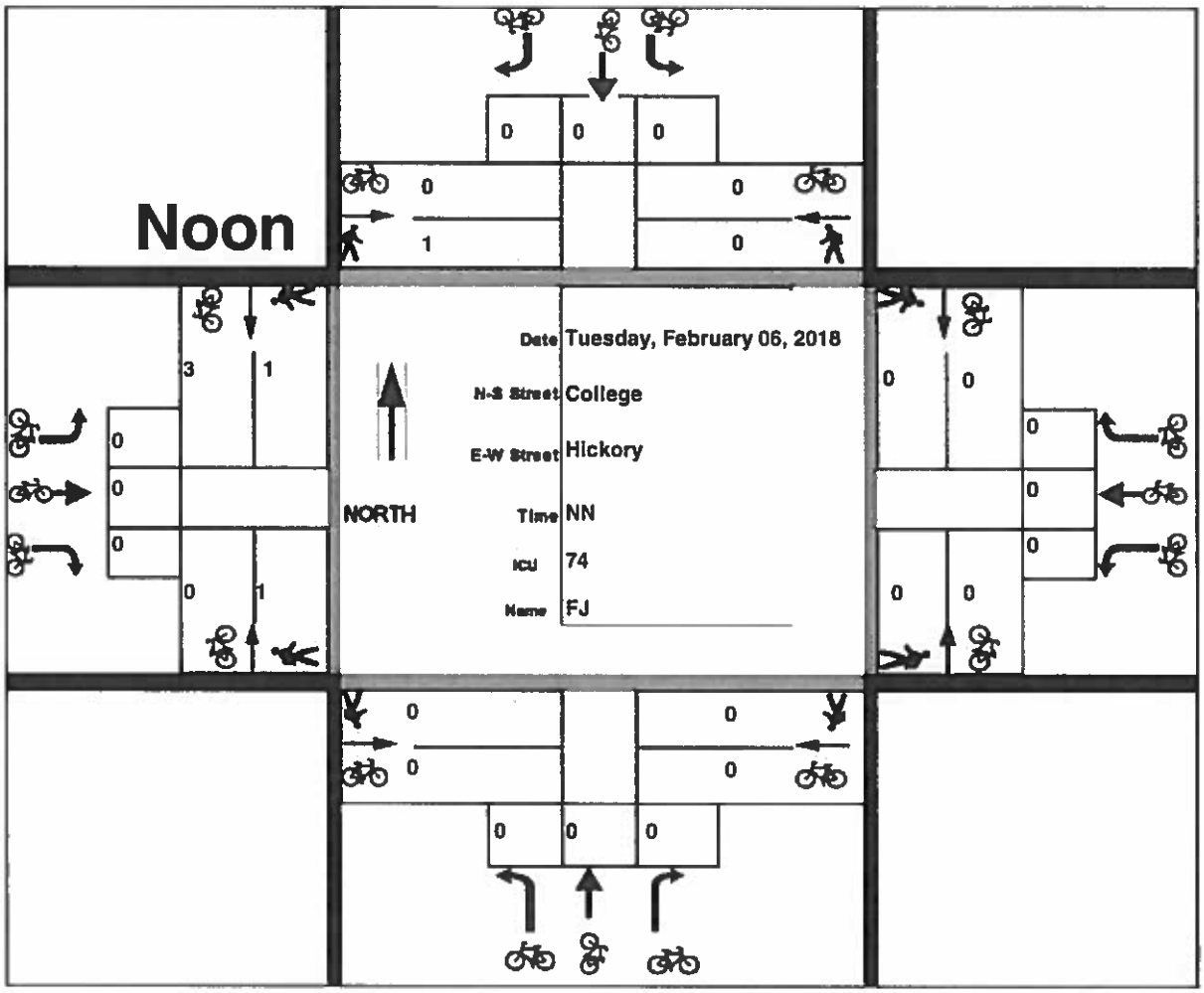
Peak Hour Turning Movement Study

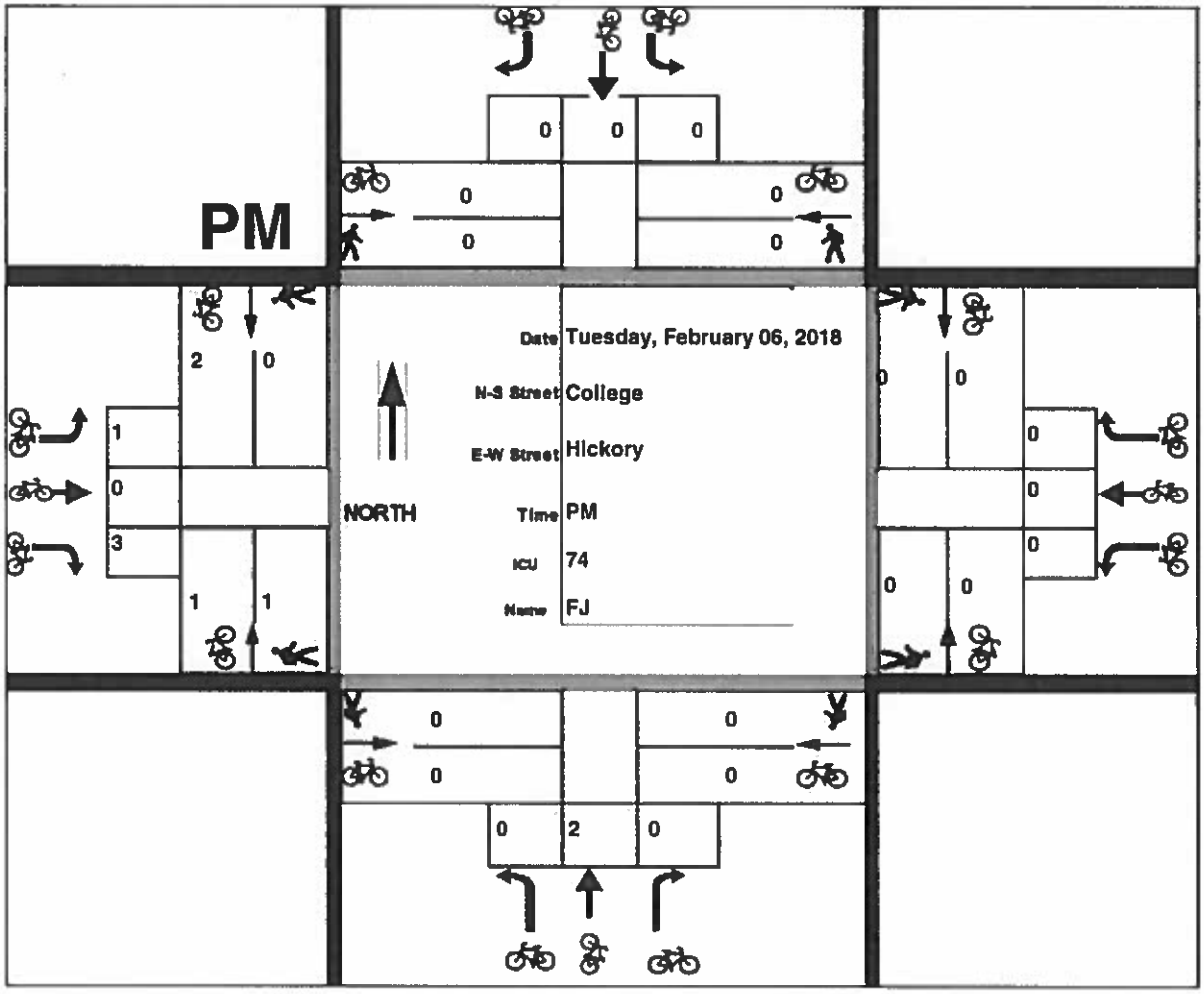
North/South Street: College
East/West Street: Hickory
Time: PHF
ICU Number: 74

File Name : College & Hickory 2-6-18
Site Code : 00000074
Start Date : 2/6/2018
Page No : 1

	College Southbound				Westbound				College Northbound				Hickory Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	14	240	0	254	0	0	0	0	0	105	24	129	24	0	5	29	412
07:45 AM	14	233	0	247	0	0	0	0	0	121	24	145	23	1	12	36	428
08:00 AM	14	160	0	174	0	0	0	0	0	98	21	119	28	0	10	38	331
08:15 AM	11	168	0	179	0	0	0	0	0	97	17	114	20	0	7	27	320
Total Volume	53	801	0	854	0	0	0	0	0	421	86	507	95	1	34	130	1491
% App. Total	6.2	93.8	0		0	0	0		0	83	17		73.1	0.8	26.2		
PHF	.946	.834	.000	.841	.000	.000	.000	.000	.000	.870	.896	.874	.848	.250	.708	.855	.871
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	13	171	0	184	0	0	0	0	0	222	15	237	27	0	15	42	463
12:15 PM	11	177	0	188	0	0	0	0	0	185	17	202	20	0	16	36	426
12:30 PM	10	167	0	177	0	0	0	0	0	149	19	168	10	0	10	20	365
12:45 PM	8	180	0	188	0	0	0	0	0	188	23	211	13	0	13	26	425
Total Volume	42	695	0	737	0	0	0	0	0	744	74	818	70	0	54	124	1679
% App. Total	5.7	94.3	0		0	0	0		0	91	9		56.5	0	43.5		
PHF	.808	.965	.000	.980	.000	.000	.000	.000	.000	.838	.804	.863	.648	.000	.844	.738	.907
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	14	170	1	185	0	0	0	0	0	217	19	236	30	0	15	45	466
04:45 PM	13	160	1	174	0	0	0	0	0	242	29	271	21	0	13	34	479
05:00 PM	9	150	0	159	0	0	0	0	0	265	23	288	34	0	17	51	498
05:15 PM	17	170	0	187	0	0	0	0	0	283	32	315	19	0	15	34	536
Total Volume	53	650	2	705	0	0	0	0	0	1007	103	1110	104	0	60	164	1979
% App. Total	7.5	92.2	0.3		0	0	0		0	90.7	9.3		63.4	0	36.6		
PHF	.779	.956	.500	.943	.000	.000	.000	.000	.000	.890	.805	.881	.765	.000	.882	.804	.923


Record Numb
779
AM
Date
Tuesday, February 06, 2018
N-S Street
College
E-W Street
Hickory
NORTH
Time
AM
ICU
74
Name
FJ


Noon
Date Tuesday, February 06, 2018
N-S Street College
E-W Street Hickory
NORTH
Time NN
ICU 74
Name FJ


PM
Date Tuesday, February 06, 2018
N-S Street College
E-W Street Hickory
NORTH
Time PM
ICU 74
Name FJ

City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

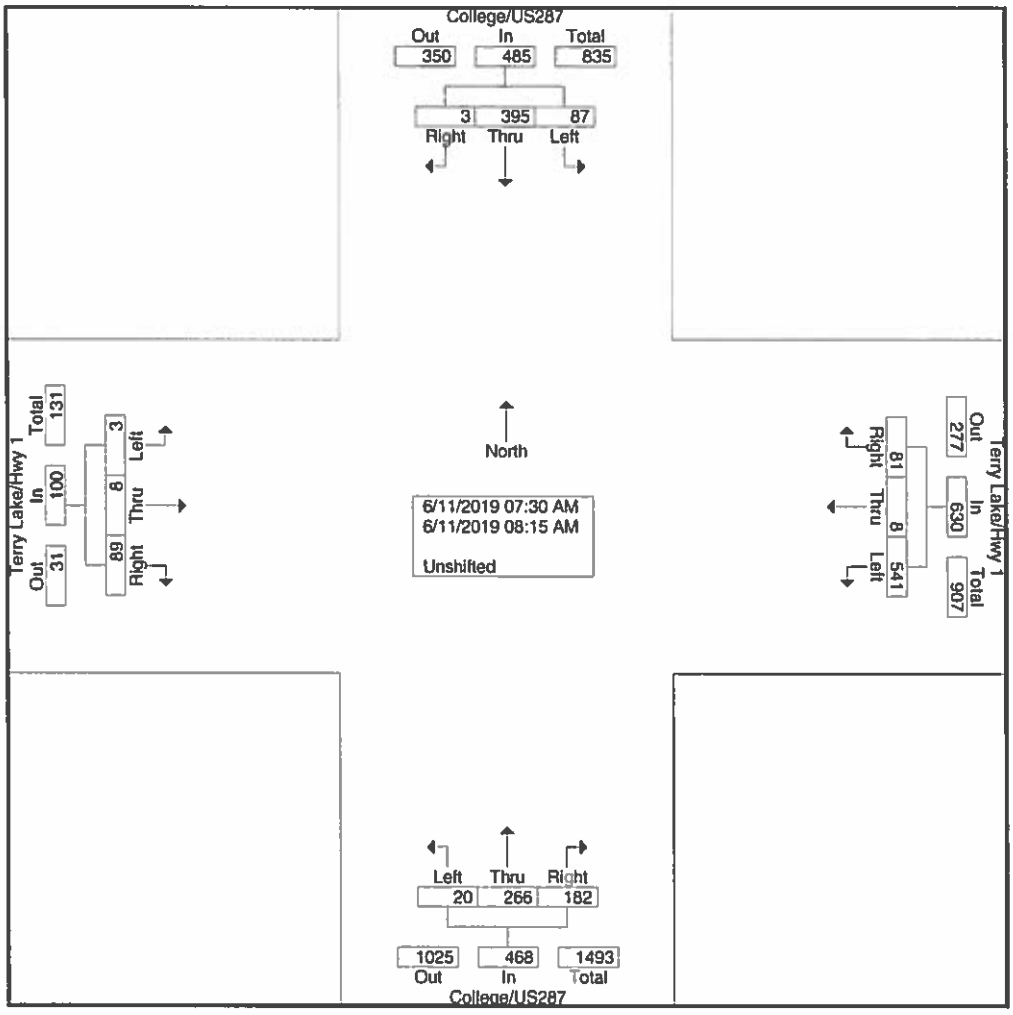
Peak Hour Turning Movement Count

North/South Street: College/US 287
East/West Street: Terry Lake/Hwy 1
Time: AM
ICU Number: 76

File Name : College & HWY 1 6-11-19
Site Code : 00000076
Start Date : 6/11/2019
Page No : 1

Groups Printed- Unshifted

	College/US287 Southbound				Terry Lake/Hwy 1 Westbound				College/US287 Northbound				Terry Lake/Hwy 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:30 AM	1	110	18	129	12	2	136	150	36	42	9	87	32	4	1	37	403
07:45 AM	0	107	27	134	26	3	161	190	54	79	3	136	32	2	1	35	495
Total	1	217	45	263	38	5	297	340	90	121	12	223	64	6	2	72	898
08:00 AM	0	101	20	121	23	1	113	137	45	65	3	113	11	0	1	12	383
08:15 AM	2	77	22	101	20	2	131	153	47	80	5	132	14	2	0	16	402
Grand Total	3	395	87	485	81	8	541	630	182	266	20	468	89	8	3	100	1683
Apprch %	0.6	81.4	17.9		12.9	1.3	85.9		38.9	56.8	4.3		89	8	3		
Total %	0.2	23.5	5.2	28.8	4.8	0.5	32.1	37.4	10.8	15.8	1.2	27.8	5.3	0.5	0.2	5.9	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

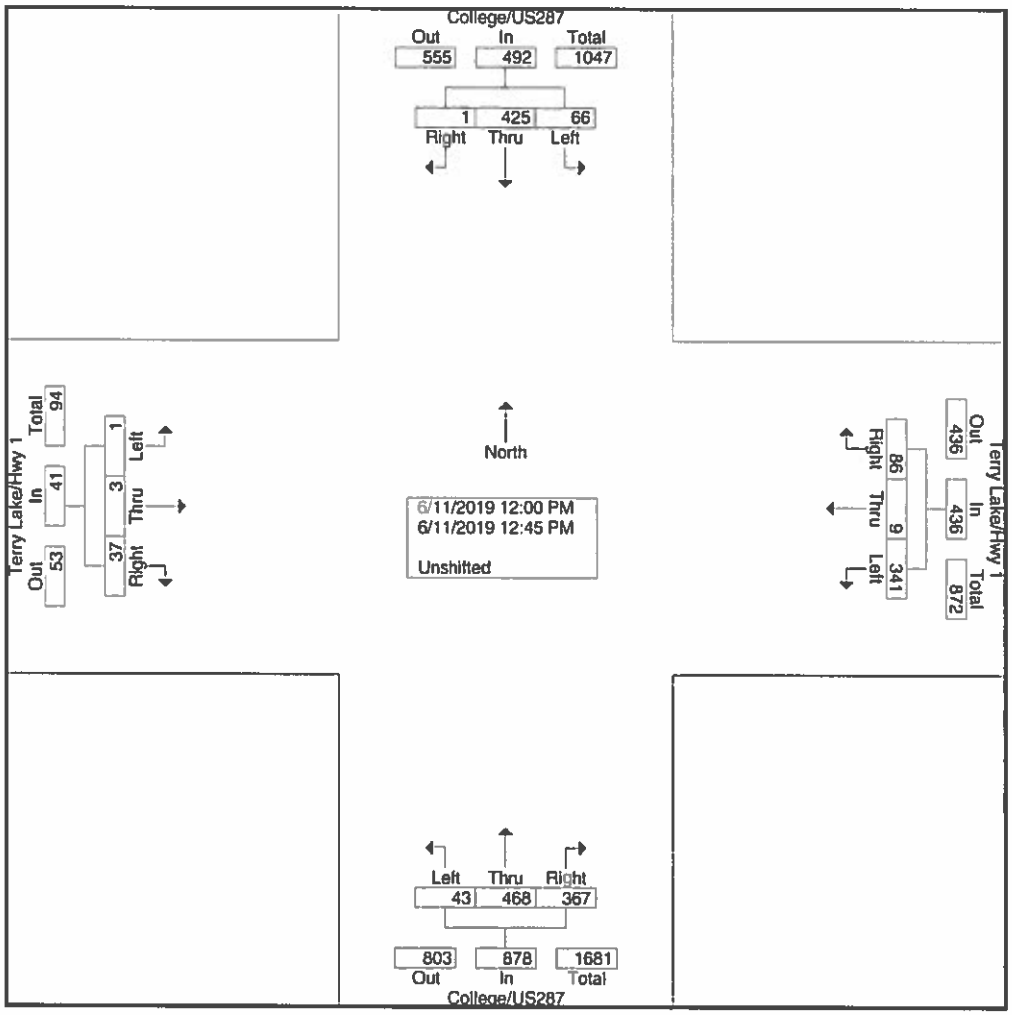
Peak Hour Turning Movement Count

North/South Street: College/US 287
East/West Street: Terry Lake/Hwy 1
Time: NN
ICU Number: 76

File Name : College & HWY 1 6-11-19
Site Code : 00000076
Start Date : 6/11/2019
Page No : 1

Groups Printed- Unshifted

	College/US287 Southbound				Terry Lake/Hwy 1 Westbound				College/US287 Northbound				Terry Lake/Hwy 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
12:00 PM	0	114	22	136	26	3	87	116	89	120	11	220	3	3	0	6	478
12:15 PM	1	105	17	123	12	2	85	99	98	115	10	223	10	0	1	11	456
12:30 PM	0	113	13	126	20	4	88	112	85	109	15	209	8	0	0	8	455
12:45 PM	0	93	14	107	28	0	81	109	95	124	7	226	16	0	0	16	458
Total	1	425	66	492	86	9	341	436	367	468	43	878	37	3	1	41	1847
Grand Total	1	425	66	492	86	9	341	436	367	468	43	878	37	3	1	41	1847
Apprch %	0.2	86.4	13.4		19.7	2.1	78.2		41.8	53.3	4.9		90.2	7.3	2.4		
Total %	0.1	23	3.6	26.6	4.7	0.5	18.5	23.6	19.9	25.3	2.3	47.5	2	0.2	0.1	2.2	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

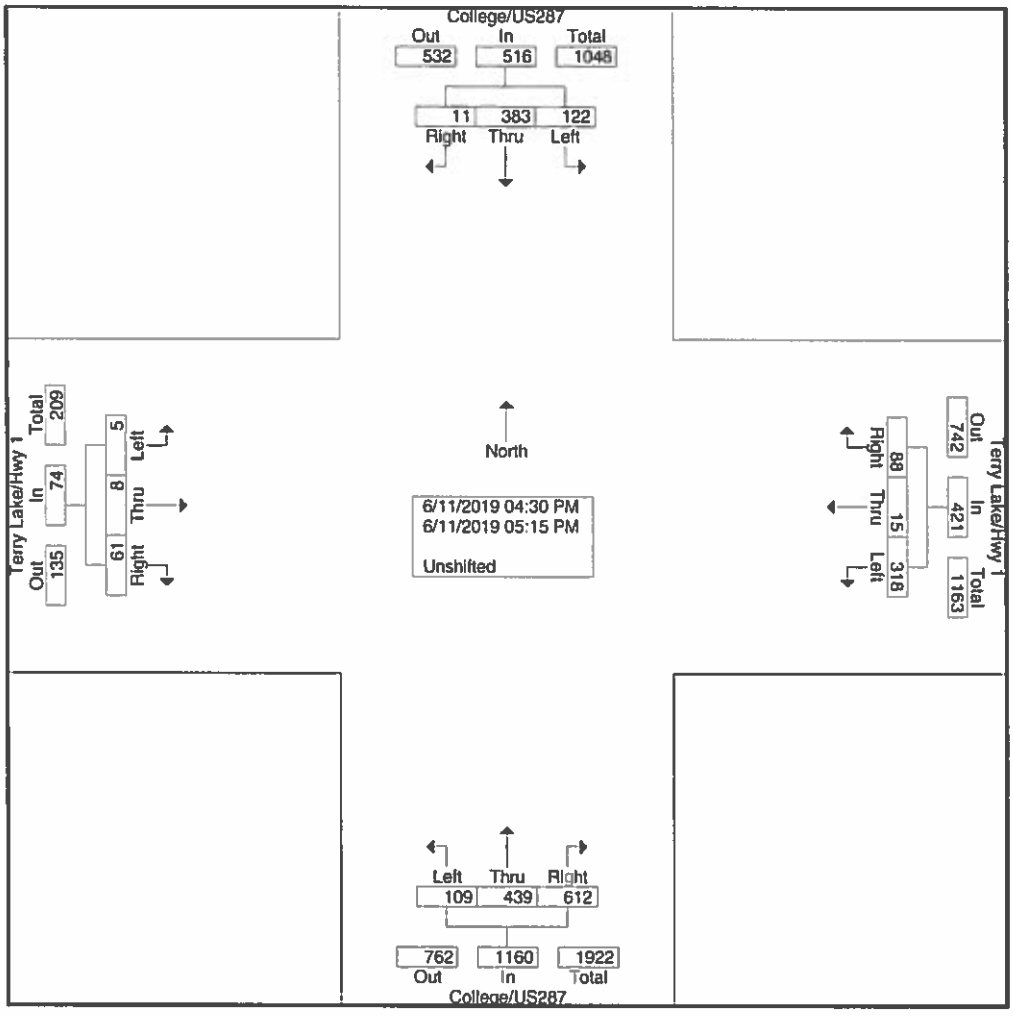
Peak Hour Turning Movement Count

North/South Street: College/US 287
East/West Street: Terry Lake/Hwy 1
Time: PM
ICU Number: 76

File Name : College & HWY 1 6-11-19
Site Code : 00000076
Start Date : 6/11/2019
Page No : 1

Groups Printed- Unshifted

	College/US287 Southbound				Terry Lake/Hwy 1 Westbound				College/US287 Northbound				Terry Lake/Hwy 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:30 PM	4	93	20	117	19	3	86	108	123	98	28	249	13	3	0	16	490
04:45 PM	1	97	33	131	26	3	88	117	157	143	16	316	18	2	1	21	585
Total	5	190	53	248	45	6	174	225	280	241	44	565	31	5	1	37	1075
05:00 PM	4	113	38	155	22	5	67	94	197	109	37	343	13	2	3	18	610
05:15 PM	2	80	31	113	21	4	77	102	135	89	28	252	17	1	1	19	486
Grand Total	11	383	122	516	88	15	318	421	612	439	109	1160	61	8	5	74	2171
Apprch %	2.1	74.2	23.6		20.9	3.6	75.5		52.8	37.8	9.4		82.4	10.8	6.8		
Total %	0.5	17.6	5.6	23.8	4.1	0.7	14.6	19.4	28.2	20.2	5	53.4	2.8	0.4	0.2	3.4	



City of Fort Collins Traffic Operations

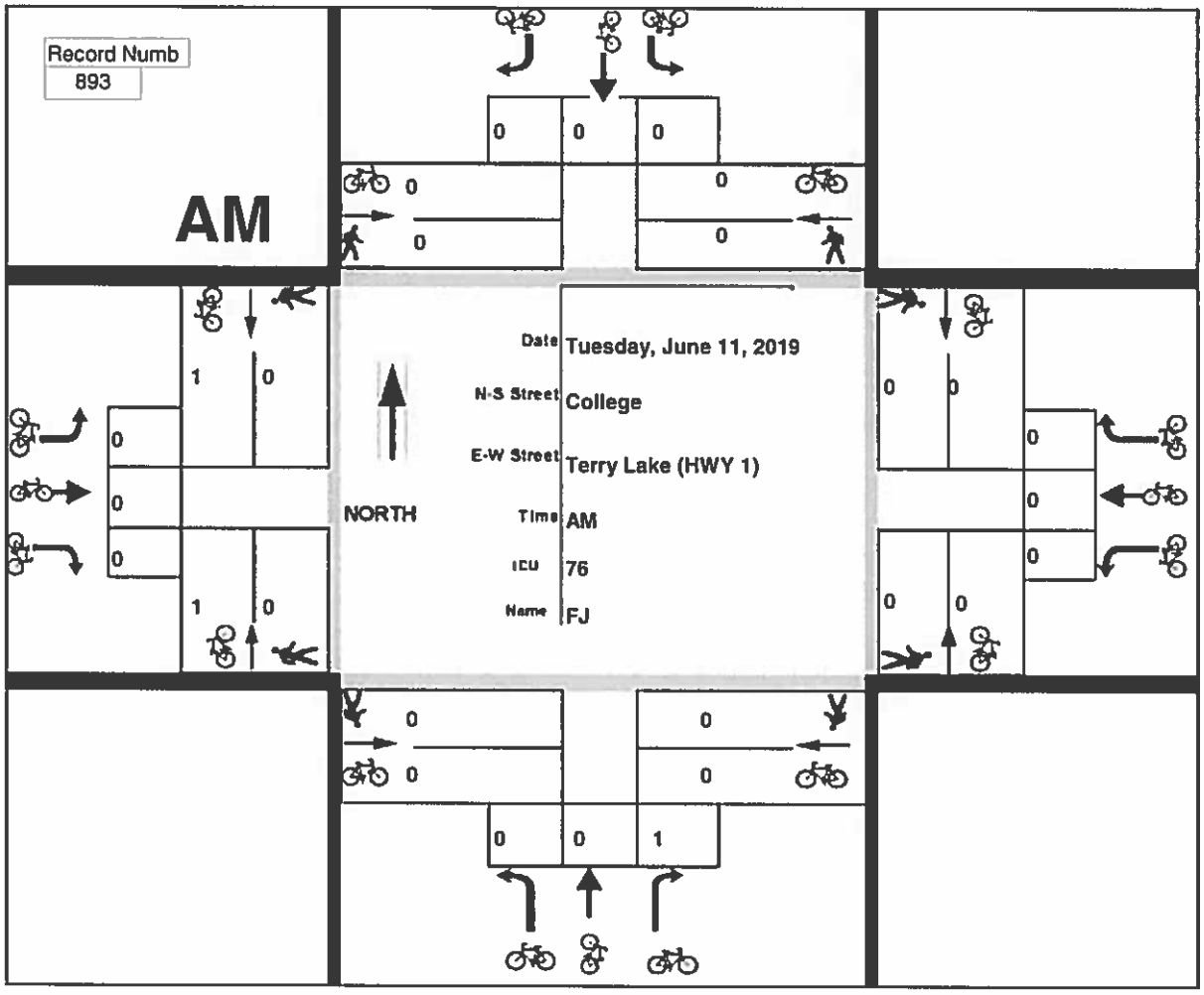
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Count

North/South Street: College/US 287
East/West Street: Terry Lake/Hwy 1
Time: PHF
ICU Number: 76

File Name : College & HWY 1 6-11-19
Site Code : 00000076
Start Date : 6/11/2019
Page No : 1

	College/US287 Southbound				Terry Lake/Hwy 1 Westbound				College/US287 Northbound				Terry Lake/Hwy 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	**110**	18	129	12	2	136	150	36	42	**9**	87	32	4	1	37	403
07:45 AM	0	107	**27**	134	**26**	**3**	**161**	**190**	**54**	79	**3**	136	32	2	1	35	**495**
08:00 AM	0	101	20	121	23	1	113	137	45	65	3	113	11	0	1	12	383
08:15 AM	**2**	77	22	101	20	2	131	153	47	**80**	5	132	14	2	0	16	402
Total Volume	3	395	87	485	81	8	541	630	182	266	20	468	89	8	3	100	1683
% App. Total	0.6	81.4	17.9		12.9	1.3	85.9		38.9	56.8	4.3		89	8	3		
PHF	.375	.898	.806	.905	.779	.667	.840	.829	.843	.831	.556	.860	.695	.500	.750	.676	.850
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	**114**	**22**	**136**	26	3	87	**116**	89	120	11	220	3	3	0	6	478
12:15 PM	**1**	105	17	123	12	2	85	99	**98**	115	10	223	10	0	**1**	11	456
12:30 PM	0	113	13	126	20	**4**	**88**	112	85	109	**15**	209	8	0	0	8	455
12:45 PM	0	93	14	107	**28**	0	81	109	95	**124**	7	**226**	**16**	0	0	**16**	458
Total Volume	1	425	66	492	86	9	341	436	367	468	43	878	37	3	1	41	1847
% App. Total	0.2	86.4	13.4		19.7	2.1	78.2		41.8	53.3	4.9		90.2	7.3	2.4		
PHF	.250	.932	.750	.904	.768	.563	.969	.940	.936	.944	.717	.971	.578	.250	.250	.641	.966
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**4**	93	20	117	19	3	86	108	123	98	28	249	13	3	0	16	490
04:45 PM	1	97	33	131	**26**	3	**88**	**117**	157	**143**	16	316	**18**	2	1	**21**	585
05:00 PM	4	**113**	**38**	**155**	22	**5**	67	94	**197**	109	**37**	**343**	13	2	**3**	18	**610**
05:15 PM	2	80	31	113	21	4	77	102	135	89	28	252	17	1	1	19	486
Total Volume	11	383	122	516	88	15	318	421	612	439	109	1160	61	8	5	74	2171
% App. Total	2.1	74.2	23.6		20.9	3.6	75.5		52.8	37.8	9.4		82.4	10.8	6.8		
PHF	.688	.847	.803	.832	.846	.750	.903	.900	.777	.767	.736	.845	.847	.667	.417	.881	.890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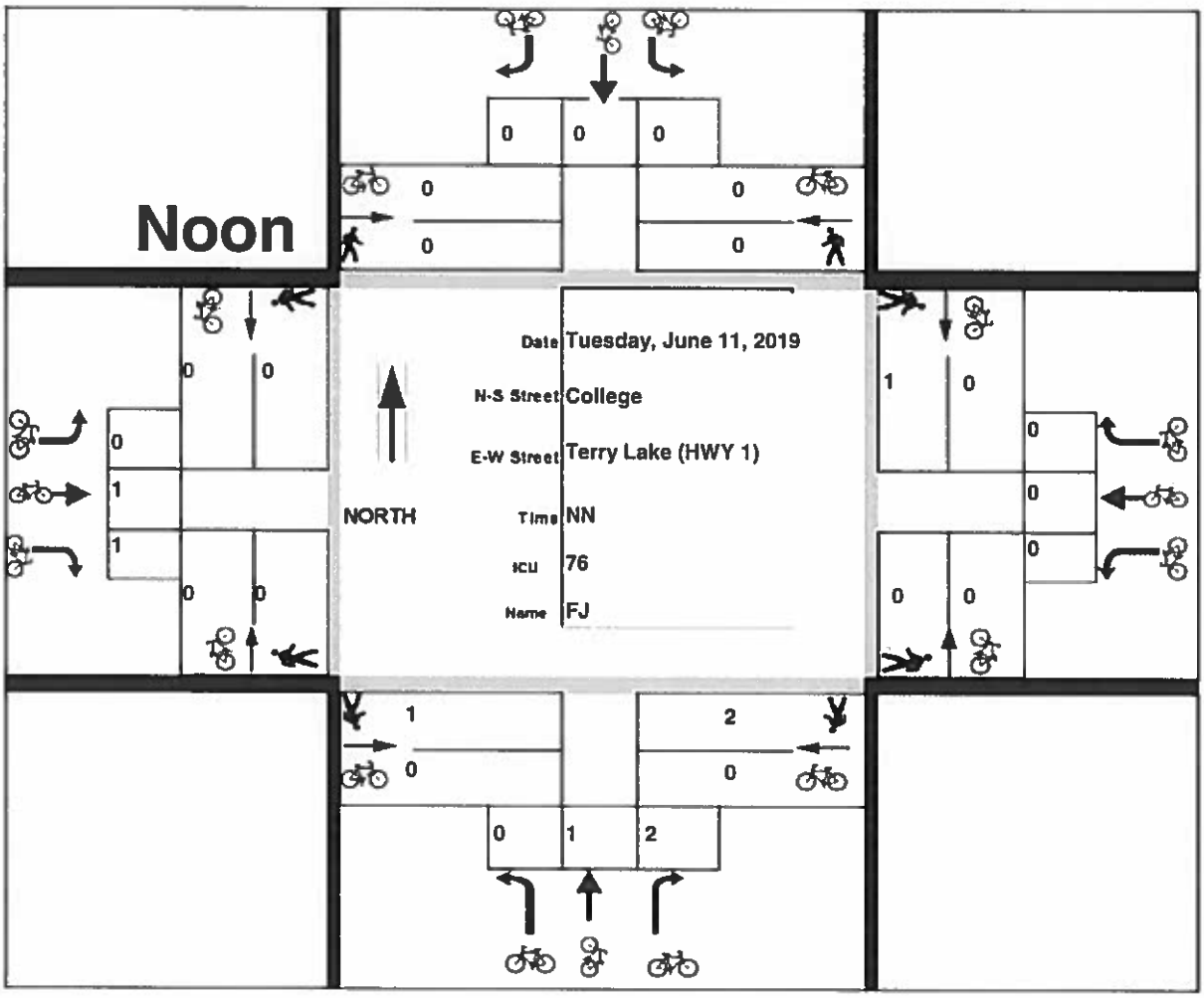
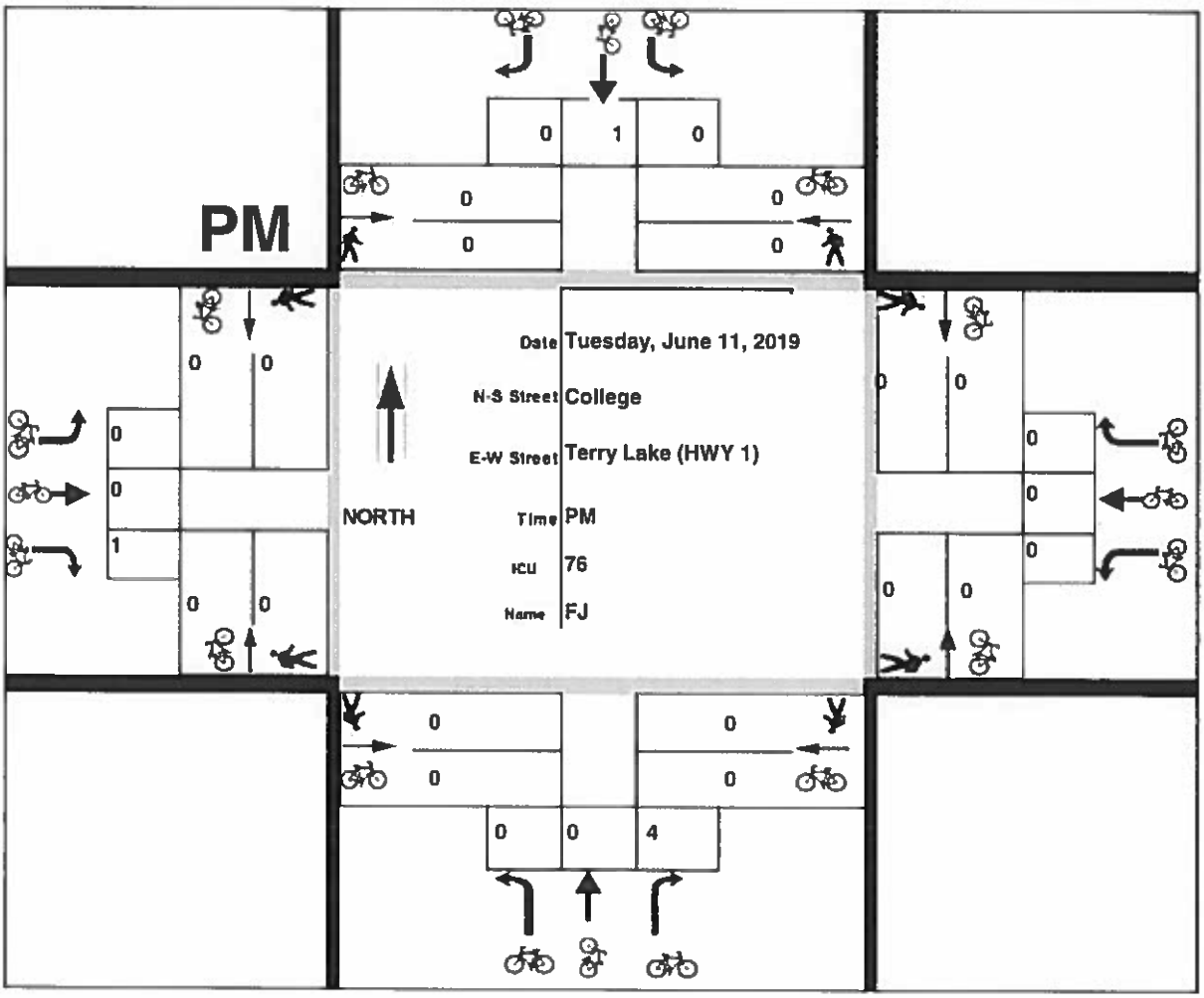
Date
Tuesday, June 11, 2019
N-S Street
College
E-W Street
Terry Lake (HWY 1)
Time
AM
ICU
76
Name
FJ


Noon
Date Tuesday, June 11, 2019
N-S Street College
E-W Street Terry Lake (HWY 1)
NORTH
Time NN
ICU 76
Name FJ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Date Tuesday, June 11, 2019
N-S Street College
E-W Street Terry Lake (HWY 1)
NORTH
Time PM
ICU 76
Name FJ

City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

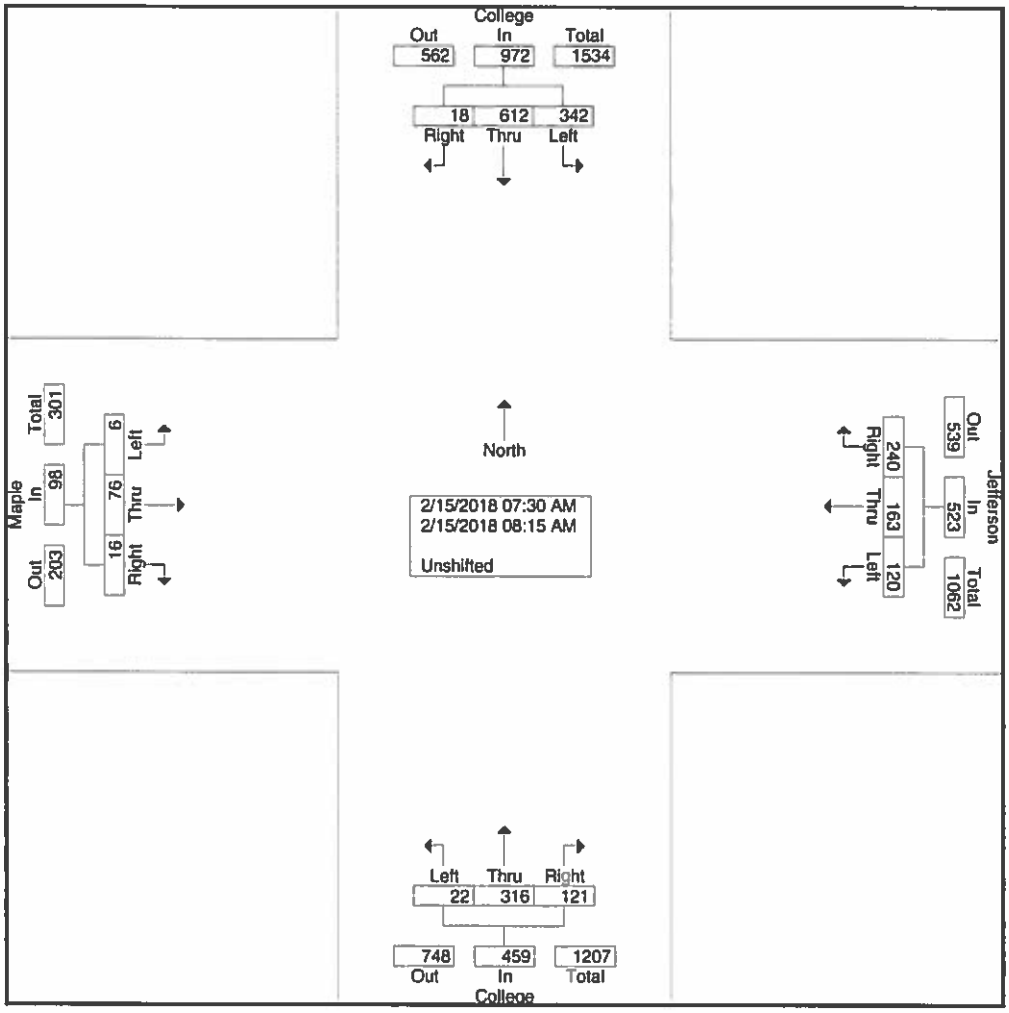
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Maple/Jefferson
Time: AM
ICU Number: 20

File Name : college & maple-jeffferson 2-15-18
Site Code : 00000020
Start Date : 2/15/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Jefferson Westbound				College Northbound				Maple Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:30 AM	8	166	99	273	63	33	25	121	31	72	4	107	1	21	1	23	524
07:45 AM	2	168	99	269	63	47	43	153	38	105	6	149	3	17	1	21	592
Total	10	334	198	542	126	80	68	274	69	177	10	256	4	38	2	44	1116
08:00 AM	6	149	72	227	45	46	26	117	24	62	3	89	6	17	2	25	458
08:15 AM	2	129	72	203	69	37	26	132	28	77	9	114	6	21	2	29	478
Grand Total	18	612	342	972	240	163	120	523	121	316	22	459	16	76	6	98	2052
Apprch %	1.9	63	35.2		45.9	31.2	22.9		26.4	68.8	4.8		16.3	77.6	6.1		
Total %	0.9	29.8	16.7	47.4	11.7	7.9	5.8	25.5	5.9	15.4	1.1	22.4	0.8	3.7	0.3	4.8	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

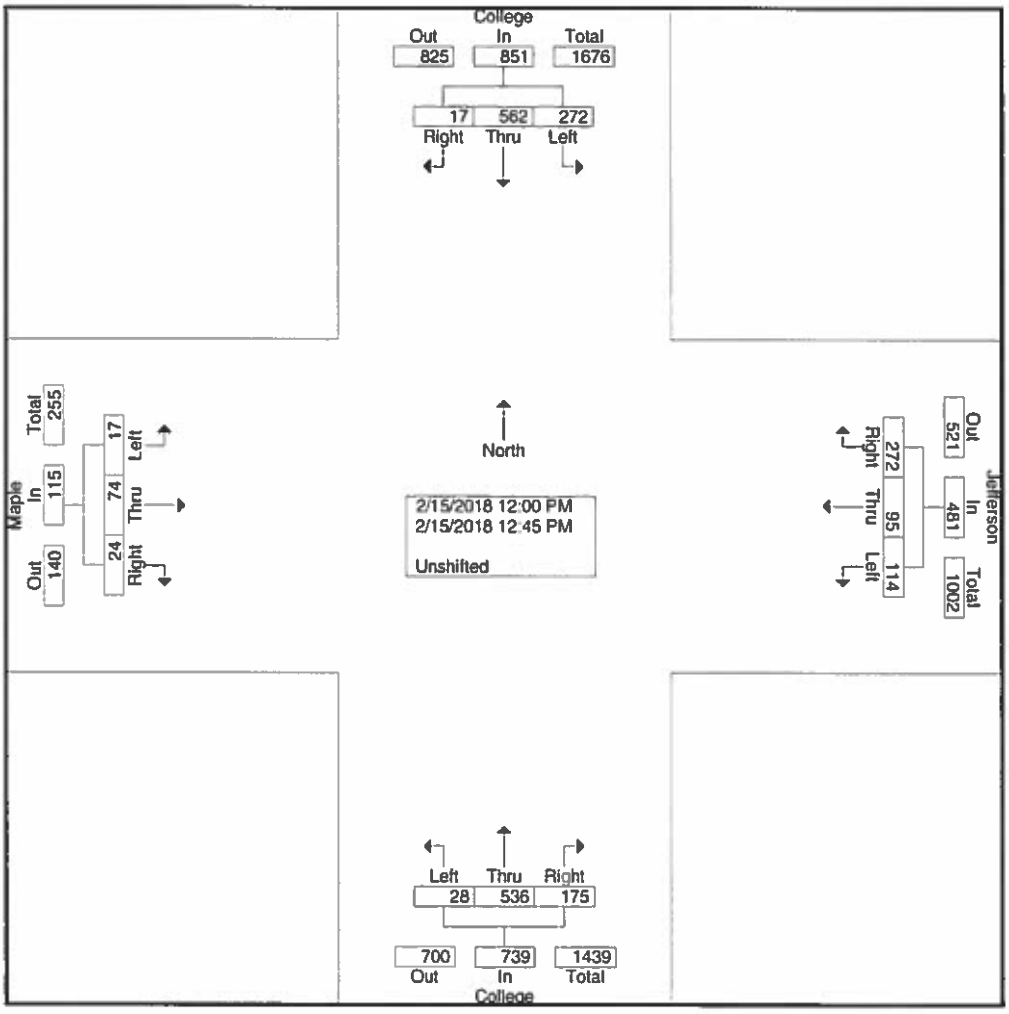
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Maple/Jefferson
Time: NN
ICU Number: 20

File Name : College & Maple-Jeffferson 2-15-18
Site Code : 00000020
Start Date : 2/15/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Jefferson Westbound				College Northbound				Maple Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
12:00 PM	4	128	57	189	76	24	33	133	50	138	5	193	11	18	4	33	548
12:15 PM	4	143	80	227	63	21	24	108	44	137	9	190	4	14	1	19	544
12:30 PM	5	133	63	201	63	22	28	113	38	129	9	176	3	22	6	31	521
12:45 PM	4	158	72	234	70	28	29	127	43	132	5	180	6	20	6	32	573
Total	17	562	272	851	272	95	114	481	175	536	28	739	24	74	17	115	2186
Grand Total	17	562	272	851	272	95	114	481	175	536	28	739	24	74	17	115	2186
Apprch %	2	66	32		56.5	19.8	23.7		23.7	72.5	3.8		20.9	64.3	14.8		
Total %	0.8	25.7	12.4	38.9	12.4	4.3	5.2	22	8	24.5	1.3	33.8	1.1	3.4	0.8	5.3	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

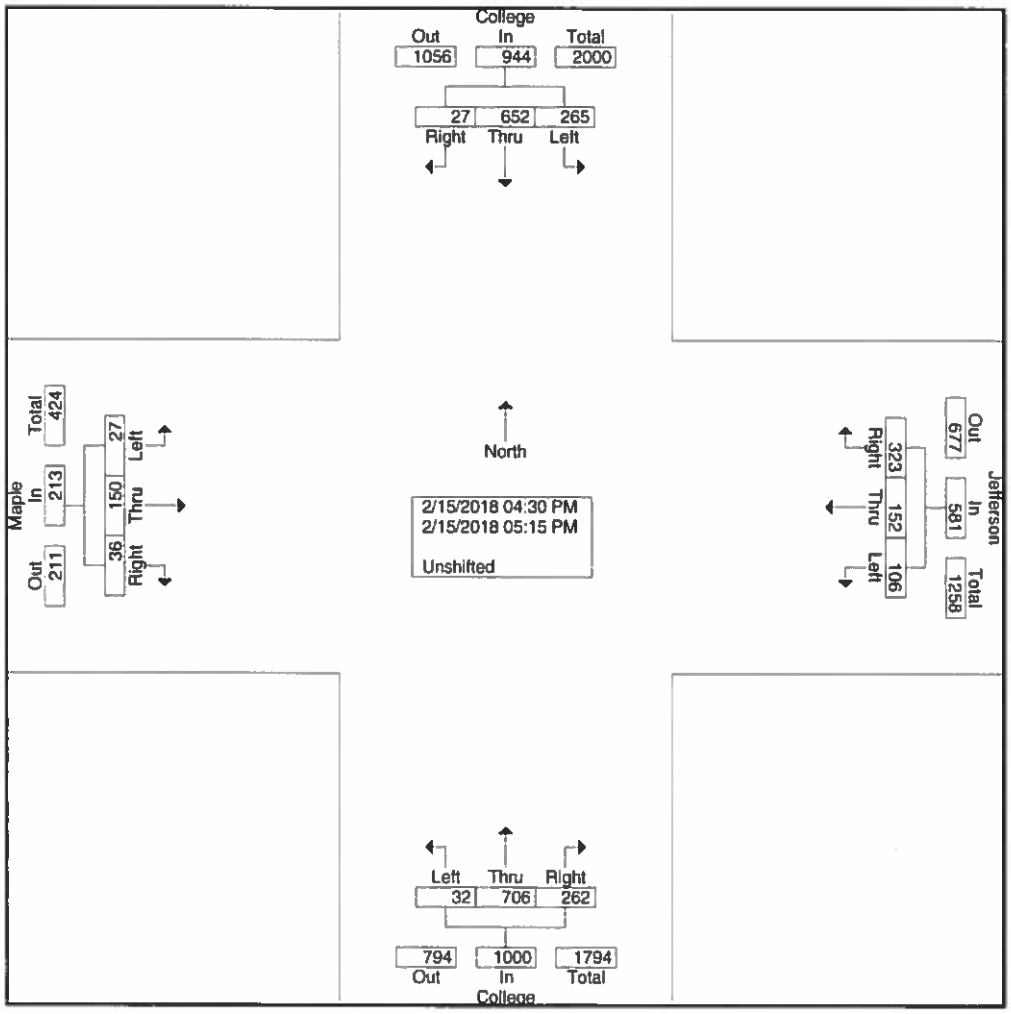
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Maple/Jefferson
Time: PM
ICU Number: 20

File Name : College & Maple-Jeffferson 2-15-18
Site Code : 00000020
Start Date : 2/15/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Jefferson Westbound				College Northbound				Maple Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:30 PM	4	189	62	255	73	27	19	119	62	200	8	270	6	22	4	32	676
04:45 PM	8	119	67	194	69	42	29	140	56	140	4	200	12	39	8	59	593
Total	12	308	129	449	142	69	48	259	118	340	12	470	18	61	12	91	1269
05:00 PM	6	183	69	258	88	46	30	164	75	207	7	289	13	46	9	68	779
05:15 PM	9	161	67	237	93	37	28	158	69	159	13	241	5	43	6	54	690
Grand Total	27	652	265	944	323	152	106	581	262	706	32	1000	36	150	27	213	2738
Apprch %	2.9	69.1	28.1		55.6	26.2	18.2		26.2	70.6	3.2		16.9	70.4	12.7		
Total %	1	23.8	9.7	34.5	11.8	5.6	3.9	21.2	9.6	25.8	1.2	36.5	1.3	5.5	1	7.8	



City of Fort Collins Traffic Operations

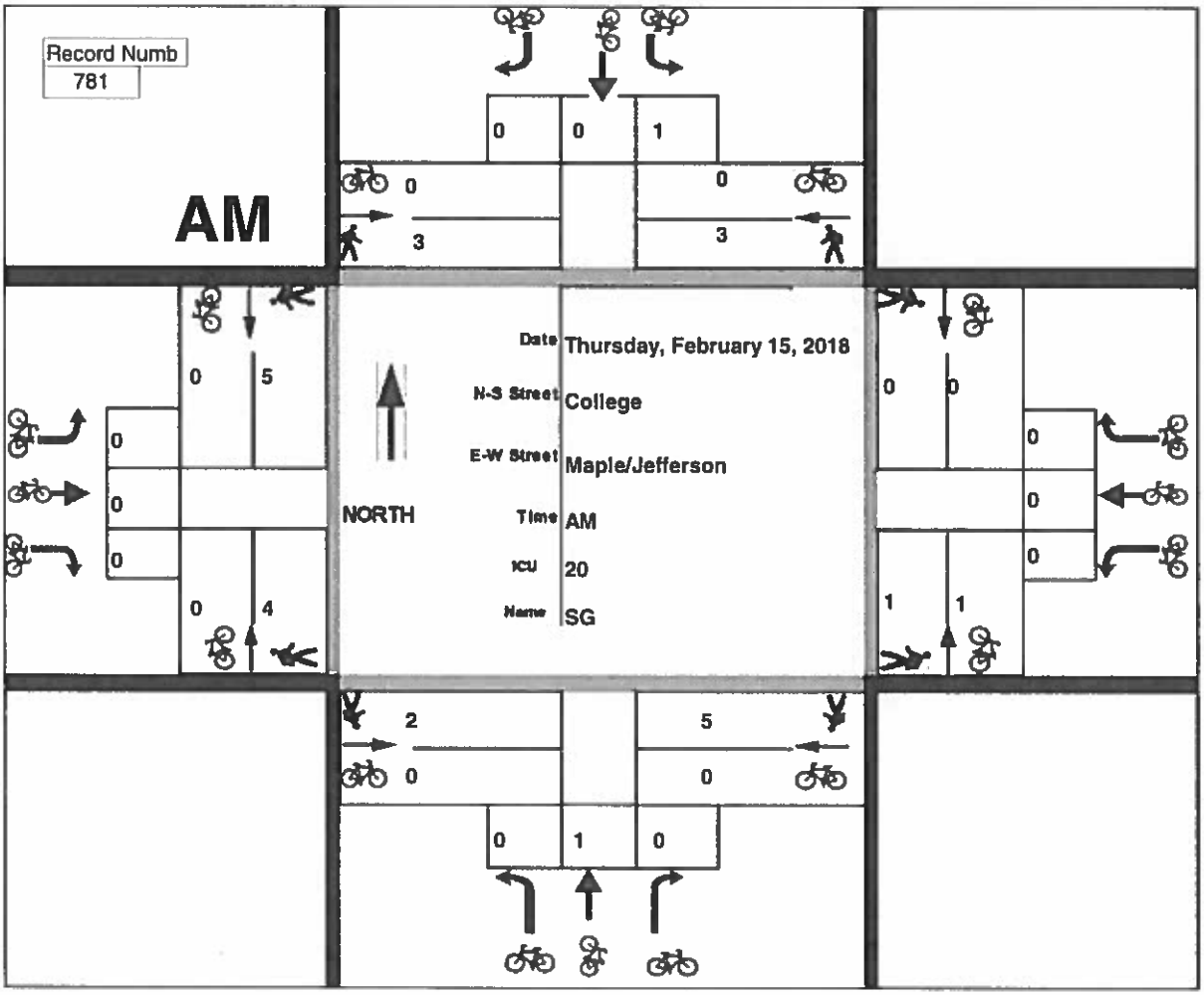
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Maple/Jefferson
Time: PHF
ICU Number: 20

File Name : College & Maple-Jeffferson 2-15-18
Site Code : 00000020
Start Date : 2/15/2018
Page No : 1

	College Southbound				Jefferson Westbound				College Northbound				Maple Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	8	166	99	273	63	33	25	121	31	72	4	107	1	21	1	23	524
07:45 AM	2	168	99	269	63	47	43	153	38	105	6	149	3	17	1	21	592
08:00 AM	6	149	72	227	45	46	26	117	24	62	3	89	6	17	2	25	458
08:15 AM	2	129	72	203	69	37	26	132	28	77	9	114	6	21	2	29	478
Total Volume	18	612	342	972	240	163	120	523	121	316	22	459	16	76	6	98	2052
% App. Total	1.9	63	35.2		45.9	31.2	22.9		26.4	68.8	4.8		16.3	77.6	6.1		
PHF	.563	.911	.864	.890	.870	.867	.698	.855	.796	.752	.611	.770	.667	.905	.750	.845	.867
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	4	128	57	189	76	24	33	133	50	138	5	193	11	18	4	33	548
12:15 PM	4	143	60	227	63	21	24	108	44	137	9	190	4	14	1	19	544
12:30 PM	5	133	63	201	63	22	28	113	38	129	9	176	3	22	6	31	521
12:45 PM	4	158	72	234	70	28	29	127	43	132	5	180	6	20	6	32	573
Total Volume	17	562	272	851	272	95	114	481	175	536	28	739	24	74	17	115	2186
% App. Total	2	66	32		56.5	19.8	23.7		23.7	72.5	3.8		20.9	64.3	14.8		
PHF	.850	.889	.850	.909	.895	.848	.864	.904	.875	.971	.778	.957	.545	.841	.708	.871	.954
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	4	189	62	255	73	27	19	119	62	200	8	270	6	22	4	32	676
04:45 PM	8	119	67	194	69	42	29	140	56	140	4	200	12	39	8	59	593
05:00 PM	6	183	69	258	88	46	30	164	75	207	7	289	13	46	9	68	779
05:15 PM	9	161	67	237	93	37	28	158	69	159	13	241	5	43	6	54	690
Total Volume	27	652	265	944	323	152	106	581	262	706	32	1000	36	150	27	213	2738
% App. Total	2.9	69.1	28.1		55.6	26.2	18.2		26.2	70.6	3.2		16.9	70.4	12.7		
PHF	.750	.862	.960	.915	.868	.826	.883	.886	.873	.853	.615	.865	.692	.815	.750	.783	.879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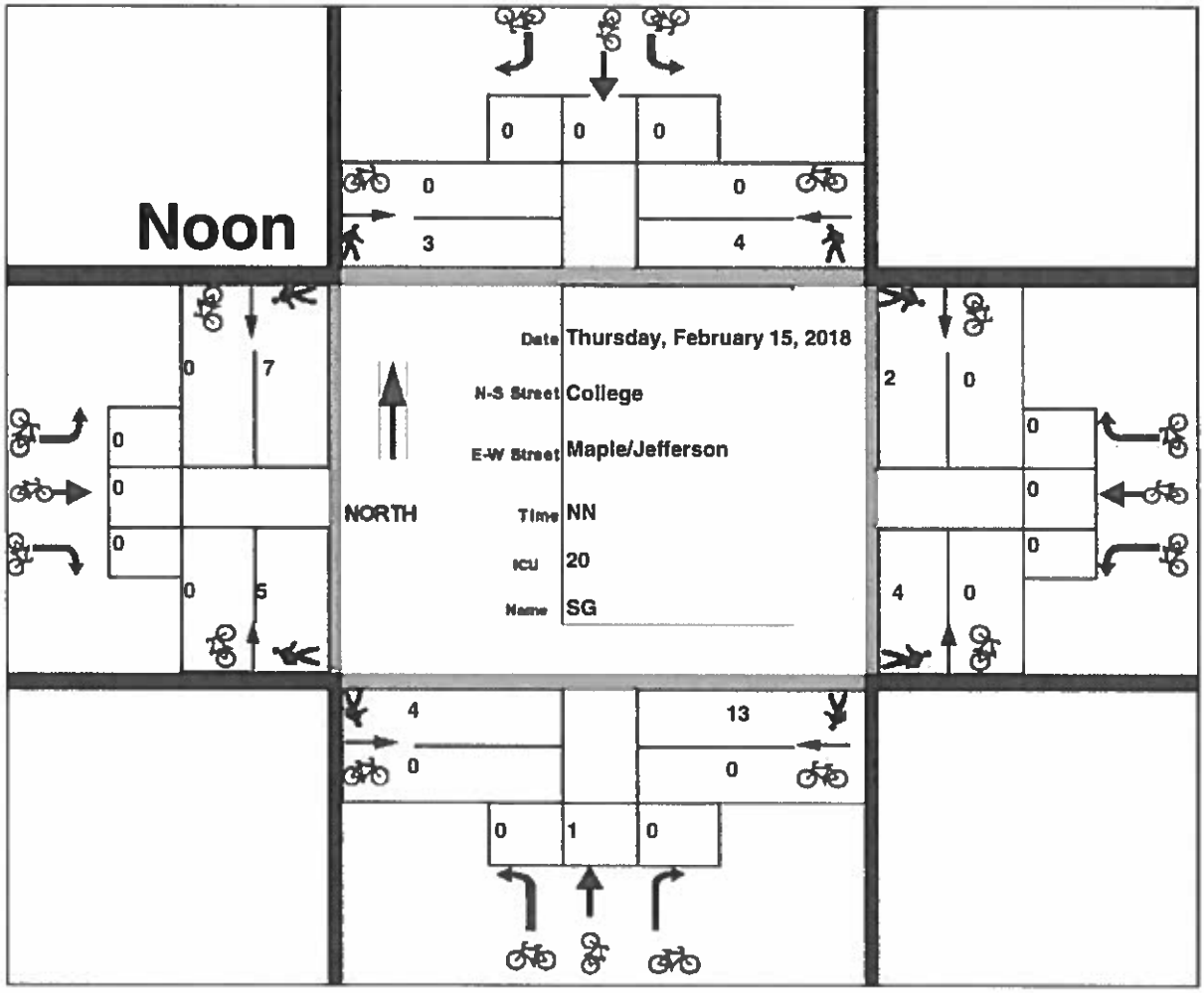
NORTH
Date Thursday, February 15, 2018
N-S Street College
E-W Street Maple/Jefferson
Time AM
ICU 20
Name SG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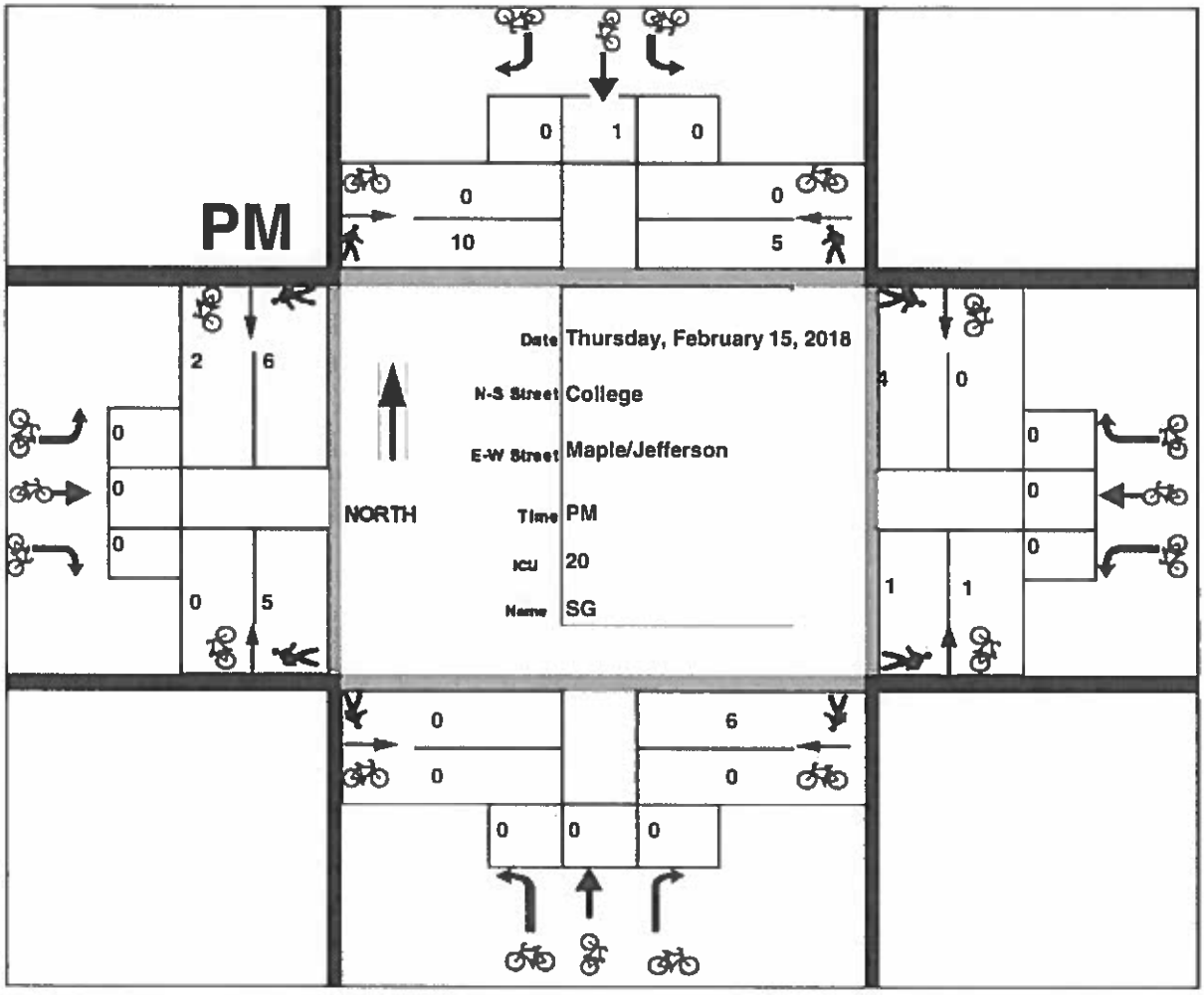
Date Thursday, February 15, 2018
N-S Street College
E-W Street Maple/Jefferson
NORTH
Time NN
ICU 20
Name SG


PM
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Thursday, February 15, 2018
N-S Street
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E-W Street
Maple/Jefferson
NORTH
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City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

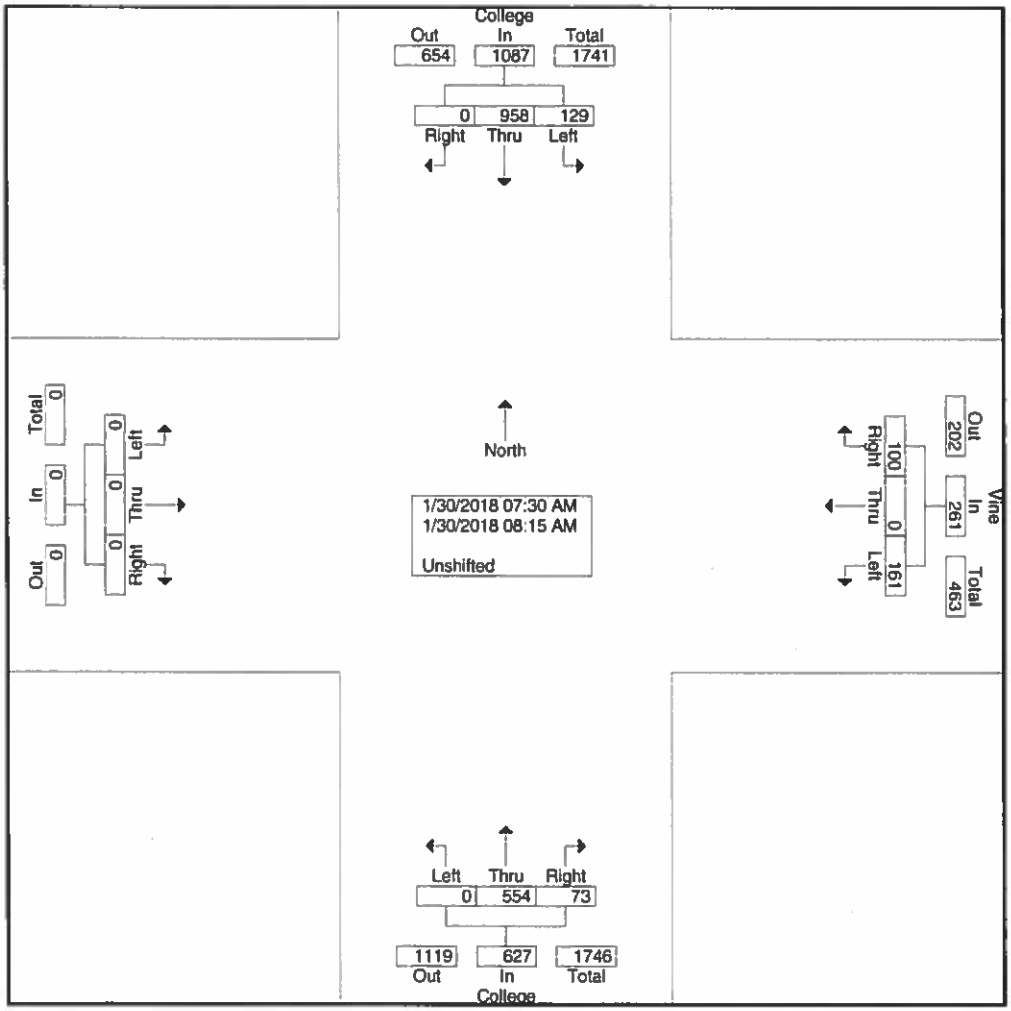
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Vine
Time: AM
ICU Number: 21

File Name : College & Vine 1-31-18
Site Code : 00000021
Start Date : 1/30/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Vine Westbound				College Northbound				Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:30 AM	0	267	32	299	19	0	43	62	14	148	0	162	0	0	0	0	523
07:45 AM	0	279	35	314	35	0	47	82	24	148	0	172	0	0	0	0	568
Total	0	546	67	613	54	0	90	144	38	296	0	334	0	0	0	0	1091
08:00 AM	0	210	31	241	24	0	26	50	15	130	0	145	0	0	0	0	436
08:15 AM	0	202	31	233	22	0	45	67	20	128	0	148	0	0	0	0	448
Grand Total	0	958	129	1087	100	0	161	261	73	554	0	627	0	0	0	0	1975
Apprch %	0	88.1	11.9		38.3	0	61.7		11.6	88.4	0		0	0	0		
Total %	0	48.5	6.5	55	5.1	0	8.2	13.2	3.7	28.1	0	31.7	0	0	0	0	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

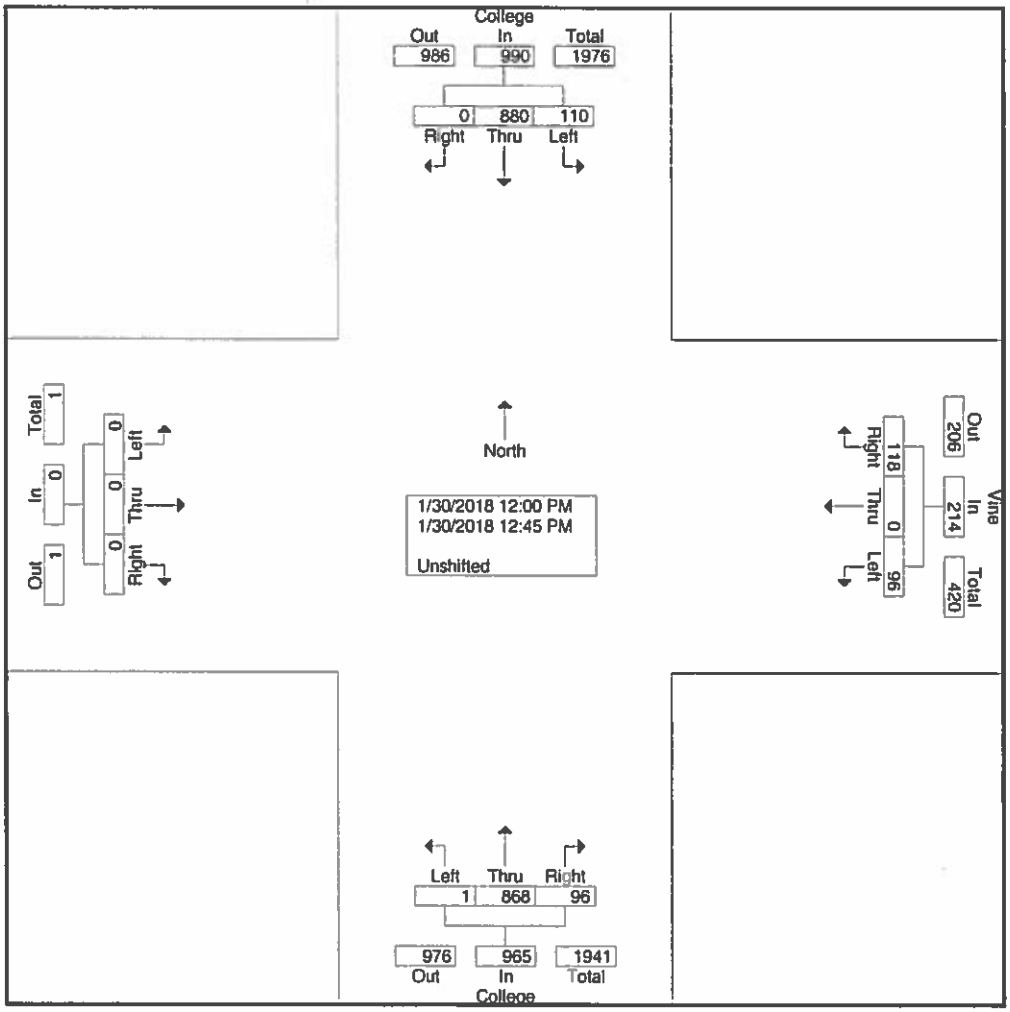
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Vine
Time: NN
ICU Number: 21

File Name : College & Vine 1-31-18
Site Code : 00000021
Start Date : 1/30/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Vine Westbound				College Northbound				Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
12:00 PM	0	205	29	234	29	0	32	61	28	218	0	246	0	0	0	0	541
12:15 PM	0	210	27	237	33	0	20	53	23	230	1	254	0	0	0	0	544
12:30 PM	0	236	28	264	30	0	17	47	17	176	0	193	0	0	0	0	504
12:45 PM	0	229	26	255	26	0	27	53	28	244	0	272	0	0	0	0	580
Total	0	880	110	990	118	0	96	214	96	868	1	965	0	0	0	0	2169
Grand Total	0	880	110	990	118	0	96	214	96	868	1	965	0	0	0	0	2169
Apprch %	0	88.9	11.1		55.1	0	44.9		9.9	89.9	0.1		0	0	0		
Total %	0	40.6	5.1	45.6	5.4	0	4.4	9.9	4.4	40	0	44.5	0	0	0	0	



City of Fort Collins Traffic Operations

626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

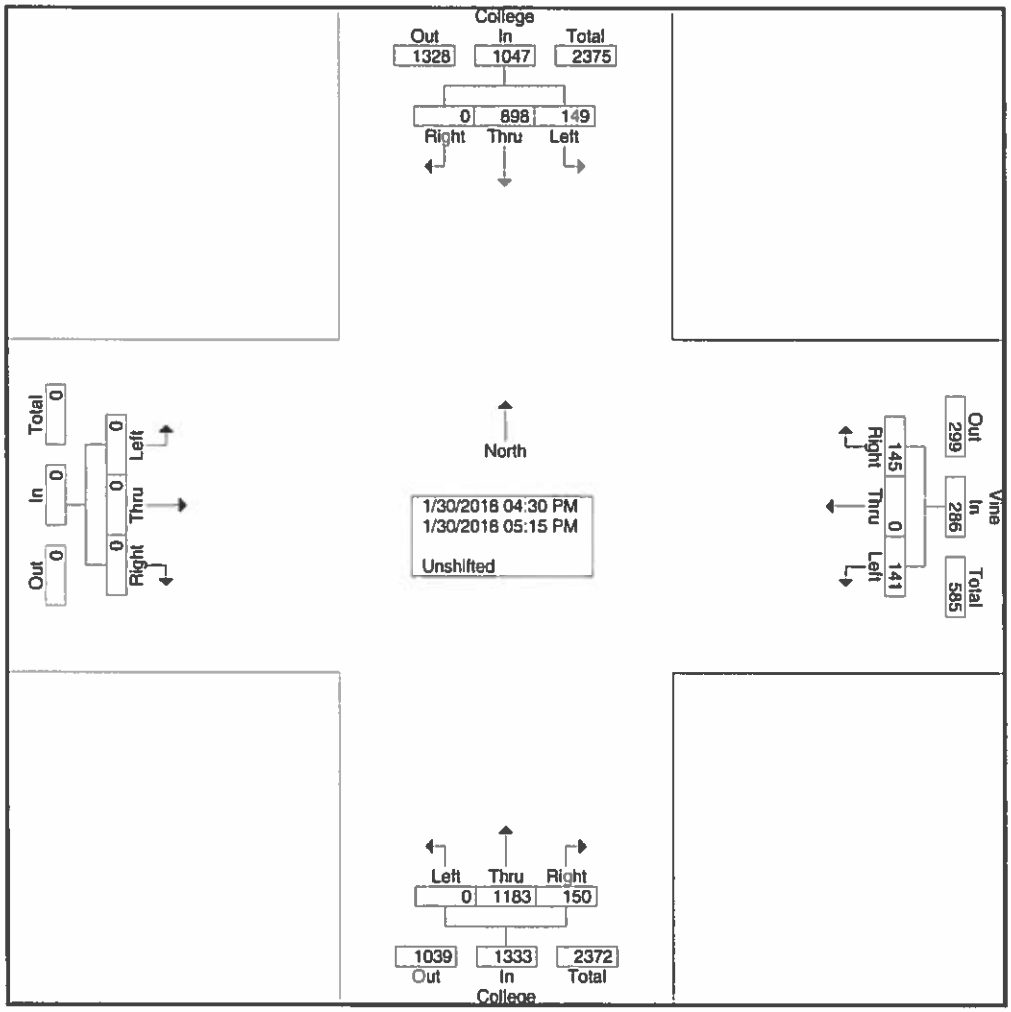
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Vine
Time: PM
ICU Number: 21

File Name : College & Vine 1-31-18
Site Code : 00000021
Start Date : 1/30/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Vine Westbound				College Northbound				Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:30 PM	0	223	46	269	39	0	25	64	21	230	0	251	0	0	0	0	584
04:45 PM	0	228	34	262	28	0	36	64	42	318	0	360	0	0	0	0	686
Total	0	451	80	531	67	0	61	128	63	548	0	611	0	0	0	0	1270
05:00 PM	0	253	28	281	35	0	47	82	45	305	0	350	0	0	0	0	713
05:15 PM	0	194	41	235	43	0	33	76	42	330	0	372	0	0	0	0	683
Grand Total	0	898	149	1047	145	0	141	286	150	1183	0	1333	0	0	0	0	2666
Apprch %	0	85.8	14.2		50.7	0	49.3		11.3	88.7	0		0	0	0		
Total %	0	33.7	5.6	39.3	5.4	0	5.3	10.7	5.6	44.4	0	50	0	0	0	0	



City of Fort Collins Traffic Operations

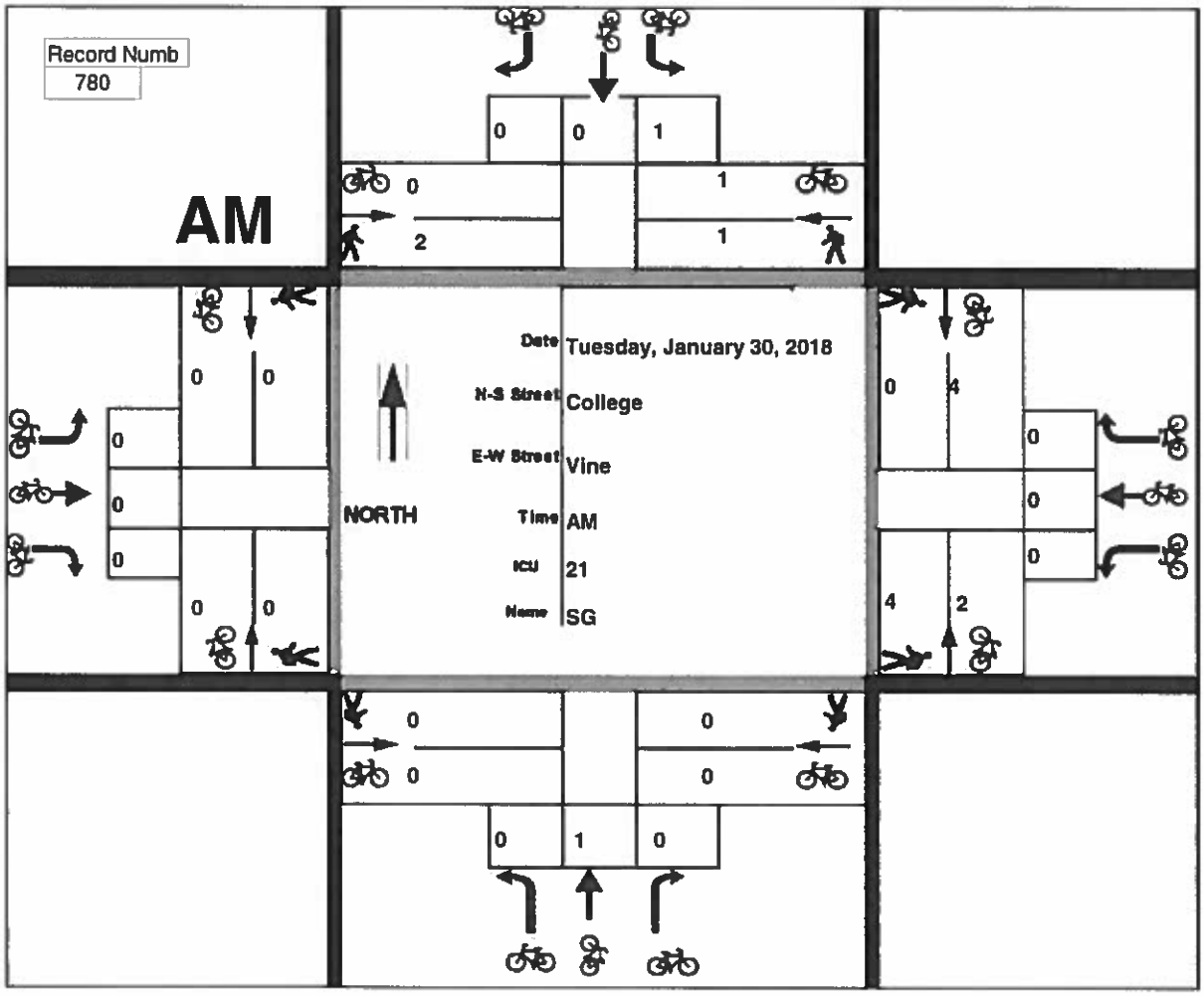
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Vine
Time: PHF
ICU Number: 21

File Name : College & Vine 1-31-18
Site Code : 00000021
Start Date : 1/30/2018
Page No : 1

	College Southbound				Vine Westbound				College Northbound				Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	267	32	299	19	0	43	62	14	148	0	162	0	0	0	0	523
07:45 AM	0	279	35	314	35	0	47	82	24	148	0	172	0	0	0	0	568
08:00 AM	0	210	31	241	24	0	26	50	15	130	0	145	0	0	0	0	436
08:15 AM	0	202	31	233	22	0	45	67	20	128	0	148	0	0	0	0	448
Total Volume	0	958	129	1087	100	0	161	261	73	554	0	627	0	0	0	0	1975
% App. Total	0	88.1	11.9		38.3	0	61.7		11.6	88.4	0		0	0	0		
PHF	.000	.858	.921	.865	.714	.000	.856	.796	.760	.936	.000	.911	.000	.000	.000	.000	.869
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	205	29	234	29	0	32	61	28	218	0	246	0	0	0	0	541
12:15 PM	0	210	27	237	33	0	20	53	23	230	1	254	0	0	0	0	544
12:30 PM	0	236	28	264	30	0	17	47	17	176	0	193	0	0	0	0	504
12:45 PM	0	229	26	255	26	0	27	53	28	244	0	272	0	0	0	0	580
Total Volume	0	880	110	990	118	0	96	214	96	868	1	965	0	0	0	0	2169
% App. Total	0	88.9	11.1		55.1	0	44.9		9.9	89.9	0.1		0	0	0		
PHF	.000	.932	.948	.938	.894	.000	.750	.877	.857	.889	.250	.887	.000	.000	.000	.000	.935
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	223	46	269	39	0	25	64	21	230	0	251	0	0	0	0	584
04:45 PM	0	228	34	262	28	0	36	64	42	318	0	360	0	0	0	0	686
05:00 PM	0	253	28	281	35	0	47	82	45	305	0	350	0	0	0	0	713
05:15 PM	0	194	41	235	43	0	33	76	42	330	0	372	0	0	0	0	683
Total Volume	0	898	149	1047	145	0	141	286	150	1183	0	1333	0	0	0	0	2666
% App. Total	0	85.8	14.2		50.7	0	49.3		11.3	88.7	0		0	0	0		
PHF	.000	.887	.810	.931	.843	.000	.750	.872	.833	.896	.000	.896	.000	.000	.000	.000	.935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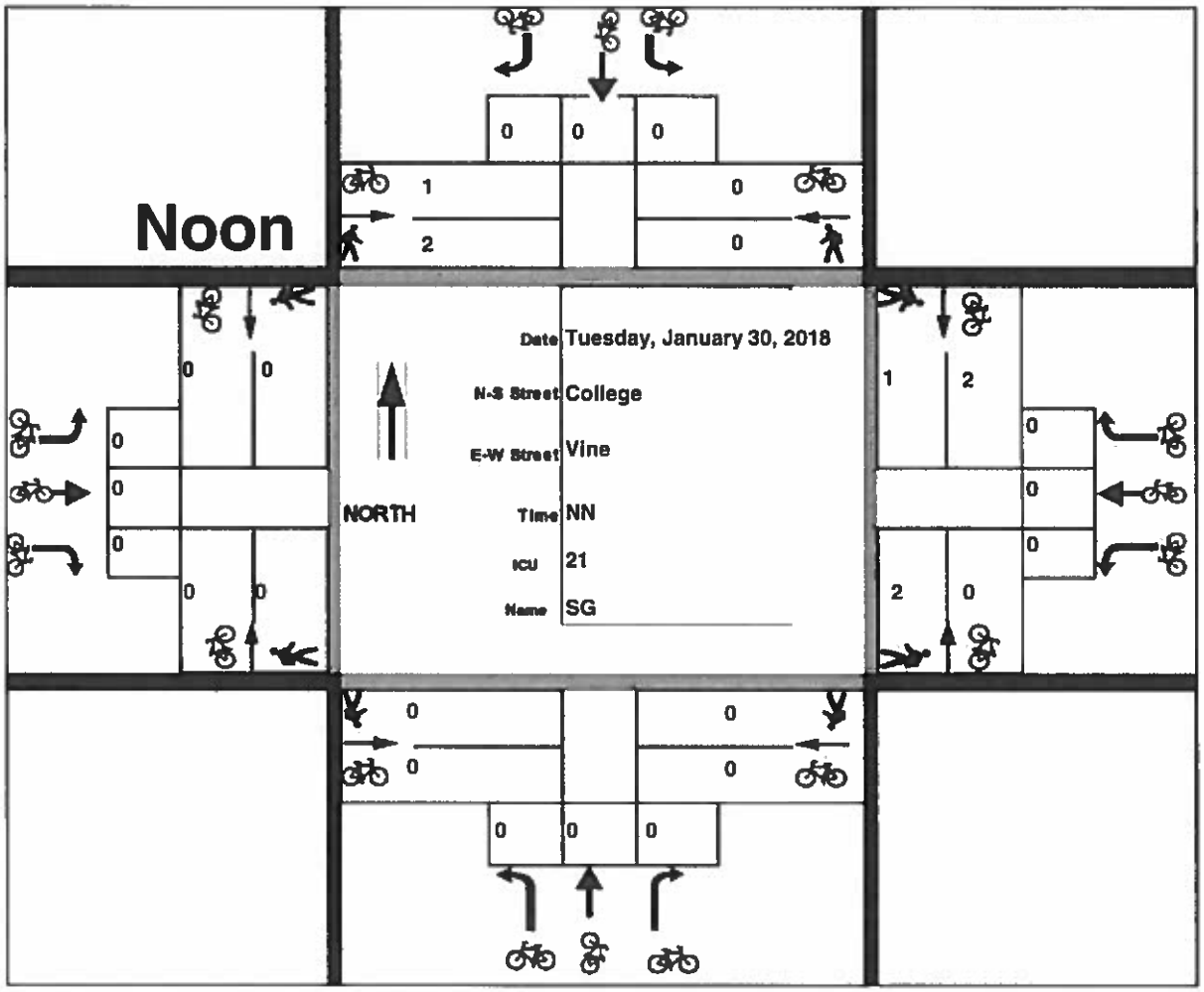
E-W Street Vine
NORTH
Time AM
ICU 21
Name SG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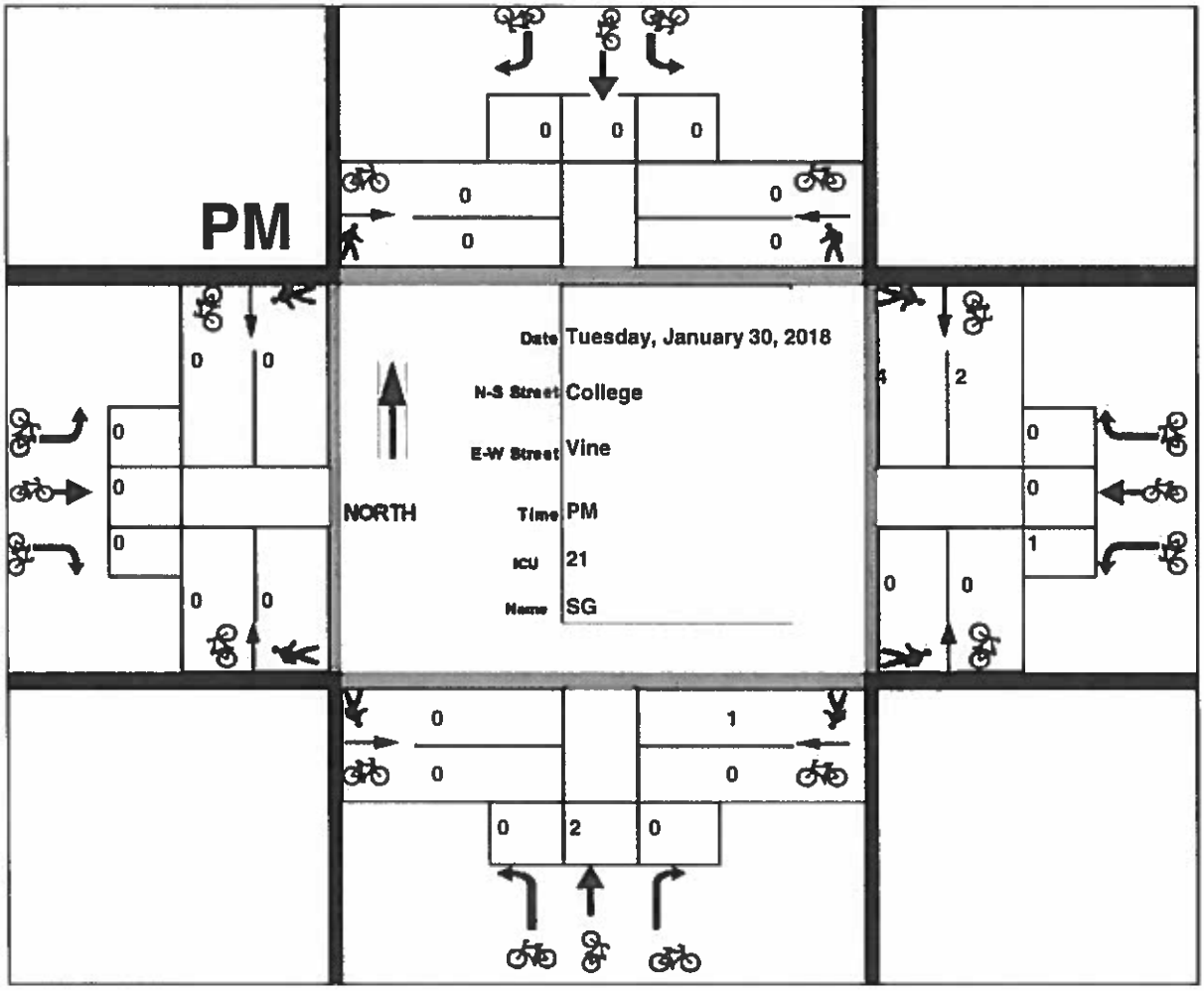
N-S Street College
E-W Street Vine
NORTH
Time NN
ICU 21
Name SG


PM
Date Tuesday, January 30, 2018
N-S Street College
E-W Street Vine
NORTH
Time PM
ICU 21
Name SG

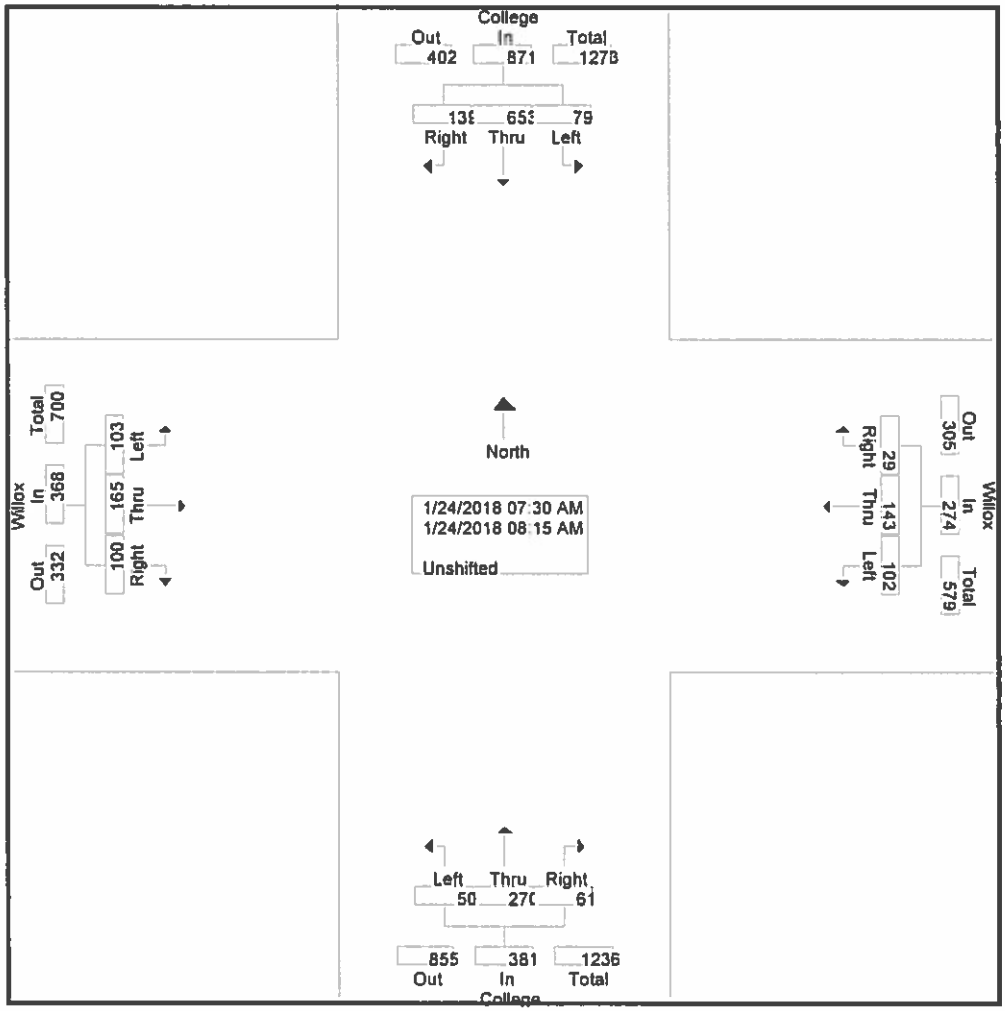
City of Fort Collins Traffic Operations
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Willox
Time: AM
ICU Number: 75

File Name : College & Willox 1-25-18
Site Code : 00000075
Start Date : 1/24/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willox Westbound				College Northbound				Willox Eastbound				
Start Time	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Int Total
07:30 AM	23	161	26	210	5	31	26	62	13	63	11	87	23	41	25	89	448
07:45 AM	33	219	15	267	9	35	24	68	16	73	11	100	22	43	35	100	535
Total	56	380	41	477	14	66	50	130	29	136	22	187	45	84	60	189	983
08:00 AM	42	128	21	191	8	36	26	70	22	66	12	100	26	51	17	94	455
08:15 AM	41	145	17	203	7	41	26	74	10	68	16	94	29	30	26	85	456
Grand Total	139	653	79	871	29	143	102	274	61	270	50	381	100	165	103	368	1894
Apprch %	16	75	9.1		10.6	52.2	37.2		16	70.9	13.1		27.2	44.8	28		
Total %	7.3	34.5	4.2	46	1.5	7.6	5.4	14.5	3.2	14.3	2.6	20.1	5.3	8.7	5.4	19.4	



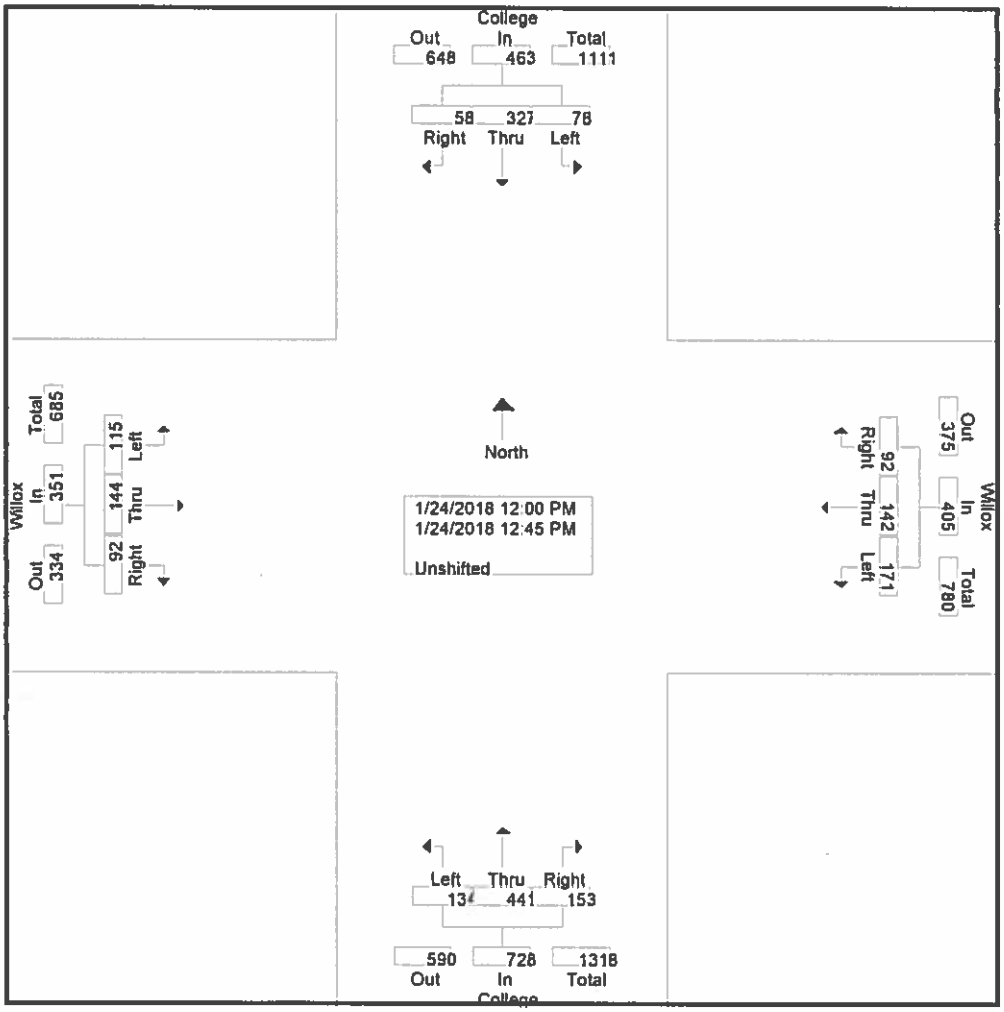
City of Fort Collins Traffic Operations
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Willox
Time: NN
ICU Number: 75

File Name : College & Willox 1-25-18
Site Code : 00000075
Start Date : 1/24/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willox Westbound				College Northbound				Willox Eastbound				
Start Time	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Int Total
12:00 PM	15	71	19	105	21	31	43	95	36	118	43	197	28	34	31	93	490
12:15 PM	16	80	21	117	25	33	32	90	44	112	29	185	21	42	26	89	481
12:30 PM	12	91	21	124	22	40	52	114	32	103	31	166	22	38	22	82	486
12:45 PM	15	85	17	117	24	38	44	106	41	108	31	180	21	30	36	87	490
Total	58	327	78	463	92	142	171	405	153	441	134	728	92	144	115	351	1947
Grand Total	58	327	78	463	92	142	171	405	153	441	134	728	92	144	115	351	1947
Apprch %	12.5	70.6	16.8		22.7	35.1	42.2		21	60.6	18.4		26.2	41	32.8		
Total %	3	16.8	4	23.8	4.7	7.3	8.8	20.8	7.9	22.7	6.9	37.4	4.7	7.4	5.9	18	



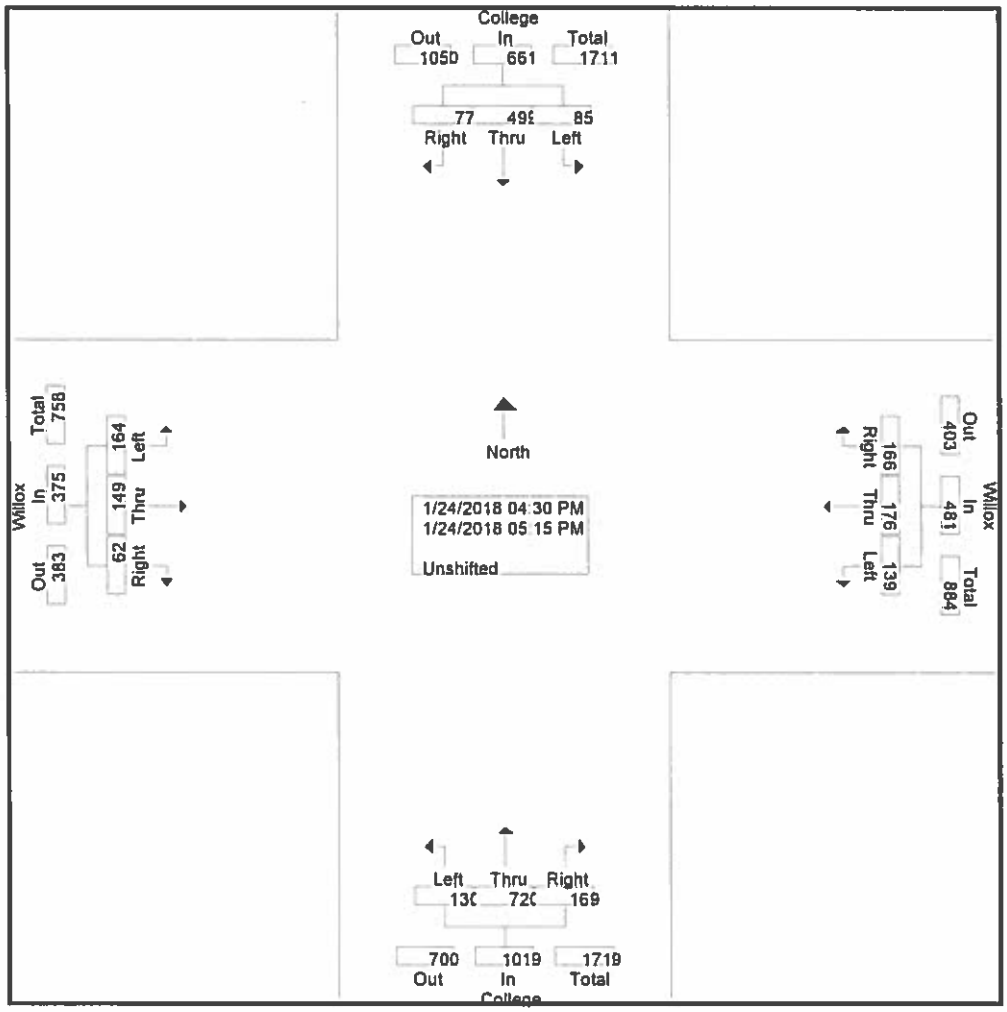
City of Fort Collins Traffic Operations
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580
Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Willox
Time: PM
ICU Number: 75

File Name : College & Willox 1-25-18
Site Code : 00000075
Start Date : 1/24/2018
Page No : 1

Groups Printed- Unshifted

	College Southbound				Willox Westbound				College Northbound				Willox Eastbound				
Start Time	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Int. Total
04:30 PM	17	113	25	155	34	53	40	127	33	171	43	247	20	33	33	86	615
04:45 PM	17	109	18	144	47	49	29	125	39	155	23	217	10	28	43	81	567
Total	34	222	43	299	81	102	69	252	72	326	66	464	30	61	76	167	1182
05:00 PM	20	146	25	191	36	42	31	109	55	212	25	292	14	36	45	95	687
05:15 PM	23	131	17	171	49	32	39	120	42	182	39	263	18	52	43	113	667
Grand Total	77	499	85	661	166	176	139	481	169	720	130	1019	62	149	164	375	2536
Apprch %	11.6	75.5	12.9		34.5	36.6	28.9		16.6	70.7	12.8		16.5	39.7	43.7		
Total %	3	19.7	3.4	26.1	6.5	6.9	5.5	19	6.7	28.4	5.1	40.2	2.4	5.9	6.5	14.8	



City of Fort Collins Traffic Operations

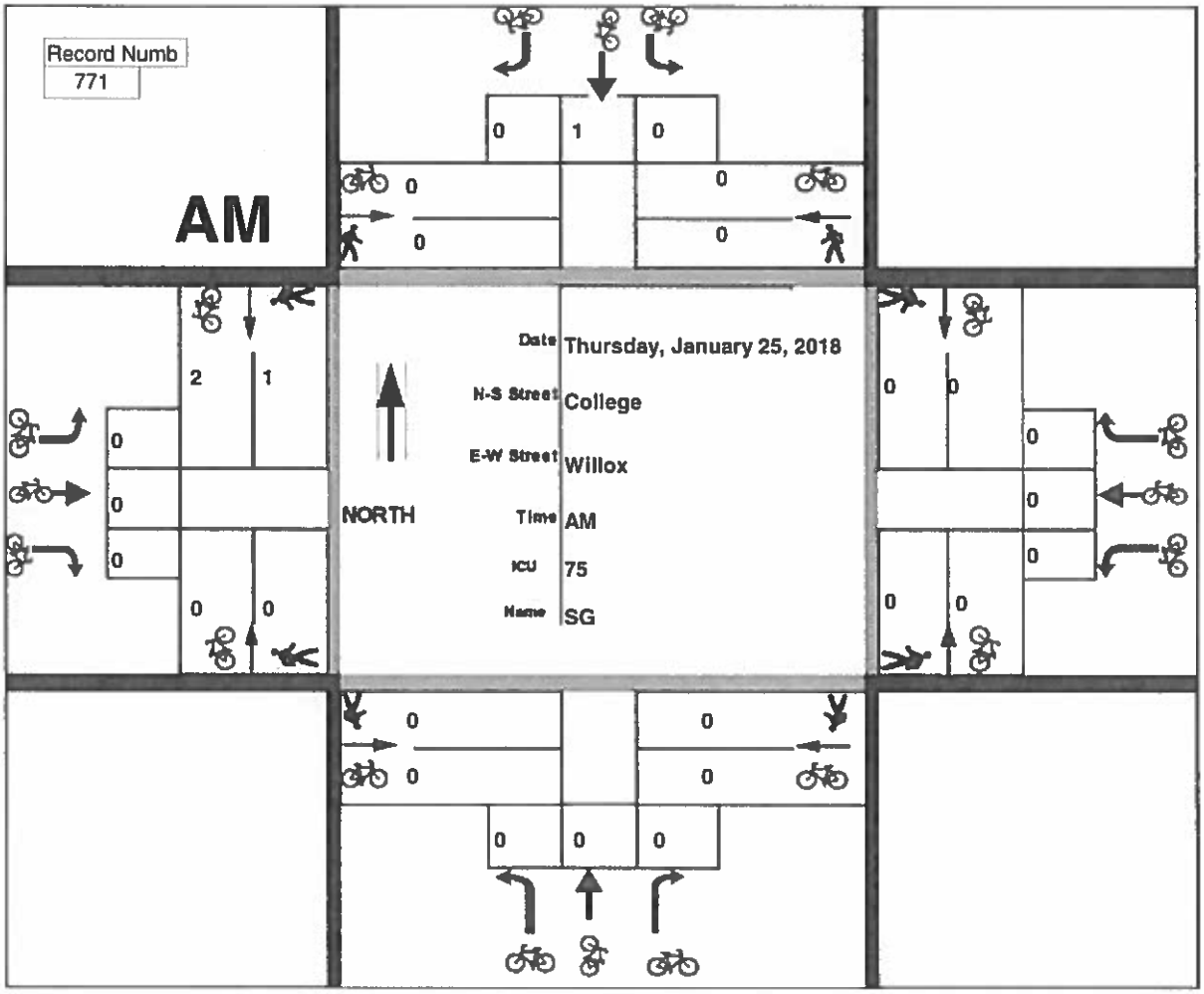
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580

Peak Hour Turning Movement Study

North/South Street: College
East/West Street: Willox
Time: PHF
ICU Number: 75

File Name : College & Willox 1-25-18
Site Code : 00000075
Start Date : 1/24/2018
Page No : 1

	College Southbound				Willox Westbound				College Northbound				Willox Eastbound				
Start Time	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Int Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	23	161	26	210	5	31	26	62	13	63	11	87	23	41	25	89	448
07:45 AM	33	219	15	267	9	35	24	68	16	73	11	100	22	43	35	100	535
08:00 AM	42	128	21	191	8	36	26	70	22	66	12	100	26	51	17	94	455
08:15 AM	41	145	17	203	7	41	26	74	10	68	16	94	29	30	26	85	456
Total Volume	139	653	79	871	29	143	102	274	61	270	50	381	100	165	103	368	1894
% App. Total	16	75	9.1		10.6	52.2	37.2		16	70.9	13.1		27.2	44.8	28		
PHF	.827	.745	.760	.816	.806	.872	.981	.926	.693	.925	.781	.953	.862	.809	.736	.920	.885
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	15	71	19	105	21	31	43	95	36	118	43	197	28	34	31	93	490
12:15 PM	16	80	21	117	25	33	32	90	44	112	29	185	21	42	26	89	481
12:30 PM	12	91	21	124	22	40	52	114	32	103	31	166	22	38	22	82	486
12:45 PM	15	85	17	117	24	38	44	106	41	108	31	180	21	30	36	87	490
Total Volume	58	327	78	463	92	142	171	405	153	441	134	728	92	144	115	351	1947
% App. Total	12.5	70.6	16.8		22.7	35.1	42.2		21	60.6	18.4		26.2	41	32.8		
PHF	.906	.898	.929	.933	.920	.888	.822	.888	.869	.934	.779	.924	.821	.857	.799	.944	.993
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	17	113	25	155	34	53	40	127	33	171	43	247	20	33	33	86	615
04:45 PM	17	109	18	144	47	49	29	125	39	155	23	217	10	28	43	81	567
05:00 PM	20	146	25	191	36	42	31	109	55	212	25	292	14	36	45	95	687
05:15 PM	23	131	17	171	49	32	39	120	42	182	39	263	18	52	43	113	667
Total Volume	77	499	85	661	166	176	139	481	169	720	130	1019	62	149	164	375	2536
% App. Total	11.6	75.5	12.9		34.5	36.6	28.9		16.6	70.7	12.8		16.5	39.7	43.7		
PHF	.837	.854	.850	.865	.847	.830	.869	.947	.768	.849	.756	.872	.775	.716	.911	.830	.923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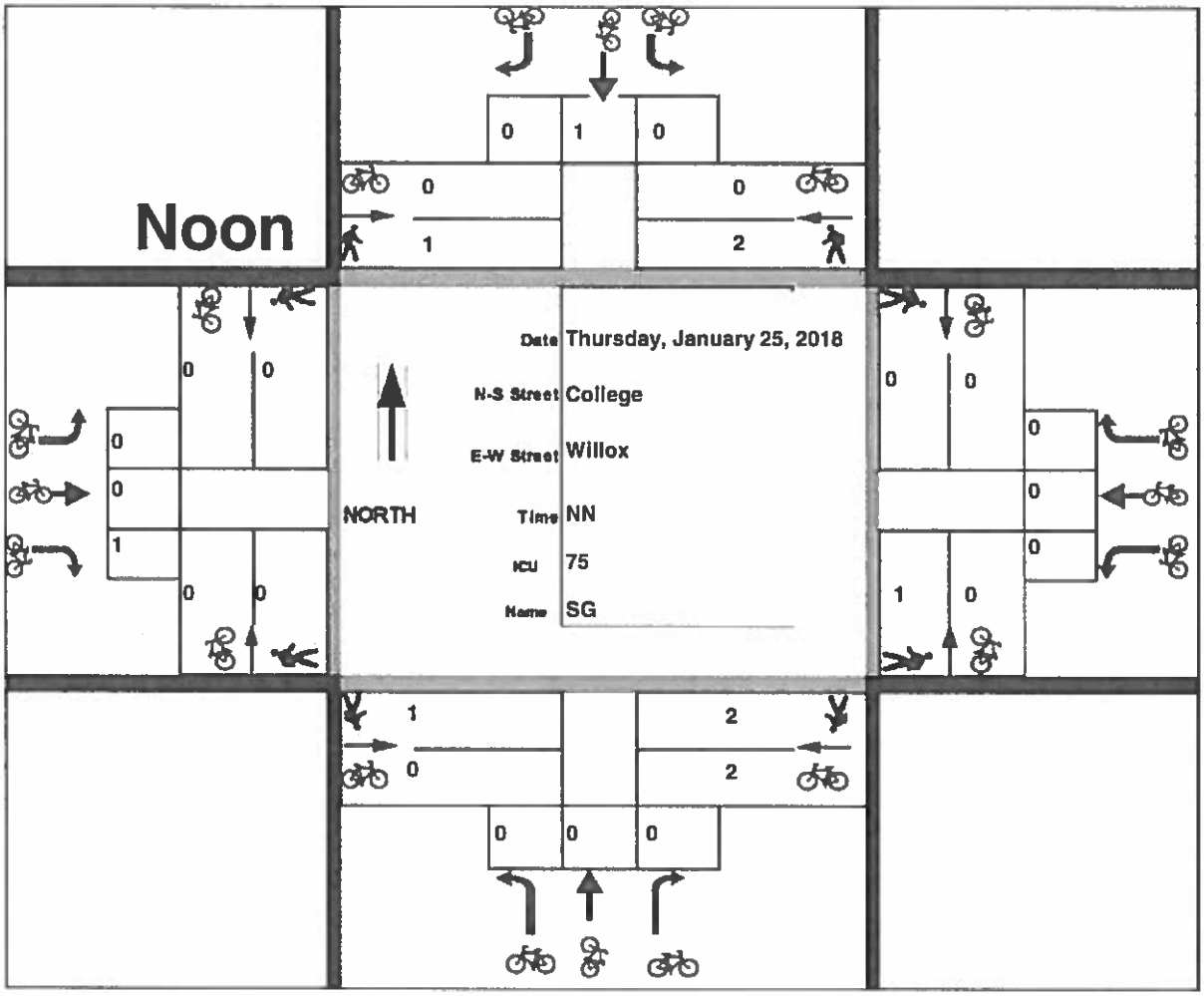
NORTH
Date Thursday, January 25, 2018
N-S Street College
E-W Street Willox
Time AM
ICU 75
Name SG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ICU 75
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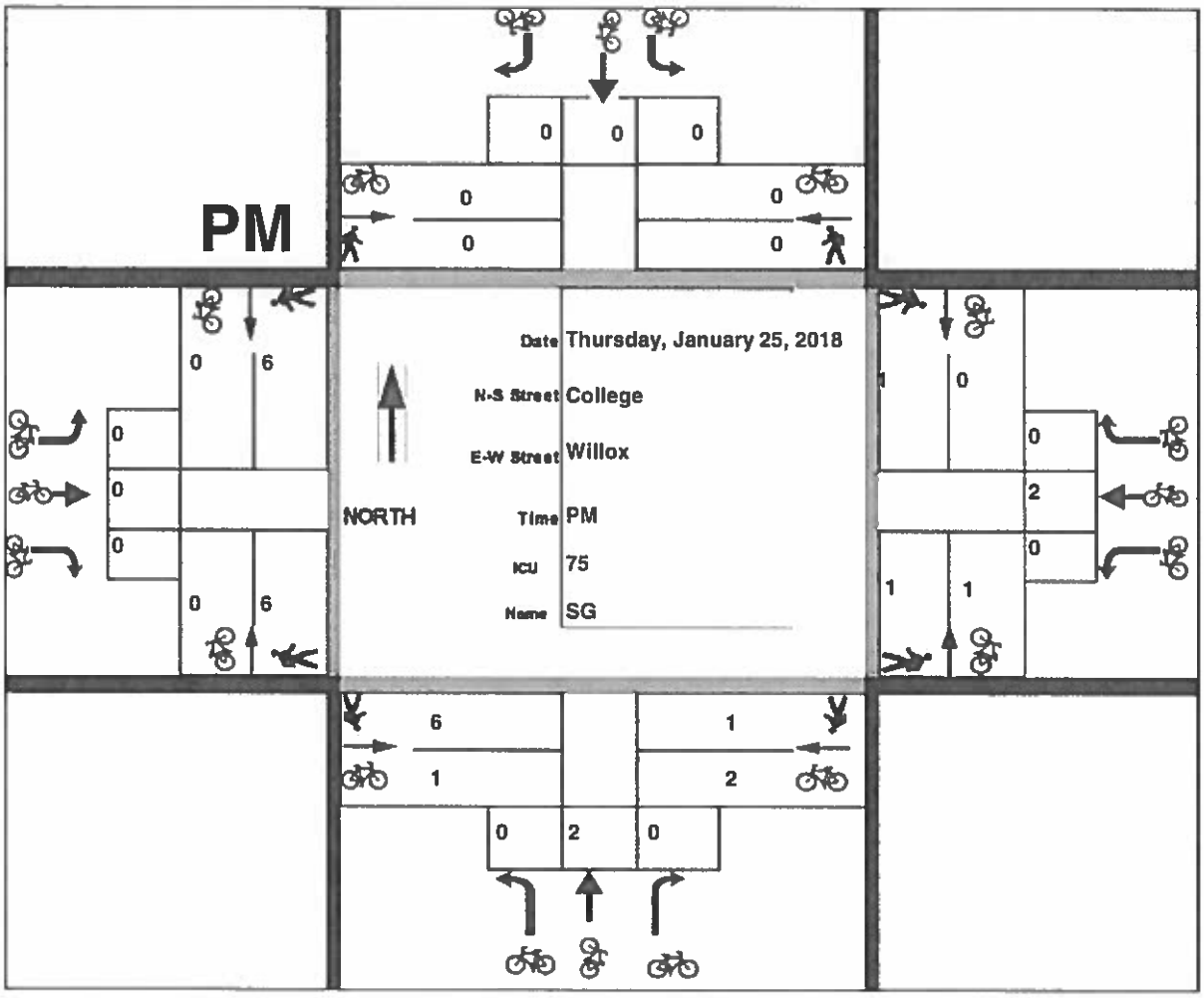
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0 2 0
Date Thursday, January 25, 2018
N-S Street College
E-W Street Willox
NORTH
Time PM
ICU 75
Name SG

APPENDIX B

NFRMPO MODEL POPULATION & EMPLOYMENT MAPS

Figure 93: NFRMPO Model - 2015 Employment Density Map

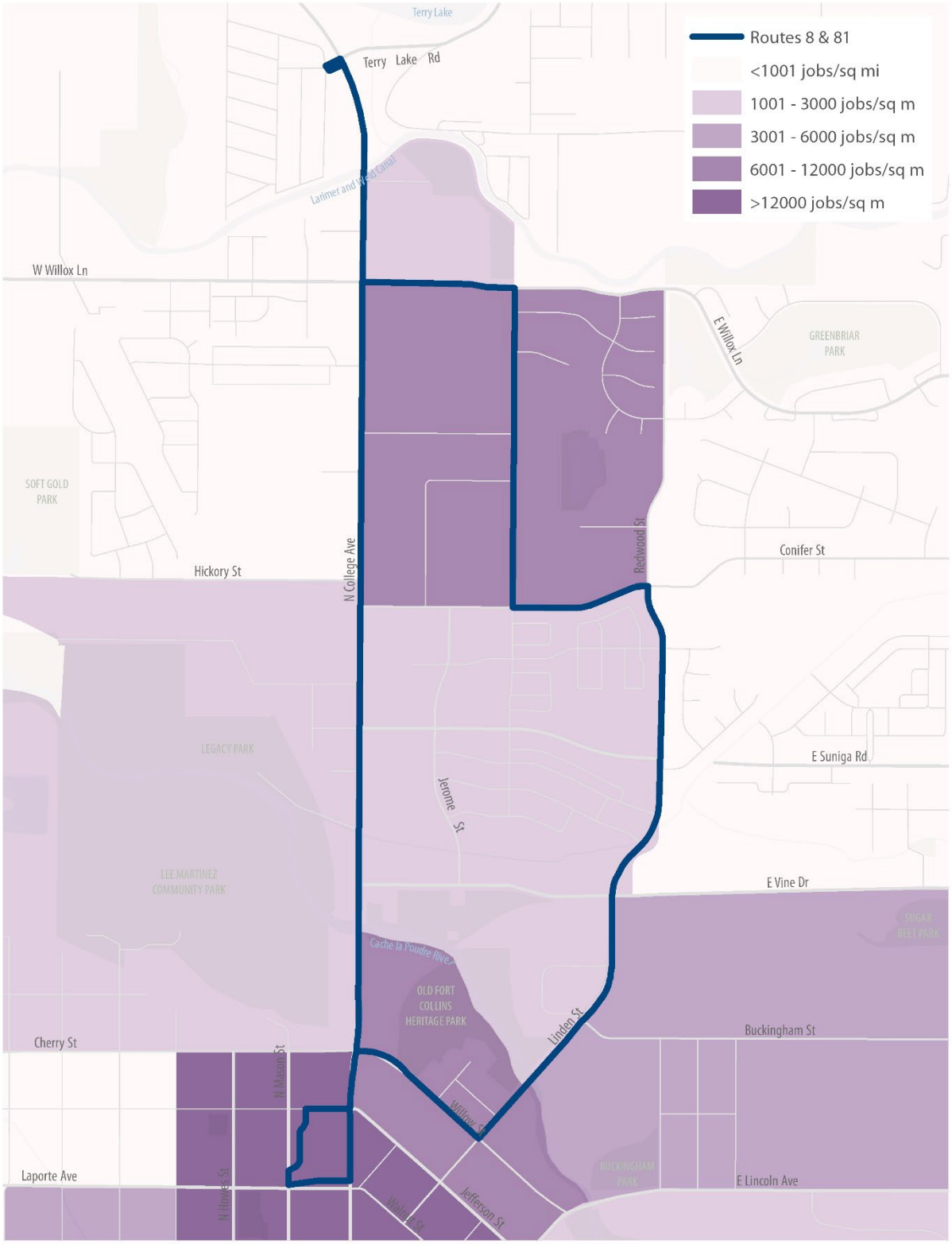


Figure 94: NFRMPO Model - 2045 Employment Density Map

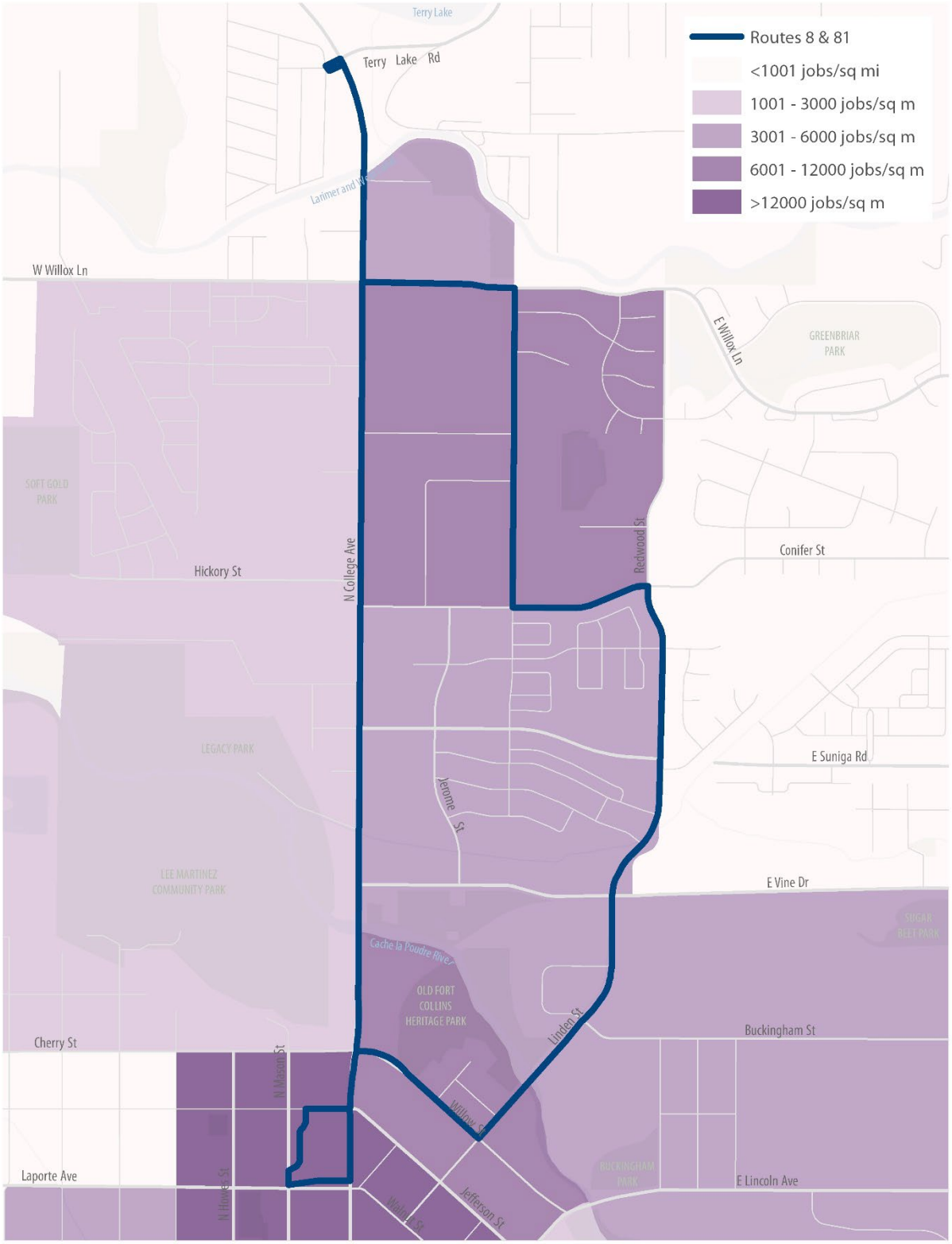


Figure 95: NFRMPO Model - 2015 Population Density Map

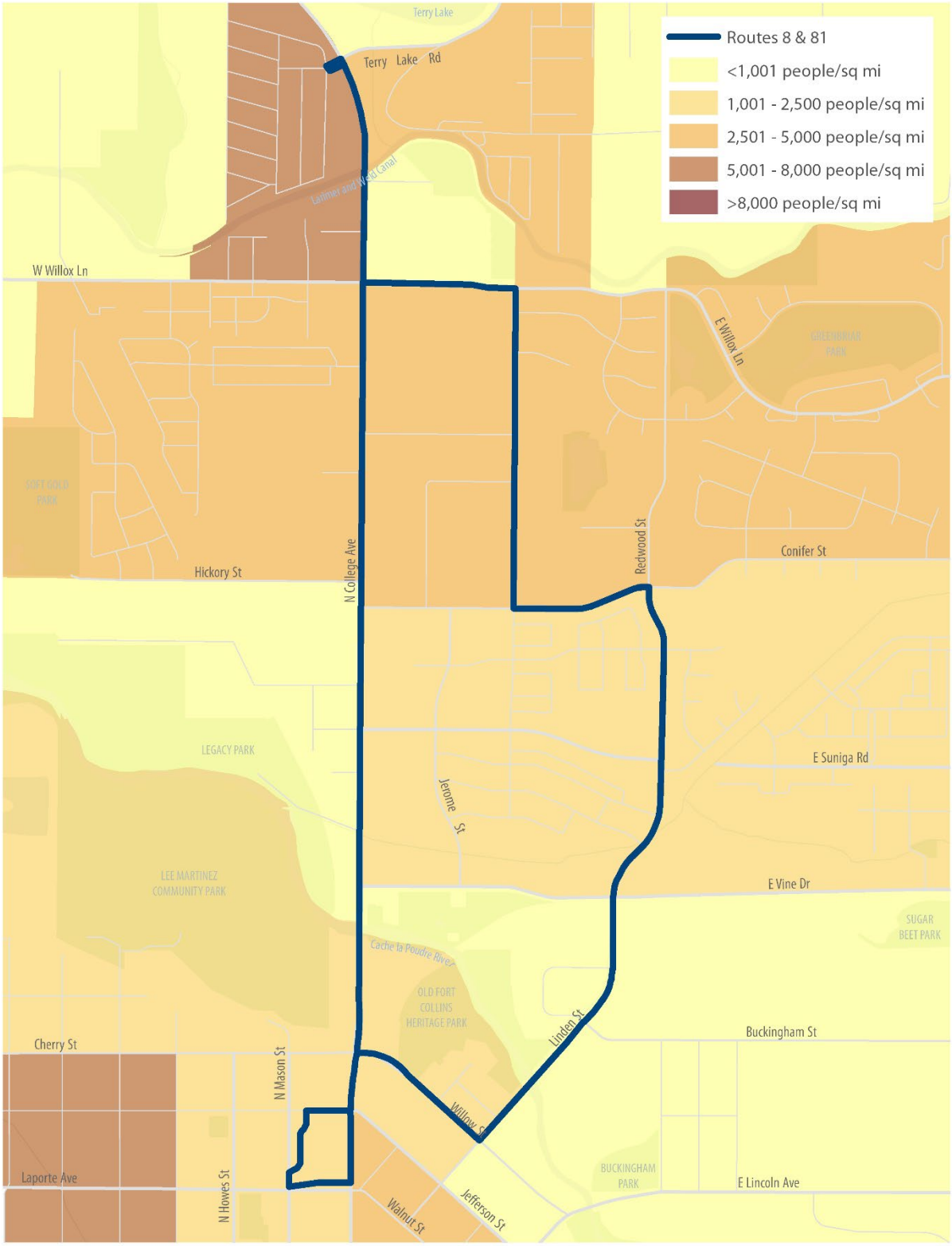
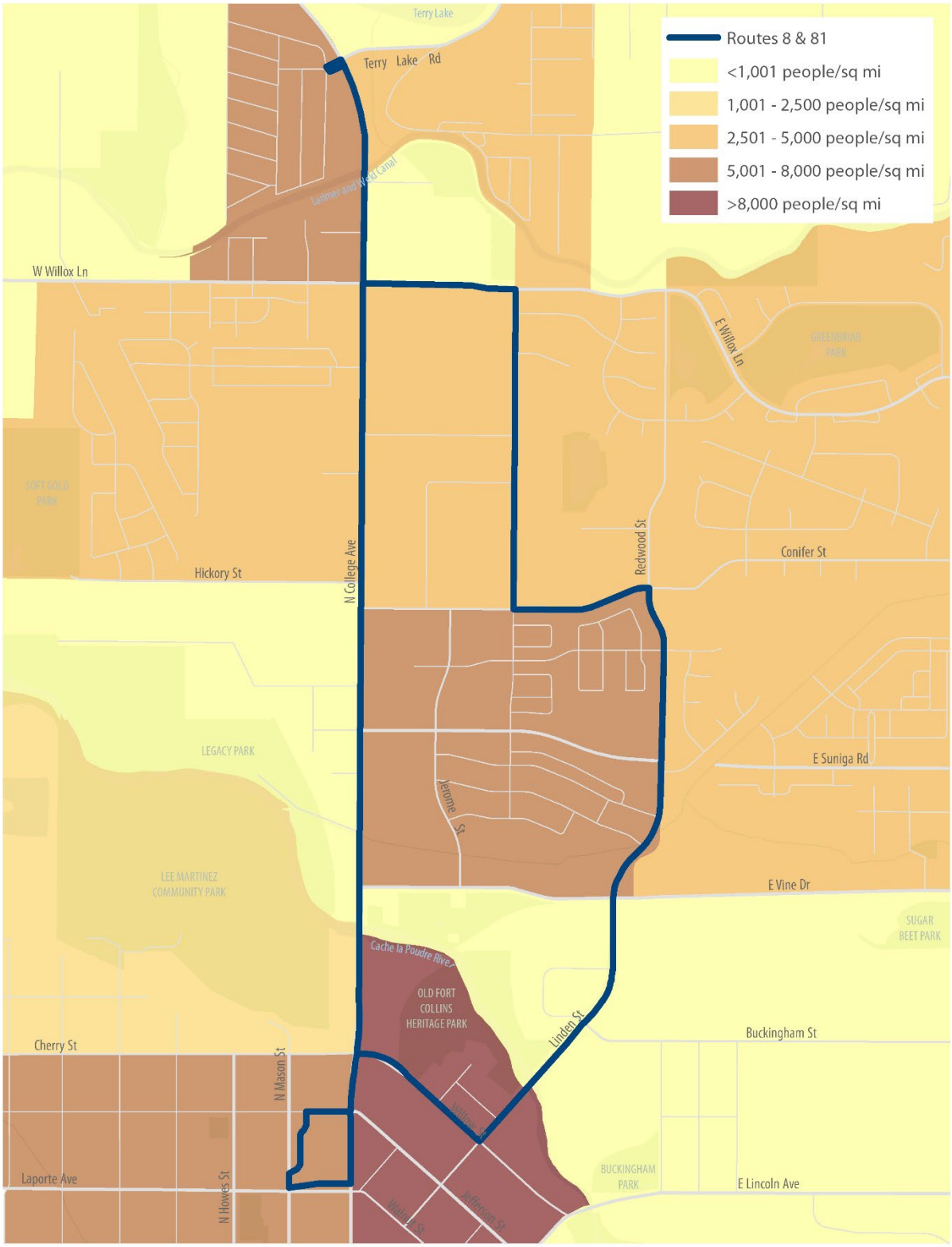


Figure 96: NFRMPO Model - 2045 Population Density Map



APPENDIX C

MARKET AND LAND USE ANALYSIS

Draft Report

North College MAX BRT
Market and Land Use Analysis

The Economics of Land Use

Prepared for:
City of Fort Collins

Prepared by:
Economic & Planning Systems, Inc.

EPS #213005

July 27, 2021

Economic & Planning Systems, Inc.
730 17th Street, Suite 630
Denver, CO 80202-3511
303 623 3557 tel
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Los Angeles
Oakland
Sacramento

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1. Introduction and Summary of Findings

Background

The North College Study Area, shown below in **Figure 1**, extends from Terry Lake Road to the north, East Vine Drive to the south, North Lemay Avenue to the east, and Cache la Poudre River to the west. The Study Area includes the North College Urban Renewal Authority (URA) boundary as shown. The majority of the Study Area is within the City of Fort Collins with the exception of the northern portion, which is located in Unincorporated Larimer County.

Scope of Work

The report is organized in two chapters following this Introduction and Summary of Findings as follows:

- **Economic and Demographic Framework** – This chapter provides an overview of the economic and demographic conditions within the North College Study Area and the City of Fort Collins. Population, households, and employment trends are summarized.

- **Land Use Analysis** – This chapter illustrates and analyzes the existing land uses within the North College Study Area at the parcel level and identifies recent and proposed development. A "soft parcel" analysis is used to identify vacant and underutilized parcels that may offer opportunities for development or redevelopment.

Figure 1. North College Study Area

Summary of Findings

1. ***The Study Area is attracting a greater diversity of residents and businesses.***

   The North College Study Area population has traditionally been predominately family households with lower-than-average household income. The area is more ethnically diverse than the city as whole as over 40 percent of residents are of Hispanic origin. Newer housing development has diversified the mix of residents living in the area. Larger student-oriented housing projects and new multifamily housing developments have led to more smaller households and non-family households.

2. ***The North College Corridor has attracted a significant increase in new households and employment over the past decade.***

   The Study Area attracted a limited amount of growth in households and employment prior to 2010. The North College Corridor has attracted a significant increase in new households and employment over the past decade. Since 2010, the Study Area has begun to capture development, specifically housing and supporting retail uses. This recent growth is a product largely of the city becoming more built out and available development sites in the city have become more limited. The attractiveness of downtown and the growth of employment in downtown has also contributed to the increase in housing development in the North College Study Area.

3. ***Future development opportunities along the North College BRT Corridor will be primarily located on larger vacant/underutilized parcels to the rear of commercial uses fronting on College Avenue.***

   Many of the commercial uses on the corridor, especially on the western side of the street, are on shallow lots of one-half to a full block in depth. As a result, there are portions of many parcels are vacant or used for marginal uses. These areas represent opportunities for future development especially for future housing projects. These parcels however have challenges with supporting development including site access and circulation and stormwater deficiencies.

2. Economic and Demographic Framework

This section provides an overview of existing conditions and trends related to household, demographic, and employment factors. Key changes between 2010 and 2021 are summarized for the North College Study Area and the City of Fort Collins.

Population and Households

There are approximately 6,466 residents living in the North College Study Area, shown in **Table 1**. The Study Area experienced increased development in recent years and gained 1,355 residents since 2010 or an average of 123 residents per year. This equates to an average annual growth rate of 2.2 percent. Prior to 2010 there were lower amounts of growth with a total of 371 residents between 2000 and 2010. This is an average of 37 residents per year at an annual growth rate of 0.8 percent. The City of Fort Collins has a total of 173,035 residents and increased by 28,342 residents since 2010 or an average of 2,577 residents per year. This is an average annal growth rate of 1.6 percent. From 2000 to 2010, the city experienced less population growth and gained a total of 19,288 residents. This is an average of 1,929 residents per year at an annual growth rate of 1.4 percent.

The North College Study Area has approximately 2,383 households. The average household size is 2.67 residents per household. Since 2010, the Study Area gained nearly 500 households with an average of 45 households per year. From 2000 to 2010 the Study Area gained 117 households or an average of 12 households per year.

Fort Collins has a total of 69,655 households and an average household size of 2.37 residents per households. From 2000 to 2010, Fort Collins gained 9,735 households or an average of 974 households per year. Household growth increased from 2010 to 2021 to a total of 11,542 households or an average of 1,049 households per year.

Table 1. Population and Households, 2000-2021

Description	2000	2010	2021	2000-2010			2010-2021		
				Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
Population									
North College Study Area	4,740	5,111	6,466	371	37	0.8%	1,355	123	2.2%
Fort Collins	125,405	144,693	173,035	19,288	1,929	1.4%	28,342	2,577	1.6%
Households									
North College Study Area	1,768	1,885	2,383	117	12	0.6%	498	45	2.2%
Fort Collins	48,378	58,113	69,655	9,735	974	1.9%	11,542	1,049	1.7%

Source: U.S. Census; ESRI Business Analyst; Economic & Planning Systems

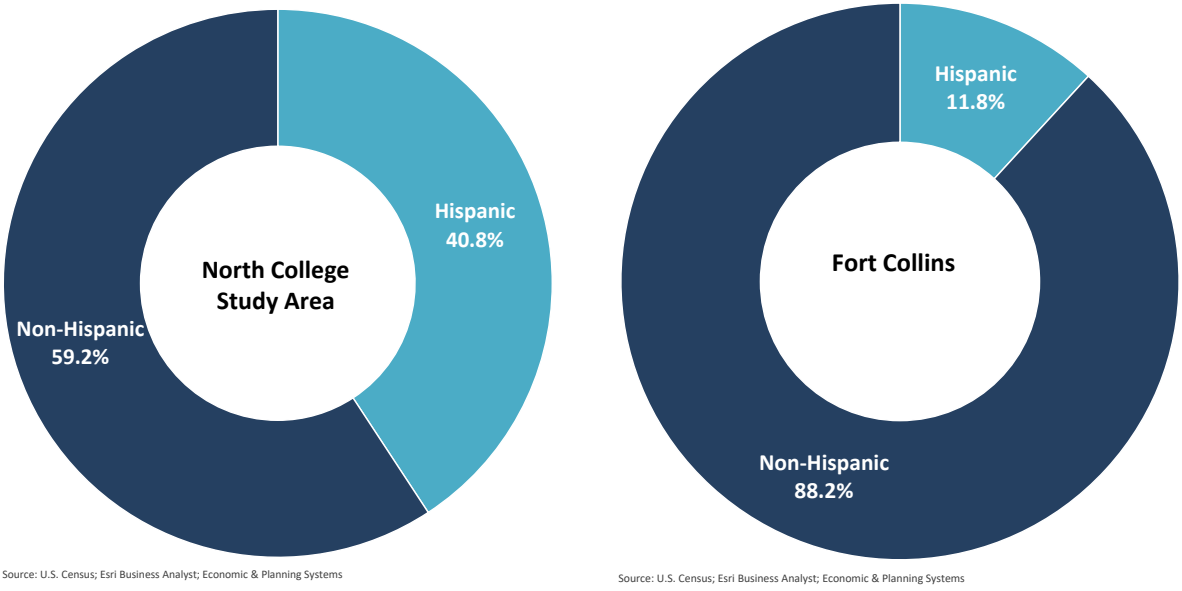
North College Study Area has a significant portion of residents who are of Hispanic origin with 40.8 percent of the total population, shown in **Table 2** and **Figure 2**. There is a greater presence of residents of Hispanic origin in the Study Area compared to Fort Collins where 11.8 percent of the population is of Hispanic origin. Independent of ethnicity, approximately 75.1 percent of the Study Area residents are White, 15.7 percent are Other Race, and 4.7 percent are Two or More Races. While the other categories for race are each less than 2 percent of the total population. In comparison, 86.9 percent of Fort Collin's residents are White, 3.8 percent are Two or More Races, 3.5 percent are Other Race, and 3.3 percent are Asian.

Table 2. North College Study Area Race and Ethnicity, 2021

Description	North College Study Area 2021	North College Study Area % Total	Fort Collins 2021	Fort Collins % Total
White	4,853	75.1%	150,369	86.9%
Black/African American	70	1.1%	2,781	1.6%
American Indian/Alaska Native	116	1.8%	1,228	0.7%
Asian	93	1.4%	5,784	3.3%
Pacific Islander	12	0.2%	162	0.1%
Other Race	1,016	15.7%	6,097	3.5%
Two or More Races	306	4.7%	6,614	3.8%
Total	**6,466**	**100.0%**	**173,035**	**100.0%**
Hispanic	2,636	40.8%	20,416	11.8%
Non-Hispanic	3,830	59.2%	152,619	88.2%
Total	**6,466**	**100.0%**	**173,035**	**100.0%**

Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

Figure 2. Hispanic Population, 2021



Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

North College Study Area and the city each have a significant portion of family households with 57.7 percent and 53.9 percent, respectively. Additionally, approximately a quarter of all households in both areas are 2-person family households, shown in **Table 3**. Nonfamily 1-person households account for approximately a quarter of all households in the Study Area and city. The Study Area has a larger proportion of children ages 9 and younger at 15.5 percent compared to 10.1 percent in Fort Collins, shown in **Table 3.** Households by Type, 2019

Description	North College Study Area 2019	North College Study Area % Total	Fort Collins 2019	Fort Collins % Total
Family Households				
2-person	584	25.5%	15,649	24.2%
3-person	323	14.1%	7,781	12.0%
4-person	201	8.8%	7,974	12.3%
5-person	168	7.3%	2,605	4.0%
6-person	9	0.4%	556	0.9%
7+ person	32	1.4%	270	0.4%
Subtotal	**1,317**	**57.5%**	**34,835**	**53.9%**
Nonfamily Households				
1-person	585	25.5%	15,969	24.7%
2-person	210	9.2%	8,850	13.7%
3-person	122	5.3%	3,722	5.8%
4-person	4	0.2%	976	1.5%
5-person	53	2.3%	189	0.3%
6-person	0	0.0%	58	0.1%
7+ person	0	0.0%	0	0.0%
Subtotal	**973**	**42.5%**	**29,764**	**46.1%**
Total	**2,290**	**100.0%**	**64,599**	**100.0%**

Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

Figure 3. North College Study Area has a lower proportion of young adults, age 20 to 34, which account for 24.2 percent compared to 31.6 percent in the city. Both geographies have a similar median age at 33.4 years old in the Study Area and 32.0 years old in Fort Collins.

Table 3. Households by Type, 2019

Description	North College Study Area 2019	North College Study Area % Total	Fort Collins 2019	Fort Collins % Total
Family Households				
2-person	584	25.5%	15,649	24.2%
3-person	323	14.1%	7,781	12.0%
4-person	201	8.8%	7,974	12.3%
5-person	168	7.3%	2,605	4.0%
6-person	9	0.4%	556	0.9%
7+ person	32	1.4%	270	0.4%
Subtotal	**1,317**	**57.5%**	**34,835**	**53.9%**
Nonfamily Households				
1-person	585	25.5%	15,969	24.7%
2-person	210	9.2%	8,850	13.7%
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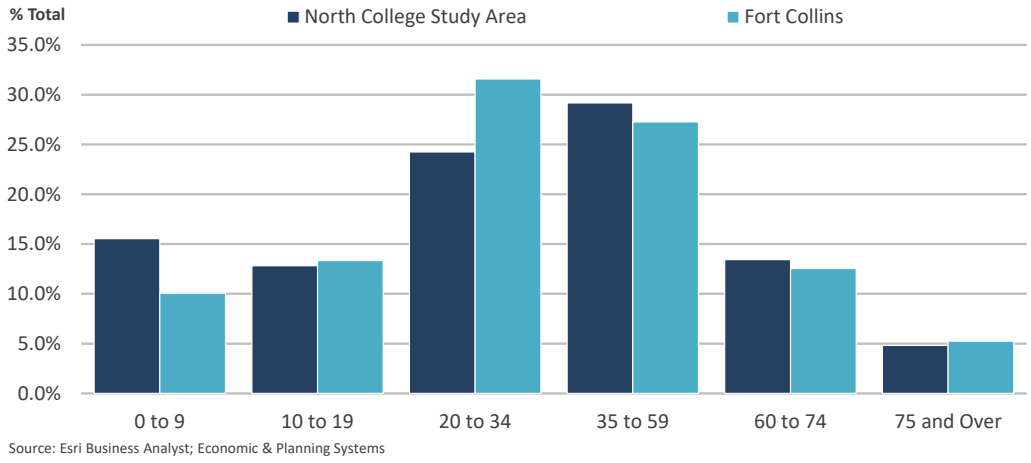
4-person	4	0.2%	976	1.5%
5-person	53	2.3%	189	0.3%
6-person	0	0.0%	58	0.1%
7+ person	0	0.0%	0	0.0%
Subtotal	**973**	**42.5%**	**29,764**	**46.1%**
Total	**2,290**	**100.0%**	**64,599**	**100.0%**

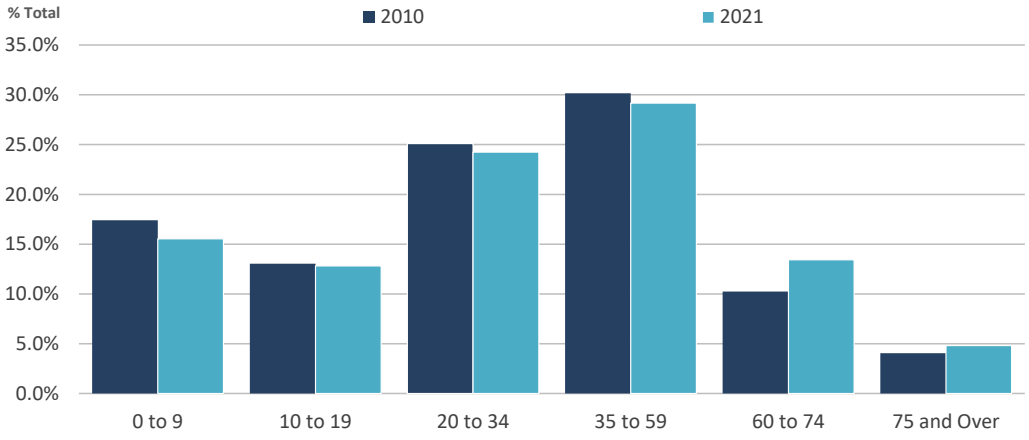
Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

Figure 3. Age Distribution, 2021



From 2010 to 2021, the Study Area shifted to a slightly older age demographic. Residents 60 years and older increased by 4.0 percentage points over this time period, shown in **Figure 4**. Additionally, the proportion of children ages 9 and younger declined since 2010 by 1.9 percentage points. The other age groups experienced slight declines of 1.0 percentage point or less.

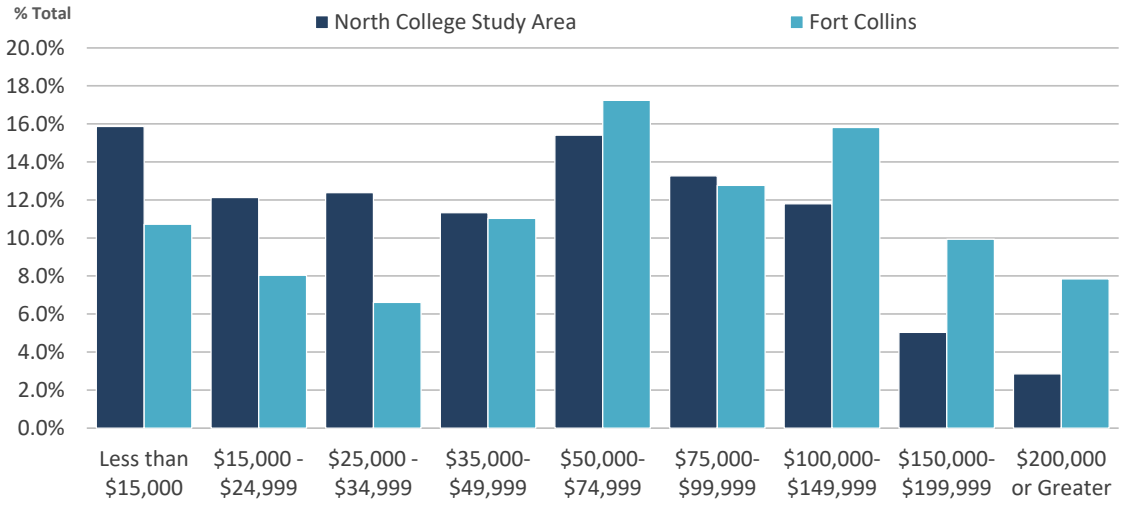
Figure 4. North College Study Area Age Distribution, 2010-2021



Source: Esri Business Analyst; U.S. Census; Economic & Planning Systems

North College Study Area has lower household incomes compared to the city. The median household income in the Study Area is $47,200 while citywide it is $68,000. Approximately 28.0 percent of households in the Study Area earn less than $25,000 each year, shown in **Figure 5**. In Fort Collins, 18.8 percent of households are within this income bracket. Additionally, 19.7 percent of households in the Study Area earn $100,000 or more annually compared to 33.6 percent in the city.

Figure 5. Household Income Distribution, 2021



Source: Esri Business Analyst; U.S. Census; Economic & Planning Systems

Housing Inventory

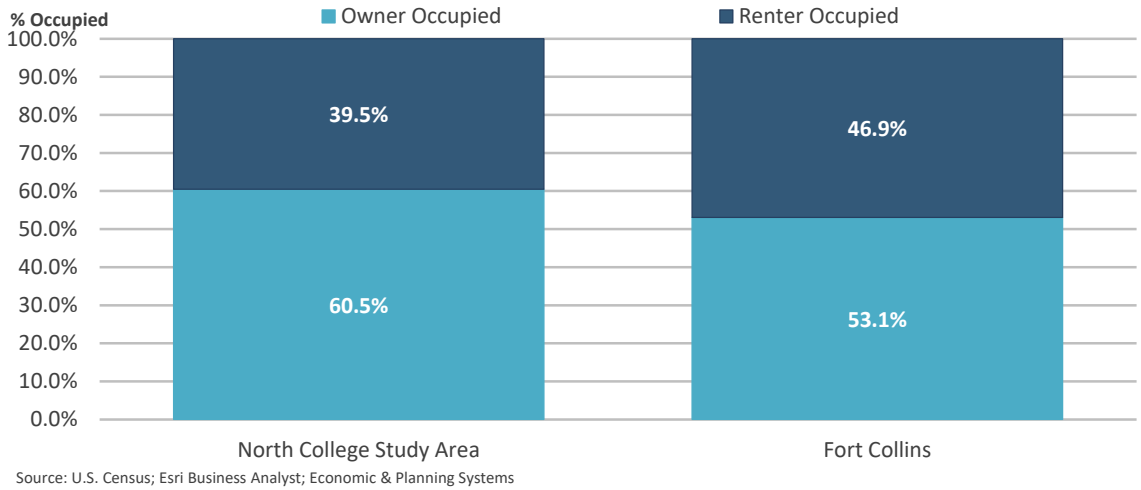
North College Study Area currently has 2,567 housing units. Since 2010, the Study Area gained a total of 576 units or an average of 52 units per year, an annual growth rate of 2.3 percent, shown in **Table 4**. These additional housing units are nearly split between homeowners and renters. The Study Area gained 223 ownership units or an average of 20 units per year and 275 renter units or an average of 25 units per year. Currently, the housing tenure of the Study Area is 60.5 percent owner occupied and 39.5 percent renter occupied, shown below in **Figure 6**. By comparison, the city's housing tenure is 53.1 percent homeowners and 46.9 percent renters

Table 4. Housing Inventory, 2000-2021

Housing Units	2000	2010	2021	2000-2010 Total	2000-2010 Ann. #	2000-2010 Ann. %	2010-2021 Total	2010-2021 Ann. #	2010-2021 Ann. %
North College Study Area									
Owner Occupied	1,219	1,218	1,441	-1	0	0.0%	223	20	1.5%
Renter Occupied	550	667	942	117	12	1.9%	275	25	3.2%
Vacant	72	106	184	34	3	3.9%	78	7	5.1%
Total	**1,841**	**1,991**	**2,567**	**150**	**15**	**0.8%**	**576**	**52**	**2.3%**
Fort Collins									
Owner Occupied	28,413	32,099	36,971	3,686	369	1.2%	4,872	443	1.3%
Renter Occupied	19,965	26,014	32,683	6,049	605	2.7%	6,669	606	2.1%
Vacant	1,919	2,694	2,040	775	78	3.5%	-654	-59	-2.5%
Total	**50,297**	**60,807**	**71,695**	**10,510**	**1,051**	**1.9%**	**10,888**	**990**	**1.5%**

Source: Esri Business Analyst; U.S. Census; Economic & Planning Systems

Figure 6. Housing Tenure, 2021

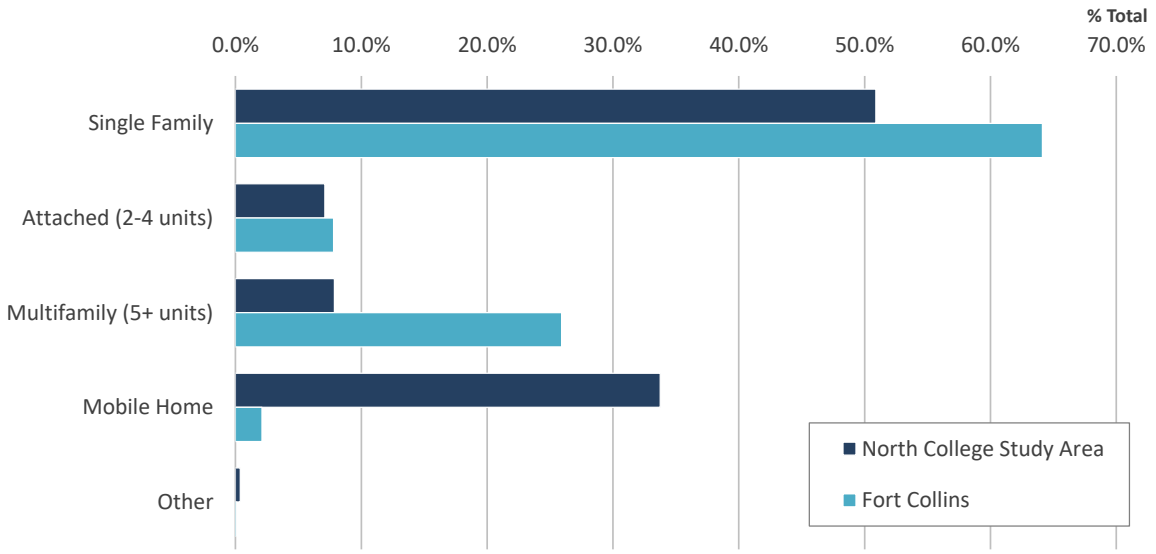


Source: U.S. Census; Esri Business Analyst; Economic & Planning Systems

In the Study Area, just over 50 percent of the housing units are single family detached units, shown in **Figure 7**. There are over 800 mobile home units in the

Study Area, which is 33.8 percent of the total inventory. Attached and multifamily units each account for approximately 7 percent of the area's housing inventory. The citywide housing inventory is largely comprised of single family detached units at 64.1 percent and multifamily units at 25.9 percent. Attached units in the city account for approximately 8 percent and mobile homes account for 2 percent.

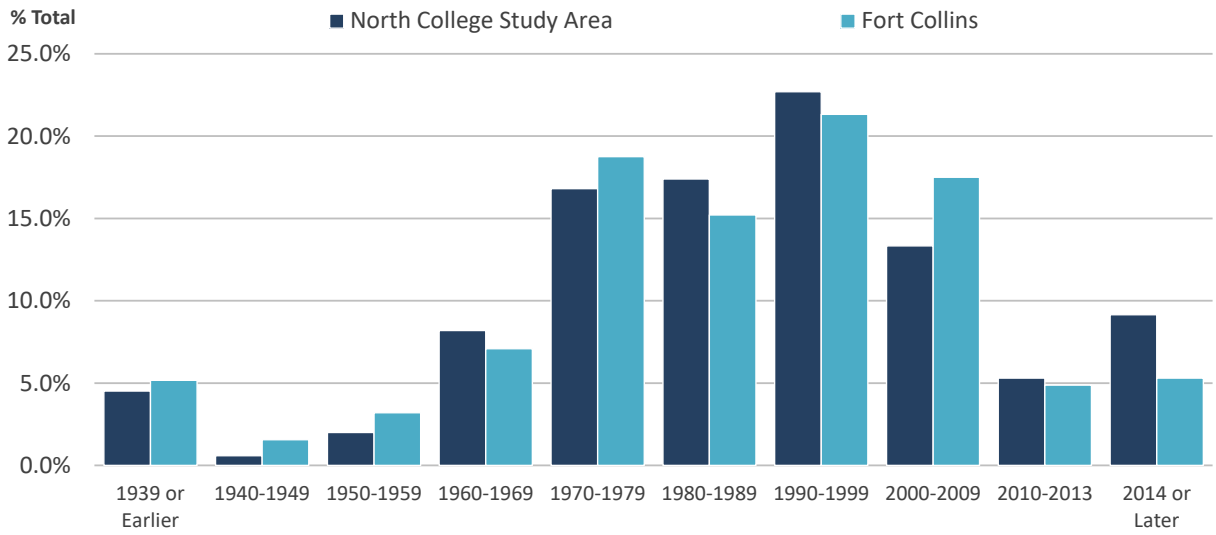
Figure 7. Housing by Unit Type, 2019



Source: U.S. Census; Economic & Planning Systems

Overall, the age of housing in the Study Area and city are similar, with the median year built being 1990 and 1989, respectively. Fort Collins had a larger proportion of homes built in the early 2000s accounting for 17.5 percent of the total housing inventory. However, the Study Area is growing faster than the city as a whole with 9.2 percent of the inventory built since 2014 compared to 5.3 percent for the city, shown in **Figure 8**.

Figure 8. Housing by Year Built, 2019



Source: U.S. Census; Economic & Planning Systems

Employment

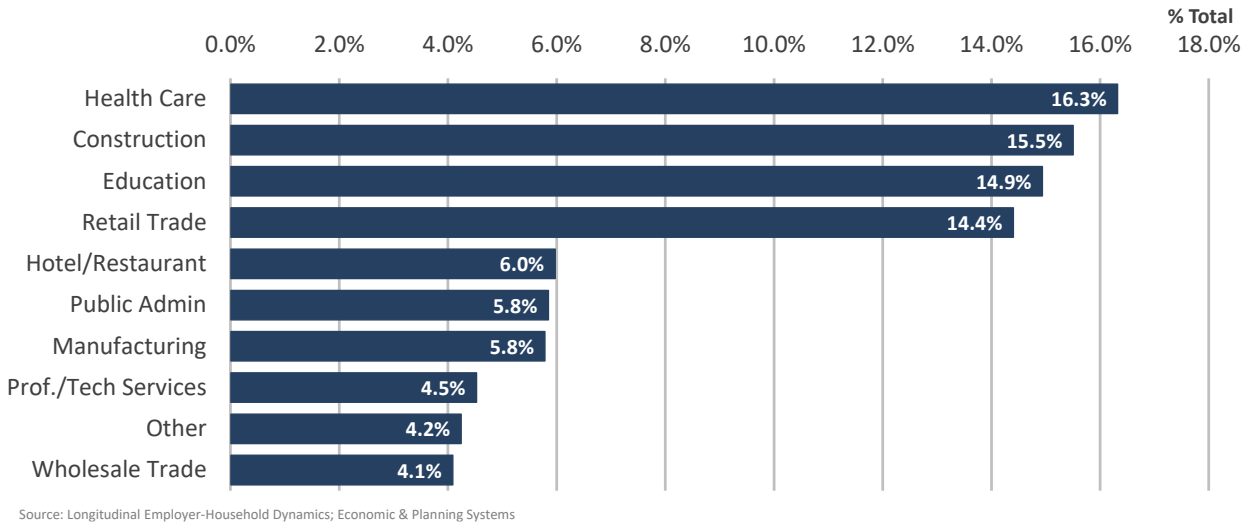
In 2018, North College Study Area had a total of 3,180 jobs, shown in **Table 5**. From 2010 to 2018, the Study Area grew by a total of 1,267 jobs or an average of 158 jobs per year. This equates to an average annual growth rate of 6.6 percent. Previously from 2002 to 2010, the area experienced minimal amounts of job growth with a total of 260 new jobs or an average of 33 jobs per year. As of 2018, the largest employment sector in the Study Area is Health Care with 519 jobs or 16.3 percent of the total employment. There are a number of local agencies in the area including the Health District of Northern Larimer County, Salud Family Health Center, and Children's Clinic. Construction is the second largest sector with 493 jobs or 15.5 percent and is followed by Education (Tavelli Elementary School) with 475 jobs or 14.9 percent, and Retail Trade with 458 jobs or 14.4 percent, shown below in **Figure 9**.

Table 5. North College Study Area Employment by Industry, 2002-2018

Industry	2002	2010	2018	2002-2010			2010-2018		
				Total	Ann. #	Ann. %	Total	Ann. #	Ann. %
Ag./Foresty/Fishing	0	5	7	5	1	---	2	0	4.3%
Mining	0	1	0	1	0	---	-1	0	-100.0%
Utilities	0	0	0	0	0	---	0	0	---
Construction	341	290	493	-51	-6	-2.0%	203	25	6.9%
Manufacturing	70	87	184	17	2	2.8%	97	12	9.8%
Wholesale Trade	46	67	130	21	3	4.8%	63	8	8.6%
Retail Trade	485	530	458	45	6	1.1%	-72	-9	-1.8%
Transport./Warehousing	130	76	44	-54	-7	-6.5%	-32	-4	-6.6%
Information	25	0	24	-25	-3	-100.0%	24	3	---
Finance	24	61	22	37	5	12.4%	-39	-5	-12.0%
Real Estate	35	32	37	-3	0	-1.1%	5	1	1.8%
Prof./Tech Services	53	91	144	38	5	7.0%	53	7	5.9%
Mgmt	0	0	0	0	0	---	0	0	---
Admin/Waste Mgmt	123	63	110	-60	-8	-8.0%	47	6	7.2%
Education	9	58	475	49	6	26.2%	417	52	30.1%
Health Care	26	329	519	303	38	37.3%	190	24	5.9%
Arts/Rec	29	1	22	-28	-4	-34.4%	21	3	47.2%
Hotel/Restaurant	125	116	190	-9	-1	-0.9%	74	9	6.4%
Other	127	104	135	-23	-3	-2.5%	31	4	3.3%
Public Admin	5	2	186	-3	0	-10.8%	184	23	76.2%
Total	**1,653**	**1,913**	**3,180**	**260**	**33**	**1.8%**	**1,267**	**158**	**6.6%**

Source: Longitudinal Employer-Household Dynamics; Economic & Planning Systems

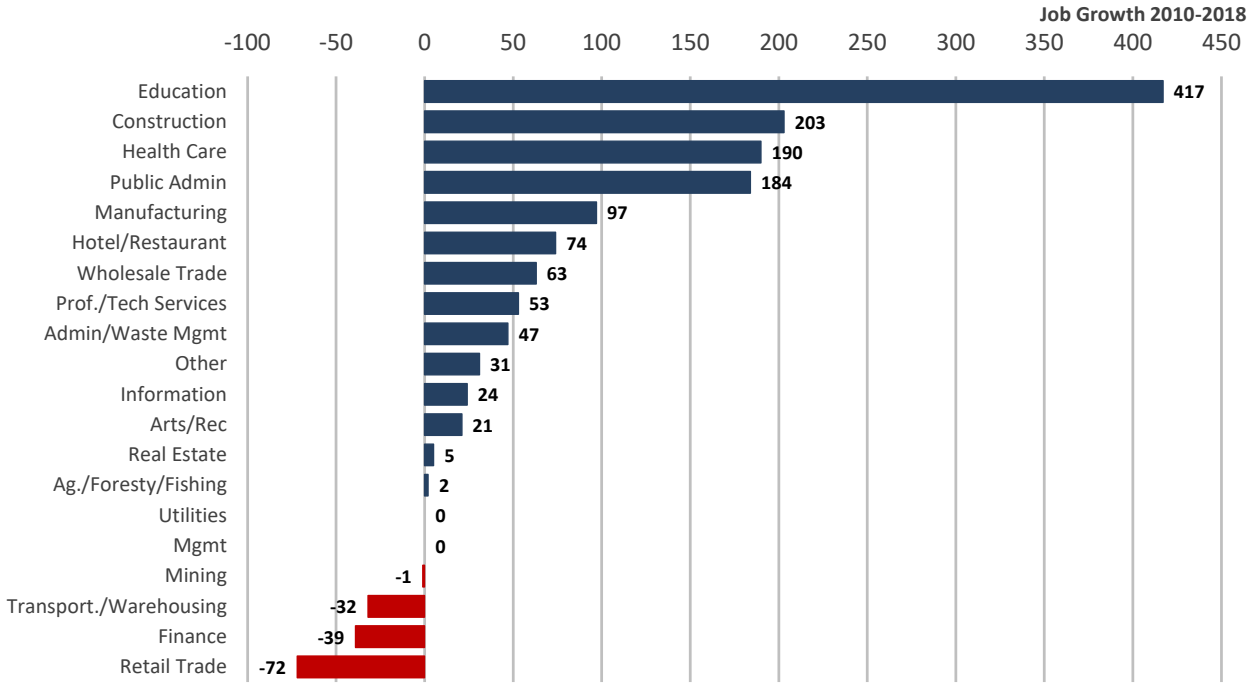
Figure 9. North College Study Area Largest Industries, 2018



Source: Longitudinal Employer-Household Dynamics; Economic & Planning Systems

From 2010 to 2018, Education experienced the largest amount of growth with 417 jobs accounting for 32.9 percent of the total employment growth over this time, shown in **Figure 10**. This growth is likely accounted for through the English Language Institute/China headquarters located in the Study Area, which has employees throughout the world that may be included in the employment data. Additionally, the Colorado State University Powerhouse Energy Campus is located on the same parcel as the Poudre River Whitewater Park, although it is technically outside the Study Area it may be included in the employment data. Construction is the second largest growing industry accounting for 16.0 percent of total employment growth with 203 jobs. There are numerous construction businesses in the Study Area including Hillside Construction, Evergreen Radon and Construction Services, Philgreen Construction, and Sunspot Greenhouse Company. Other industries with job growth in the Study Area are Health Care, which accounted for 15.0 percent of total employment growth with 190 jobs, Public Administration accounted for 14.5 percent with 184 jobs, and Manufacturing accounted for 7.7 percent with 97 jobs. Alternatively, Retail Trade, Finance, and Transportation and Warehousing each experienced a decline in employment over this timeframe.

Figure 10. North College Study Area Employment Growth by Industry, 2010-2018



Source: Longitudinal Employer-Household Dynamics; Economic & Planning Systems

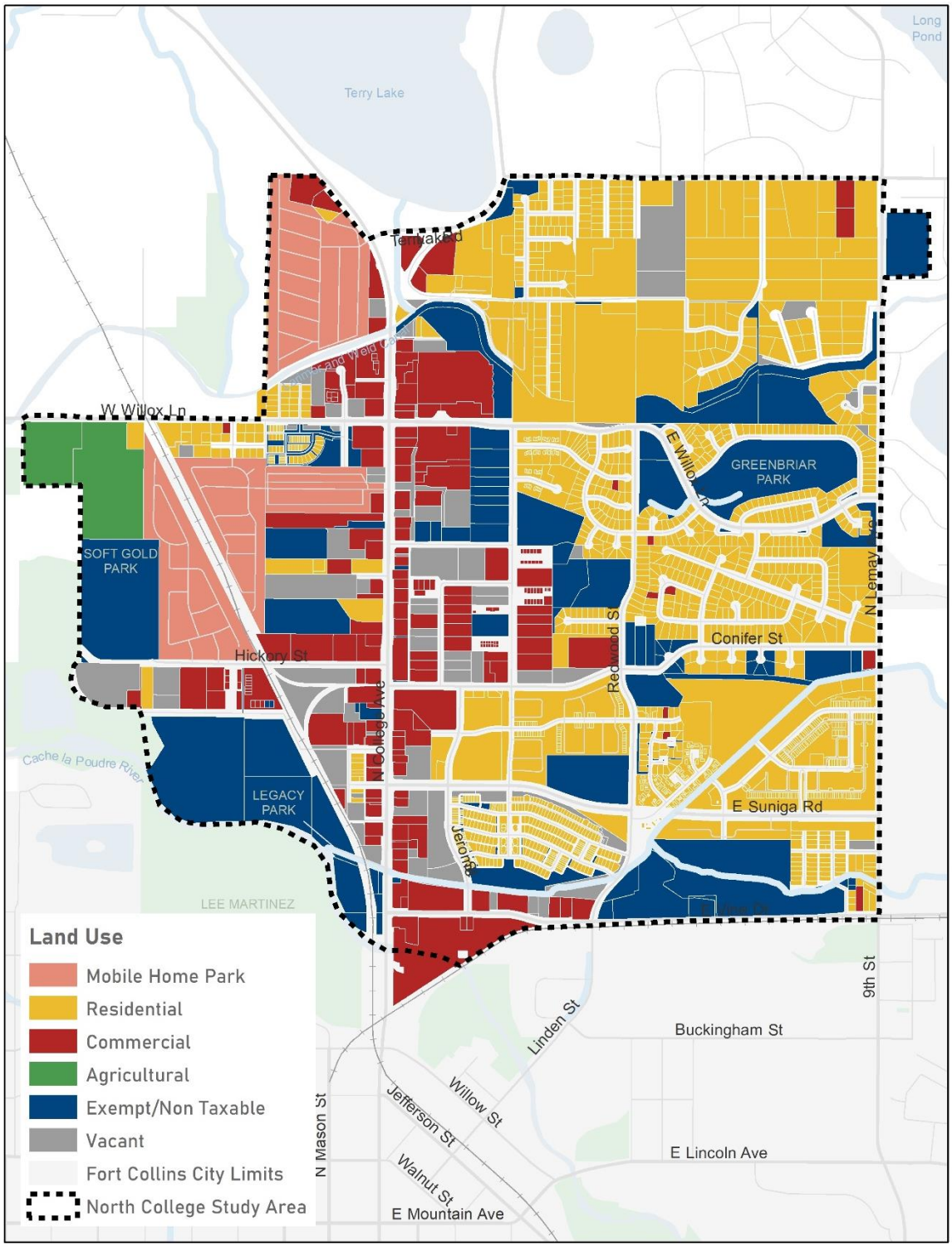
3. Land Use Analysis

This section examines and illustrates the current land use conditions within the North College Study Area. A soft parcel analysis identifies vacant and underutilized parcels, which may offer opportunities for redevelopment based on vacancy, floor area ratio (FAR), and building to land value ratio.

Land Use Conditions

Existing land use conditions are shown by category in **Figure 11**. Commercial uses primarily line North College Avenue with residential or vacant land behind the commercial frontage. There is a section east of North College Avenue between Conifer Street and Willox Lane that contains light industrial, and institutional/ non-profit uses within office and flex-industrial buildings. The residential uses within the area for the most part are the result of new development, with the exception of a few larger residential properties and large existing mobile home parks. There are three mobile home parks within the Study Area including Hickory Village west of North College Avenue, North College LLC Senior Community west of North College Avenue, and Poudre Valley Mobile Home Park in the northwest section of the Study Area.

Figure 11. North College Study Area Land Use



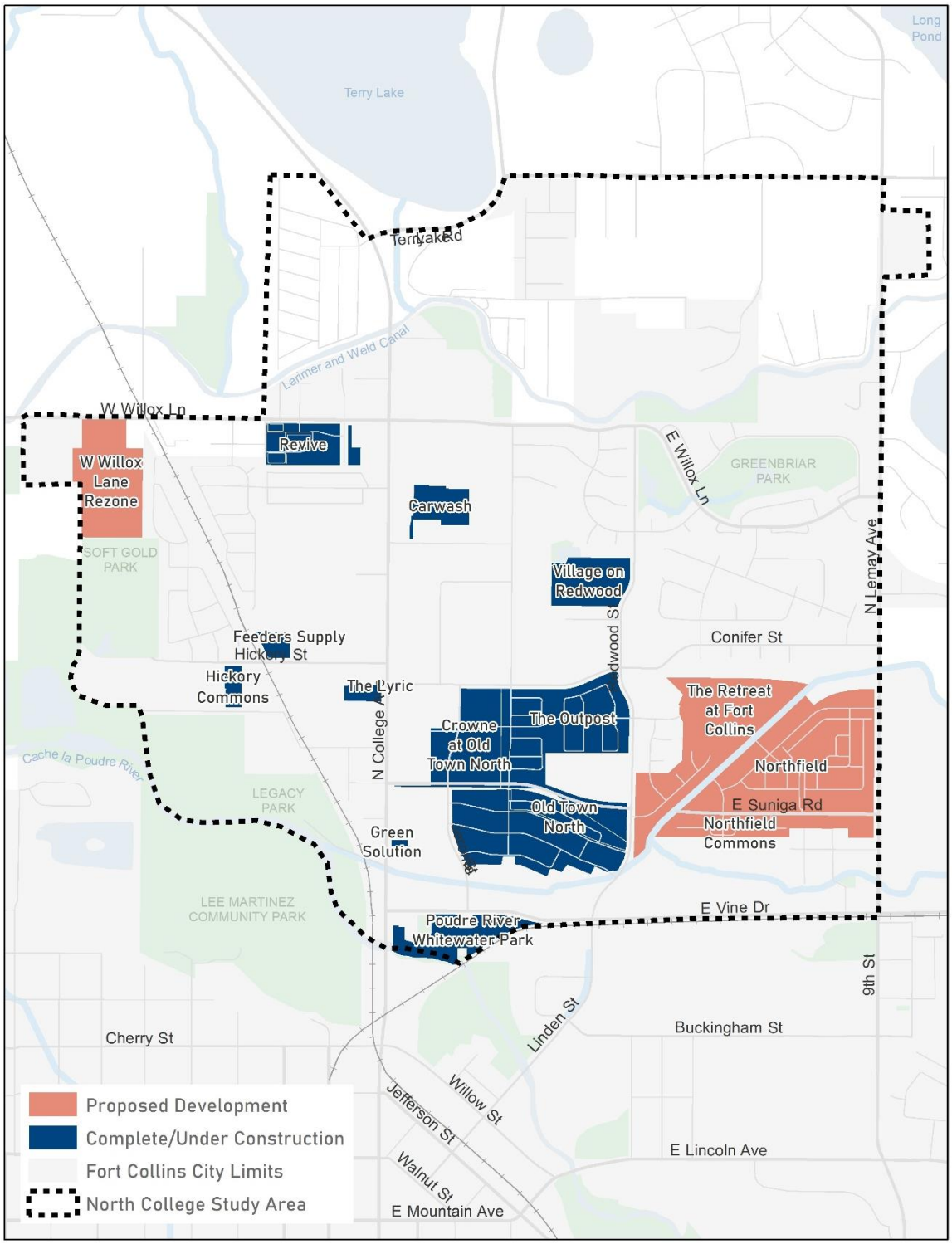
Recent and Proposed Development

The recently completed and proposed development projects within the Study Area are shown in **Figure 12**. There are two recently completed destination recreation/ entertainment uses, the Lyric Movie Theatre and Poudre River Whitewater Park, that may drive visitation to the area and additional demand. Additionally, there are recently completed infill commercial projects including a dispensary, warehouse, and carwash. There are approximately 850 residential units recently completed or under construction and 662 units proposed. The recent and proposed development projects are briefly described below.

- **Lyric Movie Theatre** – Located at 1209 North College Avenue, the Lyric Theater moved from downtown and built a new theater and coffeehouse in 2017.
- **Poudre River Whitewater Park** – This new city park located at 201 East Vine Drive and was completed in 2019. It is designed for kayakers and tubers to use the river and also includes riverbank access, an overlook plaza, and pedestrian bridge with connections to the Poudre Trail.
- **Green Solution** – A dispensary located at 810 North College Avenue that opened in 2017.
- **Hickory Commons** – Located at 321 Hickory Street are industrial warehouse condos with a total of 11,000 square feet completed in 2019.
- **Feeders Supply** – Located at 300 Hickory Street is an animal feed store that opened in 2014.
- **Carwash** – Located at 1606 North College and opened in 2017.
- **Crowne at Old Town North** – This multifamily development completed in 2020, including 304 apartment and townhome units, is located at the northwest corner of Suniga Road and Blue Spruce Drive. The development has units ranging from $1,250 to $2,200 per month
- **Revive** – This relatively small infill residential development is located along West Willox Lane and North Mason Street. The development was completed in 2019 and includes 55 single family detached units and townhome units. The single family units sold between $540,000 and $570,000, and townhome units sold between $327,500 and $360,000.
- **Village on Redwood** – This project is an affordable housing development with 72 townhomes completed in 2017 and located along Redwood Street north of Conifer Street.
- **The Outpost** – This project is a student housing development located at the southwest corner of Conifer Street and Redwood Street. It was completed in 2014 and includes 220 units. Average rental rates range from $965 for a 2-bedroom unit to $2,384 for a 5-bedroom unit.

- **Old Town North** – A residential development was started approximately 10 years ago and is nearing buildout. The development includes approximately 200 single family detached and attached units. Prices range from $350,000 to $650,000 for single family units and $300,000 to $430,000 for townhome units.
- **The Retreat at Fort Collins** – The Retreat is a proposed student housing development with 200 to 220 units and a density of 9 dwelling units per acre. The project will include single family detached and attached units.
- **Northfield** – A proposed housing development that includes 442 homes with a density of 8 dwelling units per acre. The project contains 84 affordable housing units for residents earning 60 percent of the area median income.
- **West Willox Lane Rezone** – The property is located south of West Willox Land and west of Hickory Village Mobile Home Park. The 19-acre parcel is requesting a rezone from urban estate to low density mixed use neighborhood. If approved, the rezone will allow for more dwelling units per acre. At this time there is no development plan for the property.

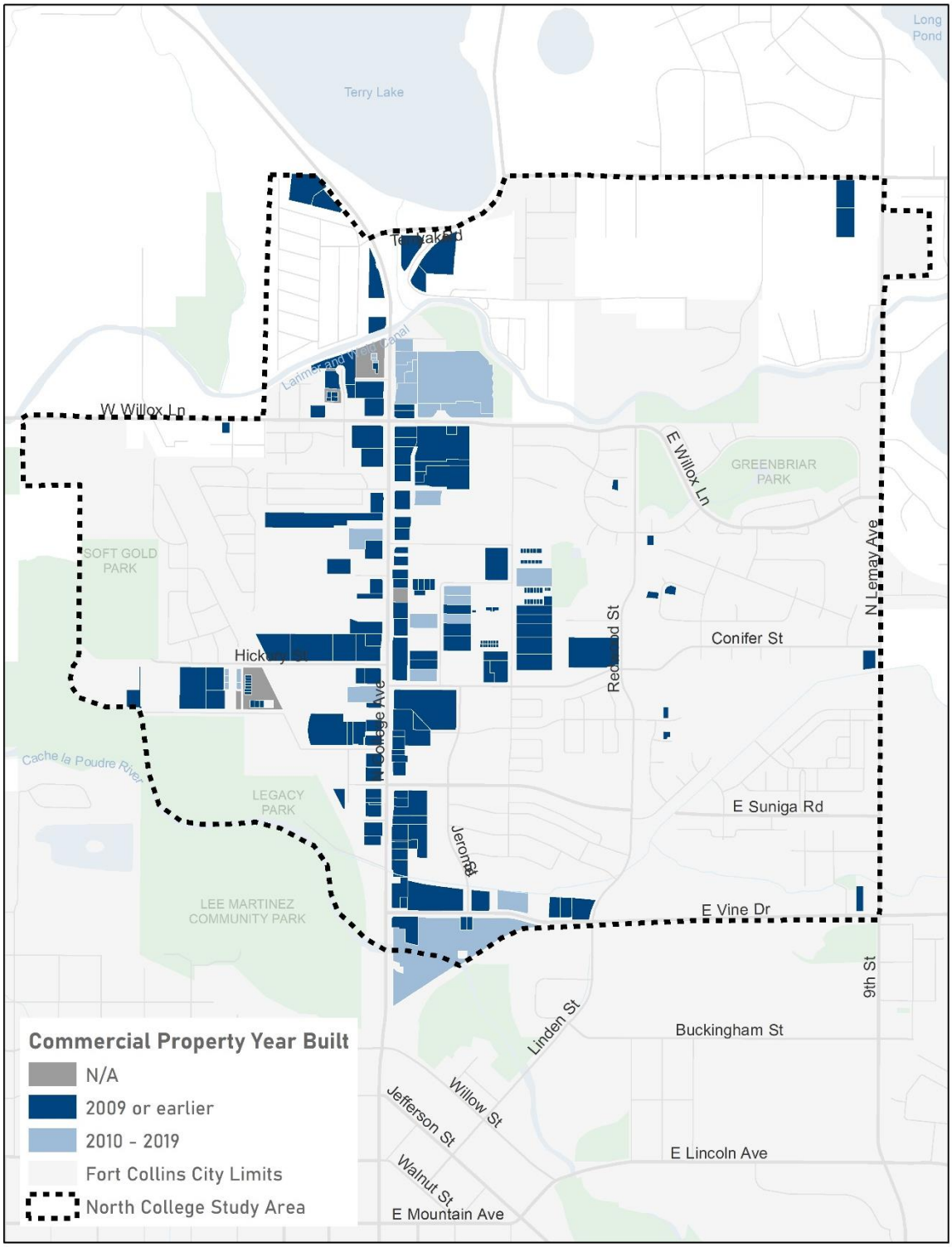
Figure 12. Recent and Proposed Development



Recent Commercial Development

The commercial property within the Study Area is shown below in **Figure 13** by year built. The majority of the commercial property along North College Avenue is older and was built prior to 2010, and much of it was built in Larimer County prior to annexation. There are a few recent commercial developments including the King Soopers Marketplace, which was built in 2010 and remodeled in 2015. Other newer commercial developments include Chase Bank, fast food restaurants, medical offices, office buildings, storage warehouses, car wash, movie theatre, and mini-storage facility.

Figure 13. Commercial Property by Year Built



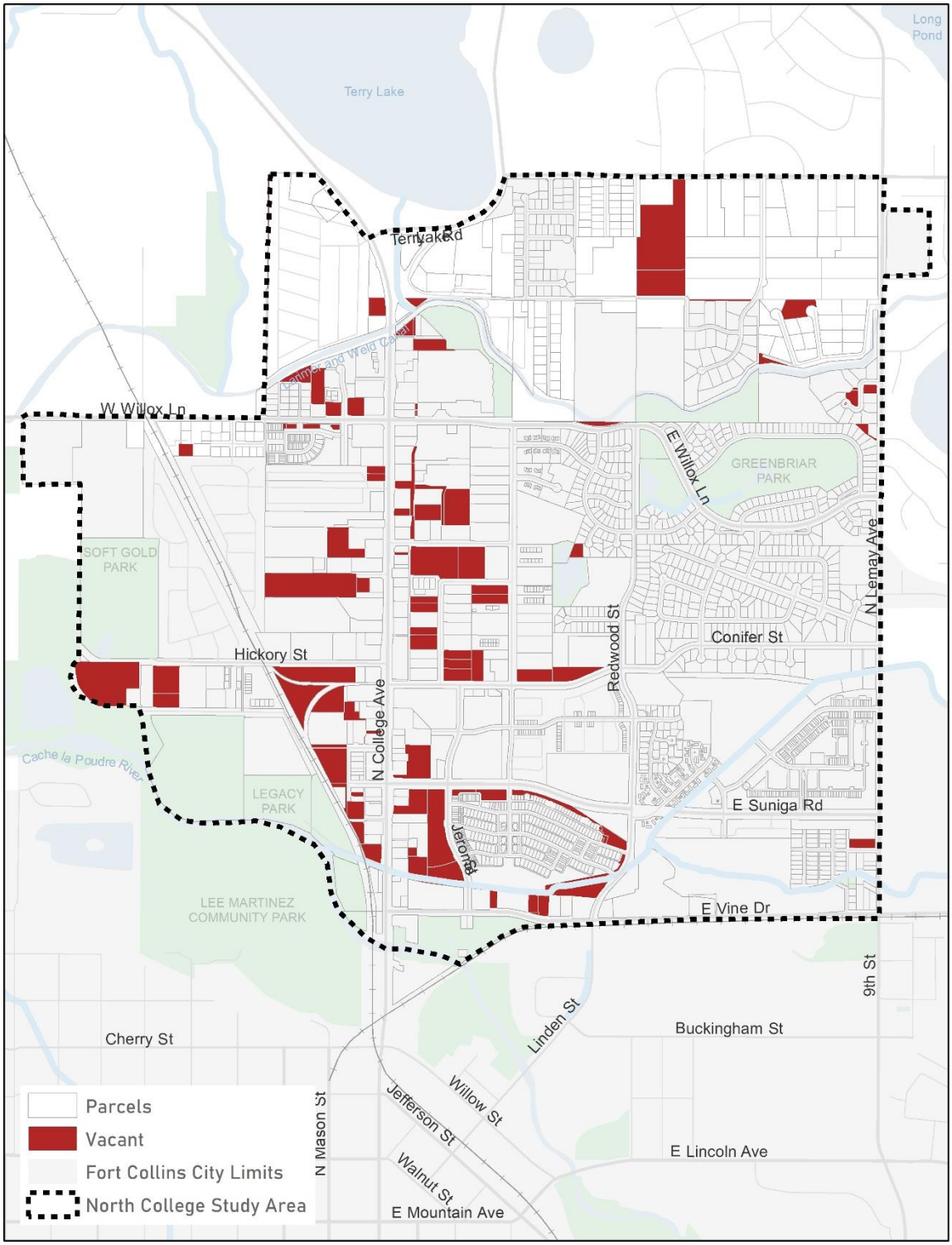
Land Utilization

EPS completed a "soft parcel" analysis to identify vacant or predominately vacant land that is likely to be developed, as well as other properties that would have the potential to be redeveloped to higher value uses based on a low floor area ratio (FAR) and/or low building to land value ratio.

Vacant

Vacant sites were identified based on Larimer County Assessor parcel data and aerial photography review. The vacant sites (excluding single platted residential lots) identified in the Study Area are shown in **Figure 14**. There are 95 vacant parcels consisting of approximately 97 acres. Vacant parcels range in size from 0.2 acres to 9.05 acres. The vacant land is primarily located behind parcels fronting North College Avenue. Lacking major north-south parallel roads, these parcels did not have a street to orient to and in many cases were subdivided off parcels located on College Avenue. As a result, these parcels remained vacant but have inferior or limited access. These parcels' viability for commercial uses is diminished due to their lack of North College Avenue frontage; therefore, their reuse is more likely to be for residential or industrial uses.

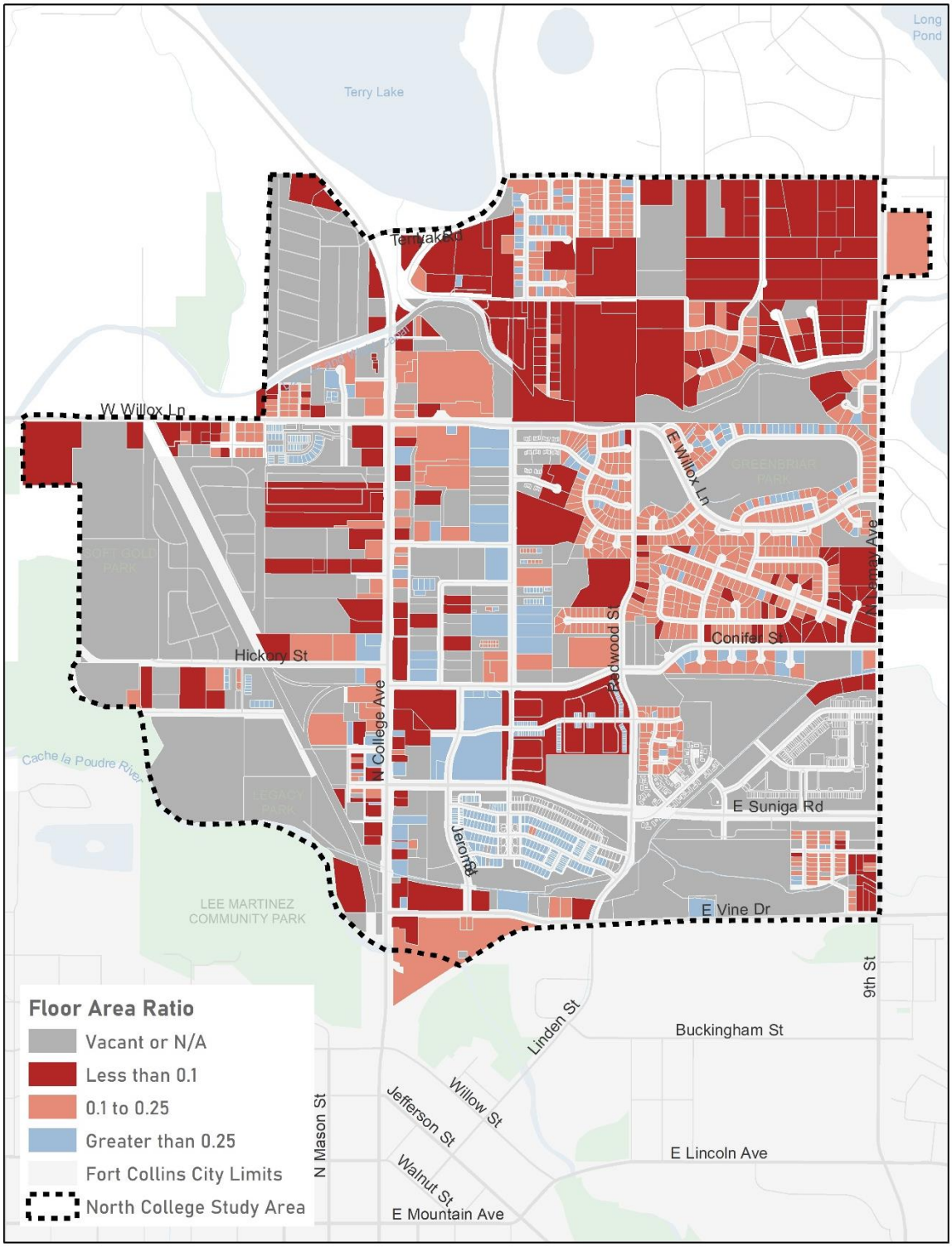
Figure 14. North College Study Area Vacant Parcels



Floor Area Ratio

The floor area ratio (FAR) of parcels in the North College Study Area was estimated to identify properties that can be characterized as underutilized. The floor area ratio (FAR) is calculated by dividing the total square feet of the buildings (improvements) on a parcel by the total square feet of the land area of parcel and shown in **Figure 15**. The definition of underutilized based on FAR varies by context and use but in this context, a FAR below 0.25 is considered potentially underutilized. There are a handful of parcels along North College Avenue that are underutilized based on FAR. These parcels are relatively small on average but could be connected in many cases with larger, vacant parcels behind to create larger development sites. Additionally, there are large lot, single family residential residences in the northeast corner of the Study Area with a FAR of 0.1 or less. Many of these homes are older and are not expected to redevelop.

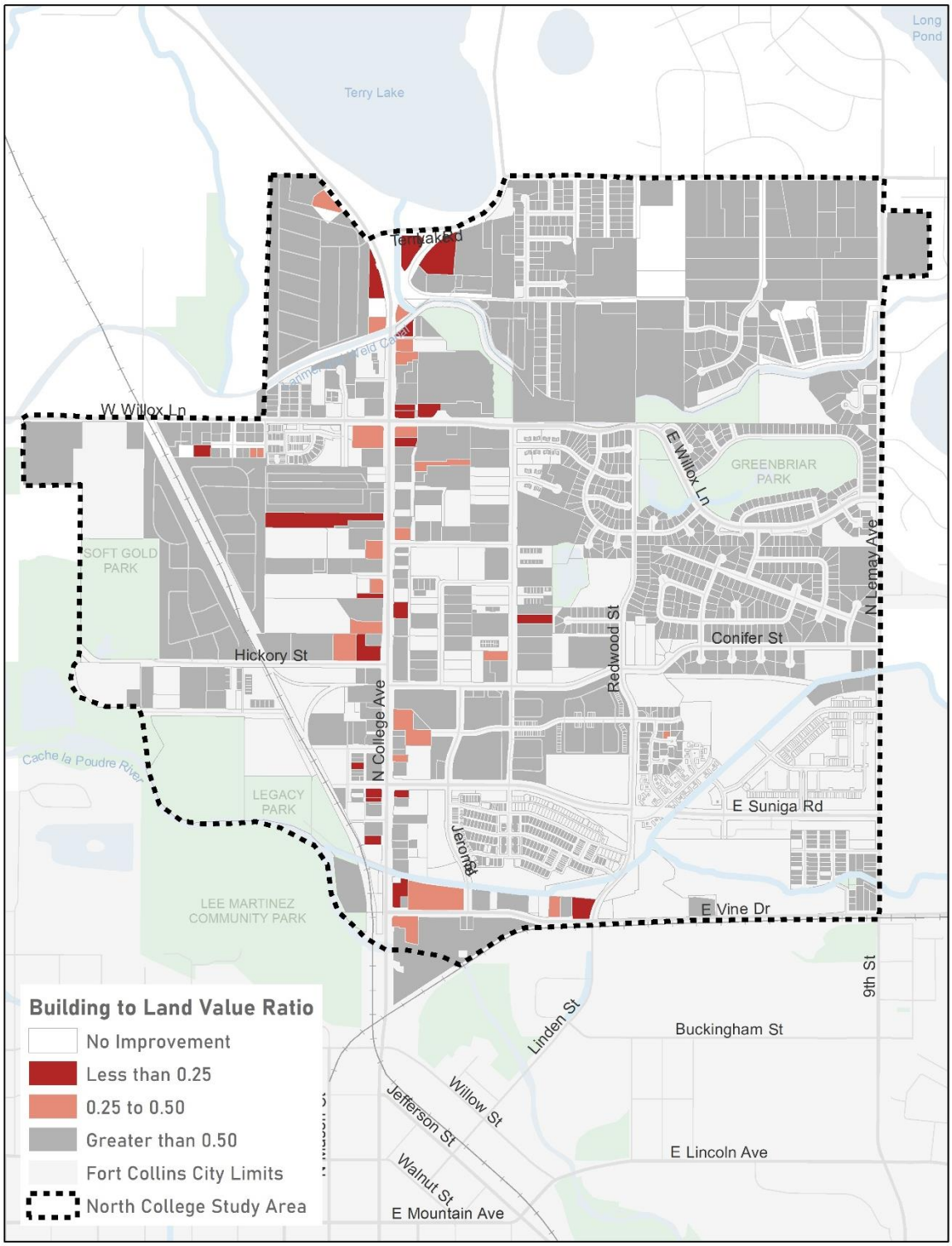
Figure 15. Floor Area Ratio (FAR)



Building to Land Value Ratio

The building to land value ratio is another measure to identify underutilized parcels as shown in **Figure 16**. In this context, parcels that are valued at one half or less of the value of land they are located on is potentially underutilized. To qualify, parcels with a building to land value ratio of less than 0.5 are analyzed. The pattern of underutilized parcels based on economic value matches closely with the FAR analysis, with a scattered set of underutilized parcels mostly lined along North College Avenue. As mentioned above, these parcels are relatively small but are next to vacant parcels in many cases. A potential approach to attracting redevelopment would be to connect areas along North College Avenue that are underutilized with vacant parcels behind. The connection allows for a large enough site and development program to justify redevelopment of the marginal/underperforming uses along North College Avenue.

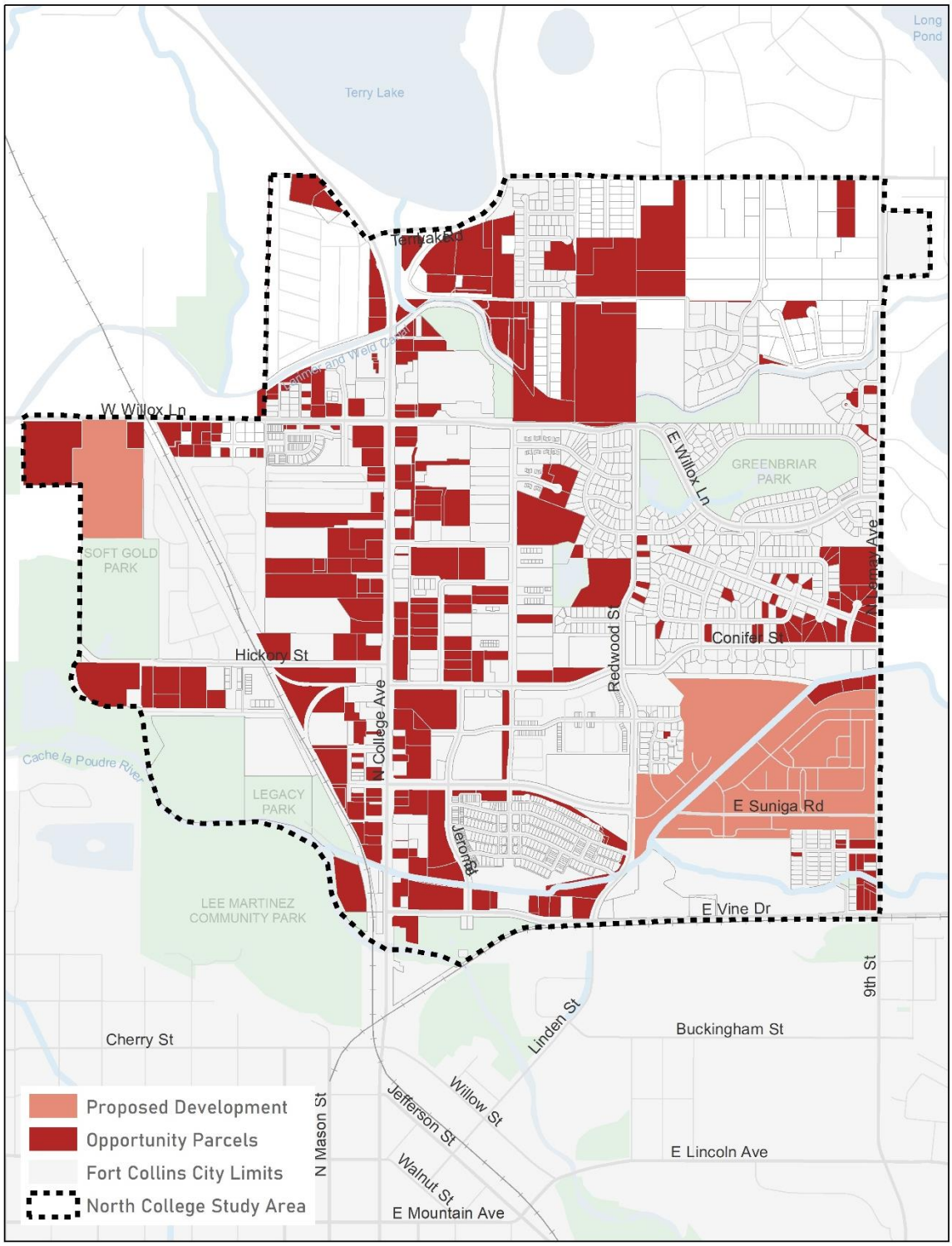
Figure 16. Building to Land Value Ratio



Opportunity Areas

Opportunity parcels are shown below in **Figure 17**. These parcels are a combination of vacant parcels, parcels with a floor area ratio of 0.1 or less, and parcels with a building to land value ratio of 0.5 or less. These characteristics demonstrate the opportunity for properties to develop or redevelop based on current underutilization.

Figure 17. Opportunity Parcels



Potential Development Sites

Based on the opportunity areas defined by vacancy, low FAR, and low building to land value ratio, potential development sites are identified below in **Figure 18**. Many of these parcels are currently vacant commercial properties. In order for parcels to develop along North College Avenue, many need to be combined with surrounding parcels due to small acreage and limited access. Each potential development site is described in detail below.

Site 1

Site 1 includes four parcels totaling 5.30 acres, shown in **Table 6**. Two parcels are owned by Powerhouse II LLC and are currently used as truck dealership. One parcel is owned by W and P LLC and is currently used as an auto repair shop. One small parcel is owned by the City of Fort Collins and is vacant. This area has the potential to redevelop as retail and office uses that front onto the corner of North College Avenue and Vine Drive, which is an important intersection and likely BRT stop.

Table 6. Site 1 Property Information

Location	Owner	Existing Use	Acres
740 North College Ave	City of Fort Collins	Vacant	0.13
704 North College Ave	Powerhouse II LLC	Office building	0.94
202 East Vine Dr	Powerhouse II LLC	Storage garage	4.01
108 East Vine Dr	W and P LLC	Service garage	0.22
Total			**5.30**

Source: Larimer County Assessor; Economic & Planning Systems

Site 2

Site 2 consists of three parcels with a total of 8.01 acres, as shown in **Table 7**. Each parcel has a different ownership, including one owned by Union Pacific Railroad containing unused RR ROW, which is an impediment for development. These are larger parcels compared to sites along North College Avenue and each one could development individually. This area has the potential to redevelop as medium density residential with apartment and/or townhome units.

Table 7. Site 2 Property Information

Location	Owner	Existing Use	Acres
Hemlock St	D and M Larsen Family LLLP	Vacant	1.60
Hickory St	Reynolds Special LLC	Vacant	3.84
Hickory St	Union Pacific Railroad	Vacant	2.57
Total			**8.01**

Source: Larimer County Assessor; Economic & Planning Systems

Site 3

Site 3 is comprised of five parcels with a total of 6.25 acres, shown in **Table 8**. Three parcels are owned by All Kinds Investments LLC and have frontage along North College Avenue and East Suniga Road. The larger of the three parcels is currently used as a parking lot for the LivWell dispensary next door. The adjacent parcel (920 North College Ave) is an ice cream shop that opened in 2020. This is likely a leased tenant that could be accommodated in a larger redevelopment. The parcel on the corner of North College Avenue is owned by Lacoste LLC and is currently being used as a dispensary. The largest parcel owned by Jerome St LLC is currently vacant. This area has the potential to redevelop as mixed use. The parcel along Jerome Street would mostly contain residential townhomes or apartments and the parcels along North College and Suniga Road would most likely redevelop as commercial restaurant, retail, or service uses.

Table 8. Site 3 Property Information

Location	Owner	Existing Use	Acres
910 North College Ave	All Kinds Investments LLC	Parking lot	1.23
910 North College Ave	All Kinds Investments LLC	Vacant	0.41
920 North College Ave	All Kinds Investments LLC	Retail store	0.35
938 North College Ave	Lacoste LLC	Dispensary	0.23
Jerome St	Jerome St LLC	Vacant	4.03
Total			**6.25**

Source: Larimer County Assessor; Economic & Planning Systems

Site 4

Site 4 consists of five parcels with a total of 14.16 acres, shown in **Table 9**. Three of the parcels are owned by North College 1311 LLC with the convenience store fronting North College Avenue and the other two parcels directly behind. These two parcels are likely vacant due to no access to North College Avenue. Additionally, the large parcel south of these is owned by the City and also has no street access. The area has the potential to redevelop as mixed use. The parcels need to be combined to create an access road to North College Avenue. The large parcels would redevelop as residential with townhomes and/or single family detached units. The parcels closer to North College Avenue would be commercial with retail or office uses.

Table 9. Site 4 Property Information

Location	Owner	Existing Use	Acres
Hickory St	City of Fort Collins	Vacant	7.50
Hibdon Ct	N College 1311 LLC	Vacant	5.20
Hibdon Ct	N College 1311 LLC	Vacant	0.52
1311 North College Ave	N College 1311 LLC	Convenience store	0.53
1307 North College Ave	Hoyt John R	Service garage	0.41
Total			**14.16**

Source: Larimer County Assessor; Economic & Planning Systems

Site 5

Site 5 consists of four parcels with a total of 3.28 acres, shown in **Table 10**. All the parcels are owned by Milan Randolph S/Debra A and are currently vacant. The area has potential to develop as commercial with retail and office uses. The commercial buildings should front Conifer Street with parking available behind.

Table 10. Site 5 Property Information

Location	Owner	Existing Use	Acres
1248 Red Cedar Cir	Milan Randolph S/Debra A	Vacant	0.68
218 Conifer St	Milan Randolph S/Debra A	Vacant	0.99
1224 Red Cedar Cir	Milan Randolph S/Debra A	Vacant	0.68
Conifer St	Milan Randolph S/Debra A	Vacant	0.93
Total			**3.28**

Source: Larimer County Assessor; Economic & Planning Systems

Site 6

Site 6 includes two parcels with a total of 5.99 acres, shown in **Table 11**. Each property has different ownership and is currently vacant. The area has potential to develop as office and/or light industrial with buildings fronting Bristlecone Drive.

Table 11. Site 6 Property Information

Location	Owner	Existing Use	Acres
Bristlecone Dr	1415 Blue Spruce LLC	Vacant	2.30
Bristlecone Dr	Johnson James P	Vacant	3.69
Total			**5.99**

Source: Larimer County Assessor; Economic & Planning Systems

Site 7

Site 7 includes two parcels with a total of 3.63 acres, shown in **Table 12**. Both parcels are under the same ownership and are currently vacant. These parcels do not have visibility from North College Avenue or Bristlecone Drive but do have accessibility through smaller north south side streets. This area has potential to develop as mixed use. There is potential for medium density residential apartment units and office development. There is medical office development directly south of this site, which could be expanded.

Table 12. Site 7 Property Information

Location	Owner	Existing Use	Acres
1512 North College Ave	Hickory Warehouse Dev. Inc	Vacant	1.09
1524 North College Ave	Hickory Warehouse Dev. Inc	Vacant	2.54
Total			**3.63**

Source: Larimer County Assessor; Economic & Planning Systems

Site 8

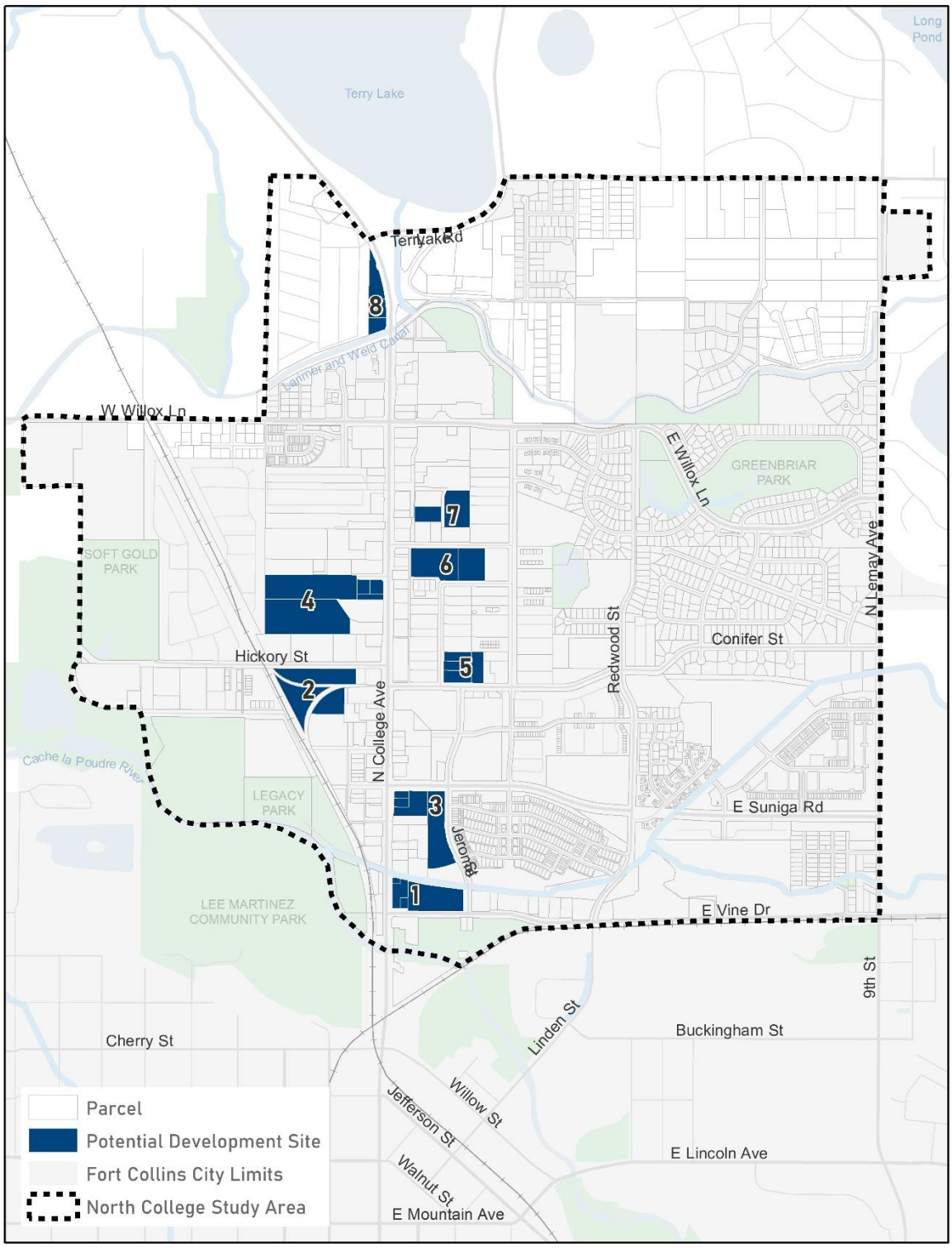
Site 8 includes three parcels with a total of 2.87 acres, shown in **Table 13**. The small retail store at 2001 North College Avenue appears to be vacant or not in use. The other two properties are owned by Lindberg John T and includes a used auto dealership. This area has potential to redevelop as commercial with retail uses that could serve the neighboring residential and drive by traffic.

Table 13. Site 8 Property Information

Location	Owner	Existing Use	Acres
2001 North College Ave	2001 N College LLC	Retail store	0.65
2019 North College Ave	Lindberg John T	Service garage	1.35
2003 North College Ave	Lindberg John T	Vacant	0.87
Total			**2.87**

Source: Larimer County Assessor; Economic & Planning Systems

Figure 18. Potential Development Sites



APPENDIX D

ENVIRONMENTAL OVERVIEW

ENVIRONMENTAL OVERVIEW

North College Bus Rapid Transit (BRT) and Transit Oriented Development (TOD) Plan

Prepared for:

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FHU Reference No. 121013

July 2021

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1.0 INTRODUCTION

The City of Fort Collins is conducting the North College Bus Rapid Transit (BRT) and Transit Oriented Development (TOD) Plan for North College between Laporte Avenue and Terry Lake Road. This project is located in Fort Collins, Larimer County, Colorado and is approximately 1.88 miles in length (**Figure 1**).

As the North College BRT and TOD Plan represents an early stage in the overall transportation planning process, the environmental overview has been structured to provide preliminary insight (presence or absence) into the environmental resources potentially impacted by potential future corridor solutions. Impacts have not been quantified at this stage to determine the level of impacts to each identified resource.

This environmental desktop analysis has been completed using currently available geospatial databases and best available information from various resource agency websites and, as a result, there may be situations where environmental resources have not been identified during this screening process. Further evaluation of each potential corridor solution will require individual environmental clearance and permitting processes. If there will be any federal funding or federal transportation agency involvement, the National Environmental Policy Act (NEPA) will need to be followed.

1.1 Project Description

The North College corridor provides an opportunity to extend the existing Transfort MAX BRT route another two miles north from the Downtown Transit Center. Presently the study area consists of primarily low-density residential, social service agencies, and industrial land uses, and is served by Transfort routes 8 and 81. However, the area is growing rapidly with 25% population growth between 2010 and 2018, and routes 8 and 81 are Transfort's fastest growing ridership with a 10% increase between 2017 and 2018.

Since the 2014 launch, the MAX BRT has resulted in exponential growth and demand for transit in Fort Collins and there has been vocal demand to extend this service to North College Avenue. The goal of this planning effort is to explore the expansion of BRT to North College including route configuration, station area identification, TOD land use and redevelopment opportunities, enhanced multi-modal infrastructure and connections to the BRT corridor, infrastructure needs, and implementation and funding strategies. This effort will be supported by robust equitable engagement strategies with the North College resident and business community.

1.2 Project Location

The project is located along North College from Laporte Avenue to Terry Lake Road, in Fort Collins, Larimer County, Colorado. The project lies on the U.S. Geological Survey (USGS) 7.5-minute Fort Collins, Colorado quadrangle, in Section 35 and 36 in Township 8 North, and Range 69 West and Section 1, 2, 11, and 12 in Township 7 North, and Range 69 West (see **Figure 1**). The approximate coordinates of the center of the project are latitude 40.602466° and longitude -105.076667° (WGS 84 datum).

1.3 Study Area

The environmental study area is approximately 94 acres and extends along North College for 1.88 miles and is 200 feet on either side of the roadway (see **Figure 2**). The North College Avenue Corridor is an eclectic mix of businesses and residences both old and new. The study area is home to many of the City's human service agencies including Larimer County Food Bank, Larimer County Department of Health and Human Services, and Murphy Center for Hope. Recent projects along the North College corridor include some higher-density residential developments and a capital project constructed with new detached sidewalks, streetscape, lighting, median, and on-street bicycle infrastructure. However, North College remains an automobile-centric corridor with high traffic volumes and speeds.

Figure 1. Project Location Map

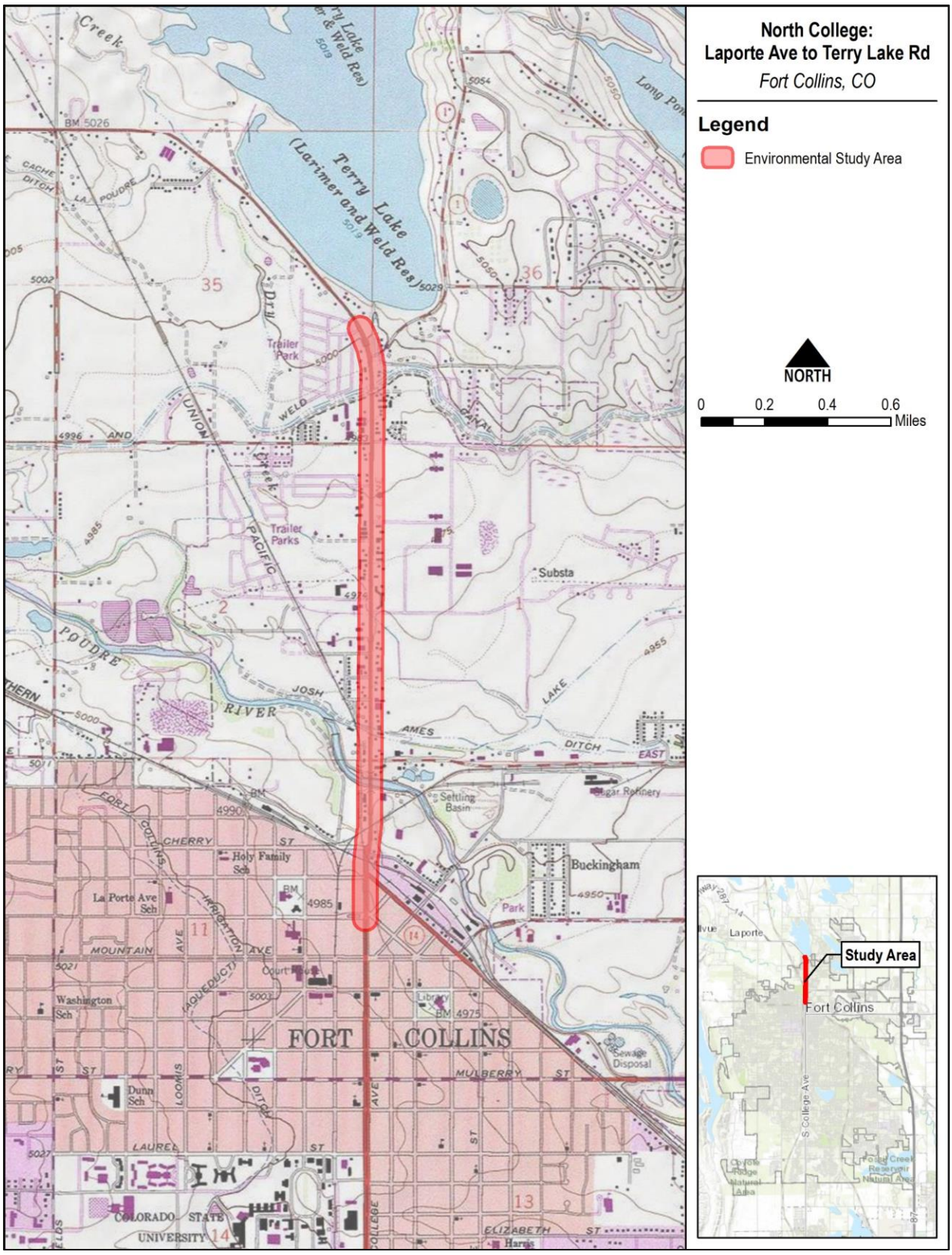
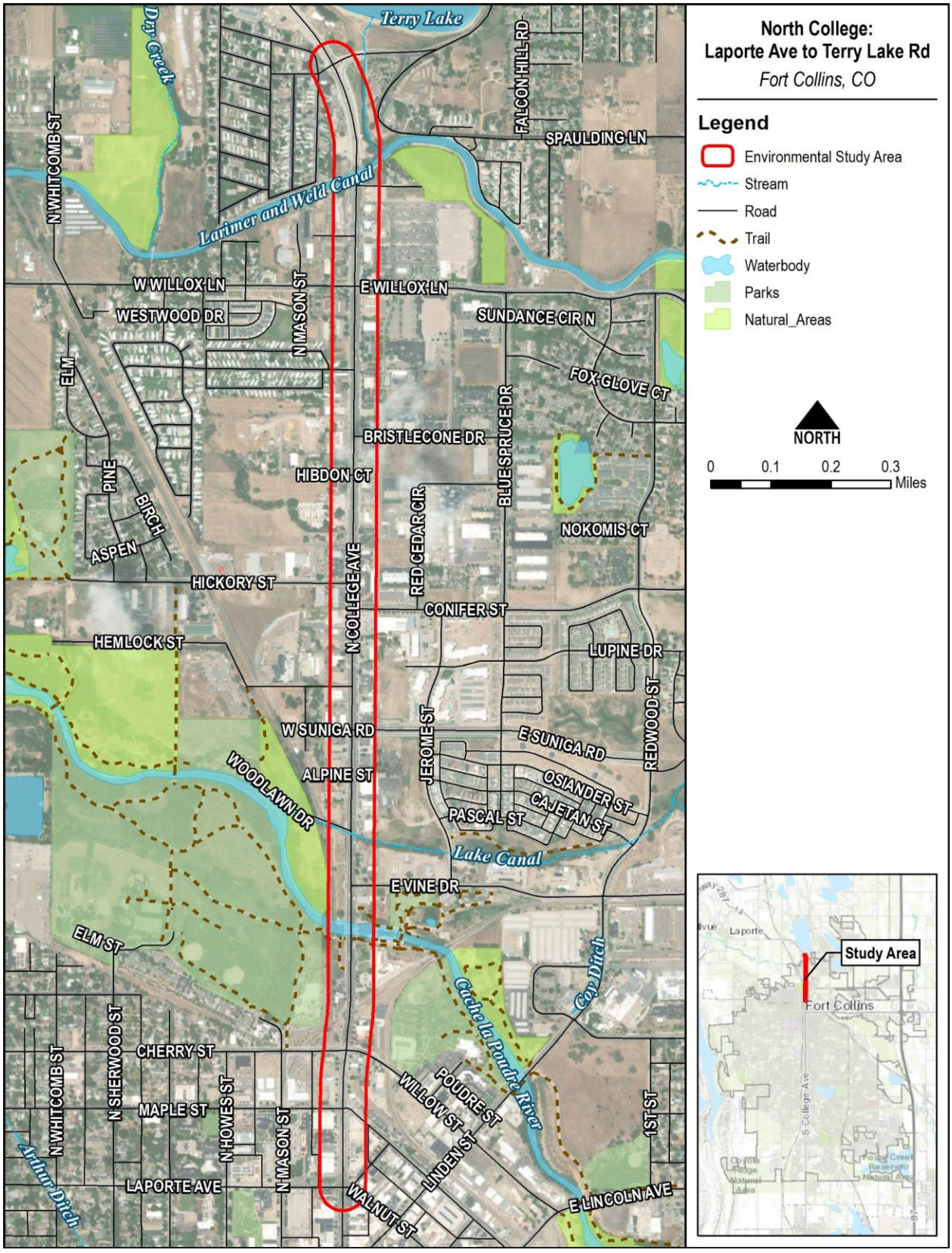


Figure 2. Study Area Map



The North College Corridor is currently identified as a Targeted Redevelopment Area, an Urban Renewal Area (URA), and a State Enterprise Zone. Assisting redevelopment with stormwater runoff is the Northeast College Corridor Outfall (NECCO). The North Fort Collins Business Association has been advocating for more robust transit service for the past five years. And, during the 2019 Transit Master Plan development process, the community voiced resounding support for BRT on North College. Recent community engagement conducted by the URA highlighted the need for improved connectivity and support for enhanced transit service that will help inform this plan.

2.0 ENVIRONMENTAL CONDITIONS

The following sections describe the environmental resources within the project environmental study area (see **Figure 2**). These sections provide a review of known and potential social and environmental resources within the environmental study area that could be affected by construction of the Proposed Project and would need to be considered during the NEPA process. The review includes a desktop analysis of the latest available data within the environmental study area. The review specifically covers resources with the potential to delay or stop project development or permitting, including those resources with specific regulatory drivers such as the Endangered Species Act (ESA) and Clean Water Act (CWA). Environmental resources evaluated include:

- Air Quality
- Hazardous Materials
- Noise
- Environmental Justice
- Historic and Cultural Resources
- Section 4(f) and Section 6(f)
- Floodplains
- Wetlands and Waters of the United States
- Water Quality
- Vegetation and Wildlife
- Special Status Species

Based on the desktop analysis, the following resources were determined not to be present in the vicinity of the Proposed Project and were, therefore, excluded from further review:

- Farmlands
- Federal and Tribal Lands
- Wild and Scenic Rivers
- Visual Resources/Aesthetics
- Soils and Geology
- Archaeological / Paleontological Resources

Each of the following subsections provides an overview of the environmental resources, findings of this evaluation, and, where appropriate, additional considerations for the Proposed Project.

2.1 Air Quality

Air quality is primarily regulated under the federal 1970 Clean Air Act (CAA) and amendments from 1977 and 1990. The purpose of the CAA is to protect and enhance air quality to promote public health, welfare, and the productive capacity of the nation.

2.1.1 Regulatory Setting

Through the CAA, National Ambient Air Quality Standards (NAAQS) were established for six criteria air pollutants: carbon monoxide, particulate matter, lead, sulfur dioxide, nitrogen dioxide and ozone.

Transportation sources are most closely associated with emissions of carbon monoxide, particulate matter, nitrogen dioxide and precursors of ozone.

Each of the states have evaluated their air quality with respect to the NAAQS. Any areas that exceeded the NAAQS were designated as nonattainment areas and are subject to more rigorous air pollution control measures. Over time and with air quality improvements, nonattainment areas may transition into NAAQS maintenance areas or NAAQS attainment areas. For reasons described in the following section, the CAA transportation conformity regulations will need to be considered for this project.

A group of hazardous air pollutants are regulated under the CAA; a subset of which are called mobile source air toxics (MSAT). Greenhouse gases (GHG) are also covered by the CAA.

The CAA established mandatory Class I federal areas, which receive extra protection and consideration from impairment from man-made air pollution. This primarily focuses on visibility/haze and aerosols from large industrial sources and includes prevention of significant deterioration to the air quality.

Construction may temporarily affect air quality (e.g., fugitive dust). Permits are likely to be needed when construction begins.

2.1.2 Existing Conditions

Fort Collins, including the project corridor, is within air quality nonattainment and maintenance areas designated by the U.S. Environmental Protection Agency (USEPA) for NAAQS pollutants under the CAA. It is within the Denver Metro/North Front Range nonattainment area for ozone and the Fort Collins maintenance area for carbon monoxide. Consequently, the federal CAA transportation conformity regulations will apply to this project. However, some transit projects may qualify for exemptions to the conformity requirements and the carbon monoxide conformity requirements are expected to expire in September 2023.

Rocky Mountain National Park is a Class I area. It is approximately 30 miles southwest of the project corridor. A BRT project typically would not be a concern for a Class I area, particularly at this distance.

2.1.3 Next Steps

As part of the NEPA clearance for the corridor improvements, an appropriate air quality analysis will be scoped and completed. This will be evaluated and determined when the specific elements of the project have been identified. Nominally, transportation conformity analysis under the CAA may be required, but this will depend on the nature and extent of proposed improvements and potential eligibility for a conformity exemption.

The need for and extent of MSAT or GHG analyses generally depends on the NEPA class of action. These analyses may be either qualitative or quantitative. An EA or EIS generally requires progressively greater consideration of MSAT and GHG. The level of analysis needed for these will be determined when the NEPA decision for the project is made.

The corridor improvements are unlikely to be a concern for the Class I area nearby and no associated air quality analysis is expected, but the area should be acknowledged.

Analysis of construction emissions is not needed for most projects. Permits are likely to be needed for construction and typical best practices should be required to minimize construction emissions and address air quality issues.

2.2 Hazardous Materials

Hazardous materials include substances or materials that have been determined by the USEPA to be capable of posing an unreasonable risk to health, safety, or property. Hazardous materials may exist within the study area at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. Examples of hazardous materials include asbestos, lead-based paint, heavy metals, dry-cleaning solvents, and petroleum hydrocarbons (e.g., gasoline and diesel fuel), all of which could be harmful to human health and the environment.

2.2.1 Regulatory

Hazardous materials are regulated by various state and federal regulations. NEPA, as amended (42 US Code (USC) 4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the US that are contaminated with hazardous substances (as specifically designated in the CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 321 et seq.), which establishes a framework for the management of both solid and hazardous waste. The federal Hazardous and Solid Waste Amendments of 1984 established a new comprehensive regulatory program for underground storage tanks containing petroleum products and hazardous chemicals regulated under CERCLA. In 2016, the USEPA retired the CERCLA Information System database, and replaced it with a more modern system called the Superfund Enterprise Management System.

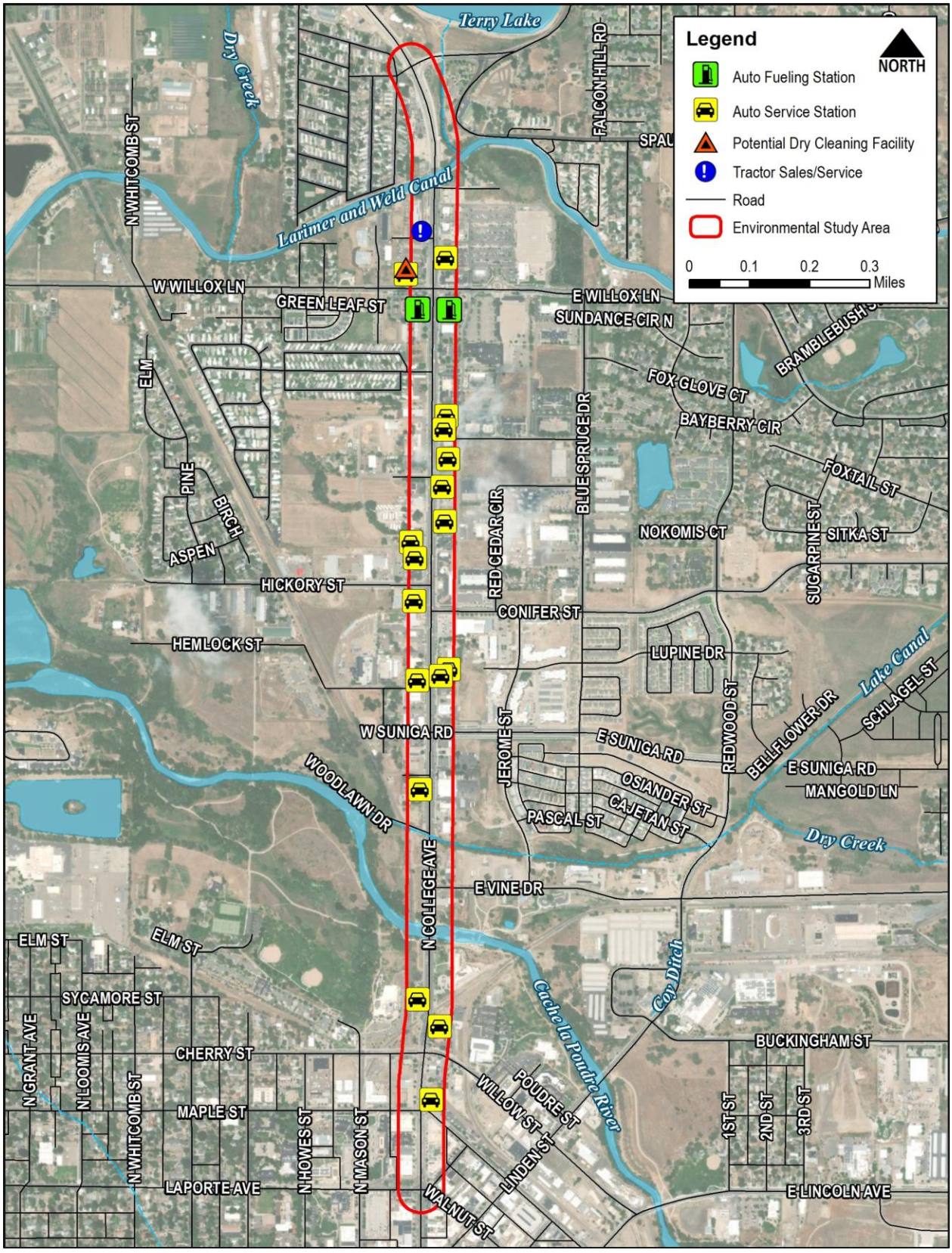
2.2.2 Existing Conditions

A desktop review of the study area revealed facilities that may utilize hazardous materials on a daily basis such as the following:

- Legacy Tractor Sales and Service (1845 North College)
- Discount Tire (1830 North College)
- ExelAnce Laundry (1805 North College)
- Loaf N Jug (1801 North College)
- Valero (1660 North College)
- Conoco (1675 North College)
- Big O Tires (1506 North College)
- Grease Monkey (1500 North College)
- Terry's Midtown Auto Service (1420 North College)
- Collins Auto Renewal (1314 North College)
- Rulon's Service (1304 North College)
- Big Tire and Wheel (1295 North College)
- Auto Trends (1235 North College)
- Ken's Automotive Repair (1219 North College)
- Frieson's Auto Center (1110 North College)
- Fort Collins 444 (1101 North College)
- Colorado Motor Car Care (1108 North College)
- Quick Lube (825 North College)
- J & M Precision Automotive (425 North College)
- Valvoline Instant Oil Change (410 North College)
- A Classic Touch Motorcycle Shop (300 North College)

These facilities are depicted in **Figure 3**. In addition to the facilities listed above, there may other properties that were previously located within the study area that may have affected groundwater and subsurface soils but have since been occupied by another business. Finally, there could be facilities located near the study area that may be undergoing active groundwater remediation.

Figure 3. Hazardous Materials



In October 2008, FHU completed a *Modified Phase I Environmental Site Assessment* for the North I-25 EIS project. The study area for that project encompassed a portion of this project's study area. Multiple files were reviewed to evaluate for the potential presence of contaminated soil and/or groundwater. Many of the properties identified were "closed" by the regulatory agency. A site is defined as "closed/clean up complete" when the "owner and/or operator has not necessarily removed all contamination, but instead actions taken have met the criteria that the State used for determining adequate clean up," and that no further investigation or remedial action is required. There were two properties in which active groundwater remediation was ongoing. These properties should be evaluated as part of the hazardous materials review (FHU, 2008).

2.2.3 Next Steps

Prior to final design, an environmental database records search of federal and state environmental resources should be obtained and reviewed for the study area. The environmental database records would be evaluated with respect to the status of the facility listing and its location within the study area boundaries. The facilities identified in the environmental database would be ranked as having either a high, medium, or low potential to impact based on the location of these facilities and known releases.

In addition to the environmental database review, an on-site visual inspection of the study area and surrounding areas should be completed. The site visit should be completed by a qualified environmental professional, skilled and experienced in identifying hazardous materials and waste issues, to identify and evaluate present conditions.

Finally, a review of historical site information such as Sanborn fire insurance maps, US Geological Survey topographic maps, and readily available historical aerial photographs should be completed. This review of historical sources should include all obvious uses from the study area's first obvious developed use or 1940, whichever is earlier, to the present time.

If findings from the historical and/or database reviews indicate that subsurface contamination may be present, a limited subsurface investigation to collect soil and/or groundwater samples may be warranted. Based on the information gathered during the subsurface investigation, a Materials Management Plan (MMP) may be recommended to detail the Standard Operating Procedures for handling potentially contaminated media, specifically soil and/or groundwater. The MMP will be designed to minimize worker exposure to potentially contaminated material, prevent releases to the environment, and ensure proper disposal.

2.3 Noise

Traffic noise can be an important and contentious environmental consideration for transportation projects. Transit projects can be especially so because the service often targets residential areas. The locations most often of concern for traffic noise are exterior areas of frequent human use.

2.3.1 Regulatory

A lead federal agency that will sponsor the project is uncertain at this time. It is expected to be either a Federal Transit Administration (FTA) or Federal Highway Administration (FHWA) (partnered with the Colorado Department of Transportation (CDOT)). FTA, in conjunction with FHWA, issued detailed regulations implementing NEPA for transit and highway projects that are codified in 23 CFR 771. FTA's noise analysis process is detailed in the *Transit Noise and Vibration Impact Assessment Manual*. For FHWA, highway traffic noise is addressed under 23 CFR 772. In Colorado, this is implemented through CDOT's *Noise Analysis and Abatement Guidelines*. These regulations apply to projects that receive federal funding or are otherwise subject to FTA, FHWA or CDOT approval.

The two noise analysis processes are substantively different from each other. When a decision has been made as to the lead agency, a corresponding decision will be made on the appropriate noise analysis process to follow. It may be that one or both processes must be followed. The noise analysis will be scoped at that time in relation to the nature of the proposed improvements and the applicable regulatory requirements.

Some type of noise analysis is likely but not all federal-aid or federal-approval highway improvement projects require a noise analysis. For example, FHWA/CDOT Type I projects require a noise analysis, while Type III projects are exempt.

2.3.2 Existing Conditions

This College Avenue corridor has a four-lane road through a heavily developed, urban setting from end to end. Most of the corridor is in commercial or industrial uses but there are residences, park/etc. properties and the Cache la Poudre River present. Noise receptors are relatively close to College Avenue in places that may need to be considered in a noise analysis. Many of the properties have direct access to College Avenue so there are frequent curb cuts and driveways. College Avenue traffic is a dominant local noise source, but there are also two railroads in the corridor.

2.3.3 Next Steps

The specific improvements that are proposed at the NEPA phase will need to be reviewed to determine the applicable noise regulation, the noise type status and what noise analysis may be required. Despite substantive differences in methods, there are general similarities between the FTA and FHWA/CDOT processes. Generally, the project is examined for any noise impacts. If impacts are identified, noise abatement measures are evaluated, typically in the form of noise barriers. If noise abatement actions found to be feasible and reasonable, they are included in the project. Note that abatement measures are not guaranteed for any noise impacts.

2.4 Environmental Justice

According to the USEPA, Environmental Justice (EJ) is defined as:

"The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (USEPA, 2021)."

2.4.1 Regulatory

Under Executive Order 12898 (1994), *Federal Actions to Address Environmental Justice in Minority Populations*, projects are required to identify and address disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. In accordance with Council on Environmental Quality (CEQ) guidance, EJ populations occur where either:

- The minority or low-income population of the affected area exceeds 50%.
- The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Title VI of the Civil Rights Act of 1964 (Title VI) ensures that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance based on race, color, or national origin (42 United States Code [USC] 2000d et seq.). Executive Order 12898 on environmental justice directs that programs, policies, and

activities not have a disproportionately high and adverse human health or environmental effect on minority and low-income populations (59 FR 7629).

2.4.2 Existing Conditions

To be consistent with the requirements of Title VI and Executive Order 12898, demographic characteristics of the environmental study area were examined to determine whether a low-income and/or minority population occurs within the study area. The demographic and economic character of the environmental study area was compared with that of the State of Colorado using data from EJSCREEN, USEPA's Environmental Justice Screening and Mapping Tool (Version 2020) (USEPA, 2020) (see **Table 1**).

Table 1. Environmental Justice Populations

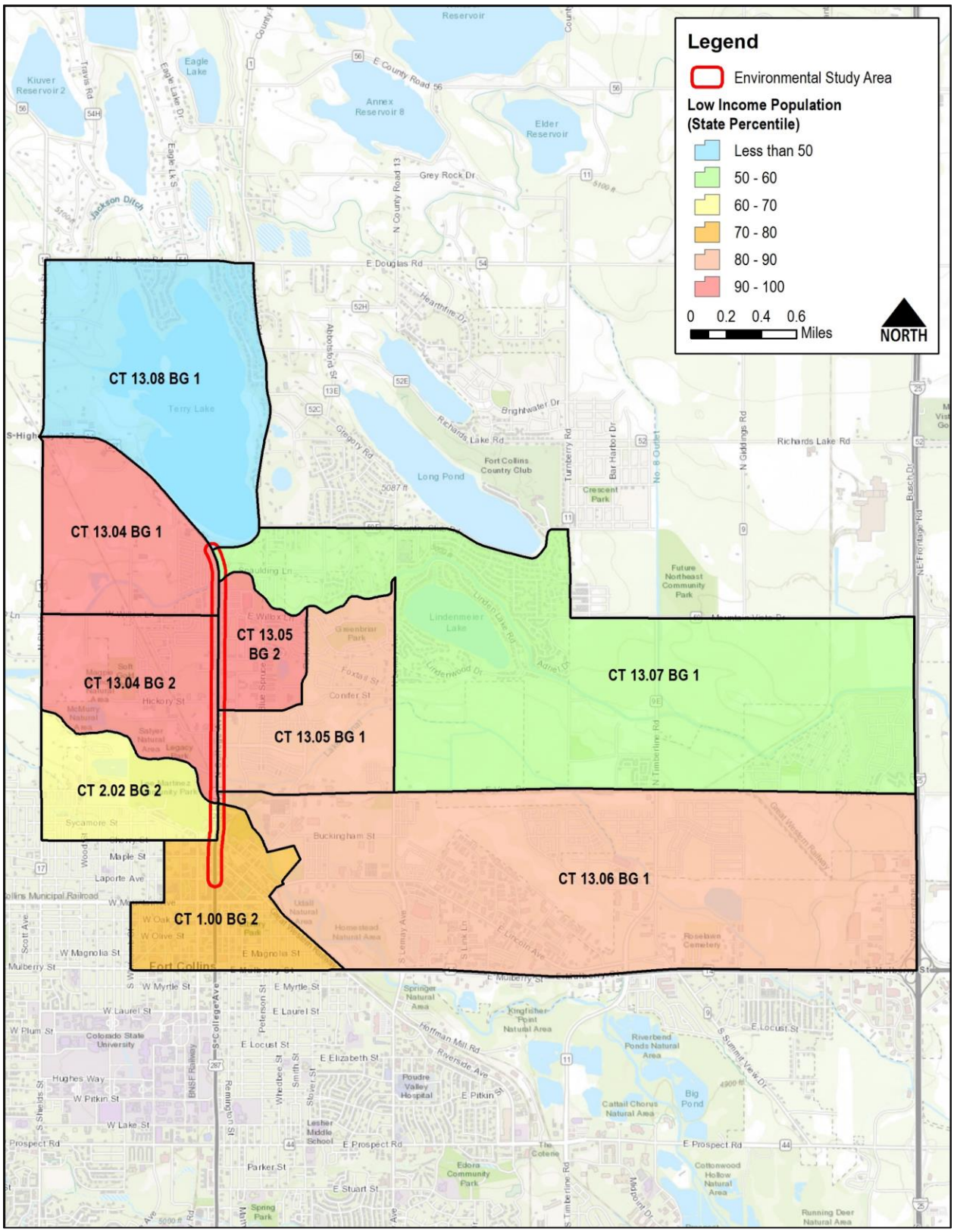
Area	Minority Population (State Percentile)	Low Income Population (State Percentile)
Census Tract 1.00, Block Group 2	23%	72%
Census Tract 2.02, Block Group 2	50%	61%
Census Tract 13.04, Block Group 1	92%	93%
Census Tract 13.04, Block Group 2	87%	99%
Census Tract 13.05, Block Group 1	48%	86%
Census Tract 13.05, Block Group 2	75%	95%
Census Tract 13.06, Block Group 1	70%	83%
Census Tract 13.07, Block Group 1	43%	60%
Census Tract 13.08, Block Group 1	5%	1%

Note: State Percentiles are a way to see how local residents compare to the rest of the State of Colorado. Instead of just showing numbers out of context, EJSCREEN compares a community to the rest of the state, by using percentiles. The State percentile tells you what percent of the State population has an equal or lower value, meaning less potential for exposure/ risk/ proximity to certain facilities, or a lower percent minority (USEPA, 2020).

According to the EJSCREEN, only Census Tract 13.08 Block Group 1 has less than a 50-percentile low-income population (see **Table 1**). The census block groups surrounding the environmental study area have a high population of low-income people. **Figure 4** shows the state percentile of low-income populations within the census block groups surrounding the environmental study area. A block group is an area defined by the U.S. Census Bureau that usually has in the range of 600-3,000 people living in it. Low-income populations are defined by USEPA as: *"The percent of a block group's population in households where the household income is less than or equal to twice the federal poverty level."*

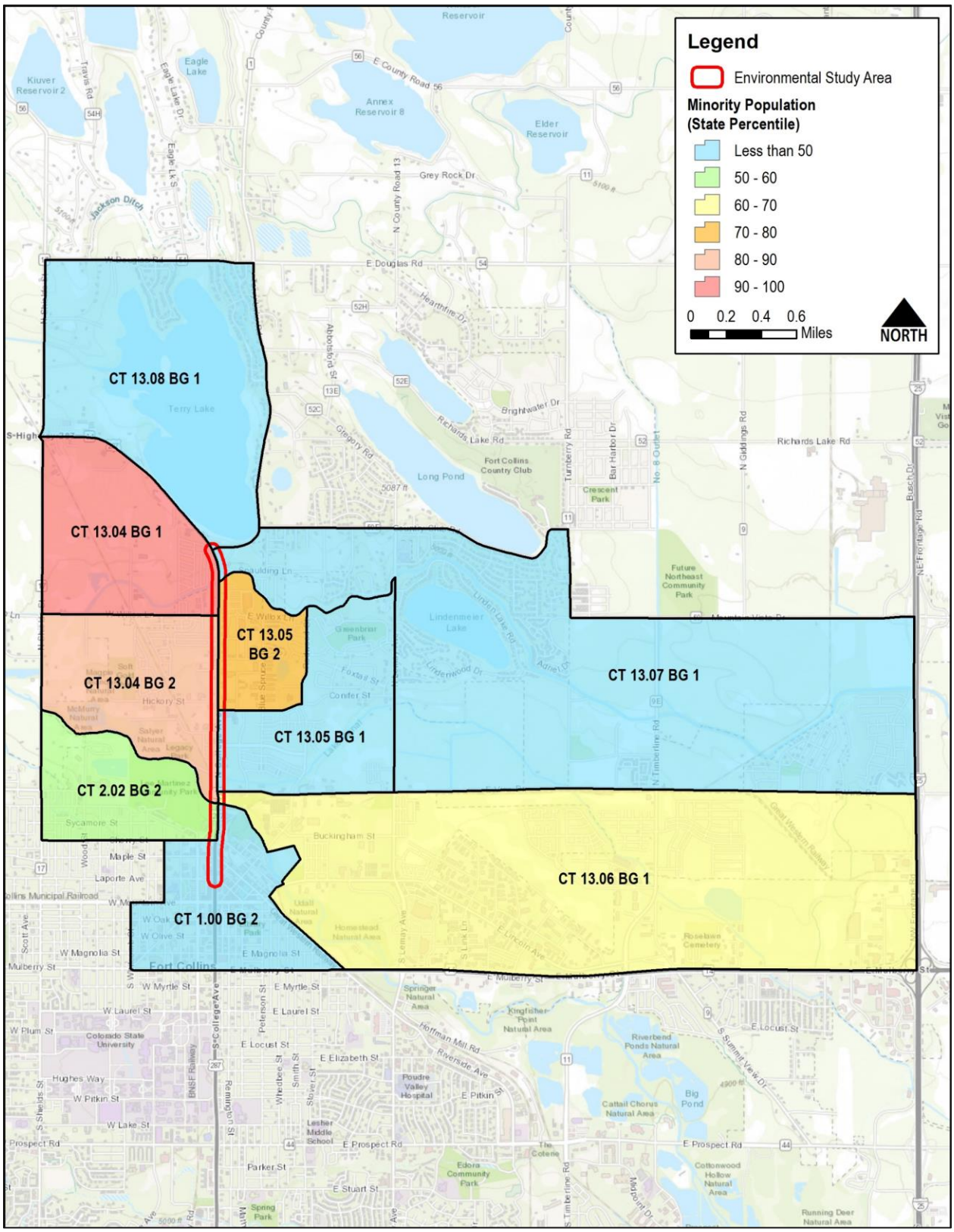
The EJSCREEN indicated that much of the study area is within a higher percentage of minority populations. Census Tract 13.04 Block Group 1, Census Tract 13.04 Block Group 2, Census Tract 13.06 Block Group 2, Census Tract 13.08 Block Group 1, and Census Tract 2.02 Block Group 2 all had a state percentile greater than 50 percent (see **Table 1**). **Figure 5** shows the state percentile of minority populations within the census block groups surrounding the environmental study area. Minority populations are defined by the U.S. Census Bureau as: *"A population of people who are not single-race white and not Hispanic. Populations of individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic."*

Figure 4. Low Income Populations



Source: USEPA EJSCREEN (https://ejscreen.epa.gov/mapper/)

Figure 5. Minority Populations



Source: USEPA EJSCREEN (https://ejscreen.epa.gov/mapper/)

2.4.3 Next Steps

When federal funding or a federal action is involved, the lead federal agency procedures for identifying EJ populations should be followed. The potential for disproportionately high or adverse impacts to be borne by EJ populations when compared to the non-EJ populations will need to be determined. Additionally, the opportunity for EJ populations to participate fully in the decision-making process must be provided. The denial, reduction, or delay of receipt of benefits by minority and low-income populations cannot occur.

Due to the high presence of low income and minority populations, a more detailed EJ analysis should be completed during the NEPA process to identify if the proposed project has a potential for disproportionately high or adverse impacts on EJ populations and identify ways to avoid and mitigate for any impacts.

2.5 Historic and Cultural Resources

2.5.1 Regulatory

Cultural resources are defined as man-made features and physical remains of past human activity, generally at least 45 years old (properties constructed in 1975 or earlier). Cultural resources include historic buildings, bridges, railroads, roads, other structures, and archeological sites. Section 106 of the National Historic Preservation Act of 1966 requires evaluation of project effects on historic properties that are on, or eligible for, the National Register of Historic Places (NRHP). Criteria for determinations of eligibility are set forth in 36 Code of Federal Regulations (CFR) Part 60.4 (70) and are described in National Register Bulletin How to Apply the National Register Criteria for Evaluation (NPS 1995).

2.5.2 Existing Conditions

FHU conducted a preliminary analysis of historic resources for the environmental study area, which includes properties directly adjacent to North College Avenue, between approximately Walnut/Laporte Street and Terry Lake Road on the north end of Fort Collins, Colorado. Several sources were consulted to determine the presence of known historic properties and additional resources with potential for eligibility to the National Register of Historic Places (NRHP).

If the proposed expansion of MAX BRT services utilizes funding, design, or permitting from a federal agency, the project may require compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (Section 106). Historic resources are afforded consideration for protection under the Section 106 when a federal action occurs. Sites qualifying for the NRHP must retain sufficient integrity (of location, design, setting, materials, workmanship, feeling, and association) and meet one or more of the following eligibility criteria as specified in 36 CFR 60.4:

- Be associated with events that have made a significant contribution to the broad patterns of our history;
- Be associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;
- Have yielded, or may be likely to yield, information important in prehistory or history.

A file search through the Office of Archeology and Historic Preservation (OAHP) Compass database was first conducted to determine the location of known historic properties (previously surveyed resources). Several previous survey reports were conducted within the Project Study Area. **Table 2** below lists the primary survey reports that generated nearly all of the prior property surveys in the study area.

Table 2. Previous Survey Reports in the Project Study Area

Survey Report No.	Report Title	Author/Date
LR.LG.R10	Old Town Square Fort Collins Building Details, Larimer County, Colorado	Author Unknown, 1983
LR.LG.R11	An Inventory of Historic Properties in and around the Central Business District of Fort Collins, Larimer County, Colorado	Jason Marmor, 1996
LR.LG.R22	Cultural Resources Survey for the Old Fort Site, Fort Collins, Colorado (CLG #08-01-16405-014)	Jason Marmor, 2002
LR.CH.R28	Historic Resources Survey Report North College Avenue Jefferson Street/Riverside Avenue US Highway 287, Larimer County, Colorado (CDOT Project No. AQC 2873-117 and STA 0142-039)	Author Unknown, 2003
LR.CH.R49	Historic Resources Survey Report North College Avenue Streetscape Improvements, Fort Collins (CDOT Project No. AQC M455-079)	Robert Autobee, 2010
LR.CH.R51	Historic Resources Inventory Report, North College Avenue Improvements – Conifer to Willox, Fort Collins, Larimer County (1/12-829-02.8003)	Jennifer Wahlers, 2013

Review of the OAHP Compass database indicated that the Project Study Area contained ten (10) NRHP eligible resources. These include four buildings, two linear irrigation canals, two linear railroad corridors, one linear roadway resource, and one historic district. Impacts to these resources should be minimized to avoid potential adverse effects to historic resources. NRHP eligible resources can be found in **Table 3** below.

Table 3. NRHP Eligible Resources within the Project Study Area

(SHPO No.) Resource Name	Date	Location/Address	Resource Type	NRHP Eligibility
(N/A) U.S. Highway 287	1935	Labeled N College Avenue through downtown Fort Collins.	Linear Roadway	*"Significant" in CDOT Statewide Highway Study*
(5LR.462) Old Town Fort Collins Historic District	1867	Mountain Avenue to Pine Street, N College Avenue to Willow Street	Historic District	*NRHP Listed 08/02/1978*
(5LR.863) Larimer and Weld Canal	1881	Crosses N College Avenue, approx. 950 feet south of Terry Lake Road.	Linear Irrigation Canal	*Officially Eligible 08/09/2007*
(5LR.1502) McMillan Transfer & Storage	1932	300 N College Avenue Fort Collins, CO 80524	Building	*Officially Eligible 05/30/2003*
(5LR.1731) Burlington Northern Railroad	1903	Crosses N College Avenue, approx. 350 feet north of Cherry Street.	Linear Railroad	*Officially Eligible 03/03/2004*

(SHPO No.) Resource Name	Date	Location/Address	Resource Type	NRHP Eligibility
(5LR.1815) Union Pacific Railroad, Buckeye Branch	1924	Parallel to west side of N College Avenue north of Cherry Street. Turns southeast and crosses N College Avenue, approx. 200 feet south of Cherry Street.	Linear Railroad	*Officially Eligible 01/19/2001*
(5LR.1829) Josh Ames Ditch	1867	Crosses N College Avenue, approx. 475 feet south of Alpine Street.	Linear Irrigation Canal	*Officially Eligible 08/23/2013*
(5LR.12232) Sunnyside Methodist Mission	1904-1940	909 N College Avenue Fort Collins, CO 80524	Building	*Officially Eligible 04/12/2010*
(5LR.12237) El Palomino Motel	1946-1957	1220 N College Avenue Fort Collins, CO 80524	Building	*Officially Eligible 07/12/2011*
(5LR.13176) Montclair Lodge	1959	1405 N College Avenue Fort Collins, CO 80524	Building	*Officially Eligible 07/12/2013*

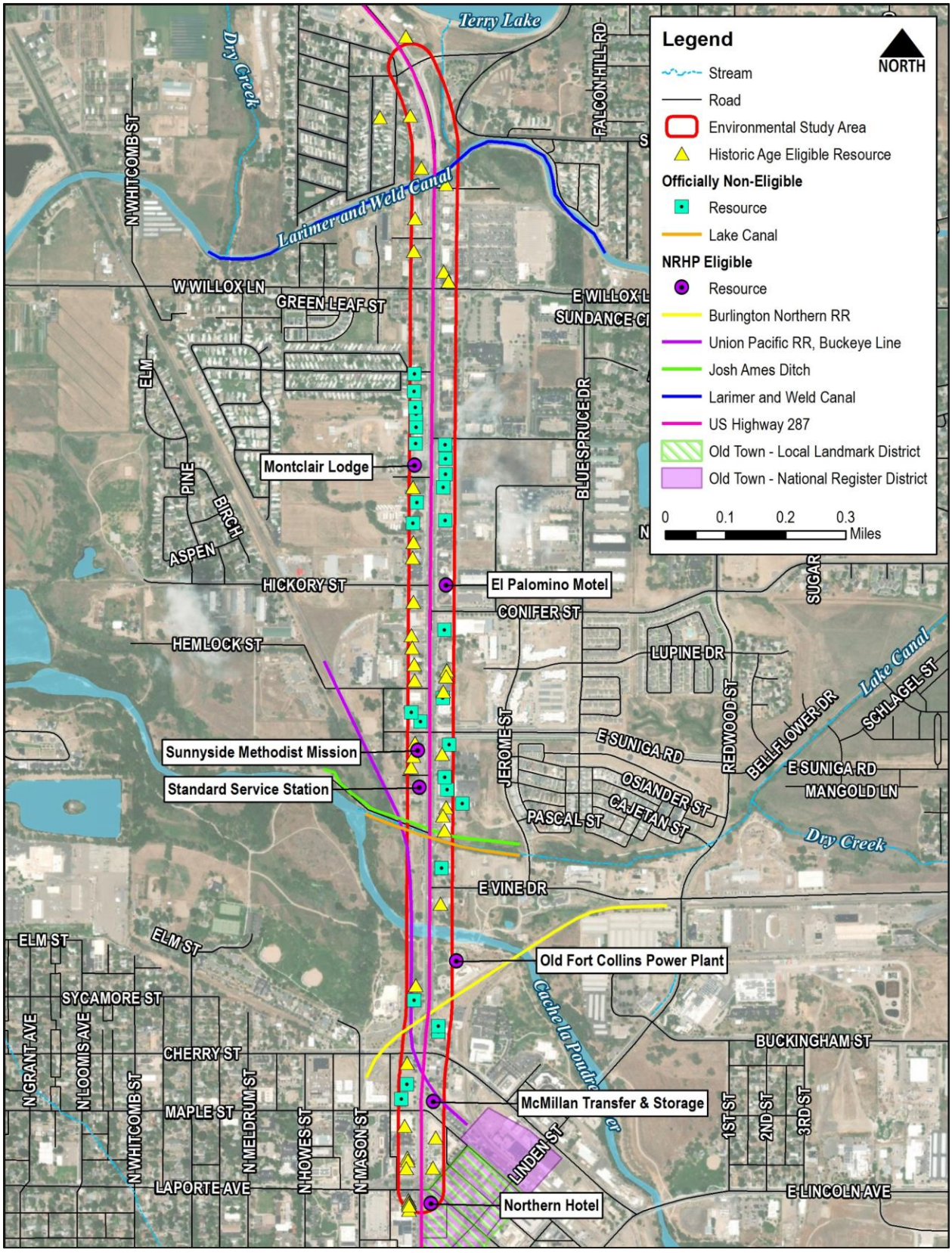
Further review of Compass indicated that the Project Study Area also contained twenty-eight (28) resources that were previously surveyed and determined Officially Not Eligible to the NRHP. Resources not eligible to the NRHP include twenty-seven buildings and one linear irrigation canal – 5LR.995 Lake Canal. These resources would not require additional survey and evaluation.

Additional review of Larimer County records indicates that forty-one (41) additional properties within the Project Study Area contain buildings that meet the minimum age requirement for NRHP eligibility. Additional review and survey of these properties in addition to consultation with the State Historic Preservation Office (SHPO) would be required in order to make formal determinations of NRHP eligibility.

2.5.3 Next Steps

Next steps would be for the responsible agency to initiate a cultural resources survey to determine whether the undertaking (project) could affect previously recoded or age eligible historic resources that are NRHP listed or eligible. The agency then proceeds to define the Area of Potential Effects (APE), which is the area that an undertaking may directly or indirectly cause changes in the character of use of historic resources. Once the APE has been defined, a cultural resources survey would be conducted, and the agency would consult with the appropriate State Historic Preservation Officer (SHPO) and on effects to historic or potentially historic resources located within the APE.

Figure 6. Historic Resources



2.6 Section 4(f) and Section 6(f)

Section 4(f) properties include publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites as defined in the US Department of Transportation (DOT) Act of 1966. US DOT agencies cannot approve use of these properties for transportation projects unless certain conditions apply. Section 4(f) is only applicable if the project is federally funded by the US DOT (FHWA or FTA). Section 6(f) properties include recreational resources developed with federal funding through the Land and Water Conservation Fund (LWCF). Section 6(f) of the LWCF Act prohibits the conversion of these properties to anything other than public outdoor recreation uses.

2.6.1 Regulatory

Section 4(f) of the Department of Transportation Act of 1966 is a regulation applicable only to projects that receive funds from US DOT agencies. FHWA and FTA implement Section 4(f) through 23 Code of Federal Regulations (CFR) 774. Under this regulation, the following resources are protected:

- Parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public;
- Historic sites of national, state, or local significance in public or private ownership; and
- Publicly-owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public to the extent that public access does not interfere with the primary purpose of the refuge.

Section 4(f) mandates that US DOT agencies can only approve the use of land from publicly owned parks, recreational facilities, wildlife and waterfowl refuges, or public and private historic sites if there is no feasible and prudent alternative to the use of the land and when the action includes all possible planning to minimize harm to the project resulting from the use.

Some park and recreational resources are also regulated under the Land and Water Conservation Fund (LWCF) Act of 1965. The LWCF established a federal funding program to assist states in developing outdoor recreation sites. Section 6(f) of the act prohibits converting property acquired or developed with these funds to a non-recreational purpose without the approval of the National Park Service (NPS).

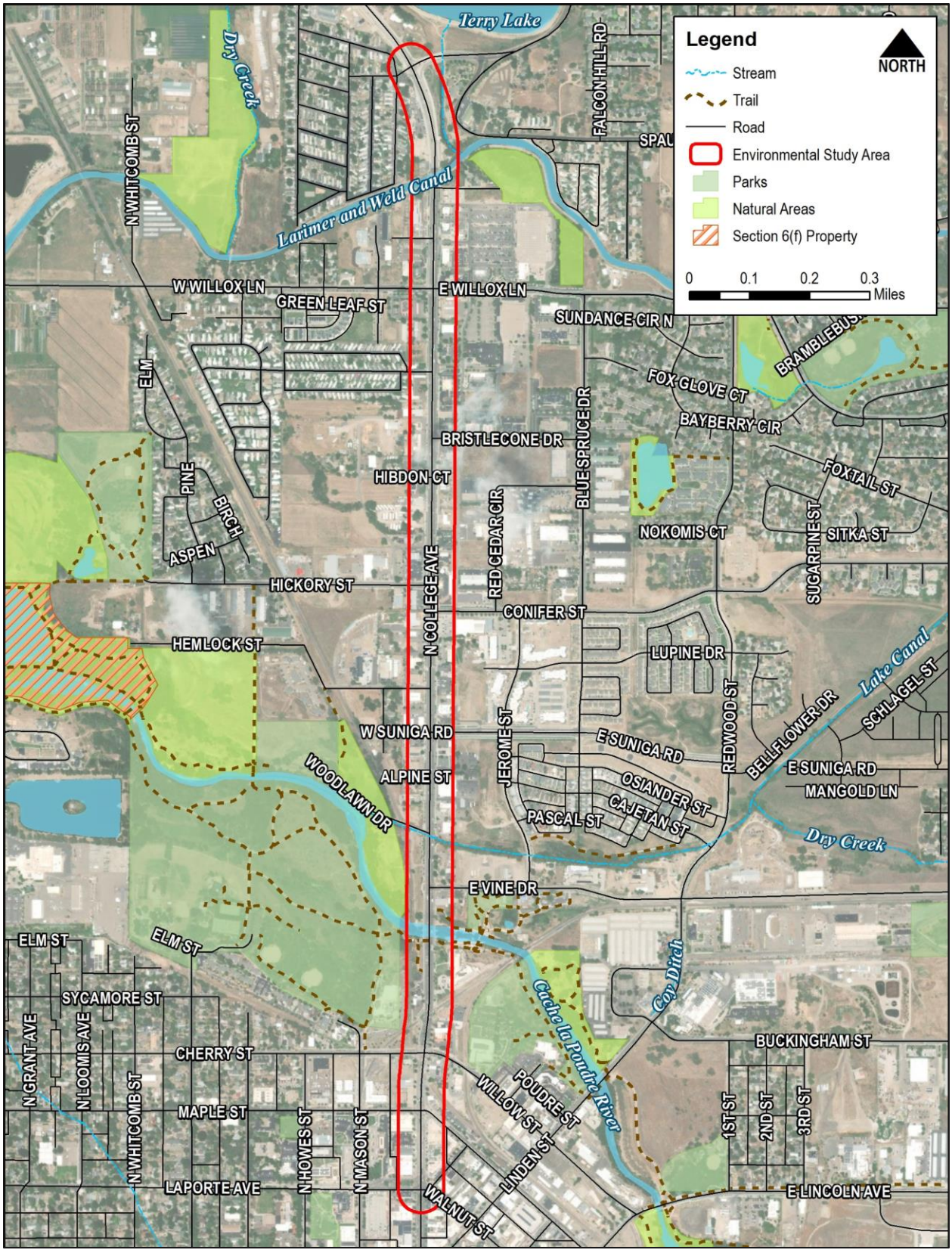
2.6.2 Existing Conditions

Figure 7 shows the location of parks, natural areas, and trails that are within and surrounding the environmental study area. The Poudre Trail crosses the study area along the Cache la Poudre River, approximately 500 feet south of East Vine Drive and North College. Bordering the study area on the west side between Cherry Street and Woodlawn Drive is Lee Martinez Community Park and Rivers Edge Natural Area. The Poudre River Whitewater Park overlaps the study area on the east side of North College south of East Vine Drive.

Historic sites that are on or eligible for the NRHP qualify for protection under Section 4(f). Currently, the study area contains 10 NRHP eligible resources. These include four buildings, two linear irrigation canals, two linear railroad corridors, one linear roadway resource, and one historic district. The project should seek to avoid a Section 4(f) "use" of these historic sites and they should be clearly identified as an avoidance area on project plans.

Section 6(f) would not apply to this project because there are no Section 6(f) properties within or near the study area. The nearest Section 6(f) resource is located at the McMurry Natural Area along the Cache la Poudre River, approximately 0.5 miles west of the study area.

Figure 7. Parks and Recreation Areas



2.6.3 Next Steps

FHWA has developed a Section 4(f) Policy Paper and FTA recommends that this policy paper be used as FTA guidance on Section 4(f) requirements, as well. For publicly-owned land, a park, recreation area or wildlife and waterfowl refuge it is considered eligible when the land has been officially designated as such (or planned) and the officials with jurisdiction over the land determine that its primary purpose is as a park, recreation area, or refuge. For purposes of Section 4(f), a historic site is protected only if it is on or eligible for the National Register of Historic Places.

The Whitewater Park and Poudre Trail overlaps the study area and 10 known NRHP Eligible resources are within the study area. There are also 41 NRHP age-eligible resources within the study area that will be further evaluated during the NEPA process to determine if they would be considered NRHP eligible or non-eligible.

During the NEPA process, potential Section 4(f) properties will be further evaluated, and it will be determined if impacts would occur as a result of the project. Alternatives must be evaluated to determine if impacts can be avoided or minimized to the extent practicable.

2.7 Floodplains

2.7.1 Regulatory

Floodplains are the lands on either side of a waterway that are inundated when a channel exceeds its capacity. The following regulatory requirements apply to floodplains:

- **Executive Order (EO) 11988, Floodplain Management (1977)**, directs federal agencies to "provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This EO assists in furthering the NEPA, the National Flood Insurance Act of 1968 (amended), and the Flood Disaster Protection Act of 1973.
- **Code of Federal Regulations (CFR), Title 23 – Highways**, prescribes the policies and procedures that FHWA is directed to implement in the location and hydraulic design of highway encroachments on floodplains.
- **CFR, Title 44 – Emergency Management and Assistance**, contains the basic Federal Emergency Management Agency (FEMA) policies and procedures to regulate floodplain management and to analyze, identify, and map floodplains for flood insurance purposes.

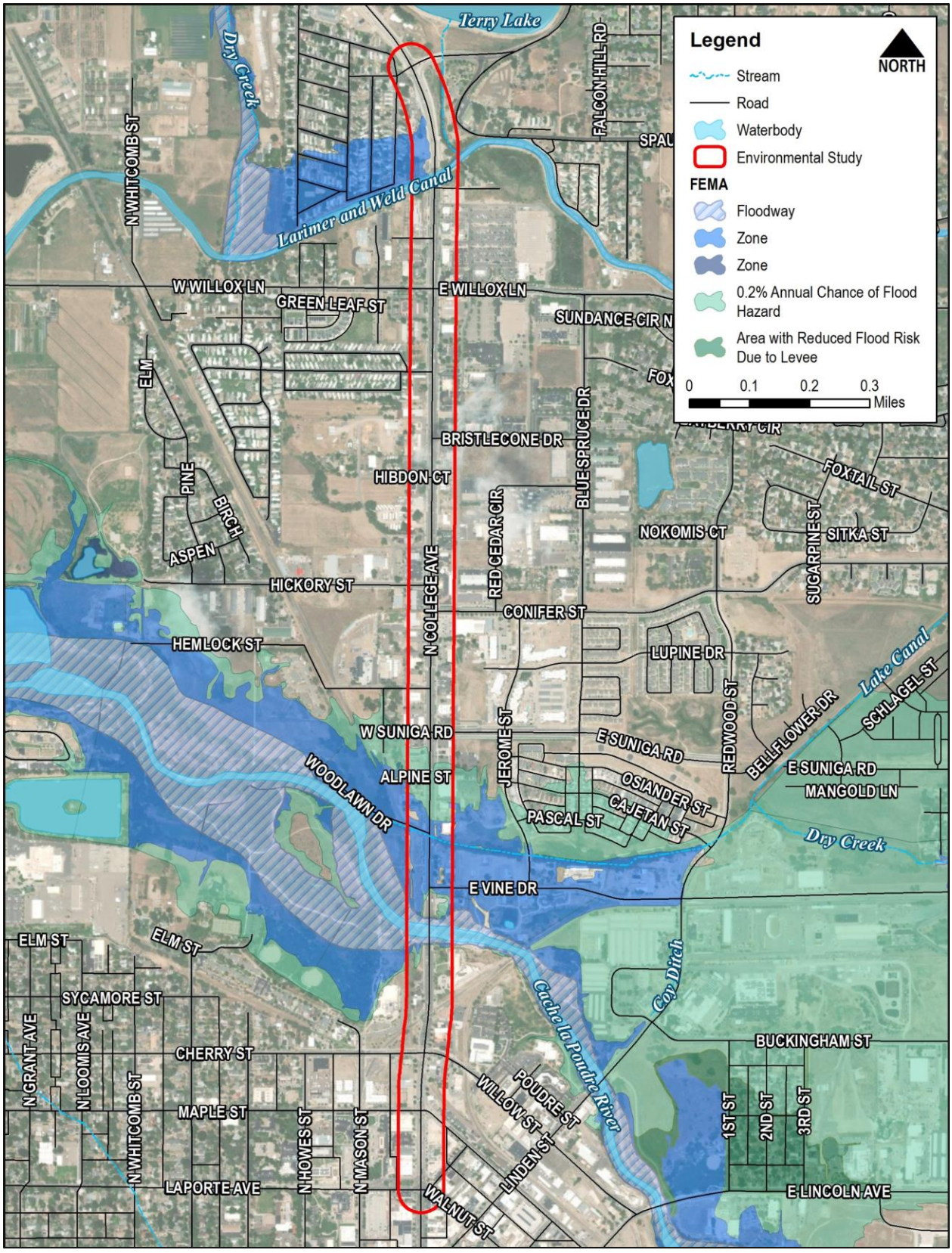
For projects within the floodplains, local jurisdictions typically require floodplain development permits.

2.7.2 Existing Conditions

The study area lies within the Flood Insurance Rate Maps (FIRM) Panels 08069C0977G (6/17/2008) and 08069C0979H (5/2/2012). A Letter of Map Revision (LOMR) was completed for this area with an effective date of 6/25/2021. As shown on **Figure 8**, the study area overlaps portions of the Cache la Poudre River Regulatory Floodway, Zone AE, and 0.2% annual chance of flood hazard along North College and south of Suniga Road. The study area also overlaps portions of the Larimer and Weld Canal Zone AE west of North College, north of Grape Street.

A Regulatory Floodway means the channel of a watercourse and the adjacent land that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA, 2020). Zone AE indicates an area inundated by 1% annual chance flooding, for which base flood elevations have been determined. Zone AE is also referred to as the base flood or 100-year flood. The 0.2% annual chance of flood hazard is also known as the 500-year flood.

Figure 8. Floodplains



2.7.3 Next Steps

Changes in the floodplain of the Cache la Poudre River or Larimer and Weld Canal would require consultation with the City of Fort Collins to ensure any proposed encroachment or alteration of a floodplain meets their requirements. Floodplain modeling would be required to assess any changes to the floodplain or floodway. Changes to the base flood elevations in the floodplain may trigger the need for a Conditional Letter of Map Revision (CLOMR) and LOMR from FEMA.

2.8 Waters of the U.S., Including Wetlands

2.8.1 Regulatory

Passed by the United States Congress in 1972, the Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into waters of the U.S. Any discharge of dredged or fill materials into a waters of the U.S., including wetlands, requires authorization by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the CWA. The CWA also protects the removal of wetlands from dredging activities. A waters of the U.S. is defined under Section 404 as all traditional navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. This definition does not include wetlands that lack a significant nexus or surface connection to a regulated water, such as a perennial stream. For regulatory purposes under the CWA, wetlands are defined as:

"…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (USEPA, 2018)."

More specifically, an area is considered a wetland when three parameters are met: hydrophytic vegetation, hydric soils, and wetland hydrology.

2.8.2 Existing Conditions

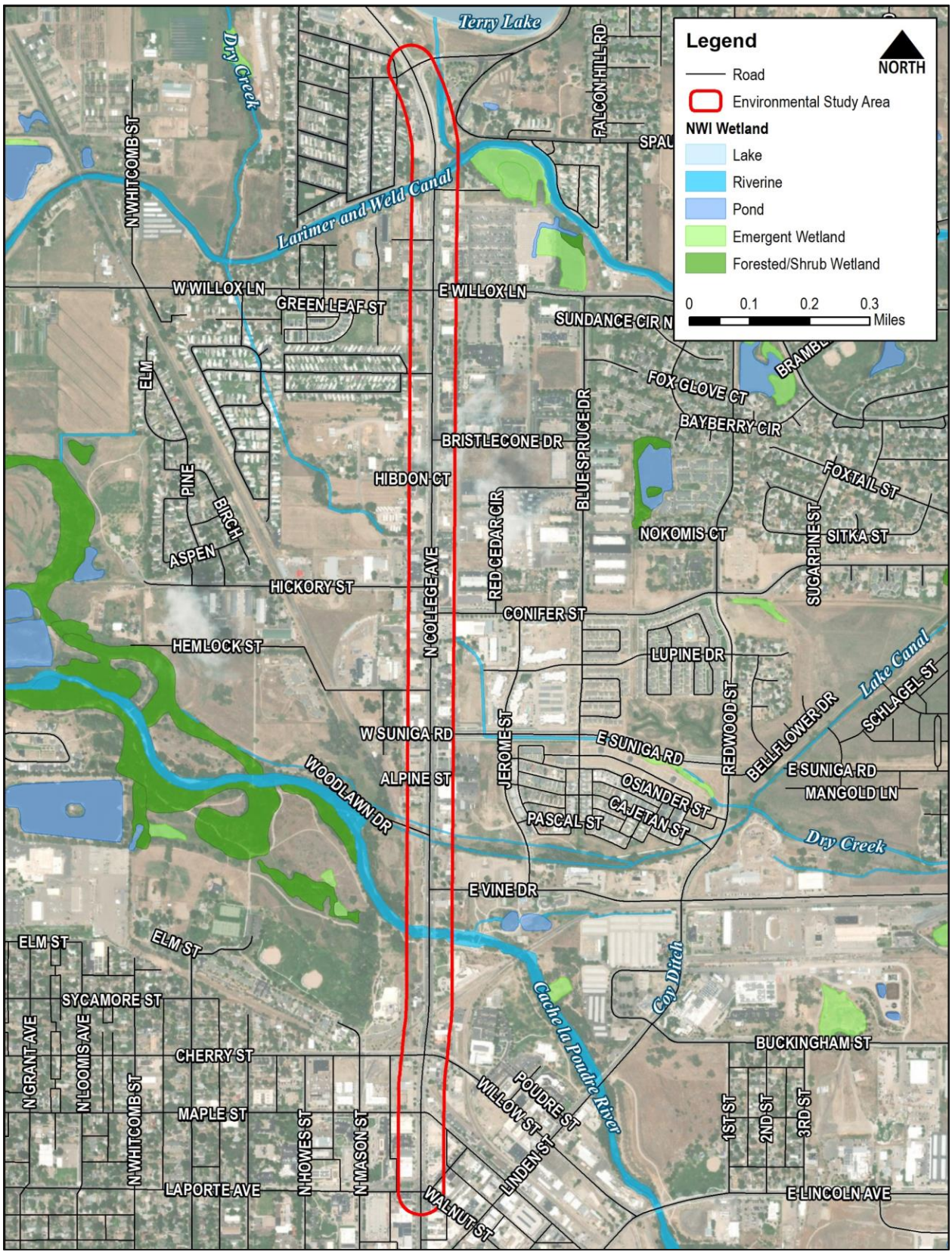
FHU staff conducted a desktop review and reviewed Google Earth and historical aerial imagery, USGS topographic maps, Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS, 2021), National Wetlands Inventory (NWI) data from the U.S. Fish and Wildlife Service (USFWS), and FEMA floodplain data, to determine the potential presence of wetlands and other waters of the U.S. in the environmental study area.

The desktop analysis identified the following surface waters within the study area:

- Cache la Poudre River
- Lake Canal
- Dry Creek
- Larimer and Weld Canal
- Terry Lake Canal

The NWI data also indicated potential wetland areas along all of these water resources except Dry Creek (see **Figure 9**). Within the study area, Dry Creek is piped underground and does not contain any surface water flows or wetland habitat. The wetland types along the remaining surface water resources within the study area are all Riverine wetlands. The Riverine wetland type usually includes all wetlands and deepwater habitats contained within a channel. Water is usually, but not always, flowing and upland islands or Palustrine wetlands may occur in the channel, but they are not included in the Riverine wetland designation (USFWS, 2021a).

Figure 9. NWI Wetlands and Other Waters of the U.S.



The NWI wetlands adjacent to the Cache la Poudre River within the study area consist of R2UBG, which is defined as a Riverine System, Lower Perennial Subsystem, Unconsolidated Bottom Class, with an Intermittently Exposed Water Regime. These wetlands are characterized by having some water flows all year, except during years of extreme drought and have a substrate that mainly consists of sand and mud with the vegetation covering less than 30 percent (USFWS, 2021a).

NWI wetlands adjacent to Lake Canal consist of R5UBFx, which is defined as a Riverine System, Unknown Perennial Subsystem, Unconsolidated Bottom Class, Semipermanently Flooded Water Regime, and was excavated by humans. This type of wetland consists of having surface water present throughout the growing season in most years, with the water table usually at or very near the surface when surface water is absent. Vegetation cover is usually less than 30 percent and at least 25 percent cover of particles smaller than stones (less than 6-7 cm) (USFWS, 2021a).

Larimer and Weld Canal and Terry Lake Canal adjacent NWI wetlands mostly consist of R4SBCx, which is defined as a Riverine System, Intermittent Subsystem, Streambed Class, Seasonally Flooded Water Regime, and was excavated by humans. These wetlands are characterized by containing flowing water only part of the year and when water is not flowing, water may remain in isolated pools or be absent. Surface water is present early in the growing season but is absent by the end of it in most years (USFWS, 2021a).

There are also a couple of small pockets of R5UBH, which is defined as a Riverine System, Unknown Perennial Subsystem, Unconsolidated Bottom Class, and a Permanently Flooded Water Regime. This type of wetland consists of having water cover the substrate throughout the year. Vegetation cover is usually less than 30 percent and at least 25 percent cover of particles smaller than stones (less than 6-7 cm) (USFWS, 2021a).

2.8.3 Next Steps

A wetland delineation and water of the U.S. identification would need to be completed to identify wetlands and other waters of the U.S. within the project footprint and to determine if these waters of the U.S could be considered jurisdictional. If resources are likely jurisdictional, a Section 404 permit will need to be acquired from the USACE prior to construction activities occurring. Once project design has progressed to a level capable of identifying final impacts, the appropriate documentation should be provided and will need to include appropriate permitting under Section 404 of the CWA and mitigation. If a Section 404 permit would be needed, clearances would also be required for compliance with the Endangered Species Act and with Section 106 of the National Historic Preservation Act (NHPA).

2.9 Water Quality

2.9.1 Regulatory

Water Quality is regulated under the Federal Water Pollution Control Act Amendments of 1972 (CWA). The objective is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters by preventing point and non-point pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. Each state has jurisdiction for managing water quality in its respective state. Section 303(d) of the CWA requires each state to evaluate water quality conditions in designated water bodies and list as impaired any water bodies not meeting water quality standards; this is to be reported every other year.

The City of Fort Collins implementes programs in accordance with its Colorado Discharge Permit System, Municipal Separate Storm Sewer System (MS4) Permit, to minimize pollutants transported by stormwater runoff into the storm sewer system and downstream receiving waters.

2.9.2 Existing Conditions

According to the Colorado Department of Public Health and Environment (CDPHE) the 2020 303(d) list of water quality limited segments requiring Total Maximum Daily Loads (TMDLs) includes the segment of Dry Creek (COSPCP13a_B) and all its tributaries and the Cache la Poudre River segment (COSPCP11_A) from Shields Street in Ft. Collins to a point immediately above the confluence with Boxelder Creek (CDPHE, 2020) (see **Figure 10**). For these segments, TMDLs are required for those parameters that are identified as impairments. Dry Creek is listed as having an impaired use due to Selenium (Dissolved), which affects Aquatic Life Use and has a medium priority level. The Cache la Poudre River segment is listed as having an impaired use due to E. coli, which affects Recreational Use and has a high priority.

The construction of the proposed project would not be expected to contribute Selenium (Dissolved) or E. coli to Dry Creek and the Cache la Poudre River or any drainages that lead to these water resources. The proposed project would require a General Permit for Storm Water Discharges Associated with Construction Activities and the implementation of sediment and erosion control measures. Furthermore, best management practices (BMPs) would be implemented to minimize pollutants entering waterbodies.

2.9.3 Next Steps

A Stormwater Pollution Prevention Plan (SWPPP) would need to be prepared for the project and a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit would be required from CDPHE.

2.10 Vegetation and Wildlife

2.10.1 Regulatory

The Colorado Noxious Weed Act requires the control of the 79 plant species designated as "noxious weeds." The aim of the Noxious Weed Program is to control noxious weeds which replace native vegetation, reduce agricultural productivity, cause wind and water erosion, and pose an increased threat to communities from wildfire (CDA, 2020).

The Fish and Wildlife Coordination Act of 1958, as amended, recognizes the vital contribution of wildlife resources to the Nation and requires equal consideration and coordination of wildlife conservation with water resources development programs.

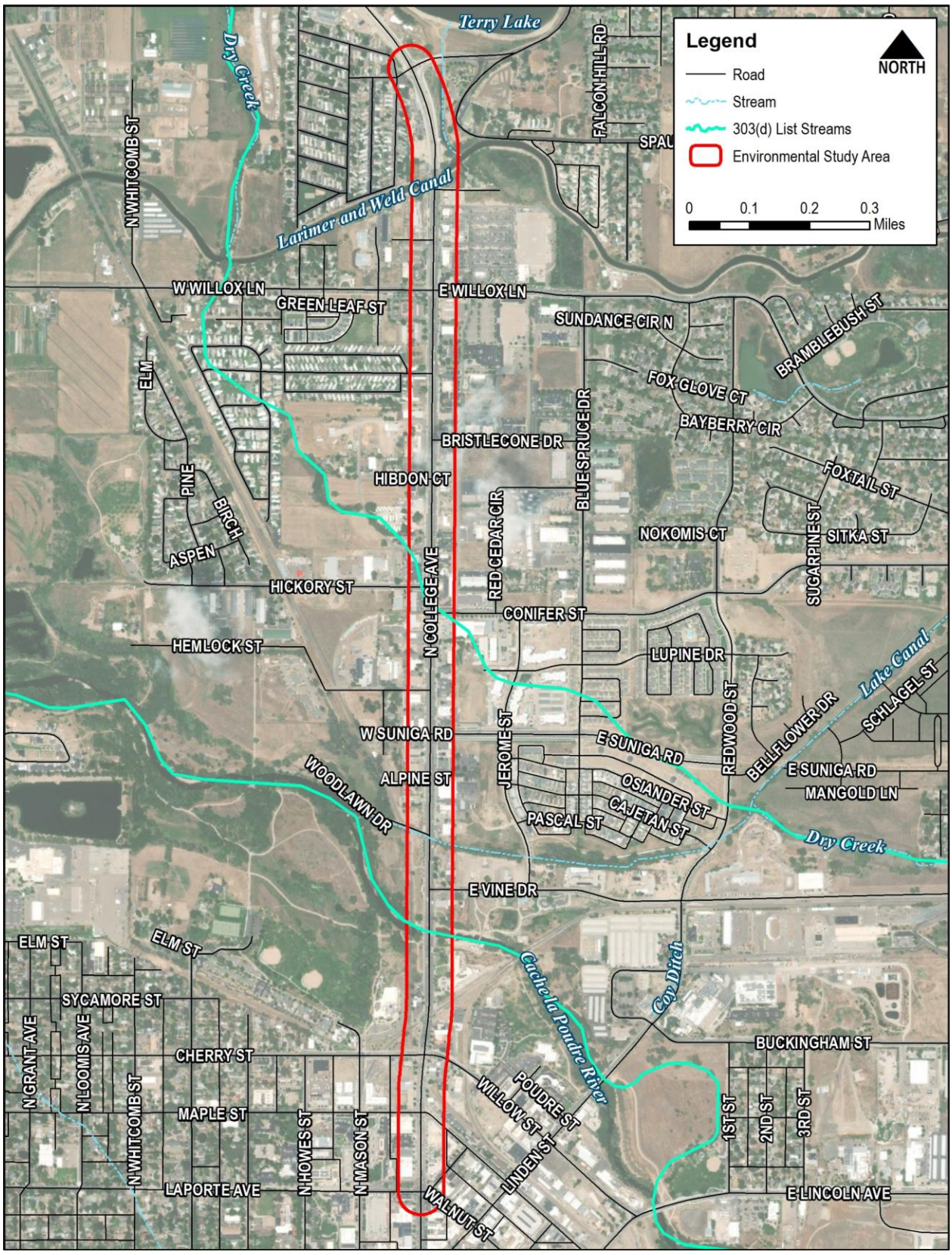
2.10.2 Existing Conditions

Vegetation

The environmental study area is located in the Front Range Fans sub-ecoregion within the High Plains Ecoregion (USEPA, 2006). The High Plains Ecoregion consists of smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass is the potential natural vegetation in this region and in Colorado, gas and oil fields are scattered throughout the region, with the greatest concentration found in the Denver Basin area. The Front Range Fans sub-ecoregion consists of more extensive urban development transitioning from mostly cropland and rangeland.

Undeveloped areas within the environmental study area primarily consist of vacant lots. Developed areas include commercial areas and some residential areas. Much of the environmental study area consists of North College right-of-way that is mowed and maintained, with some trees and shrubs in medians and along the right-of-way. Trees and shrubs primarily occur in riparian areas associated with the Cache la Poudre River, Lake Canal, Larimer and Weld Canal, and Terry Lake Canal. Wetlands could also be present within or adjacent to these surface water resources.

Figure 10. 303(d) List Streams



According to the Colorado Department of Agriculture (CDA), noxious weeds are plants that reduce agricultural productivity, lower real estate values, endanger human health and well-being, and damage scenic values (CDA, 2003; CDA, 2016; CWMA, 2013). The state has divided the 79 noxious weeds into three groups: Lists A, B, and C. In addition, the state also has a Watch List for newly introduced noxious weeds that may become listed in the future because they exhibit the same characteristics as listed noxious weeds.

List A includes 25 plant species that have very limited to no distribution in Colorado and are designated for immediate eradication. List B includes 38 species that are locally common but are managed to stop continued spreading. List C includes 16 species that are generally widespread and are not managed to stop spreading but identified for additional education, research, and biological control. The Watch List contains 19 plant species; this Watch List is intended to serve advisory and educational purposes only and is used to locate and report distributions of these species for future designation as noxious weeds (CDA, 2020).

The spread of noxious weeds can be partially attributed to the movement of seed and plant parts attached to vehicles. As a result, noxious weeds are becoming an increasing maintenance problem on roadway right-of-way. The ground disturbance caused by construction projects are often colonized by noxious weed species preventing the establishment of native vegetation.

Because much of the environmental study area is mowed and maintained, this has generally suppressed noxious weeds. However, they are still possible throughout the environmental study area where vegetation is not maintained or frequently mowed.

Wildlife

Due to the highly urbanized nature of the environmental study area, there are limited areas of natural habitat along the riparian corridors. Ungulate species such as mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*) may occur along the Cache la Poudre River, Lake Canal, and the Larimer and Weld Canal corridors. Carnivore species that could occur in the environmental study area include raccoon (*Procyon lotor*), coyote (*Canus latrans*), red fox (*Vulpes vulpes*), and striped skunk (*Mephitis mephitis*). Individuals of these species may use this area as a movement corridor, for hunting purposes, or for denning purposes.

According to the Colorado Parks and Wildlife (CPW) Species Activity Mapping (SAM) data, the project area is within the known range of black bear (*Ursus americanus*) and mountain lion (*Puma concolor*) (CPW, 2021b); however, these species are unlikely to occur in the urban setting of the project.

Many rodent species may occur in the project area. This group is very large, and species common in the project area include the deer mouse (*Peromyscus maniculatus*) and fox squirrel (*Sciurus niger*). Various mice, voles, and woodrats (*Neotoma* spp.) would also use the project area.

Reptile and amphibian species can also be present in the project area due to the presence of suitable habitat within the riparian areas of the corridor.

2.10.3 Next Steps

A field survey should be completed to identify any noxious weeds within the study area. Mitigation activities should be identified (as either a CDOT specification 217 or as a Noxious Weed Management Plan) prior to any construction activities occurring.

During the NEPA phase consideration should be given to limiting impacts to wildlife habitat along the riparian corridors and coordinate efforts of wildlife conservation during the design of the project.

2.11 Special Status Species

This section describes the special status species habitat and nesting migratory bird conditions of the study area. This section also includes resources identified from federal, state, and local agencies.

2.11.1 Regulatory

The Endangered Species Act (ESA), administered by the United States Fish and Wildlife Service (USFWS), provides protection to imperiled species and their habitats. Section 7 of the ESA requires federal agencies to consult with USFWS for projects that may affect a species listed under the ESA.

CPW also protects threatened and endangered and state sensitive species under Non-game and Endangered Species Conservation, Colorado Revised Statutes (CRS), Title 33, Article 2 (Non-game and Endangered Species Conservation, CRS 33 § 2).

The Migratory Bird Treaty Act (MBTA) of 1918 provides protection of birds classified as migratory birds by the USFWS. In Colorado, most birds, except for the European Starling (*Sturnus vulgaris*), House Sparrow (*Passer domesticus*), Rock Dove (*Columbia livia*) (Pigeon), and common grouse/pheasant species (Order Galliformes), are protected under the MBTA. The Migratory Bird Permit memorandum issued in April 2003 stipulates there is no prohibition against destruction of inactive nests. Additionally, any disturbance to these nesting areas must follow the stipulations outlined in the MBTA.

Bald and golden eagles also have specific protection under the Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668-668c.), administered by USFWS, which provides additional protection to these species from intentional or unintentional harmful conduct.

2.11.2 Existing Conditions

Threatened and Endangered Species

A review of the USFWS Information, Planning, and Conservation (IPaC) System website resulted in a list of nine federally threatened or endangered species with the potential to be impacted activities in the study area (see **Table 4**). These species include: Canada lynx (*Lynx canadensis*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Eastern black rail, (*Laterallus jamaicensis*), greenback cutthroat trout (*Oncorhynchus clarkia stomias*) and Ute ladies'-tresses (*Spiranthes diluvialis*) that may be found or have suitable habitat within Larimer County, as well as piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), pallid sturgeon (*Scaphirhynchus albus*), and western prairie fringed orchid (*Platanthera praeclara*) that has a potential to be impacted by downstream depletions in the South Platte River basin (USFWS, 2021b).

Table 4. Threatened and Endangered Species

Common Name (Scientific Name)	Status	Habitat Description
Mammals		
Canada Lynx (*Lynx Canadensis*)	Endangered	Canada lynx is found in dense subalpine forest and willow-choked corridors along mountain streams and avalanche chutes.
Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)	Threatened	Preble's meadow jumping mouse (PMJM) inhabits well-developed riparian habitat with adjacent, relatively undisturbed grassland communities and a nearby water source between 4,000 and 8,000 feet. PMJM has been found to regularly use uplands at least as far out as 100 meters beyond the 100-year floodplain.

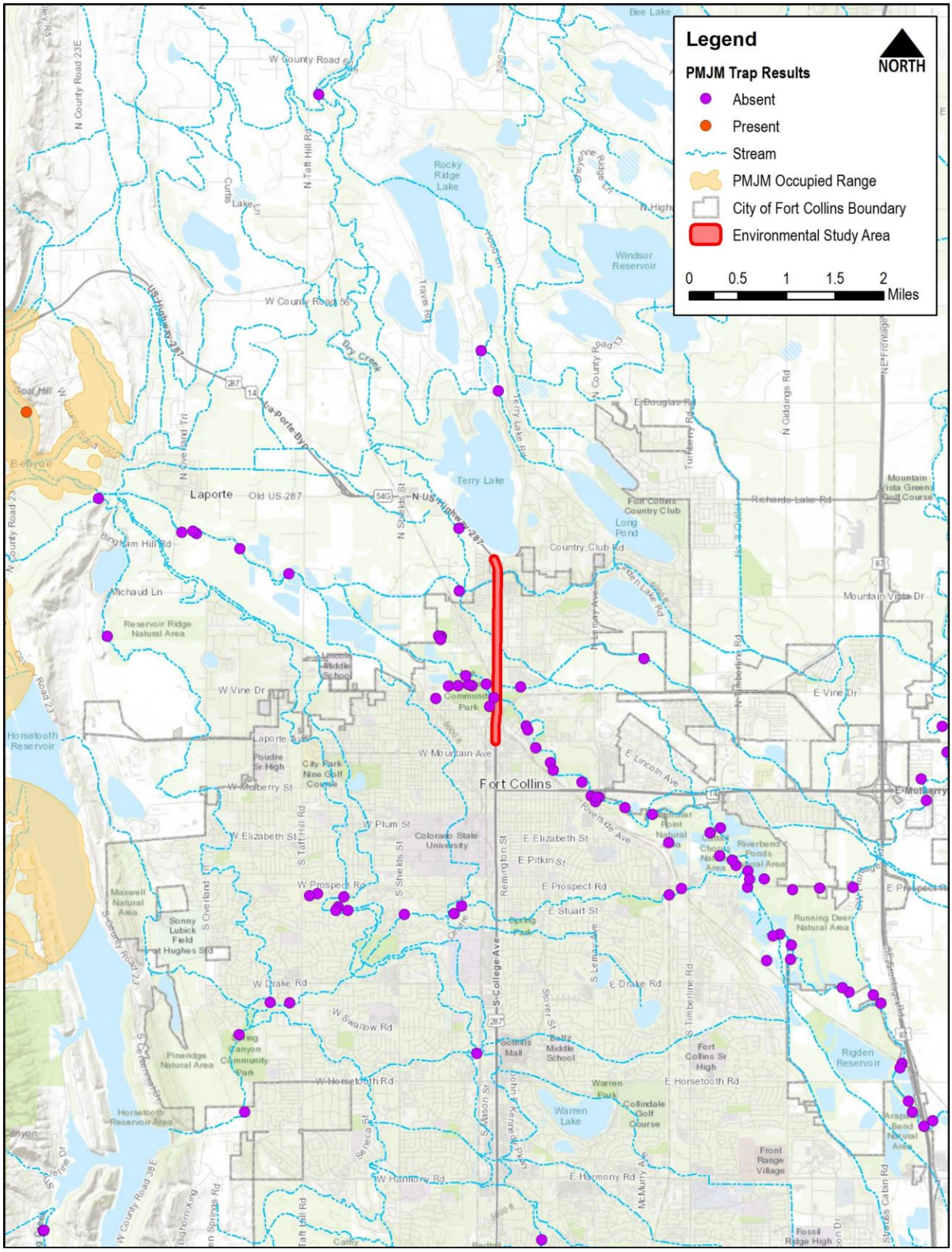
Common Name (Scientific Name)	Status	Habitat Description
Birds		
Eastern Black Rail (*Laterallus jamaicensis*)	Threatened	Black rails rely most frequently on dense emergent marshes, including beaver ponds. In Colorado, birds use shallow wetlands often dominated by cattails.
Piping Plover † (*Charadrius melodus*)	Threatened	Mudflats, shorelines of reservoirs and lakes. Sandy open shorelines with pebbles. Habitat is located downstream of the project and is associated with the South Platte River.
Whooping Crane † (*Grus americana*)	Endangered	Mudflats near reservoirs and agricultural areas. Habitat is located downstream of the project and is associated with the South Platte River.
Fish		
Greenback Cutthroat Trout (*Oncorhynchus clarkia stomias*)	Threatened	This trout inhabits undisturbed headwaters at elevations of 7,000-11,000 ft in Rocky Mountain National Park and in one spring-fed pond at Fort Carson. It prefers clear, swift flowing mountain streams. Young and juvenile fish occupy shallow, more open habitat, while older fish prefer deeper water with more cover, particularly overhanging banks and vegetation.
Pallid Sturgeon † (*Scaphirhynchus albus*)	Endangered	The species requires turbid water, diverse habitat types, and flow rates afforded by large, free flowing rivers. Habitat is located downstream of the project and is associated with the South Platte River.
Plants		
Ute Ladies'-tresses (*Spiranthes diluvialis*)	Threatened	Known primarily from moist meadows associated with perennial stream terraces, gravel bars, high flow channels floodplains, and oxbows at elevations between 4,300 - 6,850 feet.
Western Prairie Fringed Orchid † (*Platanthera praeclara*)	Threatened	A perennial orchid of the tallgrass prairie and is found most often on unplowed, calcareous prairies and sedge meadows. Habitat is located downstream of the project and is associated with the South Platte River.

† Water-related activities/use in the South Platte River Basin may affect listed species in Nebraska.
Source: USFWS Species Profiles – ECOS, IPaC July 2021

Due to the urban nature of the corridor, only limited, narrow areas of habitat occur within the study area, which includes riparian areas and associated stream channels such as the Cache La Poudre River, Lake Canal, Larimer and Weld Canal, and Terry Lake Canal.

The study area is located within the CPW designated overall range of Preble's meadow jumping mouse (PMJM) (CPW, 2020). However, the study area lies outside of the occupied range for PMJM. PMJM inhabits well developed riparian habitat with adjacent, relatively undisturbed grassland communities, and a nearby water source. Well-developed riparian habitat includes a dense combination of grasses, forbs, and shrubs; a taller shrub and tree canopy may be present. The habitat along the Cache La Poudre River, Lake Canal, Larimer and Weld Canal, and Terry Lake Canal within the study area appears to be too narrow to support PMJM and the area along the creek does not consist of a well-developed riparian area, nor does it have a relatively undisturbed grassland community adjacent to it. The nearest PMJM positive trap result (USFWS, 2021c) is located over 6-miles northwest along the Cache La Poudre River near Watson Lake. Trap results within or near the study area were all negative (see **Figure 11**). It is not likely that PMJM would be found within the study area, therefore the project is likely to have *No Effect* on PMJM.

Figure 11. PMJM Trap Results



No suitable habitat was identified within the study area for the Canada lynx during the desktop review. The study area is within a well-developed urban community and Canada lynx is found in dense subalpine forest and willow-choked corridors along mountain streams and avalanche chutes. It is not likely that a Canada lynx or its habitat would be found within the study area, therefore the project is likely to have *No Effect* on Canada lynx.

Greenback cutthroat trout generally inhabits clear, swift flowing mountain streams and is unlikely to be found in the streams and canals within the city of Fort Collins. Therefore, the project is likely to have *No Effect* on Greenback cutthroat trout.

Potential marginal habitat for the Eastern Black Rail and Ute ladies'-tresses orchid may exist along Lake Canal and possibly along Larimer and Weld Canal and Terry Lake Canal. The Eastern Black Rail typically uses shallow wetlands often dominated by cattails and Ute ladies'-tresses orchid can be found in moist meadows associated with perennial stream terraces, gravel bars, high flow channels floodplains, and oxbows. A survey of the entire study area would need to be conducted to determine the effect on the Eastern Black Rail and Ute ladies'-tresses orchid.

The threatened and endangered species listed by IPaC that are affected only by downstream depletions to the North Platte, South Platte, and Laramie River Basins are not anticipated to be affected by this project, as long as no downstream depletions to the South Platte River basin occur as a result of the project.

State Listed Sensitive Species

The Colorado Parks and Wildlife (CPW) Species Profile website and the Colorado Natural Heritage Program Spatial Data Layers were also reviewed to identify the latest information on special status species that may occur in the study area (see **Table 5**). These species include the federally listed species as well as the following: Black-tailed prairie dog (*Cynomys ludovicianus*), Northern leopard frog (*Rana pipiens*), and Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), (CPW, 2021a; CNHP 2019).

Table 5. State Listed Sensitive Species in Addition to Federally Listed Threatened and Endangered Species

Common Name (Scientific Name)	Status	Habitat Description
Mammals		
Black-Tailed Prairie Dog (*Cynomys ludovicianus*)	State Special Concern	Black-tailed prairie dogs live on grassy plains or prairies in communities called "towns" which can vary greatly in size. Prairie dog habitats are traditionally dry, flat, sparsely vegetated grasslands.
Townsend's Big-Eared Bat (*Corynorhinus townsendii pallescens*)	State Special Concern	Townsend's big-eared bat is a western species occupying semidesert shrublands, pinyon-juniper woodlands, and open montane forests. Townsend's big-eared bat can be found throughout Colorado except on the eastern plains. Its distribution seems to be determined by availability of roosts, such as caves, mines, tunnels, crevices, and masonry structures with suitable temperatures, making the conservation of suitable roosts essential to the management of this species.
Amphibians		
Northern Leopard Frog (*Rana pipiens*)	State Special Concern	Northern leopard frogs prefer wet meadows and the banks and shallows of marshes, ponds, lakes, reservoirs, streams, and irrigation ditches. May roam far from water during wet, mild weather.

Source: CPW 2021a

While the vegetation and minimal undeveloped land in the study area does provide habitat for some species and potential wildlife movement corridors, there does not appear to be suitable habitat for any state listed species other than the Northern leopard frog. While there are aquatic resources within the study area that could potentially contain suitable habitat, no confirmed records of northern leopard frog populations could be found within or near the study area.

Migratory Birds

A ground survey was not conducted at this time to determine if any nests were located within the study corridor. However, reviewing aerial imagery, the study area contains suitable habitat that may provide opportunities for forage, roosts, and nesting to migrating birds, such as raptors and passerines. The CPW SAM data identified several species of birds that contain breeding ranges within the study area such as American Bittern (*Botaurus lentiginosus*), Brewer Sparrow (*Spizella breweri*), Brown-Capped Rosy Finch (*Leucosticte australis*), Cassin Sparrow (*Peucaea cassinii*), Grasshopper Sparrow (*Ammodramus savannarum*), Lark Bunting (*Calamospiza melanocorys*), Lazuli Bunting (*Passerina amoena*), Lewis Woodpecker (*Melanerpes lewis*), Long-billed Curlew (*Numenius americanus*), and Virginia Warbler (*Leiothlypis virginiae*). Raptors that contain breeding ranges that overlap the study area include Ferruginous Hawk (*Buteo regalis*), Northern Harrier (*Circus cyaneus*), Red-tailed Hawk (*Buteo jamaicensis*), and Swainson Hawk (*Buteo swainsoni*). The CPW Raptor Nest point data (CPW, 2020) also shows raptor nests near the study area (see **Figure 12**). The nearest raptor nest is located approximately 0.5 miles west of the study area near Magpie Meander Natural Area.

Bald and Golden Eagles

Bald Eagles (*Haliaeetus leucocephalus*) require mature trees near large, open bodies of water for nesting and winter roosting. No large water bodies are present in the study area of the project, but Terry Lake is located directly north. According to CPW SAM data (CPW, 2020b), there is a Bald Eagle winter foraging area found at the northern-most extent of the project near Terry Lake and the nearest known Bald Eagle nest is located approximately 1.0 mile to the northwest near Dry Creek and Terry Lake (see **Figure 12**).

The CPW SAM data also indicates that the study area is located in Golden Eagle breeding range. Golden Eagles (*Aquila chrysaetos*) generally nest on cliffs or escarpments. Large cliffs and escarpments are lacking in the area adjacent to the project. Therefore, potential nesting habitat for Golden Eagles is not present.

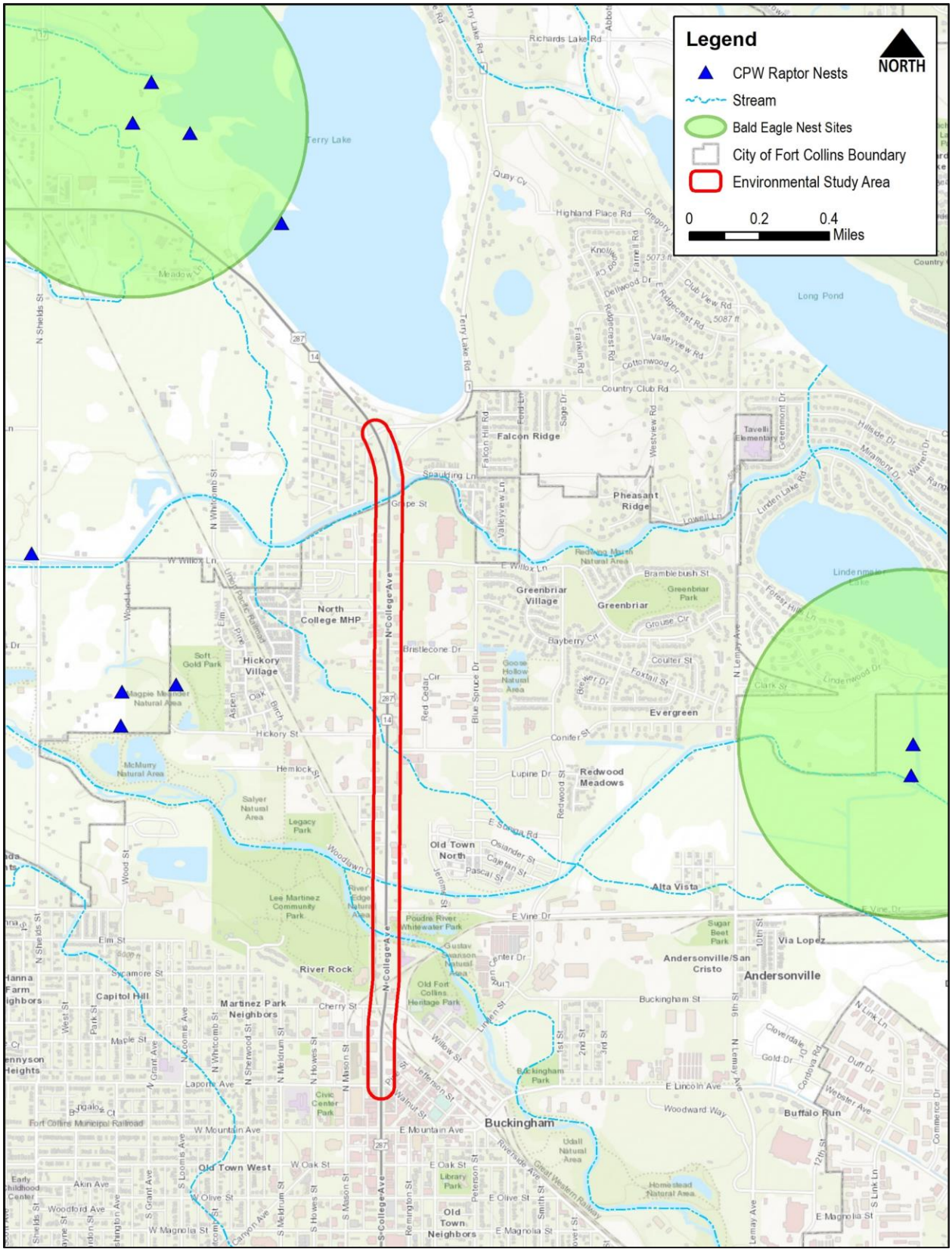
2.11.3 Next Steps

Due to the urban nature of the corridor, habitat is generally lacking for listed species within the environmental study area. A field survey should be conducted to determine if the study area contains suitable habitat for any federally listed threatened and endangered species or any state listed sensitive species.

From the desktop review analysis, it is likely the study area contains suitable habitat that may provide opportunities for forage, roosts, and nesting to migrating birds, such as raptors and passerines. A migratory bird survey should be completed during the next phase of the proposed project to determine if any migratory bird nests are within the study area.

Additional migratory bird and raptor nest surveys will be required if construction of the project occurs between April 1 and August 31 and should be conducted at least one week before construction activities begin. Construction activities around and near migratory bird nests should be based on CDOT's Project Special Specification 240, which follow CDOT's Standard Specifications for Road and Bridge Construction. If raptor nests are located within or adjacent to the study area, then coordination with CPW and USFWS must take place to identify potential impacts and mitigation. Mitigation would include using the CPW *Recommended Buffer Zones and Seasonal Restrictions for Nesting Raptors*.

Figure 12. Raptor Nests



3.0 SUMMARY

This environmental review was prepared to evaluate the presence of environmental resources within the environmental study area. The primary objective of this environmental review is to provide a planning-level overview of resources and determine the potential constraints and opportunities for the North College Bus Rapid Transit and Transit Oriented Development Plan. The information provided in this report is intended to support the selection of alternatives. As defined below, there are three classes of action that may be initiated to comply with NEPA.

- An Environmental Impact Statement (EIS) is prepared for projects where it is known that the action will have a significant effect on the environment.
- An Environmental Assessment (EA) is prepared for actions in which the significance of the environmental impact is not clearly established. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a Finding of No Significant Impact (FONSI) is issued.
- Categorical Exclusions (CEs) are issued for actions that do not individually or cumulatively have a significant effect on the environment.

The environmental setting and intensity of the impact on a particular resource are two considerations when determining the significance of impact. For this project, it seems unlikely to have any significant impacts on the environment at this time. The NEPA process will clarify the significance of the project's effects on the environment and the level of documentation will be determined during the NEPA process.

4.0 REFERENCES

Colorado Department of Transportation (CDOT). 2018. "Hazardous Materials Guidance." June.

CDOT. 2019. Project Standard and Special Provision Worksheets. CDOT Specification 217 and Revision of Section 240. Available at: https://www.codot.gov/business/designsupport/cdot-construction-specifications/2019-construction-specifications

Colorado Department of Public Health and Environment (CDPHE). 2020. 303(d) List of Water-Quality-Limited Segments Requiring TMDLs. https://cdphe.colorado.gov/impaired-waters

Colorado Parks and Wildlife (CPW). 2020. Raptor Nest GIS data point file.

CPW. 2021a. State Threatened and Endangered and Species of Concern. Available at: http://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx

CPW. 2021b. Species Activity Mapping (SAM) GIS Data. Accessed July 2021.

Federal Emergency Management Agency (FEMA). 2020. Definition of a Floodway. https://www.fema.gov/glossary/floodway

Felsburg, Holt & Ullevig (FHU). 2008. "*North I-25 EIS, Modified Phase I Environmental Site Assessment*" prepared by Felsburg Holt & Ullevig, dated October 2008.

Natural Resources Conservation Service (NRCS). 2021. Web Soil Survey website: https://websoilsurvey.nrcs.usda.gov/. Accessed June 2021.

United States Environmental Protection Agency (USEPA). Level III and IV Ecoregions of the Continental United States. Website: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states

USEPA. 2018. Definition of a Wetland. June 12, 2018. https://www.epa.gov/wetlands/what-wetland

USEPA. 2020. EJSCREEN EPA's Environmental Justice Screening and Mapping Tool (Version 2020). https://ejscreen.epa.gov/mapper/

USEPA. 2021. Definition of Environmental Justice. July 22, 2021. https://www.epa.gov/environmentaljustice

United States Fish and Wildlife Service (USFWS). 2021a. Classification of Wetlands and Deepwater Habitats of the United States, Riverine System. Accessed July 22, 2021. https://www.fws.gov/wetlands/documents/classwet/riverine.htm

USFWS. 2021b. Information, Planning, and Conservation System (IPaC). https://ecos.fws.gov/ipac/

USFWS. 2021c. Preble's meadow jumping mouse (PMJM) Trap Results GIS data point file.