City of Fort Collins

Harmony Road ENHANCED TRAVEL CORRIDOR Alternatives Analysis

Harmony Road ETC Master Plan

submitted by: FELSBURG HOLT & ULLEVIG

in association with: NELSON NYGAARD, bha

Adopted July 2, 2013

Harmony Road ENHANCED TRAVEL CORRIDOR Alternatives Analysis

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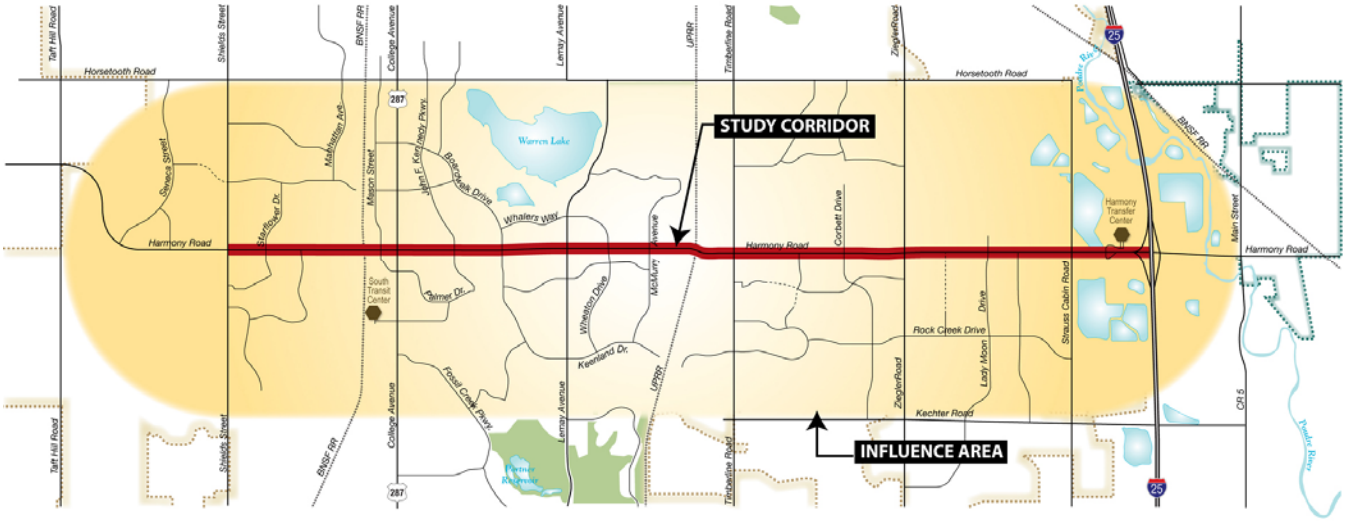
Executive Summary

The City of Fort Collins conducted this study on Harmony Road to establish existing conditions, to identify future transportation challenges (using the year 2035 as a planning horizon), and to create a vision that will serve as a blueprint for multimodal improvements in the corridor. The study developed a Locally Preferred Alternative (LPA) for multimodal transportation improvements along the 5 ½ mile corridor and presents a plan for implementation and funding of those improvements.

Harmony Road Context

Harmony Road is one of six Enhanced Travel Corridors (ETCs) in Fort Collins that are "planned to incorporate high frequency transit, bicycling, and walking as part of the corridor." The Harmony Road ETC extends from Shields Street to I-25 and includes a variety of cross-sections, land use characteristics, and travel patterns.



Harmony Road was named after the agricultural community named "Harmony" established in the area in the 1870s. Remains of the community still exist at the Harmony Road/Timberline Road intersection where the buildings from the original Harmony Store and the Harmony School still stand.

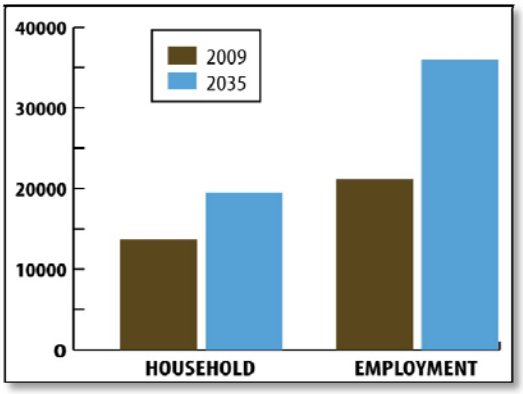
Today, Harmony Road is an important regional connection; Harmony road is the first Fort Collins exit traveling from the south on I-25. Harmony Road is considered one of the best ways into and out of Fort Collins, and with the limited number of I-25 exits, a large amount of regional traffic is funneled to Harmony Road. Harmony Road is one of the primary commercial corridors in Fort Collins and houses several large employment campuses including Hewlett Packard, Avago, and Intel. The University of Colorado Health Harmony Campus is also a prominent land use adjacent to Harmony Road. As a primary commercial corridor serving all of Fort Collins and also as a regional destination, pressures on Harmony Road are significant. Both local and regional trips and will continue to grow into the future; the future of Harmony Road corridor is tied to the future of Fort Collins and the region.

Purpose and Need

The purpose of the project is to implement multimodal transportation improvements that enhance mobility and safety along the Harmony Road Corridor. Improvements will support local and regional travel needs, land uses, economic health and environmental stewardship goals.

Improvements are needed to address the following transportation problems:

- The transit routes along Harmony Road are discontinuous
- Traveling by bicycle along Harmony Road is uncomfortable
- Pedestrian crossings are typically spaced a half-mile apart
- Traffic congestion is expected to increase due to growth in population and employment along Harmony Road and the surrounding area
- The existing cross-section does not accommodate potential mixed-use transit-oriented development
- Connections between modes to destinations along the corridor are lacking
- Harmony Road has the two intersections with the highest crash totals in the City
- Harmony Road is a wide corridor with few dedicated, safe pedestrian crossing points
- Harmony Road does not fully meet Fort Collins' sustainability goals



Residential growth within the Harmony Road study area is expected to increase 42 percent, and employment is expected to increase 71 percent.

- **Goal #1:** Improve Multimodal Mobility
- **Goal #2:** Enhance Accessibility
- **Goal #3:** Improve Safety
- **Goal #4:** Integrate Sustainability

The four goals of the project reflect the need to address the transportation problems and are consistent with the City of Fort Collins' vision for the future. These goals are the foundation for the evaluation criteria used to assess and compare improvement alternatives.

Planning Process

The Harmony Road ETC Master Plan has been developed in a manner consistent with the Federal Transit Administration's (FTA's) Alternatives Analysis (AA) study process. As described in the FTA's Framework for Alternatives Analysis, during an AA study process "…the priority corridor identified in systems planning is studied in detail, focusing on the effects of alternative solutions to the corridor's transportation problems. Information on costs, benefits, and impacts of each alternative is developed to provide a sound technical basis for project decision making."

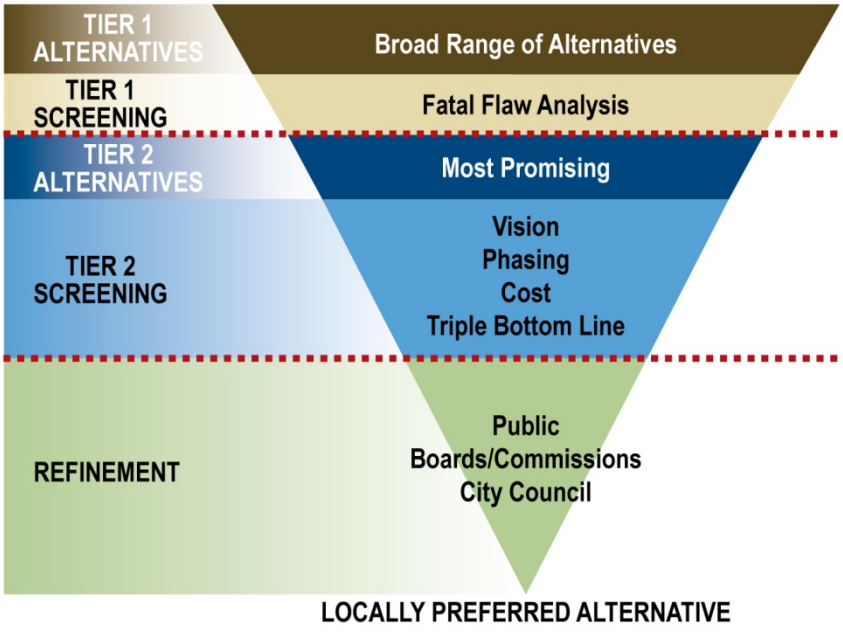
The planning process was guided by a Project Management Team (PMT), which is composed of two FC Moves transportation planners and a Transfort transit planner. The PMT and consultant team held monthly or semi-monthly conference calls throughout the planning process to discuss findings and preliminary recommendations and to prepare for meetings with the larger Technical Advisory Committee (TAC, which included individuals from

various City Departments, FTA, and adjacent jurisdictions) and public outreach efforts.
A variety of public outreach activities were designed and conducted to solicit input from residents, business owners, employees, and travelers of the Harmony Road corridor and from the community at large. In addition to the Harmony Road ETC public meetings, several other outreach mechanisms were successfully used to disseminate information about the project and to receive input throughout the planning process:

- Virtual public open houses – information from the public meetings was posted on the project website along with electronic questionnaires which received over 350 responses in total (between two questionnaires)
- Presentations to City Boards and City Council
- Booths at City events and other public meetings
- Stakeholder meetings with neighborhood groups, business associations, and major employers

Alternatives Development and Evaluation

The fundamental philosophy in the screening process was to systematically identify the positive and negative characteristics and tradeoffs among alternatives resulting ultimately in a Locally Preferred Alternative (LPA).



The alternatives development process began with the development of 18 corridor-wide elements including a broad range of improvements by travel mode (four roadway, five transit, six bicycle, and six pedestrian) that were identified as having potential address the project needs.

In the Tier 1 evaluation and screening process, the alternatives were evaluated at a high level for fatal flaws and their ability to address the Purpose and Need.

Given that no single element would necessarily address all of the project needs as a stand-alone improvement, the intent of identifying these elements by mode was to combine elements together as part of packaged alternatives in Tier 2. The Tier 2 evaluation process involved a detailed and quantitative comparison between corridor alternatives and against the No Action Alternative. Inter-departmental and agency coordination, as well as public involvement, played a major role in this process. The TAC was involved in each step of the evaluation process, as well as during the development and refinement of the LPA.

Tier 1 Cross-Sectional Elements

Travel Mode	Element
Roadway 	2 General Purpose Lanes per direction
	3 General Purpose Lanes per direction
	4 General Purpose Lanes per direction
	High Occupancy Vehicle (HOV) Lanes
Transit 	Local Bus in Mixed Traffic
	Enhanced Bus with Transit Priority Treatments (queue jumps and/or transit signal priority)
	Curbside Bus Rapid Transit (BRT)
	Median BRT
	Light Rail/Streetcar
Bicycle 	Bike Lanes (shoulder)
	Buffered Bike Lanes
	Bike/Bus Lanes
	Shared Use Paths
	Cycle Tracks
	Back Street Bike Lanes
Pedestrian 	Curvilinear Detached Sidewalks
	Shared Use Paths
	Crossing Enhancements at Signalized Intersections
	Grade Separated Crossings

Criteria for evaluating alternatives were established to respond directly to the project's Purpose and Need and its goals and objectives. The criteria were developed to be appropriate for the evaluation level being conducted and the alternatives being considered. The responsiveness of each alternative to the criteria determined whether or not the alternative was reasonable and if it should be advanced for further evaluation. Elements that best responded to the Purpose and Need and resulted in the best evaluation included:

- **Roadway:** 2 General Purpose lanes per direction from Shields Street to College Avenue; 3 General Purpose lanes per direction from College Avenue to I-25, with spot intersection improvements
  - Would provide traffic operational benefits without major ROW acquisition
- **Transit:** Enhanced Bus service with queue jumps at congested intersections
  - Would provide the best compromise of increasing transit ridership while retaining acceptable traffic operations
- **Bicycle:** Bike Lanes from Shields Street to College Avenue; Buffered Bike Lanes from College Avenue to I-25
  - Would provide the best compromise between ROW and drainage/maintenance impacts and mode shift potential

- **Pedestrian:** Curvilinear Detached Sidewalks, crossing enhancements at intersections, and grade separated crossings
    - Would continue to provide a separate space for pedestrians along the corridor, and would improve the safety and level of comfort for pedestrians crossing Harmony Road

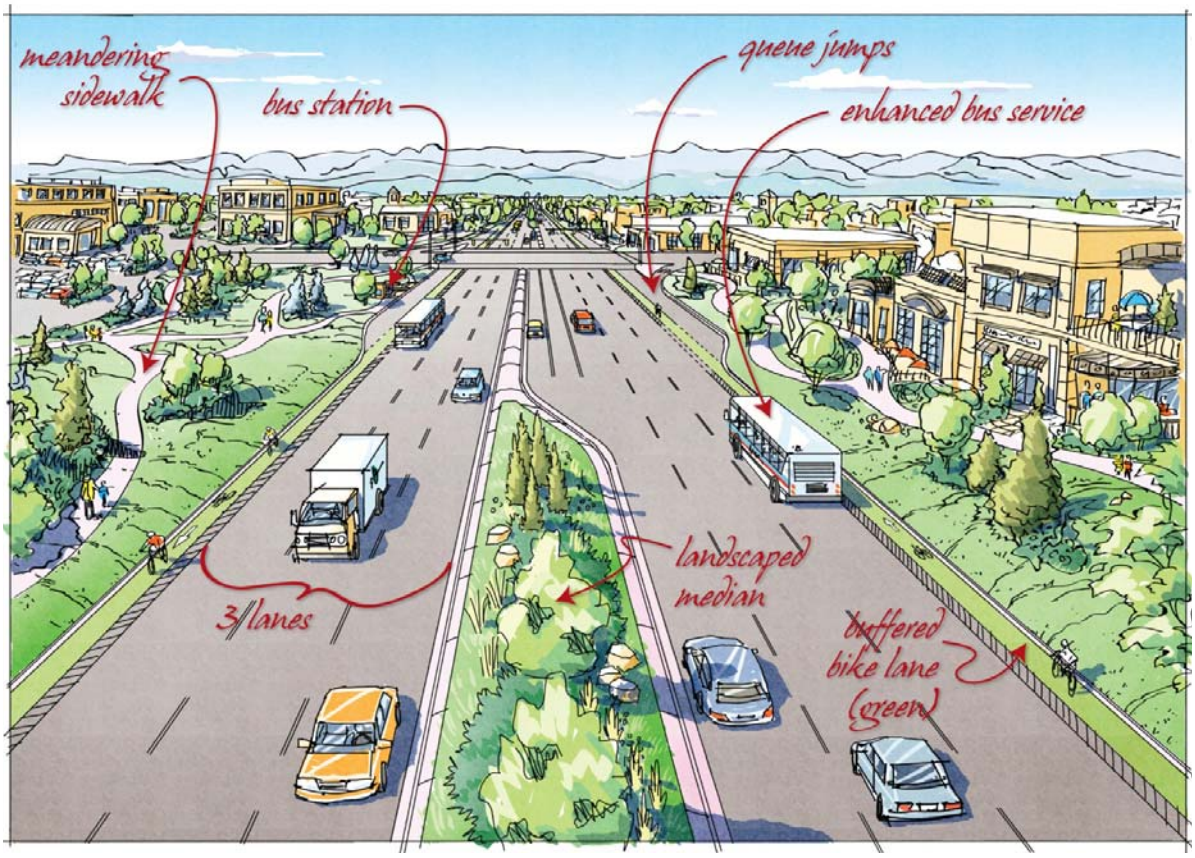
Locally Preferred Alternative

The LPA for the Harmony Road ETC, includes a series of multimodal transportation improvements to address the project Purpose and Need. The LPA includes widening the section of Harmony from College Avenue to Boardwalk Avenue to six lanes, as well as intersection improvements at selected locations to address future operational deficiencies.

The transit aspect of the LPA includes Enhanced Bus along Harmony Road between the South Transit Center and the Harmony Transfer Center. The bus would travel in the general purpose lanes along the extent of the route except where queue jumps are provided.

The LPA includes enhancements to the existing bicycle lanes including green colored pavement on the bike lanes for the full length of the corridor, and a striped buffer between the bike lane and the adjacent travel lane from College Avenue east toward I-25. The meandering sidewalk will be retained on both sides of Harmony Road, with completion of the few missing segments. The LPA will also include enhancements to bicycle and pedestrian crossings (both at-grade and grade separated crossings). The LPA includes raised, landscaped medians the entire length of the corridor.

Illustrative Example of LPA from College Avenue to I-25



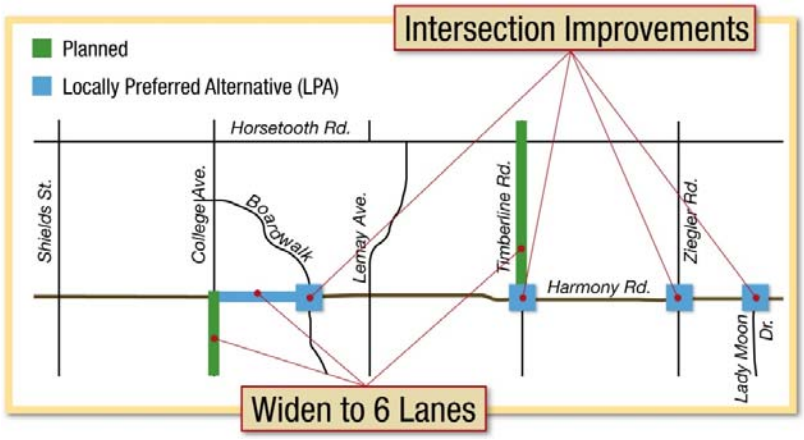
Roadway Elements

In general, the LPA makes use of the existing roadway infrastructure without major capital expansion. It includes widening a short segment (College Avenue to Boardwalk Drive) to six lanes to better accommodate future travel demands, which is consistent with the City's *Transportation Master Plan*.

Two widening projects which are anticipated within the planning horizon will affect Harmony Road. College Avenue is planned for widening to six lanes south of Harmony Road which will require reconfiguration at the Harmony Road intersection to extend three northbound and southbound lanes through the intersection. Likewise, the Timberline Road intersection will require similar geometric modifications to allow six through lanes in the north/south direction. Timberline Road is expected to transition to four lanes south of the Harmony Road intersection. Although these two widening projects are not a part of the LPA, the intersection modifications to accommodate these projects are considered part of the LPA.

The LPA also includes intersection improvements at four locations along the corridor to address future operational deficiencies and to enhance safety for automobile travel along the corridor. Four intersections identified for improvements include:

- Harmony Road/Boardwalk Drive
- Harmony Road/Timberline Road
- Harmony Road/Ziegler Road
- Harmony Road/Lady Moon Drive



In addition to the widening and intersection improvements, the LPA includes urban design elements to provide consistent aesthesis along the length of the corridor. It includes landscaped medians and curb and gutter throughout the corridor.

Transit Elements

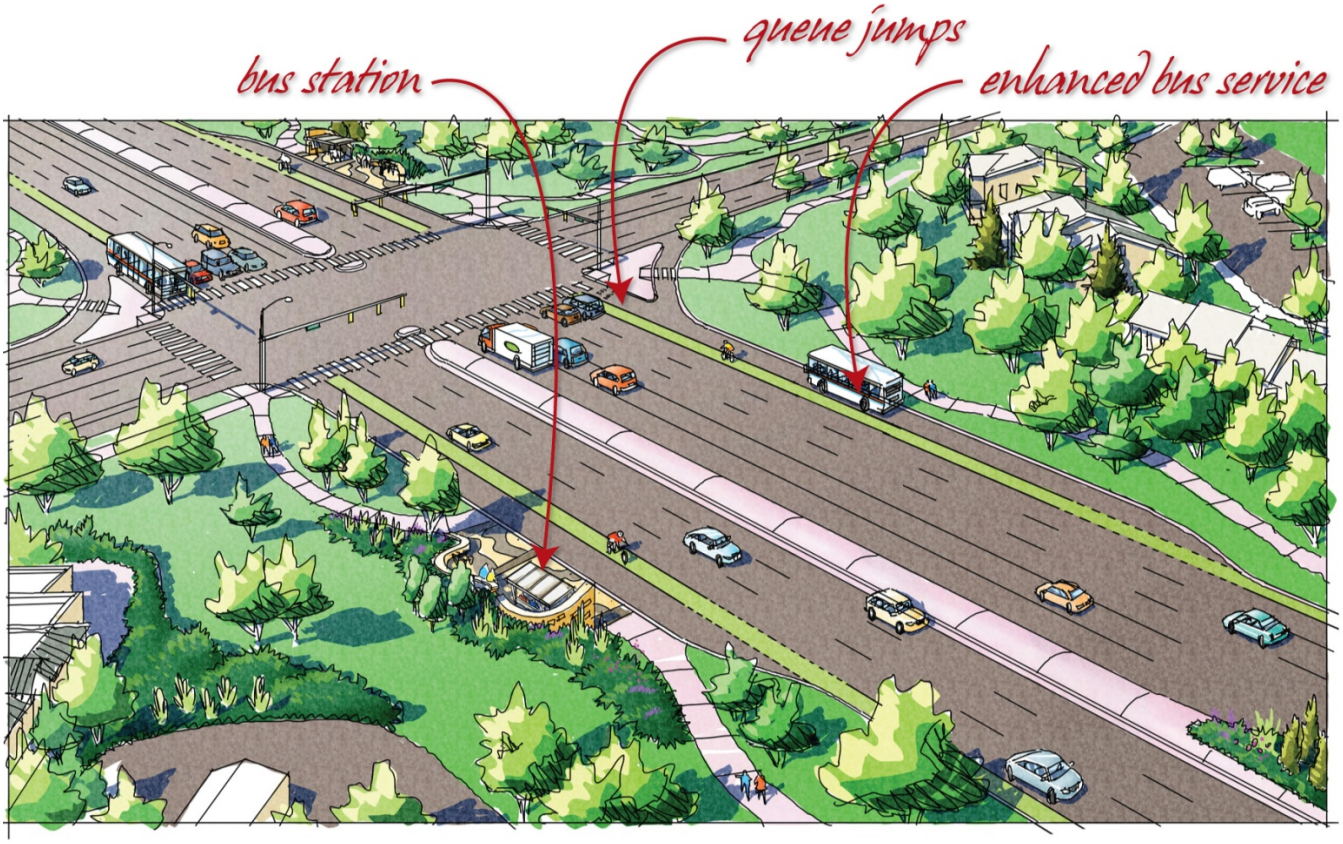
The LPA includes a new 4 ½ mile Enhanced Bus route along Harmony Road between the Harmony Transfer Center and the South Transit Center. The route would begin at the Harmony Transfer Center, north of Harmony Road and to the west of I-25. It would travel west along Harmony Road stopping on demand at bus stops and stations located approximately every ¼ mile along the corridor. At College Avenue the bus would turn south to access the South Transit Center and connect to the planned MAX service that is currently under construction. Route H would operate every 20 minutes in the peak period and 30 minutes in the off peak periods.

To the west of College Avenue, Harmony Road would be served by the existing Route 19 connecting the South Transit Center, Front Range Community College and the CSU Transit Center. Route H would connect with the Route 17 at Timberline Road and with Route 7 at John F. Kennedy Parkway.

The LPA also includes queue jumps at three intersections along Harmony Road:

- Lemay Avenue
- Timberline Road
- Ziegler Road

Buses using the queue jump and right turning vehicles cross the buffered bike lane as they approach the intersection; right turning vehicles travel around the right turn channelization island while approaching buses continue straight. With a green indication buses travel through the intersection concurrently with the other through travel lanes to a receiving lane on the far side of the intersection and to the bus stop.



Enhanced transit stations provide a comfortable and safe respite location for transit riders to gather while anticipating the arrival of the next bus. The intent is to provide shelter, seating, bike parking, waste and recycling collection, and relevant information regarding the transit system (e.g., maps and time of next bus arrival). Transit stations are located at key nodes in the transit system and serve as gathering places for users. These include locations such as major employers, the hospital, and schools. Stations will be larger than a typical bus stop and provide more amenities.

Bicycle Elements

The LPA includes enhanced bicycle facilities along the full length of the Harmony Road corridor. East of College Avenue, a buffered bike lane will provide a visual separation and greater space between the motorized travel lane and the bike. The buffered bike lanes will also provide space for a bicyclist to pass another bicyclist, and generally appeal to a wider cross-section of bicycle users.

Example of a green bike lane in San Francisco

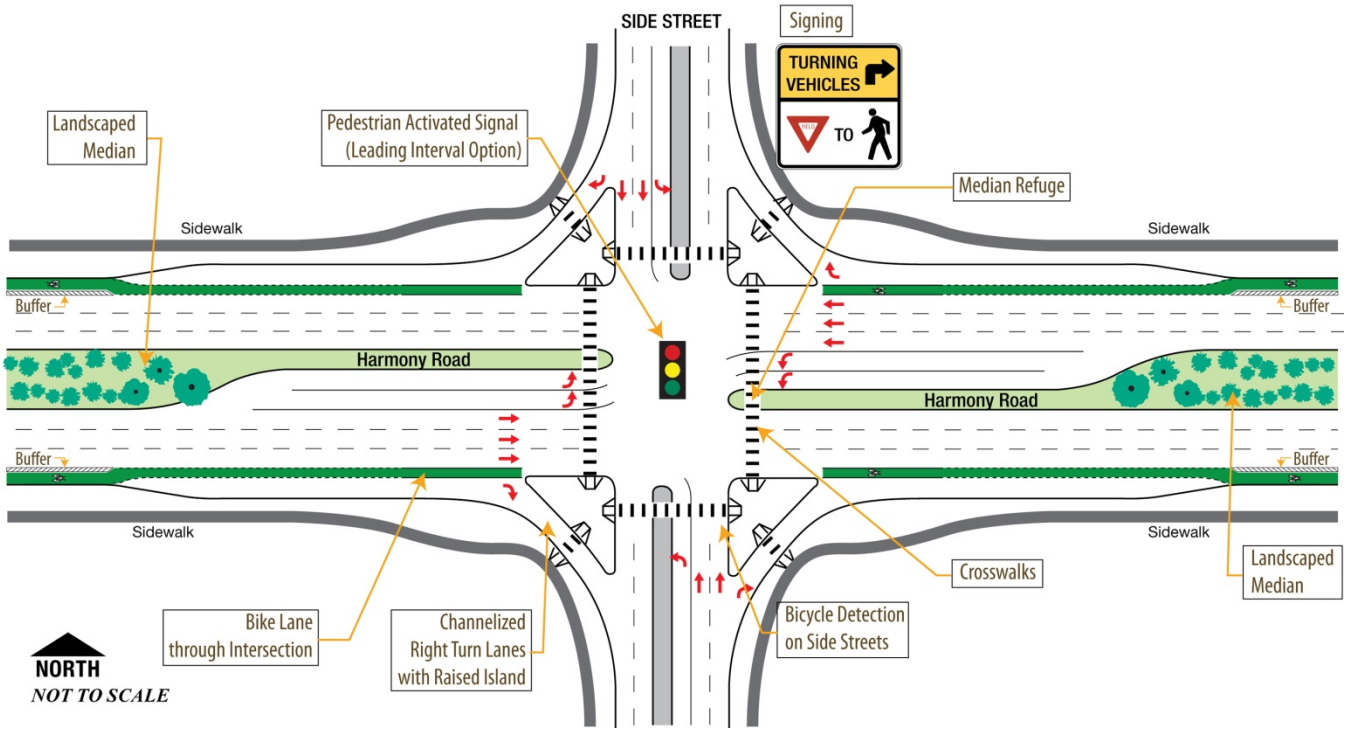
As a part of the LPA refinement process, the use of colored pavement was identified as a desired treatment for the bike lanes along the full length of Harmony Road (Shields Street to I-25).

Pedestrian Elements

Harmony Road is identified in the City's Pedestrian Plan as a Pedestrian Priority Area (PPA). The LPA seeks to enhance the pedestrian experience along the Harmony Road corridor by providing continuous sidewalk connections along the length of the corridor (Shields Street to I-25) and improving the crossing opportunities along the corridor. The LPA includes completion of the missing sidewalk segments that exist in several locations along the corridor.

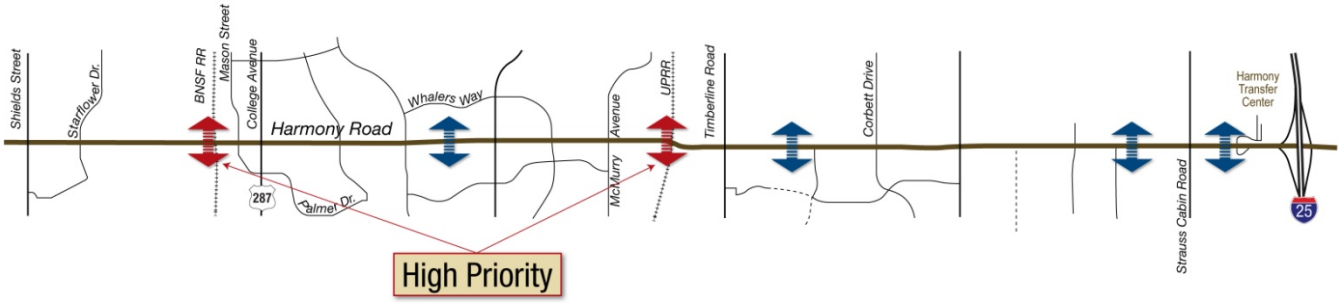
Crossing of Harmony Road has been identified as problematic by the community, and it will become more difficult as traffic volumes increase in the future. All signalized intersections along the corridor should include at-grade crossing treatments to enhance the safety and convenience for pedestrians (and bicyclists).

Example Intersection with Enhanced Bicycle and Pedestrian Crossing Treatments



In addition to the at-grade intersection crossing enhancements, six locations for future grade-separated crossings have been identified and are included in the LPA. These crossings are recommended periodically along the corridor to connect land uses north and south of Harmony Road, to facilitate access to transit stations, and to reduce the auto/pedestrian and auto/bicycle conflicts along the corridor.

Pedestrian Grade-Separated Crossing Locations



Implementation

The improvements needed to realize the LPA likely cannot be constructed at the same time. As such, an implementation plan has been developed to minimize throw-away costs, expedite high priority improvements, and advance the capital projects needed to begin enhanced bus service. The City should leverage themselves as

well as private development when possible with development projects along the corridor to take full advantage of other construction activities and magnitudes of scale.

The following table summarizes the recommended implementation plan in Immediate, Short-Term and Long-Range timeframes. A description of the plan element, the responsible party, and the approximate cost for the individual elements are included for each of these timeframes.

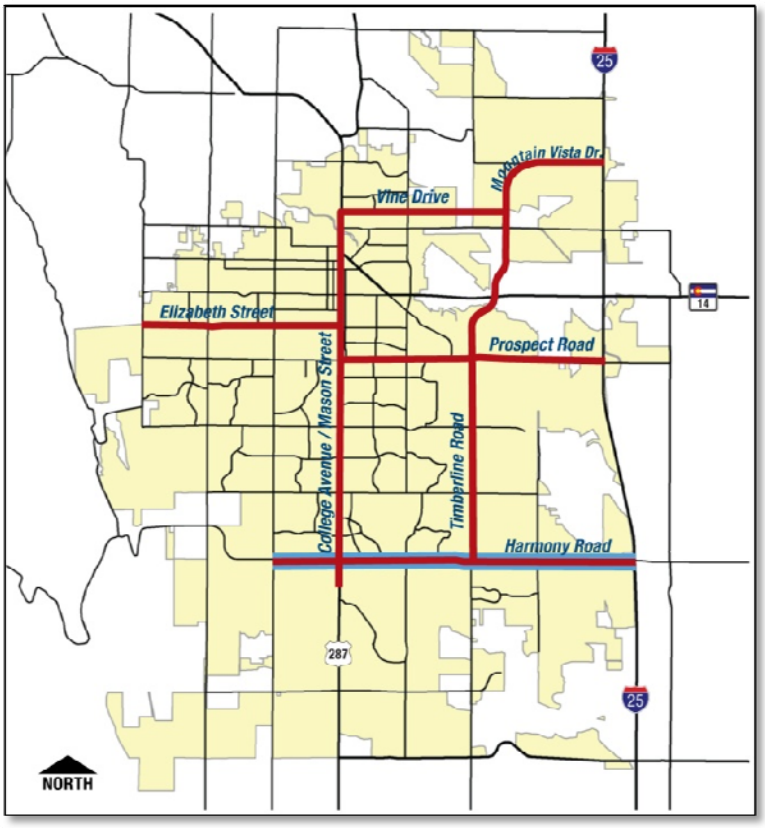
Recommended Implementation Plan

Locally Preferred Alternative Element & Description	Responsible Party	Approximate Cost
Immediate Improvements		
LPA Design • Complete the design of vehicle, pedestrian and bicycle elements • Conduct environmental resource inventory; develop mitigation plans for impacted areas • Identify ROW impacts; prepare ROW plans; start ROW acquisition process • Identify public and private utility conflicts; prepare modification plans	Engineering with Consultant Assistance	$3.50M (8% of estimated total project cost)
Finalize the Operating Plan & Determine Vehicle Type and other Requirements	Transfort	Completed by Transfort staff
Create a Transit-Oriented Development Overlay District	FC Moves/ Planning Services	Completed by FC Moves & Planning Services staffs
Revise corridor striping to create the bike lane buffer; install green epoxy paint in bike lanes	Engineering	$0.24M
Construct missing sidewalks and neighborhood connections	Engineering	$0.61M
Construct landscaped medians	Engineering	$6.47M
Construct Mason Trail and Power Trail pedestrian grade-separations	Engineering	$5.52M
Short-Term Improvements		
Identify and Secure Funding for Vehicle Procurement; Begin Process to Procure Vehicles	Transfort	Completed by Transfort Staff
Develop Enhanced Bus Operating Schedules and Begin Public Information Program	Transfort	Completed by Transfort Staff
Reconstruct the Lemay Avenue, Timberline Road (including realignment of Harmony Road to the south), and Ziegler Road intersections to include 2035 capacity improvements and Enhanced Bus queue jump lanes	Engineering	Lemay Avenue Intersection: $3.00M Timberline Road Intersection: $4.01M Ziegler Road Intersection: $2.51M

Locally Preferred Alternative Element & Description	Responsible Party	Approximate Cost
Construct the Bus Stations and Bus Stops	Engineering	$4.02M
Finalize and Implement the Marketing Plan for the Enhanced Bus Service	Transfort with Consultant Assistance	Completed by Transfort Staff
Purchase necessary buses	Transfort	$2.51M
Begin Enhanced Bus Service		
Long-Range Improvements		
Construct remaining roadway cross-sectional elements sequentially in a west to east manner. Major design elements would include: • Roadway widening or narrower to match the LPA cross-sections (including irrigation ditch enclosures where needed) • Intersection capacity improvements including channelizing islands • Traffic signal modifications • Drainage modifications or new systems • Utility modifications	Engineering	$9.47M
Construct remaining pedestrian grade-separations at: • Between Boardwalk Drive and Lemay Avenue • Adjacent University of Colorado Health Harmony Campus • Fossil Creek Reservoir Inlet • Harmony Transfer Center	Engineering	$11.04M

1. Introduction

Harmony Road is one of the six Enhanced Travel Corridors (ETCs) identified in the Fort Collins *Transportation Master Plan* (2011). ETCs are defined as "uniquely designed corridors that are planned to incorporate high frequency transit, bicycling, and walking as part of the corridor." Harmony Road crosses two other ETC's: Mason and Timberline Road/Power Trail. Construction of the Mason Corridor Bus Rapid Transit (MAX) line is underway and will bring high frequency transit service across Harmony Road, with the BRT line terminating at the South Transit Center, just south of Harmony Road. Building on the momentum of the Mason Corridor, the City has identified Harmony Road as the next ETC for multimodal improvements.



Harmony Road is one of six Enhanced Travel Corridors in Fort Collins.

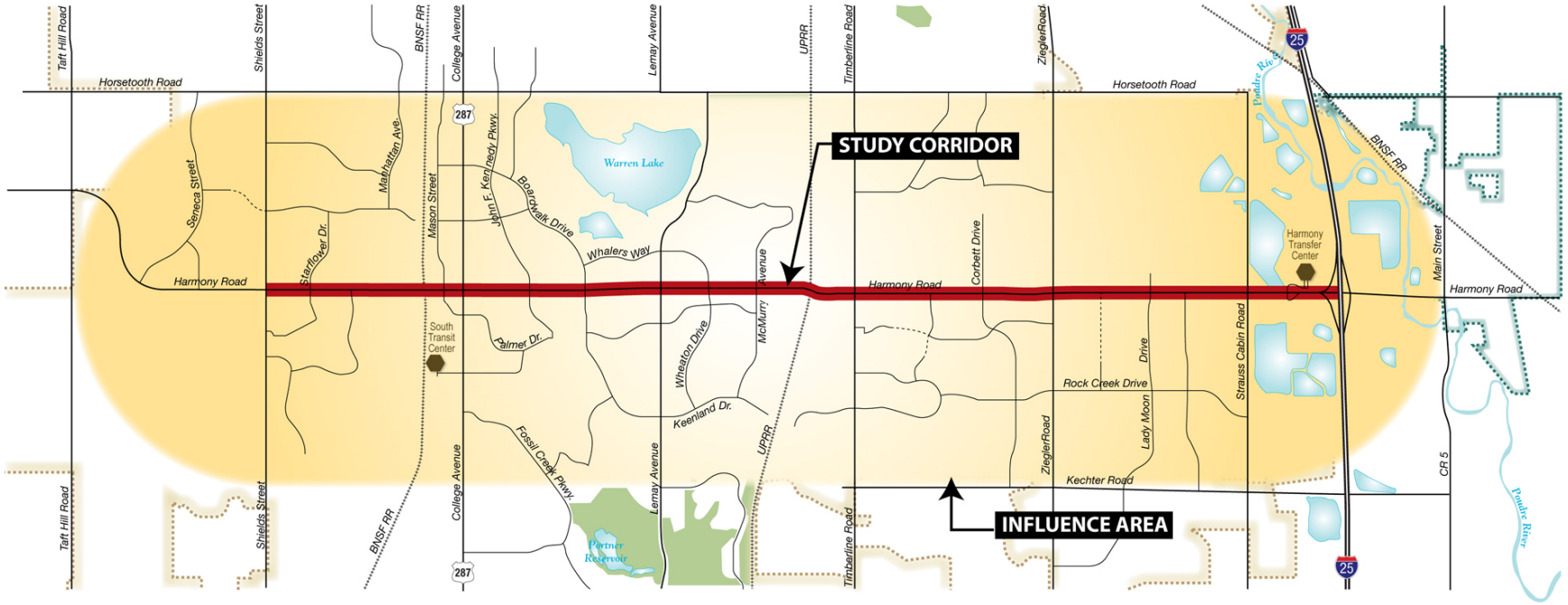
Harmony Road is also identified by the North Front Range Metropolitan Planning Organization (NFRMPO) as a Regionally Significant Corridor (RSC) which is defined in the *NFR 2035 Regional Transportation Plan Update* as "An important link in a multimodal, regional network comprised of existing or new transportation corridors that connect communities and/or activity centers by facilitating the timely and safe movement of people, goods, information, and services." Harmony Road's designations as an ETC and RSC establish the importance of the corridor for both local and regional travel.

This Harmony Road ETC Master Plan was conducted by the City of Fort Collins to create a vision that will serve as a blueprint for future multimodal transportation improvements along the corridor. This report presents the results of the Alternatives Analysis (AA) study which was conducted to assess existing conditions, identify future challenges (using the year 2035 planning horizon), and identify a Locally Preferred Alternative (LPA) for implementation.

Corridor Study Area

The Harmony Road ETC extends from Shields Street to I-25; and the study area for the Harmony Road ETC Alternatives Analysis includes a one mile buffer around this segment (see **Figure 1**). Harmony Road's cross-section and character vary and three distinct segments have been identified for the purpose of alternatives development and evaluation. These segments are described below.

Figure 1. Study Area



West Segment (Shields Street to College Avenue)

The westernmost segment of the corridor has four through lanes with a painted median. The primary adjoining land use is residential, with houses backing to Harmony Road. Front Range Community College is located in the southeast quadrant of Harmony Road and Shields Street. The Mason Corridor (including impending MAX BRT service and the existing Mason Trail) cross this segment of Harmony Road, as does the BNSF Railroad. The planned South Transit Center is located approximately one-third mile south of Harmony Road adjacent to the Mason Corridor.

West Segment

Central Segment (College Avenue to Ziegler Road)

Central Segment

While the entire central segment of the corridor is planned for six lanes, only the segment between Boardwalk Drive and Ziegler Road is currently six lanes with a raised median. Widening for the remaining section (College Avenue to Boardwalk Drive) is unfunded, however.

The urban design character of the central segment generally follows the recommendations from the *Harmony Corridor Plan* with large landscaped setbacks and informal tree plantings. Some areas along this segment have redeveloped into new activity centers that front the corridor, such as near the Snow Mesa Drive intersection. Newer urban design infrastructure improvements have been completed at the College Avenue/Harmony Road intersection. Land uses along the central segment are typically suburban-style commercial development with some residential neighborhoods backing to Harmony Road. The University of Colorado Health Harmony Campus is a prominent land use on the south side of Harmony Road, east of Timberline Road. This segment includes the UPRR crossing and a future Power Trail crossing just west of Timberline Road.

East Segment (Ziegler Road to I-25)

The eastern segment of the corridor has six travel lanes with a depressed grassy median, providing a more rural feel. Most of the land along this stretch is undeveloped farmlands or natural areas. However, three large employment campuses (Hewlett Packard, Avago, and Intel) are located near the intersection of Harmony Road and Ziegler Road. This segment has the highest potential for household and employment growth.

East Segment

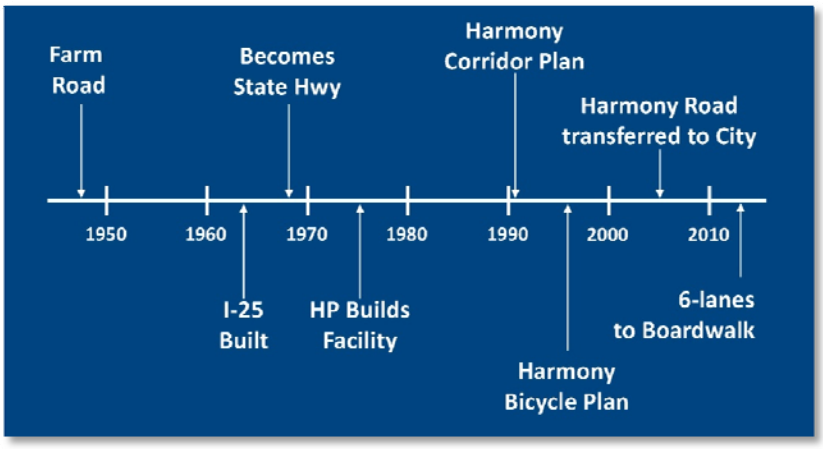
Corridor Context

Corridor History

Harmony Road owes its name to the agricultural community named "Harmony" established in the 1870s. The community of Harmony was centered on what is now the intersection of Harmony Road and Timberline Road. Remains of the community can still be seen at the intersection where the buildings from the original Harmony Store and the Harmony School still stand. To the west of Timberline Road is the Harmony Cemetery. Harmony was a farming community with crops such as grasses, wheat, corn, barley, oats, and timothy.

The Harmony School on the northeast corner of Harmony Road and Timberline Road is a designated Fort Collins Landmark. The original school house was built in 1878 and the larger masonry school building was built in 1931.

Harmony Road remained a rural agricultural road until the late 1950s and early 1960s with the construction of I-25. By 1965, I-25 connected New Mexico and Wyoming through Colorado from Walsenburg to Wellington. In about 1968 Harmony Road became a state highway connecting I-25 to US 287 (College Avenue) and was designated as State Highway 68 (SH 68). Subsequently, the Colorado Department of Transportation (CDOT) developed Harmony Road into a divided highway with a wide grass median/swale that also acted as a drainage feature from US 287 to just west of I-25. The width of the roadway and rights-of-way set the tone for a higher speed, limited access roadway; a big difference from any other arterial street in the City. In 2005 CDOT returned all of SH 68 to the City of Fort Collins.



Regional and Citywide Importance

Harmony Road is an important regional connection. Traveling from the south on I-25, Harmony Road is the first Fort Collins exit; the next Fort Collins exit is Prospect Road three miles to the north. The nearest exit to the south is State Highway 392 (the Windsor exit) which is also three miles away. Harmony Road as a six lane arterial is considered one of the best ways into and out of Fort Collins, and with the limited number of I-25 exits, a large amount of regional traffic is funneled to Harmony Road. Harmony Road also connects to the Town of Timnath, immediately to the east of I-25. Timnath is a small but rapidly growing community with land use plans that add an extensive number of new households. Timnath has also seen major employment develop along Harmony Road with a large Super Walmart located just to the east of the I-25 and Harmony interchange.

Harmony Road and College Avenue are the primary commercial corridors for Fort Collins. As a primary commercial corridor serving all of Fort Collins and also as a regional destination, pressures on Harmony Road are significant. It also serves both local and regional trips and will continue to grow into the future; the future of Harmony Corridor is tied to the future of Fort Collins and the region.

A variety of plans have been completed by the City of Fort Collins and other agencies that address transportation, access, and other issues along Harmony Road. **Appendix A** lists these plans and provides a brief description of their relevance to the Harmony Road corridor. A description of the near term projects that will affect the Harmony Road corridor are also included in **Appendix A**.

Overview of Planning and Outreach Process

The following NEPA process principles were followed for this study:

- **Preparation of a purpose and need statement**
- **Evaluation of alternatives and identification of a Locally Preferred Alternative**
- **Identification of potential environmental impacts and conceptual mitigation strategies**
- **Public involvement**

The Harmony Road ETC Master Plan has been developed in a manner consistent with the Federal Transit Administration's (FTA's) Alternatives Analysis (AA) study process. As described in the FTA's Framework for Alternatives Analysis, during an AA study process "…the priority corridor identified in systems planning is studied in detail, focusing on the effects of alternative solutions to the corridor's transportation problems. Information on costs, benefits, and impacts of each alternative is developed to provide a sound technical basis for project decision making." The AA study process, as well as the Federal Highway Administration's (FHWA's) Planning and Environmental Linkages (PEL) process can be considered precursors to the environmental review process required by the National Environmental Policy Act (NEPA). The PEL process is intended to improve and streamline the environmental process for transportation projects by conducting corridor planning activities prior to the start of the NEPA process. Although this ETC Master Plan is not considered a PEL, several NEPA process principles were followed and the FHWA PEL questionnaire was completed and is included in **Appendix B**.

As shown on **Figure 2**, the Harmony Road ETC planning process began in January 2012 and took approximately 18 months to complete. The process diagram below shows the key tasks, milestones, and meetings.

Coordination with several City departments and neighboring agencies as well as input from the public was important throughout the planning process.

The planning process was guided by a Project Management Team (PMT), which is composed of two FC Moves transportation planners and a Transfort transit planner. The PMT and consultant team held monthly or semi-monthly conference calls throughout the planning process to discuss findings and preliminary recommendations and to prepare for meetings with the larger Technical Advisory Committee (TAC) and public outreach efforts.

Coordination with other Fort Collins staff and with neighboring agencies largely occurred through the TAC. The TAC met six times from March 2012 through the conclusion of the study to provide input about the analysis of technical data for the City's decision making purposes.

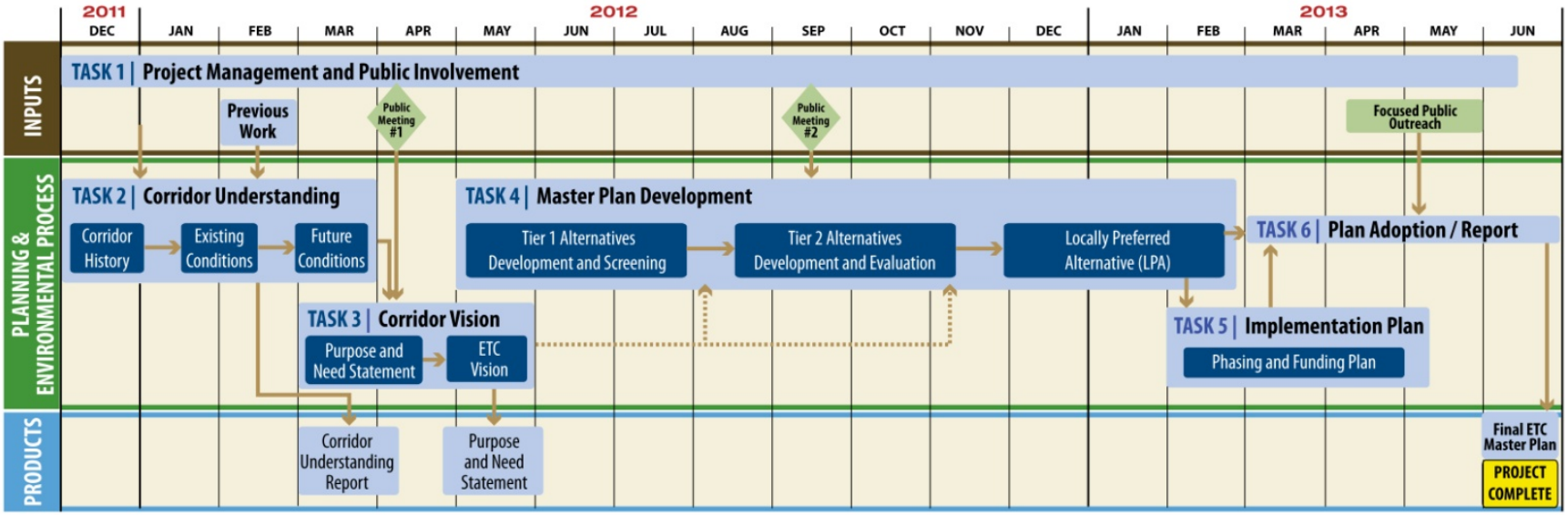
The TAC included representatives from the following City departments:

- FC Moves
- Transfort
- Advance Planning
- Community Development Neighborhood Services
- Engineering
- Streets
- Traffic Operations
- Utilities
- City Manager's Office
- Economic Health
- Natural Areas

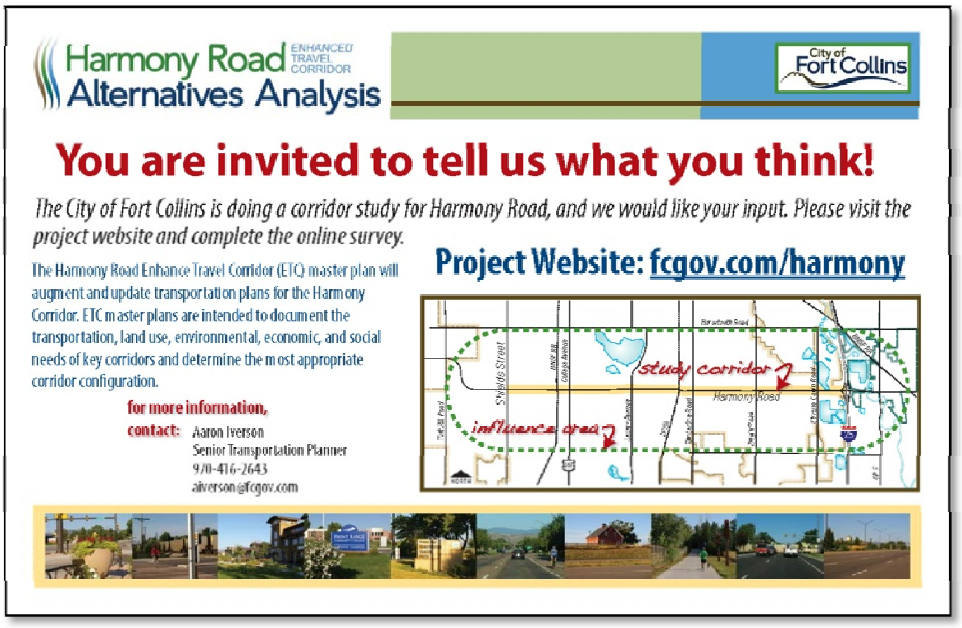
And the following agencies:

- North Front Range MPO
- Town of Timnath
- Larimer County
- Federal Transit Administration (FTA)
- University of Colorado Health Systems

Figure 2. Planning Process



A variety of public outreach activities were designed and conducted for the study to solicit input from residents, business owners, employees, and travelers of the Harmony Road corridor and from the community at large. Two public meetings were held for the project:



- The focus of the May 3, 2012 public meeting was to present existing conditions, future growth projections, and transportation needs, and to receive public input and feedback on current traveling conditions and on ideas for improvements
- The results of the Tier 1 Alternatives Development and Evaluation (as described in Chapter 3) were presented at the September 13, 2012 public meeting, along with recommendations for alternatives to be moved forward for further evaluation in Tier 2. Attendees provided input on the initial screening recommendations

In addition to the Harmony Road ETC public meetings, several other outreach mechanisms were successfully used to disseminate information about the project and to receive input throughout the planning process:

- Virtual public open houses – information from the public meetings was posted on the project website along with electronic questionnaires which received over 350 responses in total (between two questionnaires)
- Presentations to City Boards and City Council
- Booths at City events and other public meetings
- Stakeholder meetings with neighborhood groups, business associations, and major employers

A more detailed description of public outreach efforts and public input is included in **Appendix C**.

This "Word Cloud" shows the words that were most frequently included in public comments. Words that occurred more frequently are given greater prominence.

2. Purpose and Need

A critical part of the Alternatives Analysis process is the development of a Purpose and Need statement and articulation of goals and objectives of the project. The Purpose and Need statement is a key factor in determining the range of promising alternatives and to guide the development of criteria for evaluating the alternatives. This chapter documents the project Purpose and Need, transportation problem statements, goals, and project objectives which were developed during a workshop with the TAC and were refined based on input from the public.

Purpose Statement

The purpose of the project is to implement multimodal transportation improvements that enhance mobility and safety along the Harmony Road Corridor. Improvements will support local and regional travel needs, land uses, economic health and environmental stewardship goals.

Problem Statements and Travel Needs

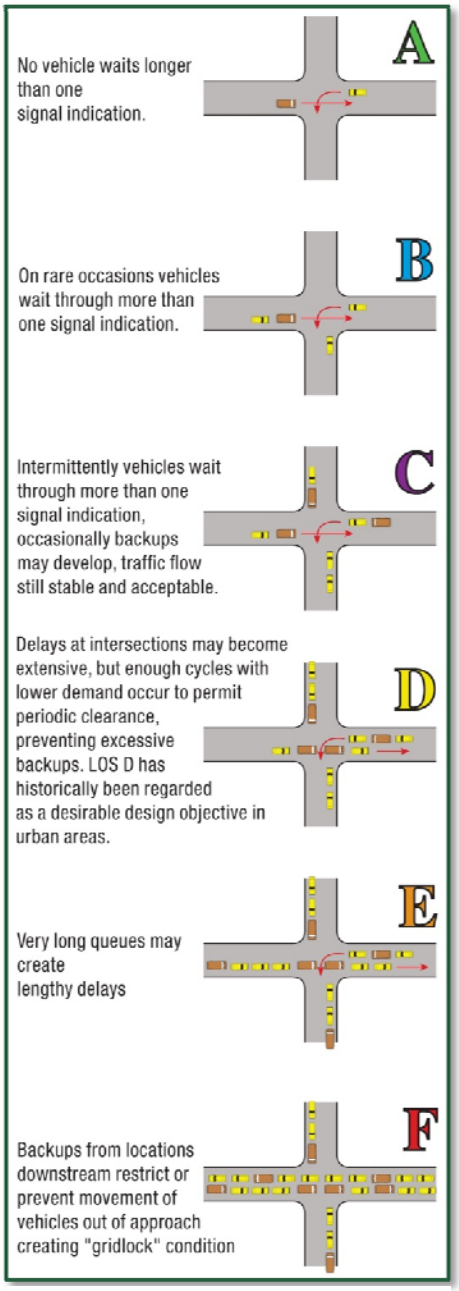
The following sections summarize the identified transportation problems followed by the existing and future travel needs by travel mode: roadway, transit, bicycle and pedestrian. A detailed description and analysis of the existing conditions is included in **Appendix A**, the land use and demographic profile is included in **Appendix D**, and the transportation analysis is included in **Appendix E**.

Roadway

Problem Statements:

- Travel demand and traffic congestion along the corridor is expected to increase due to growth in population and employment along Harmony Road and the surrounding area and will result in additional pressure on the transportation infrastructure
- Harmony Road has the two intersections with the highest crash totals in the City

Harmony Road is one of the primary gateways into the City of Fort Collins. Harmony Road travels east/west through southern Fort Collins from Horsetooth Reservoir to I-25, through the Town of Timnath, and into Weld County. Within the project limits of the Harmony Road ETC (Shields Street to I-25), the City's *Master Street Plan* identifies Harmony Road as a six-lane major arterial between College Avenue (US 287) and I-25, and as a four-lane arterial to the west of College Avenue.

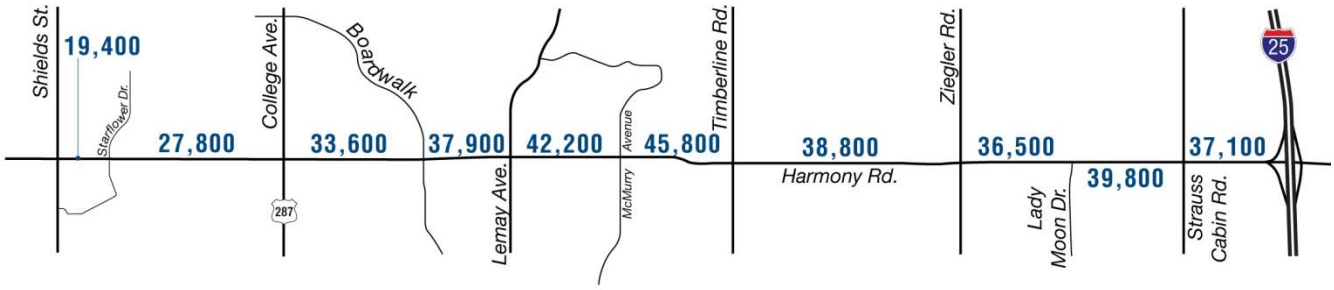


Traffic operations Level of Service (LOS Categories)

Existing Traffic Operations

The existing daily traffic volumes along Harmony Road (shown on **Figure 3**) range from approximately 19,400 vehicles per day (vpd) on the west end of the corridor near Starflower Drive to 45,800 vpd just west of Timberline Road. Traffic volumes near I-25 are approximately 37,100 vpd. The majority of the signalized intersections along the corridor operate at LOS D or better during the PM Peak hour. The only exceptions are the intersections with South College Avenue and Timberline Road, which currently operate at LOS E during the PM peak hour.

Figure 3. Existing Daily Traffic Volumes



Crash History

The top two intersections with the highest crash totals in the City (2007 – 2010) are the Harmony Road intersections at Timberline Road and at Lemay Avenue. Based on a review of the top 50 intersections for overall crash totals, there are seven intersections along Harmony Road that fall within the top 50.

Crash data were collected for the five-year period from January 2007 through December 2011. During that time, there were a total of 1,679 reported crashes at the intersections along Harmony Road and 122 mid-block crashes between Shields Street and Lady Moon Drive. There were three fatal crashes along the corridor during the five-year study period. Two were front to side crashes; one occurred at Lady Moon Drive and the other at Snow Mesa Drive. The other fatal crash occurred at Stover Street and involved a pedestrian.

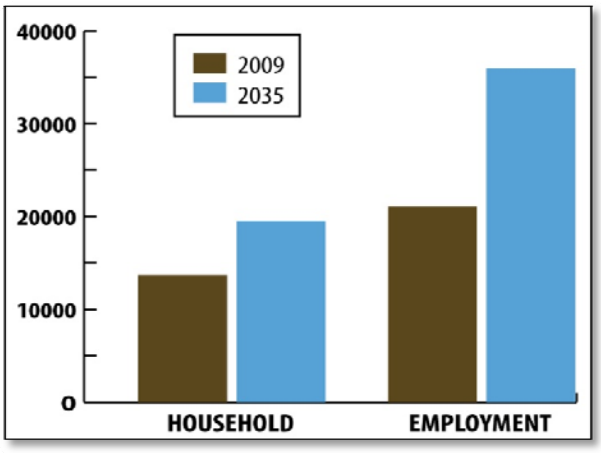
Overall, the proportion of injury / fatal crashes along Harmony Road (compared to property damage only crashes) is generally better than expected when compared to similar arterial facilities. On most four or six lane arterials, the injury / fatal percent of total is 30 percent on average. There are two intersections (Snow Mesa Drive and Crest Road) and one segment (McMurry Avenue to Timberline Road) above that threshold. The frequency of rear-end crashes is higher than normal throughout the corridor as a result of congestion.

The frequency of bicycle related crashes is higher than normal at the Shields Street intersection. However, overall, the corridor has a very low occurrence of pedestrian crashes (0.3%) and bike crashes (1.2%), which is likely in part because of the relatively lower number of bicycle and pedestrian users on the corridor. These totals are both better than expected for a four or six lane arterial which typically have bike and pedestrian crash proportions around 1.5 percent.

Land Use and Travel Demand Growth

Between 2009 and 2035, the Harmony Road study area (which includes a one-mile buffer around the corridor) is expected to see a 42 percent increase in households and a 71 percent increase in employment. These growth rates are generally in line with the remainder of Fort Collins. The highest concentration of household growth is expected to occur in the eastern section of the corridor, in the currently undeveloped land south of Harmony

Road between Ziegler Road and Strauss Cabin Road. Notable household growth is also expected in the northwest quadrant of Harmony Road and Ziegler Road and just west of the Harmony Road ETC, between Shields Street and Taft Hill Road. High concentrations of employment growth are also expected in the eastern section of the corridor in the undeveloped land south of Harmony Road, as well as in the vicinity of College Avenue.



Residential growth within the Harmony Road study area is expected to increase 42 percent, and employment is expected to increase 71 percent.

The western portion of the corridor (Shields Street to College Avenue) is projected to experience an approximate 10,000 vehicle per day (vpd) increase in traffic, with 2035 forecasts in the 30,000 to 35,000 vpd range. Forecasts in the central portion of the corridor (College Avenue to Ziegler Road) are in the range of 39,000 to 54,000 vehicles per day (vpd) through most of the segment. The eastern segment of the corridor (Ziegler Road to I-25) is expected to have the greatest increase in travel demand with forecasts ranging from 55,000 to 63,000 vpd (approximately 50 percent higher than existing).

In 2035, nearly the entire corridor is projected to be congested, even with the recent completion of the six-lane widening project between Boardwalk Drive and Timberline Road. Most of the study area intersections are projected to operate at LOS E or F during the PM peak hour in 2035 if no additional improvements are made.

Transit

Problem Statements:

- The transit routes along Harmony Road are discontinuous, making transit travel along Harmony Road and to key activity centers throughout Fort Collins inefficient and inconvenient
- The existing Harmony Road cross-section does not accommodate potential mixed-use and transit-oriented development
- Today's transportation network does not provide sufficient connections between modes (e.g., transit to pedestrian) nor between each mode and the destinations along the corridor (e.g., pedestrian connections to commercial areas)
- Today's transportation network does not fully meet Fort Collins' sustainability goals

Existing Service and Ridership

Transfort currently has three routes that provide service along Harmony Road: Routes 1, 16 and 17. Routes 1 and 17 are primarily north/south oriented except for the portion of the route serving the Harmony Road area. Route 16 generally runs east/west between the Mall Transfer Point (MTP) and Fossil Ridge High School, southeast of Harmony and Ziegler Roads. Route 19 and the regional route FLEX provide north/south connections from the corridor but no service along the corridor. Existing weekday ridership on Harmony Road is served primarily by Route 16 which serves

A typical Transfort bus stop along Harmony Road

approximately 260 riders per day. In addition, Routes 1, 17, and 19 provide north-south service through Fort Collins with service to destinations on Harmony Road. As illustrated on **Figure 4**, there is currently no bus to the Harmony Transfer Center, and traveling the length of the Harmony Road ETC would require transferring.

As can be seen on **Figure 4**, the highest concentration of transit boardings/alightings in the corridor is in the vicinity of Harmony Road/Shields Street at the Front Range Community College. Other stops with relatively high numbers of boardings/alightings include the stops east of Timberline Road, near John F. Kennedy Parkway, and in the vicinity of Ziegler Road near the major employment centers (Hewlett Packard and Intel Corporation).

Future Ridership

Based on the fiscally-committed transit system included in the *Transfort Strategic Operating Plan* (including MAX, general realignment of the transit system around the South Transit Center, and route extensions around the University of Colorado Health Harmony Campus), it is forecast that approximately 650 riders per day would board along the Harmony Road corridor in 2035. These findings suggest a 250 percent increase in transit ridership over existing conditions.

Challenges for Transit Service

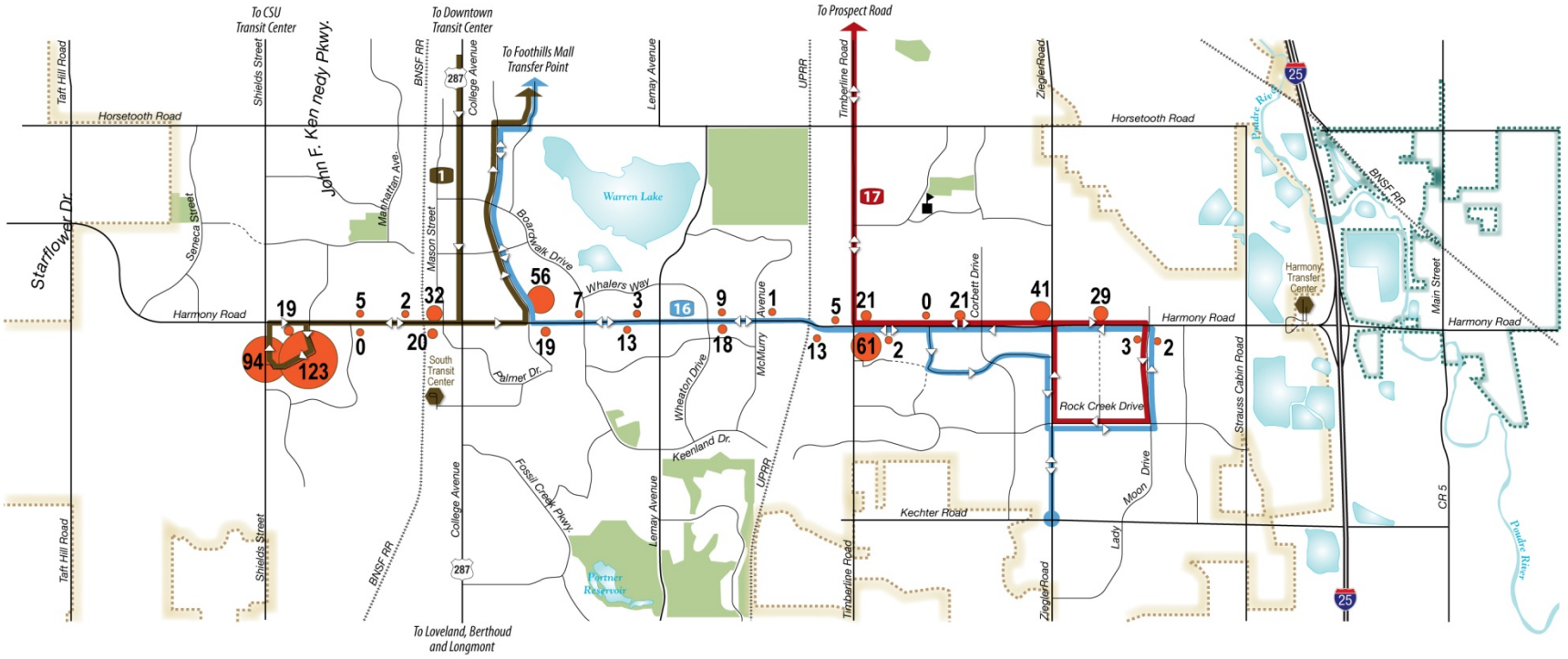
The design of much of Harmony Road makes providing safe, convenient and efficient transit service difficult for Transfort and less appealing for users and potential users. These challenges include physical impediments such as:

- Drainage ditches located directly adjacent to the roadway along much of the corridor
- Long distances between signalized intersections
- Wide right-of-way to cross (six travel lanes with deceleration/acceleration lanes and bike lanes in most locations)
- Lack of sidewalk connections in some locations
- Lack of convenient sidewalk connections to amenities along the corridor (80’ setbacks)
- Lack of curb and gutter infrastructure along most of the corridor

These physical barriers limit where transit stops are located throughout the corridor and can discourage potential riders from trying transit service.

Concrete-lined drainage ditch creates a barrier for transit rides.

Figure 4. Transit Boardings and Alightings



SOURCES: Transfort, 2012, February 2012 Ridership Survey

Bicycle

Problem Statements:

- Traveling by bicycle along Harmony Road is uncomfortable because Harmony is a high-volume, high-speed corridor
- Today's transportation network does not fully meet Fort Collins' sustainability goals

Fort Collins has an extensive bicycle network composed of on-street bike lanes, designated bike routes, and multi-use trails. Harmony Road has six- to ten-foot bike lanes on both sides of the street from I-25 through the Shields Street intersection.

The full length of the Harmony Road ETC currently provides a bicycle level of service of A or B, and this LOS is expected to remain even with the increased traffic volumes associated with the 2035 No Action scenario. Bicycle intersection LOS for movements along Harmony Road (in the east-west direction) are LOS A or B, with the exception of the crossing of College Avenue, which is LOS C. Bicycle intersection LOS for movements crossing Harmony Road (in the north-south direction) range from A to C, except at the College Avenue intersection where the bicycle LOS is D.

Bicycle segment Level of Service (LOS) represents a measure of how comfortable a bicyclists within a variety of skill levels would be when using the facility. Bicycle intersection LOS represents the perceived hazard of the shared roadway environment through the intersection.

Although bike lanes are provided along the entire length of the study corridor, and the bicycle levels of service are good, bicycle counts indicate low levels of biking activity in the corridor. The low bicycle counts may be an indication that the perceived safety of bicycling along Harmony Road is not consistent with the calculated LOS. There is a need to encourage bicycle travel along the corridor to provide a more balanced multimodal corridor.

Pedestrian

Problem Statements:

- Harmony Road traffic signals (and pedestrian crossings) are typically spaced at half-mile intervals which require long, sometimes out-of-direction travel for pedestrians crossing Harmony Road
- Today's transportation network does not provide sufficient connections between modes nor between each mode and the destinations along the corridor
- Harmony Road is a wide corridor with few dedicated, safe pedestrian crossing points
- Today's transportation network does not fully meet Fort Collins' sustainability goals

Sidewalks along Harmony Road have been built as development has occurred. In general, the sidewalks conform to the urban design character recommended in the *Harmony Corridor Plan*: wide setbacks with naturalistic berming, and a meandering eight-foot sidewalk. Sidewalks currently exist along the vast majority of the corridor,

and all but a few sections of the sidewalk are detached from the roadway. There are, however, a few sections of the corridor that lack sidewalks, most notably between Ziegler Road and Strauss Cabin Road. Pedestrian counts indicate low levels of walking activity in the corridor, despite the presence of sidewalks along the majority of the corridor.

Pedestrian segment LOS can be quantified to reflect the comfort experienced by pedestrians. Pedestrian LOS at intersections is based on the delay incurred by pedestrians the pedestrians' exposure to and interaction with turning vehicles.

The existing pedestrian segment levels of service along Harmony Road range from A to F; LOS A, B, or C is typically observed where the sidewalk is substantially separated from the vehicular traffic, providing a more comfortable environment for pedestrians. LOS D is observed where the sidewalk is attached to the roadway, and LOS E or F is observed where the sidewalk is missing. All crossings of Harmony Road are currently at LOS C or D, while the pedestrian LOS for crossing the side streets ranges from A to D. With the increased traffic volumes associated with the 2035 No Action scenario, the pedestrian segment levels of service are generally expected to degrade by one LOS (e.g., from LOS E to LOS F).

Wide meandering sidewalks exist along much of Harmony Road.

In many ways Harmony Road provides a sheltered, pleasant walking experience because of the naturalistic berming, abundant landscaping and wide setbacks. However, the corridor also requires pedestrians to walk long distances out of their way and across a large, busy road in the process. In addition, connections to corridor land uses are not ideal.

This photo illustrates large setback adjacent to Harmony Road and an example of a concrete lined ditch that separates the roadway from the corridor land uses.

Challenges for Pedestrians

Even with sidewalks provided throughout most of the corridor, pedestrian connections are often inconvenient, inaccessible and even lack safety considerations for pedestrian users. Some of the challenges pedestrians face throughout the corridor include:

- Indirect pedestrian connections to destinations (e.g., connections ending at the back of buildings and lack of desirable visual connection between the corridor and the surrounding land uses)
- Limited and long distances between signalized street crossings, encouraging jay-walking across Harmony Road
- Large 80' setback from Harmony Road and adjacent uses
- Large Harmony Road right-of-way for pedestrians to cross comfortably
- Drainage ditches located between the detached sidewalks and street, limiting the available location of bus stops

Goals and Objectives

The project goals listed below reflect the need to address four transportation problem areas (multimodal mobility, accessibility, safety, and sustainability) and are consistent with the City of Fort Collins' vision for the future. The objectives provide guidance for attaining each goal and reflect the expected results to be achieved during the planning horizon of the project. The goals and objectives are the foundation for the evaluation criteria.

Goal #1: Improve Multimodal Mobility

Objectives:

- Provide comfortable and convenient multimodal travel options that include auto, transit, walking and bicycling
- Provide a transportation system that supports existing and planned land uses, including future mixed-use and transit-oriented development
- Provide multimodal connections to the City's system of Enhanced Travel Corridors and Regionally Significant Corridors
- Help accommodate future travel demand by increasing bicycle, pedestrian and public transportation's share of trips

Goal #2: Enhance Accessibility

Objectives:

- Improve connectivity among various travel modes along and across the corridor
- Enhance transit, pedestrian and bicycle connections to existing and future land uses
- Provide a multimodal system that is accessible to all abilities and a broad demographic

Goal #3: Improve Safety

Objectives:

- Improve multimodal travel safety along and across the corridor
- Increase opportunities for pedestrians to safely cross Harmony Road

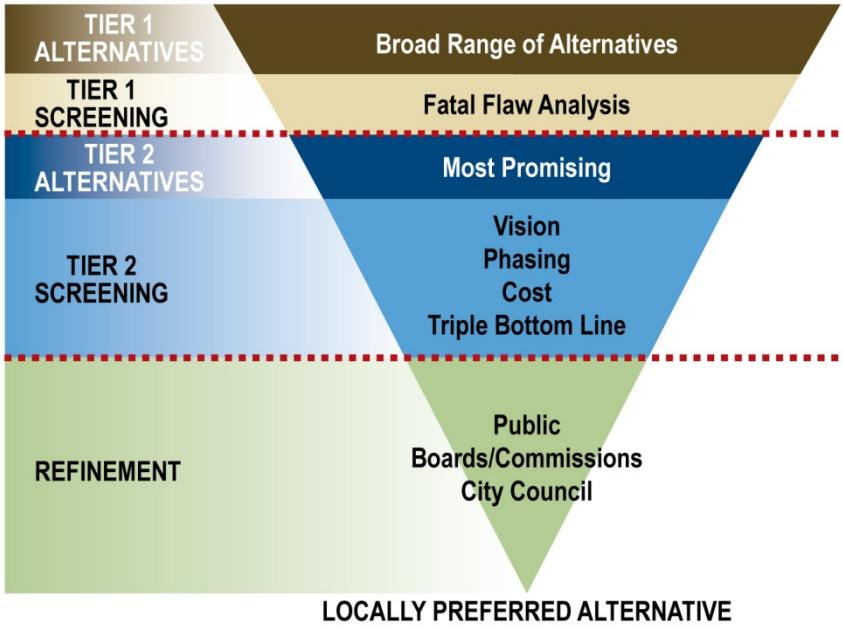
Goal #4: Integrate Sustainability

Objectives:

- Increase the use of environmentally friendly transportation options
- Implement affordable and cost-effective transportation solutions
- Implement a solution that complements the larger transportation system
- Provide a system that supports planned land uses and economic vitality

3. Alternatives Development and Evaluation

The development and evaluation of alternative improvements consisted of a two-tier process that began with a broad range of potentially promising cross-sectional elements for each corridor travel mode (roadway, transit, bicycle, and pedestrian). The fundamental philosophy in the screening process was to systematically identify the positive and negative characteristics and tradeoffs among alternatives resulting ultimately in a Locally Preferred Alternative (LPA).



In the Tier 1 evaluation and screening process, the alternatives were evaluated at a high level for fatal flaws and their ability to address the Purpose and Need. The cross-sectional elements were combined to develop Tier 2 corridor alternatives. The Tier 2 evaluation process involved a detailed and quantitative comparison between corridor alternatives and against the No Action Alternative based on the forecasted conditions in 2035. Inter-departmental and agency coordination, as well as public involvement, played a major role in this process. The Technical Advisory Committee (TAC) was involved in each step of the evaluation process, as well as during the development and refinement of the LPA. This chapter summarizes the evaluation processes and the key findings of the Tier 1 and Tier 2 evaluation. More detailed information pertaining to the evaluation process is provided in the appendices, as noted below:

- **Appendix C** summarizes the public input received throughout the study
- **Appendix D** provides more detailed transportation analysis completed in support of the alternatives development and evaluation process
- **Appendix F** describes the environmental resources inventory and evaluation
- **Appendix G** documents the Tier 1 and Tier 2 evaluation results in a matrix format

Evaluation Criteria

Criteria for developing and evaluating alternatives were established to respond directly to the project's Purpose and Need and its goals and objectives. The evaluation criteria used in the Tier 1 and Tier 2 screening are shown in **Table 1**. The criteria were developed to be appropriate for the evaluation level being conducted and the alternatives being considered. The criteria and corresponding measures used in Tier 1 were primarily qualitative in nature. The Tier 2 evaluation criteria were focused on those measures that could best be used to differentiate the corridor alternatives and facilitate the selection of the LPA. The responsiveness of each alternative to the criteria determined whether or not the alternative was reasonable and if it should be advanced for further evaluation.

Table 1. Evaluation Criteria

Objectives	Evaluation Criteria	Tier 1	Tier 2
Develop improvements that reflect stakeholder desires.	Level of support received through public outreach process	✓	✓
Goal #1: Improve Multimodal Mobility			
Provide comfortable and convenient multimodal travel options that include auto, transit, walking and bicycling. *Provide a transportation system that supports existing and planned land uses, including future mixed-use and transit-oriented development.* *Help accommodate future travel demand by increasing bicycle, pedestrian and public transportation's share of trips.*	Auto comfort and convenience	✓	
	Traffic operations		✓
	Transit comfort and convenience	✓	
	Transit ridership		✓
	Pedestrian comfort and convenience	✓	✓
	Bicycling comfort and convenience	✓	✓
	Balance multimodal needs	✓	
	Support future TOD and mixed use	✓	
Provide multimodal connections to the City's system of Enhanced Travel Corridors and Regionally Significant Corridors.	Multimodal connections to transit centers/ETCs	✓	
	Auto access to I-25	✓	
Goal #2: Enhance Accessibility			
Improve connectivity among various travel modes along and across the corridor.	Ease of bicycle/pedestrian crossing	✓	
Enhance transit, pedestrian and bicycle connections to existing and future land uses.	Quality of transit service		✓
Provide a multimodal system that is accessible to all abilities and a broad demographic.	Accommodate a variety of bicycle and pedestrian user types and abilities		✓
Goal #3: Improve Safety			
Improve multimodal travel safety along and across the corridor. *Increase opportunities for pedestrians to safely cross Harmony Road.*	Improve safety at high crash locations	✓	
	Potential crash reduction benefits (based on crash modification factors)		✓
	Buffer between vehicular traffic and bicyclists	✓	

Objectives	Evaluation Criteria	Tier 1	Tier 2
	Bicycle and pedestrian safety		✓
Goal #4: Integrate Sustainability			
Increase the use of environmentally friendly transportation options.	Potential ROW impacts	✓	✓
	Potential environmental resources impacts	✓	✓
	Drainage/impervious surface area	✓	✓
	Mode shift potential		✓
Implement affordable and cost-effective transportation solutions.	Consistent with potential demand	✓	
	Cost		✓
Implement a solution that complements the larger transportation system.	Conformance with Transportation Master Plan (TMP)	✓	
Provide a system that supports planned land uses and economic vitality.	Consistent with land use plans/zoning	✓	

No Action Alternative

The 2035 No Action transportation network includes those improvement projects which are expected to be funded by 2035. These transportation projects would be built regardless of any other improvements that are identified as part of the Harmony Road Alternatives Analysis. The No Action Alternative does not address the purpose and need but has been carried through the analysis for comparison.

Roadway

Planned Roadway Projects

Along Harmony Road, the No Action roadway network includes the recently completed widening project (Timberline Road to Boardwalk Drive). The No Action alternative also includes three widening projects in close proximity to the Harmony Road ETC:

- The Town of Timnath's Harmony Road widening project (four lane widening from CR 3 to CR 5)
- College Avenue widening to six lanes from Harmony Road to Carpenter Road
- Timberline Road widening to six lanes from Vine Drive to Harmony Road

Travel Demand Forecasts

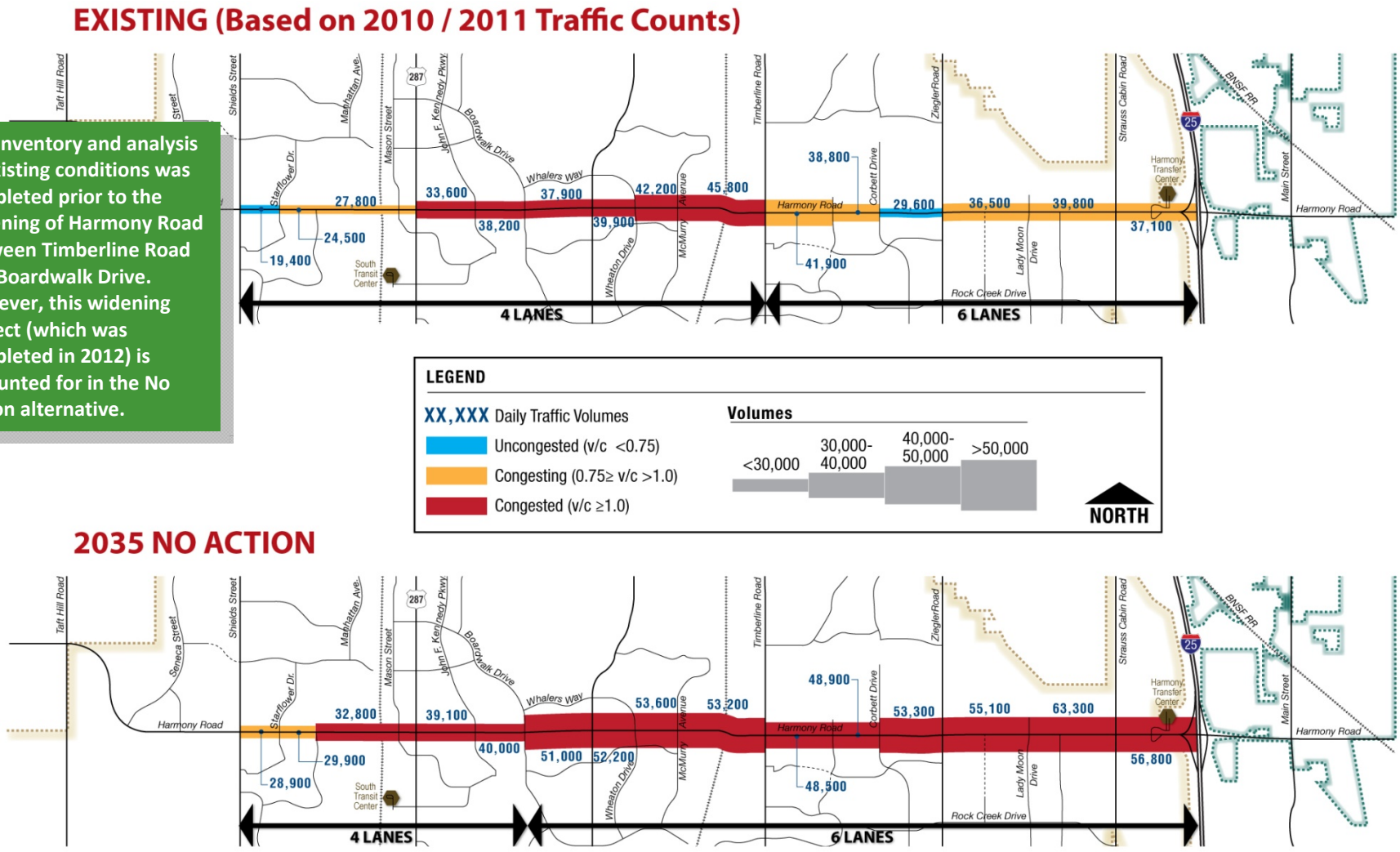
The analysis of future travel demands along the Harmony Road is based on the NFRMPO's 2035 travel demand model, as modified by the City of Fort Collins for the development of the 2011 *Transportation Master Plan* to represent the City's 2035 Fiscally Constrained transportation network. The household and employment forecasts described in **Appendix D** were used as input in the travel demand model.

A comparison of the existing and future (2035 No Action) daily traffic forecasts is presented on **Figure 5**. The western portion of the corridor (Shields Street to College Avenue) is projected to experience an approximate 5,000 to 10,000 vehicle per day (vpd) increase in traffic, with 2035 forecasts in the 30,000 to 35,000 vpd range. Forecasts in the central portion of the corridor (College Avenue to Ziegler Road) are in the range of 35,000 to 54,000 vehicles per day (vpd) through most of the segment. The eastern segment of the corridor (Ziegler Road to I-25) is expected to have the greatest increase in travel demand with forecasts ranging from 55,000 to 63,000 vpd (approximately 50 percent higher than existing).

Volume to capacity (v/c) ratios compare the capacity of a street to the volume of traffic that it carries or is projected to carry in the future. A planning level capacity of 8,000 vehicles per day per lane was used to estimate and compare the level of congestion today and in the future. **Figure 5** shows those segments of the corridor that are uncongested (v/c ratio less than 0.75), congesting (v/c ratio between 0.75 and 1.0), and congested (v/c ratio greater than 1.0) today and in the future. Based on this planning level analysis, congestion is currently experienced between College Avenue and Timberline Road, with most of the remainder of the corridor "congesting." In 2035, nearly the entire corridor is projected to be congested in the No Action scenario, even with the recently completed six-lane widening project between Boardwalk Drive and Timberline Road.

Figure 5. Traffic Forecasts and V/C Ratios (Existing and 2035 No Action)

The inventory and analysis of existing conditions was completed prior to the widening of Harmony Road between Timberline Road and Boardwalk Drive. However, this widening project (which was completed in 2012) is accounted for in the No Action alternative.



Transit

Planned Transit Projects

The No Action transit network includes the transit operational improvements recommended in the *Transfort Strategic Operating Plan* (August 2009). Key aspects of this plan include the construction of the Mason Corridor Bus Rapid Transit (BRT), construction of a new South Transit Center southwest of Harmony Road and College Avenue, and general realignment of the transit system around this new transit center that is designed to provide better service to areas of demand in 2035. Along Harmony Road, it includes route extensions around the University of Colorado Health Harmony Campus. Additionally, the No Action Alternative includes the capital cost associated with the recommendations in the North I-25 EIS Record of Decision, which includes Express Bus service along I-25 connecting Fort Collins to other Front Range destinations, including Loveland and Denver.

The Mason Corridor is currently under construction. The corridor includes MAX BRT service and improved non-motorized facilities and is scheduled to be completed in 2014. The new BRT service will run north/south adjacent to Mason Street and the BNSF Railroad, both of which parallel College Avenue. It will provide a connection between the Downtown Transit Center and the new South Transit Center (STC), which is located to the south of the Mason Street and Harmony Road intersection. This bus service, when combined with the shared-use trail along Mason Street, will improve access to the corridor. MAX will link major destinations and activity centers along the corridor including Downtown commercial, Colorado State University, Foothills Mall, and South College retail areas. It is expected to operate nearly twice as fast as auto travel along College Avenue and provide high frequency service every 10 minutes.

MAX BRT service is scheduled to commence in May 2014.

Transit Ridership Forecasts

Based on transit system changes included in the *Transfort Strategic Operating Plan*, transit ridership forecasts for the 2035 No Action have been developed. In 2012, there were approximately 260 boardings per day along the Harmony Road corridor on Route 16. It is forecast that approximately 650 riders per day would board along the Harmony Road corridor in the 2035 No Action scenario, a 250 percent increase in transit ridership over existing conditions.

Bicycle and Pedestrian

As described in Chapter 2, the bicycle and pedestrian segment LOS are impacted by the level of traffic on the adjacent roadway. The forecasted increase in traffic volumes in 2035 would result in some reduction in pedestrian LOS along the corridor. In general, the pedestrian LOS would be reduced by one level of service (e.g., from LOS C to LOS D) in the 2035 No Action scenario in comparison to the current LOS (as documented in **Appendix A**). Where new sidewalk was recently constructed between Timberline Road and the UP Railroad with the widening project, the future pedestrian LOS will improve to D (currently LOS F). The bicycle LOS methodology application along Harmony Road is less sensitive to increases in traffic volumes. The 2035 No Action bicycle LOS are expected to remain in line with current conditions (LOS A and B). However, the existing low mode split for bicyclists and pedestrians (compared to other corridors in Fort Collins) would likely be further decrease in the future if no improvements were made to the corridor.

Tier 1 Alternatives Development

The alternatives development process began with the development of 18 corridor-wide elements. As shown in **Table 2**, these elements included a broad range of improvements by travel mode (roadway, transit, bicycle, and pedestrian) that were identified to potentially address the project needs. Given that no single element would address all of the project needs as a stand-alone improvement, the intent of identifying these Tier 1 elements by mode was to combine elements together as part of packaged alternatives.

Table 2. Tier 1 Modal Elements

Travel Mode	Element
Roadway 	2 General Purpose Lanes per direction
	3 General Purpose Lanes per direction
	4 General Purpose Lanes per direction
	High Occupancy Vehicle (HOV) Lanes
Transit 	Local Bus in Mixed Traffic
	Enhanced Bus with Transit Priority Treatments (queue jumps and/or transit signal priority)
	Curbside Bus Rapid Transit (BRT)
	Median BRT
	Light Rail/Streetcar
Bicycle 	Bike Lanes (shoulder)
	Buffered Bike Lanes
	Bike/Bus Lanes
	Shared Use Paths
	Cycle Tracks
	Back Street Bike Lanes
Pedestrian 	Curvilinear Detached Sidewalks
	Shared Use Paths
	Crossing Enhancements at Signalized Intersections
	Grade Separated Crossings

Tier 1 Evaluation and Screening Results

In the Tier 1 evaluation, these elements were first assessed independently on their ability to meet the Tier 1 evaluation criteria, as set forth in **Table 1**. The evaluation was qualitative in nature, using measures of "Poor," "Fair," "Good," and "Best." Those alternative elements that were deemed to meet the project Purpose and Need were advanced to a secondary evaluation within Tier 1 in which the modal elements were combined to develop conceptual cross-section alternatives.

The cross-section alternatives were then evaluated for each of three corridor segments using the Tier 1 evaluation criteria. The three corridor segments (as shown on **Figure 6**) were identified based on their unique travel characteristics, adjacent land uses and corridor constraints (such as right of way). Evaluating the cross-section alternatives separately by segment facilitated advancing only those elements and cross-sections that are most appropriate and beneficial in each of the three segments. **Table 3** summarizes the modal elements eliminated through the Tier 1 evaluation and screening process. While most of the elements listed were eliminated for all three segments of the corridor, there are two notable exceptions. Widening to six lanes was eliminated only in the west segment (Shields Street to College Avenue), and bike lanes (as an element of a build alternative) were eliminated only in the central and east segments (College Avenue to I-25). The bike lanes have been retained as part of the No Action Alternative for comparison purposes.

Figure 6. Harmony Corridor Segment Characteristics

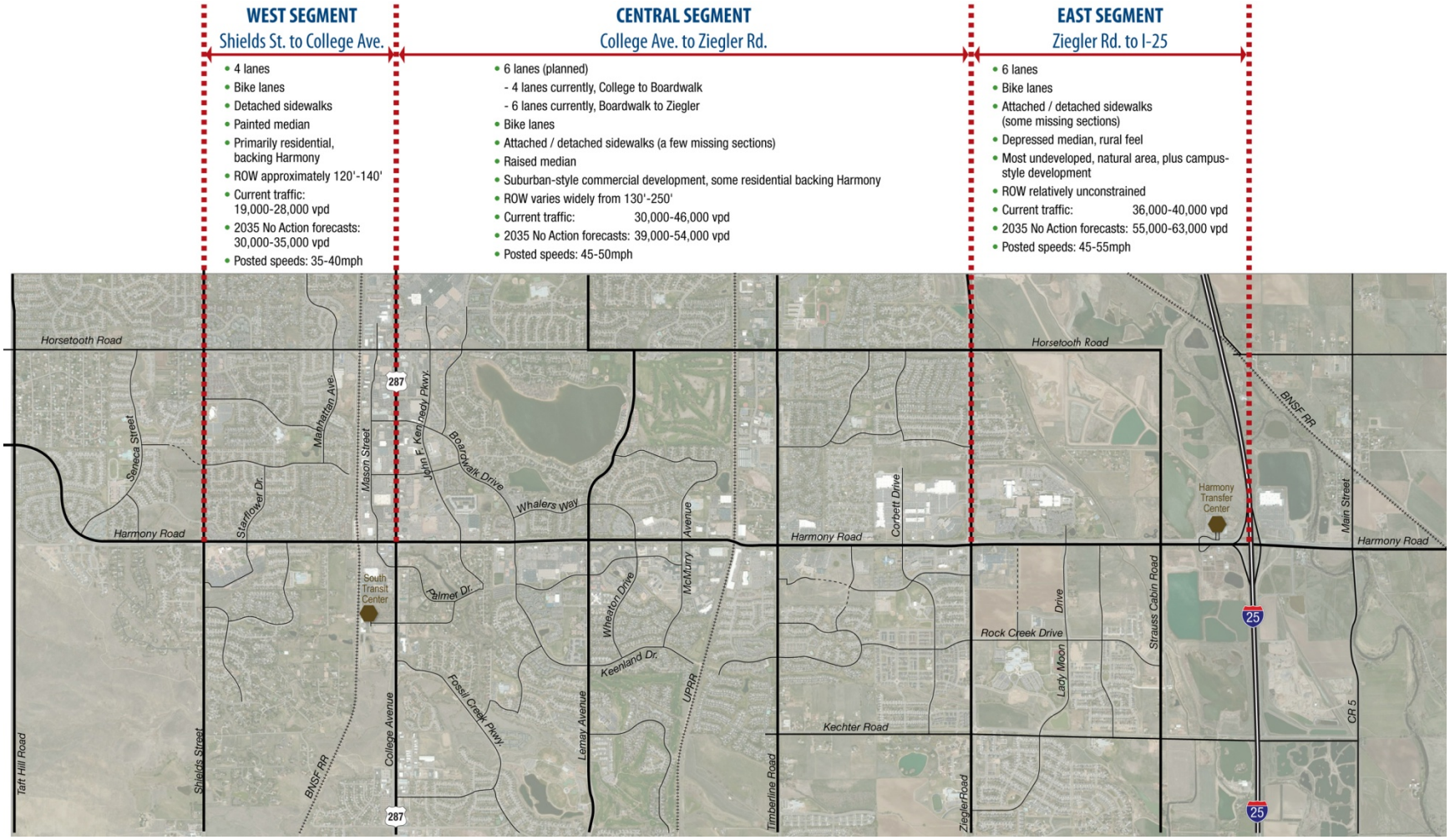


Table 3. Summary of Elements Eliminated in Tier 1

Travel Mode	Element	Example	Segment(s) in which Element was Eliminated	Primary Reason(s) for Elimination
Roadway/ Transit	Major Widening (6 lanes)		West	Considerable ROW impacts; would make Harmony more difficult to cross; therefore, less accommodating of bicycle and pedestrian modes
Roadway/ Transit	Major Widening (8 Lanes)		West, Central, East	Considerable ROW impacts; would make Harmony more difficult to cross; therefore, less accommodating of bicycle and pedestrian modes
Transit	Light Rail		West, Central, East	Prohibitive cost; inconsistent with potential demands; limited operational and implementation flexibility
Transit	Streetcar		West, Central, East	Prohibitive cost; inconsistent with potential demands; limited operational and implementation flexibility
Transit	Median BRT		West, Central, East	Higher cost compared to other alternatives; would limit opportunities for landscaping in median which is highly desired by the community
Transit	Bus only Lane		West, Central, East	Would be detrimental to traffic operations
Transit/ Bicycle	Shared Bus/ Bike Lane		West, Central, East	Would not address the need to separate the bicyclists from vehicular travel lanes
Bicycle	Bike Lane		Central, East	Does not address the need to provide comfortable and convenient multimodal travel options because of high speeds and traffic volumes (retained in No Action only)

Tier 2 Alternatives Development

The results of the Tier 1 evaluation process were presented to and discussed with the TAC, corridor stakeholder groups, and the public. After considering and reflecting upon the input received during this outreach effort, the Project Management Team discussed how to efficiently and effectively package the remaining cross-section alternatives for the more detailed analysis required in Tier 2. The Tier 2 Alternatives include improvements for all travel modes; however, because the transit elements are the key differentiators between the alternatives, the Tier 2 Alternatives are titled based on the transit service, as shown in **Table 4**.

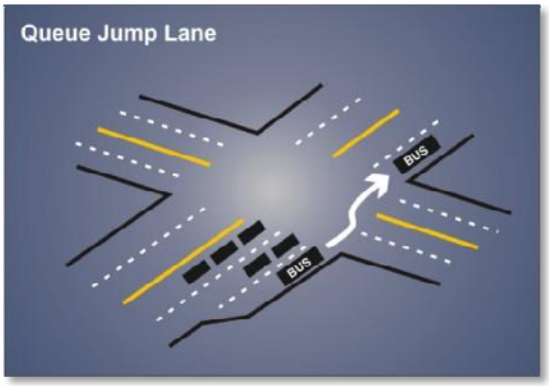
As described previously, the **No Action Alternative** includes only those improvements that are fiscally constrained. Along Harmony Road, the No Action improvements include fiscally-committed transit service modifications and widening of College Avenue and Timberline Road through their intersections with Harmony Road.

The **Transportation System Management (TSM) Alternative** consists of lower-cost alternatives that would still produce meaningful operational improvements. The local bus service along Harmony Road would be expanded to provide continuous service along the full length of the corridor. The TSM Alternative includes widening the section of Harmony Road between College Avenue and Boardwalk Drive to six lanes. To address the operational deficiencies in the No Action Alternative, four intersections along the corridor have been identified for capacity improvements:

- Harmony Road/Boardwalk Drive
- Harmony Road/Timberline Road
- Harmony Road/Ziegler Road
- Harmony Road/Lady Moon Drive

For the purpose of the Tier 2 evaluation, specific intersection improvements (turn lane additions and channelization) were identified to provide a minimum 2035 PM peak hour level of service (LOS) of E. These intersection improvements, as well as the widening of Harmony Road (College to Boardwalk), were applied to all build alternatives for consistency.

The **Enhanced Bus Alternative** would provide high-quality, high-frequency bus service operating in mixed-traffic with queue jumps at select intersections. A queue jump is a special priority lane at an intersection approach that allows transit vehicles to bypass queued vehicles. A new Harmony Enhanced Bus route would be developed that would operate from Harmony Transfer Center (HTC) to Front Range Community College (FRCC).



There are two alternatives that would provide high-quality, high-frequency Bus Rapid Transit (BRT) service. The BRT service would be provided in a curbside lane that is dedicated for use by buses and High Occupancy Vehicles (HOV). In these alternatives, the BRT/HOV lane would use the existing outside lane in both travel directions. Therefore, Single Occupancy Vehicles (SOV) would be limited to using of the inside lane in each direction between Shields Street and College Avenue and the two inside lanes in each direction between College Avenue and I-25. There are two variations of transit service for this alternative. The **End-to-End BRT/HOV Alternative** includes BRT service along the full length of the Harmony Corridor, and for trips to/from downtown, passengers would transfer to MAX. The **Interlined BRT/HOV Alternative** involves interlining the

Harmony Road BRT service with MAX; resulting in a one-seat ride from any station along Harmony Road to the Downtown Transit Center.

The bicycle and pedestrian elements that were retained from the Tier 1 screening could be paired with any of the four Tier 2 build alternatives. Therefore, the bicycle and pedestrian options (as listed in **Table 4**) were evaluated independently.

Table 4. Tier 2 Alternatives[1]

Alternative	Roadway Infrastructure	Transit Infrastructure on Harmony	Transit Service on Harmony	Bicycle and Pedestrian Accommodation
No Action	Existing	Existing	Committed FY14 Transfort service modifications	Existing
Transportation System Management (TSM)	Widen Harmony (Boardwalk to College) to 6 Lanes; intersection improvements	Existing	Expanded Local Bus service (Phase 1 of *Transfort Strategic Operating Plan*) Front Range Community College (FRCC) to Harmony Transfer Center (HTC)	<u>Options[2]:</u> ▸ Bike lanes + detached sidewalks (West Segment only) ▸ Buffered bike lanes + detached sidewalks ▸ Cycle tracks + detached sidewalks ▸ Shared use paths
Enhanced Bus	*Same as TSM*	Queue jumps at major intersections	Enhanced bus service (FRCC to HTC); increased frequency	
End-to-End BRT/HOV	*Same as TSM*	Outside lanes for bus/HOV (one in each direction)	BRT service (FRCC to HTC); increased frequency	
Interlined BRT/HOV	*Same as TSM*	Outside lanes for bus/HOV (one in each direction)	BRT service interlined with MAX; increased frequency	

1 All alternatives include: MAX BRT, College widening to 6 lanes south of Harmony, Timberline widening to 6 lanes north of Harmony (including through the Harmony Road intersection).

2 Back street bike lanes, pedestrian intersection crossing improvements, and grade separated pedestrian crossings were deemed to be needed and appropriate for all build alternatives; definition of these improvements was deferred to the LPA refinement process.

Tier 2 Evaluation and Screening Results

In the Tier 2 evaluation process, the alternatives were evaluated against the evaluation criteria that were developed based on the goals and objectives and Purpose and Need as previously summarized in **Table 1**. The Tier 2 evaluation criteria include a combination of qualitative and quantitative evaluation criteria. While some of the Tier 1 evaluation criteria were used again in Tier 2, the Tier 2 evaluation considered the criteria in more detail than the Tier 1 screening.

The NFRMPO's 2035 travel demand model, as modified by the City of Fort Collins for the development of the 2011 *Transportation Master Plan* to represent the City's 2035 Fiscally Constrained transportation network, was used to estimate and compare travel demand and travel patterns for automobile and transit modes. The following sections summarize the key findings from the Tier 2 evaluation by travel mode. More detail about the transportation analysis is included in **Appendix E**, and the Tier 2 evaluation matrix is included in **Appendix G**.

Roadway

Traffic Forecasts

The forecasted 2035 daily traffic volumes for each of the Tier 2 alternatives are shown on **Figure 7** in comparison to the existing traffic volumes. The TSM, Enhanced Bus, and BRT/HOV Alternatives are expected to carry higher traffic volumes than the No Action Alternative between College Avenue and McMurry Avenue as a result of the increased capacity (six-lane widening from College to Boardwalk). The traffic forecasts on the remainder of the corridor are expected to remain approximately consistent with the 2035 No Action forecasts.

Traffic Operations

The outputs from the NFRMPO travel demand model were used to develop 2035 PM peak hour intersection turning movements which were then analyzed in Synchro to compare the intersection operations for the Tier 2 alternatives as summarized in **Figure 8**.

Figure 7. 2035 Traffic Forecasts for Tier 2 Alternatives

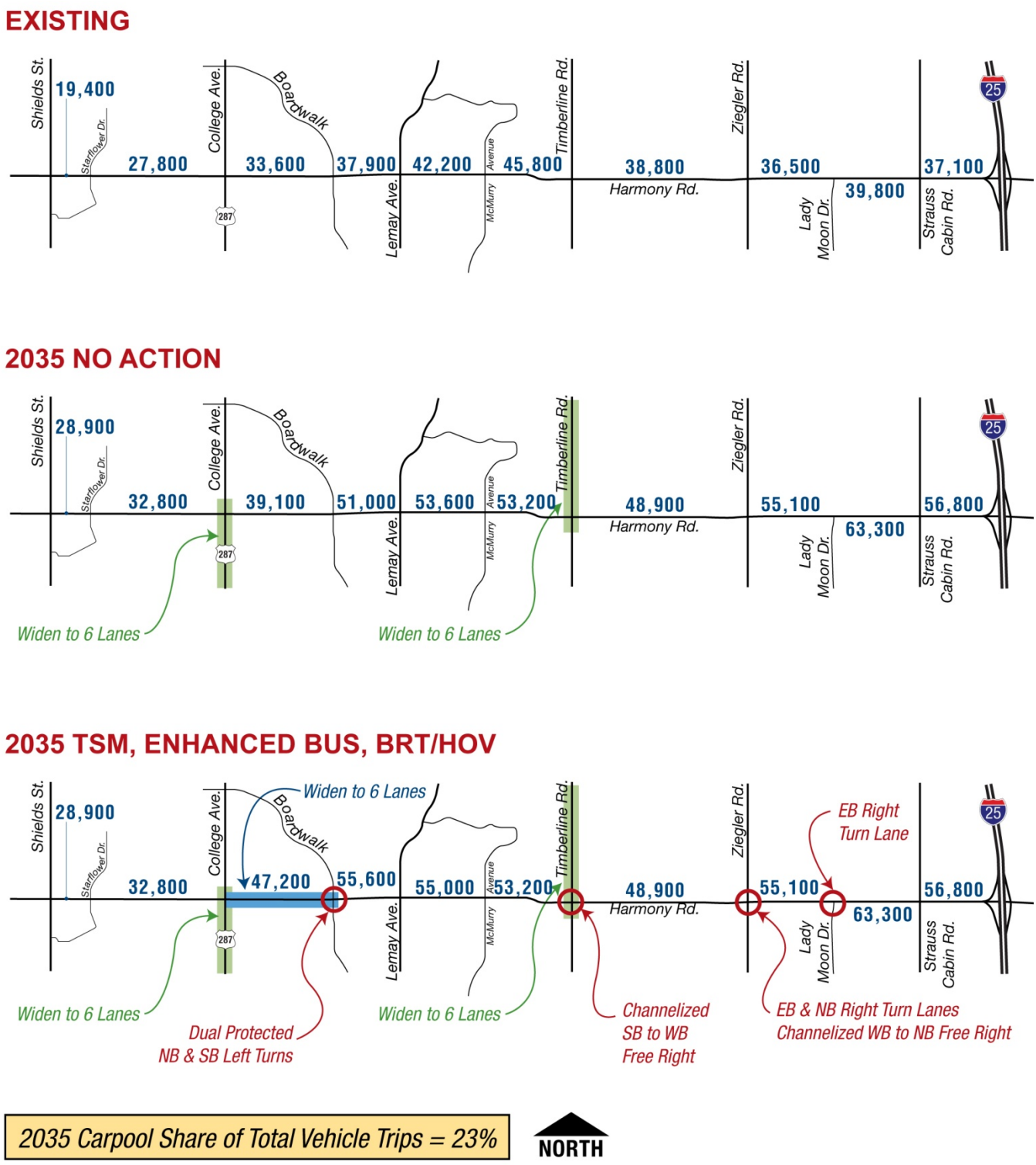
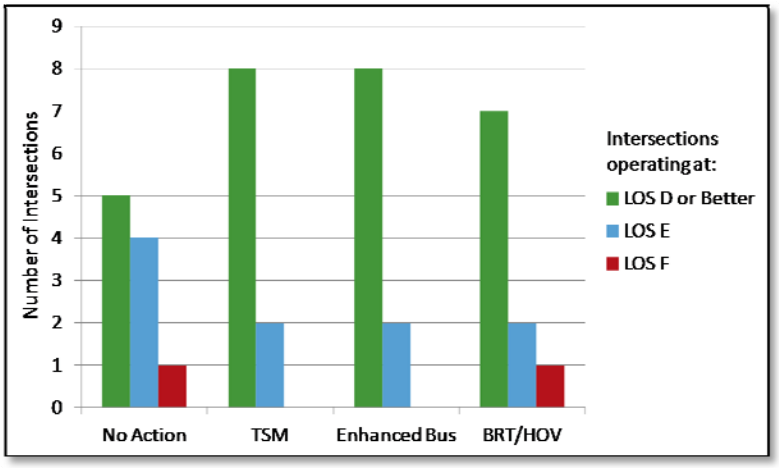


Figure 8. 2035 PM Peak Hour Traffic Operations

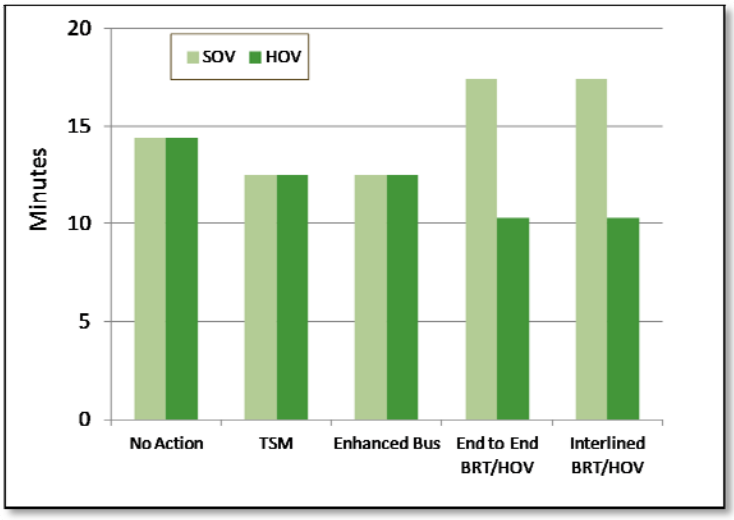


In the No Action Alternative, four intersections along Harmony Road would operate at LOS E, and one intersection (Ziegler Road) would operation at LOS F. The roadway improvements (widening and intersection improvements) associated with the TSM Alternative and Enhanced Bus Alternative would result in most intersections operating at LOS D or better, and two intersections (College Avenue and Timberline Road) operating at LOS E. The BRT/HOV Alternatives (both End-to-End and Interlined) would result in some degradation of intersection operations because SOVs (which are estimated to make up 77 percent of the traffic) would be restricted from using the curbside travel lanes. The intersection of Harmony Road and College Avenue would be most heavily affected by this configuration, with PM peak hour operations at LOS F.

Corridor Travel Times

A comparison of corridor travel times for SOV and HOV travel along Harmony Road is provided in **Figure 9**. The TSM and Enhanced Bus Alternatives would result in a 13 percent reduction in travel time (two minutes) compared to the No Action Alternative. The two BRT/HOV Alternatives would result in a 28 percent reduction in travel time for HOVs (four minutes), but a 20 percent increase in travel time (three minutes) for SOVs compared to the No Action Alternative.

Figure 9. 2035 PM Peak Hour Corridor Travel Times



Summary of Findings

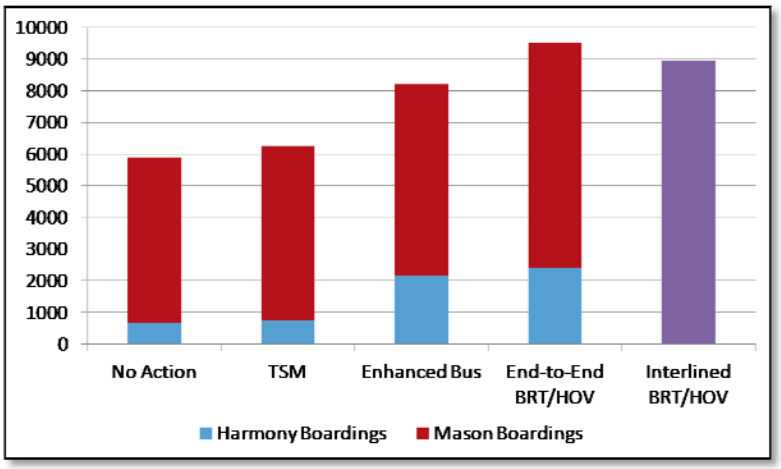
Key findings related to the traffic operations include:

- Intersection improvements are needed at several locations to accommodate future demand
- Using the outside lanes for BRT/HOV through the College intersection would cause considerable operational problems
- BRT/HOV alternatives would provide a travel time savings of as much as seven minutes for carpoolers
- Travel time for SOVs would increase 20 percent in the BRT/HOV alternatives
- Queue jumps in the Enhanced Bus Alternative could be most beneficial at about 3-5 locations where congestion and queue lengths are expected to be the longest

Transit

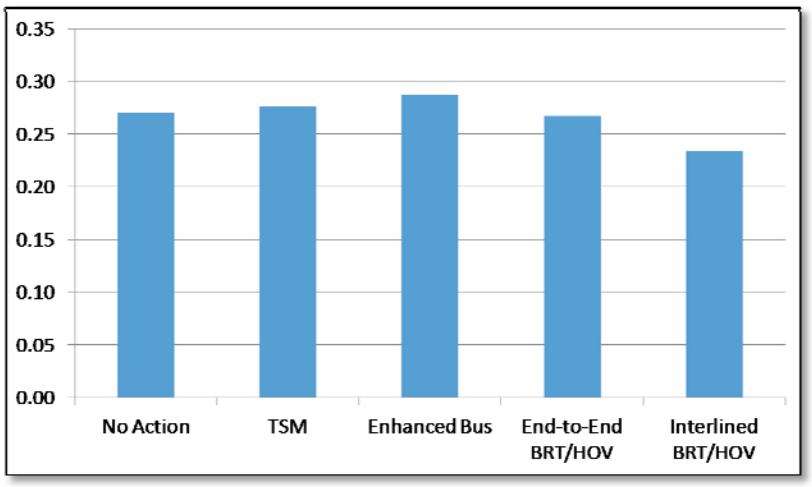
Evaluation of the transit service performance for the Tier 2 alternatives was also completed using the NFRMPO regional travel demand model (more detailed analysis results are included in **Appendix E**). The No Action and TSM Alternatives assume 60 minute peak and off-peak headways; the Enhanced Bus and BRT/HOV Alternatives assume 20 minute headways during the peak periods and 30 minute headways during the off-peak periods. **Figure 10** shows the 2035 average weekday ridership along the Harmony corridor and on MAX. MAX ridership is critical to effectively compare the Interlined BRT/HOV Alternative with the other Tier 2 alternatives.

Figure 10. 2035 Average Daily Transit Boardings



As shown, the TSM Alternative would result in a modest 15 percent increase in ridership on Harmony compared to the No Action Alternative. The Enhanced Bus Alternative would result in a more than tripling of the No Action ridership, and the End-to-End BRT/HOV would result in a nearly quadrupling of the No Action ridership. The ridership for the Interlined BRT/HOV Alternative includes those riders on Harmony and MAX as is approximately five percent less in total than the End-to-End BRT/HOV ridership. However, this decrease in overall ridership must be assessed in combination with the number of transfers being made; by providing a one-seat ride from any Harmony Road station to downtown via the Interline BRT service, the total number of boardings decreases, but the average number of transfers per trip is decreased substantially, as shown in **Figure 11**. A lower average number of transfers per trips is representative of a more convenient transit system.

Figure 11. Average Transfers per Transit Trip



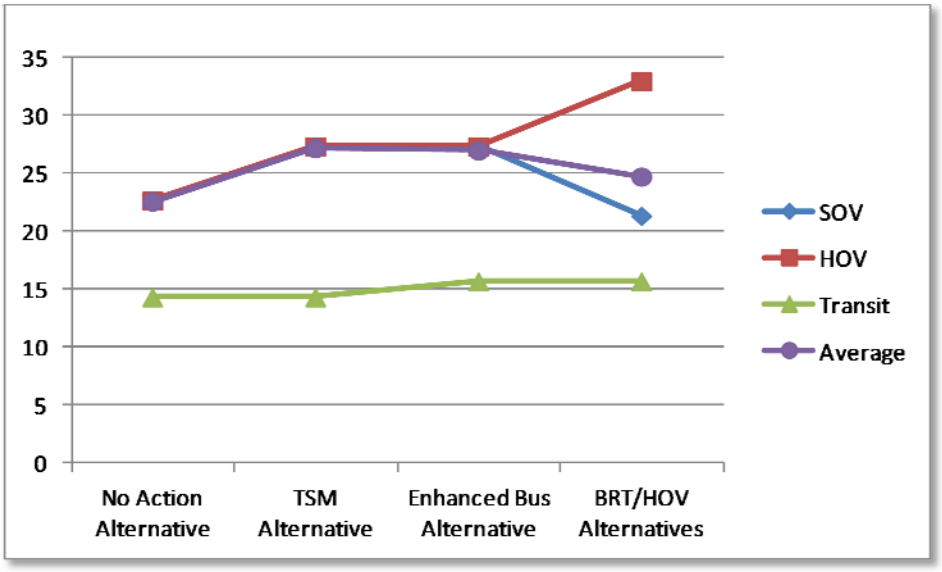
Summary of Findings

- Increasing frequency results in largest increase in boardings
- Interlined service MAX to Harmony east reduces transfers and increases ridership
- Interlined service to the west competes with Route 19
- Capital associated with HOV conversion would be relatively low
- BRT demand requires articulated fleet
- BRT shelters and fleet are very costly

Travel Speeds by Mode

In order to provide a direct comparison of the roadway and transit components of the Tier 2 Alternatives, the average corridor travel speeds were evaluated by travel mode. The average travel speeds account for intersection delays for all travel modes and dwell times to board and alight for transit. As shown in **Figure 12**, corridor travel speeds (average per person) for SOVs are the highest in the TSM and Enhanced Bus Alternatives; speeds decrease in the BRT/HOV Alternatives (primarily as a result of delays at the College Avenue intersection). Corridor travel speeds for HOVs are the highest in the BRT/HOV Alternative because they have exclusive use of the outside lanes (with transit). Corridor travel speeds for transit are highest in the Enhanced Bus and BRT/HOV Alternatives. The average corridor travel speeds (average for all people in the corridor, regardless of mode) are highest in the TSM and Enhanced Bus Alternatives, followed by the BRT/HOV Alternatives.

Figure 12. 2035 PM Peak Hour Averages Speeds



Bicycle and Pedestrian

As shown in **Table 4**, the Tier 2 bicycle and pedestrian options could be paired with any of the Tier 2 build alternatives (TSM, Enhanced Bus, End-to-End BRT/HOV or Interlined BRT/HOV). The bicycle and pedestrian options are described below along with the primary factors that were considered in the Tier 2 evaluation.

Bike Lanes + Detached Sidewalks

This alternative represents the existing conditions for much of the Harmony Road corridor. However, this option would involve completing the missing sidewalk segments that exist in several locations along the corridor. As described in the Tier 1 evaluation, bike lanes as an element of a build alternative were eliminated for the Central and East segments because of the perceived safety issue demonstrated by relatively low utilization. Bike lanes in the Central and East segments do not afford comfortable and convenient multimodal travel options because of high speeds and traffic volumes. This option has been retained for the West segment, and the primary advantages and disadvantages are described below.

Advantages

- Provides a separate space for bicyclists and pedestrians; more accommodating of different abilities than a shared use path
- Minimal cost to complete missing sidewalk segments

Disadvantages

- Less confident bicyclists may not be comfortable riding in close proximity to a travel lane

Buffered Bike Lanes + Detached Sidewalks

Buffered bike lanes provide greater space between motor vehicles and bicyclists, provide space for bicyclists to pass another bicyclist, and appeal to a wider cross-section of bicycle users. This option includes completion of the missing sidewalk segments that exist in several locations along the corridor. The primary advantages and disadvantages are described below.

Advantages

- Would improve bicycle accommodation by enhancing drivers' visibility and awareness of bicyclists
- Provides a separate space for bicyclists and pedestrians; more accommodating of different abilities than a shared use path or bike lanes
- Heightened driver awareness of bicyclists and presence of buffer may provide improved comfort for bicyclists (improved bicycle LOS)
- Relatively low cost improvement to complete missing sidewalk segments and add buffer striping

- Can be accommodated on existing infrastructure in Central and East segments

Disadvantages

- Would require widening (and higher cost) on East segment
- Would not provide a physical separation between bicyclists and motor vehicles

Cycle Tracks + Detached Sidewalks

A cycle track is an exclusive bike facility that is physically separated from motorized traffic typically by a raised median or bollards. Although cycle tracks can be one-way or two-way, for Harmony Road, the cycle track option that was deemed to be most appropriate is one-way cycle tracks on both sides of the street. A cycle track is distinct from the sidewalk; this option includes completion of the missing sidewalk segments that exist in several locations along the corridor. The primary advantages and disadvantages are described below.

Advantages

- Would improve bicycle accommodation by enhancing drivers' visibility and awareness of bicyclists and providing a physical separation between auto travel lanes and bicyclists
- Provides a separate space for bicyclists and pedestrians; most accommodating of different abilities compared to other options
- Heightened driver awareness of bicyclists and physical separation from travel lanes provides improved comfort for bicyclists (improved bicycle LOS)
- A recent study[1] shows increased bicycling activity and lower risk of injury with implementation of cycle tracks

Disadvantages

- Raised buffer would introduce drainage and maintenance complexities
- Highest cost compared to other bicycle/pedestrian options; including completion of missing sidewalk segments and construction of raised median barrier between travel lane and cycle track

Shared Use Paths

A shared use path is a bikeway physically separated from motorized traffic by an open space or barrier and can be either within the roadway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. This option would include a two-way shared use path on each side of Harmony Road (shared use paths are also referred to as sidepaths

[1] "Risk of Injury for Bicycling on Cycle Tracks Versus in the Street," Injury Prevention, February 2011, Harvard School of Public Health Researcher Anne Lusk.

when adjacent to a roadway) and would replace the existing meandering detached sidewalk with a more direct and wider (minimum 10 feet) shared use path. The primary advantages and disadvantages are described below.

Advantages

- Would provide a physical separation between bicyclists and motor vehicles

Disadvantages

- Eliminates on-street bicycling accommodation which is preferred by many advanced and non-recreational bicyclists
- Bicyclists and pedestrians of all types and abilities would be forced to use this single facility
- Would introduce safety concerns associated with operational conflicts between two-way sidepath and automobiles at intersections/access points; bicyclists riding on two-way sidepaths incur much greater risk of collision than those traveling with traffic[2]
- The use of shared use paths adjacent to a roadway such as Harmony Road is not consistent with guidelines in the AASHTO Bike Guide,[3] which states the following:
  - "Provision of a pathway adjacent to the roadway [sidepath] is not a substitute for the provision of on-road accommodation such as a paved shoulders or bike lanes…"
  - "Best use of sidepath is adjacent to roadways with no or very few intersections or driveways"

Summary of Tier 2 Evaluation

Overall, the Tier 2 evaluation identified the Enhanced Bus, detached sidewalks, bike lanes west of College Avenue, and buffered bike lanes east of College Avenue as the elements of the Locally Preferred Alternative (LPA). **Table 5** summarizes the Tier 2 evaluation results.

While the Enhanced Bus Alternative was identified as the strongest alternative for only four of the ten applicable evaluation criteria, the criteria that largely influenced the selection of the LPA were public and agency support and balance of multimodal needs. The Enhanced Bus Alternative provides the best compromise of increasing transit ridership while retaining acceptable traffic operations.

Likewise, the Buffered Bike Lane + Detached Sidewalk is the strongest bicycle/pedestrian option for the LPA because it provides the best compromise between ROW impacts/costs/drainage and maintenance (where the bike lane + detached sidewalk was identified as the strongest candidate) and mode shift potential/ accommodation of a variety of users (where the cycle track + detached sidewalk was identified as the strongest candidate).

[2] "Risk Factors for Bicycle-Motor Vehicle Collisions at Intersections," ITE Journal, September 1994.
[3] Guide for the Development of Bicycle Facilities, 2012, Fourth Edition, American Association of State Highway Transportation Officials (AASHTO).

Table 5. Summary of Tier 2 Evaluation Results

Evaluation Criteria	Strongest Roadway/Transit Alternative	Strongest Bicycle/Pedestrian Option
Public and agency support	Enhanced Bus	Cycle Track + Detached Sidewalk
Traffic operations	TSM or Enhanced Bus	N/A
Transit ridership	Interlined BRT/HOV	N/A
Pedestrian comfort and convenience	N/A	Buffered Bike Lane + Detached Sidewalk
Bicycling comfort and convenience	N/A	Cycle Track + Detached Sidewalk
Balance of multimodal needs	Enhanced Bus	Buffered Bike Lane + Detached Sidewalk
Quality of transit service	Interlined BRT/HOV	N/A
Accommodate a variety of bicycle and pedestrian user types and abilities	N/A	Cycle Track + Detached Sidewalk
Potential crash reduction benefits	TSM, Enhanced Bus or BRT/HOV	N/A
Bicycle and pedestrian safety	N/A	Cycle Track + Detached Sidewalk
Potential ROW impacts	TSM	Bike Lane + Detached Sidewalk
Drainage/impervious surface area	TSM	Bike Lane + Detached Sidewalk
Mode shift potential	BRT/HOV	Cycle Track + Detached Sidewalk
Cost	TSM	Bike Lane + Detached Sidewalk

4. Locally Preferred Alternative

This chapter describes the Locally Preferred Alternative (LPA) resulting from the extensive alternatives development and evaluation process conducted in this study. The conceptual engineering plans for the LPA are included in **Appendix H**.

LPA Decision Process

The process of selecting the Locally Preferred Alternative for the Harmony Road ETC included the following steps:

- Performing a two-tiered alternatives development and evaluation process
- Soliciting input from the public, stakeholders, and City staff
- Presenting the Tier 2 evaluation and public input to the TAC on December 19, 2012, at which time the TAC requested follow-up information related to the feasibility of infrastructure improvements identified in the build alternatives and a direct comparison of corridor travel times by mode between Tier 2 alternatives
- Presenting the requested follow-up information to a sub-group of the TAC
- Making a preliminary recommendation for the LPA based on the strongest Tier 2 roadway/transit alternative and bicycle/pedestrian option as described in Chapter 3. Consideration was given to the technical analysis (including the follow-up information), public input, and input from the Project Management Team
- Refining the LPA based on input from the TAC; the refined LPA was presented to and supported by the TAC on February 27, 2013
- Presenting the project and recommended LPA at a series of City board meetings and public meetings
    - **Transportation Board** – July 18, 2012; March 20, 2013; June 19, 2013.The Transportation Board acted on the Final Report at their June 19th, 2013 meeting. [Meeting results to be added]
    - **Bicycle Advisory Committee** – July 9, 2012; May 6, 2013. The BAC generally supported the recommendations of the LPA. They viewed the buffered bike lanes as an improvement over the existing bike lanes.
    - **Planning and Zoning Board –** May 10, 2013. The Planning and Zoning Board generally supported the recommendations of the LPA.
    - **Air Quality Advisory Board** – May 20, 2013. The Air Quality Advisory Board had numerous questions about the impact of the project on air quality. On one hand the Board felt improving traffic flow had the most potential to improve mobile emissions, while there was also a strong advocacy for increasing mode shift to transit, bicycling and walking to reduce vehicle miles traveled. The Board agreed to provide a brief, bulleted document with ideas regarding air quality issues in this project.
- The **City Council**…[when they have taken an action in support of the LPA, include date of adoption and description of action]

LPA Description

The LPA for the Harmony Road ETC, includes a series of multimodal transportation improvements to address the project Purpose and Need. The LPA includes widening the section of Harmony from College Avenue to Boardwalk Avenue to six lanes, as well as intersection improvements at selected locations to address future operational deficiencies.

The transit aspect of the LPA includes Enhanced Bus along Harmony Road between the South Transit Center and the Harmony Transfer Center. The bus would travel in the general purpose lanes along the extent of the route except where queue jumps are provided.

The LPA includes enhancements to the existing bicycle lanes including green colored pavement on the bike lanes for the full length of the corridor, and a striped buffer between the bike lane and the adjacent travel lane from College Avenue east toward I-25. The meandering sidewalk will be retained on both sides of Harmony Road, with completion of the few missing segments. The LPA will also include enhancements to bicycle and pedestrian crossings (both at-grade and grade separated crossings). The LPA includes raised, landscaped medians the entire length of the corridor.

Roadway Elements

In general, the LPA makes use of the existing roadway infrastructure without major capital expansion. As shown on **Figure 13**, the LPA does include widening a short segment (College Avenue to Boardwalk Drive) to six lanes to better accommodate future travel demands, which is consistent with the City's *Transportation Master Plan*.

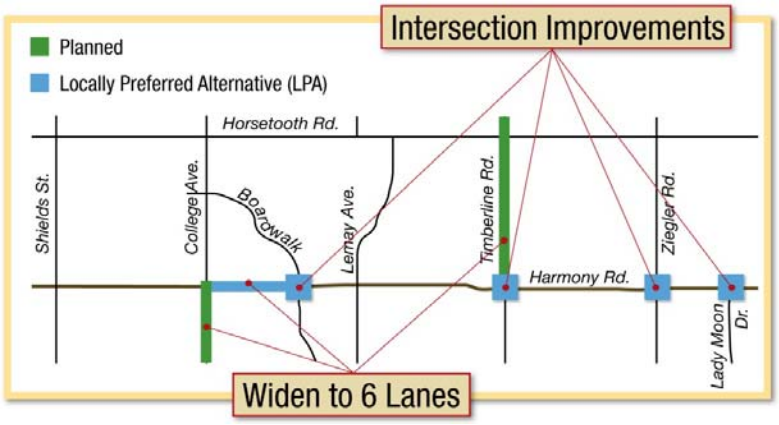
Two widening projects which are anticipated within the planning horizon will affect Harmony Road. College Avenue is planned for widening to six lanes south of Harmony Road which will require reconfiguration at the Harmony Road intersection to extend three northbound and southbound lanes through the intersection. Likewise, the Timberline Road intersection will require similar geometric modifications to allow six through lanes in the north/south direction. Timberline Road is expected to transition to four lanes south of the Harmony Road intersection. Although these two widening projects are not a part of the LPA, the intersection modifications to accommodate these projects are considered part of the LPA.

The LPA also includes intersection improvements at four locations along the corridor to address future operational deficiencies and to enhance safety for automobile travel along the corridor. As shown on **Figure 13**, the four intersections identified for improvements include:

- Harmony Road/Boardwalk Drive
- Harmony Road/Timberline Road
- Harmony Road/Ziegler Road
- Harmony Road/Lady Moon Drive

For the purpose of this planning study, geometric improvements were identified to address the operational deficiencies (as noted previously on **Figure 7**). However, other types of intersection improvements may be considered and analyzed in the design phase – roundabouts, continuous flow intersections (CFIs), and Michigan left turns, for example. This study did not include an exhaustive evaluation of intersection improvements.

Figure 13. Roadway Widening and Intersection Improvements



In addition to the widening and intersection improvements described above, the LPA includes urban design elements to provide consistent aesthesis along the length of the corridor. As illustrated in **Figures 14 and 15**, the LPA includes landscaped medians and curb and gutter throughout the corridor. The typical streetscape and median landscape should emphasize mixed plantings of perennials, grasses, shrubs, and tree groupings, with a loosely patterned mulch surface. The landscape design should reflect Fort Collins' western regional character with regionally-specific plants suited to the particular microclimate and environmental conditions of the location. Typical features include native boulder groupings, varied cobble mulch areas and urban elements such as street lights and decorative railings. Low impact water quality measures may be incorporated into the design as conditions warrant.

Figure 14. Illustrative Example of LPA: Shields Street to College Avenue

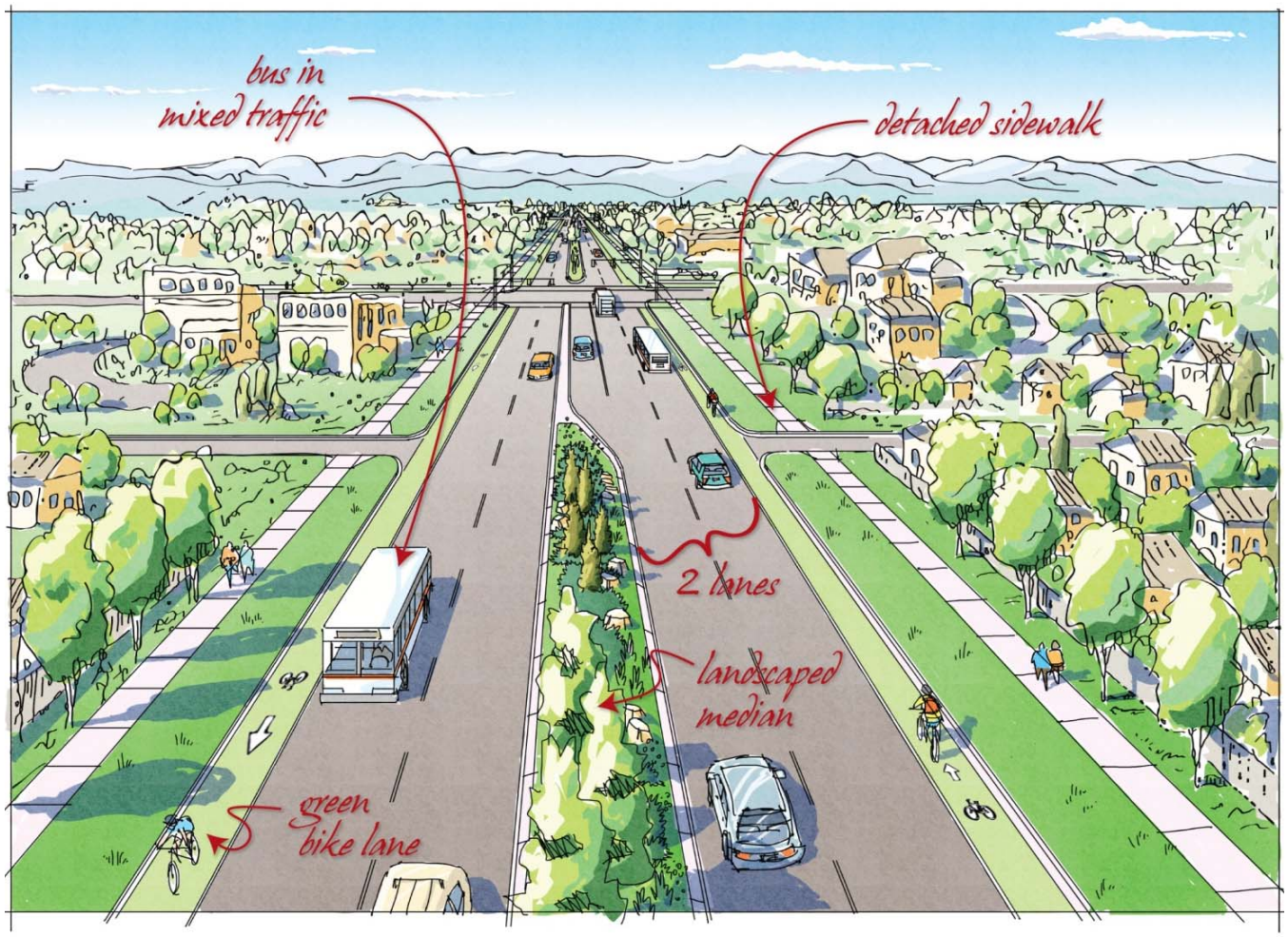
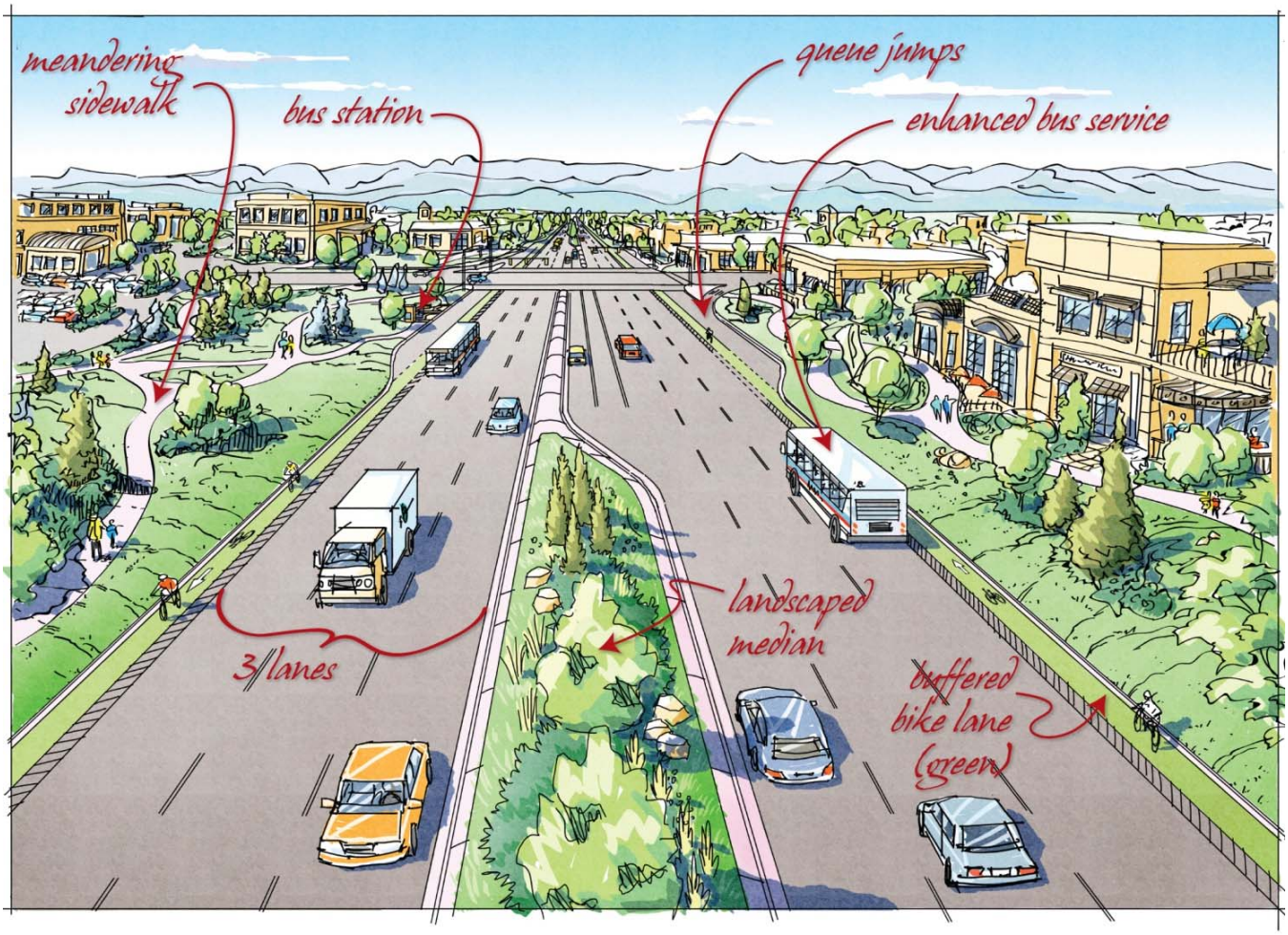


Figure 15. Illustrative Example of LPA: College Avenue to I-25



With a project of this size, utility impacts cannot be avoided. However, the relocation or undergrounding of overhead utility lines, which is quite common on some projects, is not needed since public and private utilities are already below ground along the Harmony Road corridor.

Some of the common utility impacts that may occur during the preliminary design process would be the relocation of some utility pedestals or manholes, and existing street lighting may need to be relocated. Limiting impacts to utility infrastructure should be undertaken to the best of the City's ability during the preliminary design phase.

Of particular note is that there are existing concrete-lined irrigation ditches along Harmony Road may need to be relocated or covered as part of the future design. These ditches have a typical longitudinal alignment and are used for capturing roadside drainage and, at one time, for irrigation flows from the Larimer #2 Extension Ditch (specific to the south side of Harmony Road). Visual verification of the location of the concrete-lined ditch is somewhat sporadic at times and it appears that it has been conveyed to piping systems as parcels were redeveloped along the corridor.

The concrete-lined ditch on the south side of Harmony Road, just east of College Avenue.

The locations of the visible concrete-lined ditches are:

- College Avenue to Boardwalk Drive: Sporadically along the south side of Harmony Road
- Timberline Road to Ziegler Road: Along the south side of Harmony Road; the ditch proceeds southward along the east side of Ziegler Road at this point, but continues along Harmony Road as a piped system then as an open, unlined channel
- Ziegler Road to Fossil Creek Reservoir Inlet: Along the north side of Harmony Road

Coordination with the existing irrigation ditch companies should occur as soon as possible during the preliminary design process to understand their concerns and their design requirements.

Transit Elements

LPA transit elements include enhanced bus service, bus stations and stops, and queue jumps at select locations.

Enhanced Bus Service

The LPA includes a new 4 ½ mile Enhanced Bus route along Harmony Road between the Harmony Transfer Center and the South Transit Center. **Figure 16** illustrates the proposed Harmony Enhanced Bus route referred to as Route H. The route would begin at the Harmony Transfer Center, north of Harmony Road and to the west of I-25. It would travel west along Harmony Road stopping on demand at bus stops and stations located approximately every ¼ mile along the corridor. At College Avenue the bus would turn south to access the South Transit Center and connect to the planned MAX service that is currently under construction.

To the west of College Avenue, Harmony Road would be served by the existing Route 19 connecting the South Transit Center, Front Range Community College and the CSU Transit Center. Route H would also connect with the Route 17 at Timberline Road and with Route 7 at John F. Kennedy Parkway.

Route H would operate every 20 minutes in the peak period and 30 minutes in the off peak periods. In 2035, it is estimated that the Express Bus along Harmony Road would serve approximately 2,000 boardings daily depending on the route service pattern. Interlining the Harmony Road service with MAX would result in higher ridership compared to the end-to-end stand-alone service. This is the result of providing a single seat ride between Harmony Road and downtown Fort Collins which results in shorter travel time and no transfers.

The service would require three buses plus a spare if the buses are branded for service specifically along the Harmony Road Corridor. Buses would be low floor and articulated to accommodate demand and could seamlessly integrate with MAX service. Stops would be provided approximately every ¼ mile. Drivers would stop when a passenger is waiting to board at any of the stops along the route or when a riding passenger has provided indication that they will be alighting at the approaching stop.

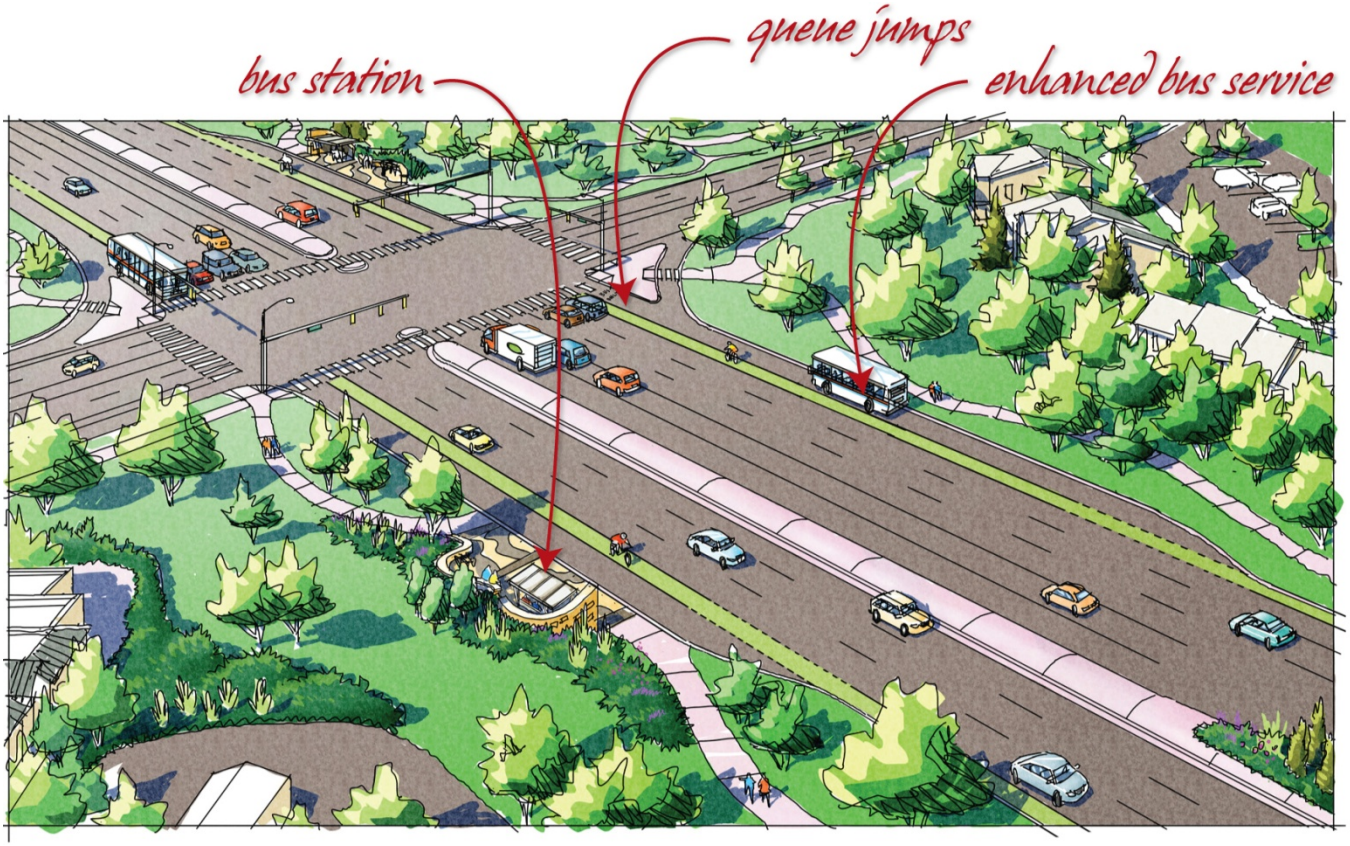
Annually the Route H service would run approximately 10,500 service hours assuming end-to-end service. Based on Transfort's current hourly cost per service hour of $93, the annual operating and maintenance costs would be approximately $990,000 (2012 dollars). A Route H service pattern interlined with MAX would require a similar number of additional service hours.

Figure 16. LPA Transit Routes

Queue Jumps

The LPA also includes queue jumps at three intersections along Harmony Road: 1) Lemay Avenue, 2) Timberline Road, and 3) Ziegler Road. Buses using the queue jump and right turning vehicles cross the buffered bike lane as they approach the intersection; right turning vehicles travel around the right turn channelization island while approaching buses continue straight. With a green indication buses travel through the intersection concurrently with the other through travel lanes to a receiving lane on the far side of the intersection and to the bus stop. **Figure 17** illustrates the queue jump in relation to the bus stop at a typical intersection.

Figure 17. Illustrative of Queue Jump Lanes at Intersection



Bus Stops and Stations

Enhanced transit stations provide a comfortable and safe respite location for transit riders to gather while anticipating the arrival of the next bus. The intent is to provide shelter, seating, bike parking, waste and recycling collection, and relevant information regarding the transit system (e.g., maps and time of next bus arrival). Transit stations are key nodes in the transit system and serve as gathering places for users. These include locations such as major employers, the hospital, and schools. Stations will be larger than a typical bus stop and provide more amenities. Station amenities would likely include a custom shelter, bench, bike racks, lighting, a small plaza area, and a trash receptacle. Spaces for future potential bike share parking should also be considered when stations are being designed. Stops would have few amenities but would include a standard shelter, lighting, bench, and trash receptacle. The proposed Harmony station and Harmony local stop locations are depicted on **Figure 18**. The LPA conceptual plans (**Appendix H**) generally do not include bus pull-outs at the local stops or stations in order to facilitate the buses' entrance back into the travel lane. There are a few exceptions:

- At the three intersections with queue jumps (Lemay Avenue, Timberline Road, and Zieger Road), the queue jump receiving lane will provide a dedicated space for buses at the station; after stopping at the station, the buses will be required to enter back into the travel lane
- A bus pull-out is recommended at the station near Mason Street to provide buses with a waiting area to facilitate timed transfers with MAX

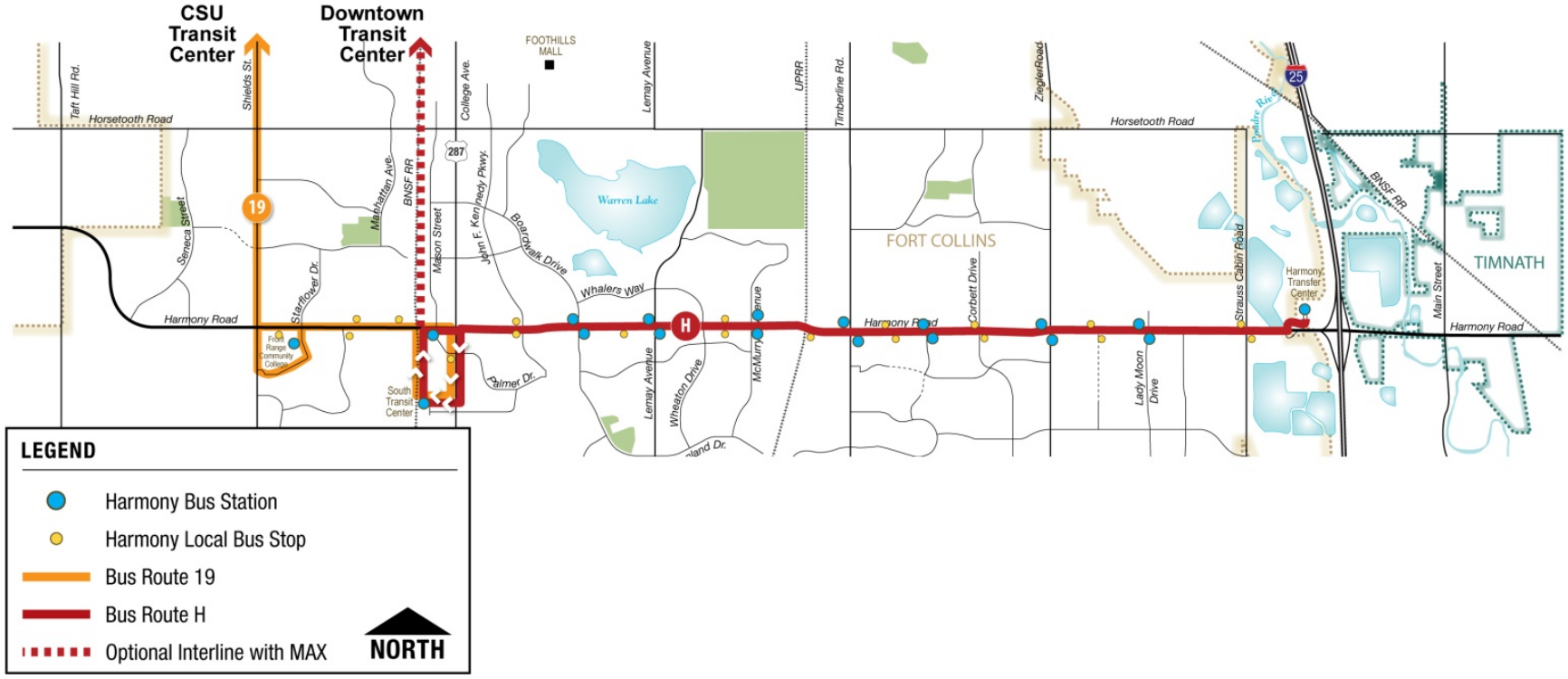
The Harmony Transfer Center would be the end-of-line station and park-and-ride facility for Route H. As such it would be upgraded to accommodate 60 foot articulated buses and provide a driver bathroom. In addition, the number of parking spaces is expected to be increased to 350 as part of the North I-25 EIS project.

Harmony Station Concept

The stop/station experience is an important part of the rider experience. The integration of high quality materials, modern messaging systems, and improved functionality will serve to improve the image of and increase the demand for the transit system. Enhanced transit stations support cultural exchange and community building by providing comfort and safety in the public realm.

Harmony Local Stop Concept

Figure 18. Harmony Road Bus Stop and Station Locations



Bicycle Elements

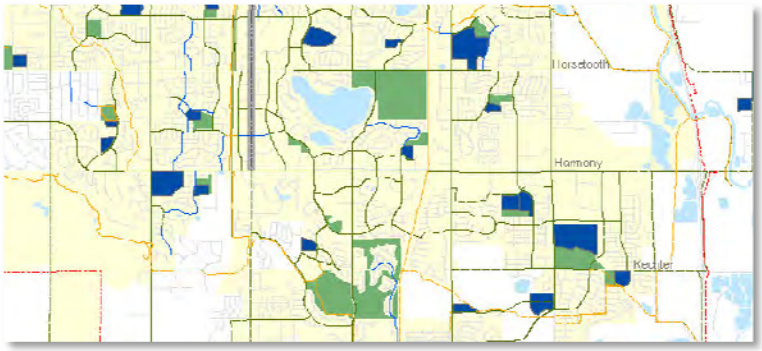
Fort Collins was recently designated a Platinum-level Bicycle Friendly Community by the League of American Bicyclists. In recognition of the importance of bicycle travel in Fort Collins, the LPA includes enhanced bicycle facilities along the full length of the Harmony Road corridor. East of College Avenue, a buffered bike lane will provide a visual separation and greater space between the motorized travel lane and the bike. The buffered bike lanes will also provide space for a bicyclist to pass another bicyclist, and generally appeal to a wider cross-section of bicycle users. Buffered bike lanes are depicted in **Figure 15** for the section of Harmony Road between College Avenue and I-25. A buffer width of three feet and a bike lane width of five is recommended, which exceeds minimum standards in the National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* and could fit within the existing roadway infrastructure on Harmony Road.

Example of a buffered bike lane in Seattle

Example of a green bike lane in San Francisco

As a part of the LPA refinement process, the use of colored pavement was identified as a desired treatment for the bike lanes along the full length of Harmony Road (Shields Street to I-25). Colored bike lanes help to increase the visibility of the facility, identify potential areas of conflict, and reinforce priority to bicyclists. Motorists are expected to yield right of way to bicyclists in the bike lane. Studies have shown that colored bike lanes, particularly in conflict areas near intersections, result in increases in motorist yielding behavior.[4] Green colored pavement on Harmony bike lanes are illustrated on **Figures 14 and 15**.

While the enhanced bicycle facilities along Harmony Road are expected to encourage bicycling as a mode of travel along the corridor, some bicyclists will not be comfortable riding on-street with the levels of traffic volume and motor vehicle speeds on Harmony Road. To accommodate these less-confident bicyclists, a network of bike facilities including back street bike lanes (that is, off the major arterial roads) is needed. A relatively well-established network of bike facilities (primarily bike lanes) exists within approximately a half-mile of Harmony Road. Bike lanes exist along a route a half-mile south of Harmony from west of Lemay Avenue to Lady Moon (approximately three miles) along Boardwalk Drive, Keenland Drive, Battle Creek Drive, Stetson Creek Drive,



An excerpt from the Fort Collins Bike Plan (2008) showing the Planned Bikeway Network in the Harmony Road ETC study area.

[4] "Evaluation of Blue Bike-Lane Treatment in Portland, Oregon," Transportation Research Record 1705, 107-115, 2008. "Effects of Colored Lane Markings on Bicyclist and Motorist Behavior at Conflict Areas," Center for Transportation Research, City of Austin, 2010.

and Rock Creek Drive. To bolster the use of these back street bike lanes, the following actions are recommended:

- Complete the missing connection across the UPRR (west of Timberline Road) with a tie-in to the future Power Trail
- Provide signing and mapping to alert bicyclists of the option to use the back street bike network instead of Harmony Road
- Consider the extension of an east-west bike route from Lemay to College, with a connection to the South Transit Center

Pedestrian Elements

Harmony Road is identified in the City's Pedestrian Plan as a Pedestrian Priority Area (PPA). The LPA seeks to enhance the pedestrian experience along the Harmony Road corridor by providing continuous sidewalk connections along the length of the corridor (Shields Street to I-25) and improving the crossing opportunities along the corridor. The LPA includes completion of the missing sidewalk segments that exist in several locations along the corridor.

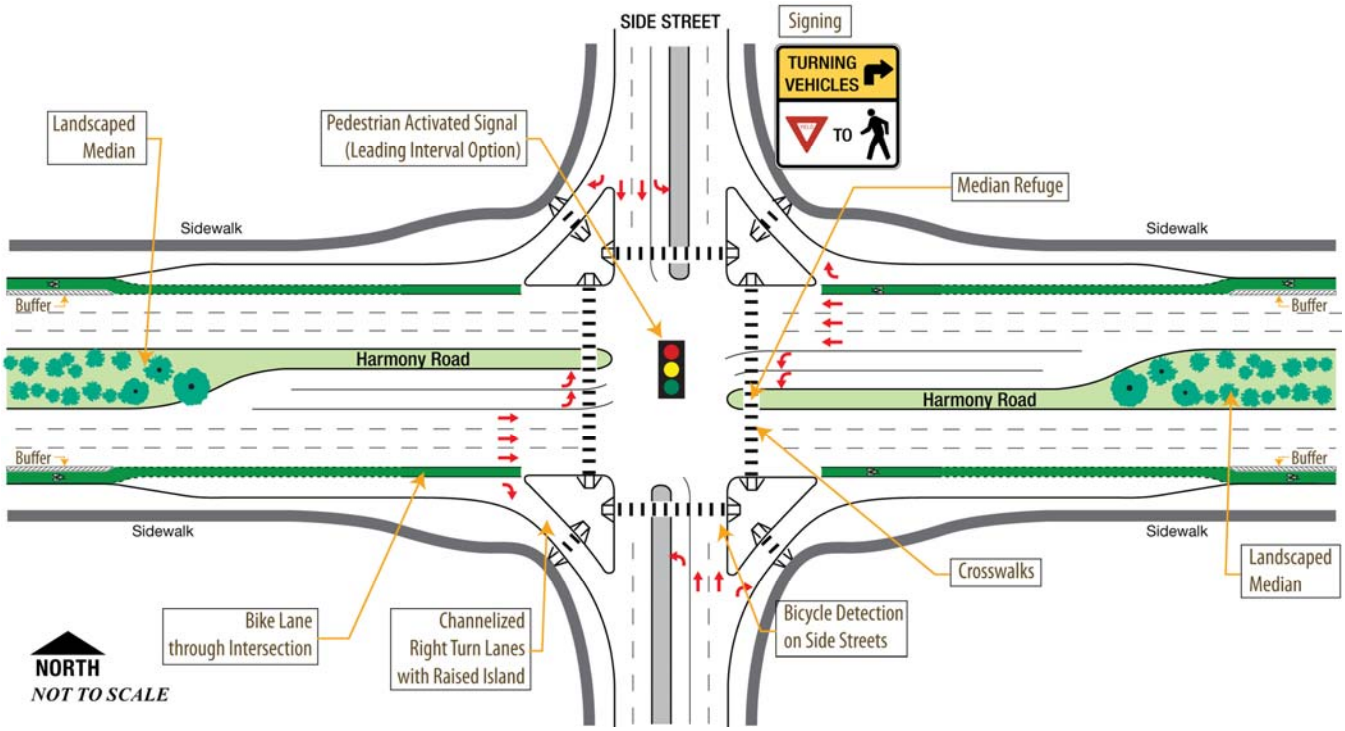
The characteristic wide meandering sidewalk along Harmony Road

Crossing of Harmony Road has been identified as problematic by the community, and it will become more difficult as traffic volumes increase in the future. All signalized intersections along the corridor should include at-grade crossing treatments to enhance the safety and convenience for pedestrians (and bicyclists). As shown schematically on **Figure 19**, these treatments could include:

- Pedestrian crosswalks
- Use of TURNING VEHICLES YIELD TO PEDESTRIANS signs (Manual on Uniform Traffic Control Devices [MUTCD] R10-15) to remind right-on-green and permissive left-turn movements of their obligation to yield to pedestrians in the crosswalk
- Pedestrian activated signals (with the option of a leading pedestrian interval)
- Channelized right turn lanes with raised islands to allow pedestrians to cross the right turning traffic independently of the rest of the intersection; the design should encourage low vehicle turning speeds and should provide unobstructed sight lines between pedestrians and motorists
- Proper bike lane striping to avoid the right lane conflict with right turning vehicles
- Bicycle detection (particularly on the side street approaches) and automatically adjusted signal timing to allow enough time for bikes to cross Harmony Road within the green time

Example of enhanced pedestrian crossing treatments at the Harmony Road/Corbett Drive intersection

Figure 19. Example Intersection with Enhanced Bicycle and Pedestrian Crossing Treatments

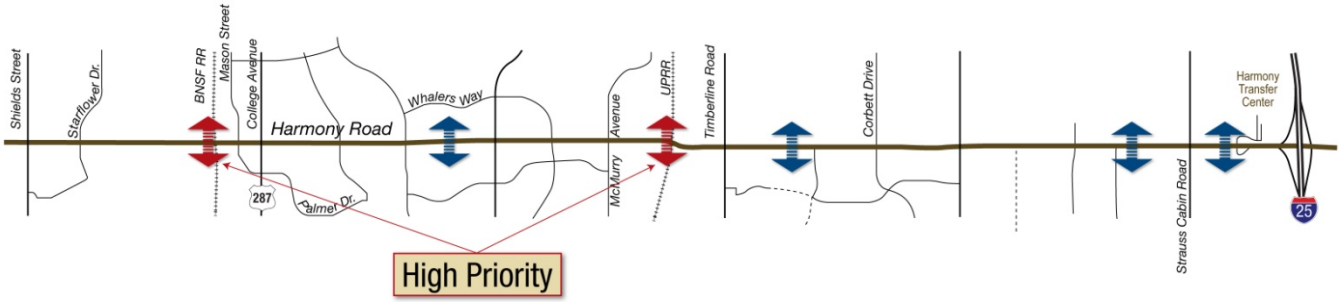


In addition to the at-grade intersection crossing enhancements, six locations for future grade-separated crossings have been identified and are included in the LPA. As shown in **Figure 20**, these crossings are recommended periodically along the corridor to connect land uses north and south of Harmony Road, to facilitate access to transit stations, and to reduce the auto/pedestrian and auto/bicycle conflicts along the corridor. Two grade-separated crossing locations have been identified as the high priority:

- Mason Trail (near the BNSF railroad)
- Power Trail (near the UP railroad)

These two trails serve regional functions for bicycle and pedestrian travel, and also coincide with future Harmony Road stations.

Figure 20. Pedestrian Grade-Separated Crossing Locations

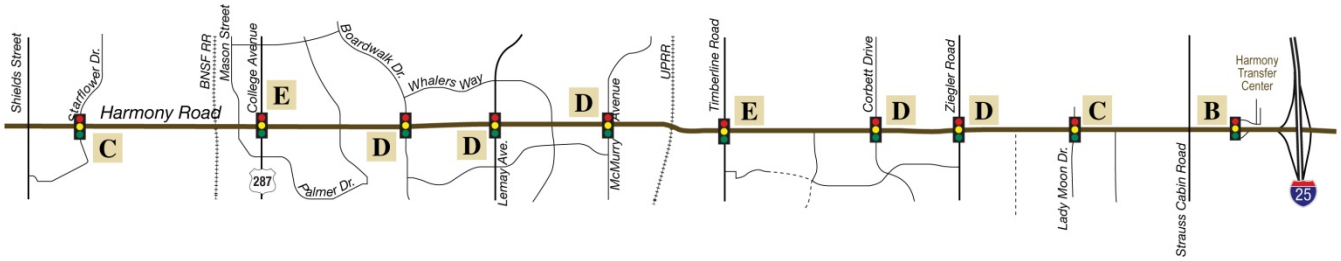


LPA Performance

Traffic Operations

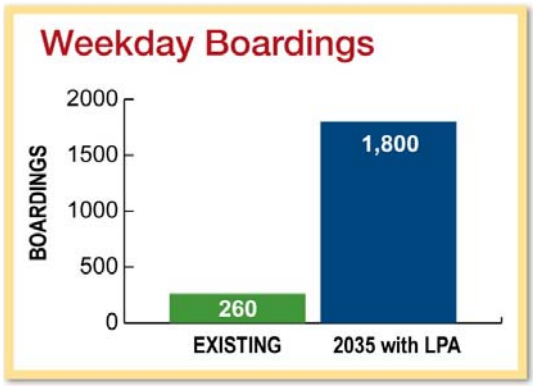
Provision of the roadway and intersection improvements in the LPA will result in improved intersection levels of service (LOS) in the future. Most of the major signalized intersections along Harmony Road are expected to operate at LOS D or better during the PM peak hour (refer to **Figure 21**). Two intersections (Harmony Road/College Avenue and Harmony Road/Timberline Road) are projected to operate at LOS E during the PM peak hour. The LPA is estimated to result in an average corridor travel time (from Shields Street to I-25 or vice-versa) of approximately 12 ½ minutes during the PM peak hour in 2035, which equates to an average speed of 27 mph (including stops at the signalized intersections).

Figure 21. LPA 2035 PM Peak Hour Traffic Operations



Transit Operations

Enhanced Bus service along the corridor would see approximately 1,800 boardings daily, substantially higher ridership than the service that exists along the corridor today. Service interlined with MAX would result in somewhat higher ridership than the end-to-end service pattern.



Bicycle and Pedestrian

The enhanced bicycle accommodation in the LPA is expected to improve bicyclists' experience and encourage bicycling as a mode of travel along Harmony Road. The buffered bike lanes will improve bicycling comfort; green bike lanes are expected to increase drivers' awareness of bicyclists along the corridor and increase motorists' yielding to bicyclists in conflict areas.

The wide meandering sidewalk that exists along much of Harmony Road provides a pleasant walking experience for pedestrians; completion of the missing sidewalk segments will further enhance the pedestrian experience and encourage walking as a mode of travel along Harmony Road. At-grade intersection crossing enhancements will enhance the safety and convenience for pedestrians crossing Harmony Road, and the provision of grade-separated crossings approximately every 1 – 1 ½ miles will reduce the auto/pedestrian and auto/bicycle conflicts across the corridor.

Environmental

Environmental Resources

A cursory-level environmental inventory of existing conditions and a preliminary assessment of the project impacts was conducted for the for the Harmony Road ETC study area. The level of analysis performed for this project is commensurate with the requirements of the Federal Transit Administration (FTA) for Alternatives Analysis.

The purpose of conducting the environmental inventory and evaluation was to develop an understanding of the existing physical opportunities and constraints of the corridor related to environmental resources. This information was used to inform the alternatives screening process and help determine which alternatives had physical limitations that could either eliminate an alternative from consideration or have an impact on an alternative's cost and/or public acceptance due to resource conflicts. The full environmental inventory and evaluation is included in **Appendix F**.

The methods used to conduct the environmental inventory included a desktop review of existing information, including existing geographic information system (GIS) data and available information from relevant agencies (e.g., City of Fort Collins, US Fish and Wildlife Service). A field visit was not performed as part of the preliminary environmental inventory. Mapping of the existing conditions within the study area is included in **Appendix F**.

A preliminary environmental evaluation of the potential project impacts was performed using the conceptual design of the Locally Preferred Alternative (LPA) for several "priority" resources that were identified in the study area. "Priority" resources are defined as the resources that could require avoidance or minimization of impacts during design and/or resources that typically have lengthy environmental clearance process.

The following resources were identified as "priority" resources within the corridor:

- Noise
- Air Quality
- Historic Resources
- Park, Trail, and Open Space Resources/Section 4(f) Resources
- Hazardous Materials
- Wetlands/Other Waters of the US

A preliminary evaluation of priority resources revealed the following findings for each resource.

Noise

Noise sensitive receptors include exterior areas of frequent human use that can be disturbed by vehicle noise, such as residential neighborhoods (FTA Category 2), and schools, parks or churches (FTA Category 3). Preliminary review of the project corridor identified ten areas (**Appendix F**) with noise sensitive receptors adjacent to Harmony Road. Harmony Road is already a major arterial corridor and generates substantial traffic noise. The traffic expected to be added and/or changed by the LPA will be relatively minor and is not likely to have a major effect on the corridor noise environment. For example, doubling the number of cars would increase noise levels by three decibels, which would be barely noticeable to most people. However, a detailed noise analysis will be completed during the NEPA study to identify specific noise impacts and identify minimization, avoidance or abatement measures to reduce noise impacts.

Air Quality

The Fort Collins metropolitan area has a couple of air quality challenges: the area is classified by the Environmental Protection Agency (EPA) as an attainment/maintenance area for carbon monoxide, and is also within the Denver regional non-attainment area for ozone. Automobiles are major sources of these air pollutant emissions. Increasing the volumes of vehicles or miles traveled can increase emissions of carbon monoxide and ozone precursors, but improved vehicular progression (reduced delay) through congested areas can reduce or offset those increases. Improvement projects in nonattainment and maintenance areas, such as the Preferred Alternative, must be examined for air quality impacts under EPA's Transportation Conformity Rule, which is done as part of the regional transportation planning process. Projects that reduce delays at intersections or improve vehicle speeds often have a side benefit of also reducing tailpipe emissions. The LPA is expected to increase total miles of travel in the corridor by approximately 5 percent over No Action, but to the positive, corridor crossing time would decrease by approximately 13 percent and average corridor vehicle speeds would increase by approximately 17 percent. These improvements should reduce tailpipe emissions on the whole.

During subsequent NEPA study of this project, the proposed improvements will be evaluated through the regional conformity process and travel demand modeling. Local air quality may need to be evaluated through a "hot-spot" analysis. Through these analyses, it must be demonstrated that the air quality requirements can be achieved prior to implementation of the LPA.

Historic Resources

Seven properties have been identified along the corridor that are designated historic resources or potentially eligible for historic designation under the Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to consider the effects of their undertakings upon significant National Register of Historic Places listed or eligible historic properties. These resources include the cemetery located in the southeast corner of Harmony Road/McMurry Avenue, Harmony Store, Harmony School, Preston Farm, Harmony House, a farmstead, and the Fairway Estates.

Based on the preliminary evaluation, the Harmony Store could be impacted by the conceptual design of the LPA. Avoidance of historic and potentially-historic properties was considered throughout all stages of the conceptual design process. For instance, based on the knowledge that the Harmony School is designated as a Fort Collins Landmark, the conceptual design of the LPA was modified to realign Harmony Road south of its current alignment to avoid impacting this property.

Based on the assumption that the funding source for any future corridor project would be federal-based, any future NEPA process would require compliance with Section 106 of the NHPA, which requires federal agencies to consider the effects of their undertakings upon significant NRHP-listed or eligible historic properties. It is recommended that avoidance and minimization of impacts to historic or potentially historic properties continue to be considered during preliminary and final design of the Preferred Alternative.

Park and Recreation Resources/Section 4(f) and 6(f) Resources

Four park and recreation resources were identified within the study area. These include the Hidden Cattails Natural Area, Mason Trail, Power Trail Bike Trail, and Arapaho Bend Natural Area. Properties within the project area that are publicly-owned are afforded protection under Section 4(f) as defined in 23 Code of Federal Regulations 774. A Section 4(f) resource is a property that functions or is designated as a significant publicly-owned park, recreation area, wildlife or waterfowl refuge, or historic site.

Based on the preliminary evaluation, the Mason Trail and Power Trail Bike Trail could be impacted based on the conceptual design of the LPA. These two trail resources would potentially require realignment in conjunction with the project roadway improvements. Any future NEPA process will require field verification of all of the park and recreational resource locations and boundaries. Also, a Section 4(f) evaluation would be required for any publically-owned resources impacted by implementation of the project.

Hazardous Materials

Nine sites with potential or known hazardous materials issues (e.g., leaking underground storage tanks, leaking aboveground storage tanks, drycleaner facilities) were identified within the study area. Based on the cursory evaluation, two of the nine sites with potential hazardous materials issues may be directly impacted based on the conceptual design of the LPA. Any future NEPA process would typically require a formal hazardous materials assessment, including a site verification, to identify any hazardous materials issues within the study area.

Wetlands/Other Waters of the US

Wetland resources are protected under Section 404 of the Clean Water Act (CWA) and Executive Order 11990 Protection of Wetlands. Two areas with wetlands (i.e., wetlands associated with Hidden Cattails Natural Area and wetlands associated with Power Trail Bike Trail) were identified based on a review of available geographic information systems (GIS) mapping data. Based on the preliminary evaluation, the wetlands located west of the Power Trail Bike Trail could be impacted by the conceptual design of the LPA.

Any future NEPA process would typically require a formal wetland delineation to verify the accuracy of the wetland resources identified through the GIS mapping data, and any additional wetlands associated with roadside ditches and/or streams that could be present and affected by the implementation of the project. Avoidance and minimization of impacts to wetlands will continue to be considered during preliminary and final design of the LPA.

Mitigation – Avoidance/Minimization

As for any project of this type, how project impacts will be mitigated is a crucial design element. In regards to the roadway features of the LPA, there are two specific design elements included in the plan to reduce environmental impacts:

- To limit any potential widening impacts along Harmony Road between Shields Street and College Avenue, the proposed cross-sectional elements of this segment were developed such that the curb & gutter along the existing outside edges of the roadway could remain in their current location. The cross-sectional elements include 11’ wide eastbound and westbound vehicle travel lanes, a 14’ raised median, and 6’ bike lanes. At intersections, a 10’ left turn lane can be provided within the median such that a resultant 4’ wide space can still provide some pedestrian refuge.
- The Harmony School in the northeast corner of the Timberline Road intersection has played a significant role in the history of the area and it is designated as a Fort Collins Landmark. As such, an attempt was made to design the Harmony Road improvements such that these improvements would be outside of the Harmony School ROW.

As noted previously, the Timberline Road intersection is one of the intersections that will include a future bus queue jump lane on both the north and south sides of the street. As such, the roadway cross-section at this intersection is wider than the typical cross-section, thereby requiring more space than some locations.

To mitigate ROW impacts, Harmony Road has been realigned towards the south as it proceeds through the Timberline Road intersection. As can be imagined, there is a limit to how much realignment can occur without starting to impact properties on the south side of Harmony Road. The realignment has been designed to balance the roadway between existing buildings.

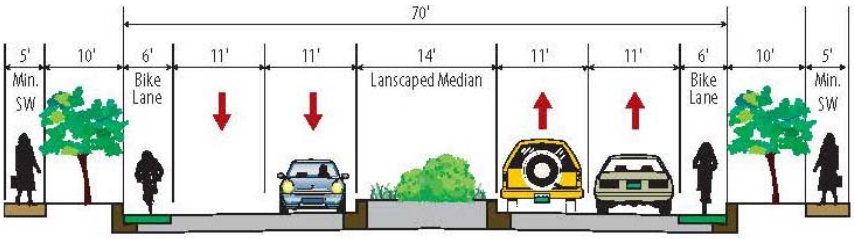
Additionally, some cross-sectional dimensions have been modified to limit these impacts. Eastbound and westbound travel lanes have been reduced to an 11' width, with the eastbound and westbound left turn lanes being reduced to 10'.

During the preliminary design process, ROW data that is more detailed than what was used for this project should be obtained and verified so that the realignment of Harmony Road can be minimized to the extent possible to limit impacts to adjoining property owners and to still provide a roadway cross-section that meets the needs of the traveling public.

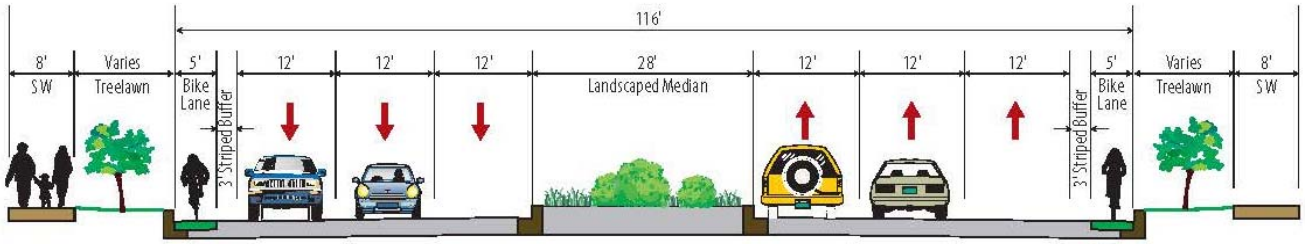
Cost Estimates

The typical cross-sections for two primary segments of the Harmony Road corridor are represented on Figure 22. These typical cross-sections represent the basic intent of each segment of the project corridor, recognizing that minor modifications may need to be made during the preliminary design phase for special circumstances.

Figure 22. LPA Typical Mid-Block Cross-Sections



West of College Avenue



East of College Avenue

These typical cross-sections were used to develop the conceptual roadway design plans shown in **Appendix H**. Project costs were estimated by quantifying major roadway design elements such as curb & gutter, asphalt, material removals, traffic signalization, landscaping, etc. Additional items that affect project costs, but that cannot be quantified at this time are added to the estimates on a percentage of construction cost basis. Detailed project cost estimates for eight project segments are included in **Appendix H**. The eight estimates are summarized in the following eight segments:

1. Shields Street to the east side of College Avenue
2. East side of College Avenue to the west side of Lemay Avenue
3. Lemay Avenue intersection (queue jump location)
4. East side of Lemay Avenue to the west side of Timberline Road
5. Timberline Road intersection (queue jump location)
6. East side of Timberline Road to west side of Ziegler Road
7. Ziegler Road intersection (queue jump location)
8. East side of Ziegler Road to I-25

There is a benefit to the City's planning process to summarize project costs in a different manner, however. For example, the City may choose to install certain project elements over several segments, but without completing all design elements in that segment. As such, project costs are summarized below in the four main travel mode categories: 1) roadway, 2) bike, 3) pedestrian, and 4) transit. The information in **Table 6** summarizes these costs for the entire project corridor (rounded for planning purposes).

Table 6. Summary Project Costs by Travel Mode

Cost Estimate Elements	Approximate Quantity	Approximate Cost (2013 $)
Roadway		
Construction Elements (Minus Queue Jump Intersections)		
- Removals	Several Items & Unit Types	$ 83,000
- Earthwork	35,345 Cubic Yards	$ 495,000
- Asphalt	10,610 Tons	$ 1,198,000
- Curb & Gutter	65,200 Lineal Feet	$ 777,000
- Drainage	Percent Estimate	$ 631,000
- Utilities	Percent Estimate	$ 405,000
- Signing & Striping	Percent Estimate	$ 292,000
- Traffic Signalization	Varies by Intersection	$ 686,000
- Lighting	Percent Estimate	$ 584,000
- Construction Traffic Control	Percent Estimate	$ 1,460,000
Landscaped Medians	514,250 Square Feet	$ 4,688,000
Right-of-Way	10,000 Square Feet	$ 254,000
	Subtotal =	**$ 11,553,000**
Mobilization & Contingencies (32%)	Percent Estimate	$ 3,696,960
Design & Construction Engineering (14%)	Percent Estimate	$ 1,617,420
	Travel Mode Cost Estimate =	**$ 16,867,380**
Transit		
Queue Jump Intersections (Lemay, Timberline & Ziegler)	Numerous Items	$ 7,520,000
Stations & Stops	17 Stations; 18 Stops	$ 2,910,000
Buses	3	$ 2,505,000
	Subtotal =	**$ 12,935,000**
Mobilization & Contingencies (32%)	Percent Estimate (Not on Buses)	$ 3,337,600
Design & Construction Engineering (14%)	Percent Estimate (Not on Buses)	$ 1,460,200
	Travel Mode Cost Estimate =	**$ 17,732,800**
Bike		
Buffered Bike Lane	4 Miles	$ 80,000
Bike Lane w/o Buffer	6 Miles	$ 90,000
	Subtotal =	**$ 170,000**
Mobilization & Contingencies (32%)	Percent Estimate	$ 54,400
Design & Construction Engineering (14%)	Percent Estimate	$ 23,800
	Travel Mode Cost Estimate =	**$ 248,200**
Pedestrian		
Missing Sidewalk	13,650 Square Yard	$ 444,000
Grade Separations	6 Each	$ 12,000,000
	Subtotal =	**$ 12,444,000**
Mobilization & Contingencies (32%)	Percent Estimate	$ 3,982,080
Design & Construction Engineering (14%)	Percent Estimate	$ 1,742,160
	Travel Mode Cost Estimate =	**$ 18,168,240**
	TOTAL ESTIMATED PROJECT COST =	**$ 53,016,620**

5. Implementation Plan

Implementation of the Locally Preferred Alternative (LPA) can take several forms relative to the sequence of construction of the physical infrastructure and the introduction of the operational aspects of the Enhanced Bus service. Since it is not likely that the City can construct the entire LPA at one time, a phased implementation approach is recommended. The implementation plan is influenced by the needs of the bus service, lead time for vehicle purchases, and by the construction of roadway facilities to support the Enhanced Bus service.

Phasing Options

Three phasing options could be used to construct the physical elements of the LPA when considering the overall length of the project corridor, the differing roadway characteristics along the corridor, and the proposed cross-sectional elements of the LPA. These methods include a Segment-by-Segment Approach, a Congested Areas Approach, and a Sequential Corridor Element Approach. The three phasing options are described below.

Option 1: Segment-by-Segment Approach

The cross-sectional elements of the LPA can be constructed in a segment-by-segment, linear fashion. The City could chose to construct the LPA in this way to build upon the relatively recent roadway construction (and on upcoming construction) along Harmony Road that could construct the median, bike lane buffers, transit stations, etc. in pre-determined, one-mile (+/-) segments, potentially between major intersections. This approach has two basic advantages:

- All of the construction within a bounded segment can be completed at the same time, thereby limiting construction interruptions and overall construction time for the traveling public ("Is construction ever going to be finished?" factor)
- If constructed in a west to east manner, construction can be completed in the more densely populated areas first, followed by those segments that are more rural in nature regardless of the level of congestion that may exist in any one segment

Main Disadvantage: Beginning of the Enhanced Bus service relies on completion of construction in all corridor segments.

Potential Sequence Options if this Approach is Pursued

Option 1a: West to East Sequence – This option would construct the LPA beginning at Shields Street and proceed towards I-25. Beginning construction of the LPA in the segment from Shields Street to College Avenue has two benefits:

1) This segment has the least amount of new infrastructure required of any segment. As such, it would be the least expensive segment to construct (estimated as $4.8 million).
2) Construction issues related to the installation of the green, epoxy pavement marking for the bike lanes could be evaluated on the most western segment initially and the selection of this method for highlighting the bike lanes could be confirmed for the remainder of the corridor.

Construction of the remaining segments from College Avenue to Lemay, Lemay to Timberline, etc. can progress in approximate one-mile segments to address the LPA improvements in the more densely-populated areas of Fort Collins first.

Of note, while these segments are identified between major intersecting streets, construction should include each of the major intersections in any one segment so that the entire intersection is constructed at one time.

Option 1b: Least Expensive to Most Expensive Sequence – Under this option the City would begin with the least expensive segment (Shields Street to College Avenue again) and progress to the more expensive segments so that lessons learned during the construction process can be of value to the next segment. If this option is used, the progression of constructed segments would be:

Table 7. Potential Sequencing and Costs by Corridor Segment (Excluding Bus Costs)

Sequence	Corridor Segment	Approximate Cost
1	Shields Street to College Avenue	$4.83
2	Timberline Road to Ziegler Road[1]	$8.61M
3	College Avenue to Lemay Avenue	$10.10M
4	Lemay Avenue to Timberline Road[1]	$11.15M
5	Ziegler Road to I-25	$14.94M

[1] As noted in the LPA description, the Harmony Road/Timberline Road intersection is proposed to be realigned to the south to avoid the historic Harmony School. As such, construction at this intersection is likely the most expensive roadway component of the project. Sequence 2 and 4 could be interchangeable depending upon which segment the intersection reconstruction is coupled with.

Option 2: Congested Areas Approach

Corridor congestion is typically confined to, or influenced by, the operation of intersections. Traffic signals, for example, require vehicles for any one movement to stop so that another movement can have the opportunity to proceed through the intersection. This type of intersection traffic control inherently causes congestion and long vehicle queues during the peak travel times.

This approach would "fix" problem intersections first by constructing the 2035 LPA improvements so as to provide an optimal operating experience as quickly as possible. This approach would also be the opportunity to install the Enhanced Bus queue jump lanes, lanes that require additional roadway width at three critical intersections along Harmony Road: 1) Lemay Avenue, 2) Timberline Avenue, and 3) Ziegler Road.

Once construction is completed at the most congested locations, other improvements that are required between intersections could proceed. These enhancements would include all of the physical cross-sectional roadway needs and the operational components of the Enhanced Bus System.

Main Disadvantage: LPA construction is completed in a disjointed fashion.

Potential Sequence if this Approach is Pursued

- *Reconstruct Queue Jump Intersections* – Complete the reconstruction of the Lemay Avenue, Timberline Road (including realignment of Harmony Road to the south), and Ziegler Road intersections to include 2035 capacity improvements and the Enhanced Bus queue jump lanes as a necessary improvement for good Enhanced Bus service
- *Construct Bus Stations and Bus Stops* – Construct all of the proposed bus stations and stops. Construct ancillary improvements to provide good access to/from the stations and stops, i.e., complete the LPA sidewalk connections where necessary and construct the pedestrian grade-separations
- *Begin Enhanced Bus Operation* – Procure new/spare vehicles during construction completion of the bus stations and stops and begin operation of Enhanced Bus service

- *Improve Roadway Segments and Other Intersections* – Complete the LPA improvements along corridor segments based on projected 2035 daily traffic volumes. Improvements would include all cross-sectional elements such as roadway widening, medians, drainage facilities, bike lanes, channelizing islands, utility modifications, etc.:
  - Ziegler Road to I-25
  - Lemay Avenue to Timberline Road
  - Timberline Road to Ziegler Road
  - College Avenue to Lemay Avenue
  - Shields Street to College Avenue
- Apply green, epoxy pavement markings - installation of the green, epoxy pavement marking in the bike lanes would need to wait until at least several continuous segments have been constructed to reduce consistency confusion.

Option 3: Corridor Element Approach

A corridor element approach to implementing the LPA would construct certain corridor elements in a layered way so that the Enhanced Bus service could be implemented as quickly as possible while also providing amenities for other modal users before fully completing all of the roadway cross-sectional elements.

For example, the likely first step would be to construct the bus queue jump areas at the Lemay Avenue, Timberline Road (including realignment of Harmony Road to the south), and Ziegler Road intersections, followed by construction of all of the bus stations. These two improvements would allow the Enhanced Bus service to begin without requiring the installation of medians, the buffered bike lanes, or other roadway elements.

The benefit to this approach is that the Enhanced Bus system can become operational more quickly than other approaches since the Enhanced Bus system still uses typical general purpose lanes along Harmony Road.

Main Disadvantage: This approach would construct sequential elements over time throughout the entire corridor – motorists would be continually impacted by construction activities throughout the entire 5-mile project corridor, potentially over numerous years.

Potential Sequence if this Approach is Pursued

- *Reconstruct Queue Jump Intersections* – Complete the reconstruction of the Lemay Avenue, Timberline Road (including the realignment of Harmony Road), and Ziegler Road intersections to include 2035 capacity improvements and the Enhanced Bus queue jump lanes as a necessary improvement for good Enhanced Bus service
- *Construct Bus Stations and Bus Stops* – Construct all of the proposed bus stations and stops. Construct ancillary improvements to provide good access to/from the stations and stops, i.e., complete the LPA sidewalk connections where necessary and construct the pedestrian grade-separations
- *Begin Enhanced Bus Operation* – Procure new/spare vehicles during construction completion of the bus stations and stops and begin operation of Enhanced Bus service
- *Complete Cross-Sectional Elements* – Construct the remaining roadway cross-sectional elements such as any roadway widening, medians, drainage facilities, bike lanes, channelizing islands, utility modifications, etc.; include side street improvements
- *Install green, epoxy pavement marking* – Apply green epoxy in bike lanes as a last construction item for consistency purposes

Implementation Considerations

Each of the phasing options described above are influenced by other factors that are described in the following sections.

LPA Design

It is recommended that the City design the entire corridor to ensure that each phase fits appropriately within the context of the entire project. This will help to minimize or ideally avoid reconstruction in later phases. While completing design for the entire corridor will require a reasonably sized budget outlay at the beginning, it will pay benefits throughout the life of the LPA construction by having a designed roadway for the ultimate LPA system. The initial design efforts could also include an initial phase or two that could be part of the first construction bidding package(s). Considerations when completing design are described below.

ROW Impacts

One of the benefits of completing the design of the entire LPA first (rather than designing in segments) is that all of the ROW impacts can be verified at the start of the project. The ROW acquisition process can then begin early in the project and help the project move forward in a timelier manner including preservation of ROW on properties that are currently undeveloped.

Identifying ROW acquisitions during the initial design does not mean that all of the ROW would need to be purchased at the same time, however. Properties could still be purchased when needed.

Environmental Inventory and Mitigation

Another benefit to completing the design of the entire corridor at one time is that environmental resources can be inventoried and impacts identified. Impacted areas can be further analyzed during the design process to minimize, avoid, and mitigate impacts as feasible. If federal funding is obtained for any part of the corridor at any time, there would be benefits to having all of the environmental resources inventoried, and impacts and mitigation understood so that the construction process can move forward smoothly regardless of the phasing or timing of the improvements. If the project phases begin to stretch over quite a few years, it is likely that only an update to the environmental documentation would be required. Once again, there should be benefits to the City in conducting these investigations up front and on a larger scale than in a piecemeal fashion for any number of project phases.

Utility Impacts

Completing the design of the entire LPA would enable the City to identify all utility impacts associated with the LPA. Since some utilities are very longitudinal in nature and are not confined to any one segment of the corridor, having a plan in place to modify or relocate utilities where necessary will provide long-range benefits to the project related to timing, coordination and cost implications. Discussions with irrigation companies related to realignment or enclosure of existing ditches can begin early in the project to help reduce delays.

Enhanced Bus Implementation

The implementation of Enhanced Bus service along Harmony Road will require several steps beyond the construction of the physical roadway elements:

Finalize the Operating Plan and Vehicle Type

Transfort has not yet determined whether Harmony Road service will be operated as an extension of MAX BRT service or as a separate route and, if it will operate as a separate route, whether it would have a unique identity. Whether service is operated as an extension of the MAX BRT service or as a separate route, three new buses will be required. Additionally, a spare bus will be required unless Transfort's existing spare ratio is sufficient to cover the needs of Harmony Road service. The decision on whether or not to brand the Harmony Road service uniquely could have an impact on the type of vehicle that is used and, as a result, this decision will need to be made before the procurement of new vehicles can begin.

Procure Vehicles

Vehicle acquisition can take up to 24 months for regular transit buses, and sometimes longer for more specialized BRT vehicles. However, the acquisition timeline can possibly be shortened if Transfort can piggy-back onto an existing order – either one of its own (of MAX BRT vehicles for example), or that of another transit provider. Because of the time required, vehicle procurement activities should start as quickly as possible after the operating plan and vehicle type have been determined and funding commitments have been secured.

Develop Schedules and Broadcast Public Information

Transfort will need to develop public timetables as well as driver and vehicle schedules. This could be done concurrently with Transfort's regular service change process, with service most likely implemented as part of a regular schedule change. Public information (schedule brochures, and updated system map, etc.) will also need to be updated.

Develop and Implement Marketing Plan for the New Service

In the months leading up to implementation, Transfort will also need to develop a marketing plan for the new service – one that can begin with basic information once funding has been secured, followed by a buildup to higher levels of information as the implementation date draws nearer.

Transit-Oriented Development Overlay District Creation

The City may consider the development of an overlay district for the Harmony Road corridor to facilitate the types of development and redevelopment that will both benefit and drive the success of the Enhanced Bus system.

Recommended Implementation Plan

The preceding sections outlined several project implementation approaches as well as considerations that influence the overall procedure, design, procurement, and construction sequence to construct and operate the recommended LPA

This section synthesizes the information in the preceding sections into a recommended implementation plan. More detail on the implementation plan is included in **Table 8**, but in general, the overarching approach can be summarized as a division of the LPA into Immediate, Short-Term, and Long-Range projects, a division that recognizes the most important desires of the community, and one that strives to limit throw-away project costs.

The improvements needed to realize the LPA likely cannot be constructed at the same time. As such, an implementation plan has been developed to minimize throw-away costs, expedite high priority improvements, and advance the capital projects needed to begin Enhanced Bus service. The City should work with private development when possible to preserve ROW, construct missing sidewalks, install bus shelters and amenities, etc., that are adjacent to the development.

The following table summarizes the recommended implementation plan (which generally follows Options 1 & 3, i.e., partially layered, partially sequential) in Immediate, Short-Term and Long-Range timeframes. A description of the plan element, the responsible party, and the approximate cost for the individual elements are included for each of these timeframes.

Table 8. Recommended Implementation Plan

Locally Preferred Alternative Element & Description	Responsible Party	Approximate Cost
Immediate Improvements		
LPA Design • Complete the design of vehicle, pedestrian and bicycle elements • Conduct environmental resource inventory; develop mitigation plans for impacted areas • Identify ROW impacts; prepare ROW plans; start ROW acquisition process • Identify public and private utility conflicts; prepare modification plans	Engineering and Transfort with Consultant Assistance	$3.50M (8% of estimated total project cost)
Finalize the Operating Plan & Determine Vehicle Type and other Requirements	Transfort	Completed by Transfort staff
Create a Transit-Oriented Development Overlay District	FC Moves/ Planning Services	Completed by FC Moves & Planning Services staffs
Revise corridor striping to create the bike lane buffer; install green epoxy paint in bike lanes	Engineering	$0.24M
Construct missing sidewalks and neighborhood connections	Engineering	$0.61M

Locally Preferred Alternative Element & Description	Responsible Party	Approximate Cost
Construct landscaped medians	Engineering	$6.47M
Construct Mason Trail and Power Trail pedestrian grade-separations	Engineering	$5.52M
Short-Term Improvements		
Identify and Secure Funding for Vehicle Procurement; Begin Process to Procure Vehicles	Transfort	Completed by Transfort Staff
Develop Enhanced Bus Operating Schedules and Begin Public Information Program	Transfort	Completed by Transfort Staff
Reconstruct the Lemay Avenue, Timberline Road (including realignment of Harmony Road to the south), and Ziegler Road intersections to include 2035 capacity improvements and Enhanced Bus queue jump lanes	Engineering	Lemay Avenue Intersection: $3.00M Timberline Road Intersection: $4.01M Ziegler Road Intersection: $2.51M
Construct the Bus Stations and Bus Stops	Engineering	$4.02M
Finalize and Implement the Marketing Plan for the Enhanced Bus Service	Transfort with Consultant Assistance	Completed by Transfort Staff
Purchase necessary buses	Transfort	$2.51M
Begin Enhanced Bus Service		
Long-Range Improvements		
Construct remaining roadway cross-sectional elements sequentially in a west to east manner. Major design elements would include: • Roadway widening or narrower to match the LPA cross-sections (including irrigation ditch enclosures where needed) • Intersection capacity improvements including channelizing islands • Traffic signal modifications • Drainage modifications or new systems • Utility modifications	Engineering	$9.47M
Construct remaining pedestrian grade-separations at: • Between Boardwalk Drive and Lemay Avenue • Adjacent University of Colorado Health Harmony Campus • Fossil Creek Reservoir Inlet • Harmony Transfer Center	Engineering	$11.04M

Funding Strategies

Funds for multimodal projects such as the Harmony Road ETC can be provided through a variety of sources which typically consist of a combination of federal, state, and local public funds, and sometimes non-governmental funds. The following sections describe funding sources that could potentially be used to fund Harmony Road infrastructure improvements and Enhanced Bus service.

Federal Funding

With Harmony Road designated as a Regionally Significant Corridor (RSC) by the NFRMPO, projects along the corridor are potentially eligible to receive federal funding through the MPO.

Congestion Mitigation Air Quality Funds (CMAQ)

The CMAQ program, which is jointly administered by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), provides funding to State DOTs, MPOs, and transit agencies to invest in projects that reduce air pollution in areas that do not meet the National Ambient Air Quality Standards (nonattainment areas), which includes Fort Collins. CMAQ funds can be used for a wide variety of transit uses, including programs to improve public transit, High Occupancy Vehicle (HOV) facilities, Employee Trip Reduction (ETR) programs, traffic–flow improvements that reduce emissions, bicycle/pedestrian facilities, park-and-ride facilities, and programs to restrict vehicle use in areas of emission concentration. CMAQ funds can be used for up to 88.5% of capital costs. In the Fort Collins area, CMAQ funds are allocated by NFRMPO, and projects prioritized based on the reductions in ozone that they would produce. For FY 2012 to 2015, NFRMPO has programmed a total of $8.4 million in CMAQ funding.

Transportation Alternatives Program (TAP)

FHWA's Transportation Alternatives Program (TAP) provides funding for programs and projects defined as transportation alternatives, including bicycle and pedestrian facilities, infrastructure projects to improve non-driving access to public transportation, environmental mitigation, recreational trails, and safe routes to school projects. TAP was authorized under MAP-21; its predecessor was the Transportation Enhancements program.

FHWA Transportation Mobility Program Funds

The Federal Highway Administration's Transportation Mobility Program (TMP), which replaced the former Surface Transportation Program (STP), is a "flexible funding" source that allows states to shift up to 20% of its TMP funds to other uses, including the FTA funding programs described above. In Colorado, CDOT, which administers state highway spending, determines the amount of funds to be "flexed" to other uses.

FTA Funds

Since the passage of MAP-21, the major sources of urban federal transit funding for bus services are:[5]

- FTA Section 5307 Urbanized Area Formula Grants
- FTA Section 5309 New Starts Program
- Congestion Mitigation Air Quality Funds (CMAQ)
- FHWA Transportation Mobility Program (TMP)

[5] One key element of these new programs is that there is not an equivalent to the former FTA Section 5309 Buses and Bus-Related Equipment and Facilities program through which Congress historically earmarked funds for a variety of projects including Enhanced Bus services.

FTA Section 5307 Urban Area Formula Funds

FTA Section 5307 provides funding for transit capital and transportation-related planning, and for smaller transit systems such as Transfort, operating assistance. In urbanized areas with populations of 200,000 or more, which includes the Fort Collins/Loveland urbanized area, these funds are apportioned by a formula based on a number of population and service-based factors.

Transfort currently receives 5307 funds, and will continue to receive them with or without Harmony Road Enhanced Bus service.[6] Thus, while FTA Section 5307 funds could be used to develop Harmony Road service, they would not represent a new source of funding.

FTA Section 5309 New Starts Funds

The FTA Section 5309 New Starts Program includes "Small Starts" and "Very Small Starts" components that can be used to fund smaller scale BRT and Enhanced Bus projects (Small Starts funding is the largest source of funding for MAX service). However, there are a number of eligibility requirements for each program, as listed to the right. Harmony Road Enhanced Bus service would fail to meet the eligibility requirement in a number of respects (minimum ridership, minimum service frequencies, unique branding, and/or transit signal priority), and, thus, would not be eligible for funding under either of these programs.

Very Small Starts Eligibility Requirements:

- Transit Stations
- Signal Priority/Pre-emption (for Bus/LRT)
- Low Floor / Level Boarding Vehicles
- Special Branding of Service
- Frequent Service - 10 min peak/15 min off peak
- Service offered at least 14 hours per day
- Existing corridor ridership exceeding 3,000/day
- Less than $50 million total cost
- Less than $3 million per mile (excluding vehicles)

Small Starts Eligibility Requirements:

- Substantial Transit Stations
- Signal Priority/Pre-emption (for Bus/LRT)
- Low Floor / Level Boarding Vehicles
- Special Branding of Service
- Frequent Service - 10 min peak/15 min off peak
- Service offered at least 14 hours per day

State Funding

Currently, the only source of state transit funding is the "Funding Advancement for Surface Transportation and Economic Recovery (FASTER) program. This program provides funding for transportation projects through vehicle registration fees, with a portion is set aside for transit purposes:

- A Local share for "local transit grants"
- A Statewide share to be used "for the planning, designing, engineering, acquisition, installation, construction, repair, reconstruction, maintenance, operation, or administration of transit-related projects, including, but not limited to, designated bicycle or pedestrian lanes of highway and infrastructure needed to integrate different transportation modes within a multimodal transportation system, that enhance the safety of state highways for transit users"

These funds can be used for any items defined as capital expenses by the FTA, which would include all capital elements of Harmony Road Enhanced Bus service, and can fund up to 80% of a project's total cost. For FY 2014 and 2015, CDOT anticipates being able to offer $5 million for local transit projects and approximately $9 million for statewide and interregional projects.

[6] Since these funds are allocated based on a formula that includes the amount of service provided, the development of new service would result in an increase in FTA Section 5307 funds. However, the increase would be relatively small and would represent the proportional increase in Transfort service versus the rest of the country.

Senate Bill 48 may provide another funding opportunity. This bill, which was signed into law in April 2013, enables cities and counties to flex Highway Users Tax Fund (HUTF) dollars to transit, multi-modal, bicycle and pedestrian projects. The HUTF is funded through revenues raised from statewide gas tax, vehicle registration fees, license fees and user fees. Historically these funds have been restricted to highway projects. With the passage of the FASTER legislation in 2009, CDOT was authorized to expend HUTF revenues on transit and other multi-modal investments. This bill amends the original HUTF language to provide cities and counties the same flexibility to spend HUTF dollars on transit and other multi-modal projects.

Local Sources

Throughout Colorado, local funds provide the major source of funding for capital infrastructure as well as transit operations. This is the case in Fort Collins, where the City provides approximately 70% of Transfort's operating expenses, and will provide over $7 million in local funding toward the capital costs of MAX service. In a similar manner, and unless new sources of funds are developed, it is likely that the City would need to provide most of the funding for operations, plus a local contribution to capital costs.

New Sources

As part of the development of its Strategic Operating Plan, Transfort identified a number of potential new funding sources, which included:

- A 0.1 to 0.25% dedicated sales tax
- An $8 Transit Utility Fee that would be assessed on all utility accounts
- A new (higher) negotiated fee with Associated Students of Colorado State University (ASCSU) and potentially with other partners
- A special assessment district in which a per household or square foot charge would be assessed on properties within a special improvement district "identified as receiving a direct and unique "benefit" from a public project," which would most likely include MAX BRT, but could also include Harmony Road

To date, the City has not moved forward on any of these proposals. However, if it were to do so, the additional revenues that would be generated could potential funds, at least in part, for both operating and capital costs for Harmony Road Enhanced Bus service.

Summary

As with most transportation improvement projects, it is likely that Harmony Road infrastructure improvements and Enhanced Bus service would need to be funded through a number of different sources. The most likely of these would be:

- **Federal**
  - Congestion Management and Air Quality (CMAQ) funds
  - Transportation Alternatives Program (TAP) funds
  - Transportation Mobility Program (TMP) funds
- **State**
  - FASTER funds
  - HUTF funds
- **Local**
  - Additional City General Funds

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