City of Greenwood Village

I-25 Corridor Transportation Improvement Study

August 10, 2009

GREENWOOD VILLAGE COLORADO

August 10, 2009

I-25 Corridor Transportation Improvement Study

Prepared For:

City of Greenwood Village
6060 S. Quebec Street
Greenwood Village, CO 80111

Tom Reiff, Project Manager
(303) 486-5748
treiff@greenwoodvillage.com

Prepared By:

Stantec Consulting Inc.
Chuck Huffine, PE, PTOE, AICP, Project Manager
(303) 758-4058
chuck.huffine@stantec.com

Stolfus & Associates, Inc.
Matt Brown, PE
(303) 221-2330
matt@stolfusandassociates.com

ACKNOWLEDGEMENTS

The City of Greenwood Village would like to acknowledge the efforts of the following individuals, who assisted in the development of this plan:

1. City of Greenwood Village
   A. Mayor and City Council Members
      i. Nancy Sharpe, Mayor
      ii. Denise Rose, District 1
      iii. Jerry Presley, District 1
      iv. Dave Kerber, District 2
      v. Jeff Roemer, District 2
      vi. Bette Todd, District 3
      vii. Gary Kramer, District 3
      viii. Gary Kleeman, District 4
      ix. Ron Rakowsky, District 4
   B. City Manager
      i. Jim Sanderson
   C. Project Staff
      i. George Weaver, Jr., Community Development Director
      ii. John Sheldon, Public Works Director
      iii. Derek Slack, City Engineer
      iv. Joy McGee, Planning Manager
      v. Steve Hebert, (Former) Planning Manager
      vi. Jeremy Hanak, Traffic Manager
      vii. Thomas Reiff, Land Use/Transportation Planner II, Project Manager
2. Consultants
   A. Stantec Consulting Services Inc.
      i. Bob Sakaguchi, PE, Project Principal
      ii. Chuck Huffine, PE, PTOE, AICP, Project Manager
      iii. Rich Garcia, GISP, Project Planner
   B. Stolfus & Associates, Inc.
      i. Matt Brown, PE
      ii. Jeremy Colip
   C. All Traffic Data Services Inc.
      i. Eric Boivin

TABLE OF CONTENTS

1.0 Introduction 1

1.1 Purpose of the Study 1

1.2 Multi-Modal Network Planning Process 2

1.3 Corridor Trends 7

2.0 Existing Transportation Network and Operations 12

2.1 Network Inventory 12

2.2 Existing Traffic Volumes and Operations 14

2.3 Existing Transportation Demand Management (TDM) 19

2.4 Intelligent Transportation Systems (ITS) 19

3.0 Future Transportation Demand and Operations 30

3.1 Planning Horizon 30

3.2 2020 Transportation Network Demand 30

3.3 2020 Transportation Network Changes and Operations 33

3.4 Development of the Proposed Project List 36

4.0 Transportation Needs and Recommendations 42

4.1 Multi-Modal Needs and Recommendations 42

4.2 Summary of Multi-Modal Needs and Recommendations 50

4.3 Estimates of Probable Costs 50

4.4 Recommended Project Evaluation and Prioritization 51

5.0 Implementation 61

5.1 Total Estimated Capital Costs 61

5.2 Operations and Maintenance Costs 61

5.3 Current Revenue Sources 62

5.4 Potential Funding Sources 62

5.5 Implementation Strategies and Actions 67

6.0 Appendix 71

APPENDICES

Appendix A Recommended Improvement Projects .....A

Appendix B Estimates of Probable Costs .....B

Appendix C Prioritized Project Scoring Sheet..... C

Appendix D Summary Ranking Sheets for Roadway and Intersection Projects ..... D

Appendix E Existing Weighted Intersection Crash Rates .....E

Appendix F 2008 Existing Peak Hour Traffic Volumes (AM/PM).....F

Appendix G 2020 Future Peak Hour Traffic Volumes (AM/PM)..... G

LIST OF TABLES

Table 1: Study Area Socio-Economic Statistics 9

Table 2 – Characteristics of Intersection Level-of-Service (LOS) 17

Table 3 – Existing Level of Service (2008) with Current Signal Timings 18

Table 4 – Anticipated New Development (2005 through 2020) 31

Table 5: 2020 Level of Service with Existing Timings 34

Table 6 – 2020 Level of Service with Signal Timing Improvements 35

Table 7 – 2020 Level of Service with Capital and Signal Timing Improvements 44

Table 8 – Estimated Capital Needs 61

Table 9 - Potential Transportation Financing Tools 63

Table 10 – Recommended Strategies and Actions 68

LIST OF FIGURES

Figure 1 – Study Area 10

Figure 2 – I-25 Corridor Land Uses 11

Figure 3 – Street Network and Through Lanes (2008) 21

Figure 4 – Existing Medians (2008) 22

Figure 5 – Lane Assignments at Intersections – North 23

Figure 6 – Lane Assignments at Intersections – South 24

Figure 7 – Existing RTD Transit Service 25

Figure 8 – Existing Bicycle Facilities (2008) 26

Figure 9 – Existing Pedestrian Facilities (2008) 27

Figure 10 – Existing Level of Service (2008) 28

Figure 11 – Existing Traffic Signal System (2008) 29

Figure 12 – Study Area TAZ Boundaries 38

Figure 13 – Existing 2008 and 2020 Projected Traffic Volumes 39

Figure 14 – 2020 Level of Service with Current Signal Timing 40

Figure 15 – 2020 Level of Service with Improved Signal Timing 41

Figure 16 – 2020 Level of Service with Improved Signal Timings and Capital Improvements ... 55

Figure 17 – Recommended Roadway and Intersection Projects 56

Figure 18 – Recommended Bicycle Projects 57

Figure 19 – Recommended Pedestrian Projects 58

Figure 20 – Area-Wide/Multi-Jurisdictional Projects 59

Figure 21 – Roadway and Intersection Projects Inconsistent with Prior Policy Direction 60

1.0 Introduction

1.0 INTRODUCTION

1.1 Purpose of the Study

The *I-25 Corridor Transportation Improvement Study* is intended to serve as a 10-year action plan to improve accessibility and mobility in the I-25 corridor by identifying existing deficiencies and providing solutions to create a balanced transportation system. Figure 1(page 10) depicts the general study area. This study is designed to determine transportation improvement projects by identifying current and future transportation needs that the Village and its transportation partner agencies could undertake within the next 10 years to accommodate the projected transportation demand. These projects will be incorporated into the Village's Capital Improvement Program. The objective for the study is to achieve the goals and policies of the *Greenwood Village Comprehensive Plan, 2004*; the *2008 Comprehensive Plan amendments*; and *Greenwood Village Transportation Plan, 1998* for the study area. Based on these guiding documents, the objectives for the *I-25 Corridor Transportation Improvement Study* are:

- Mitigate the negative effects of traffic on neighborhoods, while promoting easy access to and from the Village's commercial areas.
- Promote Interstates 25 and 225, and public transit as the primary access ways to the commercial areas of the Village and discourage traffic in residential areas.
- Encourage all employers to promote alternative transportation systems which reduce air pollution.
- Support public transit and carpooling in the area and facilitate bicycling and walking.
- Accommodate anticipated commercial development by facilitating commercial traffic flow along arterial streets, supported by other means of transportation.

- Provide for integration of multiple modes of transportation at transportation centers, such as the Arapahoe park-n-Ride and light rail station, and the Orchard light rail station.
- Work with regional agencies and neighboring jurisdictions to maintain and improve the ability of the regional transportation network to accommodate regional mobility needs of area workers, residents and visitors.
- Provide numerous, safe, and convenient connections to the Village's comprehensive trail and sidewalk system.

- Develop continuous, lighted pedestrian walkways and bicycle paths in the form of sidewalks and trails to connect focal points of pedestrian activity, such as the Arapahoe Light Rail Station and other transit stops, street crossings, public plazas and parks, building entry points, and parking areas.
- Encourage bicycle opportunities in the study area by providing bicycle facilities, including lockers or racks, within well-lighted, well-signed, highly visible areas that are close to the light rail stations and other concentrated areas of activity. Provide on-street and off-street bicycle lanes and paths that are safe and visible and that provide connections to uses throughout the area.

Although Arapahoe Road (east from Yosemite St., including the I-25 interchange) is within the study area, it was not included as part of this analysis because it was addressed in the recent Arapahoe Road Corridor Study, completed in 2007. Instead of duplicating planning efforts, this study takes into account the proposed improvements identified in the Arapahoe Road Corridor Study and incorporates them into the area wide and multi-jurisdictional project list. Furthermore, the Belleview Avenue corridor (Monaco to DTC Blvd), including the I-25 interchange, was also not part of this study because a separate multi-jurisdictional planning study is being pursued. However, this I-25 Corridor Transportation Improvement Study does recognize that improvements to the Belleview Avenue corridor and I-25 interchange are needed. Both the Arapahoe Road and Belleview Avenue corridor projects have been added to the area-wide and multi-jurisdictional project lists in Appendix A.

1.2 Multi-Modal Network Planning Process

The I-25 Corridor and surrounding area has been analyzed by various planning efforts over the past decade. This section briefly describes each plan and issues identified during the planning efforts. The following completed studies provided guidance regarding the transportation planning history of the study area and provided valuable input to this study.

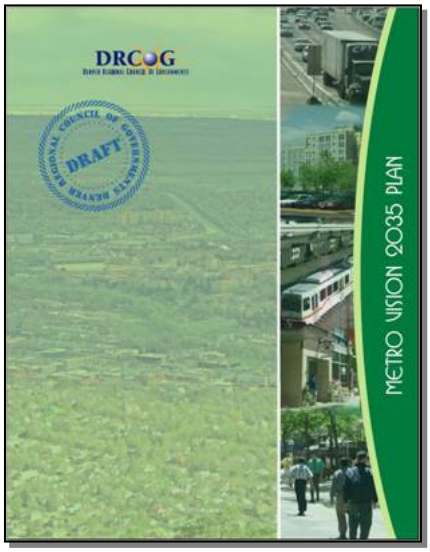
Greenwood Village Comprehensive Plan, 2004 (City of Greenwood Village)

According the *Greenwood Village Comprehensive Plan*, the concept of the Corridor Planning Area is to design and develop a mix of commercial, institutional, residential and open public gathering spaces that will help create a unique Village identity. Some of the goals and objectives set forth in this plan pertain to establishing a complete, easily accessible transportation system for all potential users. This includes providing safe and well connected pedestrian facilities, bicycle linkages throughout the planning area, and minimizing vehicular traffic on the periphery. Moreover, the Plan calls for the integration of multiple modes of transportation at transportation centers, such as the Village Center hub.

In 2008, the City Council amended the Comprehensive Plan for the I-25 Corridor Planning Area. Issues discussed in the amendment that affect this study include:

- Defining the I-25 Corridor, Village Center and Orchard Station planning areas
- Fiscal impacts relating to the planning areas
- Assessment and mitigation of street and traffic impacts
- Land use planning, especially relating to residential development by limiting future homes to the Orchard Station planning areas.

Metro Vision 2035 Plan, 2007 (Denver Regional Council of Governments -DRCOG)

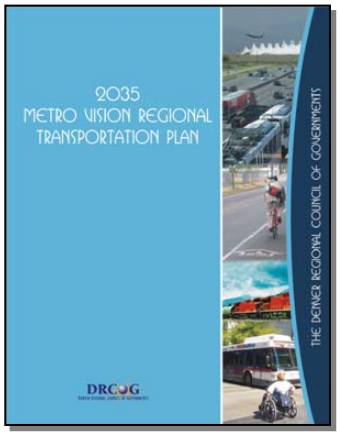


Metro Vision 2035 Plan is a regional long-range plan to manage growth within the Denver metro area. There are three main components of the plan: 1) growth and development; 2) environment; and 3) transportation. Key plan elements include urban centers, senior friendly development, free standing communities, water and air quality, open space, regional transit and roadway system, and transportation funding. Because of this study's location in an urban center and proximity to the Regional Transportation District (RTD) southeast light rail line, it will be affected by implementation of the goals set forth in the *Metro Vision 2035 Plan*. The plan aims for a balanced transportation system that moves people and goods efficiently, by incorporating bus and rapid transit, bicycle and pedestrians facilities, and reducing congestion at key locations in the metro area. In addition, RTD's system of timed transfer points known as FastConnects will enable convenient bus-to-bus, bus-to-rail and rail-to-bus transfers. Two key congestion points in Greenwood Village recognized in the plan are the I-25 and Belleview Avenue interchange and the Arapahoe Road corridor, including the I-25 interchange. *Metro Vision 2035 Plan* calls for improved and increased pedestrian and bicycle facilities, such as

- Continuous sidewalks
- Appropriate intersection treatments including crosswalk markings, pedestrian signal indicators, signal actuation and road narrowing techniques
- Multipurpose trails (off-street "bike paths")
- Bicycle lanes--exclusive on-street and bicycle signal actuation
- Paved shoulders and wide curb lanes

Key connections such as cul-de-sac cut-through paths and straightforward connections through developments to building entrances overpasses and underpasses should be established.

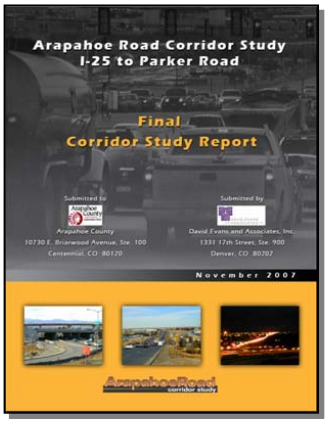
Metro Vision 2035 Regional Transportation Plan, 2007 (DRCOG)



The *Regional Transportation Plan (RTP)* is a sub plan to *Metro Vision 2035 Plan* and is consistent in goals and policies set out for each of the elements in Metro Vision. It is based on the foundation that transportation interacts closely with growth, development, and environmental elements. It provides more detail on the steps for implementing Metro Vision's transportation element.

The plan anticipates that an increase in the region's population and employment will occur within the urban growth boundary area. Because growth will occur in locations further from the Denver Central Business District (CBD), the average length of trips made in the future will likely increase. This will place greater demands on the transportation system along the I-25 corridor, and in urban employment centers such as the Denver Technology Center (DTC) and Greenwood Plaza areas.

Arapahoe Road Corridor Study, 2007 (Arapahoe County)



This study determined needed improvements on Arapahoe Road from Parker Road to Yosemite Street. The base recommendation was for widening to six lanes, with various auxiliary lanes at at-grade signalized intersections. Interchange grade separations were recommended at Havana Street, Revere Parkway, and Jordan Road. Right-turn auxiliary lanes were consistently proposed at all intersecting streets and private drives. Corridor safety improvement recommendations included reducing the corridor speed limit and providing consistency in design elements. The plan recommended enhanced streetscape improvements consistent with a developed suburban arterial roadway that corresponded to the Corridor Vision.

Moreover, the *Arapahoe Road Corridor Study* and the subsequent Arapahoe Road / I-25 Interchange System Level Feasibility Study conducted a detailed traffic analysis of the I-25 / Arapahoe Road interchange under current and future traffic conditions. A recommended interchange design and improvements were identified. Improvements to the interchange include the following:

- Reconstruct the I-25 bridge over Arapahoe Road and widen Arapahoe Road to six through lanes under I-25
- Provide a westbound right turn lane at Arapahoe Rd. and Yosemite St.
- Close the intersection of Yosemite Court and Arapahoe Road.
- Improve highway signage and traffic signal timing
- Extend Costilla Avenue under I-25 to Yosemite Street.
- Add a northbound left turn lane at Yosemite Street and Arapahoe Road

Southeast Light Rail Pedestrian Accessibility Study, 2005 (Southeast Urban Corridor Steering Committee)

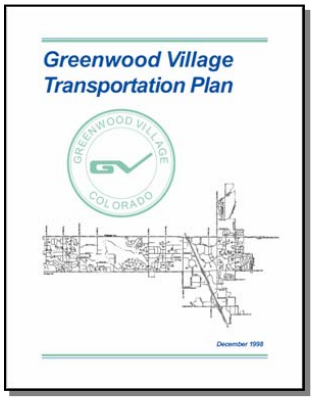
The study identified pedestrian improvement projects along the southeast light rail corridor, including in the vicinity of the Belleview, Orchard and Arapahoe LRT stations. Eleven pedestrian and bike pathways were identified as high priority for improvement or implementation, including Caley Avenue, Peakview Avenue, Greenwood Plaza Boulevard, Yosemite Street, and DTC Parkway. Gaps in connectivity or lack of sidewalks were identified around the Arapahoe at Village Center station and the Orchard station. Streets lacking sidewalks are Greenwood Plaza Boulevard, Caley Avenue, Willow Drive and Syracuse Street.

Arapahoe County Transportation Plan, December, 2001 (Arapahoe County)

Arapahoe County completed the transportation plan in 2001, which accounted for all parts of the county including Greenwood Village and the I-25 corridor study area. The planning horizon for the plan is year 2020. The Plan identified transportation goals and objectives for the county. It inventoried existing conditions for roadways, transit, bike and pedestrian facilities. A level of service (LOS) threshold for various locales in the county was created. For urban core areas, such as the Denver Technology Center, the threshold LOS was established at LOS E for peak hour and LOS D for non-peak hours. Future transportation demand was forecasted to determine future needs and practical needs based on physical, economic and social constraints. According to the plan, future needs identified for the I-25 corridor study area include:

- Add two lanes to Arapahoe Road east of I-25
- I-25 interchange improvements at Belleview Ave. and Arapahoe Road
- Various transit improvements, including bus priority signalization, call-n-Ride service, and amenities such as sidewalks, benches, shelters, and lighting at transit stops.
- Various bike and pedestrian improvements along Belleview Avenue, Orchard Road, and other travel corridors.
- Install and upgrade various Intelligent Transportation System technologies, such as video detection at key intersections, synchronized traffic signals along regional corridors, and installation of display devices at transit stops to provide riders with real time information.
- Transportation Demand Management (TDM) improvements include mixing land uses, accommodating bikes and pedestrians in street design, and coordinating with transportation management associations that support and manage TDM programs.

Greenwood Village Transportation Plan, 1998 (City of Greenwood Village)



The 1998 transportation plan analyzed the Village's entire transportation system. It reviewed roadways, transit, bike and pedestrian facilities, and neighborhood traffic calming issues. The plan also set transportation goals and policies for the Village. Issues and improvement options presented in this pre-T-REX plan include:

- Increase elements that will allow for better access to the major street system from local neighborhood streets.
- Improve existing on-street bicycle facilities, sidewalks and paths adjacent to streets and off-street trails.
- Improve minor arterial and collector level (village level) streets such as implementation of additional through lanes, major intersection improvements and/or signal timing improvements.
- Provide Traffic System Management solutions aimed at improving the function of existing facilities.
- Improve major arterials or regional roadways such as additional through lanes, auxiliary lanes or special lane designations such as high occupancy vehicle (HOV) lanes.
- Improve RTD bus service serving the newly built southeast light rail line.
- Implement mixed land use development that includes residential uses surrounding central office development, targeted retail and recreational uses.

Southeast Multimodal Transportation Evaluation, 1995 (Southeast Multimodal Transportation Group)

This study examined transportation issues in the DTC area. The recommended improvements in this pre-T-REX study addressed roadways, transit, sidewalks, bicycle facilities, and street lighting. Recommendations for roadways included capital expenditure projects, which deal with the addition of lanes or completely new facilities. An improvement of traffic signal synchronization was recommended for certain areas of the study. The study also recommended better intergovernmental agreements to be established. Recommendations for transit pertained to rail/HOV lanes, bus routes and stops, and amenities. Some of these recommendations were addressed during T-REX construction.

Greenwood Village Parks, Trails, and Open Space Master Plan Update, DRAFT (City of Greenwood Village)

This draft planning document will help Greenwood Village ensure that development plans include the creation of urban outdoor spaces. Parks, trails, and open space will play a major role in achieving the long range vision for this planning area. Strategies to obtain the vision include promoting walking, biking, and transit use by improving the physical environment. This plan calls for the Village to promote a "Bicycle Friendly" community through the addition of bike facilities, such as bike lockers/racks, trail connections and signage, and grade separated crossings.

Mediated Transportation Agreement (Four Corners Agreement) (City of Greenwood Village, Arapahoe County, City of Aurora, and the Joint Southeast Public Improvement Association)

Agreed to in 1997 by the partnering agencies or association, the Four Corners Agreement identified future transportation improvements to ease congestion and improve the quality of life for their respective constituencies. Transportation improvements include the Parker Road and Arapahoe Road intersection, I-225/Parker Road interchange, Peakview and Caley Avenue alignments (serpentine road concept), Union and Dayton Street area, I-25/Arapahoe Road interchange, I-25/I-225 interchange, closure of Jordan Road, and the development of light rail along the I-25 corridor.

Greenwood Village Traffic and Safety Study, CDOT, December, 2006

This study provided safety assessments for streets that are not on the State or Federal Highway System, based on the Colorado Revised Statutes (CRS), the Manual on Uniform Traffic Control Devices – 2003 Edition (MUTCD), and other documents. The report examined the following issues: crash history, obstacles, parking, pavement markings, signing, speed zoning, traffic flow, school zones, and additional areas of concern. In recent years, the Village has implemented many of the report's recommendations including protected left-turn phasing for the eastbound to northbound left-turn at Belleview Avenue and Yosemite Street.

1.3 Corridor Trends

The I-25 Corridor Planning area and the Arapahoe Road Planning areas serve as the primary gateways into the Village from I-25 and Arapahoe Road. The study area is currently undergoing a period of increased development and population influx partially attributable to the recent transportation improvements, such as the construction of the RTD Southeast Corridor light rail system.

1.3.1 Land Use

The area is dominated by commercial zones, such as the DTC and Greenwood Plaza area, which consists primarily of office uses. Along Arapahoe Road, the predominant land use is retail/commercial. Other existing land uses include small pockets of multi-family and single family residential, and mixed use areas that integrate residential and commercial. There are few parks within the study area (see Figure 2, page 11).

The Village's vision for the study area is to have a mix of commercial, institutional or civic, residential, and park/open space areas that define the village identity. Future mixed use development will primarily occur in the Village Center. This area will account for the majority of growth in the study area. Other areas expecting growth include the undeveloped parcels in the DTC, redevelopment of outdated office buildings around the Orchard light rail station, and smaller infill projects throughout the study area.

1.3.2 Socio-Economics

Housing and population trends within the I-25 Corridor study area have affected the Village's regional census statistics, especially in terms of employment. As described in the Village's 2004 Comprehensive Plan, the economic expansion during the 1990s brought thousands of new jobs to the Village. According to DRCOG employment statistics, new and expanding businesses are located primarily in the major office parks along the southeast I-25 corridor. In 1997, total employment for the area was 41,016. Between 1997 and 2005 during the T-REX construction (2001 – 2005) and the 2001 recession, the area increased in overall jobs to roughly 45,000. Future projections anticipate a steady increase in job growth over the next 10 years as the Village Center and infill projects develop. By Year 2020, roughly 57,000 jobs are projected within the study area.

The number of households in the I-25 corridor study area increased from 736 in 1997 to 2,088 in 2005. The most predominant housing type in 2005 was multi-family, making up over 2/3 of the homes. Within the I-25 corridor study area, the predominant land use is business mixed use, with residential on the outlying boundaries. By 2020, the number of households is projected to reach 3,528.

As with employment and housing, the population of the I-25 corridor study area grew from 1997 to 2005. The number of residents increased over 150% from 1,331 in 1997 to 3,357 in 2005. Population within the study area will continue to experience future growth as the Landmark and European Village residences, as well as homes within the Village Center, are constructed. Population is expected to increase to 6,465 by year 2020.

Table 1: Study Area Socio-Economic Statistics

I-25 CORRIDOR			
	1997	2005	2020
Households	736	2,088	3,528
% Change	~	184%	73%
Population	1,331	3,357	6,465
% Change	~	152%	93%
Jobs	41,016	45,716	57,359
% Change	~	11%	25%
Sources: Revised DRCOG TAZ data			

1.3.3 Development Patterns

Transit-supportive development has affected the land use, demographics, and transportation characteristics of the I-25 Corridor since the construction of the southeast light rail corridor. Common to major transportation development projects that span multiple municipalities, the T-REX project greatly influenced future trends of population, housing, and employment. Greenwood Village is currently experiencing these effects. Changes to the area include:

- A regional urban center containing a mixture of uses in close proximity of one another, including office, compact residential developments, and retail uses.
- An increased importance of walkability
- Integration of transit-supportive design elements within the Village Center and other corridor developments
- RTD bus routes that serve as collectors to the light rail transit system.
- More bicycle- and pedestrian-friendly design elements and facilities.

Figure 1 – Study Area

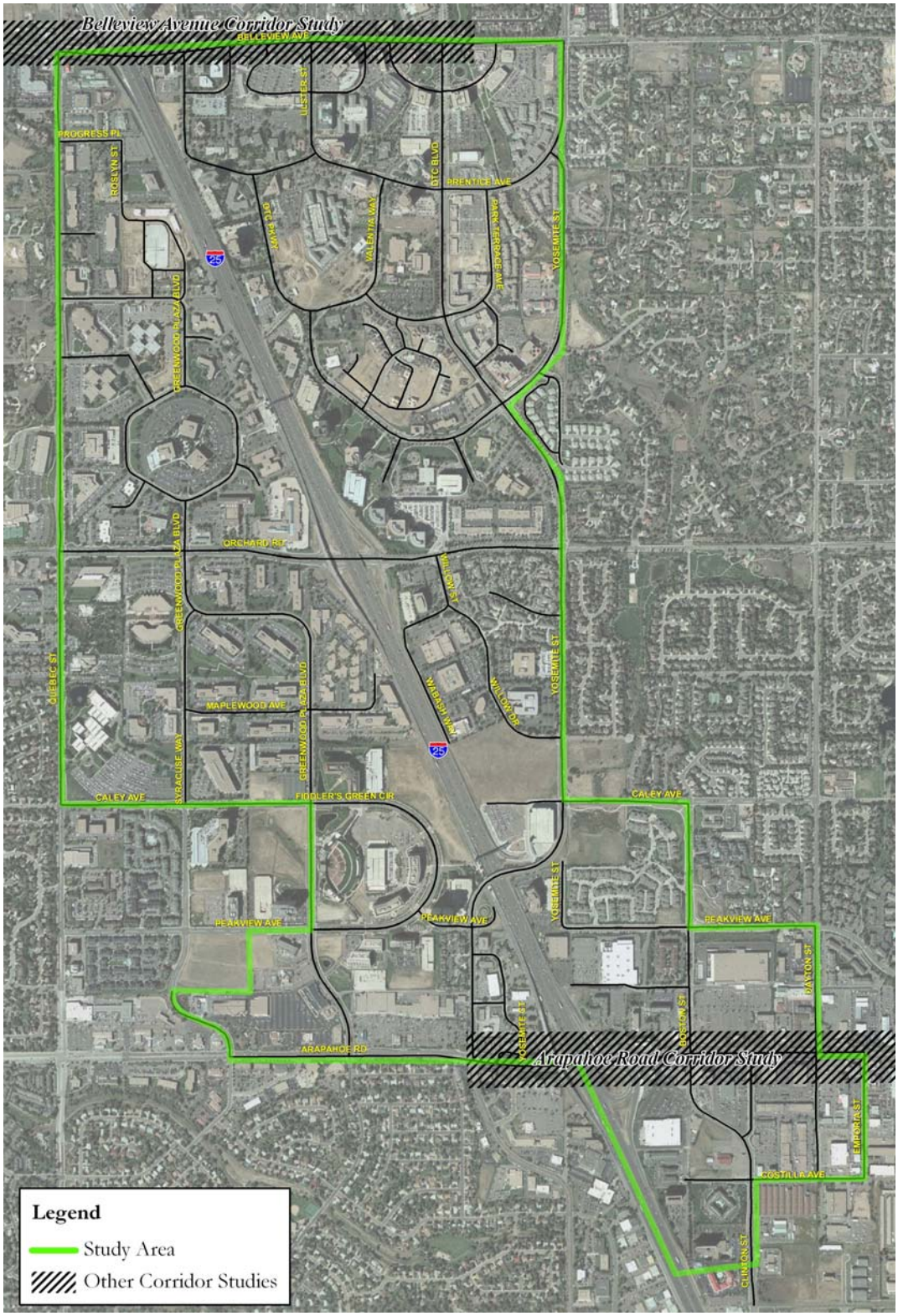
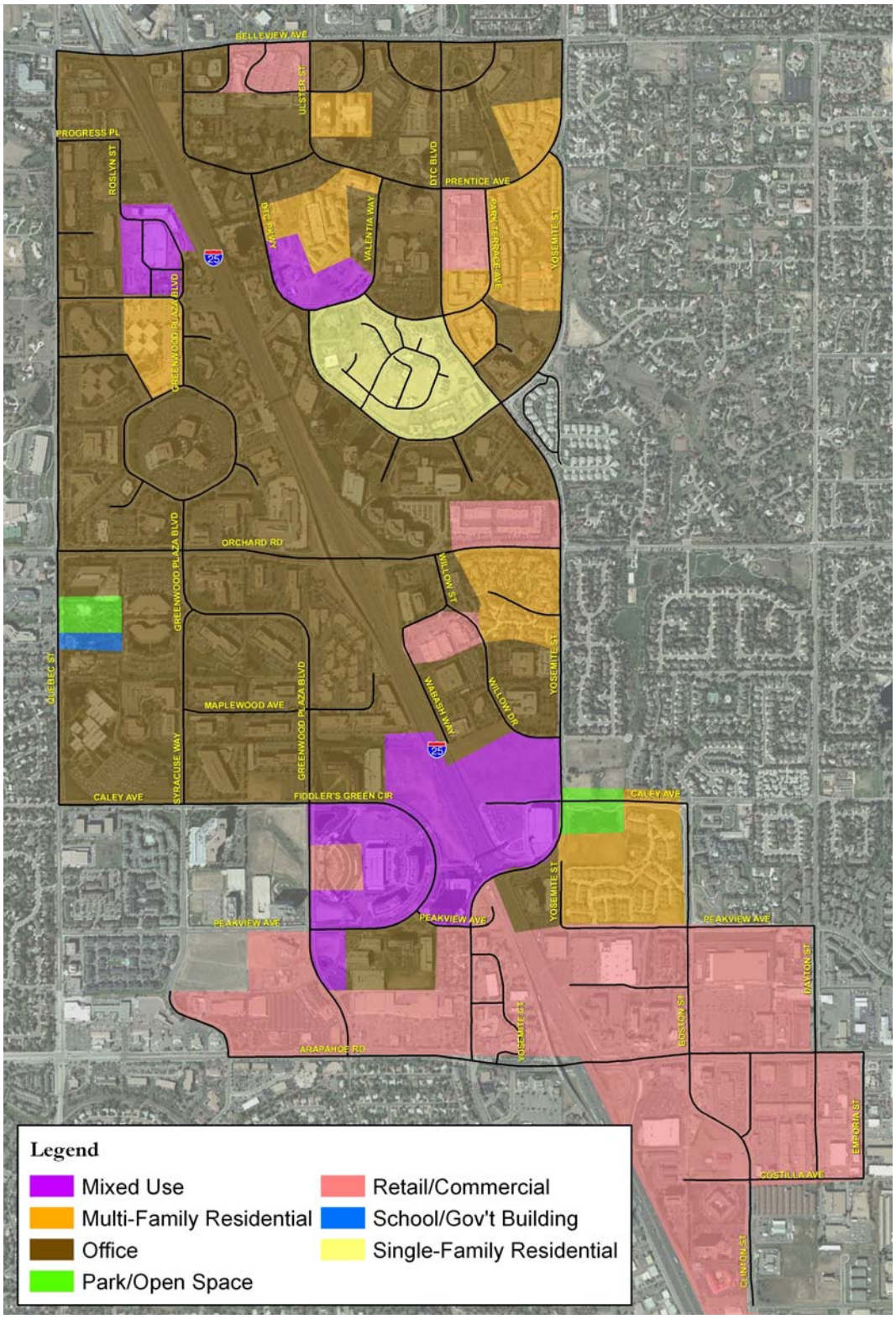


Figure 2 – I-25 Corridor Land Uses



2.0
Existing Transportation Network and Operations

GREENWOOD VILLAGE COLORADO

2.0 EXISTING TRANSPORTATION NETWORK AND OPERATIONS

2.1 Network Inventory

The first step in determining future transportation is to obtain a full understanding of the current transportation network within the study area. A comprehensive inventory of all modes of transportation was created as a starting point for the current and future transportation analysis.

2.1.1 Roadway Inventory Data

To adequately assess the existing traffic operations, it is important to have a clear picture of the functions and physical characteristics of the streets and intersections in the study area. Data on the majority of roadway features that were needed to assess the existing conditions was available from existing digital sources or digitized using best available aerial photography. Two factors determined whether roadway features were collected in the field using Global Positioning System technology:

- Features that did not exist in a digital, geo-referenced format
- Features that could not be reasonably seen on available aerial photography

In order to fill data gaps that were needed to develop a 10-year action plan, the following existing road features and conditions were collected using GPS technology (see Figure 3 through Figure 6, pages 21-24):

- Street network and through lanes
- Existing medians
- Lane assignments at intersection

2.1.2 Transit Inventory Data

The existing transit system in the study area is operated by RTD, who maintains up-to-date system mapping. For purposes of this study, RTD's current mapping was used to assess the current transit system. At present, there are five local bus routes (27, 66, 77, 105, and 465), three regional bus routes (T, SkyRide/AT, and FREX), three light rail transit (LRT) lines (E, F and G) with two stations, the Arapahoe and Orchard call-n-Ride services, and nearly 100 bus stops servicing the study area (see Figure 7, page 25).

The Southeast Light Rail Line is accessible to Greenwood Village residents, businesses, and visitors. The three existing lines travel between the City of Lone Tree at Lincoln Station, the City of Aurora at Nine Mile, Denver and the Central Business District. The Orchard LRT Station is supported by the Orchard park-n-Ride which offers 48 parking spaces and is located on the west side of I-25, adjacent to Greenwood Plaza Boulevard. The Arapahoe at Village Center LRT Station is located on the west side of I-25 with a covered pedestrian overpass to connect riders to the station's supporting park-n-Ride garage of 817 parking spaces and access to the RTD bus transfer facility located on the east side of I-25.

The Arapahoe at Village Center is an important transit hub for RTD along the southeast corridor. There are currently five local bus routes, three regional bus routes (including the SkyRide and FREX), the Arapahoe call-n-Ride, and the previously mentioned LRT and park-n-Ride garage servicing the center. FREX provides bus service between the cities of Fountain, Colorado Springs, Monument, Castle Rock, Greenwood Village, and Denver. There are over 500 daily transit operations at the center. In addition, there are bike racks and bike lockers available to the public. All RTD buses and call-n-Ride vehicles are equipped with front bike racks to support the bikes/bus program.

2.1.3 Bicycle Inventory Data

A bicycle inventory of the study area was conducted in order to assess existing facilities and determine if there are any gaps or barriers in the bicycle network. The inventory was conducted using a combination of aerial photography and field observations (see Figure 8, page 26).

Few dedicated bicycle facilities exist within the study area. On street bike lanes are present along Greenwood Plaza Boulevard through the Landmark development and Berry Avenue will have bike lanes between Quebec Street and Greenwood Plaza Boulevard upon reconstruction. Dayton Street from Peakview Avenue to just south of Arapahoe Road also has on street bike lanes but are dropped through the Arapahoe Road intersection. Orchard Road has bike lanes west of Quebec Street and east of Yosemite Street, but are not present on Orchard Road within the study area.

There are two multi-use off street trails that service the study area on the east and west boundary of the study area. Goldsmith Gulch Trail travels north and south along the east edge of the study area and parallels Yosemite Street and DTC Boulevard. The Running Fox Park Trail travels north and south along the west edge of the study area and parallels Quebec Street. The Yosemite Street bridge crossing of I-25 presents an opportunity for bicycle crossings of the interstate, but should be improved with roadway striping and signage to create a safer facility.

2.1.4 Pedestrian Inventory Data

A pedestrian inventory of the study area was conducted in order to assess conditions and determine if there are any gaps in the sidewalk system or other conditions that affect walking. The inventory was conducted using a combination of aerial photography and field observations.

The field observations were conducted to:

1. Verify the information shown on the aerial photography and update as needed to reflect existing (2008) conditions;
2. Record the type of material (asphalt, concrete, gravel) for each pedestrian facility;
3. Record the width of sidewalks and note whether they are attached or detached;
4. Identify whether curb ramps at intersections have detectable warning surfaces (truncated domes);
5. Make record of existing pedestrian facilities so that existing deficiencies (facility "gaps", American with Disabilities Act (ADA) compliance issues and locations where facilities need repair) could be identified.

Many of the streets in the study area have existing sidewalks (Figure 9, page 27). East of I-25 in the DTC area, most of the streets have wide detached sidewalks with tree lawns separating the walk from the roadway. However, in the Greenwood Plaza employment area, there are many streets lacking sidewalks on both sides of the street, such as Greenwood Plaza Boulevard, Syracuse Way, and Caley Avenue.

The pedestrian inventory also found a lack of continuous sidewalks. In some cases, sections of walk are missing, forcing pedestrians onto landscaped areas or onto roadways. Several key destinations are not connected via continuous sidewalks. For example, the Landmark development is not connected via a sidewalk to the north along Roslyn Street or to the south along the east side of Greenwood Plaza Boulevard. Also the Orchard LRT Station is not connected to the north or south by a continuous sidewalk along the east side of Greenwood Plaza Boulevard. Connecting trip origins and destinations by a safe pedestrian facility is imperative to increase the viability of walking within the study area. Additional barriers identified within the study area include large intersection crossings, poorly lit sidewalks and streets, deteriorating sidewalks, and non compliant ADA locations.

Many curb ramps in the study area do not have detectable warning surfaces, or truncated domes (Figure 9, page 27). These detectable warning surfaces are needed at street intersections, signalized intersections, high volume driveways along arterial streets, and where driveways operate like public streets.

2.2 Existing Traffic Volumes and Operations

Existing traffic volumes for roadways and intersections were key data used to determine how existing roadways and intersections in the study area operate. Vehicular facilities, traffic flow and operations were examined to determine the potential need for physical improvements that could support planning goals of improved connectivity, safety, and level of service.

2.2.1 Daily Traffic Data

Existing daily traffic volumes were obtained from DRCOG's regional travel demand model. The existing daily flows were used as a supplement to assess current conditions and rank overall roadway facility performance. This information gave the project team an overall picture of roadway facility performance and helped identify key areas of concern. These areas were then studied further for current AM/PM peak hour traffic.

2.2.2 AM/PM Peak Hour Traffic

After reviewing the daily traffic volumes, conducting field observations, and obtaining input from Greenwood Village staff, the consultants conducted traffic counts at the following 40 intersections in the study area:

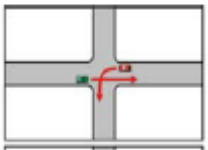
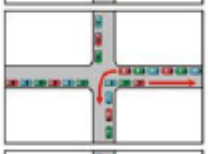
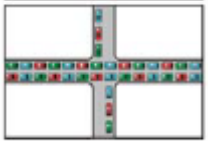
- Belleview/Ulster
- Belleview/DTC Blvd.
- Belleview/Yosemite
- DTC Blvd./Crescent
- Quebec/Progress
- DTC Pkwy./Prentice
- Ulster/Prentice
- Prentice/Valentia
- Prentice/DTC Blvd.
- Prentice/Yosemite
- Quebec/Berry
- Greenwood Plaza Blvd./Circle North
- Greenwood Plaza Blvd./Circle South
- Yosemite/Willow and Fair
- DTC Pkwy./Valentia
- Valentia/Park Terrace
- DTC Blvd./Park Terrace
- DTC Blvd./DTC Pkwy./Yosemite
- Orchard/Quebec
- Orchard/Greenwood Plaza Blvd.
- Orchard/I-25 SB ramps
- Orchard/I-25 NB ramps
- Orchard/Willow
- Orchard/Yosemite/DTC Blvd
- Greenwood Plaza Blvd./Syracuse
- Syracuse/Caley
- Greenwood Plaza Blvd./Caley
- Yosemite/Caley
- Boston/Caley
- Greenwood Plaza Blvd./Peakview
- Fiddler's Green/Peakview
- Yosemite/Peakview
- Boston/Peakview
- Dayton/Peakview
- Yosemite/Yosemite Circle
- Arapahoe/Syracuse
- Arapahoe/Greenwood Plaza Blvd.
- Clinton/Target Plaza
- Clinton/Costilla
- Costilla/Emporia

Traffic counts for these intersections were collected in June 2008. Weekday counts were collected between 7:00-9:00 am and 4:00-6:00 pm Tuesday through Thursday and then analyzed to determine the peak hours. See Appendix F for existing AM/PM peak hour traffic volumes.

2.2.3 Definition of Target Level of Service (LOS)

The LOS of an intersection ranges from A to F, characterizing the operational conditions of the traffic flow. LOS A represents the free-flow conditions where vehicles experience little to no delays. LOS F indicates the worst-case scenario with high congestion, a complete breakdown of traffic flow and high vehicular delays. Although LOS A through C may be the desired levels, LOS D is considered acceptable in urban areas during the peak hours. Attaining LOS C becomes cost prohibitive with additional roadway lanes that would be required to achieve a higher LOS. Traffic conditions with LOS of E or F are generally considered unacceptable and represent significant travel delay, increased accident potential, and inefficient motor vehicle operation. For these reasons, LOS D was chosen as the target LOS for the study, which is consistent with the American Association of State Highway and Transportation Officials for developed areas and the Colorado Department of Transportation (CDOT); however Arapahoe County has a threshold LOS E for urban core areas, such as the Denver Technology Center during peak hours and LOS D for non-peak hours. Table 2 displays the level of service definitions.

Table 2 – Characteristics of Intersection Level-of-Service (LOS)

Intersection LOS Based on Vehicle Seconds of Delay				
Delay Description	LOS		Seconds of Delay	
			Signalized	Unsignalized
Minimal or no vehicle delay		A	≤ 10	≤ 10
Slight delay to vehicles		B	>10-20	>10-15
Moderate vehicle delays, traffic flow remains stable		C	>20-35	>15-25
More extensive delays may occur at intersections		D	>35-55	>25-35
Long queues create lengthy delays		E	>55-80	>35-50
Severe delays and congestion "gridlock"		F	>80	>50

2.2.4 Existing Level-of-Service (LOS)

A capacity analysis was performed for the roadway network in the study area to determine the intersections LOS. Synchro© Version 7 software was utilized to analyze LOS for all 40 study area intersections according to methods put forth by the Transportation Research Board's **Highway Capacity Manual** (HCM2000). This software is for modeling, optimizing, managing, and simulating traffic systems. This is the recognized standard for assessing intersection operations.

In the analysis for signalized intersections, the overall peak hour LOS is calculated from all of the approach delays. For unsignalized intersections the LOS is based on the approach with the worst delay. The results of the Synchro© analysis are shown on Table 3 and Figure 10.

Table 3 – Existing Level of Service (2008) with Current Signal Timings

Intersection	Weekday AM Peak		Weekday PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Signalized Intersections				
Arapahoe & Greenwood Plaza	B	16	D	39
Arapahoe & Syracuse	B	12	C	24
Belleview & DTC Blvd.	C	28	D	37
Belleview & Ulster	B	15	C	29
Belleview & Yosemite	C	26	D	46
Caley & Boston	C	32	C	24
Clinton & Costilla	B	15	B	15
Clinton & Target Plaza	A	<10	A	<10
DTC Blvd. & Crescent	A	<10	A	<10
DTC Blvd. & DTC Pkwy./ Yosemite	B	18	B	18
DTC Blvd. & Park Terrace	B	11	B	13
DTC Blvd. & Prentice	C	32	B	19
Greenwood Plaza & Caley/Fiddlers	C	23	C	22
Greenwood Plaza & Peakview/Fiddlers	C	23	C	22
Greenwood Plaza & Syracuse	C	25	C	22
Orchard & DTC Blvd./ Yosemite	D	45	E	71
Orchard & Greenwood Plaza	C	26	E	55
Orchard & I-25 Northbound Ramps	C	24	F	124
Orchard & I-25 Southbound Ramps	F	94	E	62
Orchard & Willow	D	36	F	166
Peakview & Boston	B	16	C	31
Peakview & Dayton	C	24	C	30
Peakview & Fiddler's Green Circle	B	17	B	19
Quebec & Berry	A	<10	A	<10
Quebec & Orchard	D	37	C	31
Syracuse & Caley	C	28	C	25
Yosemite & Caley	C	28	C	32
Yosemite & Peakview	C	26	C	27
Yosemite & Yosemite Circle	B	19	D	36
Unsignalized Intersections				
Costilla & Emporia	A	<10	A	<10
DTC Pkwy & Prentice	A	<10	A	<10
DTC Pkwy & Valentia	A	<10	A	<10
Greenwood Plaza & Greenwood Circle North	A	<10	A	<10
Greenwood Plaza & Greenwood Circle South	B	18	A	<10
Prentice & Valentia	A	<10	A	<10
Prentice & Yosemite	A	<10	A	<10
Quebec & Progress	A	<10	A	<10
Ulster & Prentice	A	<10	A	<10
Valentia & Park Terrace	A	<10	A	<10
Yosemite & Willow/Fair	A	<10	A	<10

2.3 Existing Transportation Demand Management (TDM)

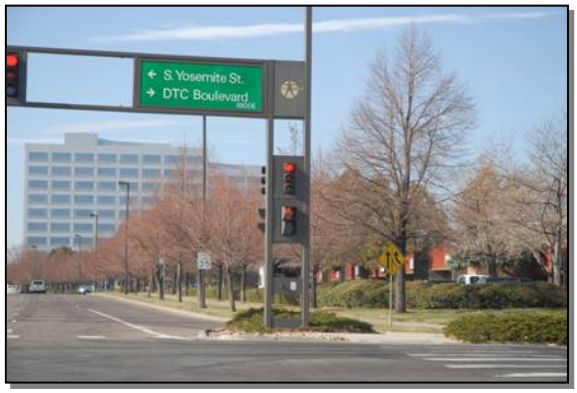
TDM is a range of programs and services that make the most efficient use of existing transportation facilities by managing the actual demand. Strategies that promote the use of modes other than the automobile, such as transit through higher occupant vehicles, reduce the demand placed on a facility, thereby easing peak hour congestion. TDM efforts can also extend the life of transportation facilities, enhance community mobility, and improve air quality. Examples of TDM programs and support strategies are:

- Promote carpooling, vanpooling, transit, biking, and walking.
- Encourage projects that maximize the efficient use of existing parking resources (e.g. shared parking).
- Promote flexible work schedules and variable work hours to reduce peak hour congestion.
- Encourage mixed land uses to shift travel modes, reduce distances, and alter travel patterns while reducing congestion by distributing traffic over a longer time period.
- Reduce or eliminate some trips through teleworking and teleconferencing.
- Offer a guaranteed ride home or rideshare matching.
- Require TDM-friendly design standards, such as transit oriented development (TOD).
- Offer financial incentives to employees to alter their travel behavior.

The City of Greenwood Village has historically partnered with the South I-25 Urban Corridor Transportation Management Agency (TMA) and other partners on TDM strategies in the southeast corridor. Current TDM programs include the Transit Rider Incentive Program (TRIP), which is designed to provide a transportation incentive to employees within the Southeast Public Improvement Metropolitan District (SPIMD) boundaries to use public transit, and support for carpooling, vanpooling, biking, walking, and teleworking.

2.4 Intelligent Transportation Systems (ITS)

ITS is a method in which new technology is used to improve the transportation system. Although ITS technology has been employed in various forms for many years, it was originally intended to increase the nation's transportation system without having to build more roadways and lanes as demand increased. Since ITS relies upon technology to maximize the efficiency of the existing transportation system, ITS is always evolving into more efficient methods and applications. There are numerous ITS applications used



throughout the region and the Village, such as variable message signs, toll road payment transponders, and freeway ramp metering, but the most familiar application in the Village is the installation of synchronized traffic signals along an urban corridor.

2.4.1 Greenwood Village ITS Applications

Most traffic signals within the Village are interconnected and synchronized by fiber optic cable or radio communication to maximize the flow of vehicular traffic on a number of corridors. These corridors include Arapahoe Road, Yosemite Street/DTC Boulevard, Belleview Avenue, and Orchard Road. A 2009 CIP project will connect more traffic signals with fiber optic cables. Few traffic signals within the study area are not interconnected (see Figure 11).

Figure 3 – Street Network and Through Lanes (2008)

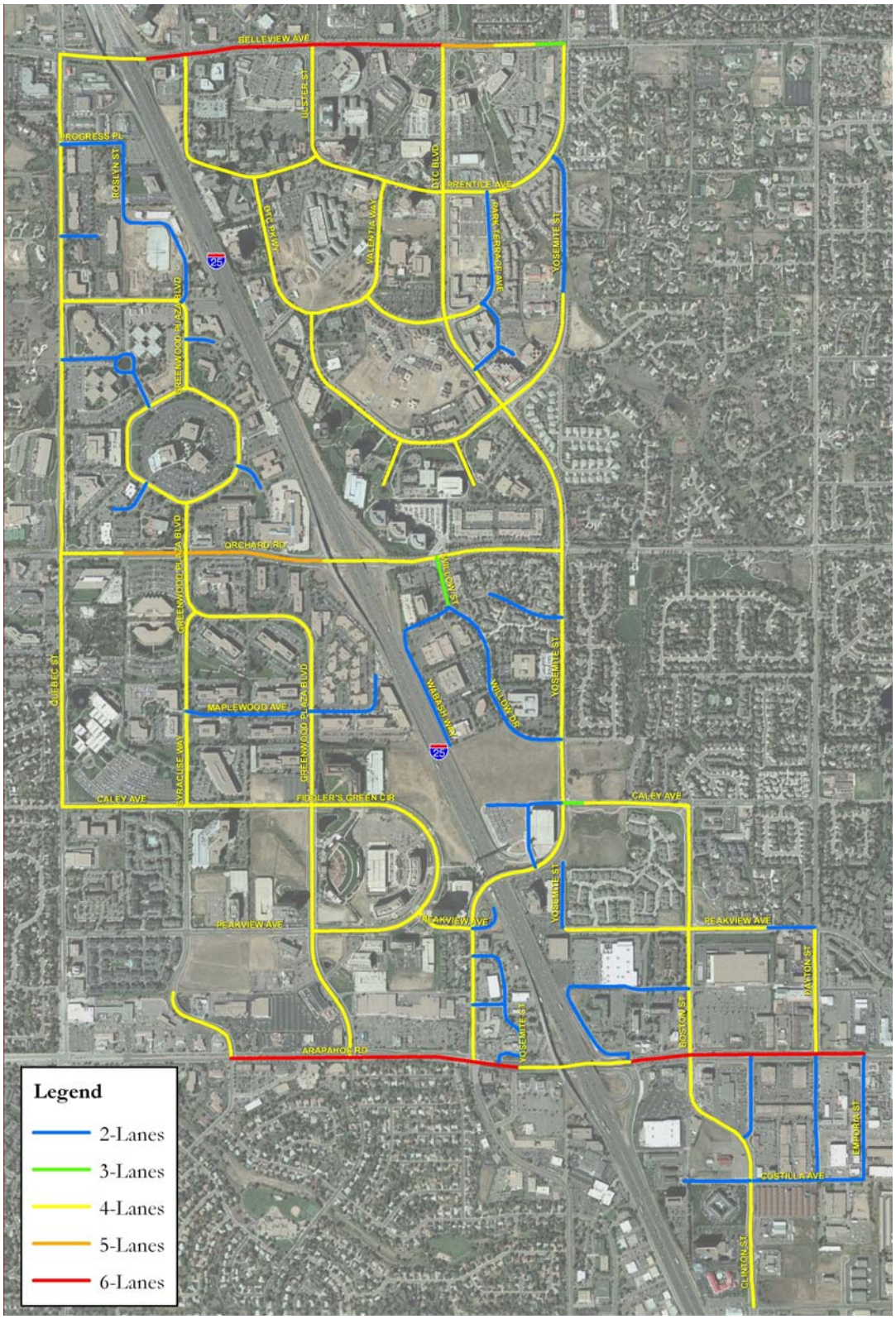


Figure 4 – Existing Medians (2008)

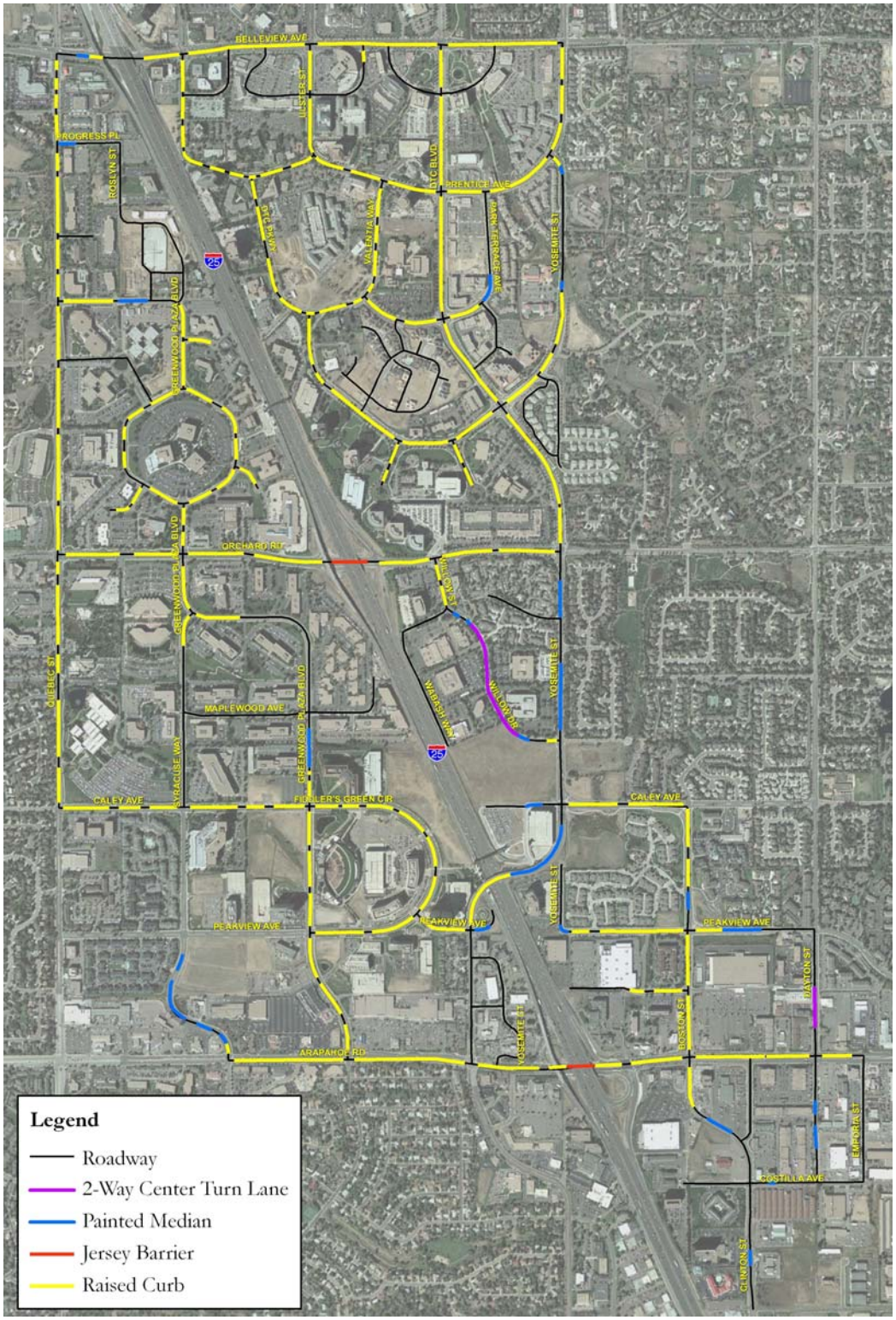


Figure 5 – Lane Assignments at Intersections – North

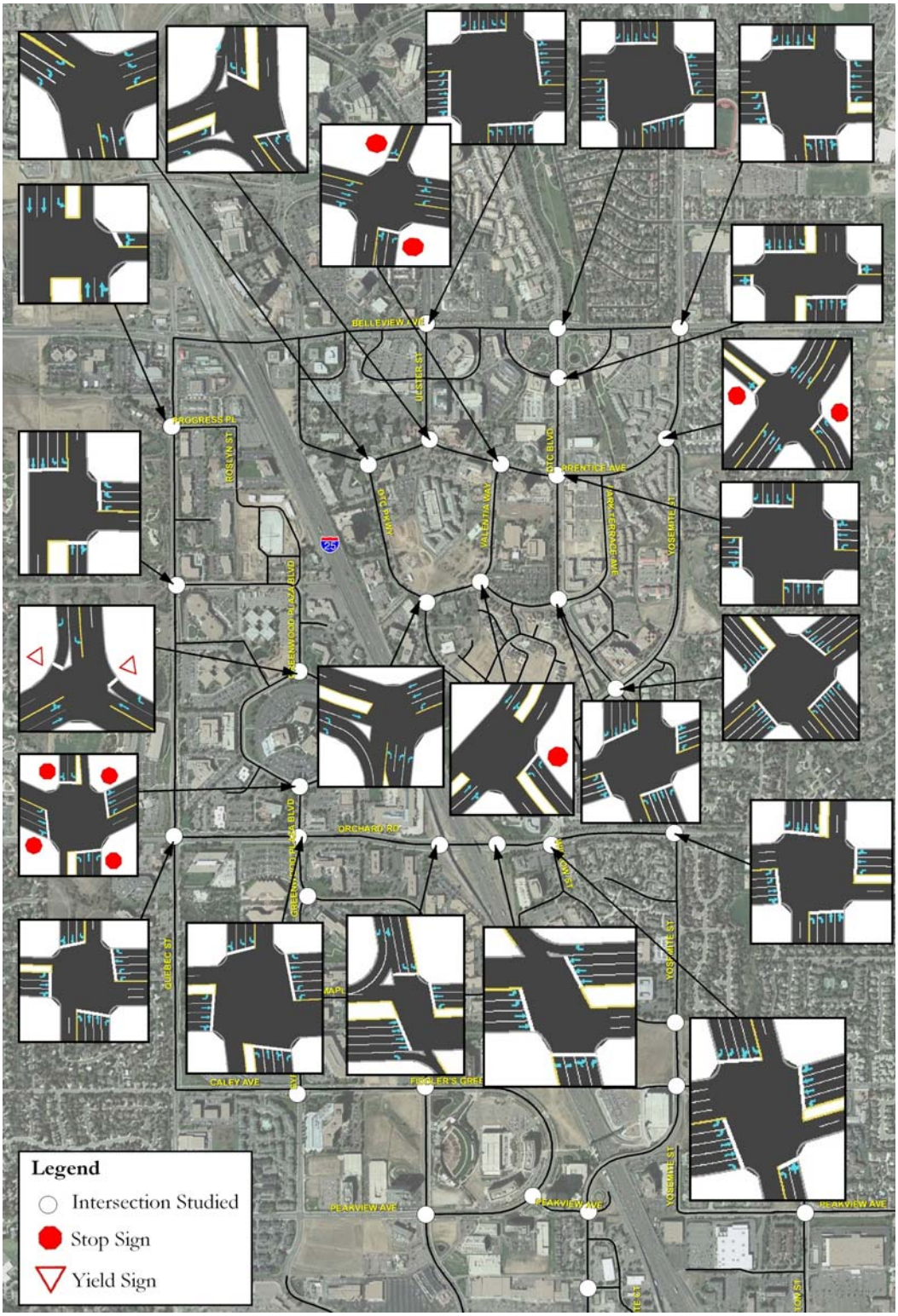


Figure 6 – Lane Assignments at Intersections – South

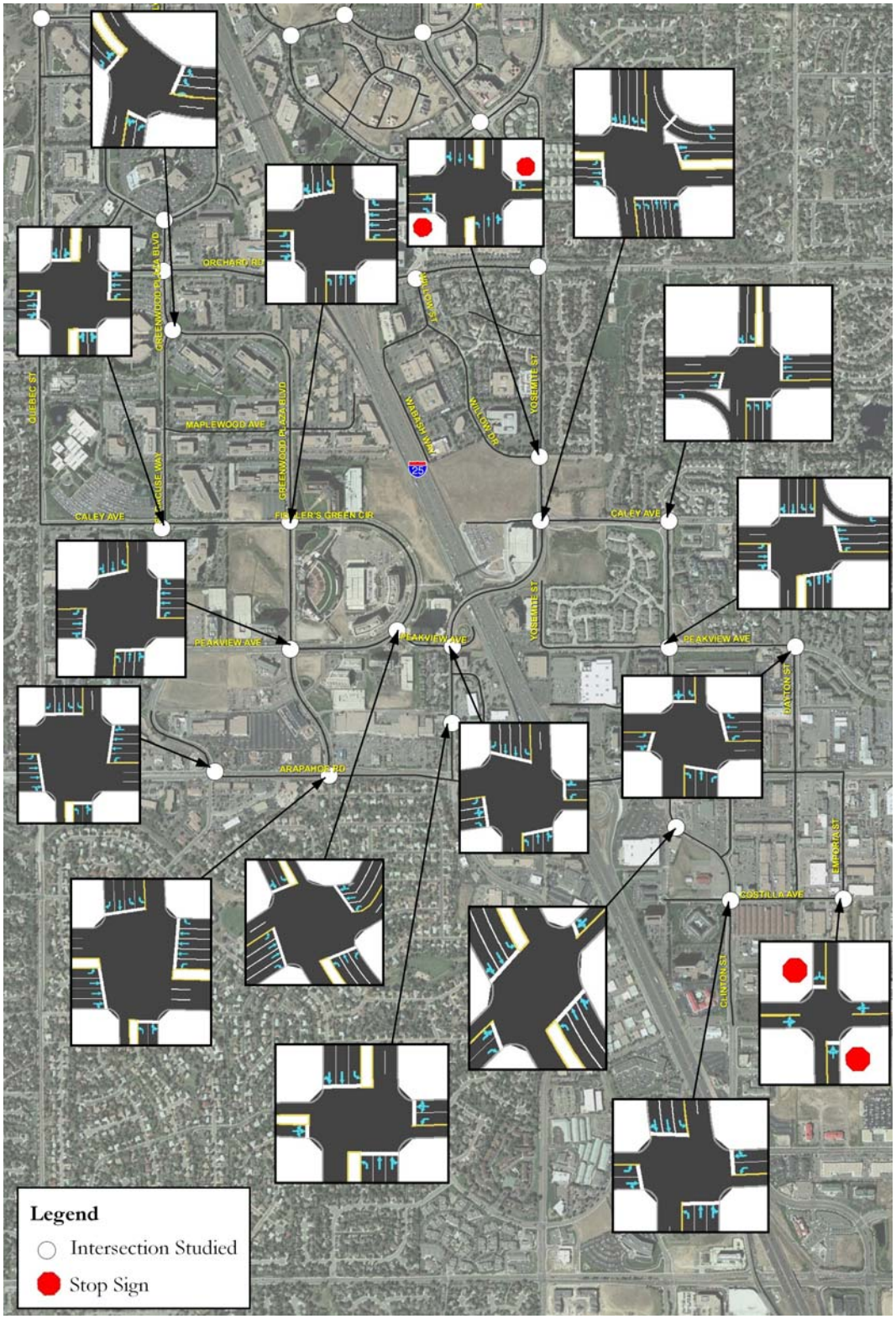


Figure 7 – Existing RTD Transit Service

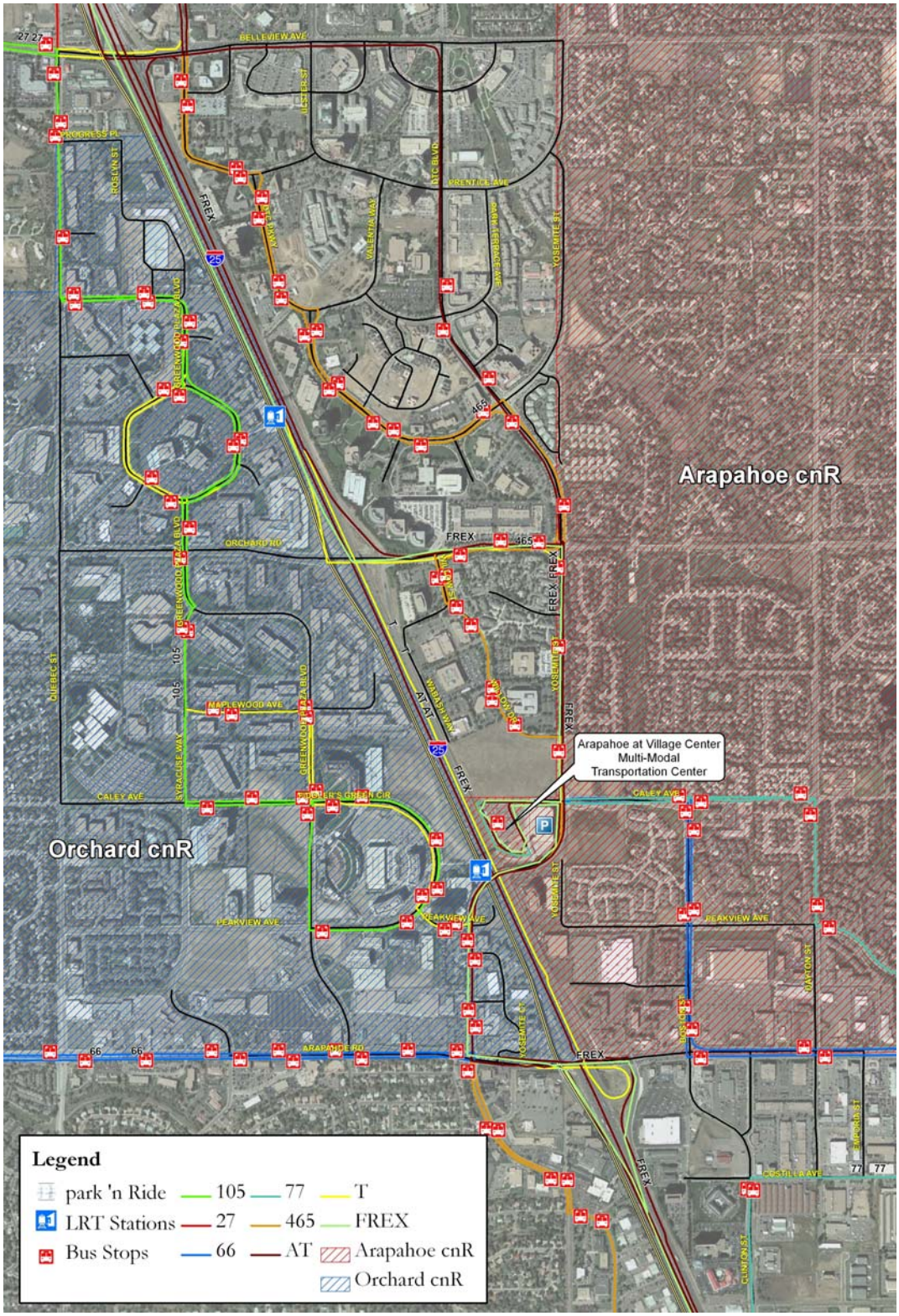


Figure 8 – Existing Bicycle Facilities (2008)

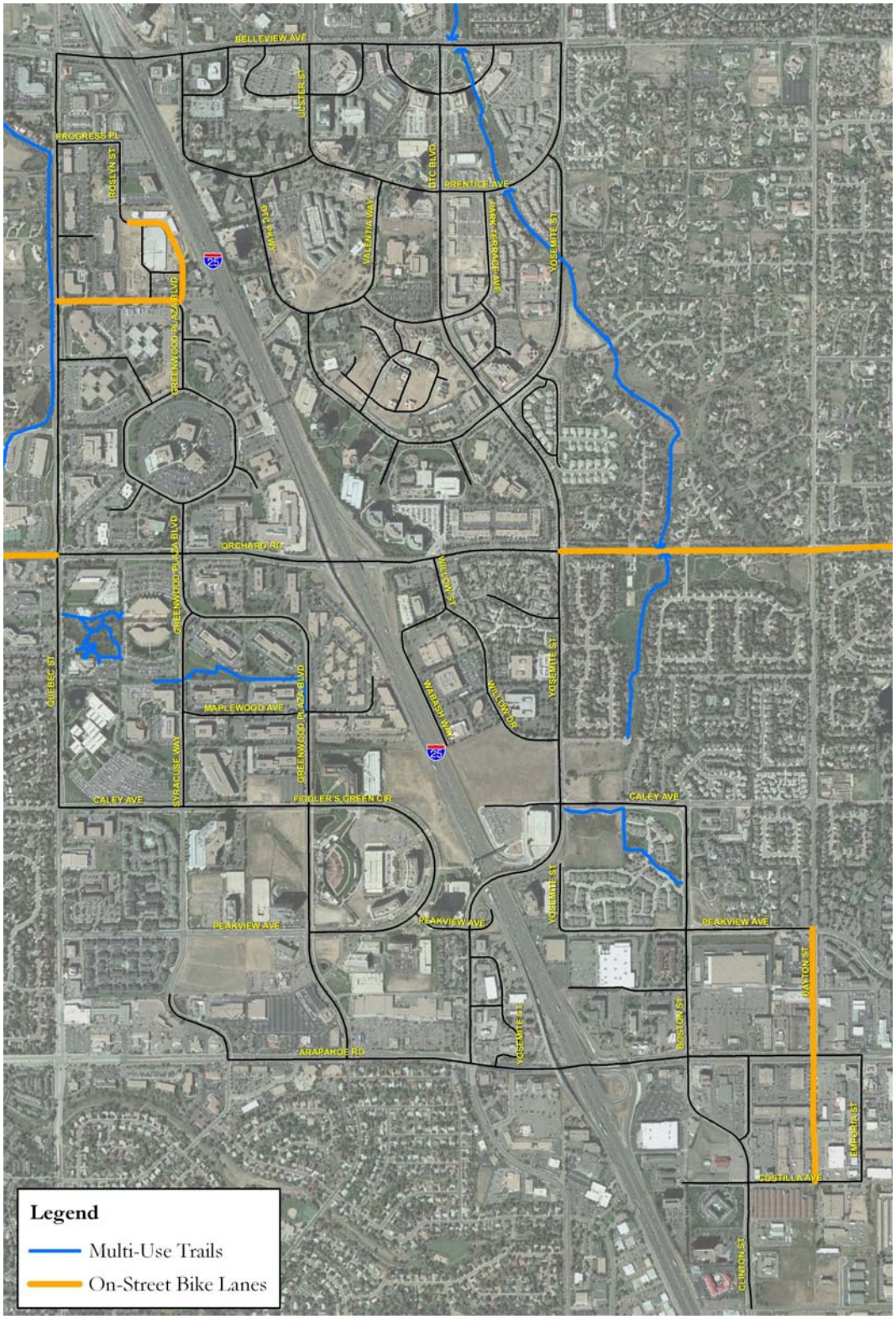


Figure 9 – Existing Pedestrian Facilities (2008)

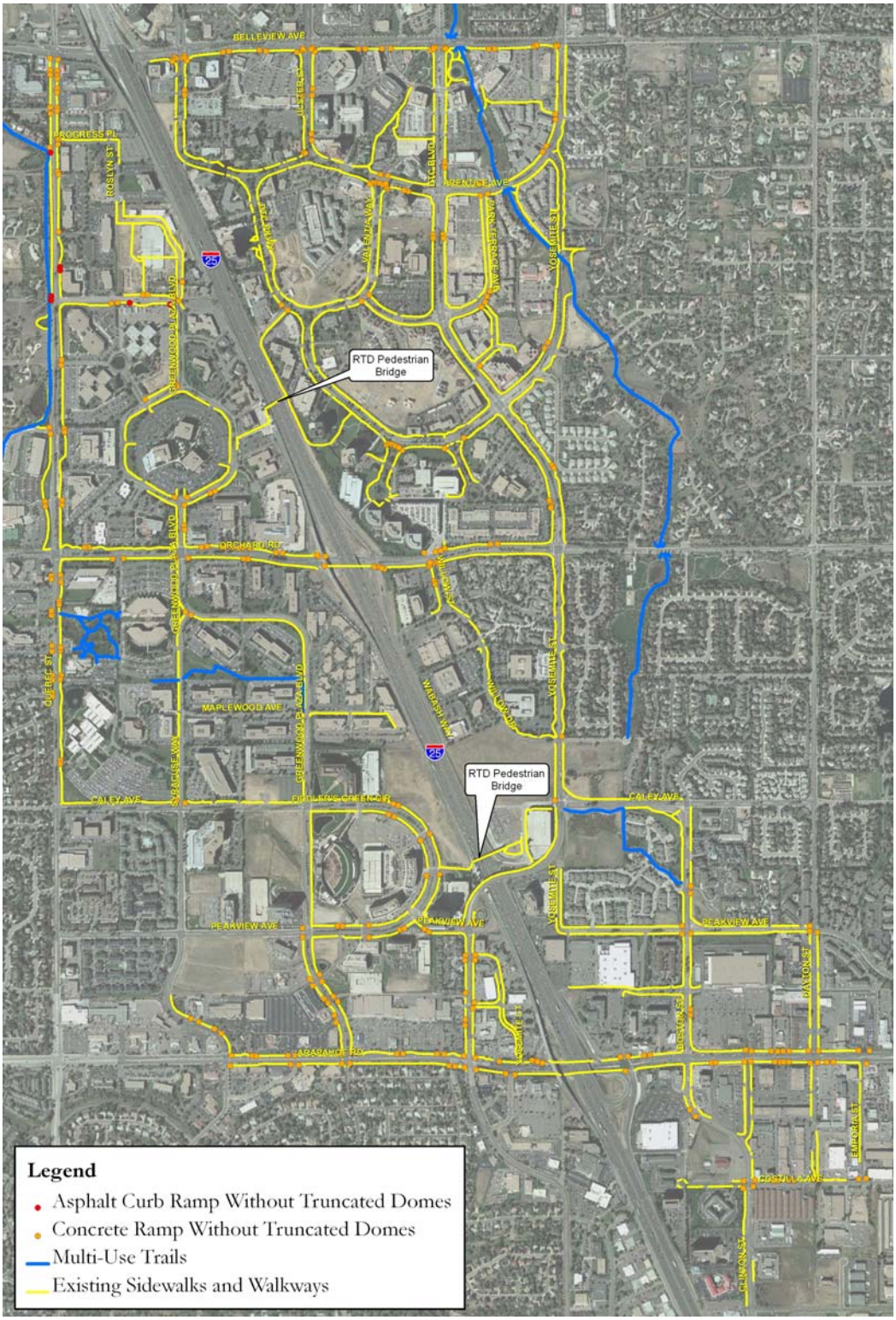


Figure 10 – Existing Level of Service (2008)

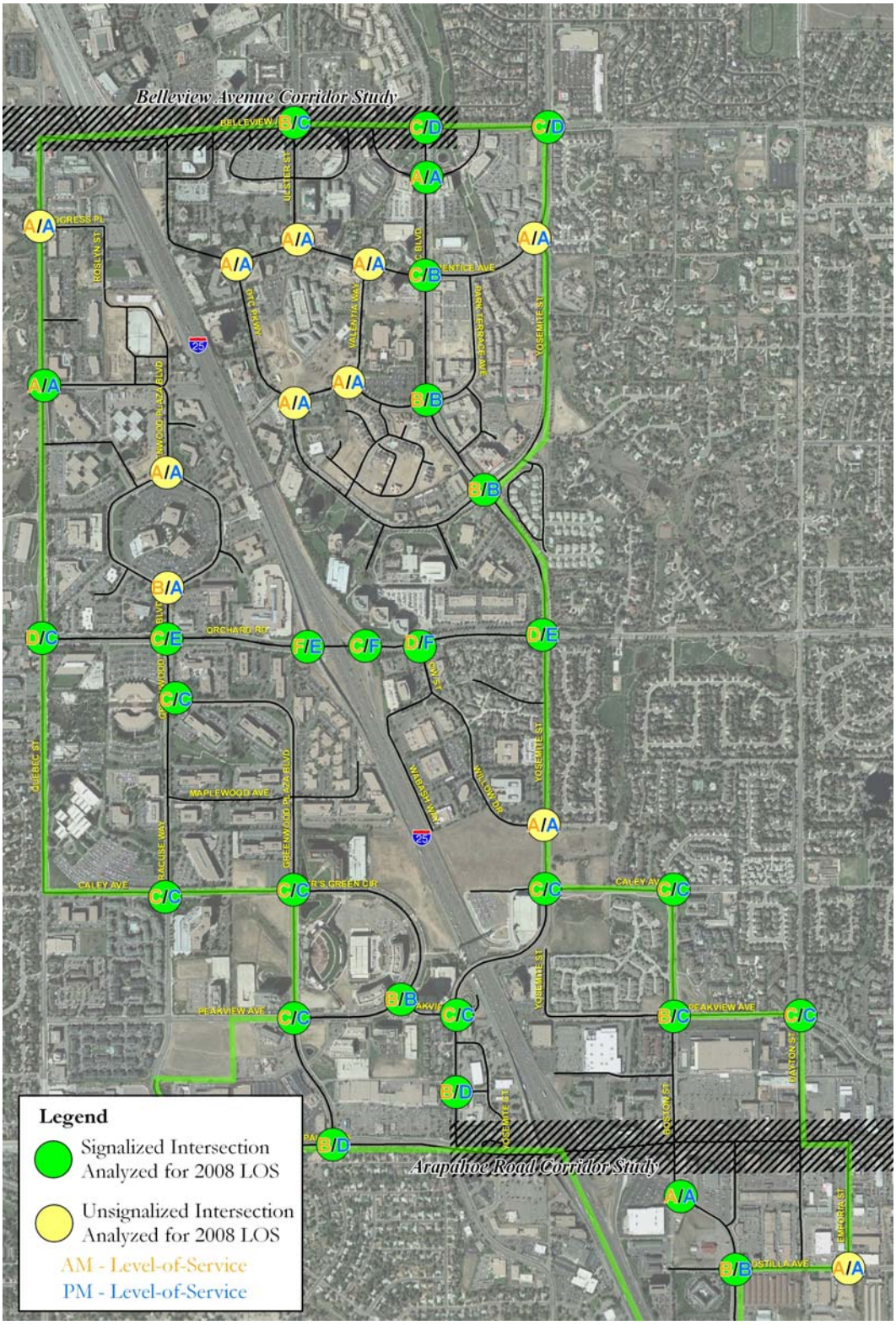
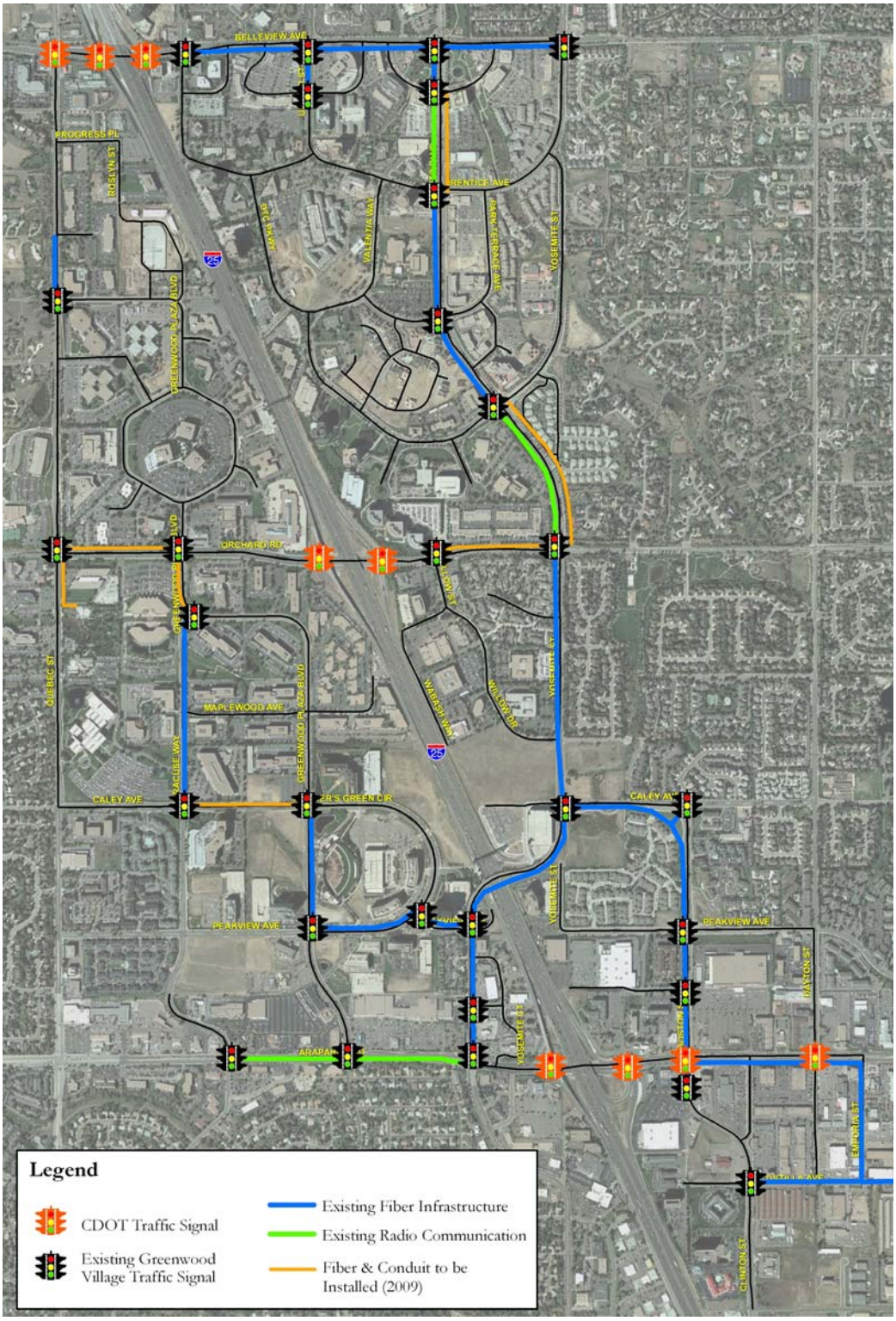


Figure 11 – Existing Traffic Signal System (2008)



3.0
Future Transportation Demand and Operations

GREENWOOD VILLAGE
COLORADO

3.0 FUTURE TRANSPORTATION DEMAND AND OPERATIONS

3.1 Planning Horizon

As described in Chapter 1, this study is a 10-year action plan to identify existing deficiencies and provide solutions for a safe and accessible balanced transportation system. The study began in spring 2008, but instead of using 2018 for the planning horizon it was decided that year 2020 would be a more logical planning horizon and would correspond with an interim planning horizon year used in the DRCOG travel demand model.

3.2 2020 Transportation Network Demand

To better understand the future transportation needs in Greenwood Village, the DRCOG transportation model was used to develop travel forecasts. The model considers land use and future development, the existing and planned multi-modal transportation network, and socio-economic data such as employment and population, to estimate trips, travel patterns, traffic volumes and travel mode split.

It is important to realize that the DRCOG model is a tool developed for the region to assist governments in planning and estimating future transportation system demand. It is the industry standard for government agencies to utilize a travel model when conducting transportation studies, such as a corridor study or the creation of a Transportation Master Plan. However, this model is not intended to assess impacts for an individual development project. The Village's requirement that developers conduct a Traffic Impact Study to determine their project's specific impacts to the Village's transportation system will continue to be used to analyze and mitigate impacts.

3.2.1 Travel Demand Model Development

Model Description

In fulfilling its role as a Metropolitan Planning Organization, DRCOG maintains a "regional" travel demand model, called "Compass". The model is capable of projecting reasonable estimates of the number of vehicles on a roadway, which can then be used to assess intersection level of service, ridership on a transit system, and other outcomes associated with investments in transportation infrastructure. Land use and socio-economic information is developed in conjunction with local jurisdictions to better reflect current and future development patterns and trends. The transportation data is then used in the planning process to aid decision-makers in their selection of transportation alternatives, develop regional transportation policies, and aid in air quality planning processes.

Model Modification and Run Process

While the DRCOG model is regional in nature, several modifications to the model and data were made to reflect local conditions. Changes to the model include incorporating

current and future development and socio-economic data based on recent direction from the 2008 Comprehensive Plan amendment, discussions with property owners, developers, and representatives of metro districts. Several collector level streets were added to the model to account for local conditions. Changes to the Transportation Analysis Zones (TAZ) include the following:

- Two additional zones were added between Prentice Ave., DTC Blvd., Park Terrace Ave., and Valentia Way, and between Peakview Ave., Dayton St., Arapahoe Rd. and Boston St. to provide more detail in commercial trip generation.
- Additional links were added to reflect access from commercial and residential zones to the collector road system.
- Streets were added, such as Willow Drive, Peakview Avenue, Syracuse Way, and Greenwood Plaza Boulevard, so that traffic volumes could be estimated for the collector system.

Table 4 below reflects recent development projects and anticipated new developments within the study area from 2005 through 2020. Also reflected in the table are the anticipated developments in the Belleview Station area (TAZ 1676) and in the City of Centennial adjacent to the Village Center (TAZs 2088 and 2092). Refer to Figure 12 for a map of the TAZ boundaries within the study area.

Table 4 – Anticipated New Development (2005 through 2020)

Transportation Analysis Zone (TAZ)	Anticipated New Development (2005 through 2020)
1676 (Denver)	- 1 million sf office - 100,000 sf retail - 652 homes
2077	- 300 condos (Landmark) - 30,000 sf retail - 187,000 sf retail (Landmark) - 1,500 seat theater (Landmark)
2078	- 240 homes (European Village) - 6,500 sf retail
2079	- Additional 200,000 sf office
2080	- Divided into 2 separate zones (new zone #2665 created for portion of Village Center)
2081	- 75,000 sf office
2082	- No change
2088 (Centennial)	- 450,000 sf office - 185 homes
2089	- 570,000 sf office (Palazzo Verdi I & II) - 180 room hotel
2090	- No change
2091	- 100,000 sf office - Removed homes approved in Highpoint FDP (399)

Transportation Analysis Zone (TAZ)	Anticipated New Development (2005 through 2020)
2092 (Centennial)	- 400 homes - 500,000 sf office
2115	- No change
2116	- 100,000 sf office
2117	- 100,000 sf office
2118	- No change
2120	- No change
2121	- 15,000 sf office - 101 condos - 36,500 sf retail
2122	- 220 homes
2123	- 80 homes
2124	- No change
2125	- No change
2126	- No change
2131	- 99 homes - 10,500 sf retail
2132	- 400 homes - 400,000 sf office - 76,000 sf retail
2133	- No change
2134	- 50,000 sf retail
2135	- No change
2665	- 80,000 sf retail - 900,000 sf office - 200 room hotel
2666	- No change
2667	- 5,500 sf retail

The resulting updated model was run to produce a set of 2020 daily traffic counts and peak hour volume forecasts. These 2020 projections were used as an input to establish future conditions and rank overall roadway facility performance. This information gave the project team an overall picture of future roadway facility performance and helped identify key areas of concern. These areas were then analyzed further for future AM/PM Peak hour traffic.

3.2.2 2020 Projected Traffic Volumes

The 2020 daily traffic projections are shown in Figure 13. 2020 AM and PM peak hour traffic projections were also generated by the DRCOG model, but only for roadway segments. In order to assess 2020 intersection operations, these volumes were converted to turning movement volumes at intersections. The resulting 2020 AM and PM peak hour turning movement volumes were then analyzed, to make sure that volumes and turning movement distributions more accurately reflect travel patterns. The 2020 AM and PM peak hour turning movement volumes are illustrated in Appendix G.

3.3 2020 Transportation Network Changes and Operations

3.3.1 2020 Intersection Level-of-Service (LOS)

Capacity analysis was performed for the roadway network in the study area to quantify how well the intersections will process the traffic in the future. Synchro© Version 7 software was utilized to analyze all study area intersections according to methods put forth by the Transportation Research Board's **Highway Capacity Manual** (HCM2000).

3.3.2 2020 Congestion Points without Improvements

Table 5 below lists the forecasted LOS for the 40 intersections analyzed in the study area. There are 17 intersections that are expected to operate below the targeted LOS D without any capital improvements and using the current traffic signal timing (see Figure 14, page 40).

Standard engineering practice, however, calls for constant signal timing adjustments and improvements as traffic conditions change. Table 6 below represents the forecasted LOS for the 40 intersections with signal timing improvements. If the 40 intersections continue to be adjusted with traffic signal improvements, 15 of the 40 intersections are expected to operate below the targeted LOS D without capital improvements (see Figure 15, page 41).

Table 5: 2020 Level of Service with Existing Timings

Intersection	Weekday AM Peak		Weekday PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Signalized Intersections				
Arapahoe & Greenwood Plaza	F	115	F	100
Arapahoe & Syracuse	F	329	F	113
Belleview & DTC Blvd.	D	41	E	67
Belleview & Ulster	E	63	F	98
Belleview & Yosemite	E	56	F	101
Caley & Boston	D	36	C	27
Clinton & Costilla	B	14	B	17
Clinton & Target Plaza	A	<10	A	<10
DTC Blvd. & Crescent	A	<10	D	43
DTC Blvd. & DTC Pkwy./ Yosemite	D	36	D	49
DTC Blvd. & Park Terrace	C	23	B	15
DTC Blvd. & Prentice	D	43	F	88
Greenwood Plaza & Caley/Fiddlers	C	25	C	24
Greenwood Plaza & Peakview/Fiddlers	C	29	C	23
Greenwood Plaza & Syracuse	C	27	C	27
Orchard & DTC Blvd./ Yosemite	F	121	F	188
Orchard & Greenwood Plaza	E	56	F	139
Orchard & I-25 Northbound Ramps	F	88	F	187
Orchard & I-25 Southbound Ramps	F	196	F	145
Orchard & Willow	E	78	F	189
Peakview & Boston	B	19	D	35
Peakview & Dayton	C	26	D	44
Peakview & Fiddler's Green Circle	C	23	F	169
Quebec & Berry	A	<10	A	10
Quebec & Orchard	F	119	F	182
Syracuse & Caley	C	31	C	25
Yosemite & Caley	F	100	F	105
Yosemite & Peakview	F	134	F	199
Yosemite & Yosemite Circle	D	35	F	248
Unsignalized Intersections				
Costilla & Emporia	A	<10	A	<10
DTC Pkwy & Prentice	A	<10	A	<10
DTC Pkwy & Valentia	A	<10	A	<10
Greenwood Plaza & Greenwood Circle North	A	<10	A	<10
Greenwood Plaza & Greenwood Circle South	C	22	C	26
Prentice & Valentia	A	<10	A	<10
Prentice & Yosemite	A	<10	A	<10
Quebec & Progress	D	39	E	67
Ulster & Prentice	A	<10	A	<10
Valentia & Park Terrace	A	<10	A	<10
Yosemite & Willow/Fair	D	47	D	51

Table 6 – 2020 Level of Service with Signal Timing Improvements

Intersection	Weekday AM Peak		Weekday PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Signalized Intersections				
Arapahoe & Greenwood Plaza	F	66	F	100
Arapahoe & Syracuse	F	128	F	113
Belleview & DTC Blvd.	D	39	D	52
Belleview & Ulster	C	28	D	54
Belleview & Yosemite	C	35	F	98
Caley & Boston	C	30	C	22
Clinton & Costilla	A	7	B	17
Clinton & Target Plaza	A	<10	A	<10
DTC Blvd. & Crescent	A	<10	D	38
DTC Blvd. & DTC Pkwy./ Yosemite	D	36	D	48
DTC Blvd. & Park Terrace	C	21	A	<10
DTC Blvd. & Prentice	C	34	F	88
Greenwood Plaza & Caley/Fiddlers	B	20	B	18
Greenwood Plaza & Peakview/Fiddlers	C	28	B	20
Greenwood Plaza & Syracuse	B	16	C	23
Orchard & DTC Blvd./ Yosemite	F	121	F	179
Orchard & Greenwood Plaza	D	49	F	139
Orchard & I-25 Northbound Ramps	E	78	F	169
Orchard & I-25 Southbound Ramps	E	68	E	80
Orchard & Willow	C	34	F	95
Peakview & Boston	B	18	D	35
Peakview & Dayton	C	24	D	44
Peakview & Fiddler's Green Circle	B	17	F	124
Quebec & Berry	A	<10	A	10
Quebec & Orchard	F	113	F	177
Syracuse & Caley	A	10	C	23
Yosemite & Caley	F	88	E	73
Yosemite & Peakview	F	104	F	188
Yosemite & Yosemite Circle	B	17	F	167
Unsignalized Intersections				
Costilla & Emporia	A	<10	A	<10
DTC Pkwy & Prentice	A	<10	A	<10
DTC Pkwy & Valentia	A	<10	A	<10
Greenwood Plaza & Greenwood Circle North	A	<10	A	<10
Greenwood Plaza & Greenwood Circle South	C	22	C	26
Prentice & Valentia	A	<10	A	<10
Prentice & Yosemite	A	<10	A	<10
Quebec & Progress	D	39	E	67
Ulster & Prentice	A	<10	A	<10
Valentia & Park Terrace	A	<10	A	<10
Yosemite & Willow/Fair	D	47	D	51

3.3.3 Transit Network

Future improvements and changes to the Regional Transportation District's (RTD's) system within the study area are anticipated. RTD has recently proposed changes to the service in the study area. Changes include modifications to the LRT G Line service and bus route 465. Since RTD does not conduct long range strategic transit service plans, there are no additional service changes anticipated for the study area within the next 10 years.

It is expected that transit-supportive development will continue to occur around the Orchard and Arapahoe at Village Center light rail stations within the 10-year planning horizon, although redevelopment around the Orchard station will occur at a smaller scale. The extension of the southeast corridor to the RidgeGate Parkway in Lone Tree and the construction of the FastTracks transit system by RTD will increase overall ridership through the study area, however it is not anticipated that major transit facilities will be needed in the study area to accommodate the increase.

3.3.4 Bicycle Network

The lack of well connected bicycle facilities as shown in Figure 8 (page 26) will continue to create hardships on people who choose to bike or ride to transit stops. The RTD program combining bikes and transit, will most likely increase the demand for bicycle facilities in the study area. Therefore, it will be important to connect origins and destinations so that people can safely and conveniently choose biking to work, home, shop or recreate.

3.3.5 Pedestrian Network

Sidewalks and walkways are the most readily identifiable elements of the pedestrian infrastructure. As more development occurs in the study area and more transit supportive developments are built, there will be an increased emphasis on walkability. Safe access to intermodal destinations, such as the LRT stations, will be imperative to increase transit ridership and shift travel away from motor vehicles, resulting in less congestion, air pollution, and fuel consumption. Unfortunately, there are many sidewalks within the study area that are not continuous or do not have sidewalks on both sides of the street, as shown in Figure 9 (page 27).

3.4 Development of the Proposed Project List

3.4.1 Development Process

Future transportation improvement projects were identified that would alleviate existing and future system deficiencies. Data described in Section 2.0 - Existing Transportation Network and Operations, and Section 3.0 - Future Transportation Demand and Operations, were used to develop the list of improvement projects. These improvements were organized by type: Roadway and Intersection, Transit, Pedestrian, Bicycle, TDM,

and ITS projects. Various alternatives under each grouping were generated as part of the study and are described in the following chapters.

3.4.2 Support Sources for Project Selection

In addition to the DRCOG travel demand model, the following sources were utilized to develop the list of transportation improvement projects:

- Current projects listed on the Capital Improvement Program
- Current projects listed on the regional Transportation Improvement Program or Regional Transportation Plan
- Arapahoe Road Corridor Study, 2007
- Four Corners Agreement
- Greenwood Village staff recommendations
- I-25 Corridor Transportation Improvement Study Synchro analysis
- Goldsmith Gulch Metropolitan District
- Southeast Public Improvement Metropolitan District (SPIMD)
- Greenwood Village Transportation Plan, 1998
- Arapahoe County Transportation Plan, 2001
- Greenwood Corporate Plaza Master Development Plan (1st Amended 2005)
- Greenwood Plaza Master Development Plan (1977)
- Greenwood Village Parks, Trails, and Open Space Master Plan (Draft 2008)
- Denver Technology Center Master Transportation Plan
- Greenwood Village Traffic and Safety Study, 2006

Figure 12 – Study Area TAZ Boundaries

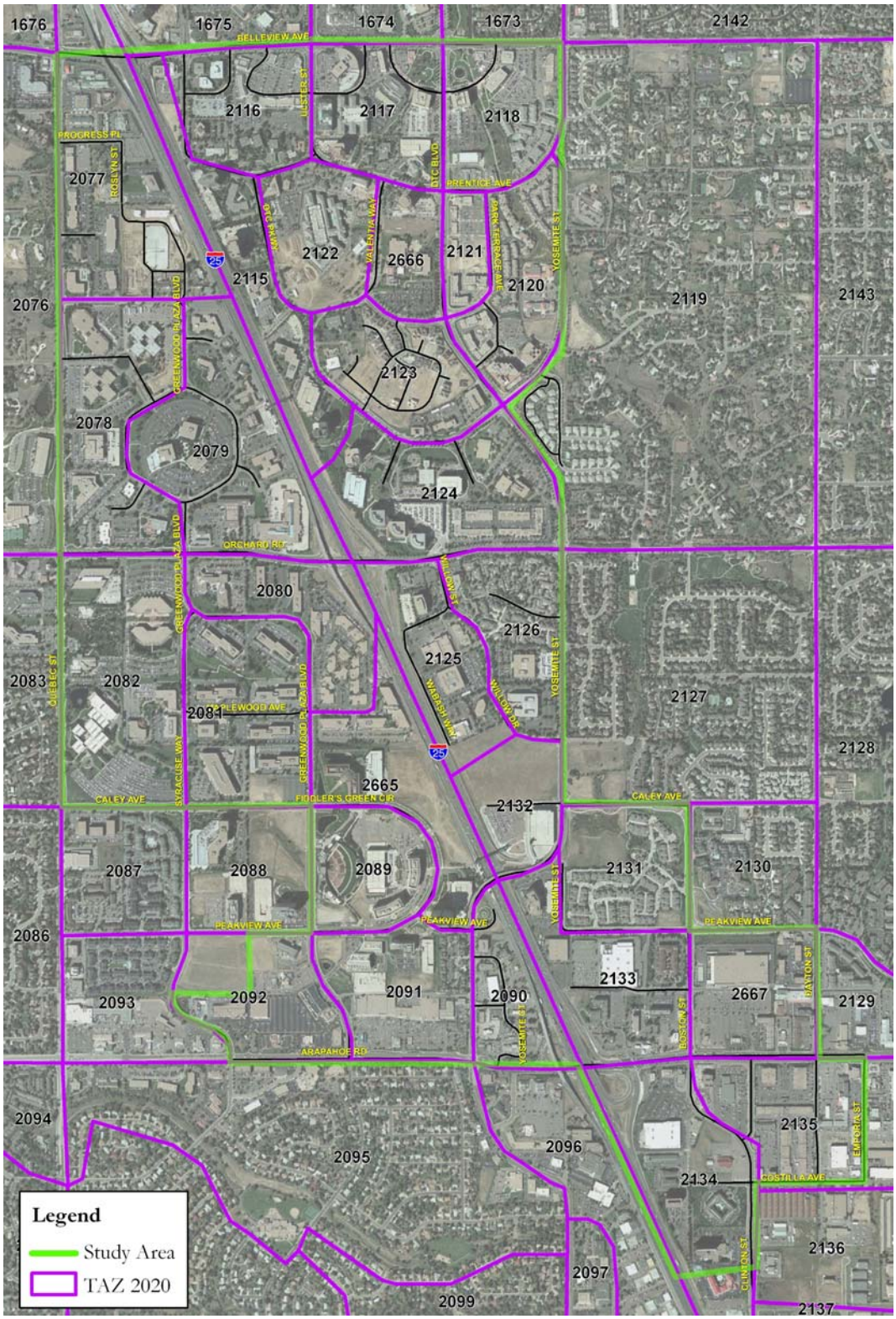


Figure 13 – Existing 2008 and 2020 Projected Traffic Volumes

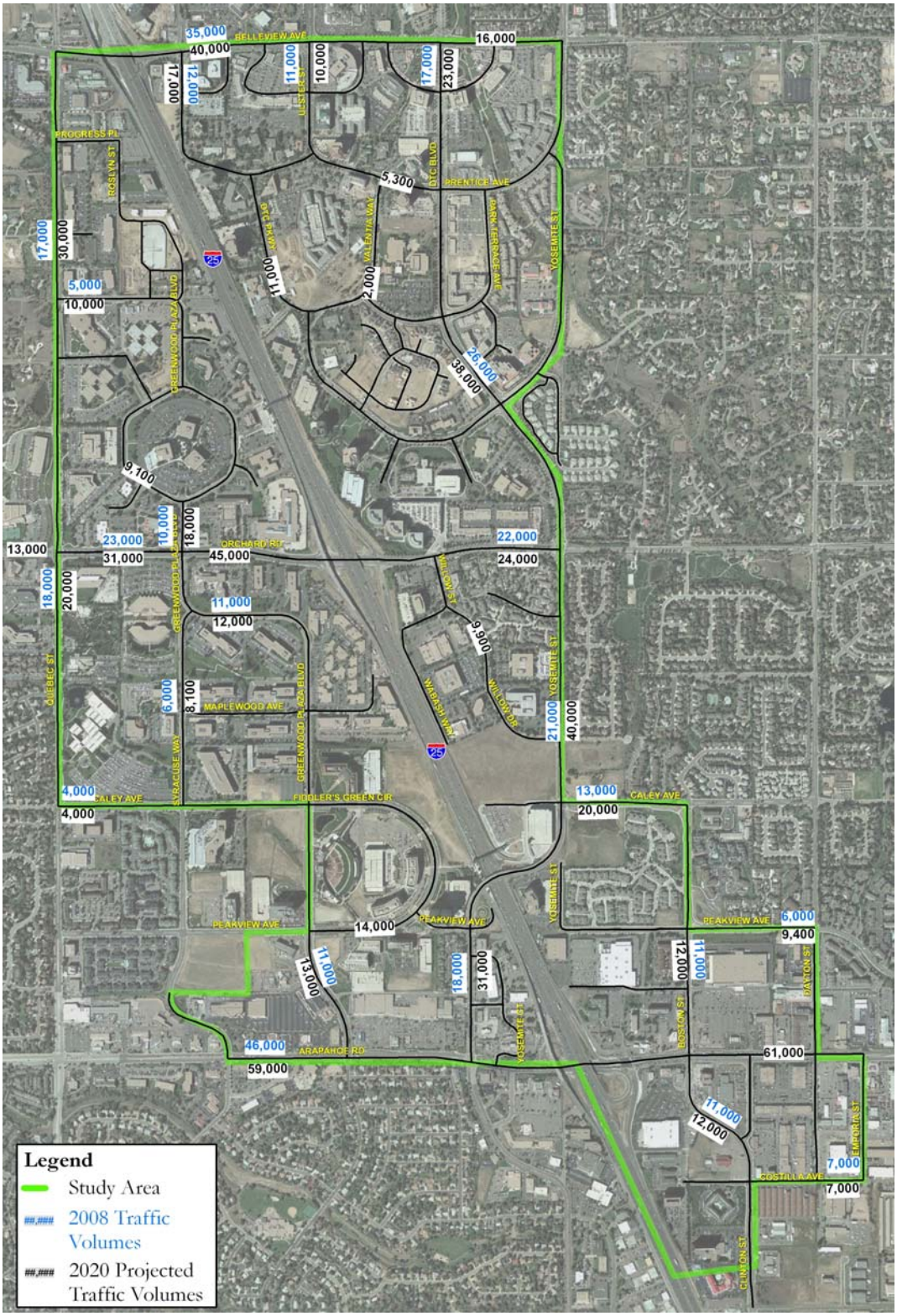


Figure 14 – 2020 Level of Service with Current Signal Timing

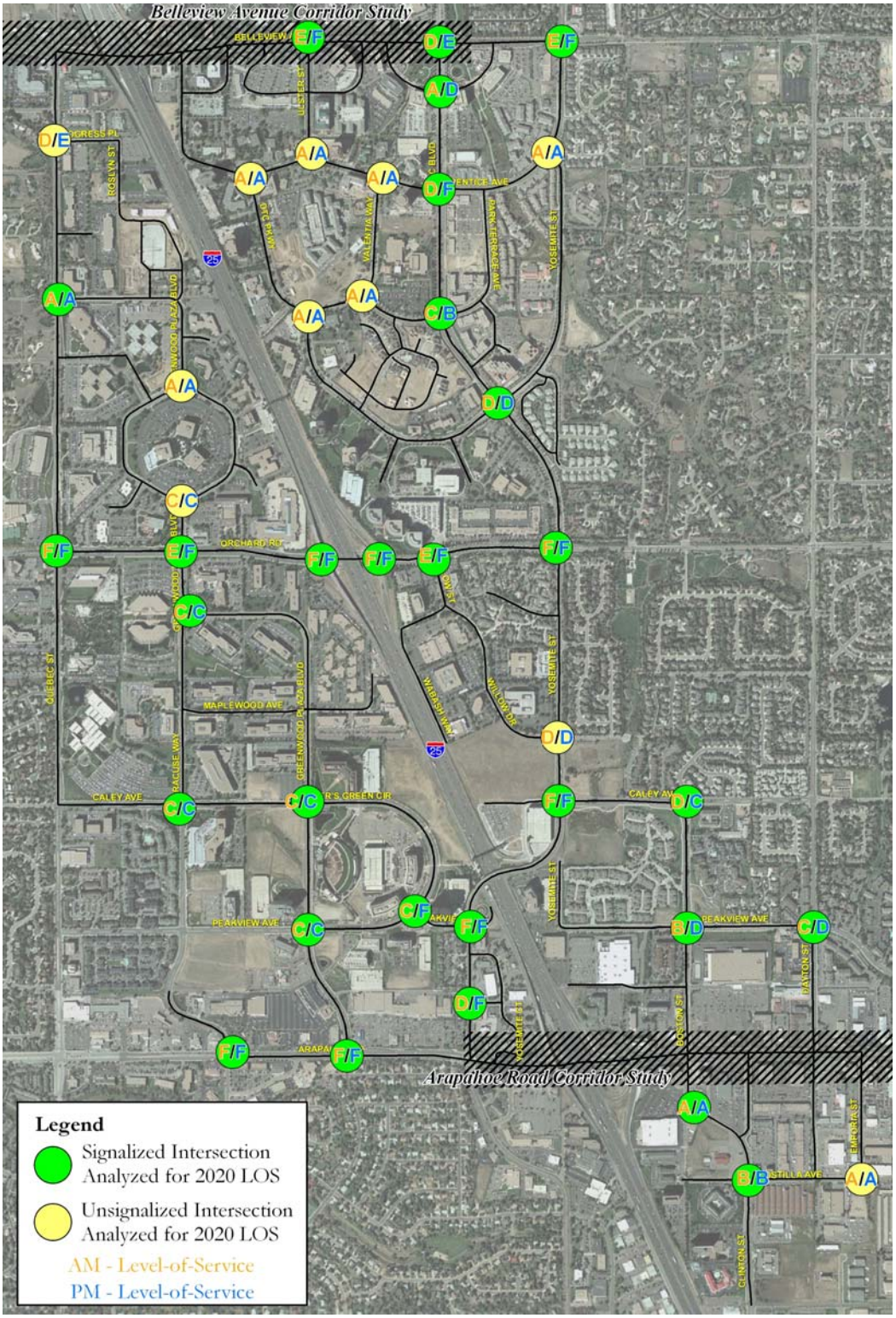
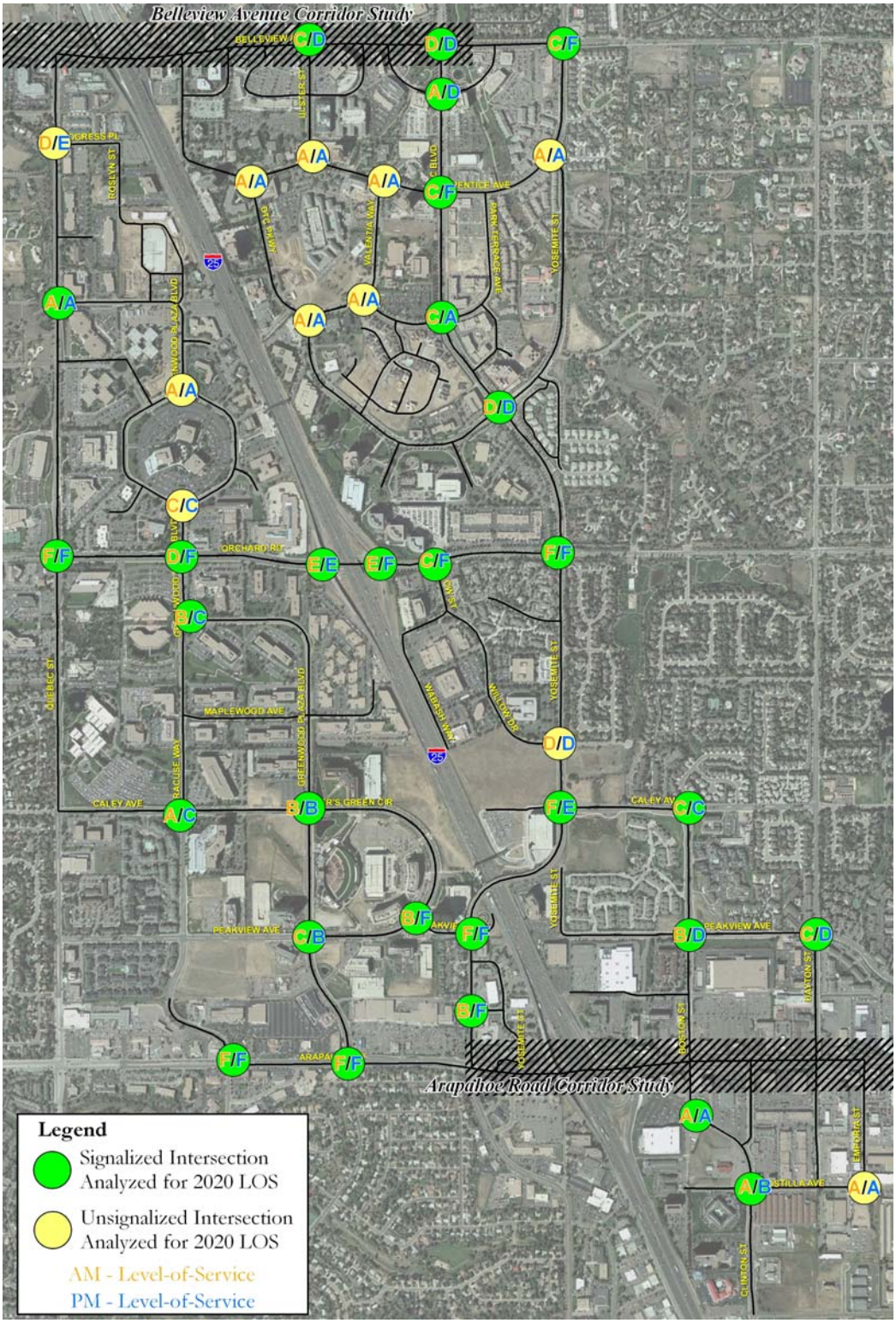


Figure 15 – 2020 Level of Service with Improved Signal Timing



4.0
Transportation Needs and Recommendations

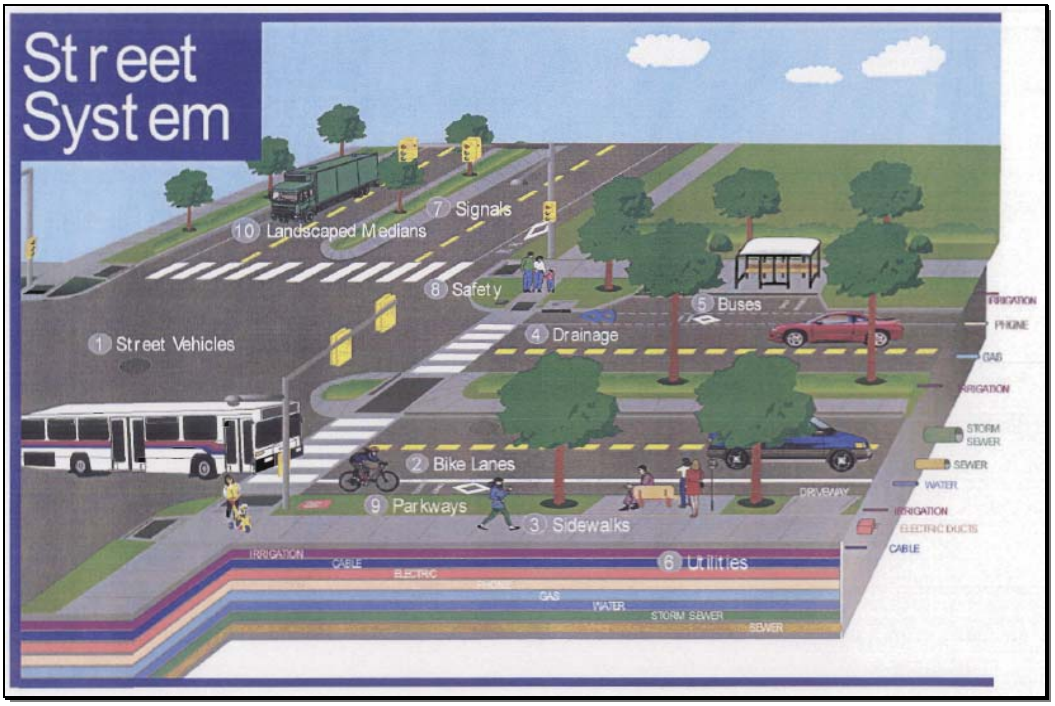
GREENWOOD VILLAGE COLORADO

4.0 TRANSPORTATION NEEDS AND RECOMMENDATIONS

The focus of this chapter is to generate a prioritized list of recommended improvement projects for each mode of transportation and recommend other measures intended to improve mobility and access in the Village. Moreover, the project list is intended to be incorporated into the Village's CIP. Conceptual capital costs were also estimated for the majority of projects on the list. The timeframe for the implementation of these projects will be dependant on funding availability, priority and other factors, such as physical constraints (e.g. steep grade, existing development).

4.1 Multi-Modal Needs and Recommendations

All modes of transportation need the street system for mobility (motor vehicles, walking, biking and transit). The image below identifies many different elements of the street system, such as roadway travel lanes, bike lanes, bus service, sidewalks, streetscape, traffic signals and utilities.



While there are some off-road trails and transit systems that operate on rails, for the most part, the street system is the primary transportation infrastructure. As described in previous chapters a multi-modal needs analysis was conducted by inventorying existing conditions or deficiencies and analyzing existing operations to assist in identifying needed improvements for each transportation mode. The analysis generated and evaluated the effectiveness of potential improvements that would fix existing deficiencies and meet future needs. The resulting project list includes several project categories including, roadway and intersection, bicycle, pedestrian, ITS, transit, TDM,

enhancement, and larger area wide or multi-jurisdictional projects. In addition, staff took into account previous City Council discussions and directions which resulted in a table of roadway and intersection projects inconsistent with prior policy direction. Lastly, follow-up studies were identified in the project list that address the long term vision for the study area.

4.1.1 Roadway and Intersection Needs and Recommended Improvements

Since all modes of transportation use the street system for mobility, they are also impacted by the physical condition and operation of the street. In order to address the needs for all modes using the street, the analysis included congestion levels, design, and safety review. The congestion analysis discussed in Chapter 3 identified several congested intersections and corridors within the study area. To ensure a safe and efficient flow of traffic in the study area, a LOS of D for peak hours was targeted.

A variety of sources were used to compile the initial project list for roadways and intersections improvements:

- I-25 Corridor Study Analysis
- Local transportation studies
- Greenwood Village staff observation
- Projects identified in the CIP
- Arapahoe County Transportation Plan
- DTC Master Transportation Plan

Improvements identified included:

- Capacity and operational improvements
- Streetscape enhancements
- New road connections
- Traffic control system improvements
- Roadway signing and striping

Refer to Appendix A to view the list of recommended roadway and intersection improvement projects. The “timeframe” column indicates whether the solution fixes an existing deficiency, or one that is forecast to emerge in the future with anticipated traffic growth. Levels of service, with the proposed improvements, are presented in Figure 16 (page 55) and Table 7. Figure 17 (page 56) graphically represents the recommended roadway and intersection projects.

Table 7 – 2020 Level of Service with Capital and Signal Timing Improvements

Intersection	Weekday AM Peak		Weekday PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Signalized Intersections				
Arapahoe & Greenwood Plaza	C	36	D	49
Arapahoe & Syracuse	D	40	D	55
Belleview & DTC Blvd.	D	39	D	52
Belleview & Ulster	C	28	D	54
Belleview & Yosemite**	C	32	D	55
Caley & Boston	C	30	C	22
Clinton & Costilla	A	7	B	17
Clinton & Target Plaza	A	<10	A	<10
DTC Blvd. & Crescent	A	<10	D	38
DTC Blvd. & DTC Pkwy./ Yosemite	D	36	D	48
DTC Blvd. & Park Terrace	C	21	A	<10
DTC Blvd. & Prentice	C	25	D	54
Greenwood Plaza & Caley/Fiddlers	B	20	B	18
Greenwood Plaza & Peakview/Fiddlers	C	28	B	20
Greenwood Plaza & Syracuse	B	16	C	23
Orchard & DTC Blvd./ Yosemite**	D	36	D	50
Orchard & Greenwood Plaza	D	52	D	54
Orchard & I-25 Northbound Ramps	D	36	D	34
Orchard & I-25 Southbound Ramps	C	34	D	40
Orchard & Willow	C	32	D	53
Peakview & Boston	B	18	D	35
Peakview & Dayton	C	24	D	44
Peakview & Fiddler's Green Circle	B	15	D	38
Quebec & Berry	A	<10	A	10
Quebec & Orchard**	D	49	D	53
Quebec & Progress	C	23	D	28
Yosemite & Caley	D	49	D	40
Yosemite & Peakview	D	40	D	44
Yosemite & Willow/Fair	C	33	D	55
Yosemite & Yosemite Circle	B	16	D	46
Unsignalized Intersections				
Costilla & Emporia	A	<10	A	<10
DTC Pkwy & Prentice	A	<10	A	<10
DTC Pkwy & Valentia	A	<10	A	<10
Greenwood Plaza & Greenwood Circle North	A	<10	A	<10
Greenwood Plaza & Greenwood Circle South	C	22	C	26
Prentice & Valentia	A	<10	A	<10
Prentice & Yosemite	A	<10	A	<10
Ulster & Prentice	A	<10	A	<10
Valentia & Park Terrace	A	<10	A	<10

** Note: Sensitive intersection location based on previous City Council discussion. Refer to Section 4.1.8 Not Recommeded Projects

4.1.2 Transit Needs and Recommended Improvements

Transit is seen as playing a larger role in the future transportation network for the study area. RTD operates the transit system in the area, which includes light rail, bus service, call-n-Ride, and park-n-Ride facilities. Although the Village does not manage the transit service, there are methods or facilities that travelers need which can be provided or enhanced by the Village. In addition to providing vehicle, bike and pedestrian access to the transit facilities, the Village has the opportunity to partner with RTD or other agencies in the area to provide amenities for transit riders such as shelters, benches, and bike racks/lockers.

Sources used to compile the initial project list for transit improvements:

- Greenwood Village staff observation
- RTD transit service plans
- I-25 Corridor Study observation
- Arapahoe County Transportation Plan
- SPIMD and Goldsmith Metropolitan District
- Arapahoe Road Corridor Study

Solutions identified included:

- Enhanced or added amenities at transit stops
- Wayfinding signage
- Access for physically impaired

Refer to Appendix A to view the list of recommended transit improvement projects.

4.1.3 Bicycle Needs and Recommended Improvements

At present, there are few facilities dedicated to bicycle travel in the study area. To create a safe and efficient bicycle network, it is important to retrofit existing roadways to accommodate bikes and provide safe and convenient supporting facilities such as bike racks/lockers. Retrofits and improvements may include signing and striping on street bike lanes, shared use lanes, and constructing off street multi-use trails. If bicycling is to be a practical transportation mode, it requires the same connectivity and directness of linkages to destinations that automotive modes typically have.

Bicyclists are as varied as the general population, with skills ranging from children and inexperienced recreational riders to highly skilled commuter cyclists. The recreational bicyclist is typically looking for an attractive, easy-to-use and easy-to-access multi-use trail, with nearby amenities. Directness of route is less important than safety and riding conditions. The commuter bicyclist is typically looking for a route between origin and destination that is direct, safe and fast. On-street bike lanes are often preferred over off-road trails by commuters.

Sources used to compile the initial project list for bicycle improvements:

- I-25 Corridor Study observation
- Greenwood Village Staff observation
- Greenwood Village Parks, Trails, and Open Space Master Plan Update
- Other local transportation/pedestrian studies
- Projects identified in the CIP
- Arapahoe County Transportation Plan
- Arapahoe Road Corridor Study
- DRCOG Bike and Pedestrian Plan
- DTC Master Transportation Plan
- SPIMD
- Greenwood Corporate Plaza Master Development Plan

Shared Lane Pavement Marking

Solutions identified included:

- Complete connections for existing bike lanes
- Addition of bike lanes and shared use lanes
- Construct new multi-use trails
- Construct grade-separated crossings
- Establish route signing

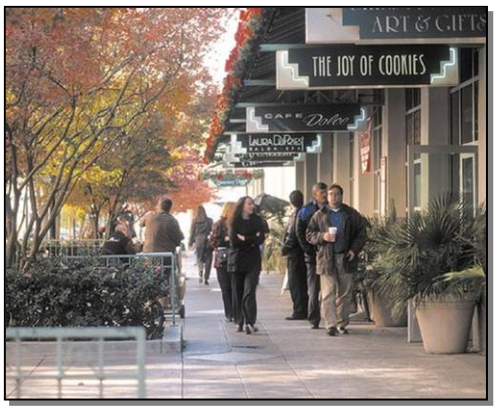
Refer to Appendix A to view the list of recommended bicycle improvement projects. Figure 18 (page 57) graphically represents the recommended bike projects.

4.1.4 Pedestrian Needs and Recommended Improvements

Within the study area, pedestrian facilities typically consist of sidewalks along streets. Only two multi-use trails are within or near the study area. The Running Fox Park Trail and the Goldsmith Gulch Trail lie on the west and east edge of the study boundary, respectively. Other factors influencing the pedestrian decision to travel by foot include connectivity between origins and destinations, intermodal connections, ease of crossing the street, signalization at intersections, grade separated crossings of busy roadways, mixed land uses, pedestrian first or transit supportive design, separation from traffic, and streetscape elements.

Although there is an increase in mixed use development and improved transit service within the study area, the lack of continuous sidewalks, street lighting, and other needed improvements make walking difficult and unsafe in some locations. Moreover, sidewalks, transit passenger waiting areas, building access, crosswalks and other pedestrian facilities need to be designed so that they can be easily and safely navigated by persons

with disabilities. Guidelines for this purpose are provided by the Americans with Disabilities Act (ADA). It should be noted that, while specific to persons with disabilities, these guidelines provide reasonable guidance for a safe environment for all pedestrians.



Sources used to compile the initial project list for pedestrian improvements:

- I-25 Corridor Study observation
- Greenwood Village Staff observation
- Greenwood Village Parks, Trails, and Open Space Master Plan Update
- Other local transportation/pedestrian studies
- Arapahoe County Transportation Plan
- Arapahoe Road Corridor Study
- DRCOG Bike and Pedestrian Plan
- Projects identified in the CIP
- Goldsmith Metropolitan District

Solutions identified included:

- Sidewalk construction
- Sidewalk reconstruction
- Street crossing improvements
- Construct grade-separated crossings
- Access for physically impaired
- Wayfinding signage
- Multi-use trail construction

Refer to Appendix A to view the list of recommended pedestrian improvement projects. Figure 19 (page 58) graphically represents the recommended pedestrian and trail projects.

4.1.5 Transportation Demand Management (TDM) Needs and Recommended Improvements

Incorporating TDM into the Village's transportation network recognizes that no single approach to solving transportation problems will be completely effective. Expanding transportation choices for residents, workers, and visitors to the study area can be achieved through TDM strategies. Additional choices will further aid individuals who do not or can not drive, as well as people who choose to use another mode as their primary means of transportation. TDM is a complementary part of a balanced transportation system.

There are a variety of TDM opportunities the Village can explore with the South I-25 Urban Corridor TMA and other partnering agencies or metropolitan districts in the area. Developing and implementing these strategies requires financial commitments, flexibility in policies and codes, and construction of the supporting infrastructure.

Sources used to compile the initial project list for TDM recommendations:

- I-25 Corridor Study observation
- Greenwood Village Staff observation
- Projects identified in the Village's general fund (e.g. TRIP program)
- South I-25 Urban Corridor TMA
- SPIMD

Solutions identified included:

- Promote carpooling, vanpooling, teleworking, and teleconferencing
- Construct improvements to the pedestrian, bike and transit infrastructure
- Continue to promote flexible work schedules and variable work hours to reduce peak hour congestion
- Consider financial incentives to alter people's travel behavior (e.g. pre-tax deductions for transit passes and bicycling expenses)
- Encourage mixed use development and TDM supportive urban design

Refer to Appendix A to view the list of recommended TDM improvement projects.

4.1.6 Intelligent Transportation System (ITS) Needs and Recommended Improvements

ITS applications have grown rapidly in the last 10-15 years. Applications available to the Village are part of the transportation infrastructure, such as traffic signals, informational signs, and applications that improve overall transportation operations and safety.

Increased vehicular traffic volumes are expected within the study area over the next 10 years. One approach to address this increase is to construct larger transportation facilities (e.g. more roadway lanes). Another approach would be to utilize ITS applications to increase the operational capacity of the system. As part of the operational analysis, signal timing was optimized to ease congestion at some intersections. However, even with optimizing the signal timing physical roadway improvements are still necessary. In constrained or sensitive areas where safety and mobility are important, but its not feasible or desirable to increase the width of the road because of negative effects on existing development, neighborhood livability, or other community values, ITS becomes a viable option. To fully utilize ITS requires the supporting infrastructure. Examples of the supporting infrastructure include fiber optic connectivity, video detection cameras, variable message signs, and master controllers.

Sources used to compile the initial project list for ITS improvements:

- Greenwood Village Staff observation
- Greenwood Village CIP project list
- I-25 Corridor Study observation
- Arapahoe Road Corridor Study
- Arapahoe Road/I-25 Interchange Final System Level Feasibility Study

Solutions identified included:

- Traffic control system improvements
- Integrate I-25 on-ramp meters with traffic signals on Arapahoe Road, Orchard Road and Belleview Avenue
- Construct traffic operations center
- Install wayfinding signs to direct motorists to destinations thus preventing negative impacts to adjacent neighborhoods

Refer to Appendix A to view the list of recommended ITS improvement projects.

4.1.7 Area-Wide / Multi-Jurisdictional Recommended Projects

Area-wide projects are ones that would involve multiple locations or the entire study area, such as street lighting, and streetscape enhancements. Multi-jurisdictional projects require involvement, coordination, and most likely financial participation from other agencies, such as CDOT, RTD or adjacent municipalities. Examples of these projects include improvements to the I-25 interchanges at Arapahoe Road, Belleview Avenue, and Orchard Road, and widening regional roadways along city boundaries.

In addition to improvement projects, there are several studies for the project area that are recommended for the Village to conduct. These studies include a “Main Street” master plan for Greenwood Plaza Boulevard, and a transit stop design standard manual.

See Appendix A and Figure 20 (page 60) for the list of Area Wide / Multi-Jurisdictional Projects.

4.1.8 Roadway and Intersection Projects Inconsistent with Prior Policy Direction

The projects listed in this category consists of projects primarily on the edge of the study area. Although the technical analysis recommends that these projects be completed to improve mobility and access in the study area, they are not included on the recommended list based on direction Village staff has received from current and/or past

City Council direction. Projects such as improvements to the Orchard Road and Quebec Street intersection and increasing traffic flow on Belleview Avenue east of Yosemite Street were placed in this table. Other projects, such as widening Yosemite Street to 6-lanes between Orchard Road and Arapahoe Road were included because of the monetary cost and negative impacts it would have on the adjacent properties and neighborhoods.

See Appendix A and Figure 21 (page 60) for the list of Roadway and Intersection Projects Inconsistent with Prior Policy Direction.

4.2 Summary of Multi-Modal Needs and Recommendations

Once the list of improvement projects was developed, staff and the consultant team then conducted an iterative process to refine and finalize the project list. Projects that were already funded in the CIP, or under the jurisdiction of another agency, such as City of Centennial, were removed from the project list. This includes projects such as the westbound right turn lane extension at Orchard and Yosemite Street/DTC Blvd., and the northbound right turn lanes at Arapahoe Road and Syracuse.

The remaining projects were divided into several categories – such as Roadway and Intersection Projects, Bicycle Projects, and Pedestrian Projects. Probable costs were then estimated for these projects and eventually prioritized based on a standard set of criteria for each category. Cost estimates were not created for the transit or TDM projects because these projects or costs would be paid for by other agencies or become part of an existing program or strategy that the Village already partners with such as the South I-25 Urban Corridor TMA or RTD. Other recommended TDM programs are related to Village codes or policies. ITS projects, such as upgrading the traffic signals to a responsive system, have already been identified in the CIP and cost estimated.

4.3 Estimates of Probable Costs

Planning-level estimates of probable project costs were prepared for the Roadway/ Intersection, Pedestrian and Bicycle projects. The accuracy of estimates is commensurate with the level of detail with which the projects are defined in the study. In this case, the cost estimates give a basis of comparison between projects and provide a general “order of magnitude” estimate of the project’s anticipated costs. The estimates also contribute to the project screening and prioritization process. However, the accuracy of planning level estimates will need to be refined further for CIP budgeting purposes. Further project definition and engineering investigation should be conducted before CIP budgets are established.

To develop cost estimates for this study, similar projects were grouped into improvement categories (e.g., Roadway Capacity (Major Construction), Roadway Capacity (Minor Construction), Bike Facilities, and Pedestrian / Trail Facilities) based on the type of construction, right-of-way requirements, and other project characteristics. A conceptual cost estimate was prepared for a representative project within each improvement category. The conceptual cost estimates included the major work items, quantities, and unit costs. Unit costs were based on recent bid tabulations and were adjusted to reflect the project’s size and expected complexity. Cost factors were applied to account for those items of work that could not be precisely defined at this time, including but not

limited to: utility relocations; construction phasing and traffic control; and engineering. A 15% contingency was also applied to provide an overall estimate that was reasonably conservative.

The representative project cost estimates were then converted to an aggregate unit cost (typically a total project cost per lineal foot). This unit cost was applied to other projects within the improvement category using quantities determined through a combination of field review and aerial photography.

Recognizing that not every project within an improvement category is the same, specific line item costs were included in the individual project estimates, as appropriate. Line item costs include those items that are unique to a particular project or are otherwise not included in the aggregate unit cost. Traffic signals, box culverts, and right-of-way are examples of specific line item costs. The estimates of probable costs for Roadway/ Intersections, Pedestrian, and Bicycle projects are shown in Appendix B.

4.4 Recommended Project Evaluation and Prioritization

Prioritization criteria were established by the study team for each mode of transportation because of differing evaluation criteria and priorities. For example, roadways and intersections project evaluation will place a higher priority on LOS, while pedestrian and bicycle facilities evaluations will place a higher priority on network completeness and continuity. All criteria placed a heavy emphasis on public safety. However, in some cases, such as transit and travel demand management (TDM), prioritization criteria were not established due to the limited role the Village plays in determining the type and amount of transit service provided and the partnership role the City has with the South I-25 Urban Corridor TMA and other partnering agencies, who develop and manage many of the TDM programs within the Village.

4.4.1 Roadway and Intersection Prioritization Criteria and Scoring

Many categories were explored and analyzed for determining the prioritization criteria for roadway and intersection projects. The objective of the process was to create an unbiased method of ranking the projects by a set of standard criteria. The criteria include public safety, LOS analysis, multi-modal enhancements, cost/benefit score, project feasibility, and the ability to construct the project in conjunction with other projects.

Criteria are:

Level of Service (LOS): The 2020-year projected overall intersection LOS categories A through D receive 0 points, LOS E receives 5 points, and LOS F receives 10 points (without improvements).

Cost/Benefit: A Cost/Benefit score was calculated for each project based on the peak hour traffic volumes, the reduction in delay due to the proposed projects, and the estimated costs. The project with the highest Cost/Benefit score was awarded 10 points. Cost/Benefit scores for the other projects were prorated down to 0, proportional to the calculated ratios.

Safety: Crash data was evaluated for all key intersections within the study area. At each intersection, the type of crash was tallied into three categories; property damage only, injury crashes, and fatal crashes. In order to consider crash severity, the number of crashes at each intersection was weighted based on these crash types. Fatal accidents were weighted the highest (12 points), followed by injury crashes (5 points) and property damage only crashes (1 point). The weighted crashes were then divided by the annual traffic volumes traveling through each intersection to calculate a weighted crash rate. The resulting crash rates ranged from 4.54 weighted crashes per million entering vehicles at the intersection of S. Quebec Street and E. Orchard Road to 0.05 weighted crashes per million entering vehicles at the Quebec Street and Berry Avenue intersection.

The intersection with the highest weighted crash rate was awarded 15 points. Weighted crash rates for the other intersections were prorated down to 1. The resulting scores for the proposed projects were then used. Refer to Appendix E for a list of weighted intersection crash rates.

Construction Feasibility: Projects were rated based on their ease of constructability, such as available right-of-way, physical limitations, or neighborhood sensitivity. Projects with little or no constraints received 8 points, those with some constraints received 5 points, and those with severe constraints received 1 point.

Roadway Classification: Projects on arterial roads received 8 points, those on City/County level streets or collectors received 5 points, and local streets received 1 point.

Multi-modal Enhancement: 5 points were awarded to each project that includes a multi-modal benefit, such as transit features (e.g. bus pullout, concrete pad), addition of bike lanes or shared wide outside curb lanes, constructing grade separated facility for bikes and pedestrians, or adding transit or bicycle actuation at traffic signals.

Construct Jointly with other Project or Agency: If project can be constructed jointly with other CIP projects, agency projects, or as part of the pavement management program, 5 points were awarded.

4.4.2 Bicycle Prioritization Criteria and Scoring

The bicycle prioritization criteria were developed based on establishing a safe, continuous, and well connected bike network that provides access to destinations, multi-modal connectivity and the ability to construct jointly with other transportation or capital projects. Criteria are:

Known Safety Hazard or Barrier: Awarded 10 points if the area is a known safety hazard/barrier and the project will eliminate the hazard/barrier entirely. Awarded 5 points if the project improves the hazard/barrier by providing a new dedicated facility or a controlled crossing, otherwise 0 points were awarded.

Access to Destinations: Awarded 8 points if the project connects major destinations, such as the Village Center. Award 5 points to projects that connect neighborhoods,

shopping and employment areas. Awarded 3 points to projects that connect to recreational destinations such as trails, or parks, otherwise 0 points were awarded.

Multi-modal Connectivity: Five points were awarded if the facility connects to another mode of transportation, such as transit, park-n-Ride, or a trail, otherwise 0 points were given.

Roadway Classification: Projects on arterials received 8 points, on City/County level streets or collectors received 5 points, local streets 1 point.

Construct Jointly with other Project or Agency: If project can be constructed jointly with other CIP projects, agency projects, or as part of the pavement management program, awarded 5 points.

4.4.3 Pedestrian/Trail Prioritization Criteria and Scoring

Criteria for prioritizing pedestrian/trail projects were developed to help create a safe and secure network which is well connected to other transportation modes, parks, activity centers and neighborhoods, and provides universal access to all users including children, seniors, and the mobility-impaired. Projects that can be constructed jointly with other capital projects also received additional points. Criteria were:

Multi-modal Connectivity: Five points were awarded if the facility connects to another mode of transportation, otherwise 0 points were given.

Roadway Classification: Projects on arterials received 8 points, projects on City/County level streets or collectors received 5 points, local streets 3 points, and off street trails received 1 point.

Continuity: Ten points were awarded if the facility fills an existing gap in the pedestrian network, otherwise 0 points were given.

Street Crossing: Eight points were awarded if a project eliminates pedestrian/ vehicle conflict points entirely by grade separation, 5 points were awarded for projects improving a signalized intersection, 3 points awarded for improving an unsignalized crossing or mid-block crossing, otherwise 0 points were given.

Security / Safety: 5 points were awarded for projects that are located at a known accident location and 1 point for each of the following (up to 5 points);

- Improves visibility
- Increases lighting levels
- Located along a roadway with a speed limit between 25 mph and 30 mph, or 2 points if located along a roadway with a speed limit greater than 35 mph
- Eliminates hazards or physical barrier, such as deteriorating facility or median

Access for Physically Impaired: If project created the only accessible route for the physically impaired along the street 10 points were awarded. Five points awarded for projects that corrected a non-compliant ADA condition, such as access ramps, widening existing sidewalks, mitigating excessive slopes, or connecting building entrances via an accessible route, otherwise 0 points were awarded.

Construct Jointly with other Project or Agency: If project can be constructed jointly with other CIP projects, agency projects, or as part of the pavement management program awarded 5 points.

4.4.4 Prioritized Project Recommendations

After transportation projects were scored, they were then prioritized based on the overall project score and divided into separate tables and sections based on travel mode. Included within the tables is the conceptual cost estimate for each project. In addition, projects were placed in a GIS database to provide a visual representation of the Village's transportation needs within the study area. Associated with each prioritized table are maps generated from the GIS database illustrating all the project locations (Figure 17 through Figure 19) in the study area.

Roadway and Intersection Prioritized Project List

Prioritized roadway and intersection projects are listed in Appendix C. Brief project descriptions are included in the table.

Pedestrian Prioritized Project List

Prioritized pedestrian and trail projects are listed in Appendix C. Brief project descriptions are included in the table.

Bicycle Prioritized Project List

Prioritized bicycle projects are listed in Appendix C. Brief project descriptions are included in the table.

Figure 16 – 2020 Level of Service with Improved Signal Timings and Capital Improvements

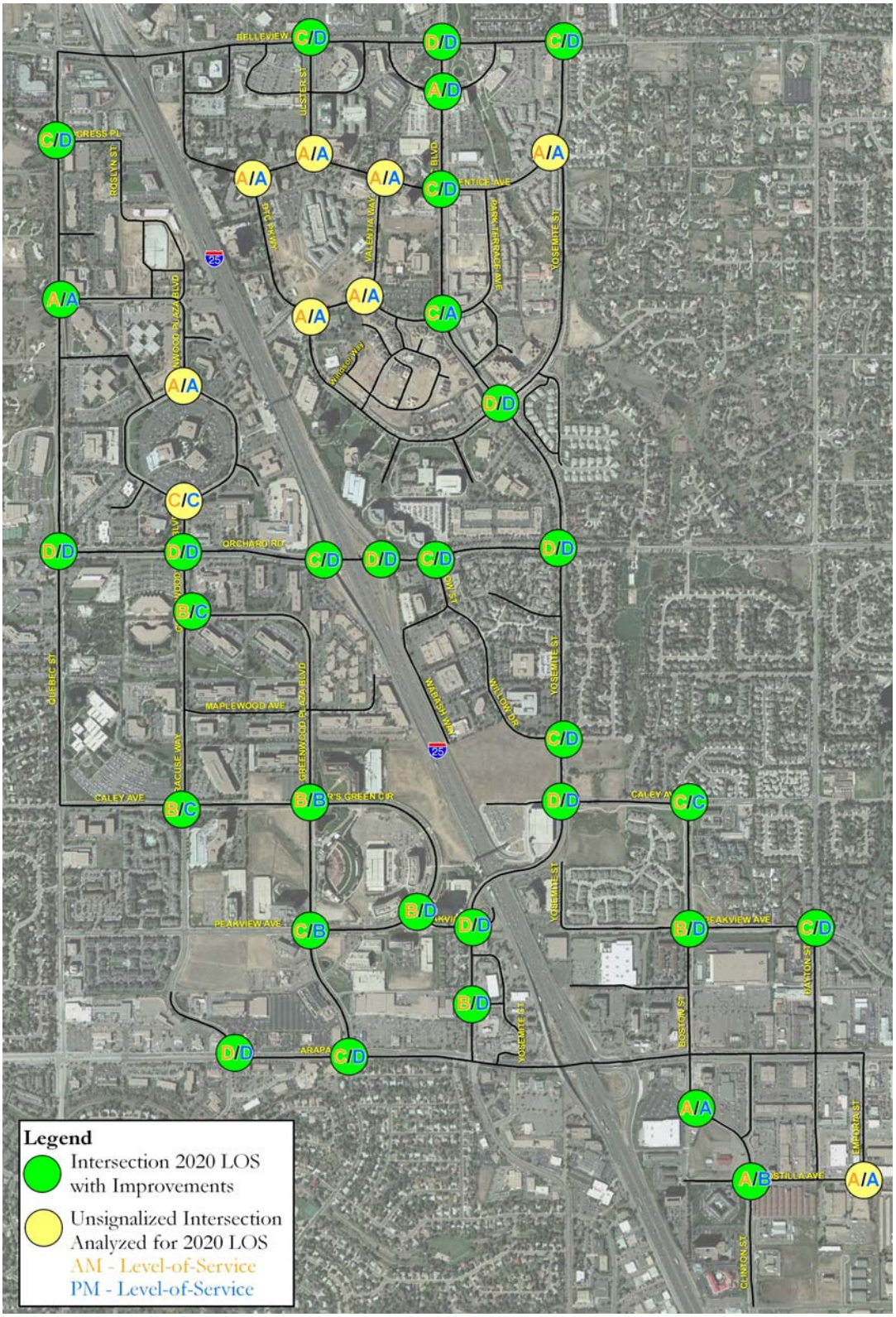


Figure 17 – Recommended Roadway and Intersection Projects

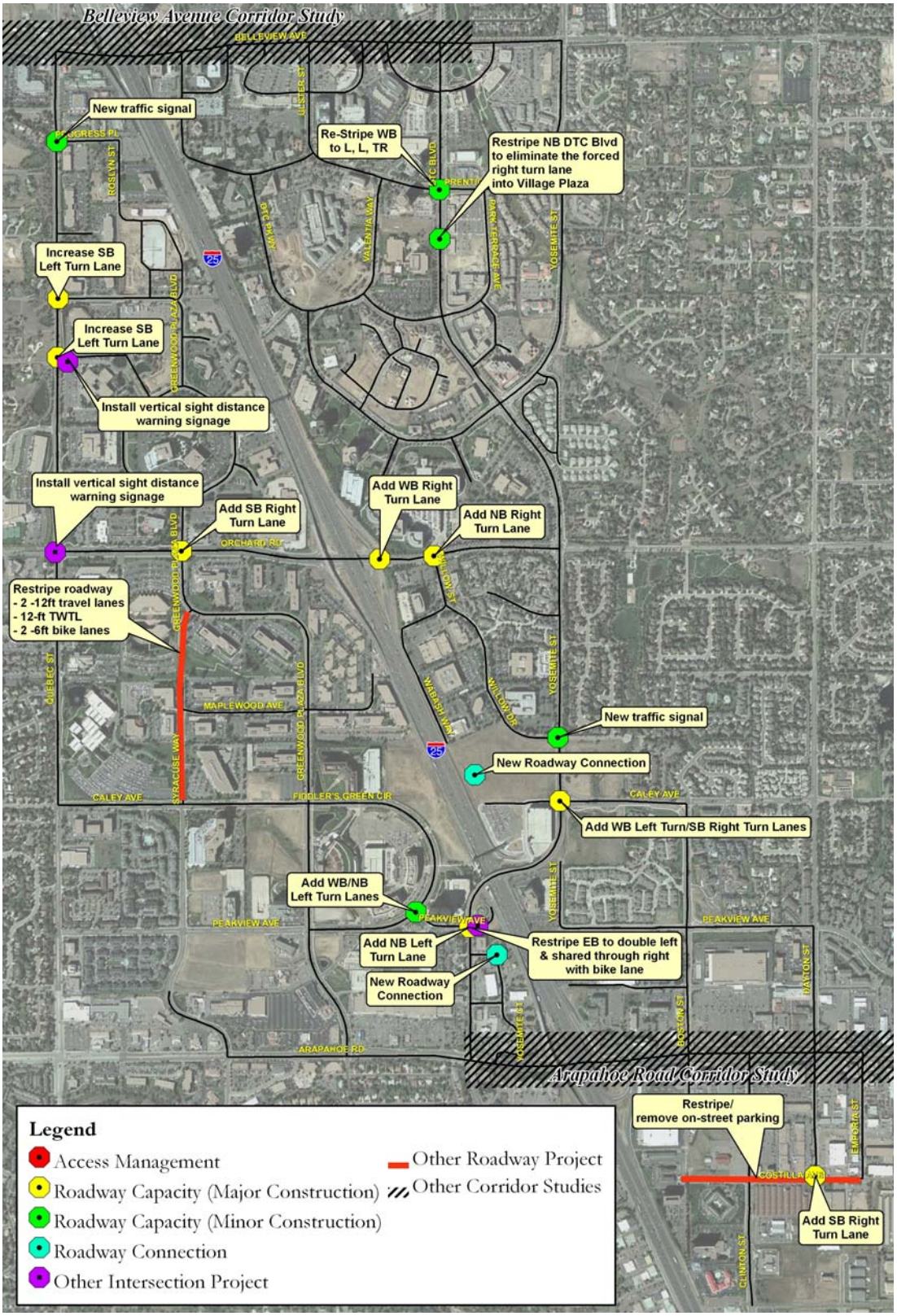


Figure 18 – Recommended Bicycle Projects

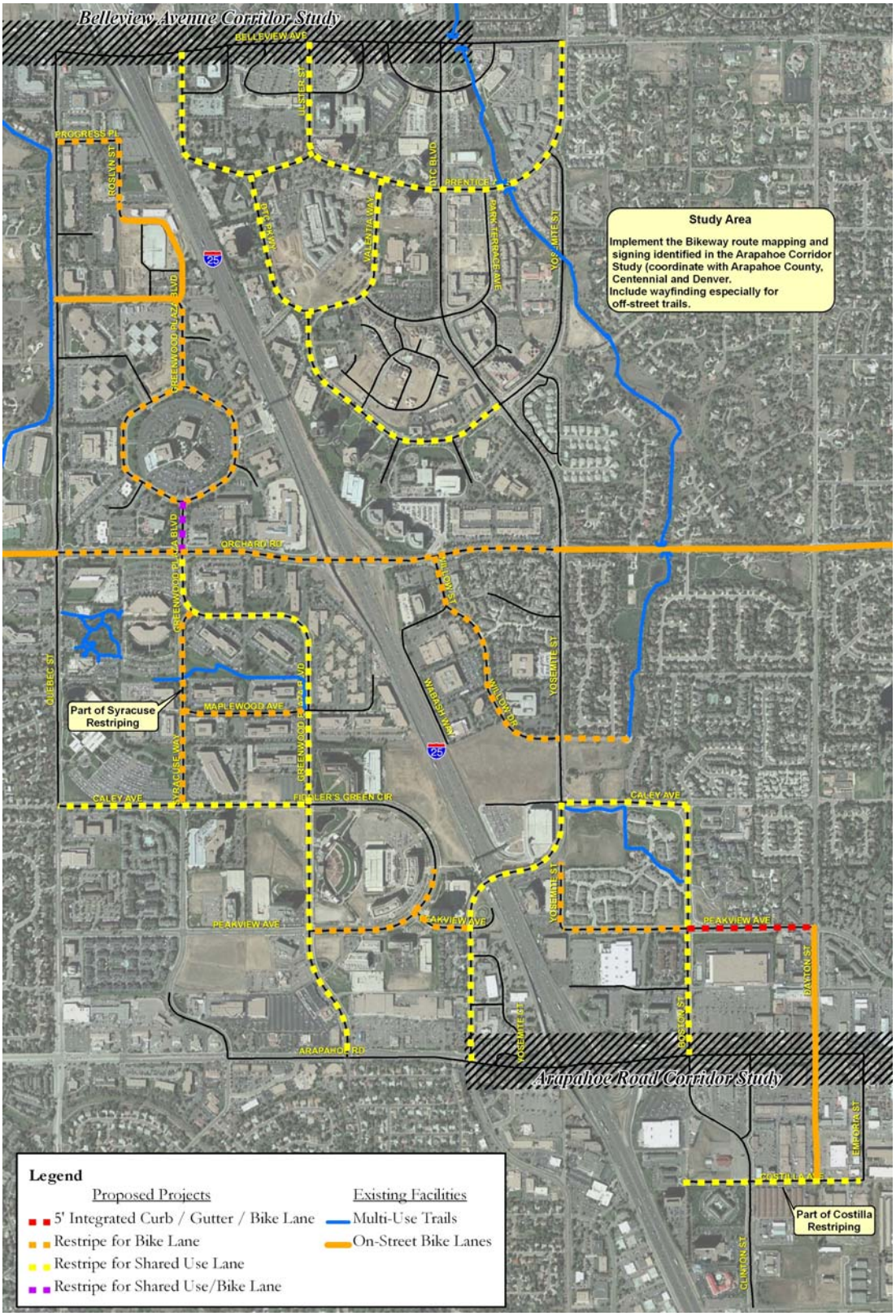


Figure 19 – Recommended Pedestrian and Trail Projects

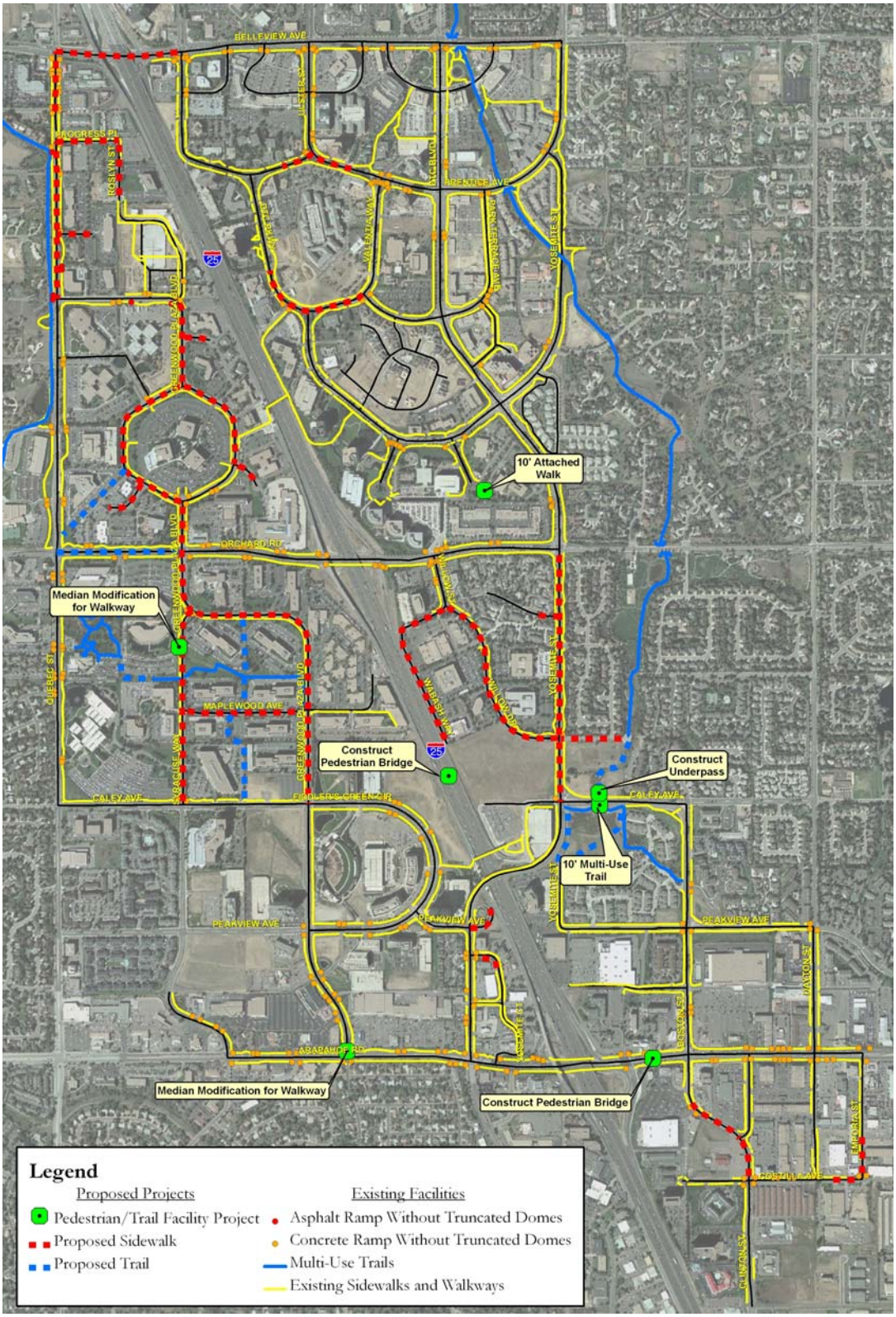


Figure 20 – Recommended Area-Wide/Multi-Jurisdictional Projects

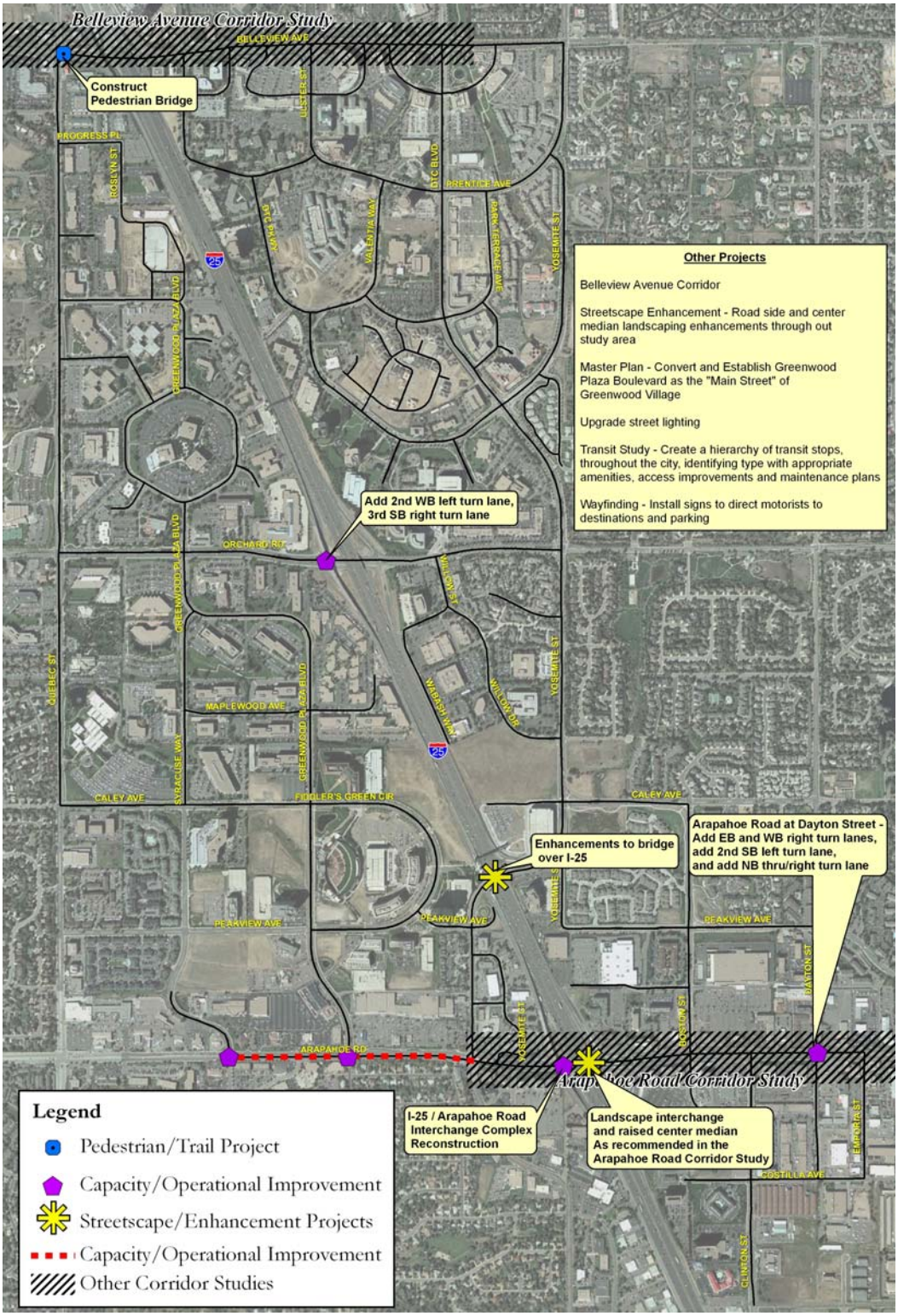
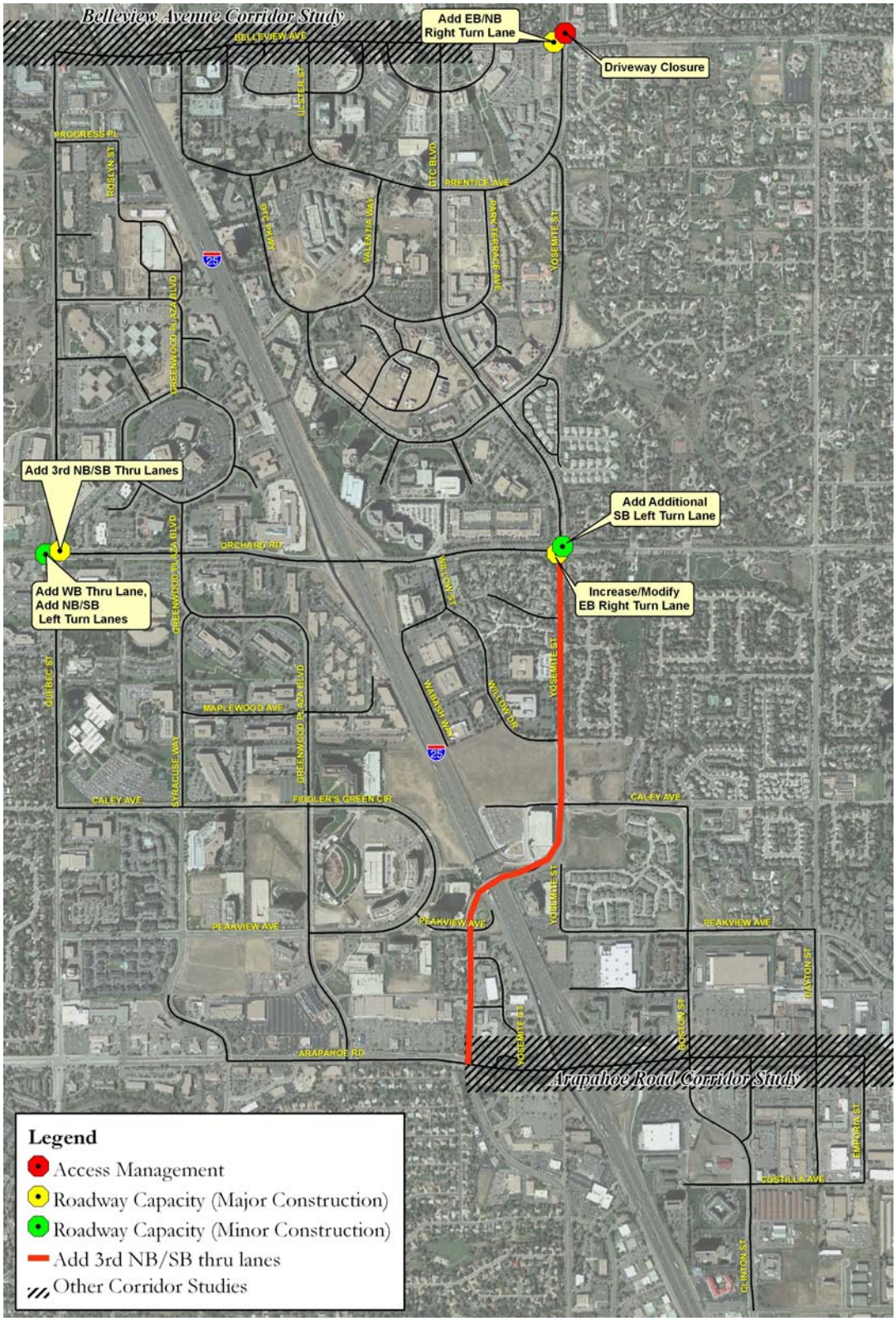


Figure 21 – Roadway and Intersection Projects Inconsistent with Prior Policy Direction



5.0 Implementation

GREENWOOD VILLAGE
COLORADO

5.0 IMPLEMENTATION

This chapter focuses on the implementation aspects of the recommended improvement projects for various transportation modes and summarizes potential strategies and funding sources for completing the list of projects. There are numerous potential strategies and funding sources available outside the Village's budget, depending on the mode of transportation or the recommended improvement. However, the CIP is considered the primary tool to fund and complete the recommendations in the study.

5.1 Total Estimated Capital Costs

Cost estimates for the proposed improvement projects are summarized below. Table 8 provides a summary of capital costs by transportation facility type for the recommended projects and an overall total that includes the cost estimates for the projects inconsistent with prior policy direction.

Table 8 – Estimated Capital Needs

Facility Type	Capital Cost
Roadway & Intersections	$6,649,000
ITS	$1,625,000
Bike	$1,660,000
Pedestrian Facilities	$6,852,000
Multi-Use Trails	$2,125,000
Grade Separated Crossings	$4,747,000
RECOMMENDED PROJECTS TOTAL	**$23,658,000**
Roadway and Intersections Inconsistent with Prior Policy Direction	$5,808,000
OVERALL TOTAL	**$29,466,000**

The above capital needs do not include improvements to the Arapahoe Road corridor, such as reconstruction of the I-25/Arapahoe Road interchange, or improvements along Belleview Avenue between Monaco Street and DTC Boulevard, such as the I-25 interchange. Currently, the I-25/Arapahoe Road interchange reconstruction is estimated between $85 and $125 million. Since this is a regional project involving multiple agencies and jurisdictions, the Village's capital share is unclear at this time.

5.2 Operations and Maintenance Costs

Costs discussed in Table 8 only represent capital costs. Associated operational and maintenance (O&M) costs are not included. When CIP projects are considered for

construction, it is important to consider the O&M costs associated with that facility. For fiscal year 2009, the Village budgeted approximately $5 million for pavement and concrete rehabilitation, pavement striping and other roadway related maintenance.

5.3 Current Revenue Sources

The General Fund provides a substantial contribution to transportation funding in Greenwood Village. In 2009, the Village budgeted a total of approximately $6.2 million for transportation-related projects and maintenance, of which $4.5 million came from the General Fund. This represents 13% of the General Fund revenues. Previous budgets have had similar amounts allocated toward transportation. Furthermore, revenues from the General Fund provide the Village's required local share for federal grants and other funding sources that require a local funding match. At present, the only funding source earmarked for transportation projects is the Occupational Privilege Tax and the Village's share of the Highway User Trust Fund. In 2008, $1.65 million was budgeted from this revenue source and the same amount is budgeted for 2009.

5.4 Potential Funding Sources

Managing and financing the I-25 corridor study area requires collaboration between agencies involved in transportation, including CDOT, DRCOG, Arapahoe County, the South I-25 Corridor TMA, SPIMD, metropolitan districts, and adjacent municipalities. Roles and commitments may be formalized through intergovernmental agreements or joint policy resolutions, such as the Four Corners Agreement. Joint collaboration may also include combining financing efforts to construct improvement projects that are either on the edge or include multi-jurisdictional boundaries. This especially applies to constructing large regional projects such as the I-25 / Arapahoe Road interchange complex.

To aid in financing the construction of the identified transportation improvement projects, potential financing tools other than the Village's General Fund have been identified in Table 9**.** The table lists many potential revenue sources or methods to raise funds at the federal, state, county, regional, and local levels, as well as possible authorities, districts, developers and public/private partnerships. Of these tools, a few examples used by the Village or are currently used within the study area include: using programs within SAFETEA-LU, the Arapahoe County Open Space Program, tax or fee rebates, and metropolitan districts. Other potential tools mentioned in the table could become additional sources of revenue.

Table 9 - Potential Transportation Financing Tools

Source: Federal / State		
Source	**Financing Tool**	**Program Description**
Federal	SAFETEA-LU/CDOT: Surface Treatment Program	This federal funding program provides Colorado with formula-based funds for improving such facilities as bridge projects on any public road, high accident/congested intersections, public bus terminals and facilities, environmental restoration, and pollution abatement. A required minimum 80/20 (federal/state) funding match is required.
Federal	SAFETEA-LU: Enhancement Funds	The federal funding program sets aside 10% of the Surface Treatment Program funds for projects that support pedestrian, bicycle, scenic easements, landscaping and other improvements.
Federal	SAFETEA-LU: Congestion Mitigation / Air Quality (CMAQ) Funds	The federal funding program provides funds for communities to meet the requirements in the Clean Air Act. Funding is available for areas that do not meet the National Ambient Air Quality Standards (non-attainment areas) as well as former non-attainment areas that are now in compliance (maintenance areas).
Federal	SAFETEA-LU: Highway Safety Improvement Program (HSIP)	Separately funded this federal funding program allows States to target funds to the most critical safety needs, such as railway-highway grade separation and hazard elimination.
Federal	SAFETEA-LU: Safe Routes to School	This federal funding program focuses on infrastructure and behavioral projects geared toward providing a safe and appealing environment for walking and biking to school.
Federal	SAFETEA-LU: Transportation Community System Preservation Program (TCSP)	This federal funding program allows communities to address relationships among transportation, community, and system preservations plans and practices and identify private sector-based initiatives to improve those relationships.
Federal	SAFETEA-LU: National Highway System (NHS)	This federal funding program includes the Interstate system, other urban and rural principal arterials, highways that provide access between the NHS and major intermodal transportation facilities, the defense strategic highway network and strategic highway network connectors.
Federal	SAFETEA-LU: Highways for Life Pilot Program	This federal funded program fosters the use of new state-of-the-art technologies, new business practices in the highway construction process that results in improved safety, faster construction, reduced congestion from construction, and improved quality and user satisfaction. The program will fund up to 20% of the project, but not more than $5 million.
Federal	SAFETEA-LU: Recreational Trails	This federal program is focused on developing and maintaining trails for recreational purposes that include pedestrian, equestrian, bicycling, and non-motorized snow activities as well as off-road motorized vehicle activities. Projects include construction and maintenance equipment, real estate costs, educational program costs, State administration costs, and assessment of trail conditions.

Source: Federal / State		
Source	**Financing Tool**	**Program Description**
State	Land and Water Conservation Fund	If funds are available the State will assist the National Park Service in administering grants from the program; bicycle paths may be eligible for funding
State	Highway Users Trust Fund	These funds come primarily from the State's motor fuel tax and vehicle registration. A portion of the funds are distributed to local governments on a formula basis.
State	State Surplus (TABOR Growth Dividend)	Once the State's General Fund reaches its TABOR ceiling and the CDOT fund transfer is completed, excess revenues (Growth Dividend) are distributed 2/3rds to transportation and 1/3 to the capital construction fund.
State	Sales Tax	Increase the State's sales tax to aid funding transportation improvements and maintenance.
State	Vehicle Miles Traveled (VMT) Fee	A fee imposed on motorists based on the number of miles driven annually. It can be monitored and assessed annually when vehicles are registered.
State	Private Activity Bonds	Tax exempt bonds that may be issued for specific purposes including transportation. The State receives an authorization per capita and allocates the authorization among state agencies and local governments.
State	Severance Tax	State imposes a higher tax upon nonrenewable natural resources that are extracted from the earth. The tax is applied to gross oil and gas income. Additional revenues are then earmarked for transportation improvements throughout the state.
State	Vehicle Emissions Fee	Annual fee imposed on motor vehicles based on their impact to air quality. Revenues can then be used to improve air quality through transportation improvements, such as reducing traffic congestion, improving transit, and providing non-polluting transportation options.
State	Colorado Conservation Trust Fund and Great Outdoors Colorado Trust Fund	State lottery proceeds (40%) go to the Trust for use by local governments for park and recreation projects and distributed per capita.
State	Colorado Trails Program	Colorado combines revenue sources from the state and federal sources to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Federal sources include the Recreational Trails Program (RTP), an assistance program of the Department of Transportation's Federal Highway Administration (FHWA).
State	Motor Fuel Tax	Tax imposed by the State on distributers of gasoline and similar fuels at wholesale level in lieu of a state sales tax.
State	Bridge Safety Fee	Fee applied toward motorists to improve and maintain the safety and conditions of the bridges on roadway system. The fee can be applied at the time of vehicle registration.

Source: Federal / State		
Source	**Financing Tool**	**Program Description**
State	Daily Visitor Fee	Fee would be applied toward visitors to the State. It could be applied to hotel stays, rental car agreements, or conference fees.
State/ County	Motor Vehicle Registration Fee	Registration fee administered by the State on motor vehicle type and weight. Counties collect the fee for the State and retain a portion per vehicle. The State earmarks the fee for the HUTF, a portion of which is returned to the cities and counties.

Source: County and Local Taxes and Fees		
Source	**Financing Tool**	**Program Description**
County	Regional Transportation Improvement Fee	A fee administered by the County on new development to pay for transportation improvements.
County	Specific Ownership Tax (County)	A county impose an annual tax on vehicle ownership and is collected when license plates are renewed. The tax is then distributed to local governments in the county based on property tax revenues. This tax is in lieu of personal property tax on motor vehicles.
County	Road and Bridge Fund	Counties impose a mill levy on properties for road and bridge improvements. Cities participate in revenues equal to 50% of the total; it is apportioned on the basis of property tax received by the fund.
County	Arapahoe County Open Space Program	County program specified to acquire open space and develop trails.
Local	Property Tax Mill Levy	Tax applied to real and personal property. With voter approval, the City may increase the levy and set aside the revenue for transportation projects or pay debt service on issuance of bonds for transportation projects. The mill levy for the City is 2.932.
Local	Sales Tax	Tax applied to the sale of goods at retail establishments. A portion of which could be earmarked for specific transportation projects. Voter approval would be required to increase the current overall sales tax of 7.35% (3% local).
Local	Motor Vehicle Sales Tax	This would be a local option to tax the sales of vehicles in the City or sale of vehicles registered in the City.
Local	Use Tax	Tax imposed on the purchase of goods outside the City similar to the City's sales tax. Use tax primarily comes from building materials, office equipment, machinery, and motor vehicles.
Local	Accommodations Tax	An excise tax imposed on lodging businesses based on room revenue.
Local	Rental Car Fee	A tax imposed on each rental car agreement.
Local	Transportation Impact Fee	A fee applied to new or redevelopment similar to the Arapahoe County's transportation improvement fee. It can be applied in various ways including number of housing units, square footage, or vehicle trips generated.

Source: County and Local Taxes and Fees		
Source	**Financing Tool**	**Program Description**
Local	Occupational Privilege Tax	A tax imposed on area employers or employees who work within a city to offset city costs for providing transportation services or facilities.
Local	Tax Increment Financing (TIF)	A tax earmarked for public improvements and paid for by incremental increases in sales and property tax revenues from redevelopment within a specified area. If an urban renewal authority is used than ALL incremental property tax revenues may be earmarked for project area improvements.
Local	Tax or Fee Rebates	A Public/Private agreement that is entered into by a private developer and jurisdiction to fund public transportation improvements. Typically a share back of a portion of tax or fee revenues generated from the development. The share back of tax or fee revenues is limited by a specified dollar amount or by time period.
Local	Project Improvement Fee (PIF)	A voluntary fee that functions as a supplemental sales tax earmarked for public improvements.
Local	Transportation Utility Fee	A fee based on street linear footage, number of parking stalls, square footage of buildings, or other equitable method applied toward the maintenance of public streets.
Local	Off Street Parking Space Fee	An annual fee applied to property owners based on the number of street parking spaces
Local	On Street Parking Fee	A fee applied to motorist parking on the street. This can be applied in various technologies and enforcement methods.
Local	Sidewalk Fee	A fee applied to people who pull a building permit that exceeds a certain dollar amount has the option of either building the sidewalk along their street frontage or paying the City a fee to construct the sidewalk. Any easement or right-of-way dedication would also be required.
Local	Bicycle Fee	A one time fee applied to the purchase of a new bicycle. Revenues can be earmarked to build and maintain cycling facilities throughout the City.
Local	Advertising	A tool which allows for the placement of advertisement on city owned facilities, such as bus benches, or shelters.
Local	Cost Participation Agreements	Developers would enter into an agreement with the City to participate in their fair share of specific future improvements, such as transit stops, interstate interchanges, and bicycle improvements.

Source: Regional Authorities, Local Districts, Organizations		
Source	**Financing Tool**	**Program Description**
Regional	Regional Transportation Authority	Organized by member jurisdictions and agencies to provide services and facilities that exceed local government boundaries. It may levy property taxes and must include all of one county and may include counties outside the Denver metro area.
Regional	Southeast Public Improvement Metropolitan Districts	A joint partnership consisting of several metro districts in the southeast corridor focused on improving transportation conditions.
Local	General Improvement District	All property owners pay an increase in their property tax mill levy to fund improvements within their district.
Local	Specific Improvement District	Cities may create SIDs to pay for capital improvements with a district. All property owners pay for the improvements with an annual assessment based on benefits received.
Local	Business Improvement District	Cities may create BIDs to fund capital improvements or maintenance within a district. Non-residential property owners pay for improvements with an annual assessment or fee.
Local	Metropolitan District	Metro Districts are separate government entities that use property tax, user fees, or assessments to pay for improvements within the district.
Local	Transportation Management Association / Organization	Private non-profit organizations that implement specific public improvements to provide public services or convene multiple interest groups with common objectives.

Source: Public / Private Partnerships	
Build or Sale and Leaseback	The City acquires property or constructs an improvement and leases it back to private-for-profit, or non-profit party or authority. Alternatively, a private party could construct an improvement and lease it back to the city.
Homeowner Associations	Organizations that may be willing to maintain adjacently owned public facilities if they contribute to the value of their neighborhood or individual property.
Civic Associations	Organizations that can aid in the maintenance of public improvements, such as landscaping.
Joint Development	Public/Private development which occurs when there is an opportunity to construct or share complementary uses of public or private facilities, such as parking structures.

* Note: Unlike a tax, the proceeds of a fee are used to pay for a particular government service and not for general expenses. Fees are paid for by those who benefit from the service.

5.5 Implementation Strategies and Actions

There are a number of potential implementation strategies and actions the Village can use to complete the recommended list of improvement projects. Using only one strategy to construct the projects would be difficult within the next 10 years. Therefore, multiple strategies are recommended.

Strategies may include the development of design principles, guidelines, and standards for accommodating transit users, bikes, pedestrians, and emerging transportation

technologies, or through mitigation and exactions placed on development. Building partnerships should also be considered. They provide joint funding, planning, and lobbying opportunities to build consensus for the project and commitment to complete the project. Partnerships require working with other agencies, jurisdictions and stakeholders to develop approaches to coordinate strategic plans, managing multiple funding sources, estimating costs, and project development.

Table 10 discusses the Village's transportation goals and policies for the study area and the strategies or actions that can be used to achieve the desired outcome. The third column identifies the potential partners that can assist in implementation.

Table 10 – Recommended Strategies and Actions

Goal / Policy	Strategy or Action	Potential Partners
Mitigate the negative effects of traffic on neighborhoods, while promoting easy access to and from the Village's commercial areas.	- Increase roadway capacity, and utilize ITS and TDM measures to ease traffic congestion in the commercial areas. - Create a wayfinding program to direct motorist to destinations in the commercial core - Update the street design standards in the Subdivision Land Development Regulations to accommodate all transportation modes	Greenwood Village, metro districts, RTD, public/private partnerships, DRCOG, South I-25 Urban Corridor TMA
Promote Interstates 25 and 225, and public transit as the primary access ways to the commercial core of the Village and discourage traffic in residential areas.	- Improve traffic conditions at the Belleview Ave, Orchard Rd, and Arapahoe Rd interchanges at I-25 - Improve amenities at transit stops, and improve bike and pedestrian access to the transit routes/stops	Greenwood Village, CDOT, SPIMD, RTD, Arapahoe County, City of Centennial, City & County of Denver, South I-25 Urban Corridor TMA
Accommodate anticipated commercial development by facilitating commercial traffic flow along arterial streets supported by other means of transportation.	- Continue to adjust traffic signal timing along arterial streets to facilitate efficient flow of vehicles by utilizing existing and new ITS technologies. - Construct capital improvements as recommended in this study to improve traffic conditions on arterial streets. - Improve pedestrian and bike access to transit stops to support service within the study area.	Greenwood Village, DRCOG, South I-25 Urban Corridor TMA, metro districts, RTD
Encourage employers to promote alternative transportation systems which reduce air pollution.	- Partner with the south I-25 TMA and metro districts on effective TDM programs and strategies - Improve facilities that promote the use of alternative transportation systems (e.g. transit, and bike)	Greenwood Village, South I-25 Urban Corridor TMA, metro districts, RTD, SPIMD

Goal / Policy	Strategy or Action	Potential Partners
Support public transit and carpooling in the area and facilitate bicycling and walking.	- Partner with the south I-25 TMA and metro districts on effective TDM programs and strategies - Improve amenities at transit stops, and improve bike and pedestrian access to the transit routes/stops	Greenwood Village, South I-25 Urban Corridor TMA, metro districts, RTD, SPIMD
Provide for integration of multiple modes of transportation at transportation centers, such as the Arapahoe park-n-Ride and light rail station, and the Orchard light rail station.	- Study potential opportunities at the light rail station to create a varied multi-modal transportation hub. - Improve multi-modal access to the stations and provide supporting facilities (e.g. bike racks/lockers)	Greenwood Village, SPIMD, RTD, public/private partnerships, metro districts
Work with regional agencies and neighboring jurisdictions to maintain and improve the ability of the regional transportation network to accommodate regional mobility needs of area workers, residents and visitors.	- Create Intergovernmental Agreements to complete larger area wide or multi-jurisdictional projects - Leverage funding with partnerships to obtain federal or state funds for transportation improvements - Financially support TDM strategies that managed by regional agencies to improve regional mobility for workers - Conduct multi-jurisdictional and agency studies to determine future transportation needs	Greenwood Village, South I-25 Urban Corridor TMA, SPIMD, RTD, CDOT, Arapahoe County, City of Centennial, City & County of Denver
Provide numerous, safe, and convenient connections to the city's comprehensive trail and sidewalk system	- Develop an overall bike and pedestrian plan - Ensure that all new bike and pedestrian facilities are integrated into existing and future trail and sidewalk plans.	Greenwood Village, SPIMD, South I-25 Metro District TMA
Develop continuous, lighted pedestrian walkways and bicycle paths in the form of sidewalks and trails to connect focal points of pedestrian activity, such as the Arapahoe Light Rail Station and other transit stops, street crossings, public plazas and parks, building entry points, and parking areas.	- Update the street design standards in the Subdivision Land Development Regulations - Require new development/redevelopment to include adequate lighting for sidewalks, entry points, and parking areas - Coordinate efforts with RTD to safely light transit stops - Partner with metro districts to provide safe lighting levels for sidewalks, street crossings, and public plazas.	Greenwood Village, metro districts, RTD, public/private partnerships, SPIMD, South I-25 Urban Corridor TMA

Goal / Policy	Strategy or Action	Potential Partners
Encourage bicycle opportunities in the study area by providing bicycle facilities, including lockers or racks, within well-lighted, well-signed, highly visible areas that are close to the light rail stations and other concentrated areas of activity. Provide on-street and off-street bicycle lanes and paths that are safe and visible and that provide connections to uses throughout the study area	- Update the street design standards in the Subdivision Land Development Regulations to accommodate all transportation modes - Require all new development or redevelopment to include bike parking facilities in a secure well lit area near building entry points - Incorporate new roadway striping standards within the Pavement Management Program to accommodate on-street bike lanes or wider shared outside lanes	Greenwood Village, South I-25 Urban Corridor TMA, SPIMD, RTD, metro districts

6.0 Appendices

GREENWOOD VILLAGE
COLORADO

Recommended Roadway and Intersection Improvement Projects

Facility Type	Location	Project Description	Source	Timeframe
Capacity/Operational Improvement	Dayton/Costilla	Add SB right turn lane	GV /Arapahoe Corridor Study	Existing
Capacity/Operational Improvement	Orchard/Greenwood Plaza	Add SB Right Turn Lane	I-25 Study Synchro	Future
Capacity/Operational Improvement	Orchard/I-25 NB Ramps	Add 2nd WB Right Turn Lane	I-25 Study Synchro	Future
Capacity/Operational Improvement	Orchard/Willow	Add NB Right Turn Lane	I-25 Study Synchro	Future
New Street Connection	Yosemite Court	Connect Yosemite Court to Peakview Avenue between Brooks Steak House and 6530 S. Yosemite Street	GV /Arapahoe Corridor Study	Future
Capacity/Operational Improvement	Peakview/Fiddler's Green Circle	Restripe for 2nd WB Left Turn Lane, Add NB left turn lane	I-25 Study Synchro	Future
Capacity/Operational Improvement	Quebec/Marin Drive	Increase taper on SB Quebec Street for left turn lane at Marin Drive	GV (staff observation)	Existing
Capacity/Operational Improvement	Quebec/E. Berry	Increase Quebec SB left turn lane at Berry	GV (staff observation)	Existing
Traffic Control System	Quebec/Progress Place	Install modular traffic signal	GV (private traffic studies)	Future
Traffic Control System	Yosemite/Willow/Fair	Install modular traffic signal	I-25 Study Synchro	Future
Capacity/Operational Improvement	Yosemite/Caley	Add 2nd WB Left Turn Lane, SB Right Turn Lane	I-25 Study Synchro	Future
Capacity/Operational Improvement	Yosemite/Peakview	Add 2nd NB Left Turn Lane	I-25 Study Synchro	Future
New Street Connection	Wabash Way	Connect Wabash Way to Caley Avenue	GV (Village Center plans)	Future
		Other Roadway and Intersection Projects		
Roadway Signing and Striping	Costilla Avenue	Restripe roadway to include a 11-ft TWTL, and two 15-ft shared use lanes - remove on street parking.	GV (staff observation)	Existing
Roadway Signing and Striping	DTC Blvd/Prentice	Re-Stripe WB to L, L, TR	I-25 Study Synchro	Future
Roadway Signing and Striping	DTC Blvd	Restripe NB DTC Blvd to eliminate the forced right turn lane into Village Plaza	GV (staff observation)	Existing
Sight Distance/Visibility	Quebec Street/Berry Avenue	Install site distance signage to address vertical site distance warning/speed control	I-25 Study	Existing
Sight Distance/Visibility	Quebec Street/Orchard Road	Install site distance signage to address vertical site distance warning/speed control	I-25 Study	Existing
Roadway Signing and Striping	S. Syracuse Way	Restripe roadway to include two 12-ft travel lanes, a 12-ft TWTL and two 6-ft bike lanes	GV (staff observation)	Existing
Roadway Signing and Striping	Yosemite Street/Peakview Avenue	Restripe EB to double left & shared through right with bike lane	I-25 Study Synchro	Existing

Recommended Transit Improvement Projects

Facility Type	Location	Project Description	Source	Timeframe
Transit Stop	Study Area	Complete accessibility and connections to continuous sidewalks at all transit stops within the study area. Include in the recommended transit study	GV (staff observations)	Existing
Transit Stop	Study Area	Add bus shelters or other amenities at larger stops, hubs, transfer points, or other key locations (coordinate with RTD)	GV (staff observations)	Existing
Transit Stop	Arapahoe at Village Center LRT station	Construct protective canpoy on the LRT platform	GV (staff observations), SPIMD	Existing
Transit Stop	Routes 27, 66, 77, 105, 465	Provide route information at all stops, including time schedule, fare information, and other important transit user data (coordinate with RTD)	GV (staff observations), Goldsmith	Existing
Transit Stop	Orchard LRT Station	Coordinate with RTD) to install bike parking at Orchard LRT station. This may require converting one vehicular parking stall into bike parking	GV (staff observations), SPIMD	Existing

Recommended Bicycle Improvement Projects

Facility Type	Location	From/To	Project Description	Source	Timeframe
Shared Use Lane	Boston Street	Arapahoe Road to Caley Ave	Restripe and sign for Shared Use Lane (Restripe NB and SB roadway with an 11' inside lane and 13' outside shared lane.)	GV (staff observation)	Existing
Shared Use Lane	Caley Avenue	Quebec St. to Greenwood Plaza Blvd.	Restripe and sign for Shared Use Lane (Restripe roadway for 2 - 11' inside lanes and 2 - 14' outside lanes)	GV (staff observation)	Existing
Shared Use Lane	Caley Avenue	Boston St. to Yosemite St.	Restripe and sign for Shared Use Lane (Restripe EB and WB roadway with an 11' inside lane and 13' outside shared lane)	GV (staff observation) Arapahoe Road Corridor Study	Existing
Bike Lane	Dayton Street	Peakview Avenue to Costilla Street	Stripe and sign bike lane to Costilla Avenue (Collaborate with Arapahoe County/City of Centennial to complete gap in Dayton on-street bicycle lanes). Stripe bike lanes through Arapahoe Road intersection according to MUTCD	I-25 Study	Existing
Shared Use Lane	DTC Parkway	Belleview Avenue to Yosemite Street	Restripe and sign for Shared Use Lane (Restripe roadway with 11'/12' inside lane and 14' outside lane.)	GV (staff observation)	Existing
Bike Lane	Fair Avenue	Yosemite St. to Goldsmith Gulch Trail	Restripe and sign for Bike Use Lane (Stripe for 2 - 10' travel lanes, and 2 - 6' bike lanes.)	GV (staff observation)	Existing
Bike Lane	Greenwood Plaza Boulevard	Berry Avenue to Greenwood Plaza Blvd	Restripe for Bike Lane - Berry Avenue to 4-way stop sign north of Orchard Road (Restripe roadway for 2-17' travel lanes and 2-7' bike lanes.)	GV (staff observation)	Existing
Bike Lane/ Shared Use Lane	Greenwood Plaza Boulevard	4-way stop sign to Orchard Road	Restripe and sign for Shared Use/Bike Lane (Restripe NB roadway with an 11' inside lane and 13' outside shared lane, also restripe SB roadway for 3-11' travel lanes and 5' bike lane.)	GV (staff observation)	Existing
Shared Use Lane	Greenwood Plaza Boulevard	Orchard Road to Caley Ave.	Restripe and sign for Shared Use Lane (Restripe with 2 - 12' inside lanes and 14' outside lanes.)	GV (staff observation)	Existing
Shared Use Lane	Greenwood Plaza Boulevard	Caley Ave. to Arapahoe Road	Restripe and sign for Shared Use Lane (Restripe with 2 - 12' inside lanes and 14' outside lanes.)	GV (staff observation)	Existing
Bike Lane	Maplewood Avenue	Syracuse Way to Greenwood Plaza Blvd.	Restripe and sign for Bike Lane (Restripe roadway for a 12' TWTL, 2 - 12' inside lanes and 2 - 6' bike lanes.)	GV (staff observation)	Existing
Bike Lane	Old Yosemite Street Alignment	End of culd-e-sac to Peakview Ave.	Restripe and sign for Bike Lane (Restripe roadway to include 2 - 12' travel lanes and 2 - 7' bike lanes.)	I-25 Study	Existing
Bike Lane	Orchard Road	Quebec Street to Yosemite St	Adjust travel lane widths to close gap in Orchard Road on-street bike lanes.	GV (staff observation)	Existing
Bike Lane	Peakview Avenue	Old Yosemite Street to Boston Street	Restripe and sign for Bike Lane (Restripe roadway for 2-17' travel lanes and 2-7' bike lanes.)	GV (staff observation)	Existing
Bike Lane	Peakview Avenue	Boston St. to Dayton St.	5 Foot Integrated Curb / Gutter / Bike Lane (As redevelopment occurs or as part of other Capital Improvement Projects construct 5-foot curb, gutter, bikelane integrated facility.) (1300 LF x 5 LF)	GV (staff observation)	Existing
Bike Lane	Peakview Avenue	Yosemite St. to Fiddlers Green Circle	Restripe and sign for Bike Lane (Restripe EB & WB roadways for 2 - 12' travel lanes, and a 8' bike lane, @ intersections restripe EB & WB roadways for 3 - 12' travel lanes and 2 - 6' bike lanes.)	GV (staff observation)	Existing
Bike Lane	Peakview Avenue	Fiddlers Green Circle to Greenwood Plaza Blvd.	Restripe and sign for Bike Lane (Restripe roadway for 2 - 12' travel lanes and a bike lane.)	GV (staff observation)	
Shared Use Lane	Prentice Ave. / Yosemite St.	DTC Pkwy to E. Belleview Ave	Restripe and sign for Shared Use Lane (Restripe for 2 - 11' inside lanes and 2 - 13' outside lanes)	GV (staff observation)	Existing
Shared Use Lane	Prentice Ave. / Ulster St.	Belleview Ave. to DTC Blvd.	Restripe and sign for Shared Use Lane (Restripe roadway for 2 - 12' inside lanes, and 2 - 14' outside lanes)	GV (staff observation)	Existing
Bike Lane	Progress Place and Roslyn Street	Quebec Street to Greenwood Plaza Blvd	Restripe and sign for Bike Lane (Restripe roadway with 2 - 12' travel lanes and 2 - 6' bike lanes.)	I-25 Study	Existing

Recommended Bicycle Improvement Projects

Facility Type	Location	From/To	Project Description	Source	Timeframe
Shared Use Lane	Valentia Way	DTC Pkwy to Prentice Ave.	Restripe and sign for Shared Use Lane (Restripe roadway for 2 - 11' inside lanes and 2 - 14' outside lanes.)	GV (staff observation)	Existing
Bike Lane	Willow Drive	Orchard Road to S. Yosemite Street	Restripe and sign for Bike Lane (From Orchard Road to S. Yosemite St.) (Restripe roadway to include a 11' TWTL, 2 - 10' travel lanes, and 2 - 6' bike lanes)	GV (staff observation) Arapahoe Road Corridor Study	Existing
Shared Use Lane	Yosemite Street	Yosemite St. bridge	Restripe and sign for Shared Use Lane (Restripe roadway with 2 - 12' inside lanes and 2 - 14' outside lanes.)	GV (staff observation)	Existing
Shared Use Lane	Yosemtie Street	Yosemite St. bridge to Arapahoe Road	Restripe and sign for Shared Use Lane (Restripe with 1 - 12' TWTL, 2 - 12' travel lanes, 2 - 15' outside lanes	GV (staff observation)	Existing
Other Bike Projects					
Route Signing	Study Area	NA	Implement the Bikeway route mapping and signing identified in the Arapahoe Corridor Study (coordinate with Arapahoe County, Centennial and Denver. Include wayfinding especially for off-street trails	Arapahoe Road Corridor Study	Existing

Recommended Pedestrian and Trail Improvement Projects

Facility Type	Location	Side of Street	From/To	Project Description	Source	Timeframe
Sidewalk	Clinton St	West	Target Access to Costilla Avenue	Construct minimum detached 6-foot sidewalk along former Country Dinner Playhouse property (could be part of redevelopment)	I-25 Study	Existing/Future
Sidewalk	Ulster Circle East	East	Around circle	Complete missing sidewalk segments outside circle	I-25 Study	Existing
Sidewalk	Belleview Ave	South	Quebec St. to DTC Pkwy	Construct sidewalk	I-25 Study	Existing
Sidewalk	Berry Place	North	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Berry Place	South	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Clinton St	East	Wells Fargo access to Clinton Court	Construct sidewalk east side from Wells Fargo driveway to existing sidewalk along east side of Clinton Court (could be part of redevelopment)	I-25 Study	Existing/Future
Sidewalk	Costilla Avenue	North	Bowling alley to Emporia	Construct sidewalk	GV staff observations	Existing
Sidewalk	Crestline Circle	North	Quebec to culda-sac - entire length	Construct sidewalk	I-25 Study	Existing
Sidewalk	Crestline Circle	South	Quebec to culda-sac - entire length	Construct sidewalk	I-25 Study	Existing
Sidewalk	Dorado Place	North	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Dorado Place	South	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Emporia Street	West	Shane Company to Costilla Avenue	Construct continuous sidewalk from Shane Company to Costilla Avenue	I-25 Study	Existing
Sidewalk	Fair Ave.	South	Yosemite St. to Goldsmith Gulch Trail	Construct detached sidewalk along the Village's vacant property	I-25 Study	Existing
Sidewalk	Greenwood Plaza Blvd.	East	Berry Ave to Caley Ave	Construct sidewalk east side from Berry Avenue to Caley Avenue (most likely a combined detached and attached sidewalk depending on location	I-25 Study	Existing
Sidewalk	Greenwood Plaza Blvd.	West	Greenwood Plaza Blvd loop around Triad Buildings	Close sidewalk gaps on the outside loop of Greenwood Plaza Blvd	I-25 Study	Existing
Sidewalk	Long Avenue	North	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Long Avenue	South	Greenwood Plaza Blvd around culda-sac	Construct sidewalk	I-25 Study	Existing
Sidewalk	Maplewood Avenue	North	Greenwood Plaza Blvd to Syracuse Way	Construct detached sidewalk	I-25 Study	Existing
Sidewalk	Maplewood Avenue	South	Greenwood Plaza Blvd to Syracuse Way	Construct detached sidewalk	I-25 Study	Existing
Sidewalk	Progress Place	South	Quebec St to Roslyn St	Construct sidewalk south side from Quebec Street to Roslyn Street.	I-25 Study	Existing
Sidewalk	Roslyn St	East	Progress Place to Greenwood Plaza Blvd (Landmark development)	Complete missing sidewalk segments with a detached 6-foot sidewalk	I-25 Study	Existing
Sidewalk	Roslyn St	West	Progress Place to Greenwood Plaza Blvd (Landmark development)	Complete missing sidewalk segments with a detached 6-foot sidewalk (could be part of redevelopment)	I-25 Study	Existing

Recommended Pedestrian and Trail Improvement Projects

Facility Type	Location	Side of Street	From/To	Project Description	Source	Timeframe
Sidewalk	Roundtree Street	North	S. Yosemite Street to internal walkway	Roundtree Condos has an internal private walkway network that provides pedestrian circulation for residents, but no public system or connection to Yosemite Street sidewalk	I-25 Study	Existing
Sidewalk	Syracuse Way	East	Greenwood Plaza Blvd to Caley Ave	Construct sidewalk along east side of road	I-25 Study	Existing
Sidewalk	Willow Drive	West	Yosemite Street to Wabash Way	Construct detached sidewalk west side between Yosemite Street and Wabash Way (portions could be part of Village Center development).	I-25 Study	Existing/Future
Sidewalk	Wabash Way	East	Willow Drive to dead end	Construct detached sidewalk east side between Willow Drive and dead end (portions could be part of redevelopment).	GV (staff observations)	Existing/Future
Sidewalk	Yosemite Court	South	All Seasons Rent-all to Yosemite Street	Construct sidewalk along Yosemite Circle from Yosemite Street to existing sidewalk	I-25 Study	Existing
Sidewalk	Yosemite Street	East	Orchard to Fair Drive	Replace existing 5-ft sidewalk with 8-ft detached sidewalk	I-25 Study	Existing
Sidewalk	Yosemite Street	West	Orchard to Willow Drive	Replace existing 5-ft sidewalk with 8-ft detached sidewalk	I-25 Study	Existing
Sidewalk	Yosemite St. / Peakview Ave.	NA	Arapahoe LRT platform to Peakview Avenue/Yosemite Street intersection	Construct sidewalk from Arapahoe LRT Station to Peakview/Yosemite intersection along Peakview Avenue alignment (originally part of TREX contingency funds)	SEBP/staff observations	Existing
Sidewalk Reconstruction	DTC Parkway	North	Vacant Lot Adjacent to the Georgetown Development	Replace existing asphalt sidewalk (property is part of the DTC and under their control)	I-25 Study	Existing
Sidewalk Reconstruction	Prentice Avenue	South	At Ulster Street	Replace existing walk with ADA compliant walk (existing sidewalk is obstructed by street trees, walls, and parking and under DTC control)	I-25 Study	Existing
Sidewalk Reconstruction	Quebec Street	West	Belleview Avenue to Progress Avenue	Widen existing sidewalk on west side of Quebec from Belleview to Progress.	CIP	Existing
Sidewalk Reconstruction	Quebec Street	East	Berry Ave. to Progress Place	Replace existing asphalt walk and improve drainage	GV (staff observations)	Existing
Street Crossing	Greenwood Plaza Blvd.	North	At Arapahoe Road	Modify center median blocking crosswalk	I-25 Study	Existing
Street Crossing	Syracuse Way	West	South of Greenwood Plaza Blvd	Modify center median blocking crosswalk	GV (staff observations)	Existing
Multi-Use Trail	Greenwood Corporate Plaza Area	NA	Greenwood Plaza Blvd to Caley Ave	Construct a multi use trail through the Greenwood Corporate Plaza as shown on the Master Development Plan	GV staff observations	Existing
Multi-Use Trail	Goldsmith Gulch Trail extension	NA	Vicinity of Village Center (east side)	Extend trail through City property north of Caley Avenue, and around Caley Pond down to the old Yosemite Street	GV staff observations	Existing
Multi-Use Trail	Orchard Road	NA	Orchard/Quebec intersection to Greenwood Plaza Blvd	Construct a multi use trail from the Orchard/Quebec intersection through landscaping and parking lot Greenwood Plaza Blvd	GV staff observations	Existing
Multi-Use Trail	Syracuse Way at Greenwood Corporate Plaza trail	NA	Syracuse Way to City Hall	Construct 10-foot trail from Syracuse Way sidewalk to city Hall paths around the park.	GV staff observations	Future

Recommended Pedestrian and Trail Improvement Projects

Facility Type	Location	Side of Street	From/To	Project Description	Source	Timeframe
Grade Separated Crossing	Arapahoe Road	NA	Vicinity of I-25 and Boston/Clinton intersection	Construct pedestrian bridge over Arapahoe Road	Arapahoe Corridor Study	Existing/Future
Grade Separated Crossing	Village Center	NA	Koelbel property to Shea property - north of Caley Avenue alignment	Construct environmentally controlled pedestrian bridge over I-25	GV staff observations	Existing/Future
Grade Separated Crossing	Village Center	NA	City owned property to Caley Pond	Construct trail underpass for Goldsmith Gulch trail extension at Caley Ave.	CIP/staff observations /Arapahoe Corridor Study	Existing/Future

Recommended Transportation Demand Management Projects

Facility Type	Location	Project Description	Source	Timeframe
Program	Study area	Promote carpooling, vanpooling, with a guaranteed ride home, as wells as teleworking, and teleconferencing through supportive program efforts with partner agencies and through publications	GV (staff observation), TMA, SPIMD	Existing
Code	Study area	Encourage efficient use of off street parking by encouraging shared parking facilities	GV (staff observation)	Existing
Policy	Study area	Promote and support flexible works schedules and variable work hours with partner agencies	GV (staff observation)	Existing
Code	Study area	Encourage TDM supportive urban design, such as TOD	GV (staff observation), TMA, SPIMD	Existing/Future
Policy	Study area	Use financial incentives to promote use of other modes through existing federal tax benefit programs, parking cash out, or a discount program coordinated with partner agencies	GV (staff observation)	Existing

Recommended ITS Improvement Projects

Facility Type	Location	Project Description	Source	Timeframe
Building	Public Works	Construct/Upgrade the traffic operations center	GV (staff observations)	Existing
Traffic Control System	Study area	Traffic signal modifications and upgrade to fully responsive system	GV (staff observation)	Existing
Traffic Control System	Study area	Upgrade signals to fully actuated video detection system for low demand times	GV (staff observation)	Existing

Roadway and Intersection Projects Inconsistent with Prior Policy Direction

Facility Type	Location	Project Description	Source	Timeframe
Capacity/Operational Improvement	Belleview Ave. & Yosemite St.	Add EB & NB Right Turn Lanes, driveway closure	I-25 Study Synchro	Future
Capacity/Operational Improvement	Orchard Road at DTC Blvd/Yosemite St.	Add 2nd SB LT lane, modify EB right turn lane, add 3rd NB/SB thru lanes	I-25 Study Synchro/ Goldsmith	Existing
Capacity/Operational Improvement	Quebec St. & Orchard Road	Add 2nd SB left turn lane, add 2nd NB left turn lane, add 3rd NB/SB thru lanes, and add 2nd WB thru lane	I-25 Study Synchro	Future
Capacity/Operational Improvement	S. Yosemite Street	Add 3rd NB/SB travel lane to Yosemite Street (Orchard to Arapahoe)	I-25 Study Synchro	Future

Area Wide / Multi-Jurisdictional Projects

Discipline	Project Type	Location	Project Description	Source
Multi-Jurisdictional Projects	Capacity/Operational Improvement	Arapahoe Road / I-25 Interchange Complex Reconstruction, Costilla underpass	Design has yet to be finalized - current project estimates in 2008 dollar cost = $85 - $125 million	Arapahoe Road Corridor Study
	Capacity/Operational Improvement	Arapahoe Road at Dayton Street	Add EB and WB right turn lanes, add 2nd SB left turn lane, and add NB thru/right turn lane	Arapahoe Road Corridor Study
	Street Crossing	Belleview Avenue overpass (east of Quebec Street intersection)	Construct pedestrian bridge over Belleview Avenue on east leg of intersection at Quebec Street	GV (staff observations), CDOT
	Capacity/Operational Improvement	Orchard Road/SB I-25	Add 2nd WB left turn lane, 3rd SB right turn lane (New I-25 bridge required)	I-25 Study Synchro
	Capacity/Operational Improvement	Arapahoe Road (Yosemite Street to Syracuse Way)	Add 4th EB/WB Thru Lanes	I-25 Study Synchro
Enhancement Projects	Streetscape Enhancement	I-25/Arapahoe Road Interchange, and Arapahoe Road - Dayton to Yosemite	Landscape interchange and raised center median (add medians to SPIMD corridor landscape maintenance contract and coordinate with the interchange reconstruction project)	GV /Arapahoe Corridor Study
	Streetscape Enhancement	Study Area	Road side and center median landscaping enhancements through out study area	GV (council, studies and staff observation)
	Upgrade street lighting	Study Area	Upgrade street lighting	Goldsmith metro district
	Way finding	Study area	Install signs to direct motorists to destinations and parking	GV (staff)
	Streetscape Enhancement	Yosemite bridge	Enhancements to bridge over I-25	Yosemite bridge enhancement project
Study Projects	Capacity/Operational Improvement	Belleview Avenue Corridor	Improve mobility at I-25 interchange and adjacent intersections. Improve bike and pedestrian facilities	GV (staff observations), CDOT, Denver & Arapahoe Counties
	Transit Study	Citywide	Create a hierarchy of transit stops throughout the city identifying type with appropriate amenities, access improvements, and maintenance plans	GV (staff observation)
	Master Plan	Greenwood Plaza Blvd Corridor	Establish Greenwood Plaza Boulevard as the "Main Street" of Greenwood Village	GV (staff observation)

Probable Roadway and Intersection Project Cost Estimates

Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
Roadway Capacity (Major Construction)	Dayton Street	Add SB Right Turn Lane (S. Dayton St. onto E. Costilla Ave.)	100	Linear Foot	$680	$68,000	
		-- Additional Right - of - Way needed (100 LF x 15 LF)	1,500	Square Foot	$20	$30,000	
		-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
					Total =	$103,000	
Roadway Capacity (Minor Construction)	Fiddlers Green Circle / Peakview Ave.	Add 2nd NB Left Turn Lane (From E. Peakview Ave. to S. Fiddlers Green Circle)	250	Linear Foot	$400	$100,000	May be completed as part of the Fiddlers Green Cir improvements currently under design by the City.
		-- Signal Modifications	1	Lump Sum	$50,000	$50,000	
					Total =	$150,000	
		Restripe S. Fiddlers Green Cir to provide 2nd WB Left Turn Lane (to E. Peakview Ave).					
		-- Signal Modifications	1	Lump Sum	$50,000	$50,000	
					Total =	$50,000	
Roadway Capacity (Major Construction)	Orchard Road / I-25 NB Ramps	Add 2nd WB Right Turn Lane (onto I-25 NB On Ramp)	800	Linear Foot	$680	$544,000	
		-- Add Signal for right turn movements onto NB On Ramp	1	Lump Sum	$150,000	$150,000	
		-- Additional Right - of - Way needed (800 LF x 15 LF)	12,000	Square Foot	$20	$240,000	
		-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
					Total =	$939,000	
Roadway Capacity (Major Construction)	Orchard Rd. / Greenwood Plaza Boulevard	Add SB Right Turn Lane (onto WB E. Orchard Road)	300	Linear Foot	$680	$204,000	
		-- Additional Right - of - Way needed (300 LF x 15 LF)	4,500	Square Foot	$20	$90,000	
					Total =	$294,000	
Roadway Capacity (Major Construction)	Orchard Rd. / Willow Drive	Add NB Right Turn Lane (S. Willow Drive onto E. Orchard Road)	200	Linear Foot	$680	$136,000	Presumed widening would occur to the east.
		-- Additional Right - of - Way needed (200 LF x 20 LF)	4,000	Square Foot	$20	$80,000	
		-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
					Total =	$221,000	
Roadway Capacity (Minor Construction)	Quebec Street / Berry	Increase SB Left Turn Lane (Intersection of S. Quebec St. and E. Berry Ave.)	50	Linear Foot	$400	$20,000	
					Total =	$20,000	
Roadway Capacity (Minor Construction)	Quebec Street	Increase SB Left Turn Lane (Intersection of S. Quebec Street and E. Marin Drive)	100	Linear Foot	$400	$40,000	
					Total =	$40,000	
Roadway Capacity (Minor Construction)	Quebec Street / Progress Place	Minor Roadway Modifications (Intersection of S. Quebec St. and E. Progress Place)	75	Linear Foot	$400	$30,000	Tee intersection will require only three signal poles and arms.
		-- Install Modular Traffic Signal	1	Lump Sum	$500,000	$500,000	
					Total =	$530,000	
Roadway Connection	Yosemite Court / Peakview Avenue	New Roadway Connection (Connect Peakview Avenue to Yosemite Court between Brooks Steak House and 6530 S. Yosemite Street)	200	Linear Foot	$1,160	$232,000	Coordinate with S. Yosemite Court Changes at Arapahoe Road
		-- Additional Right - of - Way needed (200 LF x 60 LF)	12,000	Square Foot	$20	$240,000	
		-- Parcel Appraisal Cost	2	Each	$5,000	$10,000	
					Total =	$482,000	

Probable Roadway and Intersection Project Cost Estimates

	Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
	Roadway Capacity (Major Construction)	Yosemite Street / Caley Avenue	Add 2nd WB Left Turn Lane (Add WB left turn lane by restriping and widening north)	450	Linear Foot	$680	$306,000	WB left turn lane by restriping existing right turn and constructing a right turn by widening to the north. The existing culvert will need to be modified.
			-- Extend box culvert (10 LF x 12 LF x 30) and new wing walls (40 LF)	300	Cubic Yard	$600	$180,000	
						Total =	$486,000	
			Add SB Right Turn Lane (Add SB right turn lane storage and taper)	300	Linear Foot	$680	$204,000	
			-- Additional Right - of - Way needed (300 LF x 20 LF)	6,000	Square Foot	$20	$120,000	
			-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
						Total =	$329,000	
	Roadway Capacity (Major Construction)	Yosemite Street / Peakview Avenue	Add 2nd NB Left Turn Lane (onto E. Peakview Ave.) (restripe E. Peakview Ave. to create an additional EB left turn lane)	400	Linear Foot	$680	$272,000	Widen 4 feet to the west to accommodate second NB left turn. Maintain EB to SB acceleration lane and re-stripe roadway for new geometry.
			-- Additional Right - of - Way needed (400 LF x 5 LF)	2,000	Square Foot	$20	$40,000	
			-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
						Total =	$317,000	
	Roadway Capacity (Minor Construction)	Yosemite St. / Willow Drive / Fair Drive	Minor Roadway Modifications (intersection of S. Yosemite St. and S. Willow Drive)	75	Linear Foot	$400	$30,000	
			-- Install Modular Traffic Signal	1	Lump Sum	$750,000	$750,000	
						Total =	$780,000	
	Roadway Connection	S. Wabash Way	New Roadway Connection (between S. Wabash Way and E. Caley Ave.)	800	Linear Foot	$1,160	$928,000	Part of Village Center Development
			-- Additional Right - of - Way needed (800 LF x 60 LF)	48,000	Square Foot	$20	$960,000	
			-- Parcel Appraisal Cost	4	Each	$5,000	$20,000	
						Total =	$1,908,000	
						Overall Total =	$6,649,000	

Probable Pedestrian / Trail Project Cost Estimates

Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
Pedestrian / Trail Facilities	**Belleview Avenue**	10 Foot Attached Walk (South side between S. Quebec St. to DTC Pwky under I-25) (1200 LF x 10 LF)	**12,000**	Square Foot	**$15**	**$180,000**	Presumed that construction of sidewalk would require removal of slope paving and constructing a structural wall.
		-- Removal of Slope Paving along south side (200 LF x 15 LF)	**330**	Square Yard	**$40**	**$13,000**	
		-- Removal of Retaining Wall along south side (100 LF x 10 LF)	**110**	Square Yard	**$200**	**$22,000**	
		-- Retaining Wall (200 LF x 15 LF)	**3,000**	Square Foot	**$50**	**$150,000**	
		-- Additional Easement (1200 LF x 10 LF)	**12,000**	Square Foot	**$10**	**$120,000**	
					Total =	**$485,000**	
Pedestrian / Trail Facilities	**Berry Place**	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. around cul-de-sac) (800 LF x 8 LF)	**6,400**	Square Foot	**$15**	**$96,000**	
		-- Additional Easement (800 LF x 8 LF)	**6,400**	Square Foot	**$10**	**$64,000**	
					Total =	**$160,000**	
Pedestrian / Trail Facilities	**Clinton Street**	8 Foot Detached Walk (Along former Country Dinner Playhouse property (could be part of redevelopment) (930 LF x 8 LF)	**7,440**	Square Foot	**$15**	**$112,000**	Removal of asphalt in parking lot may add cost to project.
		-- Additional Easement (930 LF x 8 LF)	**7,440**	Square Foot	**$10**	**$74,000**	
					Total =	**$186,000**	
Pedestrian / Trail Facilities	**Clinton Street**	8 Foot Detached Walk (East side from Wells Fargo driveway to existing sidewalk along east side of Clinton Court (420 LF x 8 LF)	**3,360**	Square Foot	**$15**	**$50,000**	Presumed that sidewalk would be placed at a lower elevation than the roadway. Removal of asphalt may add cost to project.
		-- Additional Easement (420 LF x 8 LF)	**3,360**	Square Foot	**$10**	**$34,000**	
					Total =	**$84,000**	
Pedestrian / Trail Facilities	**Costilla Avenue**	8 Foot Attached Walk (North side between Emporia Street and Bowling Alley) (500 LF x 8 LF)	**4,000**	Square Foot	**$15**	**$60,000**	Also identified as part of the Arapahoe Road / I-25 Interchange project.
		-- Additional Easement (500 LF x 8 LF)	**4,000**	Square Foot	**$10**	**$40,000**	
					Total =	**$100,000**	
Pedestrian / Trail Facilities	**Crestline Circle**	6 Foot Detached Walk (South and north sides east of S. Quebec St.) (800 LF x 6 LF)	**4,800**	Square Foot	**$15**	**$72,000**	
		-- Additional Easement (800 LF x 8 LF)	**6,400**	Square Foot	**$10**	**$64,000**	
					Total =	**$136,000**	
Pedestrian / Trail Facilities	**Dorado Place**	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. around cul-de-sac) (800 LF x 8 LF)	**6,400**	Square Foot	**$15**	**$96,000**	
		-- Additional Easement (800 LF x 8 LF)	**6,400**	Square Foot	**$10**	**$64,000**	
					Total =	**$160,000**	
Pedestrian / Trail Facilities	**DTC Parkway**	8 Foot Detached Walk (Replace existing walk along north side of DTC Pkwy between Georgetown Development and S. Park Terrace Ave.) (1000 LF x 8 LF)	**8,000**	Square Foot	**$15**	**$120,000**	Replacement of sidewalk does not include easement costs, if applicable. Likely to occur with development.
		-- Removal of Sidewalk along east side (1000 LF x 6 LF)	**700**	Square Yard	**$25**	**$18,000**	
					Total =	**$138,000**	
Pedestrian / Trail Facilities	**Emporia Street**	8 Foot Attached Walk (Along west side between Shane Company and E. Costilla Avenue) (1000 LF x 8 LF)	**8,000**	Square Foot	**$15**	**$120,000**	
		-- Additional Easement (1000 LF x 8 LF)	**8,000**	Square Foot	**$10**	**$80,000**	
					Total =	**$200,000**	

Probable Pedestrian / Trail Project Cost Estimates

Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
Pedestrian / Trail Facilities	**Fair Avenue**	6 Foot Detached Walk (Provide a sidewalk along south side east of S. Yosemite Street) (650 LF x 6 LF)	**3,900**	Square Foot	**$15**	**$59,000**	Likely to occur with development.
		-- Additional Easement (650 LF x 6 LF)	**3,900**	Square Foot	**$10**	**$39,000**	
					Total =	**$98,000**	
Pedestrian / Trail Facilities	**Greenwood Plaza Boulevard**	(Greenwood Plaza Blvd. modify median blocking crosswalk north of E. Arapahoe Road) (14 LF x 18 LF)	**250**	Square Foot	**$15**	**$3,750**	
		-- Additional Easement (14 LF x 18 LF)	**250**	Square Foot	**$10**	**$2,500**	
					Total =	**$6,250**	
Pedestrian / Trail Facilities	**Greenwood Plaza Boulevard**	6 Foot Detached Walk or 8 Foot Attached Walk (West side along Greenwood Plaza Blvd. circle) (1400 LF x 8 LF)	**11,200**	Square Foot	**$15**	**$168,000**	
		-- Additional Easement (1400 LF x 8 LF)	**11,200**	Square Foot	**$10**	**$112,000**	
					Total =	**$280,000**	
Pedestrian / Trail Facilities	**Greenwood Plaza Boulevard**	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Berry Avenue to Dorado Pl.) (2700 LF x 8 LF)	**21,600**	Square Foot	**$15**	**$324,000**	
		-- Additional Easement (2700 LF x 8 LF)	**21,600**	Square Foot	**$10**	**$216,000**	
					Total =	**$540,000**	
Pedestrian / Trail Facilities	**Greenwood Plaza Boulevard**	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Orchard Road to E. Caley Avenue) (3600 LF x 8 LF)	**28,800**	Square Foot	**$15**	**$432,000**	Parking lot north of Maplewood Ave. may interfere with walk. Landscaping south of Maplewood Ave. may add cost to project. Difficult grades south of Orchard may add significant cost.
		-- Additional Easement (3600 LF x 8 LF)	**28,800**	Square Foot	**$10**	**$288,000**	
					Total =	**$720,000**	
Pedestrian / Trail Facilities	**Long Avenue**	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. to parking lot) (900 LF x 8 LF)	**7,200**	Square Foot	**$15**	**$108,000**	Vicinity of buildings may interfere with placement of portions of sidewalk.
		-- Additional Easement (900 LF x 8 LF)	**7,200**	Square Foot	**$10**	**$72,000**	
					Total =	**$180,000**	
Pedestrian / Trail Facilities	**Maplewood Avenue**	6 Foot Detached Walk (North and south sides from Greenwood Plaza Blvd. to S. Syracuse Way) (2500 LF x 6 LF)	**15,000**	Square Foot	**$15**	**$225,000**	
		-- Additional Easement (2500 LF x 6 LF)	**15,000**	Square Foot	**$10**	**$150,000**	
					Total =	**$375,000**	
Pedestrian / Trail Facilities	**Prentice Avenue**	8 Foot Attached Walk (Replace existing walk with ADA compliant walk along south side of E. Prentice Ave.) (550 LF x 8 LF)	**4,400**	Square Foot	**$15**	**$66,000**	Parking lots may interfere with portions of walk. Replacement of sidewalk does not include easement costs, if applicable.
		-- Removal of Sidewalk along south side (400 LF x 8 LF)	**360**	Square Yard	**$25**	**$9,000**	
					Total =	**$75,000**	
Pedestrian / Trail Facilities	**Progress Place**	6 Foot Detached Walk (South side from S. Quebec Street to S. Roslyn Street) (600 LF x 6 LF)	**3,600**	Square Foot	**$15**	**$54,000**	
		-- Additional Easement (600 LF x 6 LF)	**3,600**	Square Foot	**$10**	**$36,000**	
					Total =	**$90,000**	
Pedestrian / Trail Facilities	**Quebec Street**	10 Foot Attached or 8 Foot Detached Walk (Replace existing asphalt walk and improve drainage along east side from E. Berry Ave. to E. Progress Pl.) (1600 LF x 10 LF)	**16,000**	Square Foot	**$15**	**$240,000**	Replacement of sidewalk does not include easement costs, if applicable.
		-- Drainage Improvements along east side	**1**	Lump Sum	**$30,000**	**$30,000**	
		-- Removal of Sidewalk along east side (1600 LF x 10 LF)	**2,000**	Square Yard	**$25**	**$50,000**	
					Total =	**$320,000**	

Probable Pedestrian / Trail Project Cost Estimates

Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
Pedestrian / Trail Facilities	Quebec Street	8 Foot Attached Walk (Remove and replace existing 5 foot sidewalk on west side from E. Belleview Ave. to E. Progress Ave.) (550 LF x 8 LF)	4,400	Square Foot	$15	$66,000	Right-of-Way for Pedestrian Bridge was calculated for the structure base at each end of the pedestrian bridge structure.
		-- Removal of Sidewalk along west side (550 LF x 5 LF)	300	Square Yard	$25	$8,000	
		-- Additional Easement (550 LF x 3 LF)	1,650	Square Foot	$10	$17,000	
					Total =	$91,000	
Pedestrian / Trail Facilities	Roslyn Street	6 Foot Detached Walk (Complete missing sidewalk segments along east and west sides from E. Progress Place to Landmark development) (1000 LF x 6 LF)	6,000	Square Foot	$15	$90,000	Some of the sidewalk construction may already be completed through the development.
		-- Additional Easement (1000 LF x 6 LF)	6,000	Square Foot	$10	$60,000	
					Total =	$150,000	
Pedestrian / Trail Facilities	Roundtree Avenue	6 Foot Detached Walk (From internal private walkway network to existing S. Yosemite St. sidewalk on SW corner (40 LF x 6 LF)	240	Square Foot	$15	$4,000	
		-- Additional Easement (40 LF x 6 LF)	240	Square Foot	$10	$3,000	
					Total =	$7,000	
Pedestrian / Trail Facilities	Syracuse Way	(West side south of Greenwood Plaza Blvd. at driveway modify median blocking crosswalk) (12 LF x 12 LF)	150	Square Foot	$15	$2,250	
		-- Additional Easement (12 LF x 12 LF)	150	Square Foot	$10	$1,500	
					Total =	$3,750	
Pedestrian / Trail Facilities	Syracuse Way	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Caley Avenue to Greenwood Plaza Blvd.) (2000 LF x 8 LF)	16,000	Square Foot	$15	$240,000	
		-- Additional Easement (2000 LF x 8 LF)	16,000	Square Foot	$10	$160,000	
		-- Retaining Wall and additional earthwork along East side (100 LF x 5 LF)	500	Square Foot	$100	$50,000	
					Total =	$450,000	
Pedestrian / Trail Facilities	Ulster Circle East	10 Foot Attached Walk (Complete missing sidewalk segments outside circle on east side) (430 LF x 10 LF)	4,300	Square Foot	$15	$65,000	Trees and the vicinity of the south parking lot may add to constraints and cost to the project.
		-- Additional Easement (430 LF x 10 LF)	4,300	Square Foot	$10	$43,000	
					Total =	$108,000	
Pedestrian / Trail Facilities	Wabash Way	6 Foot Detached Walk or 8 Foot Attached Walk (East side between S. Willow Drive and just dead end) (1700 LF x 8 LF)	17,000	Square Foot	$15	$255,000	Parking lot may interfere with portion of sidewalk.
		-- Additional Easement (1700 LF x 8 LF)	13,600	Square Foot	$10	$136,000	
					Total =	$391,000	
Pedestrian / Trail Facilities	Willow Drive	6 Foot Detached Walk or 8 Foot Attached Walk (East side between S. Wabash Way to S. Yosemite St.) (2000 LF x 8 LF)	16,000	Square Foot	$15	$240,000	Portions of sidewalk may be completed with development.
		-- Additional Easement (2000 LF x 8 LF)	16,000	Square Foot	$10	$160,000	
					Total =	$400,000	
Pedestrian / Trail Facilities	Yosemite Court	8 Foot Attached Walk (South side between S. Yosemite St. and existing sidewalk) (300 LF x 8 LF)	2,400	Square Foot	$15	$36,000	Near All Seasons Rent All
		-- Additional Easement (300 LF x 8 LF)	2,400	Square Foot	$10	$24,000	
					Total =	$60,000	

Probable Pedestrian / Trail Project Cost Estimates

Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
Pedestrian / Trail Facilities	Yosemite Street	8 Foot Detached Walk (Remove and replace existing 5 foot sidewalk on east and west sides from E. Orchard Road to E. Fair Ave.) (4000 LF x 8 LF)	32,000	Square Foot	$15	$480,000	
		-- Removal of Sidewalk along east and west sides (4000 LF x 6 LF)	2,700	Square Yard	$25	$68,000	
		-- Additional Easement (4000 LF x 4 LF)	16,000	Square Foot	$10	$160,000	
					Total =	$708,000	
Pedestrian / Trail Facilities	Yosemite Street / Peakview Avenue	8 Foot Attached Walk (from LRT station to S. Yosemite St. along E. Peakview Ave.) (750 LF x 8 LF)	6,000	Square Foot	$15	$90,000	
		-- Additional Easement (750 LF x 8 LF)	6,000	Square Foot	$10	$60,000	
					Total =	$150,000	
Pedestrian / Trail Facilities	Greenwood Corporate Plaza Area	10 Foot Multi-Use Trail (Greenwood Plaza Blvd. to E. Caley Ave.) (4500 LF x 10 LF)	45,000	Square Foot	$15	$675,000	May not require purchase of easement because it is in the Greenwood Corporate Plaza Master Development Plan.
		-- Additional Easement (4500 LF x 10 LF)	45,000	Square Foot	$10	$450,000	
					Total =	$1,125,000	
Pedestrian / Trail Facilities	Orchard Road	10 Foot Multi-Use Trail (From the intersection of Orchard Road/Quebec Street to Greenwood Plaza Blvd.) (1300 LF x 10 LF)	13,000	Square Foot	$15	$195,000	
		-- Additional Easement (1300 LF x 10 LF)	13,000	Square Foot	$10	$130,000	
					Total =	$325,000	
Pedestrian / Trail Facilities	Syracuse Way / Greenwood Corporate Plaza Trail	10 Foot Multi-Use Trail (From S. Syracuse Way existing sidewalk to the City Hall paths around William McKinley Carson Park) (1600 LF x 10 LF)	16,000	Square Foot	$15	$240,000	
		-- Additional Easement (1600 LF x 10 LF)	16,000	Square Foot	$10	$160,000	
					Total =	$400,000	
Pedestrian / Trail Facilities	Village Center / Goldsmith Gultch Trail	10 Foot Multi-Use Trail (Extension of Goldsmith Gulch Trail around Caley Pond) (1100 LF x 10 LF)	11,000	Square Foot	$15	$165,000	Pedestrian underpass at Caley is listed separately.
		-- Additional Easement (1100 LF x 10 LF)	11,000	Square Foot	$10	$110,000	
					Total =	$275,000	
Pedestrian / Trail Facilities	Village Center	Construct Pedestrian Bridge (Over I-25 north of Caley Ave. at Wabash Way) (350 x 15 LF)	5,250	Square Foot	$300	$1,575,000	Right-of-Way was calculated for the base at each end of the pedestrian bridge structure. May occur with Village Center development.
		-- Additional Bridge Amenities	1	Lump Sum	$1,000,000	$1,000,000	
		-- Additional Right - of - Way (100 LF x 20 LF)	2,000	Square Foot	$20	$40,000	
		-- Parcel Appraisal Cost	2	Each	$5,000	$10,000	
					Total =	$2,625,000	
Pedestrian / Trail Facilities	Arapahoe Road	Construct Pedestrian Bridge (Over E. Arapahoe Road between I-25 and S. Boston St. and S. Clinton St. Intersection) (200 x 15 LF)	3,000	Square Foot	$400	$1,200,000	Right-of-Way was calculated for the base at each end of the pedestrian bridge structure. Could be built as part of Arapahoe Road corridor improvements.
		-- Additional Amenities	1	Lump Sum	$500,000	$500,000	
		-- Additional Right - of - Way (100 LF x 20 LF)	2,000	Square Foot	$20	$40,000	
		-- Parcel Appraisal Cost	2	Each	$5,000	$10,000	
					Total =	$1,750,000	
Pedestrian / Trail Facilities	Village Center	Construct Pedestrian Underpass (Under Caley Avenue for Goldsmith Gultch Trail extension.) (12 LFx 14 LF) (100 Feet in length)	620	Cubic Yard	$600	$372,000	Project could be constructed jointly with drainage improvements.
					Total =	$372,000	
					Overall Total =	$13,724,000	

Probable Bike Project Cost Estimates

	Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
	Bike Facilities	**Boston Street**	Restripe for Shared Use Lane (From Arapahoe Road to E. Caley Ave.) (Restripe NB and SB roadway with an 11' inside lane and 13' outside shared lane.)	**5,400**	Linear Foot	**$12**	**$64,800**	
	Bike Facilities	**E. Caley Avenue**	Restripe for Shared Use Lane (From S. Boston St. to S. Yosemite St.) (Restripe EB and WB roadway with an 11' inside lane and 13' outside shared lane)	**2,600**	Linear Foot	**$12**	**$31,200**	
	Bike Facilities	**Caley Avenue**	Restripe for Shared Use Lane (From S. Quebec St. to Greenwood Plaza Blvd.) (Restripe roadway for 2 - 11' inside lanes and 2 - 14' outside lanes)	**5,200**	Linear Foot	**$12**	**$62,400**	
	Bike Facilities	**Dayton Street**	Stripe for Bike Lane (From Peakview Ave. to Costilla Ave.)(Stripe bike lane through Arapahoe intersection according to MUTCD.)	**1,400**	Linear Foot	**$12**	**$16,800**	
	Bike Facilities	**DTC Parkway**	Restripe for Shared Use Lane (From E. Belleview Ave. to S. Yosemite St.) (Restripe roadway with 11'/12' inside lane and 14' outside lane.)	**12,600**	Linear Foot	**$12**	**$151,200**	
	Bike Facilities	**Fair Avenue**	Restripe for Bike Use Lane (From S. Yosemite St. to Goldsmith Gulch Trail) (Stripe for 2 - 10' travel lanes, and 2 - 6' bike lanes.)	**1,400**	Linear Foot	**$12**	**$16,800**	
	Bike Facilities	**Greenwood Plaza Blvd**	Restripe for Bike Lane (From Berry Avenue to 4-way stop sign north of Orchard Road) (Restripe roadway for 2-17' travel lanes and 2-7' bike lanes.)	**8,000**	Linear Foot	**$12**	**$96,000**	
			Restripe for Shared Use/Bike Lane (From 4-way stop sign to Orchard Road) (Restripe NB roadway with an 11' inside lane and 13' outside shared lane, also restripe SB roadway for 3-11' travel lanes and 5' bike lane.)	**1,200**	Linear Foot	**$12**	**$14,400**	
			Restripe for Shared Use Lane (From Orchard Road to Caley Ave.) (Restripe with 2 - 12' inside lanes and 14' outside lanes.)	**7,400**	Linear Foot	**$12**	**$88,800**	
			Restripe for Shared Use Lane (From Caley Ave. to Arapahoe Road) (Restripe with 2 - 12' inside lanes and 14' outside lanes.)	**5,400**	Linear Foot	**$12**	**$64,800**	
	Bike Facilities	**Maplewood Avenue**	Restripe for Bike Lane (From S. Syracuse Way to Greenwood Plaza Blvd.) (Restripe roadway for a 12' TWTL, 2 - 12' inside lanes and 2 - 6' bike lanes.)	**3,600**	Linear Foot	**$12**	**$43,200**	
	Bike Facilities	**Orchard Road**	Restripe for Bike Lane (From S. Quebec St. to S. Yosemite St.) (Adjust travel lane widths to close gap in on-street bike lanes.)	**8,000**	Linear Foot	**$12**	**$96,000**	
	Bike Facilities	**Peakview Avenue**	Restripe for Bike Lane (From S. Yosemite St. to Fiddlers Green Circle)(Restripe EB & WB roadways for 2 - 12' travel lanes, and a 8' bike lane, @ intersections restripe EB & WB roadways for 3 - 12' travel lanes and 2 - 6' bike lanes.)	**1,200**	Linear Foot	**$12**	**$14,400**	
			Restripe for Bike Lane (From Fiddlers Green Circle to Greenwood Plaza Blvd.) (Restripe roadway for 2 - 12' travel lanes and a bike lane.)	**2,200**	Linear Foot	**$12**	**$26,400**	
	Bike Facilities	**Peakview Ave.**	Restripe for Bike Lane (From end of Old Yosemite St. to S. Boston St.)(Restripe roadway for 2-17' travel lanes and 2-7' bike lanes.)	**2,600**	Linear Foot	**$12**	**$31,200**	
			5 Foot Integrated Curb / Gutter / Bike Lane (From S. Boston St. to S. Dayton St.) (As redevelopment occurs or as part of other Capital Improvement Projects construct 5-foot curb, gutter, bike lane integrated facility.) (1300 LF x 5 LF)	**13,000**	Square Foot	**$40**	**$520,000**	
	Bike Facilities	**Prentice Ave. / Ulster St.**	Restripe for Shared Use Lane (From E. Belleview Ave. to DTC Blvd.) (Restripe roadway for 2 - 12' inside lanes, and 2 - 14' outside lanes)	**5,000**	Linear Foot	**$12**	**$60,000**	
	Bike Facilities	**Prentice Ave. / Yosemite St.**	Restripe for Shared Use Lane (From DTC Blvd. to E. Belleview Ave.) (Restripe for 2 - 11' inside lanes and 2 - 13' outside lanes)	**5,000**	Linear Foot	**$12**	**$60,000**	
	Bike Facilities	**Roslyn St. / Progress Pl.**	Restripe for Bike Lane (From Berry Ave. to S. Quebec St.) (Restripe roadway with 2 - 12' travel lanes and 2 - 6' bike lanes.)	**4,600**	Linear Foot	**$12**	**$55,200**	

Probable Bike Project Cost Estimates

	Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
	Bike Facilities	**Valentia Way**	Restripe for Shared Use Lane (From DTC Pkwy to E. Prentice Ave.) (Restripe roadway for 2 - 11' inside lanes and 2 - 14' outside lanes.)	**1,400**	Linear Foot	**$12**	**$16,800**	
	Bike Facilities	**Willow Drive**	Restripe for Bike Lane (From Orchard Road to S. Yosemite St.) (Restripe roadway to include a 11' TWTL, 2 - 10' travel lanes, and 2 - 6' bike lanes)	**5,000**	Linear Foot	**$12**	**$60,000**	
	Bike Facilities	**Old Yosemite Street**	Restripe for Bike Lane (From end of cul-de-sac to E. Peakview Ave.) (Restripe roadway to include 2 - 12' travel lanes and 2 - 7' bike lanes.)	**1,400**	Linear Foot	**$12**	**$16,800**	
	Bike Facilities	**Yosemite Street**	Restripe for Shared Use Lane (S. Yosemite St. bridge) (Restripe roadway with 2 - 12' inside lanes and 2 - 14' outside lanes.)	**800**	Linear Foot	**$12**	**$9,600**	
			Restripe for Shared Use Lane (S. Yosemite St. bridge to Arapahoe Road) (Restripe with 1 - 12' TWTL, 2 - 12' travel lanes, 2 - 15' outside lanes.)	**3,600**	Linear Foot	**$12**	**$43,200**	
						Overall Total	**$1,660,000**	

Roadway and Intersection Projects Inconsistent with Prior Policy Direction Cost Estimates

	Improvement Category	Location	Project Description	Quantity	Unit	Unit Cost	Opinion of Probable Cost	Comment
	Roadway Capacity (Major Construction)	Orchard Rd. / Yosemite Street / DTC Boulevard	Increase / Modify EB Right Turn Lane (Intersection of E. Orchard Road and S. Yosemite St. / DTC Blvd.)	250	Linear Foot	$680	$170,000	3 Continuous through lanes in each direction are necessary to achieve LOS D (see regional projects).
			-- Additional Right - of - Way needed (250 LF x 20 LF)	5,000	Square Foot	$20	$100,000	
			-- Parcel Appraisal Cost	1	Each	$5,000	$5,000	
						Total =	$275,000	
	Roadway Capacity (Minor Construction)		Add 2nd SB Left Turn Lane (Intersection of E. Orchard Road and S. Yosemite St. / DTC Blvd.)	200	Linear Foot	$400	$80,000	Presumed removal of median and restriping of roadway.
						Total =	$80,000	
	Roadway Capacity (Minor Construction)	Quebec Street / Orchard Road	Add 2nd SB Left Turn Lane (Modify Median end remove pedestal pole)	200	Linear Foot	$400	$80,000	
			-- Signal modifications (New mast arm on NE corner)	1	Lump Sum	$150,000	$150,000	
						Total =	$230,000	
	Roadway Capacity (Major Construction)		Add 3rd NB/SB Thru Lanes (Thru lanes about 1000 feet north of intersection and 600 feet south of intersection before bridge.)	3,000	Linear Foot	$680	$2,040,000	
			-- Signal modifications (New mast arm on SW and SE corners)	1	Lump Sum	$450,000	$450,000	
			-- Additional Right - of - Way needed (3000 LF x 20 LF)	60,000	Square Foot	$20	$1,200,000	
			-- Parcel Appraisal Cost	6	Each	$5,000	$30,000	
						Total =	$3,720,000	
	Roadway Capacity (Minor Construction)		Add 2nd WB Thru Lane and NB Left Turn Lane (Restripe outside left to thru lane and extend through intersection; shift existing left turn south and merge thru lanes at existing taper)	800	Linear Foot	$400	$320,000	
			-- Signal Modifications (New mast arm on NW corner)	1	Lump Sum	$150,000	$150,000	
						Total =	$470,000	
	Roadway Capacity (Major Construction)	S. Yosemite St. / E. Belleview Avenue	Add EB Right Turn Lane (Add EB right turn lane storage and taper and accel and taper lane)	350	Linear Foot	$680	$238,000	
			-- Additional Right - of - Way needed (750 LF x 20 LF)	15,000	Square Foot	$20	$300,000	
			-- Parcel Appraisal Cost	2	Each	$5,000	$10,000	
						Total =	$548,000	
			Add NB Right Turn Lane (Add NB right turn lane storage and taper)	300	Linear Foot	$680	$204,000	
			-- Additional Right - of - Way needed (300 LF x 20 LF)	6,000	Square Foot	$20	$120,000	
			-- Parcel Appraisal Cost	4	Each	$5,000	$20,000	
			-- Signal Modifications (Reset SE Signal)	1	Lump Sum	$125,000	$125,000	
						Total =	$469,000	
	Access Management		Driveway Closure (1st driveway on NB S. Yosemite St. from E. Belleview Ave. / S. Yosemite St. intersection)	100	Linear Foot	$160	$16,000	Driveway closure to gas station property.
						Total =	$16,000	
						Overall Total =	$5,808,000	

Prioritized Roadway and Intersection Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Level of Service Score	Cost / Benefit Score	Safety Score	Construction Feasibility Score	Roadway Classification Score	Multi-modal Enhancement Score	Construct Jointly with other Project or Agency Score	Total Score	Comments
1	Roadway Capacity (Major Construction)	S. Yosemite Street / E. Peakview Avenue	Add NB Left Turn Lane	$317,000	10	10	3	5	8	0	5	41	Construct w/ Yosemite Court extension to Peakview Ave
2	Roadway Capacity (Minor Construction)	S. Fiddlers Green Circle / E. Peakview Ave.	Restripe for 2nd WB Left Turn Lane Add NB Left Turn Lane	$375,000	10	3	2	5	5	5	5	35	Construct with Fiddler's Green Cir changes, or Village Center improvements
3	Roadway Capacity (Minor Construction)	S. Quebec Street / Progress Place	Minor Roadway Modifications (New traffic signal)	$530,000	5	1	2	8	8	5	5	34	Traffic signal adds pedestrian crossing phase, construct w/ Belleview / Quebec improvements
4	Roadway Capacity (Major Construction)	S. Yosemite Street / E. Caley Avenue	Add WB Left Turn Lane Add SB Right Turn Lane	$815,000	10	1	4	5	8	0	5	33	Construct with Village Center development and trail underpass at Goldsmith Gulch
5	Roadway Capacity (Major Construction)	Orchard Rd. / Greenwood Plaza Boulevard	Add SB Right Turn Lane	$294,000	10	8	4	5	5	0	0	32	
6	Roadway Capacity (Major Construction)	Orchard Rd. / S. Willow Drive	Add NB Right Turn Lane	$221,000	10	7	4	5	5	0	0	31	
7	Roadway Capacity (Major Construction)	E. Orchard Road / I-25 NB Ramps	Add WB Right Turn Lane	$939,000	10	4	5	5	5	0	0	29	Requires coordination with CDOT and the EB left turn lane
8	Roadway Capacity (Minor Construction)	S. Yosemite St. / S. Willow Dr. / Fair Dr.	Minor Roadway Modifications (New traffic signal)	$780,000	0	0	1	8	8	5	5	27	Signal adds pedestrian crossing, construct with Village Center development
9	Roadway Connection	S. Wabash Way (to E. Caley Ave.)	New Roadway Connection	$1,908,000	NA	NA	NA	5	5	5	5	20	New street adds sidewalks, construct w/ Village Center development
10	Roadway Connection	S. Yosemite Court to Peakview Ave.	New Roadway Connection	$482,000	NA	NA	NA	5	5	5	5	20	Realigned street adds sidewalks to LRT station, construct w/ Peakview / Yosemite St. improvements or I-25 / Arapahoe interchange improvements

Prioritized Roadway and Intersection Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Level of Service Score	Cost / Benefit Score	Safety Score	Construction Feasibility Score	Roadway Classification Score	Multi-modal Enhancement Score	Construct Jointly with other Project or Agency Score	Total Score	Comments
11	Roadway Capacity (Major Construction)	S. Quebec St. / E. Berry Ave.	Increase SB Left Turn Lane	$20,000	NA	NA	1	8	8	0	0	17	
12	Roadway Capacity (Major Construction)	S. Quebec St. / E. Marin Dr	Increase SB Left Turn Lane	$40,000	NA	NA	NA	8	8	0	0	16	
13	Roadway Capacity (Minor Construction)	S. Dayton Street (at E. Costilla Ave.)	Add SB Right Turn Lane	$83,000	NA	NA	NA	5	5	0	5	15	Construct w/ Costilla Ave. widening, may need to relocate mail box drop on Dayton Street
			Projects Inconsistent with Prior Policy Direction										
NA	Roadway Capacity (Major Construction) Roadway Capacity (Minor Construction)	Orchard Rd. / S. Yosemite Street / DTC Boulevard	Increase / Modify EB Right Turn Lane Add Additional SB Left Turn Lane	$355,000	10	10	8	5	8	0	0	41	Prior City Council sensitivity to EB traffic on Orchard Road east of Yosemite Street
NA	Roadway Capacity (Minor Construction) Roadway Capacity (Major Construction)	S. Quebec Street / E. Orchard Road	Add WB Thru Lane Add NB/SB Left Turn Lanes, Add NB/SB Thru Lanes	$3,670,000	10	1	15	1	8	0	0	35	Prior City Council sensitivity to EB/WB Orchard Road traffic volumes west of Quebec Street, 3rd SB lane would be in Centennial
NA	Roadway Capacity (Major Construction) Access Management	S. Yosemite St. / E. Belleview Avenue	Add EB Right Turn Lane Add NB Right Turn Lane Driveway Closure	$1,033,000	10	1	13	1	8	0	0	33	Prior City Council sensitivity to EB traffic volumes on Belleview east of Yosemite and increased traffic on Yosemite south of Belleview Avenue, Driveway closure may create delivery truck constraints

Prioritized Bike Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Known Safety Hazard or Barrier Score	Access to Destinations Score	Multi-modal Connectivity Score	Roadway Classification Score	Construct Jointly with other Project or Agency Score	Total Score	Comments
1	Bike Facilities	E. Peakview Ave.	Restripe for Bike Lane (From S. Yosemite St. to Fiddlers Green Circle) Restripe for Bike Lane (From Fiddlers Green Circle to Greenwood Plaza Blvd.)	$40,800	5	8	5	5	5	28	
2	Bike Facilities	E. Peakview Ave.	Restripe for Bike Lane (From end of Old Yosemite St. to S. Boston St.) 5 Foot Integrated Curb / Gutter / Bike Lane (From S. Boston St. to S. Dayton St.)	$551,200	5	8	5	5	5	28	
3	Bike Facilities	S. Willow Drive	Restripe for Bike Lane (From Orchard Road to S. Yosemite St.)	$60,000	5	8	5	5	5	28	
4	Bike Facilities	S. Yosemite Street	Restripe for Shared Use Lane (On S. Yosemite St. bridge) Restripe for Shared Use Lane (From S. Yosemite St. bridge to Arapahoe Road)	$52,800	0	8	5	8	5	26	
5	Bike Facilities	S. Dayton Street	Stripe for Continuous Bike Lane (From Peakview Ave. to Costilla Ave.)	$16,800	5	5	5	5	5	25	Work with Arapahoe County to close gap on Dayton Street
6	Bike Facilities	Greenwood Plaza Boulevard	Restripe for Bike Lane (From Berry Avenue to 4-way stop sign north of Orchard Road) Restripe for Shared Use/Bike Lane (From 4-way stop sign to Orchard Road)	$110,400	5	5	5	5	5	25	
7	Bike Facilities	E. Orchard Road	Restripe for Bike Lane (From S. Quebec St. to S. Yosemite St.)	$96,000	5	5	5	5	5	25	Adjust travel lane widths to accommodate bike lanes
8	Bike Facilities	S. Roslyn St. / E. Progress Pl.	Restripe for Bike Lane (From Berry Ave. to S. Quebec St.)	$55,200	5	5	5	5	5	25	
9	Bike Facilities	E. Fair Avenue	Restripe for Bike Lane (From S. Yosemite St. to Goldsmith Gulch Trail)	$16,800	5	8	5	1	5	24	
10	Bike Facilities	Old Yosemite Street	Restripe for Bike Lane (From end of culda-sac to E. Peakview Ave.)	$16,800	5	8	5	1	5	24	
11	Bike Facilities	E. Caley Avenue	Restripe for Shared Use Lane (From S. Boston St. to S. Yosemite St.)	$31,200	0	8	5	5	5	23	

Prioritized Bike Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Known Safety Hazard or Barrier Score	Access to Destinations Score	Multi-modal Connectivity Score	Roadway Classification Score	Construct Jointly with other Project or Agency Score	Total Score	Comments
12	Bike Facilities	E. Caley Avenue	Restripe for Shared Use Lane (From S. Quebec St. to Greenwood Plaza Blvd.)	$62,400	0	8	5	5	5	23	
13	Bike Facilities	DTC Parkway	Restripe for Shared Use Lane (From E. Belleview Ave. to S. Yosemite St.)	$151,200	0	5	5	5	5	20	
14	Bike Facilities	E. Maplewood Ave.	Restripe for Bike Lane (From S. Syracuse Way to Greenwood Plaza Blvd.)	$43,200	5	5	0	1	5	16	
15	Bike Facilities	S. Boston Street	Restripe for Shared Use Lane (From Arapahoe Road to E. Caley Ave.)	$64,800	0	5	0	5	5	15	
16	Bike Facilities	E. Prentice Ave. / S. Ulster St.	Restripe for Shared Use Lane (From E. Belleview Ave. to DTC Blvd.)	$60,000	0	5	0	5	5	15	
17	Bike Facilities	E. Prentice Ave. / S. Yosemite St.	Restripe for Shared Use Lane (From DTC Blvd. to E. Belleview Ave.)	$60,000	0	5	0	5	5	15	
18	Bike Facilities	S. Valentia Way	Restripe for Shared Use Lane (From DTC Pkwy to E. Prentice Ave.)	$16,800	0	5	0	5	5	15	
19	Bike Facilities	Greenwood Plaza Boulevard	Restripe for Shared Use Lane (From Orchard Road to Caley Ave.) Restripe for Shared Use Lane (From Caley Ave. to Arapahoe Road)	$153,600	0	8	0	0	5	13	

Prioritized Pedestrian / Trail Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Multi-modal Connectivity Score	Roadway Classification Score	Continuity Score	Street Xing Score	Security / Safety Score	Access for Physically Impaired	Construct Jointly with other Project or Agency Score	Total Score	Comments
1	Pedestrian / Trail Facilities	E. Arapahoe Road	Construct Pedestrian Bridge (Over E. Arapahoe Road near S. Boston St. and S. Clinton St. Intersection)	$1,750,000	5	8	0	8	8	0	5	34	Identified in Arapahoe Road Corridor Study -potential part of I-25/Arapahoe interchange reconstruction
2	Pedestrian / Trail Facilities	E. Belleview Ave.	10 Foot Attached Walk (South side between S. Quebec St. to DTC Pwky under I-25)	$485,000	0	8	10	5	2	0	5	30	Construct with interchange improvements and redevelopment
3	Pedestrian / Trail Facilities	S. Clinton Street	8 Foot Detached Walk (Along former Country Dinner Playhouse property)	$186,000	0	5	10	0	4	10	0	29	No sidewalks on either side of street
4	Pedestrian / Trail Facilities	S. Clinton Street	8 Foot Detached Walk (East side from Wells Fargo driveway to existing sidewalk along east side of Clinton Ct)	$84,000	0	5	10	0	4	10	0	29	No sidewalks on either side of street, grade issue
5	Pedestrian / Trail Facilities	E. Maplewood Avenue	6 Foot Detached Walk (North and south sides from Greenwood Plaza Blvd. to S. Syracuse Way)	$300,000	5	3	10	0	1	10	0	29	Identified on Greenwood Corporate Plaza Master Development Plan
6	Pedestrian / Trail Facilities	S. Yosemite Street / E. Peakview Avenue	8 Foot Attached Walk (From LRT station to S. Yosemite St. along E. Peakview Ave.)	$150,000	5	5	10	0	3	0	5	28	Coordinate with RTD
7	Pedestrian / Trail Facilities	DTC Parkway	8 Foot Detached Walk (North side of DTC Pkwy between Georgetown Development and S. Park Terrace)	$138,000	5	5	10	0	2	5	0	27	Current parcel undeveloped - could be constructed with development
8	Pedestrian / Trail Facilities	Greenwood Plaza Boulevard	Median Modification for crosswalk at E. Arapahoe Road)	$6,250	5	5	0	5	2	5	5	27	Modify as part of Pavement Management Program
9	Pedestrian / Trail Facilities	S. Syracuse Way	Median Modification for crosswalk (West side south of Greenwood Plaza Blvd. at driveway)	$3,750	5	5	0	5	2	5	5	27	Modify as part of Pavement Management Program
10	Pedestrian / Trail Facilities	Village Center	Construct Pedestrian Bridge (Over I-25 north of Caley Ave. at Wabash Way)	$2,625,000	5	8	0	8	0	0	5	26	Construct with Village Center development
11	Pedestrian / Trail Facilities	Roslyn Street	6 Foot Detached Walk (Along east and west side from Progress Place to Landmark development)	$150,000	0	5	10	0	1	10	0	26	No continuous sidewalk on either side of the street
12	Pedestrian / Trail Facilities	S. Quebec Street	10 Foot Attached or 8 Detached Walk (From E. Berry Ave. to E. Progress Pl.)	$320,000	5	8	0	0	3	5	5	26	Repair existing sidewalk, construct w/ Pavement Management program
13	Pedestrian / Trail Facilities	S. Willow Drive	6 Foot Detached Walk or 8 Foot Attached Walk (West side between S. Wabash Way to S. Yosemite St.)	$400,000	5	5	10	0	1	0	5	26	Portion of sidewalk should be constructed with Village Center development
14	Pedestrian / Trail Facilities	E. Costilla Avenue	8 Foot Attached Walk (North side between Emporia Street and Bowling Alley)	$100,000	5	5	0	0	1	10	5	26	Sidewalks intermittent on both sides of the street, construct w/ Costilla Ave. widening (portion within Centennial)

Prioritized Pedestrian / Trail Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Multi-modal Connectivity Score	Roadway Classification Score	Continuity Score	Street Xing Score	Security / Safety Score	Access for Physically Impaired	Construct Jointly with other Project or Agency Score	Total Score	Comments
15	Pedestrian / Trail Facilities	S. Wabash Way	6 Foot Detached Walk or 8 Foot Attached Walk (East side between S. Willow Drive and dead end)	$391,000	0	5	10	0	1	10	0	26	Connect to future Wabash Way extension and Village Center development
16	Pedestrian / Trail Facilities	S. Yosemite Street	8 Foot Detached Walk (East and west sides from E. Orchard Road to E. Fair Ave.)	$708,000	5	8	0	0	6	5	0	24	reconstruct to wider sidewalk to accommodate bikes and pedestrians
17	Pedestrian / Trail Facilities	S. Emporia Street	8 Foot Attached Walk (Along west side between Shane Company and E. Costilla Avenue)	$200,000	0	3	10	0	1	10	0	24	Sidewalks intermittent on both sides of the street, new sidewalks hampered by existing development
18	Pedestrian / Trail Facilities	Ulster Circle East	10 Foot Attached Walk (Outside circle on east side)	$108,000	0	3	10	0	1	10	0	24	
19	Pedestrian / Trail Facilities	Village Center (Goldsmith Gulch trail)	Construct Pedestrian Underpass (Under E. Caley Ave. for Goldsmith Gulch Trail extension)	$372,000	5	5	0	8	1	0	5	24	Construct with Yosemite and Caley intersection improvements
20	Pedestrian / Trail Facilities	Greenwood Plaza Boulevard	6 Foot Detached Walk or 8 Foot Attached Walk (West side along Greenwood Plaza Blvd. circle)	$280,000	5	5	10	0	1	0	0	21	
21	Pedestrian / Trail Facilities	Greenwood Plaza Boulevard	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Berry Avenue to Dorado Place)	$540,000	5	5	10	0	1	0	0	21	
22	Pedestrian / Trail Facilities	Greenwood Plaza Boulevard	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Orchard Road to E. Caley Avenue)	$720,000	5	5	10	0	1	0	0	21	Grade issue south of Orchard may require retaining walls
23	Pedestrian / Trail Facilities	S. Syracuse Way	6 Foot Detached Walk or 8 Foot Attached Walk (East side from E. Caley Avenue to Greenwood Plaza Blvd.)	$450,000	5	5	10	0	1	0	0	21	Grade issue - may require pedestrian bridge across creek
24	Pedestrian / Trail Facilities	S. Quebec Street	8 Foot Attached Walk (From E. Belleview Ave. to E. Progress Ave. replace existing walk)	$91,000	5	8	0	0	3	0	0	16	Construct with intersection or interchange improvements
25	Pedestrian / Trail Facilities	S. Syracuse Way at Greenwood Corporate Plaza Trail	10 Foot Multi-Use Trail (From S. Syracuse Way existing sidewalk to the City Hall paths around William McKinley Carson Park)	$400,000	0	5	0	0	0	10	0	15	Extend the proposed Greenwood Corporate Plaza Trail to City Hall and park
26	Pedestrian / Trail Facilities	E. Roundtree Avenue	6 Foot Detached Walk (From internal private walkway network to existing S. Yosemite St. sidewalk on SW corner)	$7,000	0	3	10	0	2	0	0	15	Close small gap in sidewalk system between Yosemite and Roundtree
27	Pedestrian / Trail Facilities	E. Berry Place	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. around cul-de-sac)	$160,000	0	3	0	0	1	10	0	14	No sidewalks on either side of street
28	Pedestrian / Trail Facilities	E. Crestline Circle	6 Foot Detached Walk (South and north sides east of S. Quebec St.)	$136,000	0	3	0	0	1	10	0	14	No sidewalks on either side of the street

Prioritized Pedestrian / Trail Project Scoring Sheets

Staff Refined Priority Ranking	Improvement Category	Location	Project Description	Opinion of Probable Cost (2008 dollars)	Multi-modal Connectivity Score	Roadway Classification Score	Continuity Score	Street Xing Score	Security / Safety Score	Access for Physically Impaired	Construct Jointly with other Project or Agency Score	Total Score	Comments
29	Pedestrian / Trail Facilities	E. Dorado Place	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. around cul-de-sac)	$160,000	0	3	0	0	1	10	0	14	No sidewalks on either side of the street
30	Pedestrian / Trail Facilities	S. Yosemite Court	8 Foot Attached Walk (South side between S. Yosemite St. and existing sidewalk.)	$60,000	0	3	10	0	1	0	0	14	
31	Pedestrian / Trail Facilities	Long Avenue	6 Foot Detached Walk or 8 Foot Attached Walk (North and south sides from Greenwood Plaza Blvd. to parking lot)	$180,000	0	3	0	0	1	10	0	14	No sidewalks on either side of the street
32	Pedestrian / Trail Facilities	E. Prentice Avenue	8 Foot Attached Walk (South side of E. Prentice Ave.)	$75,000	0	5	0	0	1	5	0	11	Large trees and parking lot constrain possible ADA improvements
33	Pedestrian / Trail Facilities	E. Fair Avenue	6 Foot Detached Walk (South side east of S. Yosemite Street)	$98,000	0	3	0	0	1	0	5	9	Likely to occur with development (city owned)
34	Pedestrian / Trail Facilities	E. Progress Place	6 Foot Detached Walk (South side from S. Quebec Street to S. Roslyn Street)	$90,000	0	5	0	0	1	0	0	6	
35	Pedestrian / Trail Facilities	Goldsmith Gulch Trail extension	10 Foot Multi-Use Trail (Around Caley Pond connecting to Goldsmith Gulch trail)	$275,000	0	1	0	0	0	0	5	6	
36	Pedestrian / Trail Facilities	Greenwood Corp. Plaza Area	10 Foot Multi-Use Trail (Greenwood Plaza Blvd., to E. Caley Ave.)	$1,125,000	0	0	0	0	0	0	5	5	Part of Greenwood Corporate Plaza Master Development Plan
37	Pedestrian / Trail Facilities	E. Orchard Road	10 Foot Multi-Use Trail (From the intersection of Orchard Road/Quebec Street diagonally through parking lot to Greenwood Plaza Blvd.)	$325,000	0	5	0	0	0	0	0	5	

PROJECT INFORMATION:

Project Name:	S. Yosemite Street / E. Peakview Avenue Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Major Construction)
Final Category Ranking:	**1**
Project Location:	S. Yosemite Street at Peakview Avenue

PROPOSED PHASED IMPROVEMENTS:

TOTAL - Add a second NB left turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

TOTAL = $317,000

PROJECT NOTES AND OBSERVATIONS:

Widen roadway to the west to accommodate second northbound left turn lane. Maintain the eastbound to southbound acceleration lane and restripe roadway for new geometry. Coordinate improvements with other proposed projects, such as the Yosemite Street bridge enhancements and the extension of Yosemite Court to Peakview Avenue.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (2nd NB LT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Yosemite Street and E. Peakview Avenue Intersection	**Overall**			**F**	**188**	**D**	**44**
	EB Left	366	828	F	511	E	57
	EB Left/Thru/Right	-	-	F	703	E	57
	EB Right	341	451	F	710	E	67
	WB Left	58	60	F	89	F	101
	WB Thru/Right	82	82	C	28	F	137
	NB Left	124	138	C	25	E	78
	NB Thru/Right	600	1444	C	34	D	37
	SB Left	31	31	A	8	D	54
	SB Thru	820	1453	E	57	C	33
	SB Right	193	644	B	11	C	29

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

SUMMARY RANKING SHEET - *S. Fiddlers Green Circle / E. Peakview Ave. Intersection*

I-25 Transportation Improvement Study

PROJECT INFORMATION:

Project Name:	S. Fiddlers Green Circle / E. Peakview Avenue. Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity - Minor Construction)
Final Category Ranking:	**2**
Project Location:	S. Fiddlers Green Circle / E. Peakview Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – Add a 2nd NB left turn lane
Phase 2 – Restripe roadway for a 2nd WB left turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

Phase 1 = $150,000
Phase 2 = $ 50,000
TOTAL = $200,000

PROJECT NOTES AND OBSERVATIONS:

All or portions of the improvements may be completed as part of the Fiddler's Green Circle street improvements currently being designed by the Public Works Department or part of the Village center development.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 Improvement (2nd NB LT Lane)		Phase 2 (TOTAL) Improvement (2nd WB LT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Fiddlers Green Circle/ E. Peakview Intersection	**Overall**			**F**	**124**	**D**	**53**	**D**	**38**
	EB Left	7	10	C	29	E	72	E	68
	EB Thru	21	40	C	30	E	68	E	67
	EB Right	251	600	B	14	C	31	C	26
	WB Left	355	500	F	436	F	104	E	59
	WB Thru/Right	109	130	C	28	C	24	C	31
	NB Left	218	736	E	72	D	41	D	39
	NB Thru	15	10	A	3	B	15	B	11
	NB Right	64	220	A	1	A	2	A	2
	SB Left	4	10	A	7	D	53	D	46
	SB Thru/Right	142	170	A	7	F	99	D	46

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

PROJECT INFORMATION:

Project Name:	S. Quebec Street / Progress Place Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity - Minor Construction)
Final Category Ranking:	**3**
Project Location:	S. Quebec Street at Progress Place

PROPOSED PHASED IMPROVEMENTS:

TOTAL - Add a new traffic signal

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

TOTAL = $530,000

PROJECT NOTES AND OBSERVATIONS:

The intersection will only require three signal poles and mast arms. Signal timing should be coordinated with the traffic signal at Quebec Street and Belleview Avenue. The addition of the signal will also improve vehicular access to the area as well as creating a safer pedestrian crossing of Quebec Street.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (Traffic Signal)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Quebec Street / Progress Place Intersection	**Overall**			**F**	**67**	**D**	**38**
	WB Left/Right	180	477	F	500	F	101
	NB Thru/Right	1130	1571	A	0	D	50
	SB Left	194	303	F	300	D	41
	SB Thru	662	1577	A	0	A	7

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

PROJECT INFORMATION:

Project Name:	S. Yosemite Street / E. Caley Avenue Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Major Construction)
Final Category Ranking:	**4**
Project Location:	S. Yosemite Street at Caley Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 - Add a second WB left turn lane
Phase 2 - Add a SB right turn lane
Phase 3 - Add additional 3rd thru lane (NB and SB)

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

Phase 1 = $486,000
Phase 2 = $329,000
Phase 3 = Not Practical
TOTAL = $815,000

PROJECT NOTES AND OBSERVATIONS:

Future improvements may be constructed with the development of the vacant parcel to the west. The westbound left turn lane can be accommodated by restriping but may require the existing culvert under Caley Avenue to be widened. This may create an opportunity to construct the proposed trail underpass in conjunction with the proposed intersection improvements.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 Improvement (2nd WB LT Lane)		Phase 2 Improvement (SB RT Lane)		Phase 3 (TOTAL) Improvement (3rd NB/SB Lanes)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Yosemite Street and E. Caley Avenue Intersection	**Overall**			**F**	**98**	**F**	**87**	**E**	**74**	**C**	**33**
	EB Left	65	162	F	80	F	101	F	101	D	49
	EB Thru	75	110	E	56	D	53	D	53	E	61
	EB Right	59	185	E	66	E	61	E	61	D	38
	WB Left	145	230	F	101	D	50	D	50	D	42
	WB Thru	34	67	D	51	D	54	D	54	E	56
	WB Right	246	272	C	32	C	32	C	32	C	28
	NB Left	32	118	F	159	E	60	E	60	D	52
	NB Thru	744	1758	F	139	F	129	F	129	D	36
	NB Right	262	364	B	18	B	17	B	17	B	15
	SB Left	526	455	F	118	F	86	F	86	E	61
	SB Thru/Right	-	-	F	84	E	78	-	-	-	-
	SB Thru	840	1558	-	-	-	-	D	42	C	20
	SB Right	58	134	-	-	-	-	A	3	A	3

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

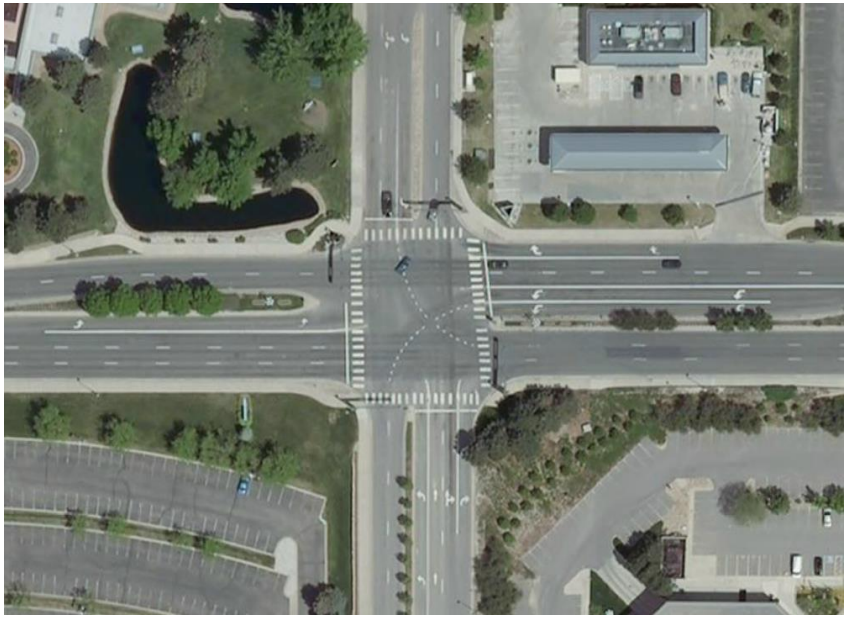
PROJECT INFORMATION:

Project Name:	E. Orchard Road / Greenwood Plaza Blvd Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity - Major Construction)
Final Category Ranking:	**5**
Project Location:	E. Orchard Road / Greenwood Village Plaza Blvd

PROPOSED PHASED IMPROVEMENTS:

TOTAL - Add a SB right turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $294,000

PROJECT NOTES AND OBSERVATIONS:

Currently, the Community Development Department is reviewing a development application that would dedicate right-of-way for the construction of the right turn lane. Public Works is currently looking into the split phasing of the traffic signal for northbound and southbound traffic to determine if it can be removed.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (SB RT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
E. Orchard Rd. / Greenwood Plaza Blvd. Intersection	**Overall**			**F**	**139**	**D**	**54**
	EB Left	145	78	F	140	E	77
	EB Thru/Right	800	950	C	27	D	40
	WB Left	235	518	F	436	E	80
	WB Thru	1065	1261	D	39	E	55
	WB Right	153	224	A	6	B	11
	NB Left	111	161	D	50	E	61
	NB Thru	95	151	D	53	E	64
	NB Right	669	659	C	20	D	38
	SB Left	484	568	F	213	F	85
	SB Thru/Right	-	-	C	500	-	-
	SB Thru	74	260	-	-	E	69
	SB Right	112	181	-	-	B	11

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

SUMMARY RANKING SHEET - *E. Orchard Rd. / S. Willow Drive Intersection*

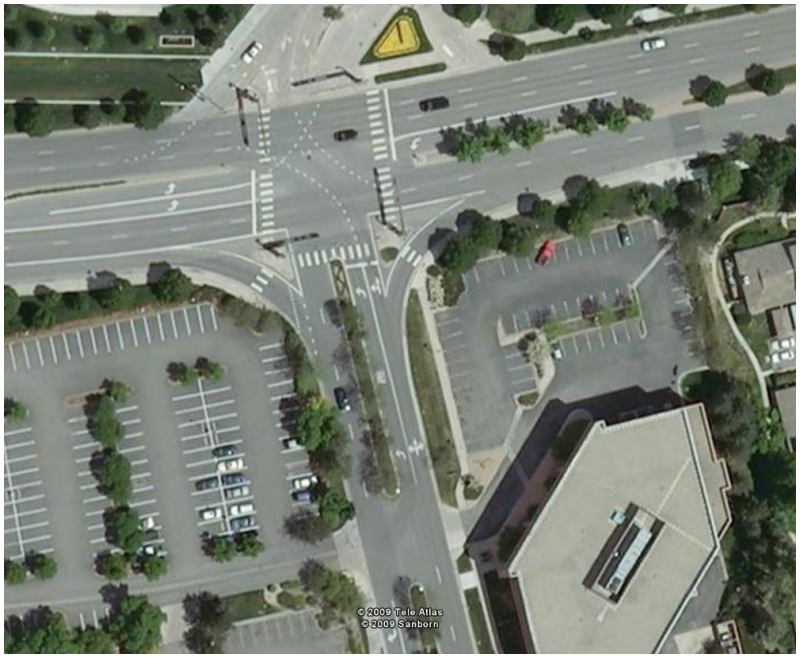
PROJECT INFORMATION:

Project Name:	E. Orchard Road / S. Willow Drive Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity - Major Construction)
Final Category Ranking:	**6**
Project Location:	E. Orchard road at Willow Drive

PROPOSED PHASED IMPROVEMENTS:

TOTAL - Add a NB right turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $221,000

PROJECT NOTES AND OBSERVATIONS:

Few constraints constructing the proposed northbound right turn lane. Presumed widening would occur to the east thus right of way will have to be purchased and landscaping will be lost.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (NB RT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Orchard Road / Willow Drive Intersection	**Overall**			**F**	**95**	**D**	**53**
	EB Left	44	174	F	169	E	77
	EB Thru	785	1087	D	50	D	52
	EB Right	64	183	A	7	B	14
	WB Left	26	36	E	75	F	82
	WB Thru/Right	1106	1393	D	45	D	51
	NB Left	237	389	E	70	-	-
	NB Left/Thru/Right	-	-	F	350	-	-
	NB Left/Thru	315	256	-	-	E	79
	NB Right	552	345	-	-	C	22
	SB Left	64	81	D	47	D	47
	SB Thru/Left	147	151	E	60	E	56
	SB Right	208	377	C	29	C	35

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

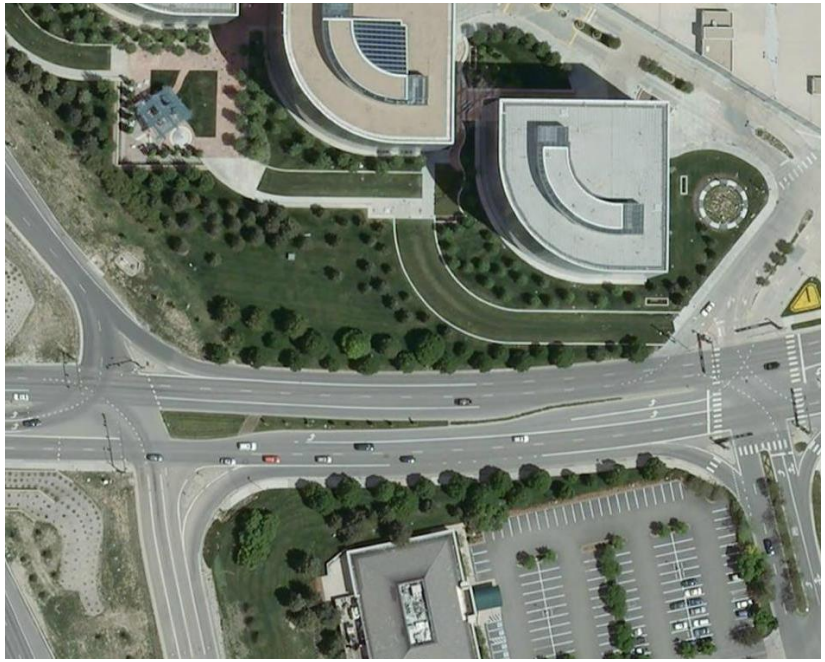
PROJECT INFORMATION:

Project Name:	E. Orchard Road / I-25 NB Ramps Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity - Major Construction)
Final Category Ranking:	**7**
Project Location:	I-25 and E. Orchard Road Interchange

PROPOSED PHASED IMPROVEMENTS:

Total - Add a WB right turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $939,000

PROJECT NOTES AND OBSERVATIONS:

Close coordination with CDOT will be necessary to assess the operational concerns with the I-25 northbound on ramp intersection.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (WB RT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
E. Orchard Road / I-25 NB Ramps Intersection	**Overall**			**F**	**169**	**C**	**34**
	EB Left	837	876	F	628	C	24
	EB Thru	772	1007	A	4	A	5
	WB Thru	1081	1119	A	4	D	52
	WB Right	469	934	F	80	B	16
	NB Left	236	401	F	268	D	43
	NB Thru/Right	-	-	D	48	F	110
	NB Right	121	443	D	52	F	110

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

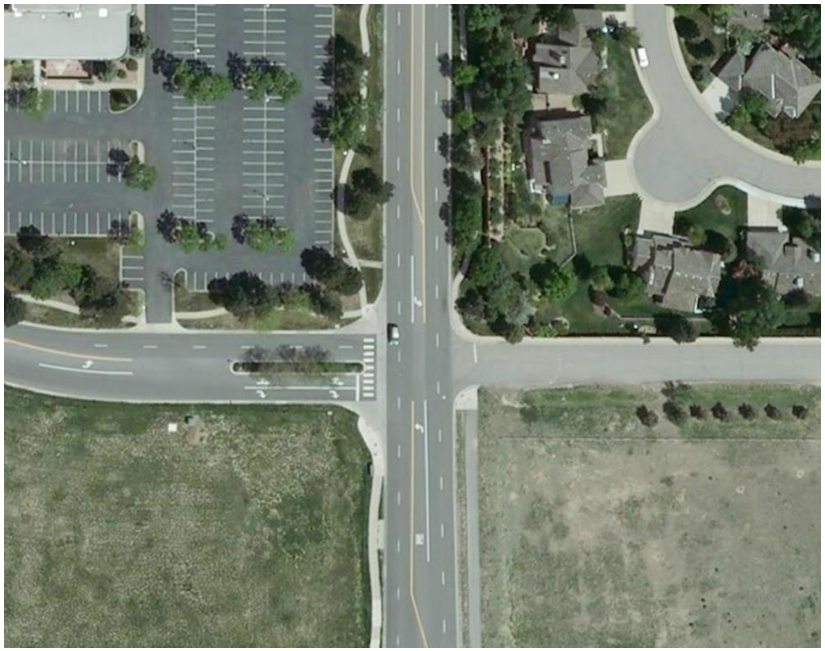
PROJECT INFORMATION:

Project Name:	S. Yosemite Street / S. Willow Drive / Fair Drive Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Minor Construction)
Final Category Ranking:	**8**
Project Location:	S. Yosemite Street and Willow/Fair Drive

PROPOSED PHASED IMPROVEMENTS:

Phase 1 - Add a new traffic signal

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $780,000

PROJECT NOTES AND OBSERVATIONS:

Future improvements may be constructed with the development of the vacant parcel to the west. Signal installation should be coordinated with proposed improvements at Yosemite Street and Caley Avenue.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 (TOTAL) Improvement (Traffic Signal)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Yosemite Street / S. Willow Dr. / Fair Dr. Intersection	**Overall**			**D**	**47**	**C**	**33**
	EB Thru/Left	2	17	F	600	D	49
	EB Right	35	169	F	78	C	26
	WB Left/Thru/Right	3	94	F	700	D	53
	NB Left	188	381	F	289	E	80
	NB Thru/Right	932	1782	A	0	B	19
	SB Left	1	14	C	17	B	14
	SB Thru/Right	783	1758	A	0	D	50

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

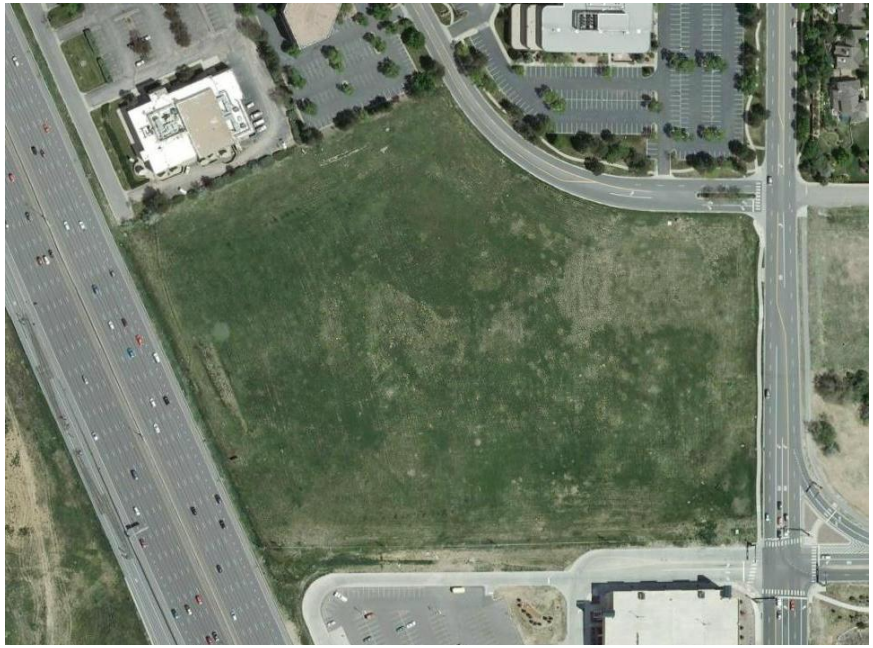
PROJECT INFORMATION:

Project Name:	S. Wabash Way street extension
Improvement Category:	Roadways and Intersections (Roadway Connection)
Final Category Ranking:	**9**
Project Location:	S. Wabash Way south dead end

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – extend Wabash Way to Caley Avenue

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $1,908,000

PROJECT NOTES AND OBSERVATIONS:

Street extension should be constructed with the village Center development east of I-25. The street should be constructed with sidewalks to the transportation center and the proposed pedestrian bridge over I-25. The new street extension can also serve as an access route for RTD and CDOT to access their facilities to the south within traveling along Yosemite Street or through the Village Center development.

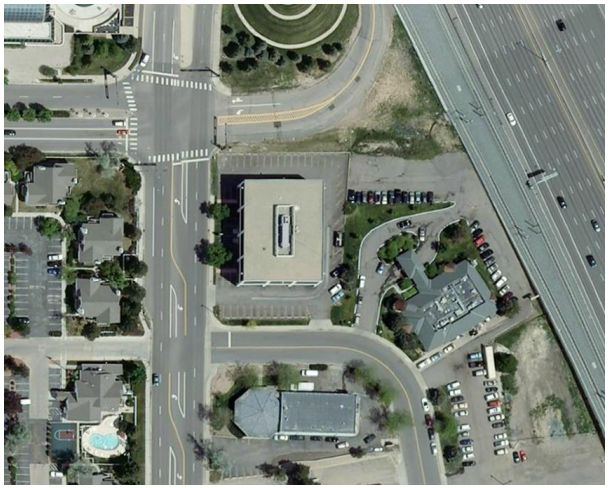
PROJECT INFORMATION:

Project Name:	S. Yosemite Court street extension
Improvement Category:	Roadways and Intersections (Roadway Connection)
Final Category Ranking:	**10**
Project Location:	S. Yosemite Court at Peakview Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – realign Yosemite Court to intersect with Peakview Avenue through Brooks Steak House and the office building at 6530 S. Yosemite Street

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $482,000

PROJECT NOTES AND OBSERVATIONS:

Project would realign Yosemite Court to intersect with Peakview Avenue through Brooks Steak House and the office building at 6530 S. Yosemite Street. Project could be coordinated with the I-25 and Arapahoe Road interchange reconstruction should the Yosemite court intersection with Arapahoe Road be closed. The current intersection of Yosemite Court and Yosemite Street would be closed directing traffic to the signal at Peakview Avenue and Yosemite Street. Access improvements and the extension of the northbound left turn at Peakview can then be made on Yosemite Street.

PROJECT INFORMATION:

Project Name:	Quebec Street left turn lane modifications at Berry Avenue
Improvement Category:	Roadways and Intersections (Roadway Capacity - Major Construction)
Final Category Ranking:	**11**
Project Location:	Quebec Street at Berry Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – Increase the southbound left turn lane on Quebec Street at Berry Avenue

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

TOTAL = $20,000

PROJECT NOTES AND OBSERVATIONS:

Project would modify the existing center median to extend the southbound stacking distance for vehicles turning east onto Berry Avenue. The existing landscaping may be lost but efforts should be made to landscape the center median to match the future landscaped medians on Berry Avenue.

PROJECT INFORMATION:

Project Name:	Quebec Street left turn lane modifications at Marin Drive
Improvement Category:	Roadways and Intersections (Roadway Capacity - Major Construction)
Final Category Ranking:	**12**
Project Location:	Quebec Street at Marin Drive

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – Increase the southbound left turn lane on Quebec Street at Marin Drive

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

TOTAL = $40,000

PROJECT NOTES AND OBSERVATIONS:

Project would modify the existing center median to extend the southbound stacking distance for vehicles turning east onto Marin Drive. The modification will also improve the taper and deceleration length making it safer for vehicles on wet or snowy roadway conditions.

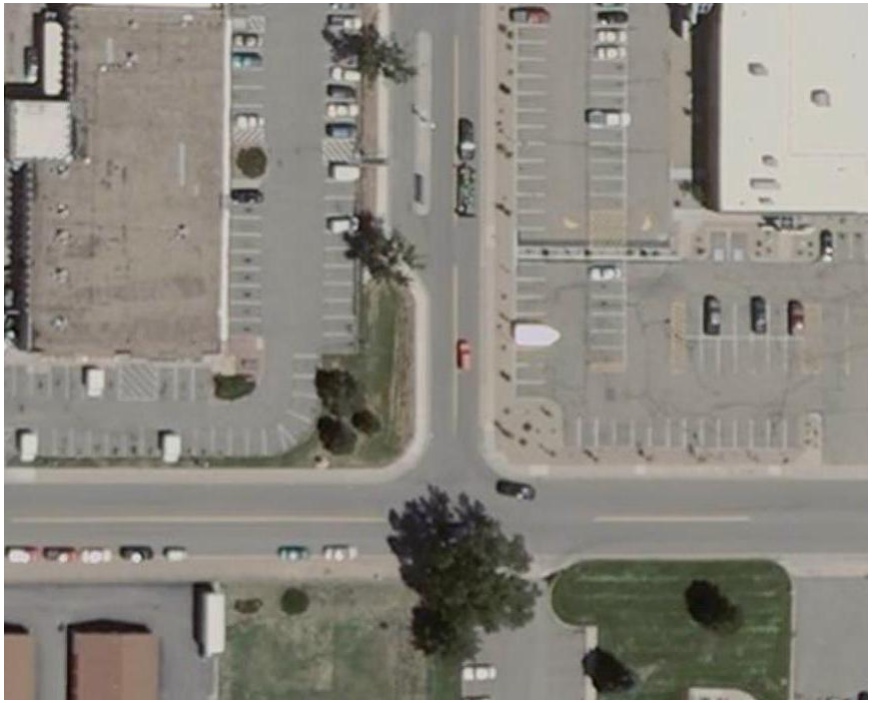
PROJECT INFORMATION:

Project Name:	Dayton Street Southbound Right Turn Lane at Costilla Avenue
Improvement Category:	Roadways and Intersections (Roadway Capacity - Minor Construction)
Final Category Ranking:	**13**
Project Location:	Dayton Street at Costilla Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 – Construct a southbound right turn lane at Costilla Avenue

AERIALS AND PHOTOS OF PROJECT LOCATION:



CONCEPTUAL COST ESTIMATE:

TOTAL = $83,000

PROJECT NOTES AND OBSERVATIONS:

Project would add a southbound right turn lane at Costilla Avenue. Construction could occur with the Costilla Avenue widening project as part of the I-25/Arapahoe Road interchange reconstruction project, which includes the Costilla Avenue underpass. The location and circulation around the mail box drop on Dayton Street may need to be relocated or modified.

PROJECT INFORMATION:

Project Name:	S. Quebec Street / E. Orchard Road Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Major/Minor Construction)
Final Category Ranking:	**Projects Inconsistent with Prior Policy Direction**
Project Location:	S. Quebec St at E. Orchard Road

AERIALS AND PHOTOS OF PROJECT LOCATION:

Phase 1 - Add a SB second left turn lane
Phase 2 - Add additional 3rd thru lane (NB and SB)
Phase 3 - Add a NB second left turn lane and a WB second thru lane

AERIALS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

Phase 1 = $230,000
Phase 2 = $3,720,000
Phase 3 = $470,000
TOTAL = $4,420,000

PROJECT NOTES AND OBSERVATIONS:

Project is not recommended based on current and past City Council direction to Village staff about not increasing traffic volumes on Orchard Road west of Quebec Street. Phase 1 and 2 may be constructed without increasing traffic west of Orchard Road but further analysis is required.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 Improvement (2nd SB LT Lane)		Phase 2 Improvement (3rd NB/SB Thru Lanes)		Phase 3 (TOTAL) Improvement (2nd NB LT, 2nd WB Thru Lanes)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Quebec Street / E. Orchard Rd. Intersection	**Overall**			**F**	**177**	**F**	**118**	**E**	**71**	**D**	**53**
	EB Left	70	126	F	125	F	126	E	79	D	44
	EB Thru/Right	358	418	C	21	C	29	C	28	E	74
	WB Left	368	408	B	15	B	19	B	17	C	29
	WB Thru	672	788	E	79	F	217	F	217	E	72
	WB Right	261	408	B	11	C	27	C	28	C	23
	NB Left	150	176	F	101	F	133	F	134	F	162
	NB Thru	309	826	D	44	D	42	C	34	D	50
	NB Right	233	279	B	10	B	16	B	15	B	19
	SB Left	194	368	F	863	F	141	F	86	D	50
	SB Thru/Right	698	1317	F	328	F	204	D	49	D	48

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour
3. 2020 LOS analysis includes signal timing improvements

PROJECT INFORMATION:

Project Name:	E. Orchard Road / Yosemite Street / DTC Blvd. Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Major/Minor Construction)
Final Category Ranking:	**Projects Inconsistent with Prior Policy Direction**
Project Location:	E. Orchard Road at Yosemite St./DTC Blvd

PROPOSED PHASED IMPROVEMENTS:

Phase 1 - Modify EB right turn lane
Phase 2 - Add second SB left turn lane
Phase 3 - Add additional 3rd thru lane (NB and SB)

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

Phase 1 = $275,000
Phase 2 = $80,000
Phase 3 = Not Practical
TOTAL = $355,000

PROJECT NOTES AND OBSERVATIONS:

Based on previous City Council direction to Village staff about not increasing traffic volumes on Orchard Road east of Yosemite Street the improvements are not being recommended by this study. However, Phase 1 may be constructed to improve public safety without increasing traffic volumes east of Yosemite Street. Three continuous northbound and southbound through lanes are necessary to achieve LOS D.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 Improvement (Mod. EB RT Lane)		Phase 2 Improvement (2nd SB LT Lane)		Phase 3 (TOTAL) Improvement (3rd NB/SB Lanes)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
E. Orchard Road / Yosemite Street / DTC Blvd. Intersection	**Overall**			**F**	**176**	**F**	**125**	**F**	**104**	**D**	**50**
	EB Left	404	327	C	31	F	111	F	111	F	85
	EB Thru/Right	-	-	F	243	-	-	-	-	-	-
	EB Thru	892	742	-	-	F	97	F	97	E	57
	EB Right	180	357	-	-	C	22	C	26	C	29
	WB Left	58	87	D	36	D	47	D	47	D	45
	WB Thru	406	404	D	50	E	56	E	56	D	52
	WB Right	170	180	A	10	B	10	B	12	B	10
	NB Left	135	306	F	171	E	77	F	91	E	77
	NB Thru/Right	943	1875	F	359	F	264	F	226	E	70
	SB Left	267	295	F	154	F	279	E	60	E	61
	SB Thru	1056	1338	E	55	E	58	D	51	D	39
	SB Right	400	689	B	17	A	1	A	1	A	1

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour 3. 2020 LOS analysis includes signal timing improvements

PROJECT INFORMATION:

Project Name:	S. Yosemite Street / E. Belleview Avenue Intersection Improvements
Improvement Category:	Roadways and Intersections (Roadway Capacity – Major Construction)
Final Category Ranking:	**Projects Inconsistent with Prior Policy Direction**
Project Location:	S. Yosemite Street at E. Belleview Avenue

PROPOSED PHASED IMPROVEMENTS:

Phase 1 - Add an EB right turn lane
Phase 2 - Add a NB right turn lane

AERIALS AND PHOTOS OF PROJECT LOCATION:

CONCEPTUAL COST ESTIMATE:

Phase 1 = $548,000
Phase 2 = $469,000
TOTAL = $1,017,000

PROJECT NOTES AND OBSERVATIONS:

Based on previous City Council direction to Village staff about not increasing traffic volumes on Belleview Avenue east of Yosemite Street the improvements are not being recommended by this study. However, Phase 1 may be constructed to improve intersection mobility without increasing traffic volumes east of Yosemite Street.

LEVEL OF SERVICE (LOS) BENEFITS OF PROPOSED IMPROVEMENTS

Project Location	Turning Movement	2008 Traffic Volume	2020 Traffic Volume	2020 LOS (without capital Improvement)		Phase 1 Improvement (EB RT Lane)		Phase 2 (TOTAL) Improvement (NB RT Lane)	
				LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
S. Yosemite Street/ E. Belleview Ave. Intersection	**Overall**			**F**	**98**	**E**	**66**	**D**	**55**
	EB Left	522	612	C	21	C	21	C	21
	EB Thru/Right	-	-	F	258	-	-	-	-
	EB Thru	531	663	-	-	F	85	F	85
	EB Right	86	138	-	-	A	3	A	3
	WB Left	64	105	D	50	E	57	E	57
	WB Thru	353	480	E	57	D	39	D	39
	WB Right	208	228	A	10	A	7	A	7
	NB Left	25	50	D	39	D	41	D	41
	NB Thru/Right	-	-	F	118	F	134	-	-
	NB Thru	627	772	-	-	-	-	F	89
	NB Right	52	81	-	-	-	-	A	10
	SB Left	222	348	F	105	F	138	F	138
	SB Thru	111	329	B	20	C	22	C	22
	SB Right	175	292	A	4	A	4	A	4

NOTES:

1. Target for Overall 2020 LOS is D
2. LOS is based on 2020 PM peak hour 3. 2020 LOS analysis includes signal timing improvements

I-25 Corridor Transportation Improvement Study
Safety Factor Calculations

INTERSECTION	Property Damage Only	Injury	Fatal	Total Crashes	Weighted Crashes1	MEV2	Weighted Rate	Normalized Ranking
S Quebec St & E Orchard Ave	55	14	0	69	125	27.5595	4.54	15
S Yosemite St & E Belleview Ave	50	14	0	64	120	30.9422	3.88	13
DTC Blvd (S Yosemite St) & E Orchard Rd	77	8	0	85	117	49.8875	2.35	8
Greenwood Plaza Blvd & E Peakview Ave	4	5	0	9	29	12.7081	2.28	8
S Yosemite St & E Arapahoe Rd	56	9	0	65	101	58.2173	1.73	6
DTC Pkwy & S Valentia Wy	4	1	0	5	9	6.09499	1.48	6
I-25 East Ramps & E Orchard Rd	20	4	1	25	52	35.7166	1.46	5
Greenwood Plaza Blvd (S Uinta St) & E Arapahoe Rd	37	5	0	42	62	43.437	1.43	5
DTC Pkwy & E Prentice Ave	2	2	0	4	12	9.03074	1.33	5
Greenwood Plaza Blvd & Fiddler's Green Cir (E Caley Ave)	5	1	0	6	10	8.93932	1.12	4
E Orchard Rd & Willow Dr	20	4	0	24	40	36.0417	1.11	4
DTC Blvd & E Prentice Ave	18	3	0	21	33	29.8553	1.11	4
DTC Blvd & E Belleview Ave	13	6	0	19	43	39.2111	1.10	4
S Yosemite St & E Caley Ave	11	4	0	15	31	31.3486	0.99	4
E Arapahoe Rd & S Syracuse Wy (S Spruce St)	10	5	0	15	35	37.6264	0.93	4
Greenwood Plaza Blvd & E Orchard Rd	20	3	0	23	35	40.0542	0.87	4
S Yosemite St & E Prentice Ave	5	1	0	6	10	12.5557	0.80	3
S Dayton St & E Peakview Ave	5	2	0	7	15	19.0164	0.79	3
S Syracuse Wy & E Caley Ave	2	1	0	3	7	9.48787	0.74	3
S Boston St & E Caley Ave	6	1	0	7	11	15.0343	0.73	3
I-25 West Ramps & E Orchard Rd	18	2	0	20	28	43.4065	0.65	3
S Yosemite St & E Peakview Ave	6	2	0	8	16	26.564	0.60	3
DTC Blvd & E Crescent Pkwy	8	1	0	9	13	21.7388	0.60	3
Greenwood Plaza Blvd & S Syracuse Way	2	1	0	3	7	13.1144	0.53	3
S Boston St & E Peakview Ave	2	1	0	3	7	14.0896	0.50	3
Greenwood Plaza Blvd & Big O Tires	6	0	0	6	6	12.3627	0.49	2
S Yosemite St & S Yosemite Cir	11	0	0	11	11	24.8574	0.44	2
DTC Blvd & Park Terrace Ave	6	1	0	7	11	26.1983	0.42	2
S Ulster St & E Prentice Ave	4	0	0	4	4	10.9202	0.37	2
S Quebec St & E Caley Ave	3	1	0	4	8	22.653	0.35	2
S Quebec St & E Progress Pl	6	0	0	6	6	22.0029	0.27	2
Fiddler's Green Cir & E Peakview Ave	3	0	0	3	3	12.7081	0.24	2
Greenwood Plaza Blvd & Greenwood Plaza Blvd (N of E Orchard Ave)	2	0	0	2	2	9.93483	0.20	2
S Yosemite St & Willow Dr	3	0	0	3	3	25.3348	0.12	1
DTC Pkwy & S Yosemite St (DTC Blvd)	2	0	0	2	2	34.2437	0.06	1
S Quebec St & E Berry Ave	1	0	0	1	1	19.1484	0.05	1
S Valentia Wy & E Prentice Ave	0	0	0	0	0	9.79262	0.00	1
S Valentia Wy & Park Terrace Ave	0	0	0	0	0	2.13325	0.00	1

1Weighted Crashes = 1 x PDO + 5 x Injury + 12 x Fatal

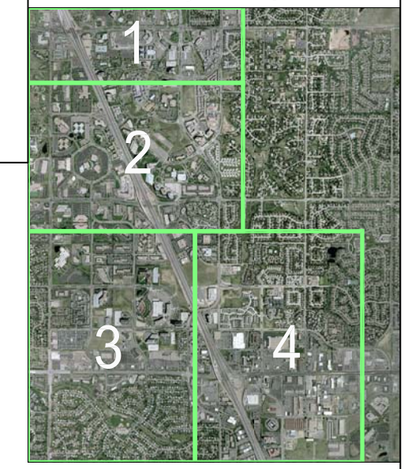
2MEV = Million Entering Vehicles = (10 x PM Peak Hour Volume x 365 days x 3 years x 0.9277) / 1,000,000

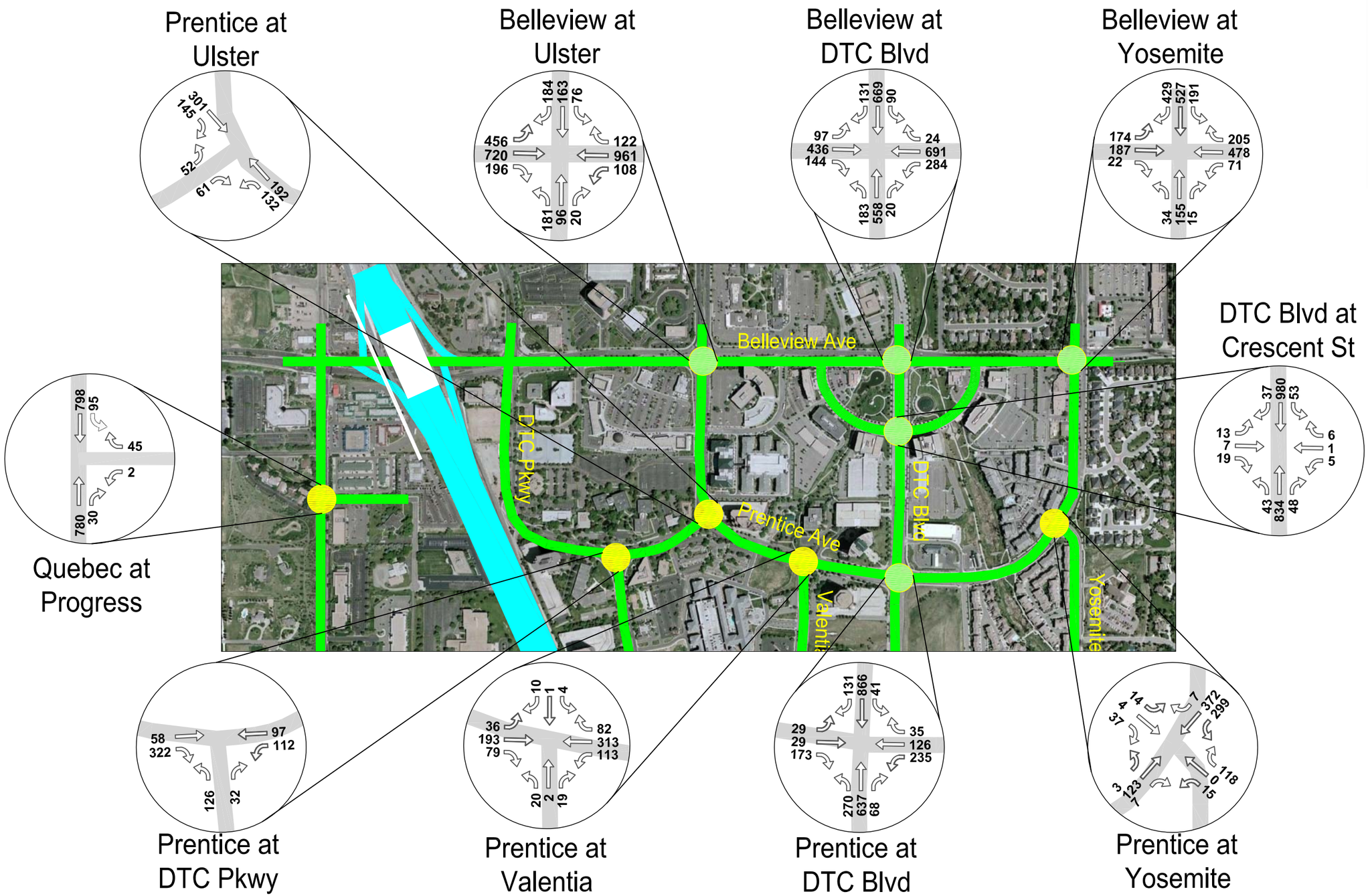
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing AM Traffic Volumes - Section 1

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



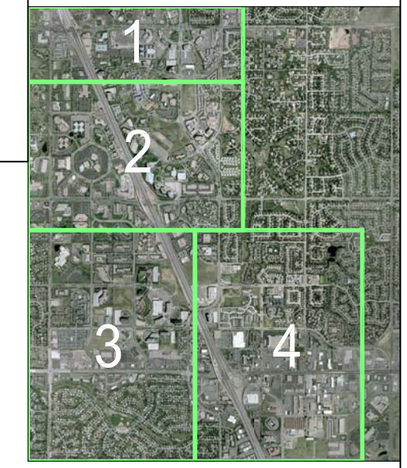


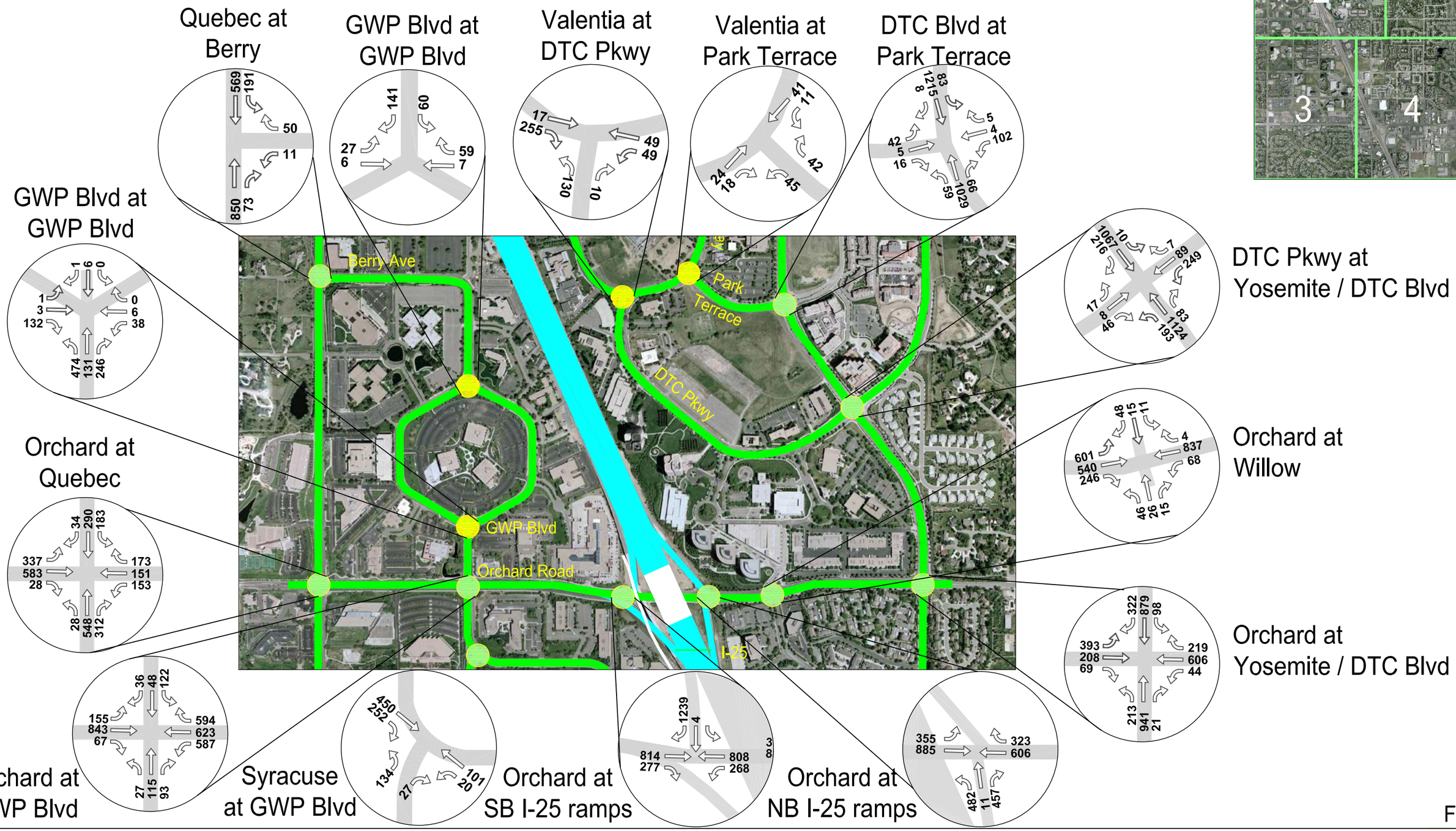
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing AM Traffic Volumes - Section 2

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



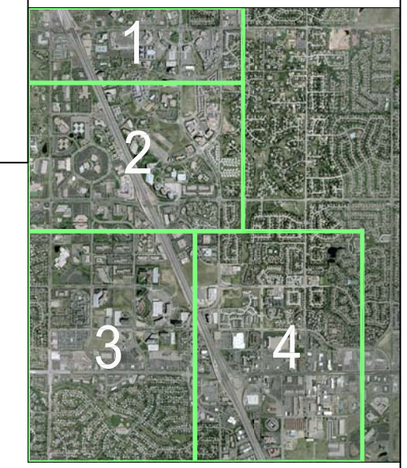


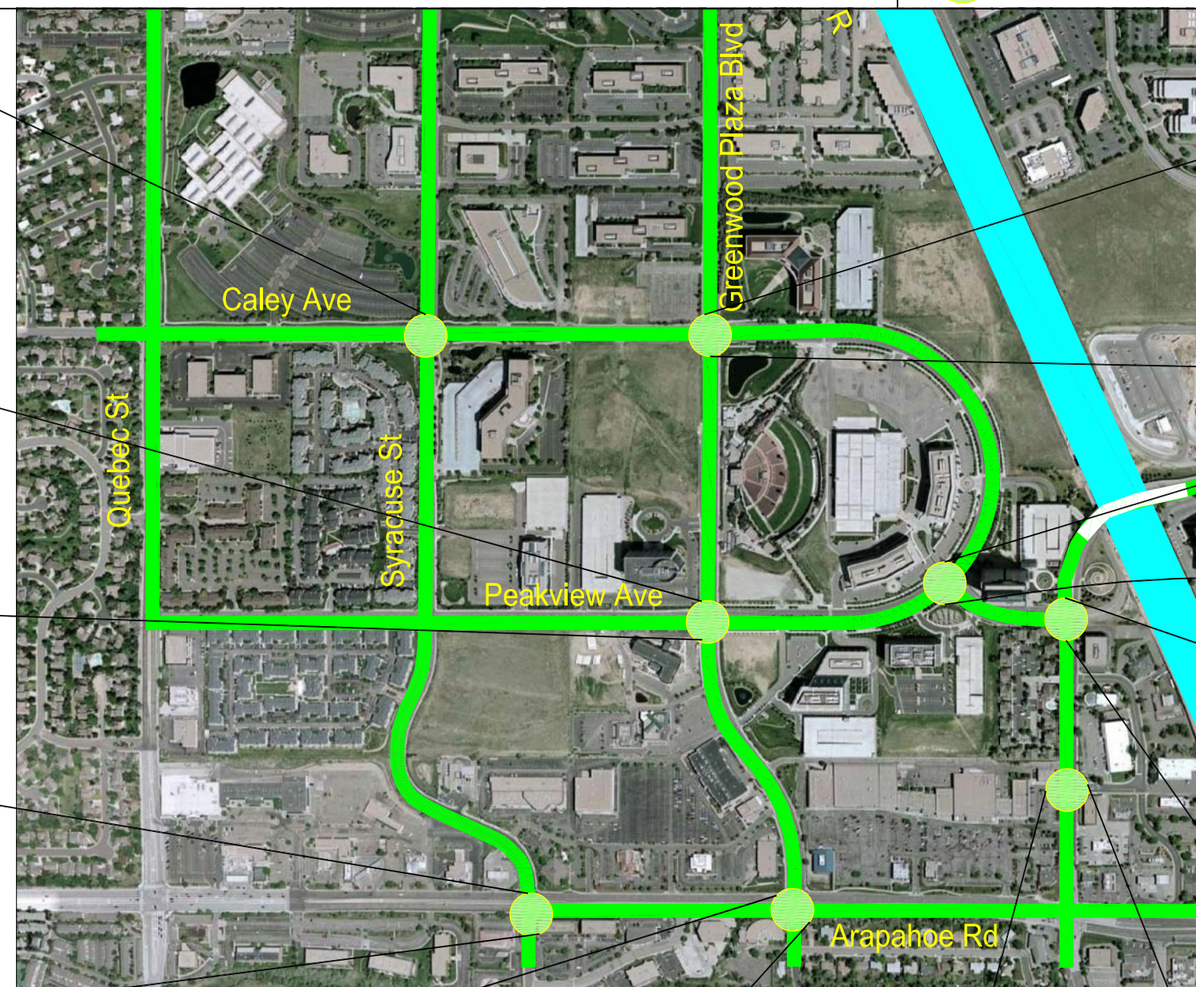
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing AM Traffic Volumes - Section 3

Legend

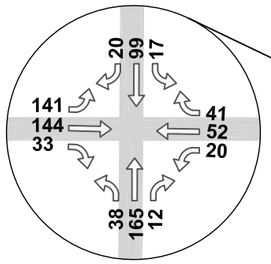
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

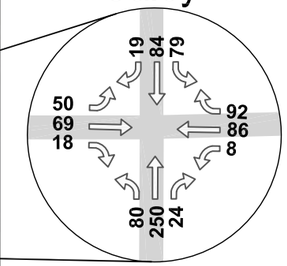




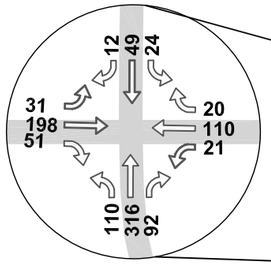
Syracuse at Caley

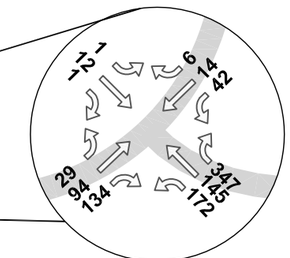


GWP Blvd at Caley



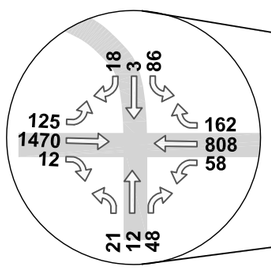
GWP Blvd at Peakview

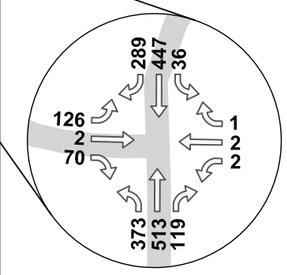




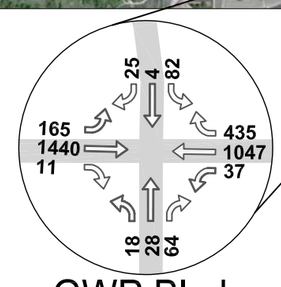
Fiddler's Green at Peakview

Syracuse at Arapahoe

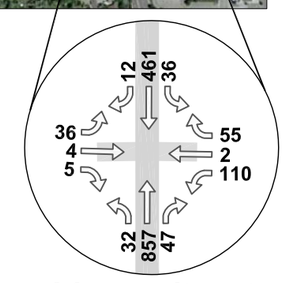




Yosemite at Peakview



GWP Blvd at Arapahoe



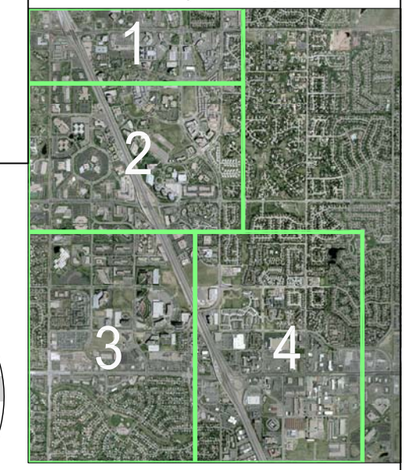
Yosemite at Shopping Center

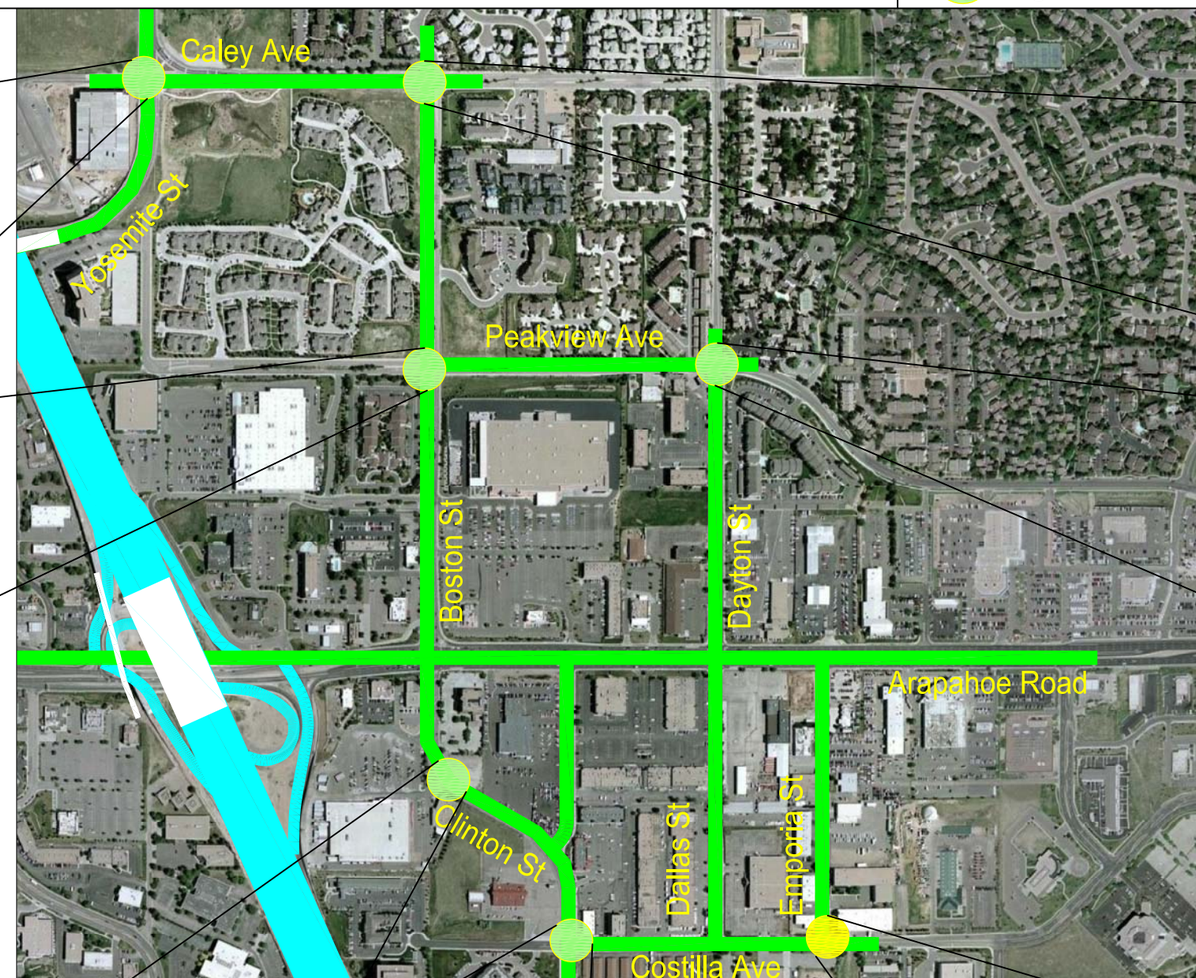
Greenwood Village I-25 Corridor Transportation Improvement Srudy
2008 Existing AM Traffic Volumes - Section 4

Legend

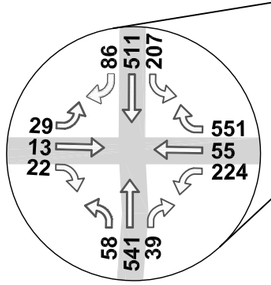
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

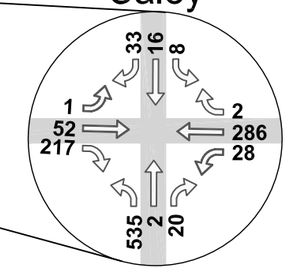




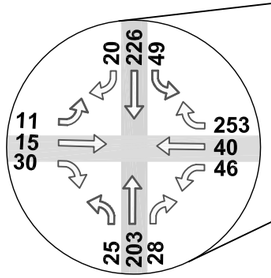
Yosemite at Caley



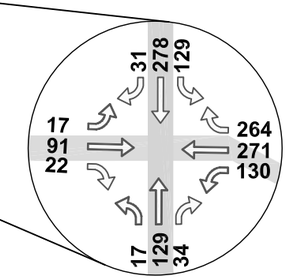
Boston at Caley



Boston at Peakview

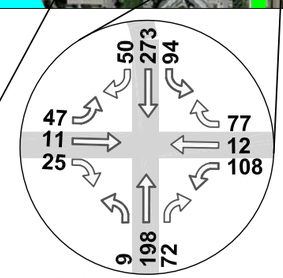


Dayton at Peakview

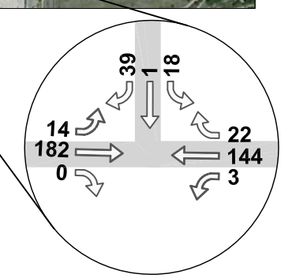


Clinton St at Target

Clinton St at Costilla



Emporia at Costilla

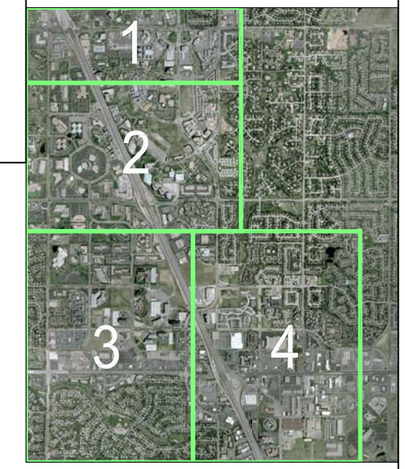


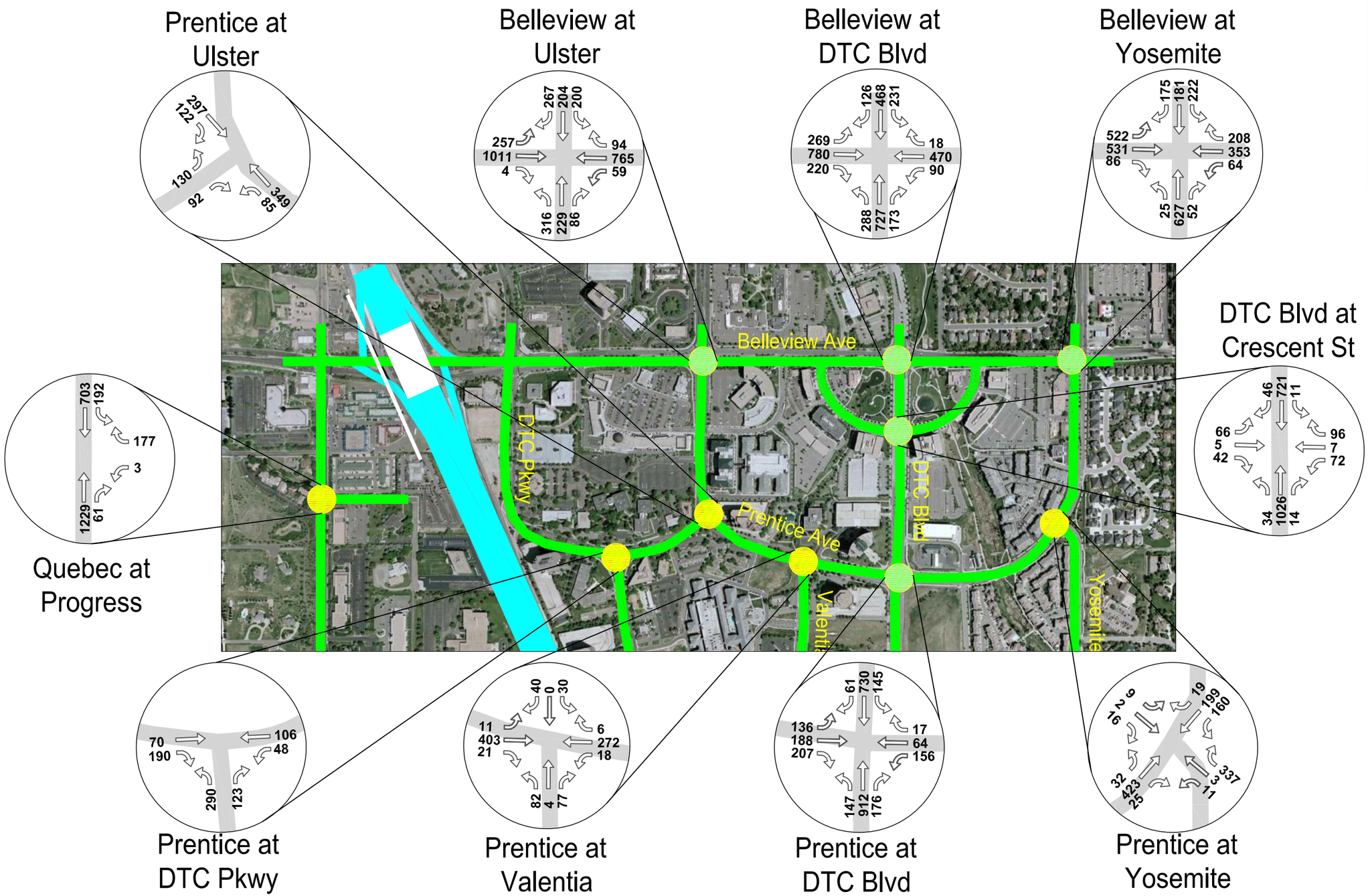
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing PM Traffic Volumes - Section 1

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



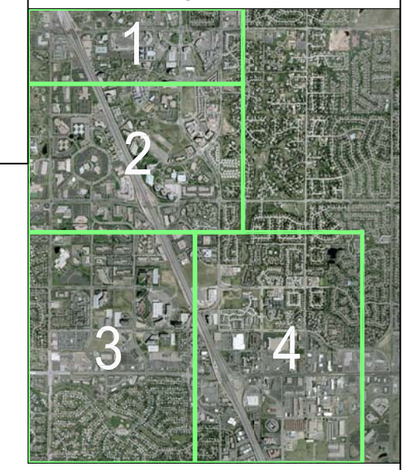


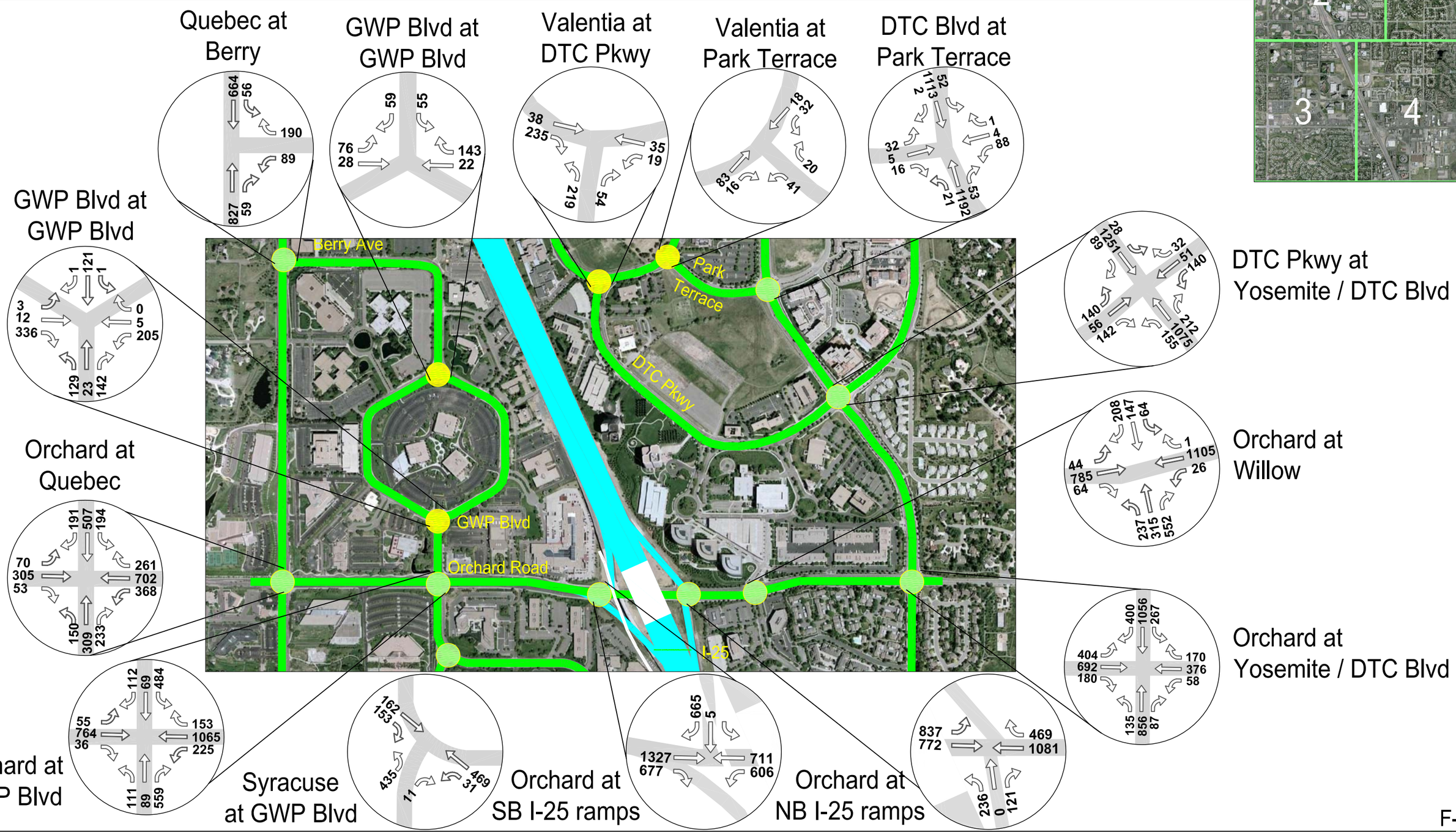
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing PM Traffic Volumes - Section 2

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



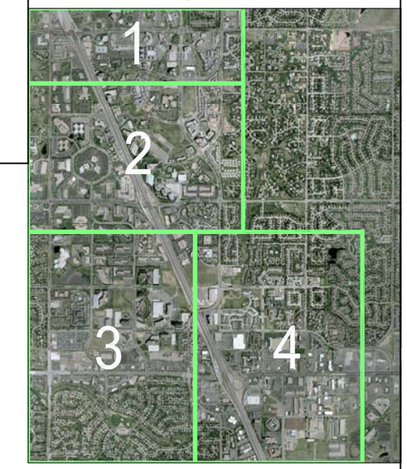


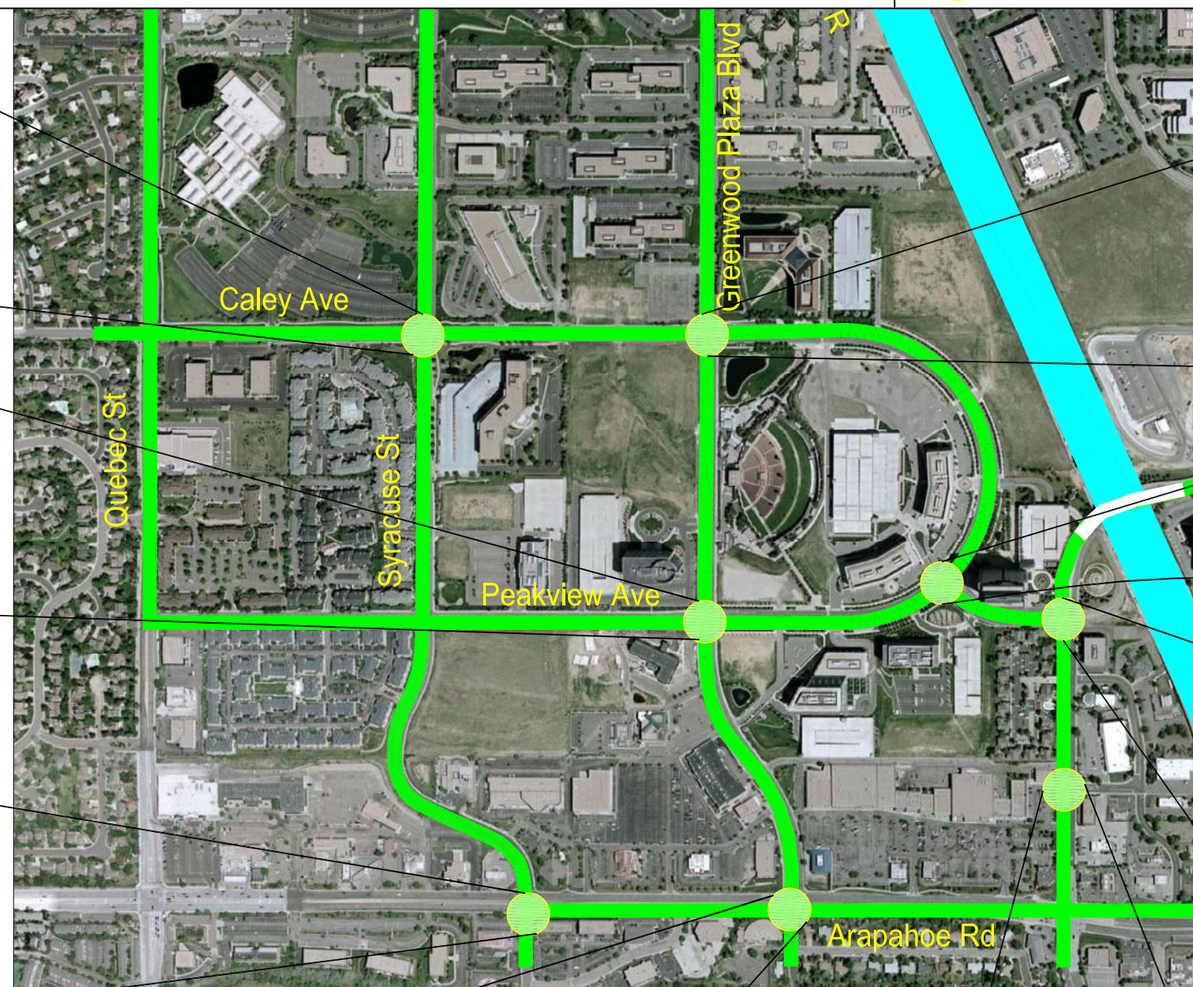
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing PM Traffic Volumes - Section 3

Legend

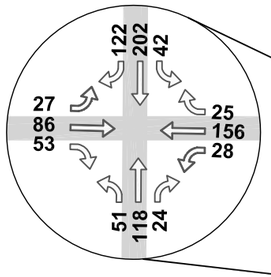
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

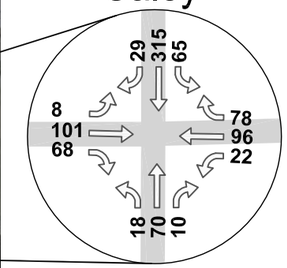




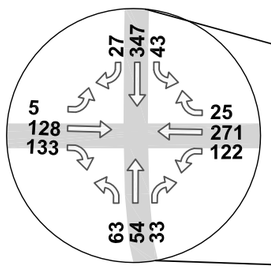
Syracuse at Caley

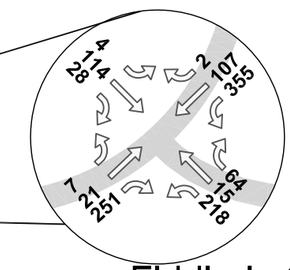


GWP Blvd at Caley



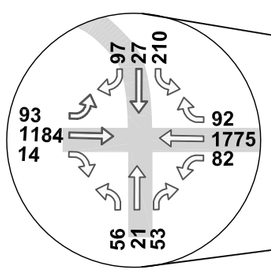
GWP Blvd at Peakview

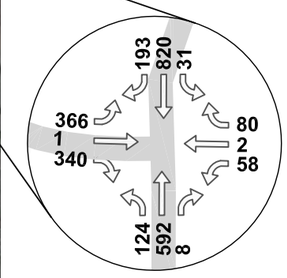




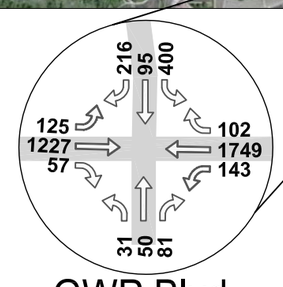
Fiddler's Green at Peakview

Syracuse at Arapahoe

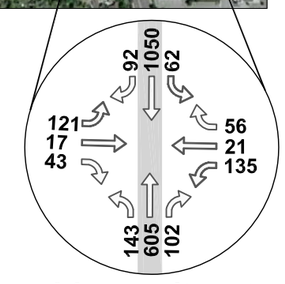




Yosemite at Peakview



GWP Blvd at Arapahoe



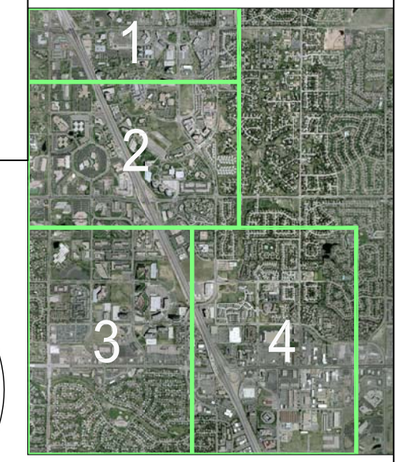
Yosemite at Shopping Center

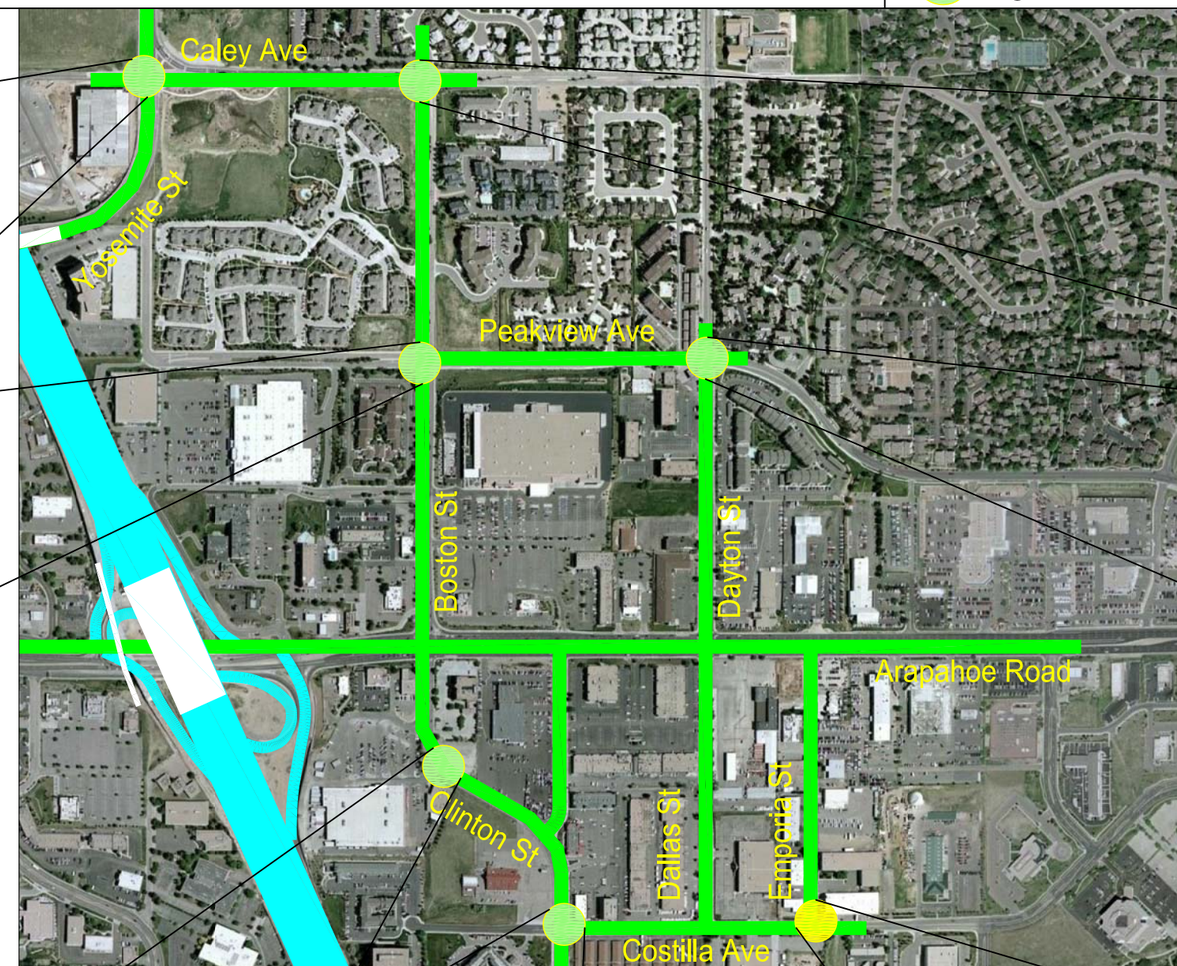
Greenwood Village I-25 Corridor Transportation Improvement Study
2008 Existing PM Traffic Volumes - Section 4

Legend

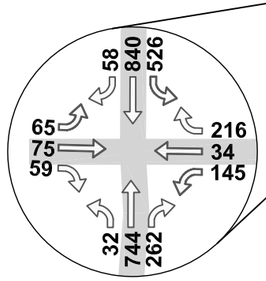
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

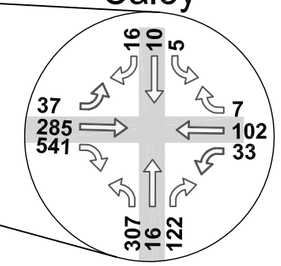




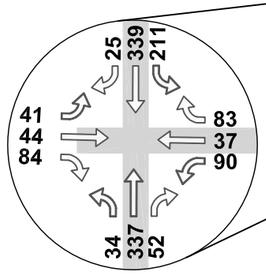
Yosemite at Caley



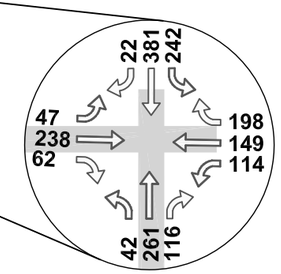
Boston at Caley



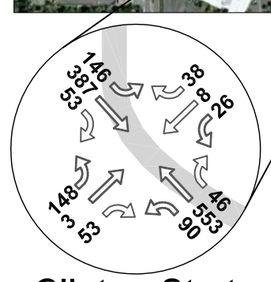
Boston at Peakview



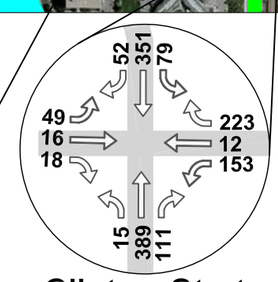
Dayton at Peakview



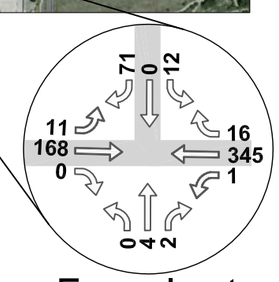
Clinton St at Target



Clinton St at Costilla



Emporia at Costilla

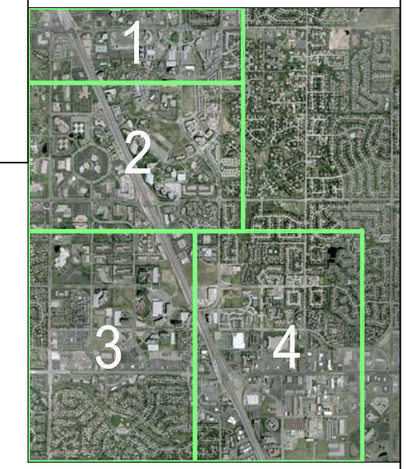


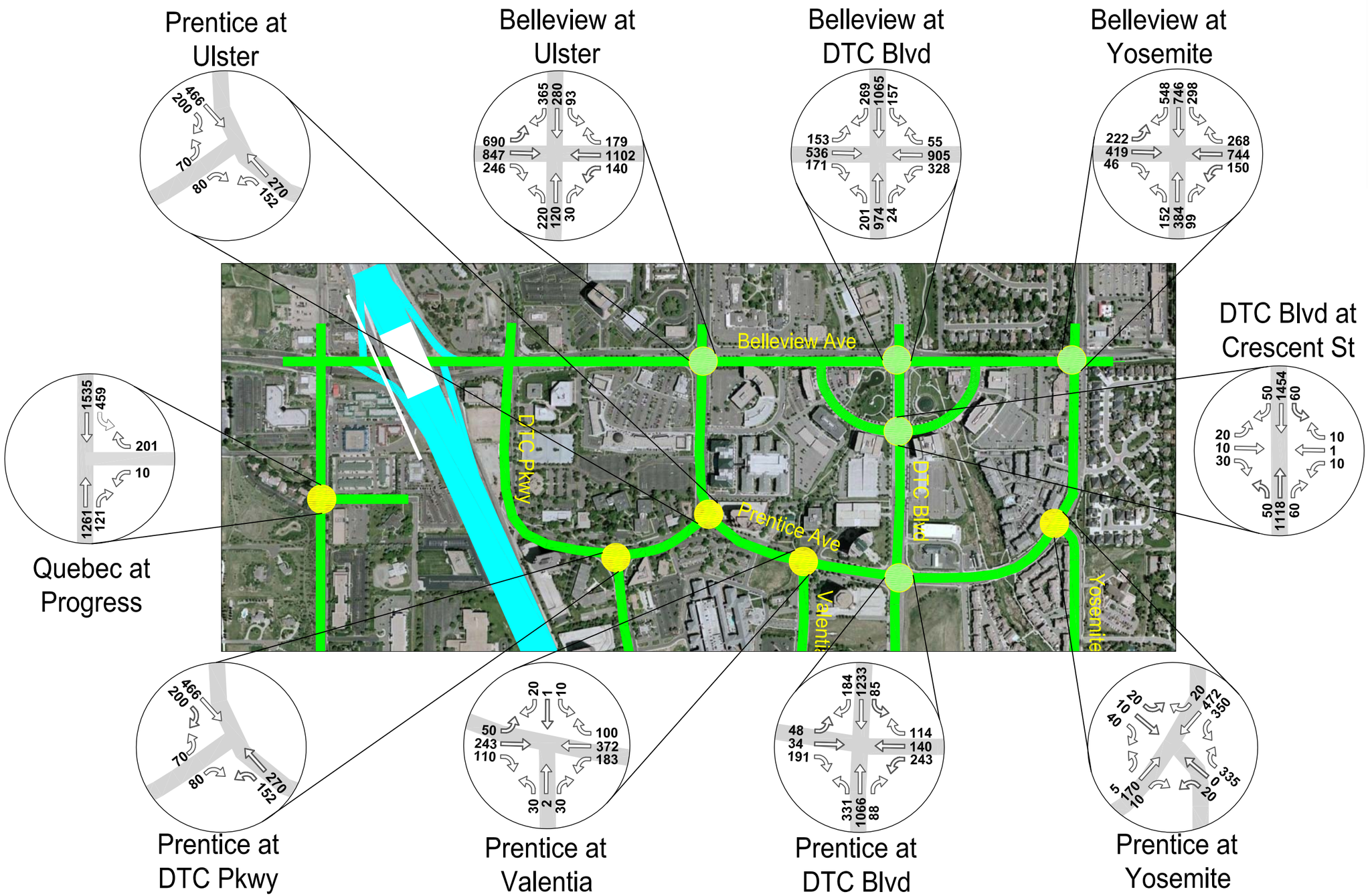
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future AM Traffic Volumes - Section 1

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



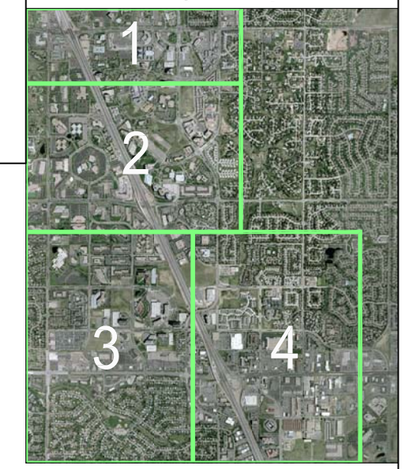


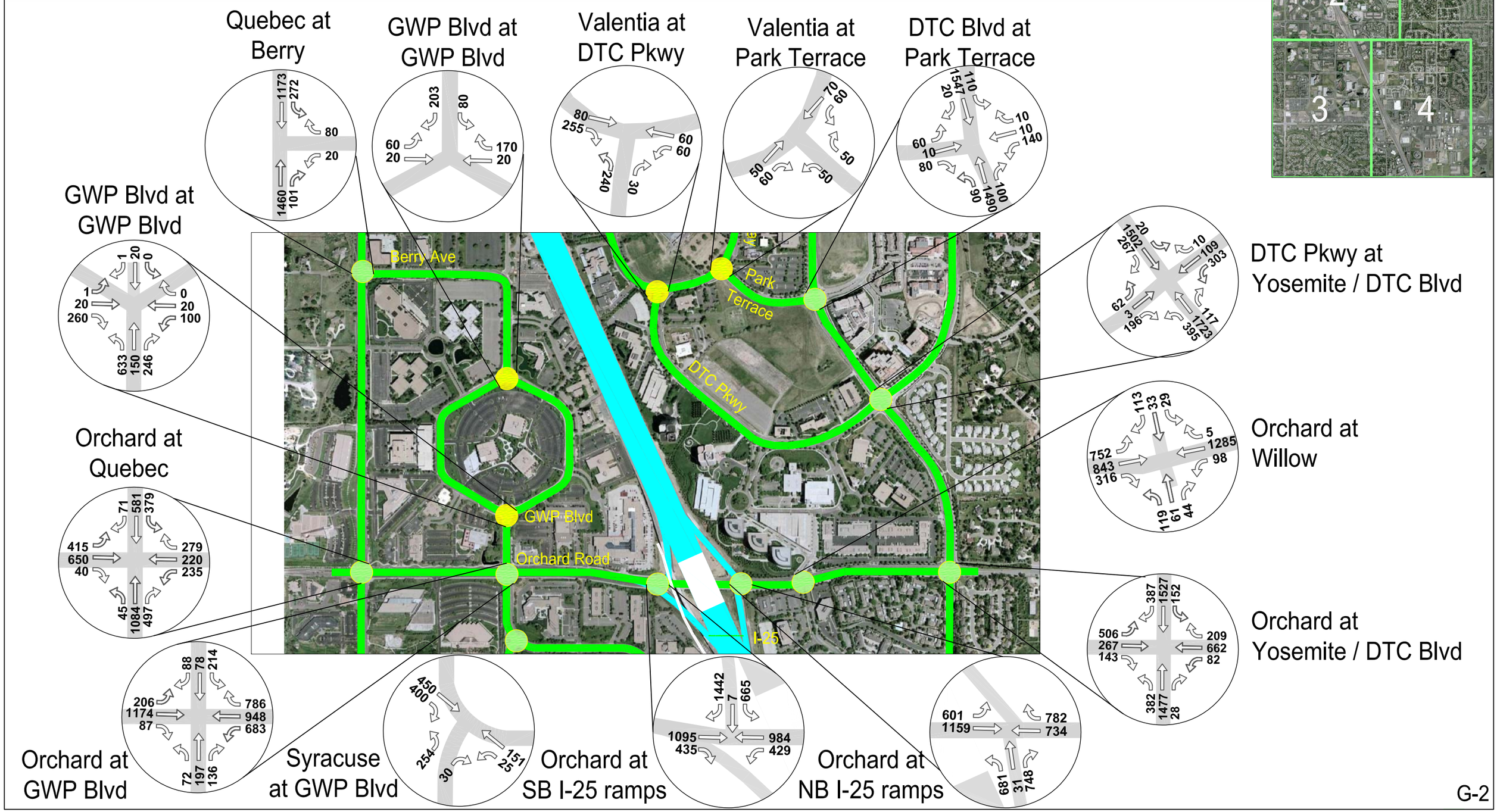
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future AM Traffic Volumes - Section 2

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



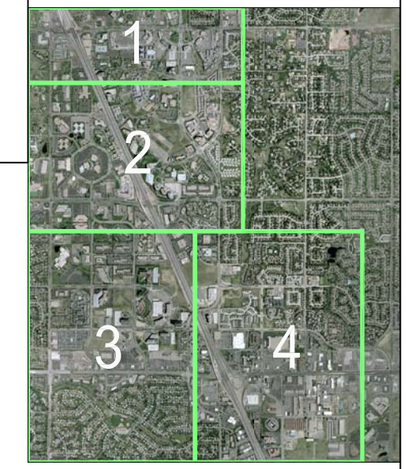


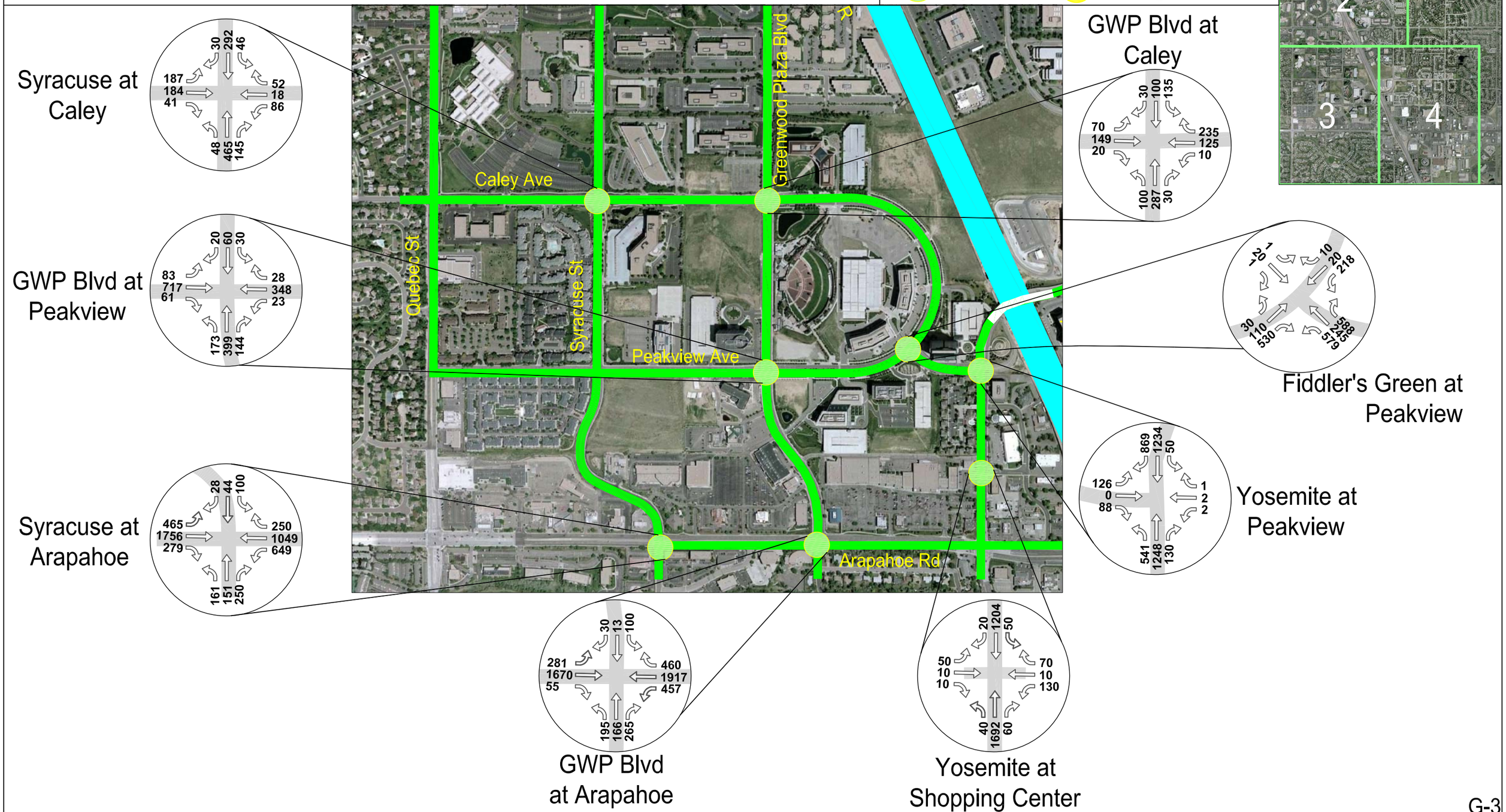
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future AM Traffic Volumes - Section 3

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



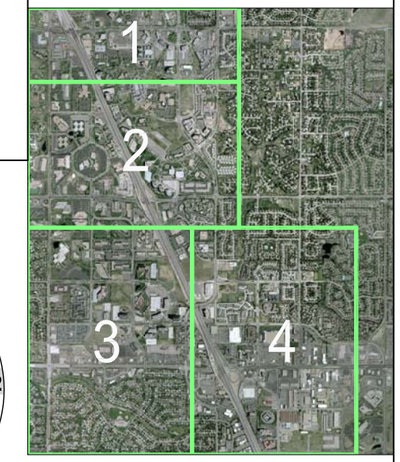


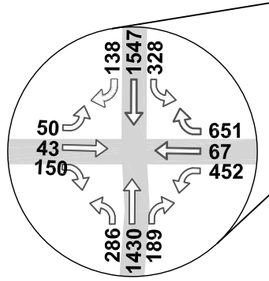
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future AM Traffic Volumes - Section 4

Legend

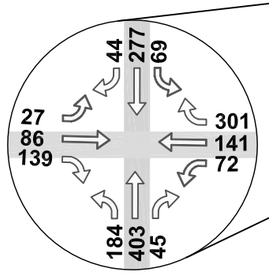
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

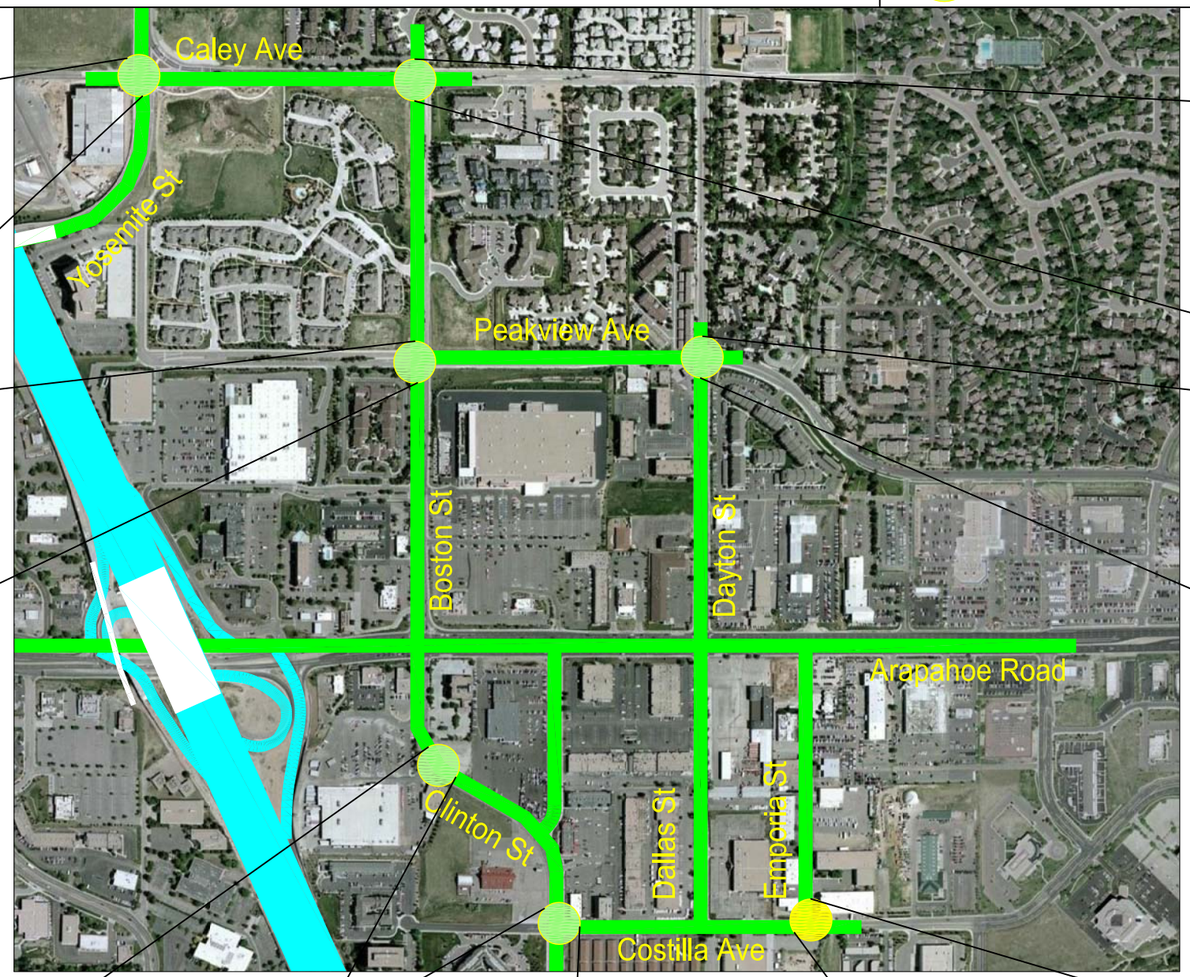


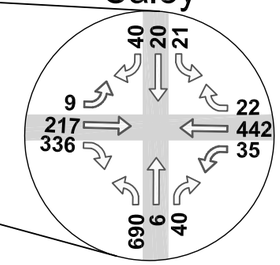


Yosemite at Caley

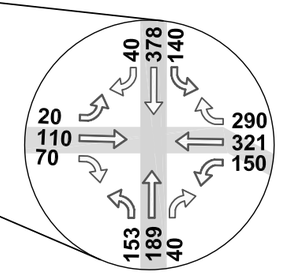


Boston at Peakview

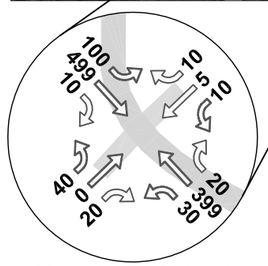




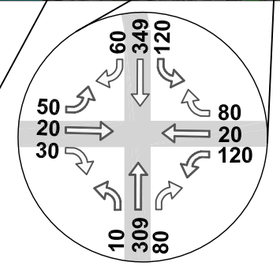
Boston at Caley



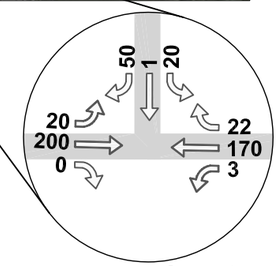
Dayton at Peakview



Clinton St at Target



Clinton St at Costilla



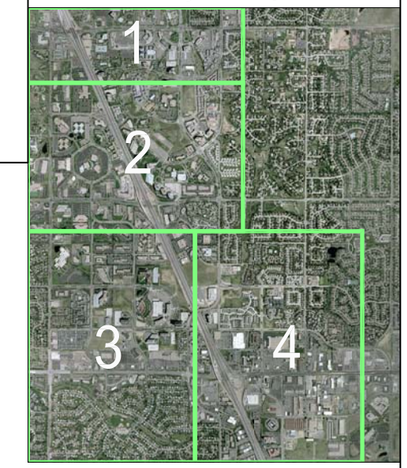
Emporia at Costilla

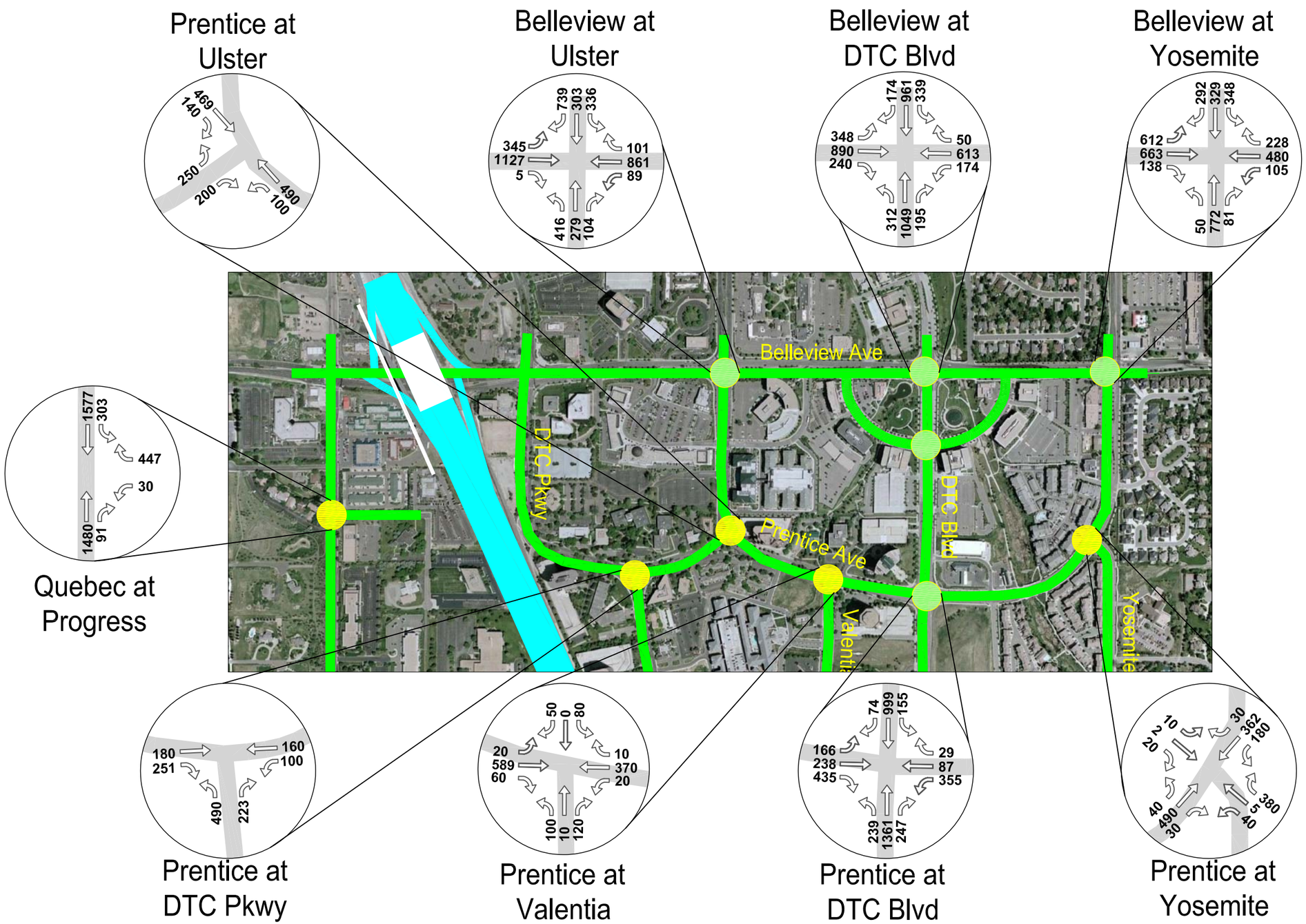
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future PM Traffic Volumes - Section 1

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



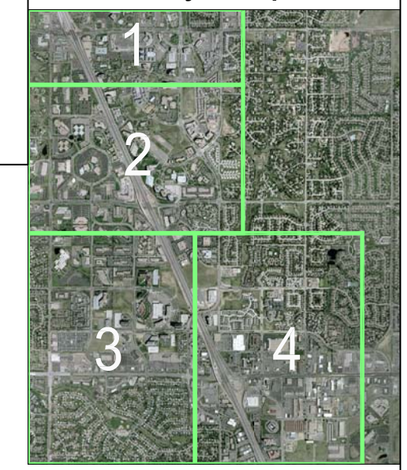


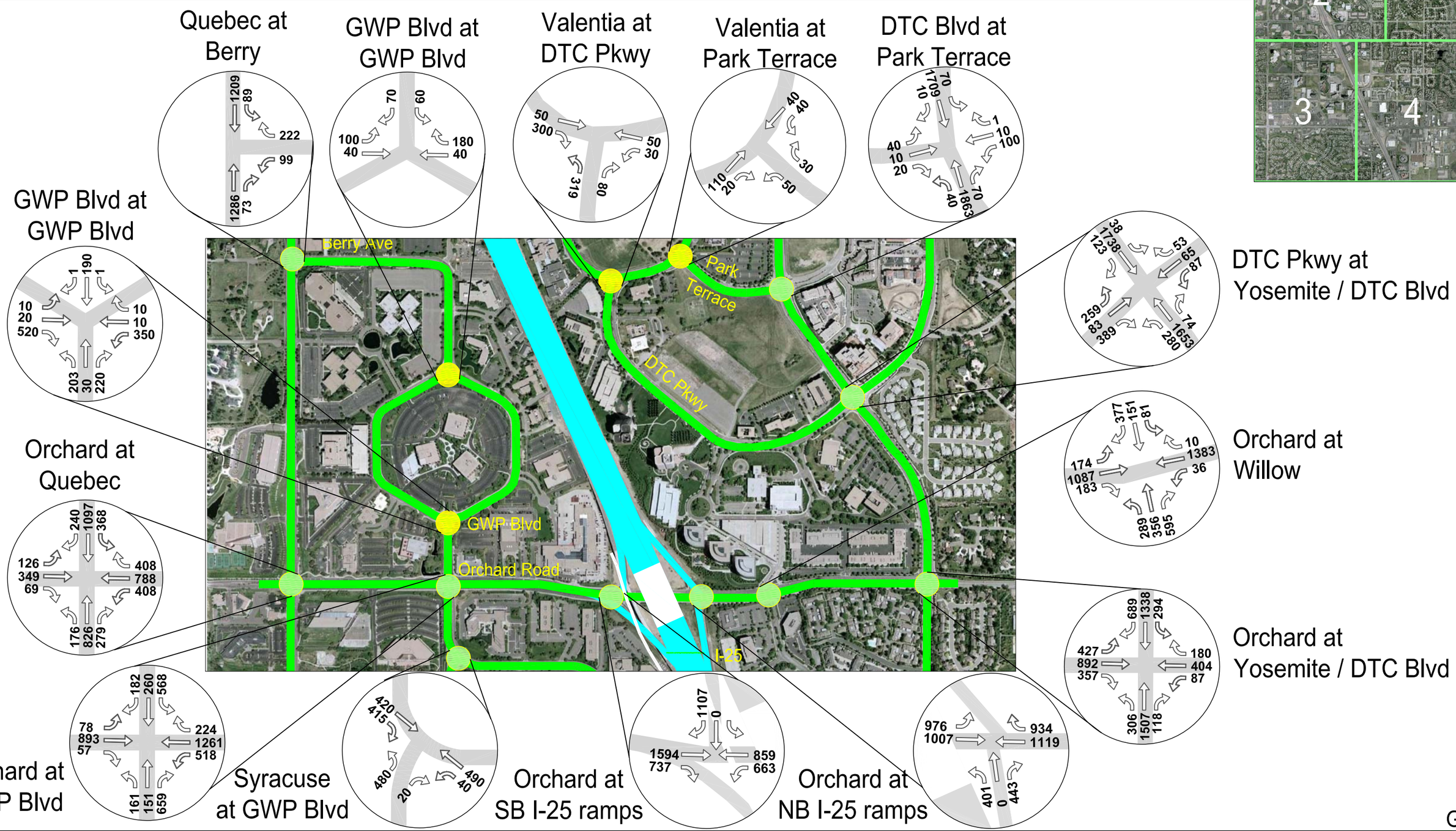
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future PM Traffic Volumes - Section 2

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



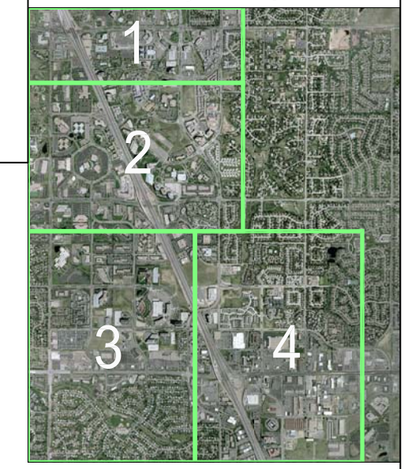


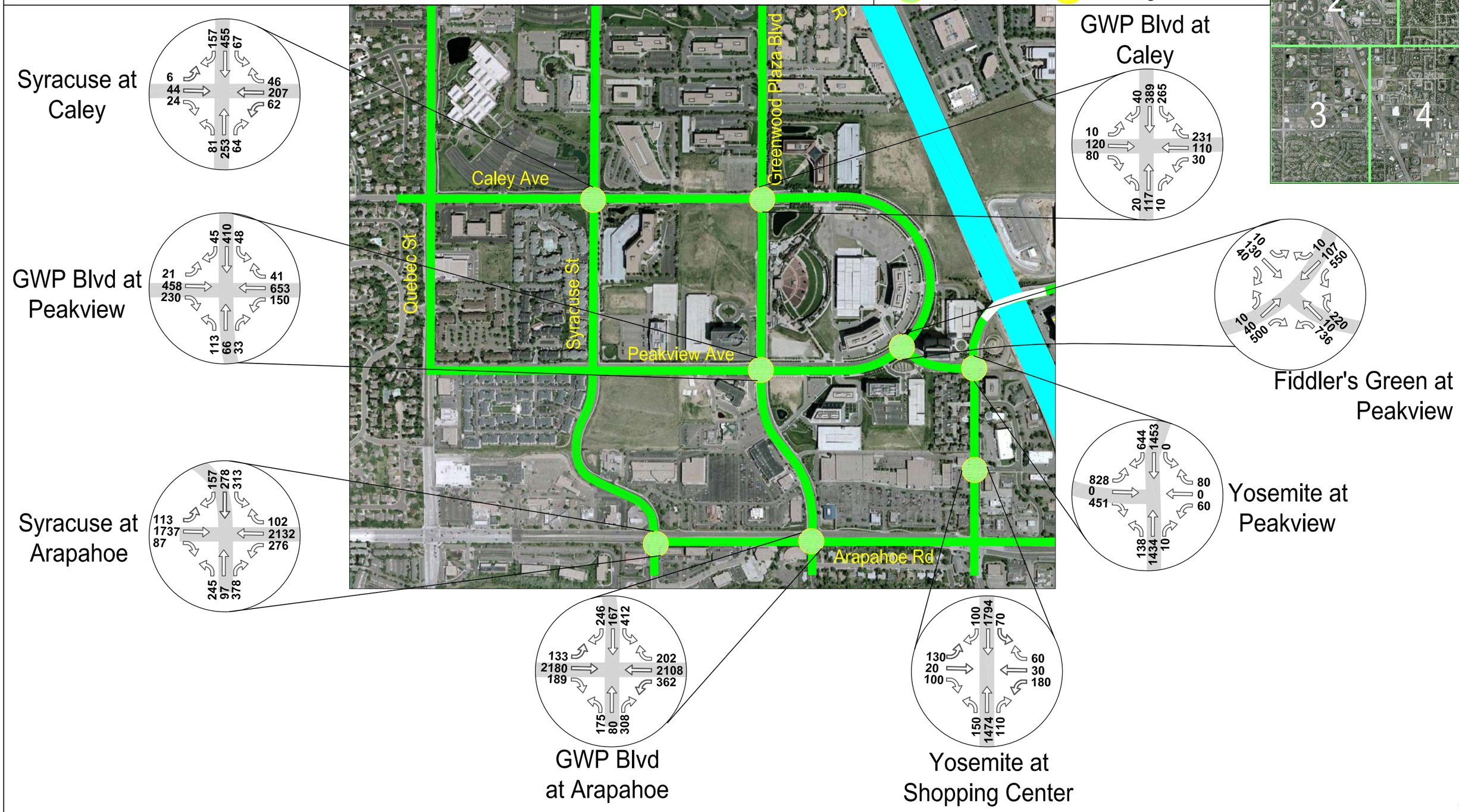
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future PM Traffic Volumes - Section 3

Legend

- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map



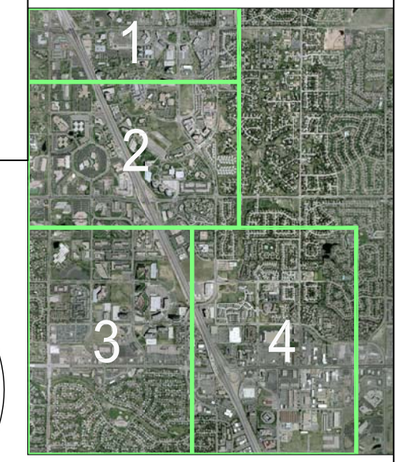


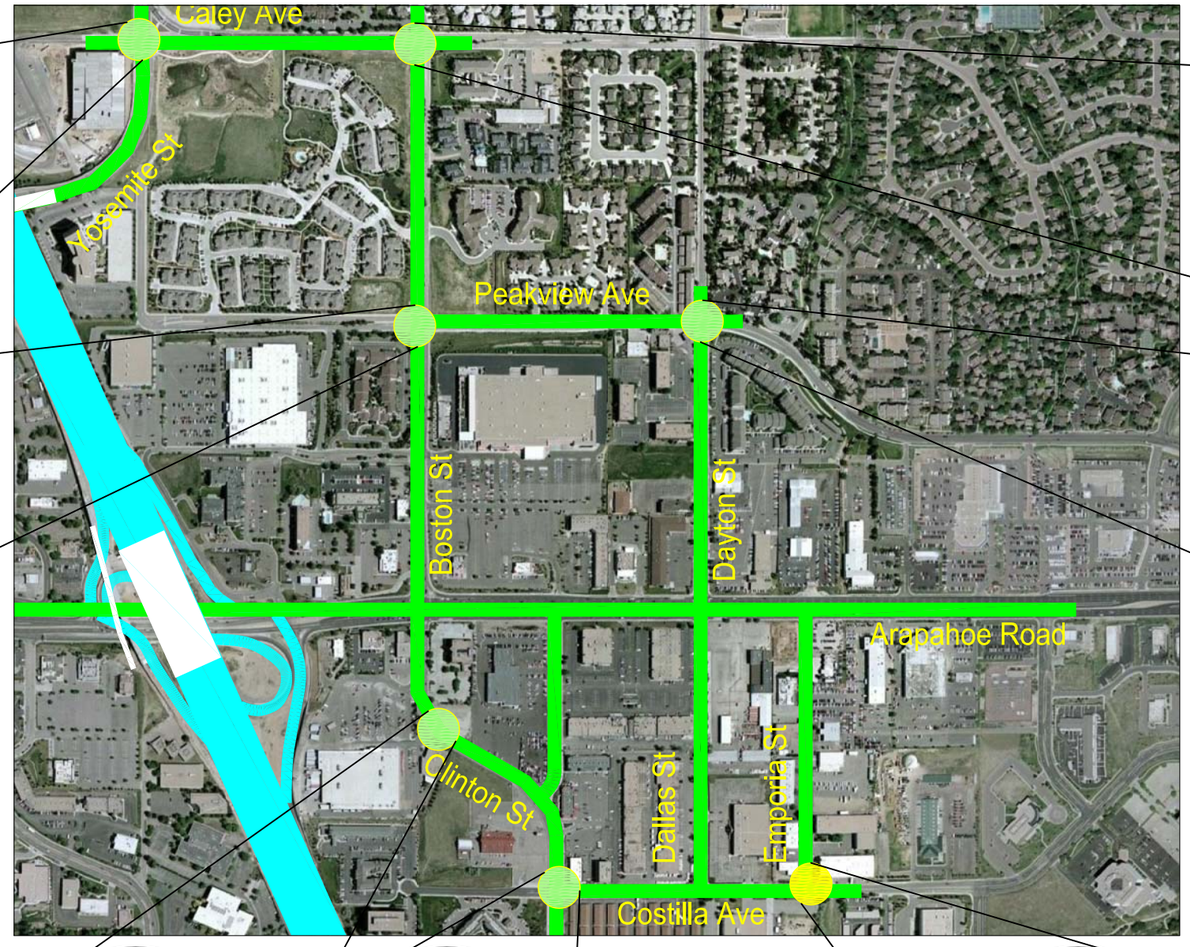
Greenwood Village I-25 Corridor Transportation Improvement Study
2020 Future PM Traffic Volumes - Section 4

Legend

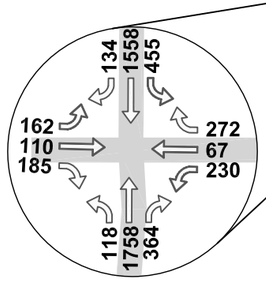
- Roads in Study Area
- I-25
- Signalized
- Unsignalized

Key Map

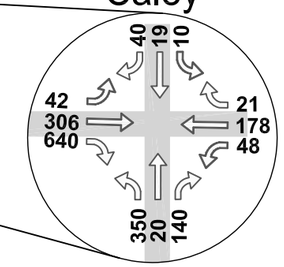




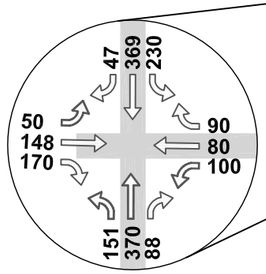
Yosemite at Caley



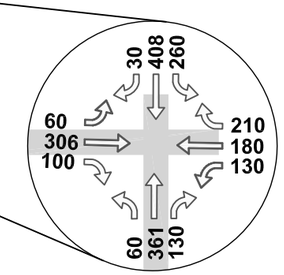
Boston at Caley



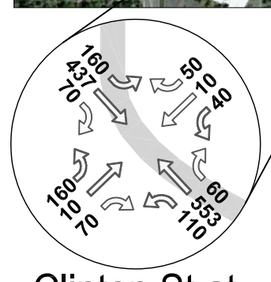
Boston at Peakview



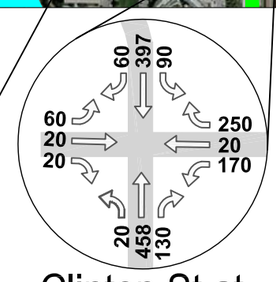
Dayton at Peakview



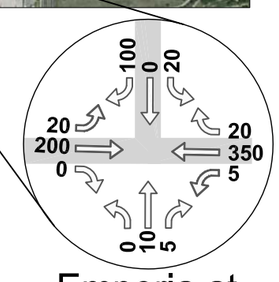
Clinton St at Target

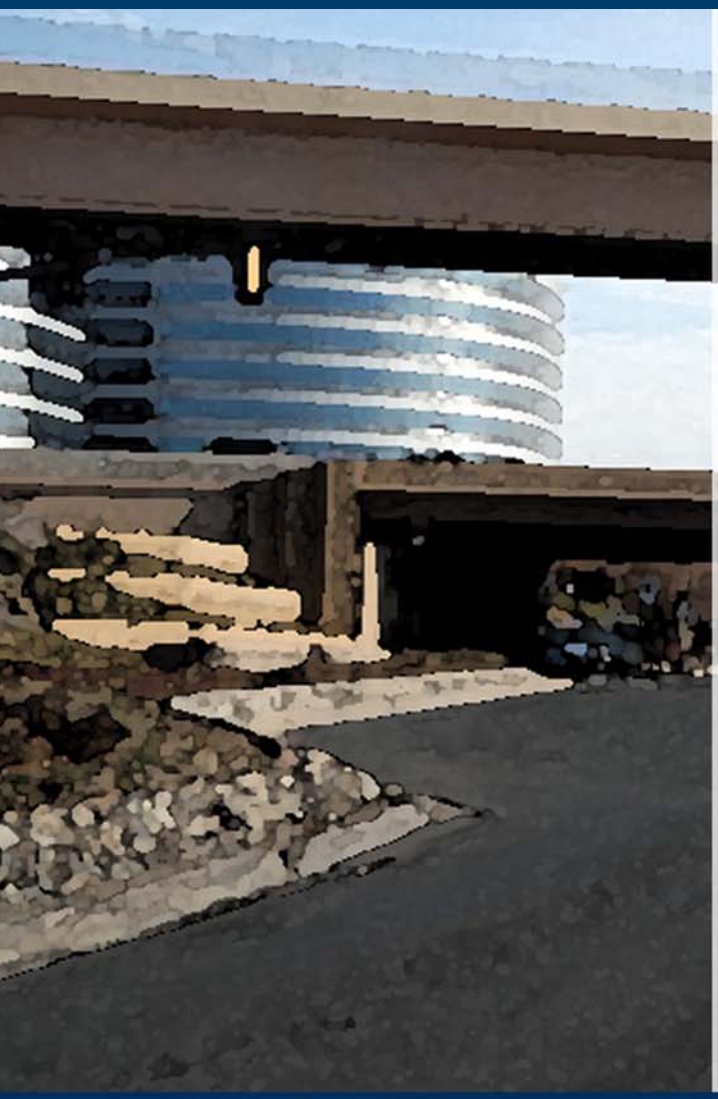


Clinton St at Costilla



Emporia at Costilla





GREENWOOD VILLAGE COLORADO

Stantec

Stolfus & associates inc