TRANSPORTATION MASTER PLAN

October 2019
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For the Love of Cities
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GLOSSARY OF TERMS AND DEFINITION

The following terms are defined for their particular use and application with this Transportation Master Plan. In some cases these terms may be defined and used differently in City Code or other City documents.

**Access Management.** The systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway as well as roadway design applications that affect access, such as median treatments and auxiliary lanes, and the appropriate separation of traffic signals.

**Access Preservation Area.** The Planning & Environmental Linkages study (PEL) led by CDOT begins in 2019 and will consider future alternatives for the US-85 Santa Fe Drive thoroughfare. There are numerous uses in the corridor including open space, residential, commercial and retail needing a variety of access routes to Santa Fe Drive; the Access Preservation Area will raise awareness with CDOT and stakeholders that the needs of all corridor residents, property owners, and businesses must be considered when reviewing potential future alternatives.

**American Association of State Highway & Transportation Officials (AASHTO).** A nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico. It represents all five transportation modes: air, highways, public transportation, rail and water. Its primary goal is to foster the development, operation and maintenance of an integrated national transportation system.

**Americans with Disabilities Act (ADA).** The legislation defining the responsibilities of and requirements for transportation providers to make transportation accessible to individuals with disabilities.

**Arterial.** A class of roads serving major traffic movements (high-speed, high volume) for travel between major points.

**Automated Vehicles (AV).** Vehicles that incorporate technology that assist with operation of the vehicle. They perform some of the tasks to drive the vehicle, and driverless vehicles require no human operator.

**Average Annual Daily Traffic (AADT).** The total volume of traffic on a highway segment for one year, divided by the number of days in the year.

**Bikeway.** 1) Any road, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes. 2) A facility designed to accommodate bicycle travel for recreational or commuting purposes. Bikeways are not necessarily separated facilities; they may be designed and operated to be shared with other travel modes.

**Bus Rapid Transit (BRT).** A bus-based public transit system combining the quality of rail transit and the flexibility and economics of a traditional bus system. BRT systems are usually constructed on designated multimodal corridors.

**Capacity.** A transportation facility's ability to accommodate a moving stream of people or vehicles in a given time period.

**Carsharing.** Rental cars that are available for use by the hour or mile. These can be located in one spot or able to be parked anywhere within a service area.

**Collector.** A class of roads that provide direct access to neighborhoods and arterials.

**Comprehensive Plan.** A guiding document; a framework for City policies and priorities; a long-range vision of what we want our City to become; a tool for making decisions about how that vision should be achieved; strategic steps to make the vision a reality; targeted and strategic planning of the City.

**Congestion Management.** A systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs.
Complete Networks Plan. Complete Networks allow every user to go everywhere. Different types of facilities are preferred by the elderly, children, commuters, and people with a variety of disabilities. In a complete network, different routes can address access to key destinations for each kind of user.

Connected Vehicles (CV). Vehicles that incorporate technology that allows the on-board computers to communicate with other vehicles and with sensors and other infrastructure on the ground.

Corridor. A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments. (APTA1)

Crash (Vehicular). An event that produces injury and/or property damage, involves a motor vehicle in transport, and occurs on a trafficway or while the vehicle is still in motion after running off the trafficway.

Electric Vehicles. Vehicles that are powered by electric motors using energy from batteries that are charged at home or at charging stations.

Expressway. A controlled access, divided arterial highway for through traffic, the intersections of which are usually separated from other roadways by differing grades.

Facility. Any tangible means of moving people and things from place to place or the structures necessary to support the process of moving people and things from place to place (such as roads, trails, bike lanes, sidewalks, etc.).

Fatality. For purposes of statistical reporting on transportation safety, a fatality is considered a death due to injuries in a transportation crash, accident, or incident that occurs within 30 days of that occurrence.

Federal Highway Administration (FHWA). A branch of the US Department of Transportation that administers the federal-aid Highway Program, providing financial assistance to states to construct and improve highways, urban and rural roads, and bridges. The FHWA also administers the Federal Lands Highway Program. It administers the highway transportation programs of the Department of Transportation under pertinent legislation.

Federal Transit Administration (FTA). A branch of the US Department of Transportation that is the principal source of federal financial assistance to America’s communities for planning, development, and improvement of public or mass transportation systems. FTA provides leadership, technical assistance, and financial resources for safe, technologically advanced public transportation to enhance mobility and accessibility, to improve the Nation’s communities and natural environment, and to strengthen the national economy.

Freeway. A divided arterial highway designed for the unimpeded flow of large traffic volumes. Access to a freeway is rigorously controlled and intersection grade separations are required.

Freight. The movement of goods by truck, train, or other vehicle.

Goals. Generalized statements which broadly relate the physical environment to values.

Grade Separated Interchange. A method of aligning a junction of two or more surface transport axes at different heights (grades), thereby removing crossing conflicts.

Grants. A federal financial assistance award making payment in cash or in kind for a specified purpose. The federal government is not expected to have substantial involvement with the state or local government or other recipient while the contemplated activity is being performed. The term "grants-in-aid" is commonly restricted to grants to states and local governments.

High Occupancy Vehicle (HOV). Vehicles carrying two or more people. The number that constitutes an HOV for the purposes of HOV highway lanes may be designated differently by different transportation agencies.
Highway. Is any road, street, parkway, or freeway/expressway that includes rights-of-way, bridges, railroad-highway crossings, tunnels, drainage structures, signs, guardrail, and protective structures in connection with highways.

Infrastructure. All the relevant elements of the environment in which a transportation system operates.

Intelligent Transportation Systems (ITS). The application of advanced technologies to improve the efficiency and safety of transportation systems.

Intersection. Used to describe the point where two or more roadways cross or meet.

Level of Service (LOS). A qualitative assessment of a road or intersection’s operating conditions. An indicator of the extent or degree of service provided by a facility based on and related to the operational characteristics of the facility. A standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F.

Light Rail. A streetcar-type vehicle operated on City streets, semi-exclusive rights-of-way, or exclusive rights-of-way. Service may be provided by step-entry vehicles or by level boarding.

Local Street. A street intended solely for access to adjacent properties.

Long Term. In transportation planning, refers to a time span of, generally, 20 years. The transportation plan for metropolitan areas and for States should include projections for land use, population, and employment for the 20-year period.

Manual on Uniform Traffic Control Devices (MUTCD). A document issued by the Federal Highway Administration (FHWA) of the United States Department of Transportation (USDOT) to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used.

Measures of Effectiveness. Measures or tests which reflect the degree of attainment of particular objectives.

Micromobility. Personal shared transportation devices like bikes, mopeds, and electric scooters.

Microtransit. Privately owned and operated shared transportation system that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling.

Mobility. The ability to move or be moved from place to place.

Mode. A specific form of transportation, such as automobile, bicycle, subway, bus, rail, or air.

Multimodal. The availability of transportation options using different modes within a system or corridor.

National Association of City Transportation Officials (NACTO). A coalition of the Departments of Transportation in North American cities.

Objectives. Specific, measurable statements related to the attainment of goals.

Parkway. A highway that has full or partial access control, is usually located within a park or a ribbon of park-like developments, and prohibits commercial vehicles.

Public Transit. Traditional public transportation via bus and rail that usually operates on a fixed route and schedule.

Ridehailing. Uber or Lyft or other services that provide on-demand point-to-point rides in privately owned autos.

Shared Mobility. A wide range of transportation options involving fleet ownership or operation of various modes of transportation.

Sharrow. A marking placed in a shared auto travel lane to indicate where people should preferably cycle.
Silver Bike Friendly Designation. Designation granted by the League of American Bicyclists to recognize communities that encourage biking for transportation and recreation.

Stakeholders. Individuals and organizations involved in or affected by the transportation planning process, including federal/state/local officials, MPOs, transit operators, freight companies, shippers, and the general public.

Transportation Demand Management (TDM) Plan. A Transportation Demand Management (TDM) plan employs a wide range of strategies to maximize existing roadway capacity through tactics such as carpooling, alternate modes, and encouraging changes in travel behavior.

Telecommuting. Communicating electronically (by telephone, computer, fax, etc.) with an office, either from home or from another site, instead of traveling to it physically.

Traffic Analysis Zone (TAZ). A traffic analysis zone or transportation analysis zone (TAZ) is the unit of geography most commonly used in conventional transportation planning models.

Traffic Management Center (TMC). The hub of a transportation management and control system. The TMC brings together human and technological components from various agencies to perform a variety of functions. TMCs may deal with freeway traffic management, surface street traffic management, transit management or some combination of these functions.

Transportation Systems Optimization. The systems that are emerging to better manage and optimize the transportation networks, using real-time data. Emerging technologies include adaptive signal control, transit signal priority, and the sensors and communications infrastructure to allow remote management of the systems.

Vehicle Hours of Travel (VHT). The number of hours traveled along a roadway or roadway network during a given time period.

Vehicle Miles of Travel (VMT). The number of miles traveled along a roadway or roadway network during a given time period.

Vulnerable User Groups. Vulnerable user groups are those most at risk in traffic. Such users include those with greater difficulty navigating around fast-moving vehicles (such as the elderly or certain disabled populations) and those unprotected by an outside shield, namely pedestrians and two-wheelers, as they sustain a greater risk of injury in any collision against a vehicle.
Chapter 1. Introduction and Planning In Context
INTRODUCTION

The Transportation Master Plan (TMP) will help address the challenges of facilitating mobility and access in a strategic manner, within the reasonable fiscal constraints of the City’s budget and limited state and federal funding opportunities, and in a way that is responsive to anticipated demographic and technological changes.

The TMP resulted from an 18-month planning and community engagement process. The process began with the Envision Littleton Vision Report, adopted unanimously by City Council on December 18, 2018. The Vision Report established a unifying vision and identified Littleton’s core values, guiding principles, and shared priorities and concerns. With influence from the City of Littleton’s Comprehensive Plan and other guiding documents, the TMP will establish the City’s ultimate transportation system vision, the policies to support that system, and capital projects that are prioritized with consideration of funding constraints. The final TMP will provide a long-term transportation vision for the City of Littleton, and serve as a guiding document for improvements to roadways and multimodal transportation networks.

LITTLETON’S MOBILITY FRAMEWORK

The mobility framework for the City of Littleton has served the City for more than 100 years, connected to Denver and beyond by the Denver & Rio Grande Railroad as well as the section line road corridors that still make up the major transportation framework today. This well-conceived and planned framework hosts a City of nearly 48,000 and has contributed to the City being recognized as one of the best places to live in Colorado. Littleton has several important and highly-functional transportation assets that contribute to its economic vitality. These include the major arterial network that provides connectivity to the Denver region, light rail service through the heart of the City, and the very popular trail network that connects citizens to the natural beauty within the City and region.

Population growth within Littleton is not new, but when the City experienced similar growth starting in the late 1970’s, the transportation investments were both long-lasting and proactive. Now population growth from surrounding areas has placed new burdens on the City’s transportation system and will require a new approach to being both proactive and provide long-term solutions. A history of the City’s major transportation initiatives is below.

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<th>Timeframe</th>
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<td>1970s and 1980s</td>
<td>Traffic signals were added throughout the City</td>
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<td>Mid 1980s</td>
<td>Mineral Avenue extended from Southpark Lane to Platte Canyon Road</td>
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<td>Mid 1980s</td>
<td>C-470 constructed</td>
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<td>Mid 1980’s</td>
<td>Bowles Avenue was widened from two lanes to four lanes from Santa Fe Drive to Sheridan Boulevard</td>
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<td>Mid 1980s</td>
<td>Railroad tracks were depressed from Ridge Road on the south to the northern border of the City</td>
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<td>Early 1990s</td>
<td>Single-point urban interchange at Santa Fe Drive and Belleview Ave completed ($25 million)</td>
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<td>Late 1990s</td>
<td>Santa Fe Drive beautification project upgrading signal poles and street lights for a more uniform corridor</td>
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<td>2000</td>
<td>Light Rail opens with two stations in Littleton; the first rail connection in the region outside Denver. The City upgraded the downtown station; adding public art and relocating the historic train station to the current site.</td>
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<tr>
<td>2010</td>
<td>Santa Fe Drive and C-470 East overpass built ($25 million)</td>
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The City’s arterials and expressways, and often its collector streets, swell with traffic beyond their physical capacity during the daily rise and fall of regional commuting traffic. The City is also significantly impacted by the regional transit solutions that have been deployed to date. For example, the Regional Transportation District (RTD) park-n-ride lots at the Mineral Avenue and Downtown Littleton Stations fill to capacity by 7am with commuters from Highlands Ranch, Southglenn, Columbine, and Ken Caryl. The ability of RTD rail and bus services to meet the local needs of the City is compromised by the undersupply of service.

There are many plans being implemented by CDOT, RTD and adjacent municipalities that will affect traffic and mobility in Littleton over the next several years.
There are also tremendous increases in regional growth south and west of Littleton that will increase pressure on the major thoroughfares and transit networks that surround and traverse the City. The implications of these changes will need to be understood and incorporated into our City’s plans moving forward.

**PLAN PURPOSE**

The intent of planning is to set the desired course for our City. When we plan, we make a commitment to make the City a better place to live, work, and play. The purpose of Envision Littleton is to set down on paper what we want to accomplish in the near future and in the long term. That is why this plan ends with a list of recommendations for projects to accomplish in the next five years, but also includes a Mission and Goals that set the long term outlook for the City. The Mission and Goals allow us to consider different types of transportation improvements on a level playing field, and allow us to prioritize improvements. Finally, viewed through the lens of what we can afford (using existing as well as new funding sources), the projects can be sorted into an implementation plan.

The TMP will serve as the reference for elected leaders and policy makers to advocate for the regional transportation needs of the City and to articulate the City’s position on regional transportation projects. The TMP will also inform the Capital Improvement Plan for streets and transportation infrastructure, setting out priorities along a logical and fiscally sound progression that fulfills the TMP over a period of years.

The TMP applies an approach to planning that focuses on providing a transportation system that works for all users. In the context of the City of Littleton and the concurrent update to the Comprehensive Plan, this means the plan maps out a complete network of streets that finds the balance where streets are vibrant, safe and promote a sense of place while providing multimodal choices for users of all ages and ability. This systematic approach emphasizes the following major themes:

- **Community**: No plan or project can truly be successful without engaging the community. This is about returning streets to the community and improving a community’s quality of life.

- **Choices**: The healthiest and most vibrant communities incorporate bicycling, walking and transit as critical components of the transportation system. A complete system not only addresses safety and mobility concerns, but also provides encouragement of active living, ultimately improving community health.

- **Capacity**: Although a multimodal approach can increase the overall person capacity of a roadway corridor, the impact on auto capacity is often a concern that must be addressed. A toolbox of analysis techniques and operations strategies to manage roadway capacity has been identified to help balance mobility needs across modes.

- **Calming**: Plans and designs should create context-appropriate streets that consider the needs of all potential users, encourage appropriate driving behaviors and speed, and provide welcoming environments for non-motorized users.

- **Connections**: We know that providing connections between sites, neighborhoods, modes and jurisdictions is crucial to maintaining healthy transportation systems and communities. A systematic approach to providing a complete network can facilitate key connections within the community.

**PLANNING IN CONTEXT**

envisionlittleton.org
This Transportation Master Plan represents an alignment of previous and ongoing plans, guidelines, and reports conducted by the City of Littleton and regional partners. In a review of 37 such documents, several common themes emerged (meaning they appeared in at least 3 previous planning efforts). Note that these themes, which are listed below, do not necessarily represent the top priorities for the City of Littleton’s transportation policy; instead, they suggest likely starting points for the discussion.

**COMMON THEMES FROM EXISTING PLANS**

- Make Littleton pedestrian friendly by expanding the pedestrian network, adding pedestrian bridges, extending sidewalks and improving existing sidewalks.
- Improving connections between downtown/river corridor/parks/trails.
- Complete network of streets in the City that provides connections, choice, calming, and capacity where appropriate.
- Improving traffic flow on arterials.
- Improving bike facilities.
- Decrease cut-through traffic in residential areas.
- Improving multimodal connections between commercial locations/residential developments.
- Improving trail network for transportation around and out of City.
- Improving intersection crossings.
- Improving connections to light rail.
- Improving road connections to key destinations but not through natural areas/build fewer cul-de-sacs/promote grid street network.
- Improving parking downtown, implement parking structures, consider parking restrictions.
- Implement traffic calming strategies in neighborhoods.
- This plan has a foundation in prior planning efforts, including but not limited to:

**LITTLETON PLANS & STUDIES**

- Citywide Plan (2014)
- Belleview Avenue Corridor Vision (2018)
- Bicycle and Pedestrian Master Plan (2011)
- Broadway Corridor Study (2009)
- Downtown Neighborhood Plan (2011)
- Mineral Station Area Framework (2018)
- Neighborhood Plans and Corridor Plans (2016)
- Three Mile Plan (2015)
- Amended Columbine Square Urban Renewal Plan, City of Littleton (2015)
- Arapaho Hills Historic Preservation Guidelines, City of Littleton (2016)
- Resident & Business Surveys (2018)
- City of Littleton Parks, Recreation, and Trails Master Plan (2016)
- Downtown Littleton Historic Preservation Guidelines (2011)
- Mineral Avenue TAP Final (2014)
- Neighborhood Traffic Management Program (not dated)
RELEVANT REGIONAL PLANS AND STUDIES

- South Platte River Corridor Vision, Arapahoe County, (2013)
- South Suburban Parks and Recreation Master Plan (2017)
- Arapahoe County Bicycle/Pedestrian Master Plan (2017)
- High Line Canal Conservancy Vision Plan (2017)
- RTD (Regional Transportation District) 2015-2020 Strategic Plan (2015)
- RTD Regional BRT Feasibility Study (2018)
- RTD Quality of Life Study (2017)
- RTD TOD Strategic Plan (2010) and Status Report (2013)
- DRCOG (Denver Regional Council of Governments) Metro Vision 2040 (Amended 2019)
- DRCOG Active Transportation Plan (Draft) (2018)
- DRCOG Regional Transportation Plan 2040 (2017)
- Arapahoe County 2035 Transportation Plan (2010)
- Jefferson County Bicycle and Pedestrian Plans (2012)
- Jefferson County Countywide Transportation Plan (1998)
- Douglas County 2030 Transportation Plan (2009)
- South Platte Working Group South Platte Connections Study (2019)

PLAN CONTENT OVERVIEW

The TMP combines quantitative analysis of the City’s existing transportation system with feedback from the Envision Littleton process. Following the Existing City report, which provides background and insights about the state of driving, walking, riding a bike, and transit service in Littleton today, the TMP introduces a strategic framework to guide decision-making about the future.

The middle sections of the plan focus on articulating a future for the transportation system and identifying a pathway toward that future. Sections on auto & freight, active transportation, transit, and mobility trends contain several common components:

Legacy of Past Planning. Plans and studies previously developed for Littleton and vicinity offer insights from the time they were prepared, and provide an essential foundation for this Plan.

Key Issues and Considerations. These reflect input and discussions from varied Envision Littleton community engagement activities, workshops with City Council and Planning Commission, and interaction with other City boards/commissions, City departments, and partner agencies and organizations.

Framework for Action. The framework is organized in three tiers: (1) Goals, (2) Policies, and (3) Actions.

The actions in each section convey tangible steps that will lead to achievement of the goals in line with the stated policies. A final section with considerations and procedures for implementation and periodic updates rounds out the plan.

IMPLEMENTATION

With the Transportation Master Plan (TMP), the City of Littleton and other partner agencies and organizations have an essential new document that should be frequently referred to for guidance in community decision-making. As with the Envision Littleton Comprehensive Plan, the TMP should be a “living document” that responds to change. Its key planning considerations, goals, policies, and action strategies must be revisited periodically to ensure that the Plan is providing clear and reliable direction on a range of matters, including land development issues and public investments in infrastructure and services.

Implementation is not just a list of action items. It is a challenging process that requires the commitment of the City’s elected and appointed officials, staff, residents, business owners, major institutions, other levels of government, and other organizations and individuals who will serve as champions of the TMP and its particular direction and strategies. Scheduled plan evaluations and updates will help maintain its relevance and credibility as the policy and action guide for the City.
Chapter 2. Existing City
INTRODUCTION

Littleton is defined by its neighborhoods, its expansive trail and open space network, and its historic downtown. The transportation system is characterized here by mode: auto, active transportation, and transit. Existing data was collected and public input reviewed to gather information on the ability of these networks to meet the needs of the community. What follows is a data book, summarizing the major takeaways from that inventory of existing conditions.

MODE: AUTO

People who drive their private automobiles (autos) make up the majority of travelers in Littleton. As ride-hailing services have proliferated in the region, an increasing portion of auto travelers are using these services as well. In general, traffic volumes have increased and congestion in Littleton has worsened throughout its recent history as more people have moved to the City and to surrounding communities.

That said, Littleton is characterized by good access to major regional auto corridors, including Santa Fe Drive (US 85), Broadway, Belleview Avenue, County Line Road, Bowles Avenue/Littleton Boulevard, Mineral Avenue, and C-470. These routes have served the residents of Littleton well, providing convenient access to regional job and activity centers.

Internal City circulation is characterized by a network of collector streets that provide access to neighborhoods (Figure 1).

Major issues related to auto travel within the City include:

- **Congestion**: Growth within and surrounding Littleton has resulted in increased congestion on many streets (Figure 2).
- **Barriers**: the City is crossed by multiple barriers limiting connectivity. While some areas of the City have a strong internal grid, barriers like the South Platte River, Santa Fe Drive, Highline Canal, the rail corridor, and even some suburban neighborhoods exist that break up the grid and force traffic to use one of only a few major connections, resulting in traffic congestion.
- **Safety**: A total of 5,089 crashes occurred in Littleton during the 5-year period from 2014 to 2018—about three per day. The social and economic impacts of these crashes are vast (Figure 3).
- **Parking**: Downtown parking has been identified as a major issue, and has been cited as a reason for avoiding coming to the downtown retail and commercial district.

**CONGESTION**

According to INRIX (a Big Data aggregator), delays on arterials and highways within Littleton have an annual economic impact of:

$25 to $33 million per year.

81.8% Percent of Littleton residents who commute to work in a private auto (including those who drive alone as well as those who carpool; 8.4% telecommute)
Figure 1. Existing Roads
Vehicular delay is common in Littleton, with several major corridors experiencing many hours of delay each day.

The map at right depicts the average number of hours of delay per day. Of note, Santa Fe Drive, Broadway, and Bowles Avenue are congested throughout most of the day.

Other roadways are congested during peak periods, particularly Prince Street and Mineral Avenue, which can experience very severe congestion, albeit during shorter periods.

Bottlenecks occur at several intersections throughout the City as well, notably including intersections along Santa Fe Drive at Mineral Avenue, Bowles Avenue, and Prince Street.

Santa Fe Drive carries as many as 60,000 vehicles per day near Mineral Avenue, well over its intended capacity.

**TRAFFIC:** #1 public concern | $25m to $33m annual economic impact
Auto Safety

Over a 5-year period from 2014 through 2018, 5,089 crashes occurred in Littleton. During that same time period, 418 people were injured in automobile crashes.

Crash concentrations exist at the following locations:

- The length of the Broadway corridor
- Santa Fe & Mineral
- Santa Fe & Church
- Santa Fe & Bowles
- Santa Fe & Prince
- Federal and Bowles
- Bowles and Platte Canyon

In general, where congestion occurs, crashes follow. Congestion-related crashes (such as rear-ends) make up by far the highest proportion of crashes in the City. Between 2014 and 2018, rear-ends accounted for 42% of all crashes.

SAFETY: #4 public concern | 1,000+ CRASHES PER YEAR

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TRANSPORTATION MASTER PLAN: EXISTING CITY

MODE: TRANSIT

Littleton is within the Regional Transportation District (RTD) service area. RTD operates fixed route and demand-response service in Littleton. Major transit routes include:

- C-line and D-line Light Rail: These two routes interline through Littleton but serve different destinations in Downtown Denver, with the C-line terminating at Denver Union Station and the D-line terminating in Central Downtown at the 18th & California Station.
- Bus routes serving the following corridors:
  - Broadway
  - Federal Boulevard
  - Lowell Boulevard
  - Bowles Avenue/Littleton Boulevard
  - Ridge Road
  - Mineral Avenue
  - South Santa Fe Drive
  - County Line Road
- Littleton’s Shopping Cart service: Shopping Cart is a scheduled fixed-route service shuttling passengers to/from area grocery stores and the Streets of Southglenn Monday-Saturday. The service is provided for disabled residents or residents age 55 or older and serves approximately 8,000 rides per year.
- Demand-response services in Littleton include:
  - RTD’s South Jeffco FlexRide (SJCR)
  - Littleton’s OmniBus: OmniBus service is scheduled by appointment only, Monday-Friday, with ride priority given to medical trips (top priority), grocery shopping, and hair/barber trips. The service is provided for disabled residents or residents age 55 or older and serves approximately 6,000 rides per year.

Existing transit facilities within Littleton are depicted in Figure 4 and transit statistics are shown in Figure 5. While 72% of respondents to the City’s recent traveler survey perceive transit service positively, several challenges have been identified:

- Parking: The Littleton Downtown and Mineral Park-n-Rides fill to capacity early in the morning and demand for parking at these stations exceeds their capacity.
- Connectivity: Auto, pedestrian, and bicycle connectivity is poor at the Mineral station and could be improved at the downtown station.
- 30-minute peak period service for most bus routes does not meet a typical Level of Service standard that makes taking transit attractive to “choice riders”—those who can choose another mode of travel.

6.4% Percent of Littleton residents who commute to work via transit
Figure 4. Existing Transit Facilities
**Transit Usage**

Transit ridership in Littleton is highest on bus service along Broadway and Littleton Blvd (especially downtown) as well as light rail. The map at right depicts the average number of boardings at each transit stop each day.

Average weekday ridership for each route:

<table>
<thead>
<tr>
<th>Route</th>
<th>Ridership</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>340</td>
</tr>
<tr>
<td>0L</td>
<td>170</td>
</tr>
<tr>
<td>29</td>
<td>170</td>
</tr>
<tr>
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</tr>
<tr>
<td>36L</td>
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<td>77</td>
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</tr>
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<td>150</td>
</tr>
<tr>
<td>402L</td>
<td>120</td>
</tr>
<tr>
<td>403</td>
<td>110</td>
</tr>
<tr>
<td>C (light rail)</td>
<td>2000</td>
</tr>
<tr>
<td>D (light rail)</td>
<td>2300</td>
</tr>
</tbody>
</table>

The D-Line service to Downtown Denver is one of only a few transit services in metro Denver that provides a travel time that is competitive with auto travel.

Route 67 along Ridge Road has been identified by RTD as struggling to meet ridership standards. This route remains in service because of the lack of transit alternatives in the area.
MODE: WALK

Littleton is a diverse City when it comes to pedestrian activity and infrastructure. On one hand, Littleton has active pedestrian-friendly areas like downtown Littleton, and the City is home to an extensive trail system. On the other hand, Littleton is crisscrossed by auto-oriented arterials that prioritize motorized travel modes. This dichotomy means that the City faces challenges and has real opportunities to address pedestrian comfort, convenience, and safety (Figure 6). Major challenges identified through the inventory of the pedestrian system include:

- **Safety:** Over the 5-year period from 2011 to 2015, 121 crashes that involved pedestrians occurred, a rate of about 2 per month. People walking are vulnerable to serious injury when involved in a crash with an auto. Of particular concern is the Broadway corridor, where 17 such auto-pedestrian collisions occurred during the study period.

- **Connectivity:** The freight and RTD rail corridor represents a major pedestrian barrier. The rail corridor and the Santa Fe Drive corridor stand between the majority of Littleton residents and the South Platte River and adjacent trails—a wonderful pedestrian amenity. Another challenge identified is pedestrian connectivity to neighborhood parks.

- **Transit Access:** While walking to the Littleton Downtown station is possible, access to the Mineral Station is difficult for pedestrians. In addition, many of Littleton’s bus stops are not well served by pedestrian facilities.

- **Accessibility:** People with disabilities encounter challenges throughout Littleton. The City has nearly 4,000 locations that have been identified in Littleton’s ADA Transition Plan as needing accessibility improvements. These upgrades will take place as community improvements are constructed over forthcoming years.

Littleton can build upon the following amenities:

- **Trail Network:** 51 miles of regional and local trails provide excellent pedestrian facilities throughout Littleton.

- **Downtown Littleton:** Downtown Littleton is a strong pedestrian destination, although walkability could be improved in the City’s core in order to improve safety and enhance economic vitality.

Adopted in November 2011, Littleton’s Bicycle & Pedestrian Master Plan was developed through a grant from tri-county health and focuses on short term, implementable improvements to the on-street system for walking and biking in Littleton.

Littleton contains 51 miles of trails.

Typical auto-oriented neighborhood street with narrow sidewalk.

49% Percent of Littleton sidewalks that are missing or don’t meet ADA standards.
Figure 6. Pedestrian Opportunities and Challenges
MODE: BIKE

As with walking in Littleton, biking is well-served by the regional facilities, but can be impeded by barriers and the design of infrastructure (Figure 7). Major challenges include:

- Safety: Over the 5-year period from 2011 to 2015, 77 crashes that involved bicyclists occurred. People biking are vulnerable to injury when involved in a crash with an auto. Again, the Broadway corridor has been a hazardous place to bike, with 17 bicycle related crashes in that period.

- Connectivity: The freight and RTD rail corridor represents a major barrier. The rail corridor and the Santa Fe Drive corridor stand between the majority of Littleton residents and the South Platte River and adjacent trails—a wonderful amenity for bicycling.

- Transit Access: Access to the Mineral Station is difficult for bicyclists, and the station itself represents a barrier for access to the Mary Carter Greenway.

Littleton can build upon the following amenities:

- Trail Network: 51 miles of regional and local trails provide excellent bicycle facilities throughout Littleton.

- On-street Bike Facilities: Littleton has 24 miles of on-street bike facilities, covering 15% of the City’s roads. These facilities include sharrows, signed bike routes, shared parking/bike lanes, and separate marked bike lanes. On most minor arterial and collector streets, these bike facilities provide convenient access for most of the City. Improvements to the design of these lanes and expansion of the network could enhance the use of these facilities.

Many of Littleton’s trails are bike-friendly.  
Typical bike lane, striped and signed, but no markings.

0.4%  Percent of Littleton residents who bike to work (does not include children bicycling to school or recreational bicycling)
Figure 7. Bike Challenges and Opportunities
FUNDING

Littleton spends the vast majority of its annual transportation budget on maintenance and operations of the existing system. Significant improvements to the system will require securing additional funding.

Littleton funds its transportation projects through a mix of revenue generated at the local, state, regional, and federal levels. The primary source of this revenue is Colorado’s Highway Users Tax Fund (HUTF), which currently disperses approximately $1.4 million to Littleton each year. Statutorily, HUTF funds must be spent only on transportation improvements, and Littleton has dedicated the entirety of these funds to maintenance.

The growth of the City and aging infrastructure has placed an increased burden on street maintenance in recent years. The available funds are currently inadequate to support ongoing maintenance needs, and no funding exists for capacity improvements.

As of today, no funding for capital improvements is available through the budget process. Typically, the only way the City has been able to fund capacity improvements, bicycle facilities, pedestrian enhancements, or other projects has been through saving funds allocated for other means and re-allocating them to transportation needs. This is not a sustainable funding plan.

A complete funding analysis can be found in Chapter 9. Implementation.
Chapter 3.
Mission and Goals
MISSION AND GOALS

HOW DID WE GET HERE?

Littleton’s Transportation Master Plan (TMP) is a tactical approach to achieving the community’s vision for a transportation network that moves people and goods while enhancing Littleton’s unique character and identity. The goals, objectives and strategies introduced here are a response to 18 months of listening to citizens and stakeholders through a series of surveys, workshops, events, newsletters, and conversations.

The Envision Littleton process created a foundation to describe what gives Littleton its identity and what is important to those who live and work here, and who enjoy all the City has to offer. Building on the adopted unifying vision, guiding principles, core values, and other guidance in that plan, the TMP’s strategic framework was developed through a lengthy refinement process involving listening sessions and workshops with City staff, Joint Leadership (City Council and Planning Commission), broad community input including a Community Coordinating Committee (CCC), and other stakeholders. Additional information about community input can be found in the Community Engagement Appendix.

"Change is going on around us. Do we want it to happen to us, or do we want to participate? It’s about time -- we need to be proactive and not reactive"

"We know we’re going to have big expenses coming up, and we don’t have the funding sources for those."

"The traffic, as is, is unsustainable, in 20 years it will be worse. It has to be addressed."

"I could think of no other City where I would wish to live."

"I’m pretty patient, but sometimes I get a little crazy when I’m sitting in traffic."

"The goal is a transportation system that supports a community where people want to live, work, and play. That’s an enabler for quality of life and it’s an enabler of job creation in the City."

"We can’t just solve today’s problems - we have to solve tomorrow’s problems."

"Happier drivers."

"I would like people to be nice when they’re going someplace."
STRATEGIC FRAMEWORK

The Envision Littleton guiding principles, values, shared priorities, and shared concerns form the basis for the TMP. The strategic framework shown here explains how the TMP is structured. The rest of this section explains each of the five goals in detail, shows how the objectives support the goals, and introduces key policy points.

**Envision Littleton Vision Report**
A unifying vision and summary of Littleton’s core values, guiding principles, and shared priorities and concerns

**Transportation Master Plan Mission**
What we are doing, for whom and why? The purpose of the Transportation Master Plan

**Goals**
Broad, qualitative statements regarding what we are trying to achieve

**Objectives**
Specific, measurable, time limited, quantifiable desired achievements in support of the goals

**Policies, Strategies, and Investments**
Actions we will be taking

**Measures**
How we will measure our progress toward our plan and a way for us to assess the need to adjust the plan

*Littleton Downtown LRT Station.*
WHAT ARE THE CITY’S MISSION AND GOALS?

TRANSPORTATION MASTER PLAN MISSION STATEMENT:
Littleton will enable connection and accessibility for all through regional leadership and responsible stewardship of the City’s transportation systems, policies, programs and services.

Connected
Connect people conveniently to the community, resources, and opportunities.

Healthy
Promote safety and support efforts to maintain a healthy and active lifestyle.

Inclusive
Allocate services and facilities so that all people have transportation options that are best suited for their needs and lifestyle.

Prosperous
Contribute to our economic prosperity while maintaining and enhancing our community’s character.

Sustainable
Build and operate a financially and environmentally sustainable transportation system.
GOAL: CONNECTED
Connect people conveniently to the community, resources, and opportunities.

What are we trying to achieve with the “connected” goal?
A connected Littleton is one where people have convenient ways to get from home to school, work, and popular destinations such as downtown and the Mary Carter Greenway. Achieving this goal will require creative approaches to crossing existing barriers and closing existing gaps in the transportation network, with a focus on comfortable and convenient networks as well as improved connections for all travelers.

“East to west connection is an issue for bikes and pedestrians as well as cars. There are significant barriers.”

“We have a desire and need to improve connections with regional systems.”

“The trail network is a huge benefit for the City.”

“Our transportation system needs to balance moving people through and encouraging them to stay.”

ALIGNMENT WITH ENVISION LITTLETON:
- Connected (Guiding Principle)
- Anchored (Guiding Principle)
- Being a Model Community (Values)
- Accessibility (Shared Priorities)
- Small town feel and community (Shared Priorities)
- Traffic (Shared Concerns)
GOAL: HEALTHY
Promote safety and support efforts to maintain a healthy and active lifestyle.

What are we trying to achieve with the “healthy” goal?
In a healthy Littleton, the transportation network minimizes the safety risks of travel by any mode, and citizens have plenty of opportunities to maintain an active lifestyle. Achieving this goal requires a holistic, ongoing effort to identify and mitigate transportation network deficiencies. Success will also mean ensuring easy access to the City’s abundant open spaces for all citizens.

“Safety, safety, safety, safety.”

“Certain intersections don’t feel safe for pedestrians.”

“The trails are great for bicyclists and people who want to run or walk to get some exercise.”

ALIGNMENT WITH ENVISION LITTLETON:
- Active (Guiding Principle)
- The Outdoors (Values)
- Integrity (Values)
- Safety (Values, Shared Priorities)
- Park, trails, and open space (Shared Priorities)
GOAL: INCLUSIVE
Allocate services and facilities so that all people have transportation options that are best suited for their needs and lifestyle.

What are we trying to achieve with the “inclusive” goal?
An inclusive Littleton allows people an intuitive way to travel, regardless of ability, age, or socioeconomic status. Success will require a human-scale approach to adapting the transportation network—one that finds practical solutions to the mobility challenges of all people in Littleton.

“How the cost of transportation shouldn’t prevent people from getting to work.”

“Community partners can continue to teach us how to create an accessible system that’s practical for people, not just compliant.”

“The light rail is a huge strength of the transportation system, but connections to the stations could be better.”

ALIGNMENT WITH ENVISION LITTLETON:
- Anchored (Guiding Principle)
- Being Inclusive (Values)
- Civic Involvement (Values)
- Accessibility (Shared Priorities)
- Affordability (Shared Concerns)
GOAL: PROSPEROUS
Contribute to our economic prosperity while maintaining and enhancing our community’s character.

What are we trying to achieve with the “prosperous” goal?
A prosperous Littleton is one where services and facilities provide a cohesive civic identity and are the backbone for prosperity. Achieving this goal requires a coordinated approach to land use, transportation, and other infrastructure development. Success will mean thriving neighborhoods throughout the City.

"Improved mobility for pedestrians, bicyclists, motorists, and transit riders would encourage more people to live here and do business here."

"Downtown is a huge strength. It’s a place where people want to be, want to walk around."

"The truth is people think there's a parking problem, so we have a parking problem."

ALIGNMENT WITH ENVISION LITTLETON:
- Authentic (Guiding Principle)
- Local History (Values)
- Quality (Values)
- Downtown Littleton (Shared Priorities)
- Compatibility of redevelopment (Shared Concerns)
- Growth impacts (Shared Concerns)
- Small town feel and community (Shared Priorities)
GOAL: SUSTAINABLE
Build and operate a financially and environmentally sustainable transportation system.

What are we trying to achieve with the “sustainable” goal?
For Littleton, sustainability means taking a long-term view of the City’s financial and environmental resources. This includes establishing a prioritized set of transportation improvements that allows for adaptability as technology and demographics change. These improvements should include a focus on improving air and water quality. The City will work toward both aspects of its sustainability goal by maintaining a strong presence in regional planning efforts.

“We can’t just solve today’s problems - we have to solve tomorrow’s problems.”

“The way the budget is currently, structured, it would be hard to keep up with transportation needs if the economy changes.”

“Colorado is a place where people want to be out in nature -- being tied up in your car for an hour runs antithetical to that goal.”

ALIGNMENT WITH ENVISION LITTLETON:
• Active (Guiding Principle)
• Anchored (Guiding Principle)
• Being a Model Community (Values)
• The Outdoors (Values)
• Quality (Values)
• Parks, trails, and open space (Shared Priorities)
• Contentious local politics (Shared Concerns)
OBJECTIVES

Building from the goals, a series of workshops involving the Community Coordinating Committee, Joint Leadership Team, and TMP technical staff worked to develop a tactical approach to planning for the future of Littleton’s transportation system. Those efforts produced the list of 31 objectives presented in Table 1, spread across seven topic areas: Quality of Life, Community, Mobility, Active, Auto, Transit, and Freight.

How the objectives are used: The objectives are statements about the direction the City wants to take its transportation system. Each objective is associated with one or more performance measures, which include a baseline and a target for 2040. These measures informed the project prioritization effort found in the TMP. In addition, they provide a system of accountability for tracking progress over time.

The TMP is designed to be a living document that can be revisited at regular intervals. The objectives offer a benchmark to evaluate how effectively the City is achieving its goals as well as a record of the community’s priorities as of 2019.

Table 1. Transportation Objectives

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Connected</th>
<th>Healthy</th>
<th>Inclusive</th>
<th>Prosperous</th>
<th>Sustainable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Achieve high resident satisfaction rates with transportation services</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Quality of Life</td>
<td>Provide spaces that people can enjoy within the public right-of-way</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety on all transportation modes</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Community</td>
<td>Provide transportation facilities that are well integrated with land use and character</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>6</td>
<td>Community</td>
<td>Minimize transportation-related air quality degradation</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Community</td>
<td>Minimize transportation-related water quality degradation</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Community</td>
<td>Minimize transportation-related noise impacts</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Community</td>
<td>Establish a transportation planning and implementation process that is flexible and adaptable</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>10</td>
<td>Community</td>
<td>Provide for a community-driven decision-making process for transportation investments</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Community</td>
<td>Provide a transportation system the City can afford to maintain</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Mobility</td>
<td>Provide a reliable and high-quality transportation system</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mobility</td>
<td>Achieve a balanced mode share</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>No.</td>
<td>Topic</td>
<td>Objective</td>
<td>Connected</td>
<td>Healthy</td>
<td>Inclusive</td>
<td>Prosperous</td>
<td>Sustainable</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
<td>-----------</td>
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<td>-------------</td>
</tr>
<tr>
<td>14</td>
<td>Mobility</td>
<td>Provide high-quality transportation systems people can afford to use</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Mobility</td>
<td>Provide travelers with relevant, timely information -- including innovative methods</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Active</td>
<td>Provide a well-connected, direct bicycling network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Active</td>
<td>Provide a safe and low-stress biking environment</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Active</td>
<td>Provide a well-connected pedestrian network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Active</td>
<td>Provide a safe and low-stress walking environment</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Active</td>
<td>Provide healthy transportation choices</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Auto</td>
<td>Provide a well-connected automotive network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Auto</td>
<td>Provide for safe automobile travel</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Auto</td>
<td>Provide a resilient and responsive traffic operations system</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Auto</td>
<td>Provide an efficient automotive network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Auto</td>
<td>Provide a roadway network that allows for excellent emergency response</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Transit</td>
<td>Connect people effectively to the transit system</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Transit</td>
<td>Provide an efficient transit system with regional partners</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Transit</td>
<td>Provide safe and comfortable transit stops and stations</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Freight</td>
<td>Provide a reliable freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Freight</td>
<td>Provide a well-connected freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Freight</td>
<td>Provide a safe freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

**WHAT IT MEANS TO PROVIDE A COMPLETE NETWORK**

A complete multimodal transportation network in the City that provides connections, choice, calming, and capacity while meeting the needs of the community will be the result of implementing the projects defined in subsequent sections. These projects and strategies, combined, will allow the City to realize its Transportation Goals, and ultimately deliver upon the Mission defined by the community. Not every street has the room or capacity to serve every mode, nor do they all have the demand for each mode, so priorities have been determined based on the adjacent land uses, network needs, ability of the right-of-way to accommodate various modes and major destinations. Many of these priorities have evolved over time already, and are in place today, in the form of transit service on some streets, wider sidewalks, and bicycle facilities. The complete networks presented here will build upon this foundation and are intended to present a path to completion of networks so that all people can choose the mode that best suits their travel needs and lifestyles.
LEVEL OF SERVICE

The City is using the term “Level of Service” (LOS) to define appropriate facility types and widths of facilities for the various transportation modes. These criteria are described in depth in the mode-specific chapters that follow. In Littleton, Level of Service allows us to judge how well our transportation networks are performing. Maintaining LOS standards allows the City to better manage the impacts of development and forms the foundation for how we can manage our transportation networks in a way that is responsive to growth pressures from within and from surrounding communities. The LOS standards or thresholds are defined within each mode-specific chapter.

- **Auto LOS**: for auto and freight networks, LOS refers to the relation between the number of vehicles that are using a specific roadway or intersection and the traffic capacity of those roadways or intersections. It is generally provided as a letter-grade that easily communicates the level of congestion that exists in a location on a scale from A to F. See The Auto and Freight Chapter for details.

- **Active Transportation LOS**: for pedestrians and bicyclists, LOS refers to the level of stress that pedestrians and bicyclists feel from adjacent auto and freight traffic. In order to provide a complete network, comfortable and safe (low-stress) facilities must be provided. In order to provide such facilities, bicycle and pedestrian facilities require different levels of protection from autos and trucks to feel safe. See the Active Transportation Chapter for details.

- **Transit LOS**: for transit, LOS refers to the availability, frequency, comfort, and convenience of transit for people who make trips via transit on either bus or rail. The percentage of citizens with convenient access to high-quality transit is used to measure how well transit services are meeting Littleton’s needs. It must be acknowledged that the Regional Transportation District (RTD) owns and operates the vast majority of transit services within the City. Littleton is a member of RTD, and can influence LOS mostly through regional partnerships. See the Transit Chapter for details.

Provision of a complete transportation network that meets the needs of the citizens of Littleton requires that these criteria, combined with the other objectives outlined in this plan are met. In order to meet our goals, we will need to re-think the way we have designed our streets. In order to lay that groundwork, the types of streets that we provide as a service have been reconsidered below.

STREET TYPES

Littleton has a diverse set of street types, from local residential streets to wide commercial streets. The City has long used a standard functional classification approach to define the street network in the past. The City’s classification system consisted of local, collector, and arterial street classes. However, this functional classification system does not adequately account for the way the surrounding land use intensity and character affect the street’s operation and design.

The Envision Littleton plan has established a method to better account for these distinct issues when designing and operating our streets. The street types listed herein allow the City to address typical challenges encountered and develop future street type maps that will set the table for updated design standards. In addition to street types, this plan also incorporates modal priorities for active transportation, transit, and auto/freight, as well as overlays for character classes, consistent with those identified in the Comprehensive Plan. The Complete Network and Overlay maps can be found in the Recommendations Chapter following the mode chapters.
<table>
<thead>
<tr>
<th><strong>Local Street</strong></th>
<th><strong>Neighborhood Connector</strong></th>
<th><strong>Suburban Connector</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical Right-of-Way</strong></td>
<td>60-100 feet</td>
<td>80-120 feet</td>
</tr>
<tr>
<td><strong>Target Design Speed</strong></td>
<td>20-25 mph</td>
<td>30-40 mph</td>
</tr>
<tr>
<td><strong>ADT Range (vpd)</strong></td>
<td>&lt;3,000</td>
<td>3,000-18,000</td>
</tr>
<tr>
<td><strong>Lanes</strong></td>
<td>2 (no lane markings)</td>
<td>2, plus turn lanes where warranted</td>
</tr>
<tr>
<td><strong>Primary Purpose</strong></td>
<td>Local access</td>
<td>Local mobility</td>
</tr>
<tr>
<td><strong>Pedestrian/Bicycle Facilities</strong></td>
<td>Attached and Detached Sidewalks</td>
<td>Attached and Detached Sidewalks, on-street bike facilities</td>
</tr>
<tr>
<td><strong>Landscaping</strong></td>
<td>Property owner</td>
<td>Property owner</td>
</tr>
<tr>
<td><strong>On-Street Parking</strong></td>
<td>Allowed</td>
<td>Allowed, with some exceptions</td>
</tr>
</tbody>
</table>

A local street can exist in any context and is used primarily for access to adjacent properties. The cross-section should encourage slow speeds and inherently multimodal operations, serving pedestrians, bicyclists, autos, and even infrequent freight traffic (i.e., deliveries, trash services, etc.). These streets provide the least through movement connectivity.

Neighborhood connector streets are typically found in areas with almost exclusively adjacent residential land use. These streets are intended to serve short to medium length trips, and are slow speed. They include some local access to properties and are characterized by modest setbacks. These streets are good candidates for active transportation connections, as they will typically have less auto and truck traffic. Traffic calming may be desired to keep speeds slow and promote safety for all users.

Suburban connector streets are typically found in areas with adjacent residential land use and some suburban retail and commercial. These streets are intended to serve medium length trips, and are medium speed. They include minimal local access to properties and are characterized by modest setbacks. These streets are good candidates for active transportation connections including bicycle facilities, but should provide adequate separation.

Example: Dry Creek Road (above)

Examples: Powers Avenue (above), Prince Street, Windermere Street

Examples: Mineral Avenue (above), Bowles Avenue
### Mixed Use/Downtown Connector

<table>
<thead>
<tr>
<th>Typical Right-of-Way</th>
<th>60-100 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Design Speed</td>
<td>20-30 mph</td>
</tr>
<tr>
<td>ADT Range (vpd)</td>
<td>6,000-24,000</td>
</tr>
<tr>
<td>Lanes</td>
<td>2 or 4, plus turn lanes where warranted</td>
</tr>
<tr>
<td>Primary Purpose</td>
<td>Local access, business access</td>
</tr>
<tr>
<td>Pedestrian/Bicycle Facilities</td>
<td>Detached Sidewalks, on-street bike facilities</td>
</tr>
<tr>
<td>Landscaping</td>
<td>City, Street Trees</td>
</tr>
<tr>
<td>On-Street Parking</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

Mixed Use/Downtown Connectors are found in areas that have a combination of retail, commercial, office, restaurant and residential uses. These streets are typically slower speed, and may have driveways. They are intended to be multimodal, with wide sidewalks and sometimes with facilities for biking.

Example: Sycamore Street (above)

### Mixed Use/Downtown Main Street

<table>
<thead>
<tr>
<th>Typical Right-of-Way</th>
<th>60-110 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Design Speed</td>
<td>20-25 mph</td>
</tr>
<tr>
<td>ADT Range (vpd)</td>
<td>6,000-40,000</td>
</tr>
<tr>
<td>Lanes</td>
<td>2 or 4, plus turn lanes where warranted</td>
</tr>
<tr>
<td>Primary Purpose</td>
<td>Business access, placemaking</td>
</tr>
<tr>
<td>Pedestrian/Bicycle Facilities</td>
<td>Detached Sidewalks, on-street bike facilities</td>
</tr>
<tr>
<td>Landscaping</td>
<td>Street Trees and other landscaping is important</td>
</tr>
<tr>
<td>On-Street Parking</td>
<td>Allowed, with some exceptions</td>
</tr>
</tbody>
</table>

The buildings along these streets should have little to no setback, pedestrian-oriented frontages, and activated main floor uses. Auto speeds should be slow and driveways should be limited. On-street parking may be incorporated, but due consideration to other uses of valuable public right-of-way should be given. Pedestrians are the priority on these streets, but people on bicycles or other soft vehicles should be provided a safe environment.

Example: Main Street (above)

### Commercial Corridor

<table>
<thead>
<tr>
<th>Typical Right-of-Way</th>
<th>80-150 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Design Speed</td>
<td>30-55 mph</td>
</tr>
<tr>
<td>ADT Range (vpd)</td>
<td>&gt;20,000</td>
</tr>
<tr>
<td>Lanes</td>
<td>4 or 6, plus turn lanes where warranted</td>
</tr>
<tr>
<td>Primary Purpose</td>
<td>Regional mobility</td>
</tr>
<tr>
<td>Pedestrian/Bicycle Facilities</td>
<td>Attached and Detached Sidewalks, shared use paths</td>
</tr>
<tr>
<td>Landscaping</td>
<td>Street trees, turf, and other landscaping</td>
</tr>
<tr>
<td>On-Street Parking</td>
<td>Allowed (with some exceptions)</td>
</tr>
</tbody>
</table>

Commercial corridors serve mostly commercial uses, including shopping, industrial, offices, etc. Commercial corridors typically serve both through trips and provide property access; direct access should be discouraged. Commercial corridors have typically been focused on auto travel. Better pedestrian, bicycle, and transit facilities can be provided where appropriate. Speed limits should only exceed 40 mph on highly controlled facilities.

Examples: Broadway (above), Santa Fe Drive, Belleview Avenue
OVERLAYS

The following overlays identify areas or corridors within the City that should provide streets that cater to certain modes. These overlays will allow the City to provide complete networks for each mode, and will affect the design of the street and guide the City to make decisions about types of facilities to provide within the right-of-way.

Modal Priorities

**Pedestrian**

The City is focused on the safe and efficient movement of pedestrians (people walking or using mobility devices such as wheelchairs). All City streets should provide safe spaces to move along and across the street. Pedestrians are our most vulnerable travelers, and prioritizing their safety is of utmost importance. This plan focuses the City’s future pedestrian enhancements on these areas of greatest need:

- First and last mile connections to transit including Mineral Station, Littleton Downtown Station, and the Broadway Transit Corridor.
- Safe Routes to Schools
- Park connections
- Regional trail connections

Tradeoff: As pedestrian enhancements are considered, it must be acknowledged that in some cases, this priority will require prioritizing space over some other mode. Sometimes this will include the removal of on-street parking in order to widen the sidewalk, or in some cases with constrained right-of-way between buildings this could entail removing a vehicle travel lane and reorganizing the road in order to provide more sidewalk space.

**Bicycle**

Bicycle priority streets aim to provide low-stress bicycle options to reach destinations. The treatments used on these streets may include striped bike lanes, protected bike lanes, cycle tracks, or separate off-street facilities, such as parallel trails. As with the pedestrian network, the City will focus on upgrades to the bicycle network where the need is greatest:

- First and final mile connections to transit including Mineral Station, Littleton Downtown Station, and the Broadway Transit Corridor.
- Safe Routes to Schools
- Park connections
- Regional trail connections, and connections to surrounding region

Tradeoff: As bicycle enhancements are considered, it must be acknowledged that in many instances, this priority will require prioritizing space for over other mode. Most often in Littleton, this will result in prioritizing space for bikes over the private automobile. Sometimes this will take the form of slower speeds due to narrower lanes, restricting turning movements or adding signals to increase safety or longer delays due to fewer lanes for auto capacity, while other times this will mean the reduction of space for on-street parking.
**Transit**

Transit corridors should be enhanced to meet the City’s objectives to provide competitive and attractive transit service as an alternative to the private auto. The future Transit priority streets in the City, in addition to maintaining light rail operations along Santa Fe Drive, are:

- Broadway
- Littleton Boulevard
- Mineral Avenue
- Church Avenue
- Bowles Avenue
- Ridge Road

Treatments to enhance transit on these streets include, but are not limited to:

- Speed and reliability: queue jumps, transit signal priority, exclusive lanes
- Amenities: enhanced stops to include benches, lighting, shelters, fare payment systems, real-time information, or other means developed and recommended by the Regional Transportation District (RTD).
- Connectivity: future transit streets should ensure that stops are accessible to users, through sidewalk connections, ramps, and crossing treatments that enhance safety.

**Truck**

The City maintains designated truck routes intended to funnel freight movement onto corridors that are designed to handle heavy vehicles. As goods delivery evolves, it will be important for the City to remain flexible, and adapt to changes in the types and numbers of freight vehicles on our streets. Given these shifting trends, the truck route map and related policies should be reviewed annually.

Tradeoff: As freight movement enhancements are considered, it must be acknowledged that in many instances, this priority will require prioritizing space over some other mode. In many instances, truck design standards require that pedestrian and bicycle facilities are not as direct or comfortable. Proper consideration for these modes must be taken into account as designs proceed.
**Character**

The character of the adjacent land use should affect the design of the street. The major character contexts listed below have been identified in Littleton.

**Estate**

On streets in the estate or natural character areas, the separation between active and auto transportation users is generally less defined. Many streets in these areas are shared streets where different user groups mingle in the same space. Detached sidewalks are rare and the natural or landscaped setting generally comes right up to the edge of the street. On-street parking is generally discouraged and off-street parking facilities are common.

**Suburban**

On streets in the suburban character areas, the City envisions detached or wider attached sidewalks, with street trees. The mix of users includes all modes on many streets in these character areas. Green space should be prioritized as part of the streetscape. Building setbacks in these areas are larger, meaning that the building frontage is less important for activation, and landscaping plays a more prominent role. On-street parking is typically permitted where appropriate on lower mobility street types.

**Urban**

On streets in the urban character areas, the urban building forms interact with the streetscape to create a street wall. Sidewalks can be wide and attached with planters or trees, or can be detached with a tree lawn separating pedestrians from autos. Generally, urban areas will have more pedestrian activity and streets should dedicate more space to active transportation. Curb space management may become a priority, as ride-hailing and valet services become more popular. On-street parking is typically permitted, although due consideration should be given to using that space for other modes.

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**POLICIES, STRATEGIES & PROJECTS**

The goals and objectives describe the community’s desired future for its transportation system. In order to move toward that future while protecting existing values, the City must develop a detailed work plan consisting of capital improvement projects, and organizational strategies.

The following chapters detail the specific needs related to auto (including freight), active transportation (such as bike, pedestrian, and micromobility), and transit (bus and rail). This analysis results in a set of strategies and projects that would help Littleton work toward its transportation objectives, in the short term as well as over the next several decades.
Chapter 4
Auto and Freight
INTRODUCTION

Because Littleton was developed in a time of rapid auto adoption and in times in which most people have access to a private auto, the City has a strong auto and freight network with few gaps. The City’s network includes the full hierarchy of auto streets, from freeway (C-470) down to local streets.

The geography of the City has determined much of this network, particularly the location of the South Platte River and the freight and light rail tracks. These major linear assets also act as barriers to east-west connectivity. The Highline Canal, which meanders through the City, also limits connectivity.

The City is characterized by these and other features, and the way people move in and through the City is shaped by the way the City has been built. The primary auto-oriented corridors exist mainly along the City’s edges:

- North-South Corridors:
  - Platte Canyon Road
  - Santa Fe Drive (US 85)
  - Broadway
- East-West Corridors:
  - Belleview Avenue
  - Bowles Avenue/Main Street/Alamo Avenue/Littleton Boulevard
  - Mineral Avenue
  - County Line Road

Meanwhile, the interior of the City is defined by its neighborhood character and slower moving traffic on narrower streets.

Auto traffic on the main auto-oriented corridors has been increasing in the recent past, spurred primarily by regional growth outside the City. Major developments have been built south and west of the City and have resulted in traffic congestion on Littleton streets.

LEGACY OF PAST PLANNING

The following plans previously developed for Littleton and vicinity offer insights from the time they were prepared and provided an essential foundation for preparing this Auto and Freight element of the Transportation Master Plan.

- Citywide Plan (2014)
- Belleview Avenue Corridor Vision (2018)
- Broadway Corridor Study (2009)
- Downtown Neighborhood Plan (2011)
- South Platte River Corridor Vision, Arapahoe County, (2013)
- Arapahoe County 2035 Transportation Plan (2010)

Key takeaways from past planning efforts include:

- Improve connections between downtown/river corridor/parks/trails.
- Complete network of streets in the City that provides connections, choice, calming, and capacity where appropriate.
- Improve traffic flow on Connector Streets and Commercial Corridors.
- Decrease cut-through traffic in residential areas.
- Improve multimodal connections between commercial locations/residential developments.
- Improve connections to light rail.
- Improve road connections to key destinations but not through natural areas/build fewer cul-desacs/promote grid street network.
KEY ISSUES AND CONSIDERATIONS

Input and discussions for this Transportation Master Plan, through varied Envision Littleton community engagement, workshops with City Council and Planning Commission, and interaction with other City boards/commissions, City departments, and partner agencies and organizations, yielded the following list of key items that relate to the auto and freight transportation network:

- **Congestion**: Growth within and surrounding Littleton has resulted in increased congestion on many streets.

- **Barriers**: the City is crossed by multiple barriers limiting connectivity. While some areas of the City have a strong internal grid, barriers like the South Platte River, Santa Fe Drive, the rail corridor, and even some suburban neighborhoods exist that break up the grid and force traffic to use one of only a few major connections, resulting in traffic congestion.

- **Safety**: A total of 5,089 crashes occurred in Littleton during the 5-year period from 2014 to 2018—about three per day. The social and economic impacts of these crashes are vast.

- **Parking**: Downtown parking has been identified as a major issue, and has been cited as a reason for avoiding coming to the downtown retail and commercial district.

More information on each of these key issues is provided below.

CONGESTION

Congestions is a term used to describe traffic conditions where motorists experience delay and the volume of traffic on a street is at or near its capacity. Congestion, also referred to as poor Level of Service, in Littleton is primarily concentrated on its major regional corridors. In urban areas, most congestion occurs at intersections. This is the case in Littleton, with congestion occurring at major bottleneck locations throughout the City where Connector Streets and Commercial Corridors intersect.

**Level of Service**

A key method of evaluating the need for improvement is to examine roadway capacities. Through goal-setting, the City has set a desired Level of Service threshold for its roadways. Level of Service (LOS) refers to a letter grade system of gauging a road’s ability to serve travel demand. The grades range from A to F, where A represents free-flow traffic conditions with almost no delay, and LOS F represents gridlock or severe congestion with high levels of delay.

The City’s desired Level of Service is LOS E or better for Commercial Corridors and Suburban Connectors and LOS D or better for all other streets. LOS is a tool that allows the City to identify the appropriate improvement types for streets within its borders, and to require roadway improvements as mitigation from development that may increase the demand on the existing system.
The capacity indicates the maximum number of vehicles per day (vpd) that can be served by a typical roadway before exceeding the LOS threshold. While the theoretical maximum number of vehicles served is higher, as traffic increases beyond these capacities, congestion occurs and travelers experience delay. Many factors can raise or lower these capacities, including but not limited to the number of intersections or access points, provision of turn lanes or other operational improvements, level of peak hour traffic, and even driver behavior. These capacities are widely-accepted typical capacities and traffic behavior and roadway characteristics in Littleton are generally consistent with the typical roadways on which these capacities are based.

In addition to corridor Level of Service, the City should also monitor intersection LOS, which is based on the typical average delay experienced by all of the motorists traveling through an intersection. Due to the number of intersections in the City, a thorough analysis of intersection LOS with traffic engineering software was not feasible for this plan. However, other tools allow the use of cell phone and GPS data to identify where poor LOS is occurring at intersections throughout the City.

An analysis of bottlenecks through use of INRIX data identifies those locations that cause the most traveler delay and frustration (Table 3, next page). INRIX is a Big Data aggregation company that compiles GPS and cell phone data all over the world. This data can be used to determine typical free-flow traffic conditions on major roads and subsequently when and where delay is occurring compared to free-flow conditions.

Analyzing the data in Littleton, it is apparent that the most severe bottlenecks in the City occur at intersections along the Santa Fe Drive, Broadway, Belleview Avenue, Bowles Avenue, and Mineral Avenue corridors. The table at right shows the 25 worst bottlenecks in the City ranked by the total delay (in minutes per day) experienced by motorists during the course of driving in 2018. These locations currently experience poor LOS at some point during a typical day.

Table 2 shows the planning level bi-directional (total of both directions) daily traffic capacities for typical roadways in Littleton based on these LOS thresholds.

**Table 2. Planning Level Bi-Directional Daily Traffic Capacities for Typical Roadways**

<table>
<thead>
<tr>
<th>Facility Type and Lanes</th>
<th>Capacity*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-lane Local Street (LOS D)</td>
<td>3,000</td>
</tr>
<tr>
<td>2-lane Mixed Use/Downtown or Neighborhood Connector or Main Street (LOS D)</td>
<td>10,000</td>
</tr>
<tr>
<td>3-lane Mixed Use/Downtown or Neighborhood Connector or Main Street (LOS D)</td>
<td>18,000</td>
</tr>
<tr>
<td>4-lane Suburban Connector or Commercial Corridor (LOS E)**</td>
<td>40,000</td>
</tr>
<tr>
<td>6-lane Suburban Connector or Commercial Corridor (LOS E)**</td>
<td>60,000</td>
</tr>
</tbody>
</table>

* 2-way total vehicles per day
** Assumes turn lanes are provided as needed at intersections
The current DRCOG tour-based transportation model was used to forecast future traffic volumes in Littleton to assess future needs and how they may differ from the needs of today. The model results were compared to real-world observations of traffic to make sure the model is accurately representing traffic in Littleton and adjusted where necessary.

In general, traffic in Littleton is expected to increase, as a result of increases in population in the region, including some in Littleton. Socio-economic data for Traffic Analysis Zones (TAZ’s, which are geographic areas within the region) that are within or directly adjacent to Littleton are presented below. Note that these forecasts differ slightly from those presented in the Comprehensive Plan Update, due to the differences in geographic area and the source. The differences are minor between the two forecasts and are not expected to have an impact on the forecasted travel demand. The growth percentages are the total percent change in population expected by DRCOG in and around Littleton. These equate to about 1% to 1.5% growth per year.

As a result of this increase in nearby population, the model projects that overall vehicle miles traveled (distance traveled in a car, VMT) and vehicle hours traveled (time spent traveling in a car, VHT) are projected to increase in Littleton if no other measures are implemented to reduce them. Correspondingly, because the City has few programmed increases to roadway capacity, the amount of congestion is expected to increase as well. Table 4 illustrates this increase, which means that Littleton residents are likely to spend a much greater percentage of their travel time in congested conditions.

### Table 4. Anticipated Increase in Congestion

<table>
<thead>
<tr>
<th>Location</th>
<th>2020 Model</th>
<th>2040 Model</th>
<th>+/- Growth</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>61,249</td>
<td>73,208</td>
<td>11,959</td>
<td>20%</td>
</tr>
<tr>
<td>Households</td>
<td>27,017</td>
<td>32,610</td>
<td>5,593</td>
<td>21%</td>
</tr>
<tr>
<td>Employment</td>
<td>37,199</td>
<td>47,628</td>
<td>10,429</td>
<td>28%</td>
</tr>
</tbody>
</table>

**Future Travel Demand**

The Denver Regional Council of Governments (DRCOG) maintains a regional Travel Demand Model that is federally-mandated and used for transportation planning purposes. The current DRCOG model is referred to as the FOCUS model and is a tour-based model capable of projecting travel demand based on socio-economic data (land use), traveler behavior (where and when people make trips), mode choice (how people choose to make those trips), and network analysis (the most convenient ways to move around).
Figure 8 shows traffic counts—existing year traffic (vehicles per day)—and forecasted volumes—future year 2040 traffic (vehicles per day)—for the street network in Littleton. A process consistent with industry practice to produce these forecasts was followed to adjust the travel demand model’s output. This allows the project team to forecast which streets are likely to be operating at a LOS that does not meet the standard set by the City. These locations are indicated in Figure 8. In general, the segments that are projected to be over capacity are consistent with existing conditions where bottlenecks occur today (Table 5).

### Table 5. Citywide Traffic Statistics

<table>
<thead>
<tr>
<th></th>
<th>2020 Model</th>
<th>2040 Model</th>
<th>+/- Growth</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMT</td>
<td>1,109,785</td>
<td>1,222,104</td>
<td>112,319</td>
<td>10%</td>
</tr>
<tr>
<td>VHT</td>
<td>34,781</td>
<td>39,986</td>
<td>5,205</td>
<td>15%</td>
</tr>
<tr>
<td>Congested VMT</td>
<td>215,583</td>
<td>322,786</td>
<td>107,203</td>
<td>50%</td>
</tr>
<tr>
<td>Congested VHT</td>
<td>9,036</td>
<td>13,550</td>
<td>4,514</td>
<td>50%</td>
</tr>
</tbody>
</table>

### Origin-Destination Analysis

Because Littleton is experiencing so many regional pressures, an origin-destination analysis was undertaken to better understand how traffic from the greater region is impacting Littleton’s streets. A tool developed by Streetlight Data, Inc. was used to determine where traffic entering or exiting the City or moving within the City is going. In general, the analysis indicates that the public and stakeholder perception of through traffic contributing to the majority of the congestion along major corridors is supported by the data. Indeed, 43% of all trips that use a Littleton street at some point in their journey are what are referred to External-to-External or Pass-Through trips, having neither an origin nor a destination within the City.

The key takeaways from this analysis are:

- Nearly half of all traffic entering the City on Broadway from the south heads east into Centennial. However, more than 11% continues through the City to the north while another 10% traverses the City to the west.
- People coming to Littleton from outside the City are generally destined for northern areas of the City.
- People leaving Littleton for other areas of the region are generally heading either north or east, with a slightly larger portion of travelers heading east.
- Eleven percent of people entering downtown at Bowles Avenue are destined for someplace within downtown. Other major origins/destinations include areas west and east of the City, accounting for 34% of traffic on Bowles Avenue/Alamo Avenue/Main Street east of Santa Fe Drive.
- People on Littleton Boulevard just east of downtown are generally headed in northern areas of the City or outside of the City, with even splits north, west, and east.
Figure 8. Proposed Street Types with Current and Future Volumes
• The perception that Santa Fe Drive serves as a pass-through corridor seems to be confirmed by the data. Only 23% of people coming into the City along Santa Fe Drive from the south have a destination within the City.

• Though not as pronounced as the northbound direction, southbound Santa Fe Drive still serves as a pass-through corridor. Only 42% of people coming into the City along Santa Fe Drive from the north have a destination within the City.

Freight
The City maintains a truck route map that identifies corridors that are appropriate for heavy vehicle use. This map is posted on the City website and is available for reference for freight haulers.

A review of the map was conducted for this plan. No changes are proposed to the Truck Route Map at this time. The map can be found in Chapter 8: Complete Network Recommendations as the Truck Overlay.

BARRIERS
The major physical barriers to auto and freight travel in Littleton are the South Platte River, Santa Fe Drive/Rail corridor High Line Canal, and some suburban neighborhoods that lack connectivity.

South Platte River: In Littleton, the only four roadways offering bridged crossings of the South Platte River include Mineral Avenue, Bowles Avenue, Prince Street, and Belleview Avenue. Particularly, the over two-mile separation between the Bowles Avenue and Mineral Avenue crossings results in a funneling of a great deal of traffic on to those two east-west corridors.

Santa Fe Drive/Rail Corridor: Again, between Mineral Avenue and Bowles Avenue/Main Street, crossings of the rail corridor and intersections with Santa Fe Drive are limited. This means that Prince Street serves as the only other viable route between the southern parts of the City and Downtown. When Santa Fe Drive is congested or an incident occurs, Prince Street is the alternate route and experiences traffic flows that are inconsistent with the classification and design.
Suburban Neighborhoods: Some neighborhoods in the southern part of the City have circuitous streets that lack connectivity to the roadway grid network and to each other. In some cases the High Line Canal creates a neighborhood barrier for driving, though it improves connections for pedestrians and bicyclists. This results in additional traffic being forced onto neighborhood connector streets that are intended to serve a minimal local area.

SAFETY

As the City’s roadway network carries more traffic due to regional and local growth, the safety of those traveling within the City will continue to be a top priority. The major current crash locations are shown in the Existing City chapter, and are generally in locations that are congested. Between 2014 and 2018, a total of 5,089 crashes occurred in the City, with 418 resulting in injuries. Locations where a high number of crashes result in injuries have been identified as the High Injury Network (HIN; Figure 9). Any intersection where 5 or more injury crashes occurred in the 5-year analysis period qualifies. The HIN list of intersections is shown in Table 6.

A map summarizing the HIN and bottleneck intersections is shown on the next page. These locations are the prime candidates for safety improvements.

Table 6. High Injury Network (2014 to 2018)

<table>
<thead>
<tr>
<th>Intersection</th>
<th># of Crashes</th>
<th>Injury Crashes</th>
<th>% of Crashes at Intersection Resulting in Injury</th>
<th># of Bike Crashes</th>
<th># of Ped Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Fe Dr &amp; Prince St</td>
<td>114</td>
<td>13</td>
<td>11%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bowles Ave &amp; Federal Blvd</td>
<td>106</td>
<td>12</td>
<td>11%</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Bellevue Ave &amp; Prince St</td>
<td>56</td>
<td>11</td>
<td>20%</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Broadway &amp; County Line Rd</td>
<td>90</td>
<td>9</td>
<td>10%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Broadway &amp; Mineral Ave</td>
<td>92</td>
<td>8</td>
<td>9%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mineral Ave &amp; Platte Canyon Rd</td>
<td>42</td>
<td>8</td>
<td>19%</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Mineral Ave &amp; Jackass Hill Rd</td>
<td>39</td>
<td>7</td>
<td>18%</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Broadway &amp; Littleton Blvd</td>
<td>86</td>
<td>6</td>
<td>7%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Broadway &amp; Grant Way</td>
<td>43</td>
<td>6</td>
<td>14%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bellevue Ave &amp; Federal Blvd</td>
<td>26</td>
<td>6</td>
<td>23%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Broadway &amp; Jamison Ave</td>
<td>14</td>
<td>5</td>
<td>36%</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Santa Fe Dr &amp; Mineral Ave</td>
<td>161</td>
<td>5</td>
<td>3%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Santa Fe Dr &amp; County Line Rd</td>
<td>59</td>
<td>5</td>
<td>8%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Santa Fe Dr &amp; Bowles Ave</td>
<td>135</td>
<td>5</td>
<td>4%</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Figure 9. High Injury Network and Bottleneck Intersections
PARKING

Throughout the Envision Littleton process, parking downtown is identified as an issue by stakeholders and residents. Downtown is currently served by a combination of on-street parking, off-street private parking lots, some off-street public parking lots, and a few privately owned valet parking services. This plan is not focused on parking but recognizes the importance of parking to the community from an economic standpoint and expectation for convenience and viability. It is recommended that parking be addressed in an upcoming Downtown Mobility Plan.

FRAMEWORK FOR ACTION

The framework for action below is organized in four tiers: (1) Goals, (2) Policies, (3) Objectives, and (4) Actions. All are intended to mesh with and support the other aspects of this Transportation Master Plan.

GOALS

Consistent with the Connected and Inclusive Guiding Principles, automobile (auto) and freight mobility are also important to the City’s transportation goals. These modes of travel serve needs that are difficult to serve with other modes. Auto trips can be longer and more convenient than trips by active transportation modes or transit. Freight movements allow us to conduct commerce efficiently. Complete Auto and Freight networks support the City’s goals:

- **Connected:** Auto and Freight networks provide connectivity that is otherwise difficult to provide through other modes, providing point-to-point access to jobs and destinations throughout the region.
- **Healthy:** It is increasingly important that people are connected to health care services in a reliable and convenient manner, particularly as our population ages.
- **Inclusive:** People who are unable to walk, bike, or otherwise use an active or transit mode should have access to transportation options that give them freedom of mobility for their daily needs.
- **Prosperous:** Our auto and freight networks provide the point-to-point long-haul and local service needed to conduct commerce and are the backbone for economic development.
- **Sustainable:** the auto and freight networks in the City are already mostly built and generally require only maintenance and operations to continue to serve their purpose. Improvements to these networks can be accomplished with incremental steps. The City should advocate for measures that encourage autos and trucks to transition to technology that does not harm the environment.

The community has consistently identified traffic congestion as the most important issue facing the City from a transportation perspective. Traffic volumes on major roadways have increased dramatically in the last two decades as development pressures to the south have mounted. This has impacted not only those major roadways but also local streets and neighborhood connector streets, as drivers search for alternate routes to avoid congestion. These pressures are expected to continue to increase as more regional development and growth occurs. Major developments like Sterling Ranch, expected to consist of more than 12,000 additional homes south of C-470 in Douglas County, have already started to influence traffic in Littleton.
Policies

In making decisions that involve public resource allocation, regulatory matters, and physical improvements, among others, Littleton will:

1. Focus on enhancing safety on auto and freight networks.
2. Advance regional partnerships to build consensus and leverage funding toward significant transportation projects.
3. Provide automobile Level of Service (LOS) E or better on Suburban Connectors and Commercial Corridors and LOS D or better on all other streets.
4. Prioritize auto and freight network projects that lead to operational and safety improvements.
5. Enhance the safety of vulnerable user groups on streets and trails.
6. Support connections to employment, retail, and entertainment/recreation land uses given the opportunity.
7. Prioritize safety and mobility over speed with corresponding street design and construction standards.
8. Manage growing demand on the transportation network by building awareness of travel choices.
9. Promote designated truck routes.

Objectives

In order to achieve the overall Transportation Master Plan goals outlined above, multiple objectives have been developed. The objectives in Table 7 are specific to improving the auto and freight networks in the City of Littleton.

Table 7. Objectives—Auto and Freight

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Related Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Achieve high resident satisfaction rates with transportation services</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety on all transportation modes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Community</td>
<td>Provide transportation facilities that are well integrated with land use and character</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Community</td>
<td>Establish a transportation planning and implementation process that is flexible and adaptable</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Community</td>
<td>Provide for a community-driven decision-making process for transportation investments</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Community</td>
<td>Provide a transportation system the City can afford to maintain</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Topic</td>
<td>Objective</td>
<td>Connected</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>12</td>
<td>Mobility</td>
<td>Provide a reliable transportation system</td>
<td>●</td>
</tr>
<tr>
<td>13</td>
<td>Mobility</td>
<td>Achieve a balanced mode share</td>
<td>●</td>
</tr>
<tr>
<td>15</td>
<td>Mobility</td>
<td>Provide travelers with relevant, timely information -- including innovative methods</td>
<td>●</td>
</tr>
<tr>
<td>21</td>
<td>Auto</td>
<td>Provide a well-connected automotive network</td>
<td>●</td>
</tr>
<tr>
<td>22</td>
<td>Auto</td>
<td>Provide for safe automobile travel</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Auto</td>
<td>Provide a resilient and responsive traffic operations system</td>
<td>●</td>
</tr>
<tr>
<td>24</td>
<td>Auto</td>
<td>Provide an efficient automotive network</td>
<td>●</td>
</tr>
<tr>
<td>25</td>
<td>Auto</td>
<td>Provide a roadway network that allows for excellent emergency response</td>
<td>●</td>
</tr>
<tr>
<td>29</td>
<td>Freight</td>
<td>Provide a reliable freight network</td>
<td>●</td>
</tr>
<tr>
<td>30</td>
<td>Freight</td>
<td>Provide a well-connected freight network</td>
<td>●</td>
</tr>
<tr>
<td>31</td>
<td>Freight</td>
<td>Provide a safe freight network</td>
<td></td>
</tr>
</tbody>
</table>

**ACTIONS**

The actions below convey tangible steps that will lead to achievement of the goals in line with the stated policies.

**Capital Investments**

Capital investments have been identified to address many of the issues related to auto and freight movement in the City. Table 8 shows these investments. Figure 10 is a map showing the location of the projects on this list.

A strategic *Action* is aimed at seizing a special opportunity or addressing a specific challenge one faces, given limited resources—financial and otherwise—and recognizing that a broader program of new or ongoing activities will also be pursued in the meantime.
<table>
<thead>
<tr>
<th>No.</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Project Life*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Belleview Ave</td>
<td>Prince St to Lowell Blvd</td>
<td>No median</td>
<td>Access control, median</td>
<td>Ultimate</td>
</tr>
<tr>
<td>2</td>
<td>Santa Fe Dr</td>
<td>Bowles Ave</td>
<td>Traffic signal</td>
<td>Alternative intersection configuration</td>
<td>Interim</td>
</tr>
<tr>
<td>3</td>
<td>Santa Fe Dr</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Alternative intersection configuration, quadrant roadway, or continuous flow intersection</td>
<td>Interim</td>
</tr>
<tr>
<td>4</td>
<td>Ridge Rd</td>
<td>Corridor-wide</td>
<td>Varies</td>
<td>Curb and gutter, geometry, intersections</td>
<td>Ultimate</td>
</tr>
<tr>
<td>5</td>
<td>Access Preservation Area</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>No connection</td>
<td>Ensure properties have access to Santa Fe Drive or a new frontage road.</td>
<td>Ultimate</td>
</tr>
<tr>
<td>6</td>
<td>S Platte Canyon Rd</td>
<td>Mineral Way</td>
<td>Right-in, right-out</td>
<td>Full movement intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>7</td>
<td>Bowles Ave</td>
<td>Federal Blvd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Interim</td>
</tr>
<tr>
<td>8</td>
<td>Belleview Ave</td>
<td>Federal Blvd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>9</td>
<td>Belleview Ave</td>
<td>Prince St</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>10</td>
<td>Belleview Ave</td>
<td>Santa Fe Dr Interchange</td>
<td>Single-Point Urban Interchange</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>11</td>
<td>Bowles Ave</td>
<td>Federal Blvd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>12</td>
<td>Bowles Ave</td>
<td>Platte Canyon Rd/ Lowell Blvd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>13</td>
<td>Broadway</td>
<td>Arapahoe Rd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>14</td>
<td>Broadway</td>
<td>Dry Creek Rd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>15</td>
<td>Broadway</td>
<td>Jamison Ave</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>16</td>
<td>Broadway</td>
<td>Littleton Blvd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>No. (map)</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Project Life*</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td>18</td>
<td>Broadway</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>19</td>
<td>Lowell Blvd</td>
<td>Berry Ave</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>20</td>
<td>Mineral Ave</td>
<td>Platte Canyon Rd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>21</td>
<td>Prince St</td>
<td>Church Ave</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>22</td>
<td>Mineral Ave</td>
<td>Jackass Hill Rd</td>
<td>Traffic signal</td>
<td>Intersection operation and safety improvements; pedestrian and bicycle focus</td>
<td>Ultimate</td>
</tr>
<tr>
<td>23</td>
<td>Santa Fe Dr</td>
<td>Bowles Ave</td>
<td>Traffic signal</td>
<td>Reconfigure into grade-separated interchange</td>
<td>Ultimate</td>
</tr>
<tr>
<td>24</td>
<td>Santa Fe Dr</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Reconfigure into grade-separated interchange</td>
<td>Ultimate</td>
</tr>
<tr>
<td>25</td>
<td>Littleton Blvd</td>
<td>Main St/ Alamo Ave/ Court Pl/ Bemis St</td>
<td>Yield control</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>26</td>
<td>Prentice Ave</td>
<td>Delaware St</td>
<td>2-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>27</td>
<td>Prentice Ave</td>
<td>Huron St</td>
<td>2-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>28</td>
<td>Prince St</td>
<td>Centennial Dr</td>
<td>2-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>29</td>
<td>Ridge Rd</td>
<td>Apache St</td>
<td>3-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>30</td>
<td>Ridge Rd</td>
<td>Elati St</td>
<td>4-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>31</td>
<td>Ridge Rd</td>
<td>Gallup St</td>
<td>4-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>32</td>
<td>Ridge Rd</td>
<td>Prince St</td>
<td>4-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>33</td>
<td>Ridge Rd</td>
<td>Windermere St</td>
<td>4-way stop</td>
<td>Roundabout</td>
<td>Ultimate</td>
</tr>
<tr>
<td>34</td>
<td>Santa Fe Dr</td>
<td>Prince St</td>
<td>Traffic signal</td>
<td>Signal timing and phasing, advanced detection and geometry, NB Left</td>
<td>Ultimate</td>
</tr>
<tr>
<td>35</td>
<td>Santa Fe Dr</td>
<td>Aspen Grove Way</td>
<td>Traffic signal</td>
<td>Signal timing and phasing, advanced detection and geometry</td>
<td>Ultimate</td>
</tr>
<tr>
<td>No. (map)</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Project Life*</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>--------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>36</td>
<td>Santa Fe Dr</td>
<td>Bowles Ave</td>
<td>Traffic signal</td>
<td>Signal timing and phasing, advanced detection and geometry</td>
<td>Ultimate</td>
</tr>
<tr>
<td>37</td>
<td>Windermere St</td>
<td>Corridor-wide</td>
<td>Varies</td>
<td>Traffic calming</td>
<td>Ultimate</td>
</tr>
<tr>
<td>38</td>
<td>Prince St</td>
<td>Corridor-wide</td>
<td>Varies</td>
<td>Turn lanes, curb and gutter</td>
<td>Ultimate</td>
</tr>
<tr>
<td>39</td>
<td>Broadway</td>
<td>Corridor-wide</td>
<td>Varies</td>
<td>V2I and ITS</td>
<td>Ultimate</td>
</tr>
<tr>
<td>40</td>
<td>Santa Fe Dr</td>
<td>Corridor-Wide</td>
<td>Varies</td>
<td>V2I and ITS</td>
<td>Ultimate</td>
</tr>
<tr>
<td>41</td>
<td>County Line Rd</td>
<td>Broadway to University Blvd</td>
<td>Varies</td>
<td>Widening</td>
<td>Ultimate</td>
</tr>
<tr>
<td>42</td>
<td>County Line Rd</td>
<td>Santa Fe Dr to Broadway</td>
<td>Varies</td>
<td>Widening</td>
<td>Ultimate</td>
</tr>
<tr>
<td>43</td>
<td>Santa Fe Dr</td>
<td>Corridor-Wide</td>
<td>Varies</td>
<td>Widening</td>
<td>Ultimate</td>
</tr>
<tr>
<td>44</td>
<td>South Platte River Pkwy</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>No connection</td>
<td>South Platte River Parkway extension</td>
<td>Ultimate</td>
</tr>
<tr>
<td>45</td>
<td>South Platte River Pkwy</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>No connection</td>
<td>Connect new South Platte River Parkway extension to Santa Fe Drive</td>
<td>Ultimate</td>
</tr>
<tr>
<td>46</td>
<td>Santa Fe Dr</td>
<td>Dad Clark Gulch</td>
<td>No signal</td>
<td>Traffic signal</td>
<td>Ultimate</td>
</tr>
<tr>
<td>47</td>
<td>Mineral Ave</td>
<td>Santa Fe to Jackass Hill Rd</td>
<td>Four-lane roadway</td>
<td>Widen to six lanes and reconstruct sidewalks under RR crossings</td>
<td>Ultimate</td>
</tr>
</tbody>
</table>

*Project life indicates whether the improvement results in a desired final condition (ultimate) or represents a step toward that final condition (interim).
Figure 10. Auto Projects
Programs and Initiatives

1. Develop and utilize a traffic operations and safety checklist of operational and safety improvements that can be implemented as part of other infrastructure investments.

2. Develop a Transportation Demand Management program focused on reducing peak hour congestion through Littleton.

3. Create and maintain an Incident Management Plan.

4. Explore the feasibility of a Traffic Management Center, ideally partnering with adjacent municipalities and other agencies.

5. Evaluate signal/corridor timing every three years.

Regulations and Standards

1. Develop new street design standards for the new street classifications consistent with current industry best practices.

Partnerships and Coordination

1. Maintain partnerships with adjacent municipalities for the US 85 (Santa Fe Drive) Planning and Environmental Linkages (PEL) study.

2. Pursue partnering with Douglas County, Arapahoe County, and Jefferson County on improvements in their jurisdictions that will benefit Littleton residents and businesses.

More Targeted Planning/Study

1. Additional planning for major corridors identified through this process as being key to achieving the City's goals for transportation. These corridors have been identified as those that should be improved for a variety of modes, and a study for each should be conducted to determine how best to address the needs of all users in these key areas of the City, and additional public and stakeholder outreach is required to make sure that the projects proposed are consistent with the local residents’ and businesses’ needs. They include:

   a. Santa Fe Drive—the US 85 PEL is expected to kick off in 2019 or 2020, in coordination with CDOT and other regional partners. Littleton should take a leadership role in that study.

   b. Littleton Boulevard—Littleton Boulevard represents a prime opportunity to re-envision how people move through a historic part of the City. A multimodal corridor study should be completed that identifies opportunities for enhancing the pedestrian and transit user experience along this corridor.

   c. Broadway—partnering with Centennial, Englewood, Douglas County, Arapahoe County, and RTD

   d. Prince Street

   e. Windermere Street

   f. Ridge Road

   g. Bowles Avenue—partnering with Jefferson County

   h. Belleview Avenue—building on past planning including the recently completed framework study Belleview Avenue Corridor Vision

2. Additional planning for the intersections identified as having safety and operational issues. These should be evaluated in detail to identify cost-effective and implementable solutions.

3. Downtown Mobility Plan to determine how the City can address the parking and circulation issues in and around downtown.

POTENTIAL PARTNERS

Partners for implementation of plan priorities related to Land Use and Community Character include:

- Area real estate and development community
- Denver Regional Council of Governments
- Regional Transportation District
- SouthPark Owners Association
- South Platte Working Group
- South Suburban Parks and Recreation District
- Tri-County Health Department
- Neighboring Municipalities
- Colorado Department of Transportation (CDOT)
STATE OF THE PRACTICE

Many municipalities and agencies are encountering increased traffic congestion on their streets. Our cities continue to grow and mobility is seen as an essential freedom. Because cars take up a lot of space on our streets, compared to other modes, cities have begun to look for ways to provide the additional auto capacity needed through innovative operations and management, as well as through innovative, non-traditional engineering solutions. These innovations have been taking the place of traditional capacity expansions in many cities and will continue to be improved upon. As Littleton searches for ways to optimize the use of limited right-of-way and time, while providing a system that we can afford to maintain, it will be incumbent upon the City to utilize these new strategies. A short sampling of these strategies is provided below, as a start to a toolkit for the City moving forward. Other resources for these solutions are available.

NON-TRADITIONAL INTERSECTIONS

The following non-traditional intersection improvements and reconfigurations should be considered to improve operations.

<table>
<thead>
<tr>
<th>Description</th>
<th>Photo/Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roundabouts</strong>: roundabouts can improve operations in many locations where un-due delay is caused by either stop-controlled intersections or traffic signals. Roundabouts can improve traffic flow by nearly eliminating delay when no opposing traffic is present. They also have major safety benefits, reducing the occurrence of crashes that result in injury by 51%.</td>
<td><img src="image" alt="Roundabout Image" /></td>
</tr>
<tr>
<td><strong>Typical cost</strong>: $1 million to $2 million</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Photo/Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous Flow Intersection (CFI)</strong>: CFI’s, or Displaced Left Turn Intersections (DLTI), are a way for cities to expand capacity at an intersection without greatly increasing the intersection footprint. These intersections require additional signals to allow left turns to move to the opposite side of the road prior to the intersection, and then travel through the intersection at the same time as through traffic. These intersections are generally less expensive than massive reconstruction projects, and can work in situations where major corridors intersect. However, this intersection design can be an impediment to pedestrian movements.</td>
<td><img src="image" alt="Continuous Flow Intersection Image" /></td>
</tr>
<tr>
<td><strong>Typical Cost</strong>: $10 million to $15 million</td>
<td></td>
</tr>
</tbody>
</table>
TRANSPORTATION MASTER PLAN: AUTO AND FREIGHT

Description
Quadrant Roadway Intersection: a Quadrant Roadway can facilitate left turn movements in locations where heavy left turns cause congestion. These intersections route some or all left turn traffic to a separate roadway and allow the main intersection to simplify signal timing and increase traffic flow.

Typical Cost: $5 million to $15 million

Description
Median U-turn Intersection, Restricted Crossing U-turn Intersection, and others

There are other non-traditional intersection types that the City should consider where appropriate, which have varying costs and applications. Many of these simplify operations at the main intersection while providing turn movements via new routes.

Typical cost: $5 million to $15 million

OPERATIONAL IMPROVEMENTS

More efficiently operating the current system can allow the City to squeeze every bit of capacity out of the roadway network it has, at low cost. Strategies, some of which the City already implements, include:

- Traffic signal re-timing: adjusting the timing and phasing of signals and providing better coordination between signals so they operate in sync with each other should be performed periodically. Typical cost: $5,000 per signal.
- Adaptive signal control: install signal detection and communications technology to allow signal timing software to continuously adjust signal timings based on real-time conditions. Typical cost: $20,000 to $50,000 per signal (USDOT).
- Planned Special Event Traffic Management: implement a traffic management program for special events.
- Road Weather Management: implement a management program to handle weather events.
- Incident Management: implement a management program to respond to traffic incidents, including crashes.
- Active Traffic Management: actively manage traffic control devices during periods of congestion through the use of communications technology and Traffic Operations Center.

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SAFETY IMPROVEMENTS

Safety innovations are focused on vulnerable users (pedestrians and bicyclists), as well as addressing issues like distracted driving and aggressive driving. In general, to improve safety, projects are focused on ways to reduce vehicle speeds, and increase driver awareness of people on foot and on bikes.

Vulnerable user safety improvements are discussed in the Active Transportation section.

Operational improvements can also improve safety by decreasing speed differentials and reducing the occurrence of congestion-related crashes.

Geometric improvements, such as improving curves, adding turn lanes, traffic calming, and other treatments can improve safety by reducing the occurrence of and severity of crashes. Signal timing adjustments can also be used to improve safety where congestion or poor signal coordination contributes to crash frequency.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

ITS, and emerging vehicle-to-infrastructure (V2I) technologies can be implemented to improve both operations and safety. These technologies are built on a communications backbone, typically fiber optics, which allow for better management of the transportation system. The City has recently completed a Fiber Master Plan in an effort to plan how to connect its signal infrastructure with fiber, with a goal of developing more robust and nimble traffic operations. See the Mobility Trends chapter for additional information on these technologies.
Chapter 5. Active Transportation
INTRODUCTION

Developing safe and comfortable “low-stress” walking and bicycling networks is a priority for Littleton. This aligns with a new emphasis on creating “low-stress” walking and bicycling networks in U.S. cities. Low-stress means that people of all ages and abilities feel comfortable walking or bicycling. The best practices for evaluating and designing walking and bicycling networks have changed to emphasize quality in addition to connections to destinations. Historically, walking networks have been built to design minimums resulting in less-than ideal sidewalks and crossings and often challenging conditions for people using wheelchairs or other mobility aids. Likewise, bicycle networks have also been built with minimal resources resulting in bike facilities that only work for the small percentage of people who are comfortable bicycling on almost any type of street with or without dedicated space for bicyclists. Most recently, micromobility devices have become more popular including electric scooters, electric bikes, hoverboards, and electric skateboards. This chapter is focused on considering the needs of people walking, biking, and rolling in the City of Littleton.

LEGACY OF PAST PLANNING

Improvements to Littleton’s Active Transportation network have been included in several recent plans. Below are some common themes and the studies that presented them.

COMMON THEMES FROM EXISTING PLANS

- Make Littleton pedestrian friendly by expanding the pedestrian network, adding pedestrian bridges, extending sidewalks and improving existing sidewalks.
- Improve connections between downtown/river corridor/parks/trails.
- Complete network of streets in the City that provides connections, choice, calming, and capacity where appropriate.
- Improve bike facilities.
- Improve multimodal connections between commercial locations/residential developments.
- Improve trail network for transportation around and out of the City.
- Improve intersection crossings.
- Improve connections to light rail.
- Implement traffic calming strategies in neighborhoods.

LITTLETON PLANS & STUDIES

- Citywide Plan (2014)
- Belleview Avenue Corridor Vision (2018)
- Bicycle and Pedestrian Master Plan (2011)
- Broadway Corridor Study (2009)
- Downtown Neighborhood Plan (2011)
- City of Littleton Parks, Recreation, and Trails Master Plan (2016)
- Neighborhood Traffic Management Program (not dated)
- South Platte Working Group South Platte Connections Study (2019)
The most relevant past plan to Active Transportation is the 2011 *City of Littleton Bicycle and Pedestrian Master Plan*. This plan conducted extensive outreach, inventoried existing bicycle and pedestrian facilities, and made project and program recommendations for improving walking and bicycling in the City of Littleton. Progress on key recommendations is shown in Table 9 and Table 10:

### Table 9  Current Progress on Pedestrian Recommendations from 2011 Plan

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian intersection improvements at Federal Blvd/Bowles Ave intersection</td>
<td>Planned for Spring of 2020</td>
</tr>
<tr>
<td>Pedestrian signal at Federal Blvd and Berry Ave</td>
<td>Curb ramps installed in 2015, full signal installation planned for Spring 2020</td>
</tr>
<tr>
<td>Actuated crossing (RRFB) at Prince St/Jackass Hill Rd and High Line Canal Trail spur crossing (south of Sunset Dr)</td>
<td>RRFB planned for installation in 2020; in-street yield to pedestrian sign installed.</td>
</tr>
<tr>
<td>Actuated crossing (RRFB) at Prince St and Lee Gulch Trail crossing (near Briarwood Ave)</td>
<td>Complete</td>
</tr>
<tr>
<td>Install stairs connecting Mineral Ave elevated sidewalk on east side of LRT tracks up to social path on Jackass Hill Rd behind subdivision</td>
<td>Planned, year to be determined</td>
</tr>
</tbody>
</table>

### Table 10  Current Progress on Bicycle Recommendations from 2011 Plan

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install “L” bicycle routes throughout City of Littleton</td>
<td>Complete</td>
</tr>
<tr>
<td>Online bike route mapping</td>
<td>Complete</td>
</tr>
<tr>
<td>Coordinate with SRTS to create a back-to-school packets giving info on biking to and from school</td>
<td>Incomplete</td>
</tr>
<tr>
<td>Create an educational video about bicycling in Littleton</td>
<td>Complete</td>
</tr>
<tr>
<td>Install bicycle route wayfinding signage including destinations</td>
<td>Incomplete</td>
</tr>
<tr>
<td>Add more bicycle parking downtown</td>
<td>Complete</td>
</tr>
</tbody>
</table>
**KEY ISSUES AND CONSIDERATIONS**

Input and discussions for this Transportation Master Plan, through varied *Envision Littleton* community engagement, workshops with City Council and Planning Commission, and interaction with other City boards/commissions, City departments, and partner agencies and organizations, yielded the following list of key items that relate to the active transportation network:

- **Existing Pedestrian Infrastructure**: Currently the City of Littleton has great walking infrastructure downtown and along the Mary Carter Greenway but some challenges exist walking along and crossing Connector Streets and Commercial Corridors.

- **Existing Bicycle Infrastructure**: There is a strong trail system that connects the City of Littleton to the rest of the region, however, there is a lack of low-stress bicycle facilities to make local connections.

- **Complete Bicycle and Pedestrian Networks**: There is a strong desire to improve bicycle and pedestrian networks to make it easier to cross Santa Fe Drive and to connect to downtown Littleton.

**LEVEL OF SERVICE**

Multiple level of service measures are documented in this Active Transportation chapter. Moving forward, the City of Littleton should continue to update measures of serving pedestrians and bicyclists. Active transportation level of service should be updated with the following considerations:

1. Pedestrian Level of Traffic Stress (for sidewalks and crossings)

2. Walksheds to high-frequency transit stops and schools

3. Bikesheds to high-frequency transit stops and schools

**EXISTING NETWORK EVALUATION**

In order to understand how existing walking and bicycling facilities are serving the Littleton community, two quality analyses were conducted: *Pedestrian Level of Traffic Stress* and *Bicycle Level of Traffic Stress*. Additionally, multiple network coverage analyses were conducted for walking and bicycling to and from schools and RTD light rail stations. These analyses were conducted based on guidance from the 2018 *FHWA Guidebook for Measuring Multimodal Network Connectivity.*

**Pedestrian Analysis**

**Pedestrian Level of Traffic Stress**

In order to quantify the experience of walking along streets in different parts of the City of Littleton, a Pedestrian Level of Traffic Stress analysis was conducted. The Pedestrian Level of Traffic Stress (PLTS) method was developed by the Oregon Department of Transportation. This method uses up to 14 data inputs about sidewalks, streets, and intersections to determine how stressful it typically is for someone to use a sidewalk or street crossing. A simplified PLTS network analysis was completed using the sidewalk network layer. Due to data limitations, segments and intersections were assigned a PLTS score using sidewalk width, adjacent land use, and presence of a traffic control device at a crossing of a Connector Street or Commercial Corridor. The PLTS method helps decision-makers understand the experience of walking along individual street segments and determines whether the experience is low-stress enough for anyone to use or so high-stress that people will likely avoid walking along a street in that area unless it is the only way to go from point “a” to point “b”.

In the City of Littleton, 65% of sidewalks are PLTS 3 or 4 (Table 11). A definition of each PLTS level is presented in Table 12.
Table 11. Littleton Sidewalk PLTS Levels

<table>
<thead>
<tr>
<th>PLTS</th>
<th>Miles</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>61</td>
<td>19%</td>
</tr>
<tr>
<td>4</td>
<td>145</td>
<td>46%</td>
</tr>
</tbody>
</table>

Table 12. Pedestrian Levels of Traffic Stress (PLTS)

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLTS 1</td>
<td>Represents little to no traffic stress and requires little attention to the traffic situation. This is suitable for all users including children 10 years or younger, groups of people and people using a wheeled mobility device (WhMD). The facility is a sidewalk or shared-use path with a buffer between the pedestrian and motor vehicle facility. Pedestrians feel safe and comfortable on the pedestrian facility. Motor vehicles are either far from the pedestrian facility and/or traveling at a low speed and volume. All users are willing to use this facility.</td>
</tr>
<tr>
<td>PLTS 2</td>
<td>Represents little traffic stress but requires more attention to the traffic situation than of which young children may be capable. This would be suitable for children over 10, teens and adults. All users should be able to use the facility but, some factors may limit people using WhMDs. Sidewalk condition should be good with limited areas of fair condition. Roadways may have higher speeds and/or higher volumes. Most users are willing to use this facility.</td>
</tr>
<tr>
<td>PLTS 3</td>
<td>Represents moderate stress and is suitable for adults. An able-bodied adult would feel uncomfortable but safe using this facility. This includes higher speed roadways with smaller buffers. Small areas in the facility may be impassable for a person using a WhMD and/or requires the user to travel on the shoulder/bike lane/street. Some users are willing to use this facility.</td>
</tr>
<tr>
<td>PLTS 4</td>
<td>Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility. Traffic speeds are moderate to high with narrow or no pedestrian facilities provided. Typical locations include high speed, multilane roadways with narrow sidewalks and buffers. This also includes facilities with no sidewalk. This could include evident trails next to roads or ‘cut through’ trails. Only the most confident or trip-purpose driven users will use this facility.</td>
</tr>
</tbody>
</table>

Most of the sidewalks that are PLTS 3 or PLTS 4 are in residential areas and were given that score because they are 4 feet wide or narrower. In the downtown area many of the sidewalks are PLTS 1 or PLTS 2 but some are PLTS 3 or PLTS 4 further away from Main Street. Most sidewalks along Connector Streets and Commercial Corridors are PLTS 1 or PLTS 2. Figure 11 shows the results of the PLTS analysis.
Figure 11. Pedestrian Level of Traffic Stress
Walksheds

A walkshed analysis was completed to understand the current walking connections to schools and RTD light rail stations. In this case, the sidewalks and trails within the City of Littleton were used as a network along which to route trips of specific distances. Currently 33% of Littleton households are within a half-mile walk of a primary, secondary, or higher education facility. A half-mile walkshed roughly equates to a 10-15 minute walk depending on the walking speed. This distance is used as a standard in determining the walkability of an area (sometimes a 5 minute or ¼ mile walkshed is used—most commonly for measuring connections to bus service). Figure 12 and Figure 13 show the results of this analysis. The existing walkshed coverage is quite good, though dead-end streets or missing sidewalks reduce the full potential walkshed coverage in some areas.

Currently, 6% of Littleton households are within a half-mile walk of the Mineral or Littleton Downtown RTD Light Rail stations, which are the only high frequency transit stops in the City. Walkshed coverage to the Littleton Downtown station is quite good, though the rail lines create a barrier for neighborhoods to the southeast of the station resulting in walking out of direction along Prince Street or Littleton Boulevard to get to the station. The Mineral station walkshed coverage is poor in comparison due to its placement adjacent to the Santa Fe Drive and Mineral Avenue intersection and the lack of a traditional street grid in the vicinity of the station. Walking to the Mineral station also requires out of direction travel for many households within a half-mile.

Maps of the walksheds are shown Figure 12 and Figure 13.
38% of Littleton households are within a ½ mile walk along sidewalks to a primary, secondary, or higher education facility.

Walksheds were created by routing ½ mile from schools along the DRCOG 2016 Planimetrics Sidewalk Layer.
Figure 13. 1/2 Mile LRT Station Walksheds

6% of Littleton households are within a ½ mile walk of the Mineral or Littleton Downtown RTD Light Rail stations, which are the only high frequency transit stops in the City.

Walksheds were created by routing ½ mile from schools along the DRCOG 2016 Planimetrics Sidewalk Layer.
Bicycle Analysis

Bicycle Level of Traffic Stress

The Bicycle Level of Traffic Stress (BLTS) method was developed in the 2012 Mineta Transportation Institute report *Low Stress Bicycling and Network Connectivity*. The inputs for this method are bicycle facility type, such as sharrows, bike lanes, protected bike lanes, and separated paths, and other street data such as traffic speed, volume, and curbside use. The analysis is intended to help determine whether a child, an average person, or only the most confident bicyclists would bicycle along a street. A simplified Level of Traffic Stress analysis was completed for streets and trails in the City of Littleton. In this case, the analysis was simplified to "low-stress" or "not low-stress" due to data limitations. Low-stress bicycle facilities were defined as:

- Off-street trails (paved or unpaved)
- Local streets, or
- Shared lanes or bike lanes on streets with a speed limit of 25 or 20 miles per hour and with less than 4,000 ADT

There are currently 60 miles of low-stress bicycle facilities in the City of Littleton.

Table 13. Existing Low-Stress Bicycle Facilities

<table>
<thead>
<tr>
<th>Type</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike Lane</td>
<td>2</td>
</tr>
<tr>
<td>Bike Shoulder</td>
<td>1</td>
</tr>
<tr>
<td>Local Street</td>
<td>2</td>
</tr>
<tr>
<td>Trails</td>
<td>50</td>
</tr>
<tr>
<td>Shared Lane</td>
<td>3</td>
</tr>
<tr>
<td>Shared Parking/Bike Lane</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

The results of the analysis below show the existing low-stress bicycle network, and identification of key gaps in the network. There is a strong existing trail system and plenty of low traffic volume streets in the City, but Connector Streets and Commercial Corridors pose a barrier both to cross and to travel along for bicyclists. The most direct routes to travel for bicyclists currently tend not to be low-stress facilities. There are 28 miles of projects proposed to complete the low-stress bicycle network in the City of Littleton. These are summarized in Table 14 and shown in Figure 14.

Table 14. Proposed New Low-Stress Bicycle Facilities

<table>
<thead>
<tr>
<th>Type</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory Bike Lane</td>
<td>2</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>1</td>
</tr>
<tr>
<td>Buffered Bike Lane &amp; Traffic Calming</td>
<td>2</td>
</tr>
<tr>
<td>Protected Bike Lane</td>
<td>14</td>
</tr>
<tr>
<td>Shared Use Path</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

Table 14. Proposed New Low-Stress Bicycle Facilities
Low-Stress Bike Routes are defined as:
- Off-street trails (paved or unpaved)
- Local streets
- Shared lanes or bike lanes on streets with a speed limit of 25 or 20 miles per hour and with less than 4,000 ADT.
Bikesheds

Using the low-stress bicycling network identified above, bikeshed analyses were completed for access to schools and the RTD light rail stations. Currently, 21% of Littleton households are within a half-mile low-stress bike ride of primary, secondary, or higher education facilities (Figure 15). This is relatively low, especially compared to the walkshed analysis shown previously. This number is low because of the lack of low-stress bicycle facilities on Connector Streets and Commercial Corridors which pose a barrier to bicycling.

Currently, 15% of Littleton households are within a 2-mile low-stress bike to the Mineral or Littleton Downtown RTD Light Rail stations (Figure 16). A 2-mile bike ride is a typical bicycle shed distance as it takes the average rider roughly 10 minutes which is the same amount of time as the ½ mile walkshed discussed previously. The existing bikeshed coverage is primarily routed along existing trails, and a lack of on-street low-stress bicycle facilities to connect to the stations reduces the potential bikeshed coverage.
TRANSPORTATION MASTER PLAN: ACTIVE TRANSPORTATION

Figure 15. 1/2-Mile Low Stress Bikeshed to Educational Facilities
15% of Littleton households are within a 2-mile low-stress bike ride to the Mineral or Littleton Downtown RTD Light Rail stations.
COMPLETE BICYCLE AND PEDESTRIAN NETWORKS

In order to connect people in the City of Littleton with more destinations more easily by walking and biking, a vision for complete bicycle and pedestrian networks was developed. The vision was developed by examining the existing network, conducting a gaps assessment, and making recommendations for completing the bicycle and pedestrian networks.

PEDESTRIAN NETWORK

At a high level, gaps in the pedestrian network were identified using sidewalk widths in the City. To better focus improvement efforts, pedestrian priority areas were identified in the City. These correspond with downtown, the area around both RTD light rail stations, and along streets in the City including:

- Bowles Avenue/ Littleton Boulevard
- Prince Street
- Windermere Street
- Gallup Street
- Elati Street
- Broadway
- Mineral Avenue
- Ridge Road
- Caley Avenue
- Belleview Avenue

The United States Access Board 2002 ADA Accessibility Guidelines (ADAAG) require a minimum clear width of 3 feet on all accessible routes (including sidewalks). If only 3 feet are provided than 5 foot by 5 foot passing areas must be provided “at reasonable intervals not to exceed 200 feet.” However, the United States Access Board created proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) in 2011 which state that the minimum clear width on all accessible routes (including sidewalks) should by 5 feet which is the minimum width required for two people in a typical wheelchair to pass each other. The PROWAG guidelines state that in constrained locations, the absolute minimum width is 4 feet. Taking these requirements into account, the design minimum clear width of sidewalks should be 5 feet with allowance for a 4-foot minimum in locations where 5 feet is infeasible.

BICYCLE NETWORK

Building off the existing low-stress bicycle network described in the Existing Network Evaluation section, key gaps in the bicycle network were identified. The NACTO Contextual Guidance for Selecting All Ages & Abilities Bikeways decision matrix was used to identify what type of bicycle facility would be most appropriate to create a low-stress connection given the existing number of lanes, motor vehicle speed, and motor vehicle volume. This guide recommends the following types of bicycle facilities based upon motor vehicle speed, volume, number of lanes, and operational characteristics:

- Shared Street
- Bicycle Boulevard
- Bike Lane
- Buffered Bike Lane & Traffic Calming
- Protected Bike Lane
- Shared Use Path

The results of this analysis are shown in Figure 17 and Figure 18.
Figure 17. Future 1/2-Mile Low Stress Bikeshed to Educational Facilities
Once the Low-Stress Bicycle Network is complete...

**76%** of Littleton households will be within a 2-mile low-stress bike ride to the Mineral or Littleton Downtown RTD Light Rail stations or Broadway bus stops.

**4.6x more people connected**
FRAMEWORK FOR ACTION

The framework for action below is organized in four tiers: (1) Goals, (2) Policies, (3) Objectives, and (4) Actions. All are intended to mesh with and support the other aspects of this Transportation Master Plan.

GOALS

Improving Active transportation in the City of Littleton will help to achieve all five overarching goals of this Transportation Master Plan.

- **Connected**: By improving connections for people walking and bicycling, more people will be connected to more destinations no matter what mode they choose to use to get around.

- **Healthy**: Active Transportation is the healthiest way for people to move around. If more people are able to walk and bicycle for more trips in the City of Littleton then more people will be able to achieve an active and healthy lifestyle.

- **Inclusive**: By elevating Active Transportation as a priority for transportation, people of all ages, abilities, and backgrounds will be able to move around the City of Littleton in ways that are best suited to their needs and lifestyle.

- **Prosperous**: People that walk or bicycle to businesses tend to visit businesses more and spend more on average than people driving past businesses. Providing Active Transportation connections to businesses will support local economic prosperity.

- **Sustainable**: Walking and bicycling are both zero-emissions modes of travel which also have a very small impact on pavements in comparison to driving. With an increase in the number of people walking and bicycling, transportation and infrastructure emissions will be reduced.

POLICIES

Existing Policies

The installation of “bikeways” is enabled by the Littleton City Code, Chapter 9 Traffic Code, Section 1-7 Bikeways. There is currently a lack of other detailed policies for implementing pedestrian and bicycle facilities.

Proposed Policies

In making decisions that involve public resource allocation, regulatory matters, and physical improvements, among others, Littleton will:

**Planning**

1. Develop a Complete Networks Plan.
2. Develop a Transportation Demand Management Plan.
3. Implement a comprehensive bicycle and pedestrian count program like the vehicle count program. Consider installation of permanent continuous counters in key locations and as part of upcoming projects.
4. Consider installing an all ages and abilities bicycle facility for every new bicycle project. All ages and abilities bicycle facilities are low-stress for all potential users, spanning from children to seniors.
5. Update City Code to address burgeoning micromobility industry. Include operating rules such as number of permits, speed limits, whether users should use sidewalks, bike lanes, or general purpose lanes depending on speeds. Establish any restricted areas for the operation of micromobility units.

**Maintenance**

1. Consider including bicycle and pedestrian facility upgrades as part of every infrastructure project, including resurfacing projects.
2. Consider bicycle and pedestrian detection for signal actuation in every new traffic signal installation
3. Maintain a fleet of smaller snow removal vehicles to plow trails, shared use paths, and protected bike lanes
4. Update City Code to require residents/businesses to clear sidewalks within 24 hours; existing code states, "within a reasonable time after every snowfall"
5. Evaluate existing sidewalk policy/code

Development

1. In development proposals, limit curb cuts along proposed planned bicycle and pedestrian routes.
2. Require maintaining clear sidewalks or bicycle lanes during building or street construction or provide a detour: [http://www2.oaklandnet.com/oakca1/groups/pwa/documents/memorandum/oak061424.pdf](http://www2.oaklandnet.com/oakca1/groups/pwa/documents/memorandum/oak061424.pdf)
3. Encourage new developments to provide secure indoor parking and other end-of-trip facilities for bicyclists.
4. Encourage development to utilize grid street networks and limit the use of cul-de-sacs.
OBJECTIVES

In order to achieve the overall Transportation Master Plan goals outlined above, multiple objectives have been developed. The objectives in Table 15 are specific to improving active transportation networks in the City of Littleton.

Table 15. Objectives—Active Transportation Networks

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Related Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Achieve high resident satisfaction rates with transportation services</td>
<td>・ ・ ・ ・</td>
</tr>
<tr>
<td>2</td>
<td>Quality of Life</td>
<td>Provide spaces that people can enjoy within the public right-of-way</td>
<td>・ ・</td>
</tr>
<tr>
<td>3</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety on all transportation modes</td>
<td>・ ・</td>
</tr>
<tr>
<td>4</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
<td>・ ・</td>
</tr>
<tr>
<td>6</td>
<td>Community</td>
<td>Minimize transportation-related air quality degradation</td>
<td>・ ・</td>
</tr>
<tr>
<td>7</td>
<td>Community</td>
<td>Minimize transportation-related water quality degradation</td>
<td>・ ・</td>
</tr>
<tr>
<td>8</td>
<td>Community</td>
<td>Minimize transportation-related noise impacts</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>11</td>
<td>Community</td>
<td>Provide a transportation system the City can afford to maintain</td>
<td>・</td>
</tr>
<tr>
<td>13</td>
<td>Mobility</td>
<td>Achieve a balanced mode share</td>
<td>・ ・ ・ ・</td>
</tr>
<tr>
<td>14</td>
<td>Mobility</td>
<td>Provide high-quality transportation systems people can afford to use</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>15</td>
<td>Mobility</td>
<td>Provide travelers with relevant, timely information -- including innovative methods</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>16</td>
<td>Active</td>
<td>Provide a well-connected, direct bicycling network</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>17</td>
<td>Active</td>
<td>Provide a safe biking environment</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>18</td>
<td>Active</td>
<td>Provide a well-connected pedestrian network</td>
<td>・ ・</td>
</tr>
<tr>
<td>19</td>
<td>Active</td>
<td>Provide a safe walking environment</td>
<td>・ ・ ・</td>
</tr>
<tr>
<td>20</td>
<td>Active</td>
<td>Provide healthy transportation choices</td>
<td>・ ・</td>
</tr>
<tr>
<td>26</td>
<td>Transit</td>
<td>Connect people effectively to the transit system</td>
<td>・ ・</td>
</tr>
</tbody>
</table>

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ACTIONS

The actions below convey tangible steps that will lead to achievement of the goals in line with the stated policies.

Capital Investments

Capital investments have been identified to address many of the issues related to Active Transportation in the City. Table 16 presents these investments. Figure 19 is a map showing the location of the projects listed in Table 16.

Table 16. Active Transportation Capital Investments

<table>
<thead>
<tr>
<th>No.</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Project Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Caley Ave</td>
<td>Prince St to Broadway</td>
<td>Shared lane</td>
<td>Advisory bike lane or bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>2</td>
<td>Powers Ave</td>
<td>Court Pl to Delaware St</td>
<td>Shared lane</td>
<td>Advisory bike lane or bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>3</td>
<td>Berry Ave</td>
<td>Blue Sage Dr to Federal Blvd</td>
<td>Shared lane</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>4</td>
<td>Powers Ave</td>
<td>Delaware St to Broadway</td>
<td>Shared lane</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>5</td>
<td>Elati St</td>
<td>Shepperd Ave to High Line Canal</td>
<td>Shared lane</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>6</td>
<td>Delaware St</td>
<td>Lehow Ave to Powers Ave</td>
<td>Shared lane</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>7</td>
<td>Windermere St</td>
<td>Ridge Rd to High Line Canal Trail</td>
<td>Shared lane</td>
<td>Buffered bike lane and traffic calming</td>
<td>Ultimate</td>
</tr>
<tr>
<td>8</td>
<td>Windermere St/Jamison Ave</td>
<td>Mineral Ave to Broadway</td>
<td>Bike lane/ bike shoulder</td>
<td>Buffered bike lane and traffic calming</td>
<td>Ultimate</td>
</tr>
<tr>
<td>9</td>
<td>Bellevue Ave</td>
<td>City Limits/ Prospect Rd to Irving St</td>
<td>Bike lane/ none</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>10</td>
<td>Windermere St</td>
<td>City Limits/ Layton Ave to Littleton Blvd</td>
<td>Bike lane/ shared parking</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>11</td>
<td>Windermere St</td>
<td>Littleton Blvd to Ridge Road</td>
<td>Bike lane/ shared parking</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>12</td>
<td>Ridge Rd</td>
<td>Prince St to Broadway</td>
<td>Bike lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>13</td>
<td>Alamo Ave</td>
<td>Prince St to Court Pl</td>
<td>None</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
</tbody>
</table>

A strategic Action is aimed at seizing a special opportunity or addressing a particular challenge one faces, given limited resources—financial and otherwise—and recognizing that a broader program of new or ongoing activities will also be pursued in the meantime.
<table>
<thead>
<tr>
<th>No.</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Project Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Main St</td>
<td>Prince St to Court Pl</td>
<td>None</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>15</td>
<td>Church Ave</td>
<td>Santa Fe Dr to Prince St</td>
<td>None</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>16</td>
<td>Federal Blvd</td>
<td>Bellevue Ave to Bowles Ave</td>
<td>Bike lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>17</td>
<td>Lowell Blvd</td>
<td>Bellevue Ave to Bowles Ave</td>
<td>Shared lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>18</td>
<td>Prince St</td>
<td>Centennial Dr to Mineral Ave</td>
<td>Bike lane/ shared lane/ shared parking/ bike lane/ bike shoulder</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>19</td>
<td>Southpark Ln</td>
<td>Mineral Ave to County Line Rd</td>
<td>Shared lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>20</td>
<td>Centennial Dr/ Prentice Ave/ Progress Ave</td>
<td>Federal Blvd to Prince St</td>
<td>Bike lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>21</td>
<td>Broadway</td>
<td>High Line Canal Trail south of Arapahoe Rd to Ridge Road</td>
<td>None</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>22</td>
<td>Broadway</td>
<td>Bannock St to Caley Ave</td>
<td>None</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>23</td>
<td>Belleview Ave</td>
<td>Irving St to City Limits</td>
<td>None</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>24</td>
<td>Mineral Ave</td>
<td>Broadway to E Dry Creek Rd</td>
<td>Shared lane</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>25</td>
<td>Broadway</td>
<td>Jamison Ave to City Limits</td>
<td>None</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>26</td>
<td>Broadway</td>
<td>Powers Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>27</td>
<td>Santa Fe Dr</td>
<td>Prince St</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>28</td>
<td>Prince St</td>
<td>Alamo Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>29</td>
<td>Santa Fe Dr</td>
<td>Bellevue Ave</td>
<td>Traffic signal - SPUI</td>
<td>Bicycle intersection improvements</td>
<td>Interim</td>
</tr>
<tr>
<td>No.</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Project Life</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td>-------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>30</td>
<td>Lowell Blvd</td>
<td>Berry Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>31</td>
<td>Mary Carter Greenway</td>
<td>Bowles Ave</td>
<td>Grade-separated crossing</td>
<td>Bridge widening</td>
<td>Ultimate</td>
</tr>
<tr>
<td>32</td>
<td>Middlefield Rd</td>
<td>Bowles Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>33</td>
<td>Prince St</td>
<td>Caley Ave</td>
<td>Cross traffic does not stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>34</td>
<td>Bannock St</td>
<td>Littleton Blvd</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>35</td>
<td>Windermere St</td>
<td>Littleton Blvd</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>36</td>
<td>Prince St</td>
<td>Main St</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>37</td>
<td>Jackass Hill Rd/ Long Ave</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>38</td>
<td>Santa Fe Dr</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Bicycle intersection improvements</td>
<td>Interim</td>
</tr>
<tr>
<td>39</td>
<td>Apache St/ High Line Canal Trail</td>
<td>Ridge Rd</td>
<td>3-way stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>40</td>
<td>Elati St</td>
<td>Ridge Rd</td>
<td>4-way stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>41</td>
<td>Gallup St</td>
<td>Ridge Rd</td>
<td>4-way stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>42</td>
<td>Prince St</td>
<td>Ridge Rd</td>
<td>4-way stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>43</td>
<td>Windermere St</td>
<td>Ridge Rd</td>
<td>4-way stop</td>
<td>Bicycle intersection improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>44</td>
<td>Broadway</td>
<td>High Line Canal Trail (S of Arapahoe Rd)</td>
<td>Cross traffic does not stop</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>45</td>
<td>Mineral Ave</td>
<td>Peninsula Dr/ High Line Canal Trail</td>
<td>Traffic signal</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>46</td>
<td>Rio Grande St</td>
<td>Slaughterhouse Gulch Trail</td>
<td>None</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>No.</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Project Life</td>
</tr>
<tr>
<td>-----</td>
<td>----------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>47</td>
<td>Santa Fe Dr</td>
<td>Slaughterhouse Gulch Trail</td>
<td>None</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>48</td>
<td>Santa Fe Dr</td>
<td>Dad Clark Gulch</td>
<td>Bridge (no connection)</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>51</td>
<td>Federal Blvd</td>
<td>Bellevue Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>52</td>
<td>Lowell Blvd</td>
<td>Bellevue Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>53</td>
<td>Windermere St</td>
<td>Bellevue Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>54</td>
<td>Southpark Ln</td>
<td>Mineral Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>55</td>
<td>Windermere St</td>
<td>Powers Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>56</td>
<td>Federal Blvd</td>
<td>Bowles Ave/ Trail Crossing</td>
<td>Traffic signal</td>
<td>Raised crossing in channelized right turn lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>57</td>
<td>Prince St</td>
<td>Little's Creek Trail</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
<td>Ultimate</td>
</tr>
<tr>
<td>58</td>
<td>Berry Ave</td>
<td>Federal Blvd</td>
<td>Cross traffic does not stop</td>
<td>Pedestrian signal</td>
<td>Ultimate</td>
</tr>
<tr>
<td>59</td>
<td>Bega Park Trail</td>
<td>Alamo Ave</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
<td>Ultimate</td>
</tr>
<tr>
<td>64</td>
<td>Bega Park Trail</td>
<td>Main St</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
<td>Ultimate</td>
</tr>
<tr>
<td>67</td>
<td>Mary Carter Greenway</td>
<td>Mineral Ave</td>
<td>Grade-separated crossing</td>
<td>Bridge widening</td>
<td>Ultimate</td>
</tr>
<tr>
<td>68</td>
<td>Broadway</td>
<td>Caley Ave/ High Line Canal Trail</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>Ultimate</td>
</tr>
<tr>
<td>69</td>
<td>Platte Canyon Rd</td>
<td>Mineral Ave/ Ken Caryl Rd</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>Ultimate</td>
</tr>
<tr>
<td>70</td>
<td>Broadway</td>
<td>Ridge Rd/ High Line Canal Trail</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>Ultimate</td>
</tr>
<tr>
<td>73</td>
<td>Mineral Ave</td>
<td>Jackass Hill Rd to Broadway</td>
<td>Bike lane</td>
<td>Protected bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>No.</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Project Life</td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------</td>
<td>----------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>74</td>
<td>Broadway</td>
<td>Lee Gulch</td>
<td>Cross traffic does not stop</td>
<td>Grade-separated</td>
<td>Ultimate</td>
</tr>
<tr>
<td>75</td>
<td>Elati St</td>
<td>Highline Canal</td>
<td>Dirt path</td>
<td>Improve connection</td>
<td>Ultimate</td>
</tr>
<tr>
<td>76</td>
<td>Bannock St</td>
<td>Powers Ave to Broadway</td>
<td>Shared lane/ none</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>77</td>
<td>Shepperd Ave</td>
<td>Bannock St to Elati St</td>
<td>Shared parking/ bike lane</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>78</td>
<td>Sterne Pkwy</td>
<td>Apache St to Broadway</td>
<td>None</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>79</td>
<td>Tule Lake Dr</td>
<td>Sheridan Blvd/ City Limits to Federal Blvd</td>
<td>None</td>
<td>Bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>80</td>
<td>Rangeview Dr</td>
<td>Windermere St to Prince St</td>
<td>Path</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>81</td>
<td>Geddes Ave</td>
<td>Windermere St to Elati St</td>
<td>None</td>
<td>Advisory bike lane or bike lane</td>
<td>Ultimate</td>
</tr>
<tr>
<td>82</td>
<td>Mineral Ave</td>
<td>Between Santa Fe Dr &amp; Jackass Hill Rd</td>
<td>Path</td>
<td>Shared use path</td>
<td>Ultimate</td>
</tr>
<tr>
<td>83</td>
<td>Mineral Ave</td>
<td>Wolff St to Polo Ridge Dr</td>
<td>Path</td>
<td>Trail crossing improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>84</td>
<td>Mineral Ave</td>
<td>Polo Ridge Dr</td>
<td>RRFB</td>
<td>Pedestrian signal or other improvement</td>
<td>Ultimate</td>
</tr>
<tr>
<td>85</td>
<td>Little's Creek Flume Trail Connection</td>
<td>RR Tracks</td>
<td>No connection</td>
<td>Trail connection across flume</td>
<td>Ultimate</td>
</tr>
<tr>
<td>86</td>
<td>City-wide</td>
<td>15.1-mi</td>
<td>Varies</td>
<td>Missing sidewalks</td>
<td>Ultimate</td>
</tr>
<tr>
<td>87</td>
<td>City-wide</td>
<td>32.5-mi</td>
<td>Varies</td>
<td>Narrow sidewalks</td>
<td>Ultimate</td>
</tr>
</tbody>
</table>

*Project life indicates whether the improvement results in a desired final condition (ultimate) or represents a step toward that final condition (interim).*
Figure 19. Active Transportation Projects
Programs and Initiatives

1. Develop and fund a sidewalk improvement program, aimed at addressing highest need areas and facilities.

2. Create a bike map that is easy to understand and use and can be integrated into mobile mapping applications.

Regulations and Standards

1. Update street design standards to include best practices from National Association of City Transportation Officials (NACTO), Federal Highway Administration (FHWA), Manual on Uniform Traffic Control Devices (MUTCD), and American Association of State Highway and Transportation Officials (AASHTO).

Partnerships and Coordination

1. The City of Littleton should coordinate with CDOT, RTD, and adjacent municipalities where appropriate to implement Active Transportation projects.

2. The City of Littleton should coordinate with neighboring or regional agencies in applications for grant funding to implement Active Transportation projects.

More Targeted Planning/Study

1. Create a bicycle wayfinding program that includes region-wide and City-specific system maps posted in key locations, as well as comprehensive, easy-to-understand signing.
STATE OF THE PRACTICE

Since the first *City of Littleton Bicycle and Pedestrian Master Plan* was completed in 2011, there have been many new progressive design and planning guidance documents published for improving walking and bicycling facilities in cities. The National Association of City Transportation Officials (NACTO) has published very thorough and easy-to-use guidance documents that help achieve the principles of designing for all ages and abilities. For linear bicycle facilities, the NACTO *Urban Bikeway Design Guide* (2014) and *Designing for All Ages and Abilities* guide (2017) are valuable references. For bicycle design at intersections, the NACTO *Don’t Give Up at the Intersection* guide (2019) is a great resource. Below are examples of best practices from these guides that the City of Littleton will consider when implementing the complete bicycle and pedestrian networks identified in this document.

BICYCLE TRAVEL LANES

**Protected Bike Lane/ Cycle Track:** A protected bike lane is a street-level bicycle facility that are protected from motor vehicle traffic by a raised physical barrier which can include concrete curbs, bollards, planters, and/or on-street parking. Typically when the protected bike lane is raised it is referred to as a cycle track.

![Protected Bike Lane, Source: NACTO](protected_bike_lane.png)

**Two-Way Protected Bike Lane/ Cycle Track:** A two-way protected bike lane is a wider protected bike lane only on one side of the street that allows for two-way bicycle travel. Typically when a two-way protected bike lane is raised it is referred to as a two-way cycle track. Because one direction of bicycle travel is running against the expected direction of traffic, special design considerations should be made to ensure the visibility and safety of bicyclists on this type of facility.

![Raised Cycle Track, Source: NACTO](raised_cycle_track.png)
Description

Buffered Bike Lane: Buffered bike lanes are a street-level bicycle facility that are separated from motor vehicle traffic by a painted buffer space usually two to three feet in width.

Photo/Image

Source: NACTO

Description

Buffered Bike Lane: Buffered bike lanes are a street-level bicycle facility that are separated from motor vehicle traffic by a painted buffer space usually two to three feet in width.

Photo/Image

Source: NACTO

Description

Conventional Bike Lane: A conventional bike lane is a street-level bicycle facility that is immediately adjacent to motor vehicle traffic.

Photo/Image

Source: NACTO

Description

Advisory Bike Lane: Advisory bike lanes work like a narrow two-way local street. Bicyclists travel in the advisory bike lane and motor vehicles must yield to bicyclists. If there is oncoming traffic then motor vehicles must yield to the bicyclist and the oncoming motor vehicle before passing. Centerlines are not compatible with advisory bike lanes. Oftentimes advisory bike lanes allow the installation of a bike facility without the need to remove existing on-street parking lanes.

Photo/Image

Source: City of Alexandria, VA/Hillary Orr
Description

**Bicycle Boulevards:** Streets with low automobile traffic volumes that are designed to prioritize bicyclists of all ages and abilities. Typically Bicycle Boulevards are installed on local streets with minimal design treatments except at intersections. Typical elements of a Bicycle Boulevard include: traffic calming, through-traffic diversion, pavement markings and wayfinding signage.

Photo/Image

Partial Closure - Except Bicycles, Source: NACTO
BICYCLE INTERSECTION TREATMENTS

Description

**Bicycle Signal**: Dedicated signal for bicyclists to be provided in addition to a traffic signal when bicycle-specific traffic movements are desired such as a protected bicycle phase or a leading bicycle interval phase. A dedicated bicycle facility should be a prerequisite to installing a bicycle signal so that bicyclists are not mixed in with motor vehicle traffic and unable to make it to the front of the queue.

![Bicycle Signal Image](source:nacto)

Description

**Bike Box**: A bike box is a dedicated space for bicyclists at the front of a traffic lane at an intersection. Bike boxes allow for large volumes of bicyclists to queue at the head of an intersection which allows them to clear the intersection more quickly. They also increase their visibility to adjacent motor vehicle drivers, reducing the likelihood of a “right-hook” crash where a vehicle turns right across the path of a through bicyclists. Bike boxes must be installed with a no turn on red sign for motor vehicle drivers.

![Bike Box Image](source:nacto)
Description

**Protected Bicycle Intersection**: A protected bicycle intersection involves installing physical barriers in the intersection to extend the protection for bicyclists from turning motor vehicles and allow for additional space for bicycle queuing ahead of stopped motor vehicles.

Photo/Image

Source: bicycledutch.wordpress.com

Description

**Intersection Crossing Markings—“Crossbike”**: Markings that indicate to bicyclists where to travel when crossing an intersection and indicate to motor vehicle drivers where to expect crossing bicyclists.

Photo/Image

Source: NACTO

Description

**Two-Stage Turn Queue Box**: Marking that indicates where to wait to make a two-stage turn. A two-stage turn is typically when a bicyclist wants to make a left turn but does not want to merge across multiple lanes of traffic. The bicyclists pull off to the right at the far side of an intersection and turns and waits for the signal to cross, effectively making a left turn.

Photo/Image

Source: NACTO
PEDESTRIAN & BICYCLE INTERSECTION TREATMENTS

Description

**Median Refuge Island:** A median with refuges for pedestrians and bicycles and enhanced crossing markings and signage. The refuges allow for two-stage crossings of a street—crossing one direction of traffic to reach the refuge and then crossing the other direction of traffic.

Photo/Image

Source: NACTO

Description

**Curb Extension:** A curb extension (also sometimes called a bulb-out or bump-out) is an extension of the sidewalk or curb line at an intersection that is roughly the same width as the parallel parking lane. Curb extensions reduce crossing distances for pedestrians and slow motor vehicle traffic by narrowing the roadway.

Photo/Image

Source: NACTO

Description

**Raised Crossing:** Elevating a pedestrian or bicycle crossing to the level of the sidewalk or adjacent curb. Motor vehicles must slow down to traverse the raised crossing which improves yielding compliance to crossing pedestrians or bicyclists. Raised crossings are easier for pedestrians of all ages and abilities to traverse because the flush crossing eliminates the need to travel down a ramp off of the sidewalk and back up a ramp at the other side of the street.

Photo/Image

Source: NACTO
Description

**Reduce Corner Radii:** The design radius of intersection corners determines the speed with which someone can take a turn at that intersection. Designing intersections with small corner radii can reduce motor vehicle speeds, increase driver awareness, shorten pedestrian crossings, provide additional space for improved ADA ramp design, and improve traffic control device visibility.

![Image](source: Dan Burden)

**Description**

**Rectangular Rapid Flashing Beacons (RRFB):** Rectangular rapid flashing beacons (RRFBs) alert drivers to the presence of a pedestrian or bicyclist crossing, and are installed along with a pedestrian, bicycle, or school crossing warning sign. RRFBs are presently installed in multiple locations in Littleton.

![Image](source: NACTO)
Chapter 6. Transit
INTRODUCTION

Transit plays an important role in defining Littleton’s transportation system. In addition to alleviating the burden on the roadway network and providing mobility options, transit can help to anchor vibrant, people-oriented centers of activity within the City.

Transit includes all fixed-route bus and rail routes, as well as demand-response transportation available to the general public. In Littleton, these services are predominately provided by RTD, although the City operates the Shopping Cart fixed-route bus and Omnibus demand-response shuttle. The Shopping Cart and Omnibus provide transit services to disabled residents and residents age 55 or older. Shopping Cart is a scheduled fixed-route service operating Monday-Saturday, shuttling passengers to/from area grocery stores and the Streets of Southglenn. Omnibus is scheduled by appointment only, Monday-Friday, with ride priority given to medical trips (top priority), grocery shopping, and hair/barber trips. Maps summarizing the City’s transit routes, frequency, and ridership can be found in the Existing City chapter.

88.6% of Littleton households are within a ½ mile walk of a bus or rail stop.

The average Littleton household has 1,346 transit trips available within ½ mile per week.¹

THE CITY’S ROLE IN PUBLIC TRANSIT

The reasons someone might choose to take a bus or train, instead of driving alone, go well beyond the service planning jurisdiction of RTD (which includes factors such as the schedule and trajectory of the route). Achieving a transportation network that optimizes transit ridership requires the participation of employers (who dictate a large percentage of overall trips), developers (who have some control over how housing, retail, and office space will incentivize certain modes of travel), municipalities like Littleton (which generally own and operate the streets, sidewalks, and trails), and the public itself.

¹ https://alltransit.cnt.org/metrics/?addr=littleton
² https://www-static.bouldercolorado.gov/docs/BOULDER_TMP-SOS_Final_Rept_COMP-1-

RTD was created by the state legislature and collects tax within its borders to fund a transit system. RTD has always worked closely with the municipalities of the region, and Littleton in particular has a history of leadership when it comes to connecting its residents with opportunities through transit expansion. The City was instrumental in building the region’s first suburban light rail line.

As an example, several of the Denver region’s municipalities have taken an even more proactive role in guiding transit service. In the 1990s, the City of Boulder established its own vision for transit by establishing the Community Transit Network (CTN), which has led the City to fund additional bus service beyond what RTD would typically have been able to provide in their City². In a similar move, the City and County of Denver will ask voters in November 2019 to approve a change in City charter to allow the public works department to offer transportation services, essentially enabling the creation of a transit agency housed within the City.
As Littleton works toward the goals of Envision Littleton, RTD and other regional partners such as DRCOG can provide administrative resources and institutional knowledge to support the City’s public transit goals. These partners can also serve as conduits for access to additional state and federal funding to bolster local investments in capital projects related to transit service (such as traffic operations or station amenities).

LEGACY OF PLANNING

The following plans previously developed in Littleton and in the region provided an essential foundation for preparing this Transit element of the Transportation Master Plan.

- RTD FasTracks (Southwest Corridor Extension Environmental Evaluation)
- RTD Regional BRT Feasibility Study
- City of Littleton Mineral Station Area Framework
- RTD Mobility Hub Guidelines

Key takeaways from past planning efforts include:

- Extension of light rail service along the southwest lines from Mineral station to a new Park-n-Ride station in Highlands Ranch at C-470 & Lucent Blvd. New station would include 1,000 parking spaces. Interim station (not included in original FasTracks system) is being considered at Santa Fe Drive & C-470. This station would include 404 parking spaces.
- Broadway/Lincoln identified as top-priority BRT corridor through three tiers of screening based on ridership, travel demand, congestion/delay, and viability.
- "Community Support" identified as key criteria for successful BRT implementation.
- Enhanced safety amenities and character based design guidelines needed for light rail stations.
- Implement character-based design guidelines.

- Shift in thinking from "transit stops" to "mobility hubs" to allow for flexibility and maximize community benefit. (Four stops/stations in Littleton).

KEY ISSUES AND CONSIDERATIONS

Input and discussions for this Transportation Master Plan, through varied Envision Littleton community engagement, workshops with City Council and Planning Commission, and interaction with other City boards/commissions, City departments, and partner agencies and organizations, yielded the following list of key items that relate to the transit network:

- **Resident Satisfaction & Usage:** Transit services in Littleton receive generally high support from residents, but satisfaction with bus service has declined somewhat in recent years. Compared with other cities in the region, Littleton has a slightly higher rate of commuting via transit.

- **Level of Service:** Includes considerations of frequency, coverage, and reliability of bus and rail service. While nearly all households in Littleton have access to transit service of some kind, the usefulness of that service varies—in general, bus routes run infrequently and most trips within the City require a transfer.

- **Stops & Stations:** Enhancements to transit stops/stations can be a useful tool for achieving desired community character (particularly for areas among the mixed-use designations).

- **Specialized Service:** The City operates fixed-route (Shopping Cart) and demand-response (Omnibus) shuttle services targeted at providing for the mobility needs of those with disabilities as well as people over the age of 55.

More information on each of these key issues is provided in Table 17.
Table 17. Peer Cities—Transit at a Glance

<table>
<thead>
<tr>
<th>City</th>
<th>2018 Population (Estimate)</th>
<th>% of Population Commuting By Public Transit</th>
<th>% of Population Commuting By Public Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Littleton, CO</td>
<td>48,007</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Wheat Ridge, CO</td>
<td>31,400</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Englewood, CO</td>
<td>34,690</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Lakewood, CO</td>
<td>156,789</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Broomfield, CO</td>
<td>69,267</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Centennial, CO</td>
<td>110,831</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Commerce City, CO</td>
<td>58,449</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Arvada, CO</td>
<td>117,268</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

RESIDENT SATISFACTION & USAGE

Overall, Littleton’s transit network and usage compares favorably to peer cities within the region and elsewhere in the country. As shown in the table below, Littleton has a greater percentage of transit commuters than comparable cities (even those with more extensive bus and rail coverage).

More than four out of five respondents to the Littleton Resident Survey rated light rail and Shopping Cart/Omnibus service “good” or “excellent.” Still, local bus routes within the City are generally underutilized, and respondents to the resident survey rate bus travel as the least convenient mode.

SERVICE QUALITY

Level of Service

For transit, LOS refers to the availability, frequency, comfort, and convenience of transit for people who make trips via transit on either bus or rail. The percentage of citizens with convenient access to high-quality transit is used to measure how well transit services are meeting Littleton’s needs (Figure 20). It must be acknowledged that Littleton is but a part of RTD and does not provide the majority of transit service in the City. Moving forward, the City of Littleton will continue to update measures of transit service.

4 https://www.littletongov.org/home/showdocument?id=16730

envisionlittleton.org
The key measurements to update are:

1. Ridership within the City (measured by boardings and alightings)
2. Households within one mile of high-frequency transit stop/station
3. Jobs within 30-minute transit ride
4. Ratio of transit travel time vs. auto travel time at peak hour on key corridors
5. Utilization of parking near high-frequency transit stop/station
6. Number and subject of submitted complaints or satisfactions
7. Stop/Station environment (percentage of stops with high quality amenities)

**Frequency**

High-frequency transit service (defined as busses or trains arriving every 15-minutes or less) is among the most important factors contributing to increased ridership as well as people’s satisfaction with transit service.\(^5\)

Currently, Littleton’s only high-frequency service is along the C and D light rail lines during peak commuting hours.

**Top 5 Bus Segments (by Ridership)**

1. Church Ave/ Santa Fe Dr/ Bowles Ave (Downtown Station to Federal Blvd)
2. Broadway (Arapahoe Rd to Littleton Blvd)
3. Broadway (Mineral Ave to Ridge Rd)
4. Littleton Blvd (Broadway to Downtown Station)
5. Federal Blvd (Bowles to North limit)

RTD’s service standards stipulate a minimum of 25 boardings per vehicle hour to warrant consideration for 15-minute frequency.\(^6\) Table 18 shows 2017 boardings per hour for each bus route that serves Littleton (note that ridership figures include segments of the route outside City limits). Candidates for shorter headways include routes along Broadway, Lowell Boulevard/ Federal Boulevard, and Littleton Boulevard.

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Table 18. Transit Route Performance

<table>
<thead>
<tr>
<th>Route</th>
<th>Boardings per Hour (Route-Wide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>72*</td>
</tr>
<tr>
<td>D</td>
<td>95*</td>
</tr>
<tr>
<td>0 (0L)</td>
<td>34* (59)*</td>
</tr>
<tr>
<td>36 (36L)</td>
<td>27* (30)*</td>
</tr>
<tr>
<td>29</td>
<td>35*</td>
</tr>
<tr>
<td>59</td>
<td>14</td>
</tr>
<tr>
<td>66</td>
<td>23*</td>
</tr>
<tr>
<td>67</td>
<td>14</td>
</tr>
<tr>
<td>402L</td>
<td>14</td>
</tr>
<tr>
<td>403</td>
<td>12</td>
</tr>
</tbody>
</table>

* Warrants 15-minute frequency consideration

Coverage

Nearly all Littleton residents live within a half-mile of a bus or rail stop, and ridership is relatively strong on the C and D light rail lines compared with other lines in the RTD network, as well as the bus routes along Broadway and Littleton Boulevard (Table 19).

Table 19. Coverage

<table>
<thead>
<tr>
<th>City</th>
<th>% of households within 1/2 mile of transit stop</th>
<th>Available transit trips within 1/2 mile of average household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Littleton, CO</td>
<td>89%</td>
<td>1,346</td>
</tr>
<tr>
<td>Wheat Ridge, CO</td>
<td>98%</td>
<td>1,259</td>
</tr>
<tr>
<td>Englewood, CO</td>
<td>95%</td>
<td>1,337</td>
</tr>
<tr>
<td>Lakewood, CO</td>
<td>94%</td>
<td>1,276</td>
</tr>
<tr>
<td>Broomfield, CO</td>
<td>57%</td>
<td>644</td>
</tr>
<tr>
<td>Centennial, CO</td>
<td>69%</td>
<td>556</td>
</tr>
<tr>
<td>Commerce City, CO</td>
<td>65%</td>
<td>726</td>
</tr>
<tr>
<td>Arvada, CO</td>
<td>89%</td>
<td>681</td>
</tr>
</tbody>
</table>

Reliability

Littleton can improve speed and reliability of existing transit service by prioritizing the movement of buses along key segments and at certain intersections. RTD analysis of average ridership and bus speed shows that buses generally operate adequately within Littleton. However, the corridor along Littleton Boulevard and through downtown experiences regular delay. Improvements would serve the existing strong ridership in the corridor and encourage transit growth in the future. Broadway is an ideal candidate for future improvements.

STOPS AND STATIONS

Stops and stations can play a significant role in determining how well transit serves riders overall, and whether or not people choose to make trips via a fixed-route bus or rail network. The way people access stops and stations, as well as the amenities they experience while waiting or transferring, can also have a symbiotic relationship with land use goals. For Littleton, enhancements to transit stops/stations can be a useful tool for achieving desired community character (particularly for corridor mixed use areas).

Littleton is home to four locations identified in RTD’s 2019 Mobility Hub Guidelines report. The two light rail stations are identified as Tier 2, meaning they have more daily activity (boardings plus alightings) than 95% of stops in the region. Two additional locations, at S Broadway/W Littleton Blvd and Arapahoe Community College, are in the 90th percentile for daily activity, and therefore qualify as Tier 3 mobility hub candidates. Additional stops along Broadway and Littleton Boulevard experience above-average activity, and would be good candidates for amenity improvements such as benches, shelters, lighting, and passenger information as appropriate.

Top Ten Transit Stops/Stations (by Daily Boardings)

1. Downtown Light Rail
2. Mineral Light Rail
3. Broadway at Littleton Blvd
4. Arapahoe Community College
5. Littleton Blvd at Broadway
6. Littleton Blvd at Windermere St
7. Broadway at Arapahoe Rd
8. Littleton Blvd at Datura St
9. Littleton Blvd at Cherokee St
10. Broadway at Mineral Ave

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SPECIALIZED SERVICES

The City operates fixed-route (Shopping Cart) and demand-response (Omnibus) shuttle services targeted at providing for the mobility needs of those with disabilities as well as people over the age of 55. Shopping Cart connects select apartment complexes with grocery stores and other services. Omnibus is available by appointment only, and prioritizes rides for: 1) medical trips, 2) grocery shopping, 3) hair & barber, 4) other activities. Both services are donation-based.

Ridership on both Shopping Cart and Omnibus has declined somewhat in recent years (Figure 21). However, Omnibus has nearly doubled its riders-per-mile since 2008, and continues to attract new riders, becoming more efficient. Increased efforts to communicate Omnibus service with residents could improve ridership.

These specialized services serve a critical need, given the large elderly population in the City. The Littleton Resident Survey and the Envision Littleton outreach efforts indicate citizen support for both Shopping Cart and Omnibus, with some respondents citing them as among the amenities they value most about living in Littleton.

Omnibus and Shopping Cart complement existing RTD Access-a-Ride demand-response service coverage in the area (available to those with physical and/or cognitive disabilities for fares ranging from $5 to $20 per one-way trip).
The framework for action below is organized in four tiers: (1) Goals, (2) Policies, (3) Objectives, and (4) Actions. All are intended to mesh with and support the other aspects of this Transportation Master Plan.

**GOALS**

Littleton has its own distinct character, and the community has articulated its vision for transportation. Improving transit service (through operations and/or amenity enhancements) can play an important role helping Littleton achieve its transportation goals. Transit aligns with the City’s established TMP goals as follows:

**Goal 1: Connected**

Transit helps decrease traffic congestion by moving more people per vehicle. It also creates activity around stops and stations, ensuring access to employment and commercial destinations.

**Goal 2: Healthy**

Bus and train riders have less than a tenth of the per-mile crash rate as automobile occupants. In addition, communities with higher transit ridership experience significantly fewer traffic fatalities overall.⁹

Goal 3: Inclusive
Transit service gives mobility options to people who cannot afford to own a car or who cannot drive (including the elderly and those with disabilities).

Goal 4: Prosperous
Transit-oriented development (TOD) can help Littleton work toward desired land-use and community character goals at the City's LRT stations and along key corridors such as Broadway and Littleton Boulevard.

Goal 5: Sustainable
Buses and trains offer significant reductions in greenhouse gas emissions on a per-person basis compared with cars. In addition, investments in high-capacity transit are associated with increased property values for nearby homes and businesses.10

POLICIES

In making decisions that involve public resource allocation, regulatory matters, and physical improvements, among others, Littleton will:

1. Advocate for maintenance and enhancement of existing RTD bus and rail service in Littleton.
2. Improve ADA connections and trip-planning services connecting to fixed-route transit network.
3. Prioritize key stops and stations as mobility hubs to promote mode choice and tech integration.
4. Pursue regional public and private partnerships with neighboring municipalities to fund high-capacity transit improvements (including light rail and BRT).
5. Prioritize the safety of vulnerable user groups on trains, buses, and at stations and stops.
6. Demand and support connections to employment, retail, and entertainment/recreation opportunities.

Manage growing demand on the transportation network by building awareness of travel choices.

OBJECTIVES

In order to achieve the overall Transportation Master Plan goals outlined above, multiple objectives have been developed. The objectives in Table 20 are specific to improving the transit network in the City of Littleton.

Table 20. Goals and Objectives—Transit Network

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Related Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Achieve high resident satisfaction rates with transportation services</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Quality of Life</td>
<td>Provide spaces that people can enjoy within the public right-of-way</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Connected</th>
<th>Healthy</th>
<th>Inclusive</th>
<th>Prosperous</th>
<th>Sustainable</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety regardless of transportation mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Community</td>
<td>Provide transportation facilities that are well integrated with land use and character</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Community</td>
<td>Minimize transportation-related air quality degradation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Community</td>
<td>Minimize transportation-related water quality degradation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Community</td>
<td>Minimize transportation-related noise impacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Community</td>
<td>Establish a transportation planning and implementation process that is flexible and adaptable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Community</td>
<td>Provide for a community-drive decision-making process for transportation investments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Community</td>
<td>Provide a transportation system the City can afford to maintain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Mobility</td>
<td>Provide a reliable transportation system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mobility</td>
<td>Achieve a balanced mode share</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mobility</td>
<td>Provide high-quality transportation systems people can afford to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Mobility</td>
<td>Provide travelers with relevant, timely information -- including innovative methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Transit</td>
<td>Connect people effectively to the transit system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Transit</td>
<td>Provide an efficient transit system with regional partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Transit</td>
<td>Provide safe &amp; comfortable transit stops and stations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ACTIONS**

The actions below convey tangible steps that will lead to achievement of the goals in line with the stated policies.
Capital Investments

Capital investments have been identified to address many of the issues related to transit in the City. Table 21 presents these investments. Figure 22 is a map showing the location of the projects on this list.

Table 21. Capital Investments

<table>
<thead>
<tr>
<th>No.</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Project Life*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>Standard bus service</td>
<td>BRT</td>
<td>Ultimate</td>
</tr>
<tr>
<td>2</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>Interim</td>
</tr>
<tr>
<td>3</td>
<td>Littleton Blvd</td>
<td>Corridor Wide</td>
<td>No circulator</td>
<td>Circulator Shuttle</td>
<td>Ultimate</td>
</tr>
<tr>
<td>4</td>
<td>Littleton Blvd</td>
<td>Corridor Wide</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>Interim</td>
</tr>
<tr>
<td>5</td>
<td>Santa Fe Dr</td>
<td>Corridor Wide</td>
<td>No light rail service</td>
<td>Relieve burden on parking via full light rail extension</td>
<td>Ultimate</td>
</tr>
<tr>
<td>6</td>
<td>Bowles Ave</td>
<td>Corridor</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>7</td>
<td>Downtown</td>
<td>District</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements - transit signal priority, queue jumps, or other operational improvements</td>
<td>Ultimate</td>
</tr>
<tr>
<td>8</td>
<td>Downtown</td>
<td>Station</td>
<td>361 parking spaces in surface lot</td>
<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>9</td>
<td>Mineral Ave/ Santa Fe Dr</td>
<td>Station</td>
<td>1,200 spaces in surface lot</td>
<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>10</td>
<td>Broadway</td>
<td>Littleton Blvd</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>11</td>
<td>Broadway</td>
<td>Arapahoe Rd</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
</tbody>
</table>

A strategic Action is aimed at seizing a special opportunity or addressing a particular challenge one faces, given limited resources—financial and otherwise—and recognizing that a broader program of new or ongoing activities will also be pursued in the meantime. Strategic Action is aimed at seizing a special opportunity or addressing a particular challenge one faces, given limited resources—financial and otherwise—and recognizing that a broader program of new or ongoing activities will also be pursued in the meantime.
<table>
<thead>
<tr>
<th>No.</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Project Life*</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Broadway</td>
<td>Mineral Ave</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>13</td>
<td>Downtown</td>
<td>Arapahoe Community College</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>14</td>
<td>Littleton Blvd</td>
<td>Windermere St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>15</td>
<td>Littleton Blvd</td>
<td>Datura St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>16</td>
<td>Littleton Blvd</td>
<td>Bannock St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>Ultimate</td>
</tr>
<tr>
<td>17</td>
<td>Mineral Ave/ Santa Fe Dr Station</td>
<td>Inadequate parking at Mineral Station</td>
<td>Inadequate parking at Mineral Station</td>
<td>Parking garage (1500 spaces)</td>
<td>Ultimate</td>
</tr>
</tbody>
</table>

*Project life indicates whether the improvement results in a desired final condition (ultimate) or represents a step toward that final condition (interim).
Figure 22. Transit Projects

Map showing transit projects in Littleton, Colorado.
**Programs and Initiatives**

1. **Maintain Omnibus and Shopping Cart service.** Consider additional uses for City-owned shuttles (including downtown parking relief, special event access, and connections to community resources).

2. **Pursue EcoPass Programs.** RTD’s EcoPasses provide unlimited transit rides. They can be purchased on a per-employer, district, or development-wide basis. Littleton should consider instituting EcoPass incentives and/or recommendations for developers and employers within the City in order to improve transit ridership.

**Regulations and Standards**

1. **Establish Standards for Stop/Station Enhancements:** All stops should be connected to the pedestrian network. RTD service standards recommend shelter installation at all stops with more than 40 boardings per day. Improvements to access and wayfinding should serve populations that might otherwise rely on demand-response service.

**Partnerships and Coordination**

1. **Advocated for service frequency increases** (especially at peak hours) on bus routes servicing Broadway (including 0, 0L, 66) and Littleton Boulevard/Downtown/Bowles Avenue corridor (including 66, 36, 36L, 29).

2. **Build support from regional partners to leverage available state and federal funding pools.** Developing that support starts with collaboration with neighboring municipalities (including Centennial, Highlands Ranch, and Englewood). Possible mechanisms include informal coordination, inter-governmental agreements (IGA), memoranda of understanding (MOU), and transportation management associations (TMA) or organizations (TMO).

**More Targeted Planning/Study**

1. **Consider opportunities for stop consolidation** (in partnership with RTD) to improve transit speeds and maximize investments in amenities.

2. **Consider circulator shuttle service east from downtown along Littleton Boulevard corridor.** Route would connect downtown with Littleton High School along future mixed-use corridor, serving vulnerable populations north of roadway and population centers throughout. Vehicles could be City-owned and operated, managed by RTD, or provided through partnerships with private companies. Autonomous vehicle technology has been applied in similar settings in several cities across the U.S.\(^\text{11}\)

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STATE OF THE PRACTICE

Transit is evolving. Cities across the world are recognizing the potential for optimizing existing bus service and re-thinking the relationship between rapid transit (bus and rail) and land use. The Transit Cooperative Research Program (TCRP) has published detailed guidance for bus transit improvements in the *Bus Rapid Transit Practitioner’s Guide (2007)*. The National Association of City Transportation Officials (NACTO)’s *Transit Street Design Guide (2016)* illustrates common transit design treatments. Below are examples of best practices from these guides that the City of Littleton will consider when implementing transit operations improvements identified in this document.

<table>
<thead>
<tr>
<th>Description</th>
<th>Photo/Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transit Lanes</strong>: Creating dedicated bus lanes requires pavement markings (typically a solid white line and “BUS ONLY” stencil at intersections) as well as signage (overhead or curbside) to indicate lane restrictions. Can be center- or side-running, offset (to allow parking between bus lane and curb), all hour or peak-hour only.</td>
<td>![Image of a bus lane]</td>
</tr>
<tr>
<td><strong>Typical Cost</strong>&lt;sup&gt;12&lt;/sup&gt;: $100,000 per route mile (re-striping)</td>
<td></td>
</tr>
</tbody>
</table>

**Transit Signal Priority (TSP)**: Active TSP involves modifying traffic signal timing or phasing when buses are present. Bus arrival information can be communicated to traffic systems via GPS, optical, or high-bandwidth (such as fiber) signals. TSP requires dedicated transit space at intersections to maximize benefits. Variations include transit signal progression (pre-timed cycles for transit), conditional (signal priority only to late vehicles), adaptive (incorporates continuous bus detection along corridors to optimize signal timing).

**Typical Cost**<sup>2</sup>: $30,000 per intersection

**Queue bypass**: Queue jump or queue bypass lanes allow buses to bypass traffic at intersections by using short dedicated lanes alongside TSP. This movement can take place in conjunction with vehicular right turns (assuming low enough traffic volumes) space formerly dedicated to parking, or a new dedicated lane.

**Typical Cost**: a) In cases of parking removal or use of right turn lane AND where TSP is already present: negligible b) In cases where a new lane must be constructed: $300,000 per intersection

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<sup>12</sup> TCRP-BRT Practitioner’s Guide, Exhibit S-1
**Bus Bulb:** Extending the curb allows buses to stop in-lane, eliminating a primary source of transit delay. Additionally, extended bus stops allow more space for pedestrians, reduce intersection crossing distances, and create placemaking opportunities.

**Typical Cost:** $60,000 per extension

**Bus Rapid Transit (BRT):** The Federal Transit Administration (FTA) defines BRT as a “rapid mode of transportation that can provide the quality of rail transit and the flexibility of buses.” Functionally, BRT is a suite of improvements to bus service on existing roadways (including a combination of all design tactics previously discussed) that allows for the reliability and consistency of rail service. The core elements of BRT service as identified by the Institute for Transportation & Development Policy (ITDP) include dedicated right-of-way, busway alignment, off-board fare collection, intersection treatments, and platform-level boarding.

**Typical Cost:** Varies, but average cost for BRT in countries like the United States is approximately $16 million per mile (as opposed to $60 million per mile for light rail).

**Mobility Hub:** A mobility hub is a place where transit service, pedestrians, bicyclists, and shared mobility options intersect. It is designed to be a safe, attractive place where people can access the transit and/or mobility system. Amenities might include shelters, lighting, wayfinding, bike-share or parking, rideshare drop-off, and placemaking elements.

**Typical Cost:** Varies, but improvements range from approximately $30,000 to $250,000 per station.

Popular transit stations such as the one at Santa Fe Drive and Mineral Avenue (which currently predominantly serves as a Park-n-Ride) offer the potential for improving multimodal connections and integrated trip planning.
Chapter 7. Mobility Trends
INTRODUCTION

Beyond mode-specific policies, capital investments, programs, and strategies, Littleton is committed to providing excellent service to the traveling public in general. The ability to respond to citizens’ mobility needs is likely to be affected by a variety of forces as this Transportation Master Plan evolves. Achieving the vision for the future, set forth in the Envision Littleton process, will require a holistic view of mobility. Major technological advancements are occurring in the transportation industry that could change everything from how cars function to how people plan each day’s travel. As these technologies evolve, the City must be prepared to remain flexible in order to ensure that these technologies serve overarching mobility and safety goals. Finally, the City must remain transparent in its efforts to plan and program improvements in order to build toward long-term goals and maintain the engagement of the community. These and other objectives will help the City stay true to the Mission laid out in this plan.

LEGACY OF PAST PLANNING

As described in the introduction to this plan, the City has a long history of planning that has resulted in many great strides forward for the mobility framework of the City. Building upon that legacy, the City will incorporate ideas and standards that have been developed but also create new, modern policies and projects for today’s and tomorrow’s mobility needs.

KEY ISSUES AND CONSIDERATIONS

Input and discussions for this TMP, through varied Envision Littleton community engagement, workshops with City Council and Planning Commission, and interaction with other City boards/commissions, City departments, and partner agencies and organizations, yielded the following list of key items that relate to general mobility trends:

- **Transparency**: the public and stakeholders have a strong desire to be involved in planning and for the City to be transparent in allocation of resources.
- **Technology**: transportation technologies are changing and advancing rapidly. There is a desire to be prepared for the impacts these technologies will have on our ability to move around the City and the region.
- **Cost-effectiveness**: there is an acknowledgment that resources are limited, and that transportation infrastructure costs have increased significantly in the past several decades. Therefore, it will be important to innovate and use every dollar effectively.

TRANSPARENCY

The City of Littleton is home to a community that takes pride in its civic traditions and identity. As the City works to realize the future described by Envision Littleton and maintain its shared values, maintaining an open, inclusive process will be critical. The City will offer clear updates on its progress toward community goals, and welcome ongoing discussion with the public.

TECHNOLOGY

The City of Littleton is well-positioned to be a major regional force in helping to determine the way technology impacts the region’s mobility systems.

The Mobility Choice Initiative, a partnership of the Denver Metro Chamber, DRCOG, RTD, and CDOT recently developed a Mobility Choice Blueprint (MCB). The MCB is an effort to document how transportation technology is impacting our daily lives and prepare for that change. The MCB states, “The disruptive forces of new transportation technologies, demographic changes, and shifting societal values are compelling us to change our vision of the Denver region’s mobility future.”

The MCB categorized mobility technology into five types of established and emerging systems:

13 [https://www.mobilitychoiceblueprintstudy.com/](https://www.mobilitychoiceblueprintstudy.com/)
Shared Mobility is defined as “a wide range of transportation options involving fleet ownership or operation of various modes of transportation.” These include:

- Micromobility—personal shared transportation devices like bikes, mopeds, and electric scooters.
- Carsharing—rental cars that are available for use by the hour or mile. These can be located in one spot or able to be parked anywhere within a service area.
- Ridehailing—Uber or Lyft or other services that provide on-demand point-to-point rides in privately owned autos.
- Microtransit—“privately owned and operated shared transportation system that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling.”
- Public Transit—traditional public transportation via bus and rail that usually operates on a fixed route and schedule.

Vehicle Technology refers to the emergence of Connected, Automated, and Electric Vehicles.

- Connected Vehicles incorporate technology that allows the on-board computers to communicate with other vehicles and with sensors and other infrastructure on the ground.
- Automated Vehicles incorporate technology that assist with operation of the vehicle. They perform some of the tasks to drive the vehicle, and driverless vehicles require no human operator.
- Electric Vehicles are powered by electric motors using energy from batteries that are charged at home or at charging stations.

Transportation Systems Optimization refers to the systems that are emerging to better manage and optimize the transportation networks, using real-time data. Emerging technologies include adaptive signal control, transit signal priority, and the sensors and communications infrastructure to allow remote management of the systems.

Travel Information and Payment refers to technology that could allow for easy, quick trip planning and payment, regardless of mode. Mobile devices can unlock the universe of travel options for users in the palm of their hand.

Freight and Delivery Logistics are changing rapidly as more people use online services (e-commerce) for everyday purchases. E-commerce companies will continue to push technology that allows for faster delivery at lower cost, including the incorporation of Connected, Automated, and Electric delivery vehicles.

The impact of these technologies on existing travel behaviors remains to be seen. However, early analysis is beginning to reveal some trends. While fully autonomous vehicles remain in the early pilot stages, some analysis suggests self-driving cars could be common within the next several decades (ranging from 24% to 87% adoption rate by 2045). The impact of this change on issues like traffic congestion remains to be seen, although some studies suggest technology could induce additional demand for car travel and ultimately exacerbate traffic issues.

Some emerging technologies are already changing travel behavior in places like Littleton. A report published by the University of Kentucky linked the emergence of transportation network companies (TNC) such as Uber and Lyft with a decrease in transit ridership—however, other services based on new technology encouraged more people to ride buses and trains.

COST EFFECTIVENESS

A critical aspect of the City’s renewed focus on strategic planning is a commitment to data-driven decision-making and priority-based budgeting. In order to maximize taxpayer dollars and leverage funding from state, federal, and private sector sources, Littleton will...
work to solve short-term problems in ways that contribute to long-term goals.

The sample toolkits in each chapter of this plan outline cost-effective strategies for addressing mobility challenges. These, combined with responsible stewardship of City resources, will allow the City to use the funds available in the most efficient manner possible.

FRAMEWORK FOR ACTION

The framework for action below is organized in four tiers: (1) Goals, (2) Policies, (3) Objectives, and (4) Actions. All are intended to mesh with and support the other aspects of this Transportation Master Plan.

GOALS

Consistent with the Anchored, Connected, Active, and Engaged Guiding Principles, responsiveness to trends is also important to the City’s transportation goals.

- **Connected**: Ability to adapt and provide services as conditions change and at reasonable cost will be increasingly important.

- **Healthy**: Healthy choices will be dependent on the City’s ability to best utilize technology to encourage an active lifestyle.

- **Inclusive**: Technology and cost-effective improvements can be used to provide services to under-served populations with the right planning.

- **Prosperous**: Being transparent and responsive, while providing excellent overall mobility allows the City to help its citizens be prosperous.

- **Sustainable**: Constantly refining and adjusting our outlook will help us respond to environmental and fiscal pressures.

POLICIES

In making decisions that involve public resource allocation, regulatory matters, and physical improvements, among others, Littleton will:

1. Coordinate Traffic Management Center technology and operations with adjacent municipalities and CDOT.

2. Partner with neighboring municipalities and the private sector as needed to manage the introduction of new technologies to Littleton.

3. Transition government fleets to alternative fuel vehicles where feasible.

4. Be transparent about prioritization and implementation of capital improvements.

5. Continuously evaluate new technologies and trends.

6. Prioritize key stops and stations as mobility hubs to promote mode choice and tech integration.

OBJECTIVES

In order to achieve the overall Transportation Master Plan goals outlined above, multiple objectives have been developed. The objectives in Table 22 are specific to responding to mobility trends in the City of Littleton.
### Table 22. Objectives—General Mobility

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Objective</th>
<th>Connected</th>
<th>Healthy</th>
<th>Inclusive</th>
<th>Prosperous</th>
<th>Sustainable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Achieve high resident satisfaction rates with transportation services</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Quality of Life</td>
<td>Provide spaces that people can enjoy within the public right-of-way</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety on all transportation modes</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Community</td>
<td>Provide transportation facilities that are well integrated with land use and character</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Community</td>
<td>Establish a transportation planning and implementation process that is flexible and adaptable</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Community</td>
<td>Provide for a community-driven decision-making process for transportation investments</td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Community</td>
<td>Provide a transportation system the City can afford to maintain</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Mobility</td>
<td>Provide a reliable transportation system</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mobility</td>
<td>Provide high-quality transportation systems people can afford to use</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Mobility</td>
<td>Provide travelers with relevant, timely information -- including innovative methods</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Auto</td>
<td>Provide a well-connected automotive network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Auto</td>
<td>Provide for safe automobile travel</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Auto</td>
<td>Provide an efficient automotive network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Freight</td>
<td>Provide a reliable freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Freight</td>
<td>Provide a well-connected freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Freight</td>
<td>Provide a safe freight network</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIONS

The actions below convey tangible steps that will lead to achievement of the Goals in line with the stated Policies.

Capital Investments

No capital investments have been identified as part of this plan for this category.

Programs and Initiatives

1. Consider testing or piloting integrated corridor management in partnership with neighboring municipalities.

2. Develop incentives and/or improve ridehailing and ridesharing operations to serve our citizens needs and improve access to services.
   a. Implement curbside management standards and smart parking practices.
   b. Pilot neighborhood-scale mobility hubs that simplify multimodal trips and create safe, inviting spaces for all residents.

3. Pilot smart parking technologies (including real-time information and variable payment) in busy locations such as downtown and in the vicinity of light rail stations.

4. Develop and use a traffic operations and safety checklist of operational and safety improvements that can be implemented as part of other infrastructure investments.

Regulations and Standards

1. Participate in the development of a regional compact defining common standards for micromobility services.

Partnerships and Coordination

1. Explore the feasibility of a Traffic Management Center, ideally partnering with adjacent municipalities and other agencies.

More Targeted Planning/Study

None at this time.

A strategic Action is aimed at seizing a special opportunity or addressing a particular challenge one faces, given limited resources—financial and otherwise—and recognizing that a broader agenda of new or ongoing activities will also be pursued in the meantime.
Chapter 8.
Complete Network Recommendations
RECOMMENDATIONS

A complete network of streets in the City that provides connections, choice, calming, and capacity while meeting the needs of the community will be the result of implementing the projects defined in previous sections. These projects and strategies, combined, will allow the City to realize its transportation Goals, and ultimately deliver upon the Mission defined by the community. The networks presented in Figure 23 trough Figure 27 are intended to present a path to completion of these networks so that all people can choose the mode that best suits their travel needs and lifestyles. A summary of the actions required for critical corridors is provided in Figure 23 trough Figure 27.

A summary of the Capital investments has been included in each of the modal chapters and in the Implementation chapter.
Figure 23. Proposed Street Types
Figure 24. Pedestrian Priority Streets
Figure 25. Bike Priority Streets
Figure 26. Transit Priority Streets
Figure 27. Existing Truck Routes
CRITICAL CORRIDOR MAPS

Summaries of the actions to be taken on critical corridors are provided in Figure 28 through Figure 31.
Critical Corridor: Santa Fe Drive (US 85)

Santa Fe Drive is a state and federal highway that has long served as Littleton’s connection to the rest of the region. Today, it is a mix of limited access expressway and commercial arterials. It carries a massive amount of traffic through the city and serves not just Littleton’s north-south travel needs, but also as a primary route for traffic moving through the City.

The future of Santa Fe Drive is as the City’s main north-south auto and freight route. Santa Fe Drive is unique in that the corridor is flanked on either side by premium transit (LRT) or active transportation (Mary Carter Greenway) facilities. These adjacent multimodal corridors allow Santa Fe Drive to be an auto and freight mover.

**STATISTICS:**

- **Right-of-way Width Range:**
  - Speed Limits:
    - 25
    - 30
    - 35
    - 40
    - 45
    - 50
    - 55

- **Traffic Volumes:**
  - [Graph showing traffic volumes]

- **Transit Ridership:**
  - [Graph showing transit ridership]

**STRATEGIES AND PROJECTS:**

The City should approach the upcoming Planning and Environmental Linkages study (PEL) with a clear vision of the desired outcomes. These include but are not limited to:

- A desire to reconnect the city to the South Platte River. Santa Fe Drive is a major physical and psychological barrier between these two areas, and any project along this corridor, particularly at downtown Littleton, should improve this condition, not worsen it.

- A desire to make the area between the river and the Santa Fe Drive corridor between Bowles Avenue and Mineral Avenue a useful and attractive place for businesses and residents alike. This should include access preservation and enhancement and parallel routes that will benefit regional traffic by allowing local circulation to occur off the mainline.

- A desire to explore transit improvements, including the potential extension of LRT to Highlands Ranch and/or Sterling Ranch to the south. Other transit improvements include an RTD Park-n-Ride expansion (garage) at Mineral Station, and increased LRT frequencies.

- A desire to alleviate traffic congestion at the intersections of Bowles Avenue & Santa Fe Drive and Mineral Avenue & Santa Fe Drive.

In addition to and related to the PEL, the City should pursue other strategies in this corridor, including but not limited to:

- Implement near-term operational improvement projects:
  - Alternative intersection at Mineral Avenue and Bowles Avenue intersections
  - Safety and operational improvements at Bowles Avenue and Prince Street intersections
  - Pursue grade-separated interchange at Mineral Avenue and Bowles Avenue

- Improve downtown connections at north and south ends of downtown to alleviate congestion at Bowles Avenue

- Create a downtown mobility and land use plan that identifies a vision for connecting downtown to the river, and establishes the desired Santa Fe Drive alignment (both horizontal and vertical).

- Pursue regional partners to proceed with the extension of LRT to Highlands Ranch.

- Study connecting South Platte River Parkway, west of Santa Fe Drive, into downtown to serve local traffic.

[Map of Critical Corridor: Santa Fe Drive (US 85)]
Critical Corridor: Broadway

Broadway currently serves a number of uses. It is the most traveled transit corridor (beside the LRT lines), it serves as a regional automotive and truck route, and it provides direct property access to a mix of general commercial uses and even some single-family residential uses. Broadway is one of the most dangerous places to be as a pedestrian or bicyclist in the City, and its wide footprint and fast speeds mean that those who attempt to cross it are vulnerable to being struck by autos.

**STATISTICS:**

- Right-of-way Width Range
- Speed Limits
  - 25
  - 30
  - 35
  - 40
  - 45
  - 50
  - 55
- Traffic Volumes
  - 0
  - 10k
  - 20k
  - 30k
  - 40k
  - 50k
  - 60k
  - 70k
- Transit Ridership

**STRATEGIES AND PROJECTS:**

The future of Broadway is as the City’s eastern transit Boulevard. Because the right-of-way is wide, Broadway is a prime candidate for exclusive transit lanes with Bus Rapid Transit service. Repurposing underutilized road space for transit will allow Broadway to evolve into an asset for Littleton, and will generate economic activity. Broadway has been identified as a Tier 1 BRT corridor by RTD and the City should dedicate resources to working with partner municipalities to take transit service on the corridor to the next level.

As the transit vision evolves, other modes, particularly auto and freight, must be accommodated. Broadway currently carries as many as 48,000 vehicles per day on some segments and experiences a significant amount of congestion.

Sacrificing space for transit vehicles will likely mean providing for auto mobility in other, innovative ways, which could include alternative intersection treatments, adaptive signal controls, or other applications of new technology.

Special attention must be paid to the residential land uses on the corridor.

Specific actions include:

- Partner with RTD, Centennial, Englewood, Denver, Douglas County and Arapahoe County to study the future of the corridor.
- Implement quick action projects to enhance transit speeds and reliability.
- Implement quick action safety projects for pedestrians, bicyclists, and motorists.
Figure 30. Critical Corridor: Littleton Boulevard, Main/Alamo, Bowles Avenue

This corridor, which passes directly through downtown Littleton, currently serves as the main east-west route through the northern part of the City. At the heart of the City, Littleton Boulevard and Main Street have a rich history as a place to go, a place to do business, and a place to be with the community. Bowles Avenue is a major regional connection for Jefferson county residents to the rest of the metro area. It is constrained by right-of-way through the City. It also serves a key connection to the Mary Carter Greenway.

The Comprehensive Plan envisions Littleton Boulevard transitioning to a mixed use corridor and extension of downtown, while respecting its history.

**STATISTICS:**

<table>
<thead>
<tr>
<th>Right-of-way Width Range</th>
<th>Speed Limits</th>
<th>Traffic Volumes</th>
<th>Transit Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STRATEGIES AND PROJECTS:**

The future of this corridor is as Littleton’s Main Street. This corridor is many things to many people, but at its core it is the identity of Littleton. Extending the positive aspects of Downtown Littleton and Main Street to the east along Littleton Boulevard and reconnecting civic uses east of the railroad tracks will bring a better sense of connection with the downtown area and the rest of the community. With Littleton High School anchoring the east end of the corridor, the transformation of Littleton Blvd into a mixed use urban arterial will create a place that generates activity and contributes to the City’s prosperity.

The corridor has the potential to serve as a true place, not just a place to move cars.

Specific Actions include:

- Conduct a corridor study that builds upon the foundation in this TMP.
- Implement quick action projects to enhance transit speeds and reliability.
- Implement quick action safety projects for pedestrians, bicyclists, and motorists.
- Advocate for increased transit frequency along the corridor with RTD.
- Enhance bicycle connections to the Powers Avenue bicycle priority street north of Littleton Boulevard to the east and through Bowles Grove Park and Valley Vista Park north of Bowles Avenue to the west.
- Enhance the pedestrian environment, particularly on the east end.

Finally, the City should conduct a Downtown Mobility Plan and Streetscape Plan.
Critical Corridor: Prince St/ Windermere St

Prince Street and Windermere Street are parallel north-south roadways, extending through the majority of the City. These roadways serve the primarily residential communities to the south and the mixed uses to the north, including the downtown area. The roadways are generally two-lane connector facilities providing access to local roadways and direct access to residential and commercial uses. The future of these facilities are as complete streets that continue to provide local access to residents and businesses of Littleton. Both Prince Street and Windermere Street are identified as pedestrian priority streets where widening narrow sidewalks will better serve the community. Both roadways are also recommended for bicycle improvements along the majority of their extents, including protected bike lanes along Prince Street and protected or buffered bike lanes along Windermere Street.

STATISTICS:

<table>
<thead>
<tr>
<th>Right-of-way Width Range</th>
<th>Speed Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Speed Limit</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>35</td>
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<td>45</td>
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<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traffic Volumes</th>
<th>Transit Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1,000</td>
</tr>
<tr>
<td>10k</td>
<td>2,000</td>
</tr>
<tr>
<td>20k</td>
<td>3,000</td>
</tr>
<tr>
<td>30k</td>
<td>4,000</td>
</tr>
<tr>
<td>40k</td>
<td>5,000</td>
</tr>
</tbody>
</table>

STRATEGIES AND PROJECTS:

The City should conduct corridor studies for these two important connector corridors. Because these corridors are the main connections for the central neighborhoods to the commercial and downtown areas at the northern end of the city, they serve an important role in the way Littleton residents move within their City. These corridors have experienced increased travel demand pressures because regional facilities have been overloaded.

A key action will be to determine the extent that these regional pressures will continue and how the City can mitigate these issues.

Strategies to examine include but are not limited to:

- Widening narrow sidewalks and bridging sidewalk gaps.
- Installing protected bike lanes along Prince Street.
- Installing protected or buffered bike lanes along Windermere Street.
- Implementing safety and operational improvements at designated intersections along both facilities.
- Implementing traffic calming along Windermere Street from Ridge Road to Rangeview Drive.
Chapter 9.
Implementation
INTRODUCTION

The projects, strategies, and plans identified in previous chapters represent the path toward meeting the City’s transportation mission. However, the plans and projects identified in this Transportation Master Plan are currently unfunded and there does not currently exist a method for prioritizing projects based on the City’s goals and objectives. Historically, the City has not had a dedicated funding stream for capital transportation improvements. This has added to the strain on the transportation infrastructure experienced through the years, as resources have become tighter. A greater and greater share of City funds have been allocated to maintaining the current system as it has grown, making it harder to fund improvements.

In order to achieve its transportation mission, the City will need to identify new revenue streams, and dedicate funding to the projects and plans that it deems most important. This chapter outlines several actions the City can take to meet these needs.

This Transportation Master Plan is a living document that will be updated, amended, and modified through the annual budget process. Based on 3-year and 5-year outlooks, the City will develop an annual work plan for priority projects and plans.

FUNDING SOURCES

The purpose of this chapter is to provide a list of projects ranked by alignment to the goals and objectives outlined in the prior chapters of this plan. This information is intended to support the initial funding discussions both internally within the City as well as with potential regional, State and federal funding partners. Included in this chapter is a review of Local verses Regionally Significant Projects and the associated conceptual funding assumptions for each. Additionally, a conceptual analysis of a potential dedicated transportation sales tax is discussed as well as an overview of potential federal, State and regional funding programs that could be targeted to support implementation of the Regionally Significant Projects.

CAPITAL COST SUMMARY

Table 22 summarizes the TMP’s estimated capital costs by project category. Additionally, the costs are separated between Local Projects and Regionally Significant Projects. As discussed in more detail in the following sections, the purpose of this separation is to initiate the discussion with potential regional, State and federal funding partners regarding cost sharing to implement the Regionally Significant Projects.

Reflecting the separation of Projects, Regionally Significant Projects account for approximately 85 percent of the TMP Program with cost estimates totaling $620.5 million. Local Projects account for the remaining 15 percent and total approximately $113.4 million. Auto Projects (55.8 percent) account for the largest categories of improvements, followed by Transit Projects (36.7 percent) and Active Transportation Projects (7.5 percent). Within the Local Projects, Auto Projects still account for the largest share of costs (50.1 percent), however Active Transportation Projects (48.6 percent) surpass Transit Projects (1.3 percent).
Table 23. Estimated Capital Costs by Project Category

<table>
<thead>
<tr>
<th>Project Categories</th>
<th>Costs (2019$, in millions)</th>
<th>Costs (2019$, in millions)</th>
<th>Percent of Total Program</th>
<th>Max Federal Funding: Local Share of Regionally Significant Projects</th>
<th>Moderate Federal Funding: Local Share of Regionally Significant Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local Projects</td>
<td>Regionally Significant Projects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td>$56.8</td>
<td>$353.0</td>
<td>$409.8</td>
<td>56% $35.3</td>
<td>$88.3</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>$55.1</td>
<td>$0.0</td>
<td>$55.1</td>
<td>8% $0.0</td>
<td>$0.0</td>
</tr>
<tr>
<td>Transit</td>
<td>$1.5</td>
<td>$267.5</td>
<td>$269.0</td>
<td>37% $66.9</td>
<td>$80.2</td>
</tr>
<tr>
<td>Total</td>
<td>$113.4</td>
<td>$620.5</td>
<td>$733.9</td>
<td>100% $102.2</td>
<td>$168.5</td>
</tr>
</tbody>
</table>

With $113.4 million in Local Projects, and $102.2 million to $168.5 million in Local Share, the City of Littleton’s projected total capital costs are between $215.6 million and $281.9 million.

CONCEPTUAL TRANSPORTATION SALES TAX ANALYSIS

For this financial analysis it was assumed that the City’s existing revenue sources would be available to implement the TMP projects. Reflecting the primary and most significant dedicated transportation revenue source used by other municipalities within Colorado, the first funding source evaluated was the potential role an increase in the City’s sales and use tax could play in funding the program of projects. According to the City’s Fiscal Year (FY) 2018 Comprehensive Annual Financial Report (CAFR), the existing 3 percent sales and use tax generated approximately $33.8 million in revenue last year. Based on the FY 2018 level, Table 24 provides an estimate of the incremental additional revenue that could be generated if the sales tax rate was increased by 0.25 percent, 0.5 percent, 0.75 percent, and 1 percent. As indicated in the table, on an annual basis the additional sales tax revenue would range from $2.8 million to $11.3 million in these conceptual scenarios. On a pay-as-you-go implementation approach, these annual levels would not support timely implementation of the TMP.

However, these funds could be used to issue debt to support accelerated implementation of a portion of the TMP. For the purpose of this conceptual analysis, it was assumed bonds would be issued against the incremental sales tax levels using the following assumptions: interest rate of 5 percent, repayment term of 30 years, and a debt service coverage ratio of 1.2x. Based on these assumptions, bond proceeds would range from $36 million to $145 million and would provide funding for between 4.9 percent and 19.8 percent of the total program.
Table 24. Estimate of Incremental Additional Revenue with Sales Tax Rate Increase

<table>
<thead>
<tr>
<th>Conceptual Sale Tax Rate Increase</th>
<th>Annual Levels (2019$, in millions)</th>
<th>Percent Share of Total Program</th>
<th>Conceptual Bond Proceeds (2019$, in millions)</th>
<th>Percent Share of Total Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25% Increase</td>
<td>2.8</td>
<td>0.4%</td>
<td>36</td>
<td>4.9%</td>
</tr>
<tr>
<td>0.50% Increase</td>
<td>5.6</td>
<td>0.8%</td>
<td>72</td>
<td>9.8%</td>
</tr>
<tr>
<td>0.75% Increase</td>
<td>8.5</td>
<td>1.2%</td>
<td>108</td>
<td>14.7%</td>
</tr>
<tr>
<td>1.0% Increase</td>
<td>11.3</td>
<td>1.5%</td>
<td>145</td>
<td>19.8%</td>
</tr>
</tbody>
</table>

LOCAL PROJECTS ANALYSIS

This section identifies the Local Projects that would likely require 100 percent of project funds to come from the City. These projects are contained within the City limits and tend to have localized impacts on the transportation network. Therefore, these projects are unlikely to be eligible for funding from the Colorado Department of Transportation (CDOT), the Regional Transportation District (RTD), and Denver Regional Council of Governments (DRCOG), and this analysis assumes the City is solely responsible for funding these projects. As shown in the second table below, the total cost estimate for Local Projects is $113.4 million.

Table 25 indicates that the conceptual annual sales tax levels described in the prior section under a pay-as-you-go implementation approach would cover between 2 percent and 10 percent of the Local Projects costs. Under the assumption that bonds are issued, the 0.25, 0.5 and the 0.75 percent sales tax increase would fund 32 percent, 63 percent and 95 percent of the Local Projects costs. The remaining increment (1.0 percent) would cover more than 100 percent of the Local Projects providing additional capacity to fund ongoing operation and maintenance of the Local Projects and a share of the costs for the Regionally Significant Projects. Table 26 summarizes the projects defined as local.

Table 25. Conceptual Sale Tax Rate Increase

<table>
<thead>
<tr>
<th>Conceptual Sale Tax Rate Increase</th>
<th>Annual Levels (2019$, in millions)</th>
<th>Percent Share of Local Projects ($102.7 M)</th>
<th>Conceptual Bond Proceeds (2019$, in millions)</th>
<th>Percent Share of Local Projects ($102.7 M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25% Increase</td>
<td>2.8</td>
<td>2%</td>
<td>36</td>
<td>32%</td>
</tr>
<tr>
<td>0.50% Increase</td>
<td>5.6</td>
<td>5%</td>
<td>72</td>
<td>63%</td>
</tr>
</tbody>
</table>

17 Please note that HDR assists clients evaluate and apply for strategic funding. For the avoidance of doubt, the City is aware of the “Municipal Advisor Rule” of the Securities and Exchange Commission (effective July 1, 2014) and the “independent municipal advisor” exemption from the definition of “advice.” The City understands that HDR Engineering Inc. is not a registered municipal advisor and is not subject to the fiduciary duty established in Section 15B(c)(1) of the Securities and Exchange Act. HDR uses financial information and interest rates publicly available or provided by a client’s Municipal Financial Advisor to complete the requested financial analysis. In evaluating funding sources, the City will be responsible for deciding to use or pursue funding/financing.

18 Ibid
## Conceptual Sale Tax Rate Increase

<table>
<thead>
<tr>
<th>Conceptual Sale Tax Rate Increase</th>
<th>Annual Levels (2019$, in millions)</th>
<th>Percent Share of Local Projects ($102.7 M)</th>
<th>Conceptual Bond Proceeds (2019$, in millions)</th>
<th>Percent Share of Local Projects ($102.7 M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75% Increase</td>
<td>$8.5</td>
<td>7%</td>
<td>$108</td>
<td>95%</td>
</tr>
<tr>
<td>1.0% Increase</td>
<td>$11.3</td>
<td>10%</td>
<td>$145</td>
<td>100%</td>
</tr>
</tbody>
</table>

---

### Table 26. Local Project Summary

<table>
<thead>
<tr>
<th>Local Project Type</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Cost (2019$, in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Operations</td>
<td>Bellevue Ave</td>
<td>Prince St to Lowell Blvd</td>
<td>No median</td>
<td>Access control, median</td>
<td>$1.5</td>
</tr>
<tr>
<td>and Safety</td>
<td>Ridge Rd</td>
<td>Corridor-wide</td>
<td>Varies</td>
<td>Curb and gutter, geometry, intersections</td>
<td>$5.0</td>
</tr>
<tr>
<td>Auto Operations</td>
<td>S Platte Canyon Rd</td>
<td>Mineral Dr</td>
<td>Traffic Signal</td>
<td>Full movement intersection</td>
<td>$0.2</td>
</tr>
<tr>
<td>and Safety</td>
<td>Bowles Ave</td>
<td>Federal Blvd</td>
<td>Traffic Signal</td>
<td>Intersection operation and safety improvements</td>
<td>$0.5</td>
</tr>
<tr>
<td>Auto Operations</td>
<td>Bellevue Ave</td>
<td>Federal Blvd</td>
<td>Traffic Signal</td>
<td>Intersection operation and safety improvements</td>
<td>$1.0</td>
</tr>
<tr>
<td>and Safety</td>
<td>Bellevue Ave</td>
<td>Prince St</td>
<td>Traffic Signal</td>
<td>Intersection operation and safety improvements</td>
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<td>Existing Condition</td>
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<td>Traffic Signal</td>
<td>Signal timing and phasing, advanced detection and geometry</td>
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<td>Varies</td>
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<td>Prince St</td>
<td>Corridor-wide</td>
<td>Varies</td>
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<td>V2I and ITS</td>
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<td>Varies</td>
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<td>Auto Capacity</td>
<td>Mineral Ave</td>
<td>Santa Fe to Jackass Hill Rd</td>
<td>Four-lane roadway</td>
<td>Widen to six lanes and reconstruct sidewalks under RR crossings</td>
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<tr>
<td>Active Transportation</td>
<td>Caley Ave</td>
<td>Prince St to Broadway</td>
<td>Shared lane</td>
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<tr>
<td>Active Transportation</td>
<td>Powers Ave</td>
<td>Windermere St to Delaware St</td>
<td>Shared lane</td>
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<td>Berry Ave</td>
<td>Blue Sage Dr to Federal Blvd</td>
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<td>Local Project Type</td>
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<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Cost (2019$, in millions)</td>
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<td>Active Transportation</td>
<td>Powers Ave</td>
<td>Delaware St to Broadway</td>
<td>Shared lane</td>
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<td>Shepperd Ave to High Line Canal</td>
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<td>Lehow Ave to Powers Ave</td>
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<td>Ridge Rd to Rangeview Dr</td>
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<td>Windermere St/ Jamison Ave</td>
<td>Mineral Ave to Broadway</td>
<td>Bike lane/ bike shoulder</td>
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<td>Belleview Ave</td>
<td>City Limits/ Prospect Rd to Irving St</td>
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<td>City Limits/ Layton Ave to Littleton Blvd</td>
<td>Bike lane/ shared parking</td>
<td>Protected bike lane</td>
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<td>Windermere St</td>
<td>Littleton Blvd to Ridge Road</td>
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<td>Prince St to Broadway</td>
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<td>Prince St to Court Pl</td>
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<td>Main St</td>
<td>Prince St to Court Pl</td>
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<td>Church Ave</td>
<td>Santa Fe Dr to Prince St</td>
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<td>Federal Blvd</td>
<td>Bellevue Ave to Bowles Ave</td>
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<tr>
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<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
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<tr>
<td>Active Transportation</td>
<td>Prince St</td>
<td>Centennial Dr to Mineral Ave</td>
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<td>Southpark Ln</td>
<td>Mineral Ave to County Line Rd</td>
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<td>Federal Blvd to Prince St</td>
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<td>High Line Canal Trail south of Arapahoe Rd to Ridge Road</td>
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<td>Bannock St to Caley Ave</td>
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<td>Existing Condition</td>
<td>Description</td>
<td>Cost (2019$, in millions)</td>
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<td>Bowles Ave</td>
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<td>Caley Ave</td>
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<td>Ridge Rd</td>
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<td>Broadway</td>
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<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Cost (2019$, in millions)</td>
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<tr>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Peninsula Dr/ High Line Canal Trail</td>
<td>Traffic signal</td>
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<td>Rio Grande St</td>
<td>Slaughterhouse Gulch Trail</td>
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<td>Slaughterhouse Gulch Trail</td>
<td>None</td>
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<td>Santa Fe Dr</td>
<td>Dad Clark Gulch</td>
<td>Bridge (no connection)</td>
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<td>Federal Blvd</td>
<td>Belleview Ave</td>
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<td>Belleview Ave</td>
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<td>Belleview Ave</td>
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<td>Mineral Ave</td>
<td>Traffic signal</td>
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<td>Powers Ave</td>
<td>Traffic signal</td>
<td>Protected bicycle intersection</td>
<td>$0.8</td>
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<tr>
<td>Active Transportation</td>
<td>Federal Blvd</td>
<td>Bowles Ave/ Trail Crossing</td>
<td>Traffic signal</td>
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<td>Little's Creek Trail</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
<td>$0.2</td>
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<td>Berry Ave</td>
<td>Federal Blvd</td>
<td>Cross traffic does not stop</td>
<td>Pedestrian signal</td>
<td>$0.2</td>
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<td>Bega Park Trail</td>
<td>Alamo Ave</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
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<td>Bega Park Trail</td>
<td>Main St</td>
<td>Pedestrian warning signage</td>
<td>RRFB/ raised pedestrian crossing</td>
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<td>Local Project Type</td>
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<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Cost (2019$, in millions)</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------</td>
<td>----------------------------------</td>
<td>---------------------------------------------</td>
<td>------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Mary Carter Greenway</td>
<td>Mineral Ave</td>
<td>Grade-separated crossing</td>
<td>Bridge widening</td>
<td>$1.0</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Caley Ave/ High Line Canal Trail</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>&gt;$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Platte Canyon Rd</td>
<td>Mineral Ave/ Ken Caryl Rd</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>&gt;$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Ridge Rd/ High Line Canal Trail</td>
<td>Traffic signal</td>
<td>Signal phasing changes</td>
<td>&gt;$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Jackass Hill Rd to Broadway</td>
<td>Bike lane</td>
<td>Protected bike lane</td>
<td>$0.4</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Lee Gulch</td>
<td>Cross traffic does not stop</td>
<td>Grade-separated</td>
<td>$5.0</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Elati St</td>
<td>Highline Canal</td>
<td>Dirt path</td>
<td>Improve connection</td>
<td>$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Bannock St</td>
<td>Powers Ave to Broadway</td>
<td>Shared lane/ none</td>
<td>Bike lane</td>
<td>$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Shepperd Ave</td>
<td>Bannock St to Elati St</td>
<td>Shared parking/ bike lane</td>
<td>Bike lane</td>
<td>&gt;$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Sterne Pkwy</td>
<td>Apache St to Broadway</td>
<td>None</td>
<td>Bike lane</td>
<td>&gt;$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Tule Lake Dr</td>
<td>Sheridan Blvd/ City Limits to Federal Blvd</td>
<td>None</td>
<td>Bike lane</td>
<td>$0.3</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Rangeview Dr</td>
<td>Windermere St to Prince St</td>
<td>Path</td>
<td>Shared use path</td>
<td>$0.3</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Geddes Ave</td>
<td>Windermere St to Elati St</td>
<td>None</td>
<td>Advisory bike lane or bike lane</td>
<td>$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Between Santa Fe Dr &amp; Jackass Hill Rd</td>
<td>Path</td>
<td>Shared use path</td>
<td>$0.2</td>
</tr>
<tr>
<td>Local Project Type</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Existing Condition</td>
<td>Description</td>
<td>Cost (2019$, in millions)</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------</td>
<td>---------------------------------</td>
<td>--------------------</td>
<td>-------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Wolff St to Polo Ridge Dr</td>
<td>Path</td>
<td>Trail crossing improvements</td>
<td>$0.3</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Polo Ridge Dr</td>
<td>RRFB</td>
<td>Pedestrian signal or other improvement</td>
<td>$0.1</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>Little’s Creek Flume Trail Connection</td>
<td>RR Tracks</td>
<td>No connection</td>
<td>Trail connection across flume</td>
<td>$1.0</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>City-wide</td>
<td>15.1-mi</td>
<td>Varies</td>
<td>Missing sidewalks</td>
<td>$2.9</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>City-wide</td>
<td>32.5-mi</td>
<td>Varies</td>
<td>Narrow sidewalks</td>
<td>$3.9</td>
</tr>
<tr>
<td>Transit</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>$0.4</td>
</tr>
<tr>
<td>Transit</td>
<td>Littleton Boulevard</td>
<td>Corridor Wide</td>
<td>No circulator</td>
<td>Circulator Shuttle</td>
<td>TBD</td>
</tr>
<tr>
<td>Transit</td>
<td>Littleton Boulevard</td>
<td>Corridor Wide</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>$0.2</td>
</tr>
<tr>
<td>Transit</td>
<td>Bowles Ave.</td>
<td>Corridor</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Downtown</td>
<td>District</td>
<td>No transit prioritization</td>
<td>Transit speed and reliability improvements - transit signal priority, queue jumps, or other operational improvements</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Downtown</td>
<td>Station</td>
<td>361 parking spaces in surface lot</td>
<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Mineral Ave/Santa Fe Dr</td>
<td>Station</td>
<td>1,200 spaces in surface lot</td>
<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Broadway</td>
<td>Littleton Blvd</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
</tbody>
</table>
### Local Project Type

<table>
<thead>
<tr>
<th>Local Project Type</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Cost (2019$, in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit</td>
<td>Broadway</td>
<td>Arapahoe Rd</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Broadway</td>
<td>Mineral Ave</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Downtown</td>
<td>Arapahoe Community College</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Littleton Blvd</td>
<td>S Windermere St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Littleton Blvd</td>
<td>S Datura St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
<tr>
<td>Transit</td>
<td>Littleton Blvd</td>
<td>S Bannock St</td>
<td>Varies</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
<td>$0.1</td>
</tr>
</tbody>
</table>

**Total $113.4**

### REGIONALLY SIGNIFICANT PROJECTS ANALYSIS

The remaining Regionally Significant Projects are summarized in Table 27 and result in a total cost estimate of $583.0 million. As in Table 28, the annual sales tax increments on a pay-as-you-go implementation approach would cover between 0.5 percent and 1.8 percent of the Regionally Significant Projects costs. Under the assumption that bonds are issued and the Local Projects are funded first, the 0.25 percent, 0.5, and 0.75 percent sales tax increase increments do not have any remaining bond proceeds available to support the Regionally Significant Projects. The remaining bond proceeds under the 1.0 percent sales tax increase increment could provide 5 percent of the Regionally Significant Projects total costs.
Table 27. Regionally Significant Projects

<table>
<thead>
<tr>
<th>Regionally Significant Project Type</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Existing Condition</th>
<th>Description</th>
<th>Cost (2019$, in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Bowles Avenue</td>
<td>Traffic Signal</td>
<td>Reconfigure into grade-separated interchange</td>
<td>$150.0</td>
</tr>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Mineral Avenue</td>
<td>Traffic Signal</td>
<td>Reconfigure into grade-separated interchange</td>
<td>$75.0</td>
</tr>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>No connection</td>
<td>Access Preservation</td>
<td>$8.0</td>
</tr>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Bowles Avenue</td>
<td>Traffic Signal</td>
<td>Alternative intersection configuration</td>
<td>$15.0</td>
</tr>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Mineral Avenue</td>
<td>Traffic Signal</td>
<td>Alternative intersection configuration, quadrant roadway, or continuous flow intersection</td>
<td>$15.0</td>
</tr>
<tr>
<td>Auto</td>
<td>County Line Road</td>
<td>Santa Fe Dr to Broadway</td>
<td>Varies</td>
<td>Widening</td>
<td>$20.0</td>
</tr>
<tr>
<td>Auto</td>
<td>County Line Road</td>
<td>Broadway to University Ave</td>
<td>Varies</td>
<td>Widening</td>
<td>$20.0</td>
</tr>
<tr>
<td>Auto</td>
<td>Santa Fe Drive</td>
<td>Corridor-Wide</td>
<td>Varies</td>
<td>Widening</td>
<td>$50.0</td>
</tr>
<tr>
<td>Transit</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>Standard bus service</td>
<td>BRT</td>
<td>$64.0</td>
</tr>
<tr>
<td>Transit</td>
<td>Santa Fe Drive</td>
<td>Corridor Wide</td>
<td>No light rail service</td>
<td>Relieve burden on parking via full light rail extension (cost shown)</td>
<td>$166.0</td>
</tr>
<tr>
<td>Transit</td>
<td>Mineral Ave/Santa Fe Dr</td>
<td>Station</td>
<td>Inadequate parking at Mineral Station</td>
<td>Parking garage (1500 spaces)</td>
<td>$37.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$620.5</strong></td>
</tr>
</tbody>
</table>
Table 28. Conceptual Sale Tax Rate Increase

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25% Increase</td>
<td>$2.8</td>
<td>0.5%</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>0.50% Increase</td>
<td>$5.6</td>
<td>0.9%</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>0.75% Increase</td>
<td>$8.5</td>
<td>1.4%</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>1.0% Increase</td>
<td>$11.3</td>
<td>1.8%</td>
<td>$32</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

CONCEPTUAL FINANCIAL STRATEGIES ANALYSIS

For the purposes of the TMP Financial Analysis, two conceptual financial strategies were evaluated to provide an estimate of the level of funding the City of Littleton would need to generate in order to provide local match funds for potential federal, State and regional funds (Table 29). For each of the conceptual financial strategies, it was assumed that the City would fully fund the $113.4 million required for the Local Projects. The two conceptual strategies for the Regionally Significant Projects reflect the following assumptions regarding the allocation of costs among Federal programs, State/Regional programs, and the City of Littleton:

- Maximum Federal Participation:
  - Transit Projects: 50 percent Federal; 25 percent State/Regional; and 25 percent City of Littleton
  - Active Transportation and Auto Projects: 80 percent Federal; 10 percent State/Regional; and 10 percent City of Littleton
  - As shown in the table below, based on these assumptions, Federal funding would total $416 million, State/Regional funding would total $102 million and the City of Littleton share would total $216 million ($113.4 million for Local Projects and $102.2 million for Regionally Significant Projects).
  - Additionally, based on the previously described annual sales tax estimates based on the four increments and the associated level of bonds that could be issued against these increments:
    - It would take between 17 and 67 years to cover the City of Littleton’s share on a pay-as-you go basis.
    - Assuming bonds are issued against a new sales tax, between 19 and 77 percent of the City of Littleton’s share would be funded.

- Moderate Federal Participation:
  - Transit Projects: 40 percent Federal; 30 percent State/Regional; and 30 percent City of Littleton
  - Active Transportation and Auto Projects: 50 percent Federal; 25 percent State/Regional; and 25 percent City of Littleton.
Based on these assumptions, Federal funding would total $284 million, State/Regional funding would total $169 million and the City of Littleton share would total $282 million ($113.4 million for Local Projects and $168.5 million for Regionally Significant Projects).

Additionally, based on the previously described annual sales tax estimates based on the four increments and the associated level of bonds that could be issued against these increments:

- It would take between 22 and 90 years to cover the City of Littleton’s share on a pay-as-you go basis.
- Assuming bonds are issued against a new sales tax, between 14 and 58 percent of the City of Littleton’s share would be funded.

Table 29. Conceptual Financial Strategies

<table>
<thead>
<tr>
<th>Scenario 1 - Maximum Federal Participation</th>
<th>Costs</th>
<th>Federal</th>
<th>State/Regional</th>
<th>City of Littleton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td>$113.4</td>
<td></td>
<td>$113.14</td>
<td></td>
</tr>
<tr>
<td>Regional Projects</td>
<td>$620.5</td>
<td>$416.2</td>
<td>$102.2</td>
<td>$102.2</td>
</tr>
<tr>
<td>Total</td>
<td>$733.9</td>
<td>$416.2</td>
<td>$102.2</td>
<td>$215.6</td>
</tr>
<tr>
<td>Potential New Sales Tax (cash basis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.25%</td>
<td>0.50%</td>
<td>0.75%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Annual Estimates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.80</td>
<td>$5.60</td>
<td>$8.50</td>
<td>$11.30</td>
<td></td>
</tr>
<tr>
<td>Number of years to cover City’s share of costs on a pay-go basis</td>
<td>77.0</td>
<td>38.5</td>
<td>25.4</td>
<td>19.1</td>
</tr>
<tr>
<td>Potential New Sales Tax (issue bonds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual Amount of Bonds Issued</td>
<td>$36</td>
<td>$72</td>
<td>$108</td>
<td>$145</td>
</tr>
<tr>
<td>% share of City’s Funding Needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17%</td>
<td>33%</td>
<td>50%</td>
<td>67%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scenario 2 - Moderate Federal Participation</th>
<th>Costs</th>
<th>Federal</th>
<th>State/Regional</th>
<th>City of Littleton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td>$113.4</td>
<td></td>
<td>$113.4</td>
<td></td>
</tr>
<tr>
<td>Regional Projects</td>
<td>$620.5</td>
<td>$283.5</td>
<td>$168.5</td>
<td>$168.5</td>
</tr>
<tr>
<td>Total</td>
<td>$733.9</td>
<td>$283.5</td>
<td>$168.5</td>
<td>$281.9</td>
</tr>
<tr>
<td>Potential New Sales Tax (cash basis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.25%</td>
<td>0.50%</td>
<td>0.75%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Annual Estimates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.80</td>
<td>$5.60</td>
<td>$8.50</td>
<td>$11.30</td>
<td></td>
</tr>
<tr>
<td>Number of years to cover City’s share of costs on a pay-go basis</td>
<td>100.7</td>
<td>50.3</td>
<td>33.2</td>
<td>24.9</td>
</tr>
<tr>
<td>Potential New Sales Tax (issue bonds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual Amount of Bonds Issued</td>
<td>$36</td>
<td>$72</td>
<td>$108</td>
<td>$145</td>
</tr>
<tr>
<td>% share of City’s Funding Needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13%</td>
<td>26%</td>
<td>38%</td>
<td>51%</td>
<td></td>
</tr>
</tbody>
</table>

The next section provides an initial list of federal, State and other local revenue sources that could be targeted in partnership with CDOT, RTD, and DRCOG to address the non-City of Littleton funding needs beyond use of a conceptual sales tax increase.
POTENTIAL FUNDING SOURCES

The following sections provide summary descriptions of potential federal, state, and other local sources that could be targeted in partnership with RTD, CDOT, and DRCOG to implement the Regionally Significant Projects. Additional details on these funding programs and other sources considered for this analysis are provided in the Funding Guidebook, which is submitted under a separate cover.

POTENTIAL FEDERAL PROGRAMS

This section provides descriptions of potential federal funding sources that could support implementation of Regionally Significant Projects within the Auto, Transit, and Active Transportation projects. The sources reflect both discretionary (competitive) and formula programs.

The federal funding sources described below reflect existing grant programs. The current federal transportation authorization legislation for these programs (Fixing America’s Surface Transportation Act, or the FAST Act) is scheduled to expire in September 2020. Based on prior legislative history, it is likely that most, if not all, of these programs will continue. However, it is also important to note that there are ongoing discussions in Washington, D.C. regarding the return of Congressional earmarks. Cities and transportation agencies across the country have started the process of marketing major capital investment projects to their federal delegations with the goal of getting these projects named and funded as part of future transportation legislation, assuming earmarks return. When Congressional earmarks were part of federal transportation legislation in the past, the average project grant awards were significantly higher than grant awards provided through the programs described below.

Discretionary/Competitive Grants

As the preferred program of projects defined in the TMP moves through the planning, environmental, and design process, there may be opportunities to leverage federal funds for entire projects or specific cost elements of projects through competitive grant opportunities offered by the Federal Transit Administration (FTA), Federal Highway Administration (FHWA), and United States Department of Transportation (USDOT). A brief overview of competitive grant programs used to support the planning, engineering, and/or construction of Auto Capacity, Auto Operations and Safety, Transit, and Active Transportation projects is provided below.

Finally, as indicated in the descriptions, there are a limited number of competitive federal grant programs and due to the volume of applications received, grant awards are typically less than $15 million for individual projects.

USDOT BUILD Grant Program (formerly known as the TIGER Grant Program)

Description: The Better Utilizing Investments to Leverage Development (BUILD) program, formerly known as the Transportation Investment Generating Economic Recovery (TIGER) program, is one of USDOT’s largest multimodal discretionary grant programs and supports innovative projects that would be otherwise difficult to fund through traditional federal programs. USDOT seeks projects that will catalyze long-lasting, positive changes in economic development, safety, quality of life, environmental sustainability, and state of good repair. Prior rounds of BUILD/TIGER have prioritized projects seeking to improve access to reliable, safe, and affordable transportation to enhance connectivity and provide ladders of opportunity for communities in urban, suburban, and rural areas.

The BUILD/TIGER program is extremely competitive with 7,300 applications submitted to USDOT requesting $143 billion in BUILD/TIGER funds over the program’s eight rounds for which summaries have been released. USDOT has awarded a total of $5.1 billion to 421 projects, which is less than six percent of all applicants. Table 30 illustrates overall supply and demand for the program since it was first authorized under the American Recovery and Reinvestment Act of 2009.
(ARRA). While there have been annual appropriations for BUILD/TIGER every FY since 2009, including the most recent BUILD notice of funding opportunity (NOFO) released in April 2019, the program is not specifically authorized in federal legislation.

Table 30. BUILD/TIGER Program Overall Supply and Demand

<table>
<thead>
<tr>
<th>Fiscal Year (FY)</th>
<th>Program Size</th>
<th>Applicants</th>
<th>Projects Funded</th>
<th>Percent of Projects Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$1,500 million</td>
<td>~1,400</td>
<td>51</td>
<td>3.6 percent</td>
</tr>
<tr>
<td>2010</td>
<td>$600 million</td>
<td>~1,700</td>
<td>75</td>
<td>4.4 percent</td>
</tr>
<tr>
<td>2011</td>
<td>$510 million</td>
<td>848</td>
<td>46</td>
<td>5.4 percent</td>
</tr>
<tr>
<td>2012</td>
<td>$500 million</td>
<td>703</td>
<td>47</td>
<td>6.7 percent</td>
</tr>
<tr>
<td>2013</td>
<td>$474 million</td>
<td>585</td>
<td>52</td>
<td>8.9 percent</td>
</tr>
<tr>
<td>2014</td>
<td>$600 million</td>
<td>797</td>
<td>72</td>
<td>9.0 percent</td>
</tr>
<tr>
<td>2015</td>
<td>$500 million</td>
<td>627</td>
<td>39</td>
<td>6.2 percent</td>
</tr>
<tr>
<td>2016</td>
<td>$500 million</td>
<td>585</td>
<td>40</td>
<td>6.8 percent</td>
</tr>
</tbody>
</table>

Source: USDOT
Note: 2017 and 2018 BUILD awards summaries have not been released by USDOT.

**Eligible Project Categories:** Auto, Transit, and Active Transportation

**Revenue Potential:** Despite the program’s $25 million statutory maximum grant amount, the typical BUILD/TIGER grant awarded to projects in urban areas is $10 to $15 million. USDOT rarely awards close to its maximum of $25 million in BUILD/TIGER funding to any one project. Between 2012 and 2016, only 20 out of 250 TIGER awards were $20 million or larger. Notably, nearly two-thirds of the 40 grant recipients in FY 2016 were repeat applicants.

**Most Recent Application Cycle:** July 15, 2019

**Example Projects:** Table 31 provides a summary of projects from around the country that are similar to what is being considered in the TMP. The purpose of the table is to highlight successful project examples and the share of costs the federal grant covered.
### Table 31. Comparable Projects

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Project Summary</th>
<th>Grant Award/Share of Total Costs</th>
<th>Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami-Dade County</td>
<td>Expand and improve two existing park-and-ride facilities along the South Dade Bus Rapid Transit (BRT) line. The project includes additional sidewalks, improved pedestrian access, bicycle parking facilities, a kiss-and-ride, additional parking for individuals with disabilities, and electric vehicle parking with charging stations.</td>
<td>$9.5 M (50%)</td>
<td>Transit</td>
</tr>
<tr>
<td>Maquoketa, IA</td>
<td>The project will make several roadway improvements including new and resurfaced street pavement; replacement curbs, gutters, pedestrian curb ramps, and sidewalks for compliance with the Americans with Disabilities Act (ADA); repair and replacement of the storm sewer, sanitary sewer, and water main; installation of a new broadband fiber-optic network; and traffic signal upgrades.</td>
<td>$3.8 M (40%)</td>
<td>Roadway</td>
</tr>
<tr>
<td>Calloway County, KY</td>
<td>The project will widen an approximately 5.7-mile section of US 641 South from a two-lane divided highway to a four-lane divided highway between the Kentucky/Tennessee state line at Hazel north to the Middle Fork of the Clarks River.</td>
<td>$23 M (41%)</td>
<td>Roadway</td>
</tr>
<tr>
<td>Hickory, NC</td>
<td>The project will develop an approximately 1.7-mile bicycle and pedestrian trail and a bridge over US 321, and construct a 1.2-mile complete streetscape loop in downtown Hickory that will add designated space for bicycles and pedestrians and concurrently incorporate underground fiber cable systems.</td>
<td>$17 M (77%)</td>
<td>Active Transportation</td>
</tr>
<tr>
<td>Butler County, PA</td>
<td>The project will realign and widen to 4 lanes the approximately 1.5-mile Balls Bend and the approximately 0.75-mile Haines School-Commonwealth sections of Route 228, including adding turn lanes, medians, connecting access roads, and pedestrian/bicycle facilities. This project is part of a larger to widen approximately 26 miles of Route 228 in Butler County.</td>
<td>$20 M (47%)</td>
<td>Roadway</td>
</tr>
</tbody>
</table>

Source: BUILD 2018 Fact Sheets

**USDOT INFRA Grant Program (formerly known as the FASTLANE Grant Program)**

**Description:** The Infrastructure for Rebuilding America (INFRA) grant program, formerly known as the Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) grant program, provides dedicated, discretionary funding for projects that address critical issues facing our nation’s highway and bridges. Eligible costs include reconstruction, rehabilitation, acquisition of property, environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance.

**Eligible Project Categories:** Auto only—however the focus of the grant program is to improve freight and goods movement.
**Revenue Potential:** In FY 2018, USDOT awarded over $1.5 billion in INFRA awards to 26 projects, or an average award of $59.1 million. Each year, 90 percent of available INFRA funds are awarded to large projects, or those with a minimum grant size of $25 million. The remaining 10 percent of available funds are reserved for small projects, which have a minimum grant size of $5 million.

**Most Recent Application Cycle:** The FY 2019 INFRA NOFO was released on December 21, 2018. The application deadline was March 4, 2019, and FY 2019 awards were announced on July 25, 2019.

**FHWA Advanced Transportation and Congestion Management Technologies Deployment**

**Description:** The FAST Act established the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Program to make competitive grants for the development of model deployment sites for large-scale installation and operation of advanced transportation technologies to improve safety, efficiency, system performance, and infrastructure return on investment.

ATCMTD grants can cover up to 50 percent of the total project cost. Recipients can use funds to deploy advanced transportation and congestion management technologies, including:

- advanced traveler information systems;
- advanced transportation management technologies;
- infrastructure maintenance, monitoring, and condition assessment;
- advanced public transportation systems;
- transportation system performance data collection, analysis, and dissemination systems;
- advanced safety systems, including vehicle-to-vehicle and vehicle-to-infrastructure communications;
- technologies associated with autonomous vehicles, and other collision avoidance technologies, including systems using cellular technology;
- integration of intelligent transportation systems with the Smart Grid and other energy distribution and charging systems;
- electronic pricing and payment systems; and
- advanced mobility and access technologies, such as dynamic ridesharing and information systems to support human services for elderly and disabled individuals.

**Eligible Project Categories:** Roadway—capital costs only

**Revenue Potential:** In the most recent application cycle, 51 applicants requested more than $265 million. Ten grants were awarded ranging from $2.4 million to $12 million for a total of $53.2 million, or an average award of $5.3 million. CDOT secured a $2.4 million grant for Wolf Creek Pass Advanced Technology Deployment.

**Most Recent Application Cycle:** The FY 2018 NOFO was published on April 18, 2018, grant applications were due on June 18, 2018, and awards were announced on April 1, 2019.

**FTA Section 5309 Capital Investment Grant Program (New Starts/Small Starts)**

**Description:** This FTA discretionary grant program funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. Federal transit law requires transit agencies seeking Capital Investment Grants (CIG) funding to complete a series of steps over several years. For New Starts projects, the law requires completion of...
two phases (Project Development and Engineering) in advance of receipt of a construction grant agreement. For Small Starts projects, the law requires completion of one phase (Project Development only) in advance of receipt of a construction grant agreement. The law also requires projects to be rated by FTA at various points in the process according to statutory criteria evaluating project justification and local financial commitment.

**Eligible Project Categories:** Transit

**Revenue Potential:** The FAST Act authorized $2.3 billion in CIG funding annually through 2020. New Starts projects require a total project cost of greater than $300 million and CIG funding of at least $100 million. Small Starts projects have total project costs of less than $300 million and less than $100 million in CIG funds. Maximum CIG share of total project cost is 60 percent for New Starts and 80 percent for Small Starts.

Recently, RTD successfully pursued $92 million in CIG funds for the $224 million Southeast Rail Extension to Lone Tree. Local funding was provided through a combination of RTD sales tax revenue and local contributions including donated right-of-way and cash contributions. Previously, RTD obtained CIG funds for earlier lines of the FasTracks Program, with the non-federal share provided by the RTD sales tax.

**Most Recent Application Cycle:** Ongoing submittal and review process

**Federal Formula Programs**

The following provides an overview of FTA and FHWA formula grant programs that could be pursued separately or in combination with the previously described competitive grant programs. While there is no limitation on the number of federal funding programs that can be included in a project’s financial strategy, the maximum federal funding participation that can be used on a project is 80 percent of the total capital costs.

If there is interest to pursue funding from any of these programs, there will need to be coordination with RTD, DRCOG, or CDOT. Use of these funds is typically identified several years in advance and is documented in the region’s transportation planning and programming documents, including the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP). More specifically, the current TIP programs federal funds through DRCOG over the 2020 to 2023 period. If FTA or FHWA formula programs are to be targeted for projects included in the TMP, the funds would have to be programmed after the current TIP period (2024 or later), or the City would have to work with DRCOG to reprogram and transfer funds from projects in the current TIP.

**Programs Administered by RTD**

- **FTA Section 5307 Urbanized Area Formula Program**
  
  **Description:** The Urbanized Area Formula Funding program (49 U.S.C. 5307) makes federal resources available to urbanized areas for transit capital and operating assistance and for transportation-related planning.

  Eligible activities for Section 5307 funds include planning, engineering, design, and evaluation of transit projects and other technical transportation-related studies; crime prevention and security equipment; vehicle acquisition and replacement; construction of maintenance and **passenger facilities**; and **capital investments in new and existing fixed guideway systems** including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software.

  **Eligible Project Categories:** Transit

  **Revenue Potential:** FY 2019 FTA Apportionment to the Denver Region: $58.4 million

- **FTA Section 5337 State of Good Repair Formula Grants**
Description: The State of Good Repair Program provides funding to transit agencies through a statutory formula for maintenance, replacement, and rehabilitation projects of high-intensity fixed guideway and bus systems to help transit agencies maintain assets in a state of good repair. Eligible activities include implementing transit asset management plans and replacing or rehabilitating rolling stock; track; line equipment and structures; signals and communications; power equipment and substations; passenger stations and terminals; security equipment and systems; maintenance facilities and equipment; and operational support equipment, including computer hardware and software.

Eligible Project Categories: Transit

Revenue Potential: FY 2019 FTA Apportionment to the Denver Region: $16.3 million

Programs Administered by DRCOG through the TIP Process

Description: The TIP programs the federally-funded transportation improvements and management actions to be completed by CDOT, RTD, local governments, and other project sponsors over a four-year period within the DRCOG region. As required by federal and State law, the TIP must be fiscally constrained to funds expected to be available. All projects selected to receive federal and State surface transportation funds, and all regionally significant projects regardless of funding type, must be identified in the TIP.

DRCOG is responsible for developing and approving the TIP. DRCOG directly selects projects with federal and State funding, and reviews CDOT and RTD-submitted projects for consistency with regional plans. This discussion focuses on the DRCOG-selected projects, which draw from the following funding sources:

- **Surface Transportation Block Grant Program (STBG):** provides funding for projects that preserve and improve the conditions and performance on any federal-aid highway, bridge, and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects. Potential TMP elements that could be eligible for STBG funds include:
  - Construction, reconstruction, rehabilitation, resurfacing, restoration, preservation, or operational improvements for highways;
  - Capital costs for transit projects;
  - Corridor parking facilities;
  - Improvements at intersections with high crash rates or levels of congestion; and
  - Infrastructure-based ITS capital improvements.

- **Transportation Alternatives (TA):** provides funding for non-motorized elements of high capacity transit projects. Potential eligible expenses within the TMP could include planning, design, and construction of facilities for pedestrians and bicyclists.

- **Congestion Mitigation and Air Quality (CMAQ):** Program funds are available for transportation projects likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution and congestion. More specifically, to be eligible for CMAQ funding, a transportation project must generate an emissions reduction, and it must be located in or benefit a nonattainment or maintenance area. Potential TMP elements that could be eligible for CMAQ funds are summarized below. Further, as noted in the list, CMAQ can be used to cover a portion of the increased operating costs associated with the introduction of expanded transit service.
  - Planning and engineering activities;
TRANSPORTATION MASTER PLAN: IMPLEMENTATION

- New or rehabilitation of existing transit facilities (e.g., lines, stations, terminals, transfer facilities) if associated with new or enhanced public transit, passenger rail, or other similar services that will increase transit service capacity;
- Advanced signal and communications systems for transit;
- Fuel, whether conventional or alternative fuel, if part of a project providing operating assistance for new or expanded transit service under the CMAQ program; and
- Operating assistance to introduce new transit service or expand existing transit service.

- **State Multimodal Transportation Options Fund (MMOF):** SB 18-001 includes a provision that establishes a Multimodal Options Fund. The Multimodal Options Fund has $96.75 million in dedicated revenue. Of that $96.75 million, $2.5 million is dedicated to the Rail Commission. The remaining $94.25 million is split between CDOT (15 percent, or $14.13 million) and local governments (85 percent, or $80.12 million). The legislation directs the CDOT Transportation Commission to establish a distribution formula for the local portion. The distribution formula must be based on population and ridership. The legislation also states that recipients shall provide a match equal to the amount of the award. However, the CDOT Transportation Commission, per legislation, may create a formula for reducing or exempting the match requirement for local governments or agencies due to their size or any other special circumstance. As of May 2019, the allocation methodology was still being developed by CDOT.

**Selection Process:** DRCOG selects projects in three phases:

1. **Set-Asides:** “Off-the-top” regional programs totaling $49.4 million over the four-year TIP period. Funding is provided through Calls for Projects and includes:
   - Community Mobility Planning & Implementation: $4.8 million and reflects a combination of the current STAMP/UC Set-Aside and small infrastructure projects from the current TDM Set-Aside;
   - TDM Services: $13.4 million and rebranded to include the TMA partnerships, non-infrastructure TDM projects, and Way to Go;
   - Regional Transportation Operations & Technology: $20 million, of which 25 percent is directed to staff DRCOG Traffic Signal Program with the remaining available for project solicitation;
   - Air Quality Improvements: $7.2 million; and
   - Human Service Transportation: $4.0 million and is a new set-aside to improve service and mobility options for vulnerable populations.

2. **Regional Share:** $32 million available for transformative projects that will provide benefits to the entire region. This represents 20 percent of available funds after accounting for the Set-Asides. Applications are submitted through subregions, and DRCOG evaluates and selects the projects. Table 32 shows the projects that were selected as part of the current TIP and the ranked waitlisted projects to provide examples of the types of projects that scored well in the DRCOG evaluation process as well as the per project grant award amounts. Finally, it should be noted that the City of Littleton is a funding partner on the US 85 PEL Study listed in Table 33.
Table 32. TIP Regional Share Funding Recommendation

<table>
<thead>
<tr>
<th>Project Sponsor</th>
<th>Project Name</th>
<th>Regional Share Funding Request</th>
<th>Total DRCOG Weighted Score H=3, M=2, L=1</th>
<th>Tier</th>
<th>Project Activity</th>
<th>Regional Share Funding Level</th>
<th>Project Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulder County</td>
<td>SH-119 BRT Enhancements</td>
<td>$8.2 2.5 1 Construction</td>
<td></td>
<td></td>
<td></td>
<td>$8.2</td>
<td>1) Center busway in Longmont on Coffman St between 1st and 9th, 2) transit bypass lanes on SH119 at SH52, and 3) Bus Access Transit (BAT) lanes in Boulder on 28th St between Iris and Valmont.</td>
</tr>
<tr>
<td>Denver</td>
<td>16th St Mall Rehabilitation</td>
<td>$20.0 2.5 1 Construction</td>
<td></td>
<td></td>
<td></td>
<td>$9.1</td>
<td>Reconstruct with new granite paver system, install bulb-out systems, and sidewalks.</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>Peaks to Plains Trail - SH-6 Tunnel 1 to Huntsman Gulch</td>
<td>$4.0 2.5 1 Construction</td>
<td></td>
<td></td>
<td></td>
<td>$4.0</td>
<td>Build a 3-mile 10-foot ADA path along SH-6, including pedestrian bridges, parking lots, and creek access points.</td>
</tr>
<tr>
<td>Arapahoe County</td>
<td>High Plains Trail/Cherry Creek Trail Connector</td>
<td>$2.0 2.4 1 Construction</td>
<td></td>
<td></td>
<td></td>
<td>$2.0</td>
<td>New trail connecting existing High Plains and Cherry Creek Trails, including a grade separation over Parker Road.</td>
</tr>
<tr>
<td>RTD</td>
<td>Mobility as a Service: Implementing an Open-Ticketing Platform</td>
<td>$1.8 2.4 1 Construction</td>
<td></td>
<td></td>
<td></td>
<td>$1.8</td>
<td>1) Upgrade back-end administration of fare payment system to account-based, and 2) install new fare validators on all RTD revenue vehicles.</td>
</tr>
<tr>
<td>RTD</td>
<td>RTD Transportation Transformation Comprehensive Plan</td>
<td>$1.4 2.3 1 Study</td>
<td></td>
<td></td>
<td></td>
<td>$1.4</td>
<td>Study will provide a vision for base transit system and maximize FasTracks investments.</td>
</tr>
<tr>
<td>Arapahoe County</td>
<td>US-85 PEL Study</td>
<td>$1.5 2.2 1 Study</td>
<td></td>
<td></td>
<td></td>
<td>$1.5</td>
<td>Planning and Environmental Linkages study on US-85, between C-470 and Alameda Ave/I-25.</td>
</tr>
<tr>
<td>Broomfield</td>
<td>SH-7 Preliminary and Environmental Engineering</td>
<td>$4.0 2.2 1 Pre-construction</td>
<td></td>
<td></td>
<td></td>
<td>$4.0</td>
<td>Develop preliminary and environmental engineering, and identify ROW and utility needs on SH-7 from Folsom St in Boulder to US-85 in Brighton.</td>
</tr>
</tbody>
</table>
### Table 33. TIP Regional Share Funding Waiting List

<table>
<thead>
<tr>
<th>Project Sponsor</th>
<th>Project Name</th>
<th>Regional Share Funding Request</th>
<th>Total DRCOG Weighted Score H=3, M=2, L=1</th>
<th>Tier</th>
<th>Project Activity</th>
<th>Waiting List Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denver</td>
<td>Broadway Station and I-25 Safety and Access Improvements</td>
<td>$20.0</td>
<td>2.3</td>
<td>1</td>
<td>Construction</td>
<td>1</td>
</tr>
<tr>
<td>Adams</td>
<td>I-270 Corridor EA and Vasquez Blvd Construction</td>
<td>$6.0</td>
<td>2.2</td>
<td>1</td>
<td>Construction</td>
<td>2</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Ward Rd and BNSF Grade Separation</td>
<td>$1.0</td>
<td>2.0</td>
<td>1</td>
<td>Pre-construction</td>
<td>3</td>
</tr>
<tr>
<td>Boulder</td>
<td>US-287 BRT Feasibility and Corridor Safety Study</td>
<td>$0.3</td>
<td>1.9</td>
<td>1</td>
<td>Study</td>
<td>4</td>
</tr>
<tr>
<td>Douglas</td>
<td>I-25/Lincoln Interchange Traffic and Mobility Improvements</td>
<td>$1.0</td>
<td>1.9</td>
<td>1</td>
<td>Pre-construction</td>
<td>5</td>
</tr>
<tr>
<td>Arapahoe</td>
<td>US-285 Congestion Management and Operations Study</td>
<td>$0.9</td>
<td>1.8</td>
<td>1</td>
<td>Study</td>
<td>6</td>
</tr>
<tr>
<td>Denver</td>
<td>I-25 Valley Highway Phase 2.0 (I-25 and Alameda)</td>
<td>$15.0</td>
<td>2.0</td>
<td>2</td>
<td>Construction</td>
<td>7</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Wadsworth Blvd Widening: 48th Ave to I-70</td>
<td>$3.3</td>
<td>2.0</td>
<td>2</td>
<td>Construction</td>
<td>8</td>
</tr>
<tr>
<td>Adams</td>
<td>US-85/120th Ave Interchange: Phase 1</td>
<td>$8.8</td>
<td>1.9</td>
<td>2</td>
<td>Pre-construction</td>
<td>9</td>
</tr>
<tr>
<td>Broomfield</td>
<td>US-36 Bikeway Realignment and Safety Improvements</td>
<td>$1.2</td>
<td>1.9</td>
<td>2</td>
<td>Construction</td>
<td>10</td>
</tr>
<tr>
<td>Adams</td>
<td>I-70/SH79 Interchange Operational Improvements</td>
<td>$0.8</td>
<td>1.7</td>
<td>2</td>
<td>Construction</td>
<td>11</td>
</tr>
<tr>
<td>CDOT</td>
<td>Central 70 (Part 2 of DRCOG's previous commitment)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Requested $58**
3. **Subregional Share:** The subregional model is new as of the 2020-2023 TIP cycle with approximately $160 million available among the subregions. It divides the region into 8 subregions according to county boundaries. The subregional funding pool is distributed according to a formula weighing population, employment, and VMT within each county. All DRCOG-member local governments who are partially or entirely within a given county boundary must be invited to participate in the subregional forum.

Scoring criteria for both regional and subregional shares are based on the following categories (although subregional forums may choose to alter the criteria or weighting for the subregional share):

1. Regional Significance (40 percent)
2. TIP Focus Area (30 percent)
3. Consistency with Metro Vision Objectives (20 percent)
4. Leveraging of funds (10 percent)

For the February 2019 Subregional Call for Projects, the City submitted applications for the following projects: Bowles Avenue and Federal Boulevard Intersection Improvements, Broadway Corridor Plan, and Mineral Avenue and Santa Fe Drive Intersection Improvements. Of the three projects submitted, only a portion of the Mineral Avenue and Santa Fe Drive Intersection Improvements was funded.

**POTENTIAL STATE PROGRAMS**

CDOT receives revenue from five sources: state revenues, federal revenues, grants, miscellaneous sources (including the sale of property, permits, and fines), and enterprise revenues. The three largest sources of revenue for CDOT (FY 2019-2020 Estimate) are:

1. General fund transfers approved by the State Legislature ($678 million)
2. The Highway User Tax Fund (HUTF), which is made up of a combination of federal and State motor fuel taxes, vehicle registration fees, and other sources ($586 million)
3. FHWA revenue—the Highway Trust Fund ($573 million)

CDOT distributes its funds through a variety of programs, and most of its funding programs are only eligible on state-owned highways. Within the City of Littleton, this includes US 85 and Belleview Avenue where intersection or corridor projects could be done in conjunction with CDOT and therefore these projects could access state highway funds.

- **Highway Safety Improvement Program**
  
  *Description:* The primary goal of the Highway Safety Improvement Program (HSIP) is to achieve a significant reduction in fatalities and serious injuries on all publicly maintained roads. This includes public roads not owned by the State and roads on tribal lands. To comply with this program, CDOT is required to:
    - Develop a strategic highway safety plan (SHSP) that identifies and analyzes highway safety problems and opportunities;
    - Create projects to reduce the identified safety problems; and
    - Evaluate and update the SHSP on a regular basis.
  
  The City of Littleton currently has one project that was awarded funding under HSIP.

  *Eligible Project Categories:* Auto

  *Revenue Potential:* $43.1 million (FY 2018-19)
• **Traffic Signal and Ramp Metering Program**

  **Description:** The Traffic Signal and Ramp Metering (TSRM) Program was developed as a result of the 2013 Mobility Operations Reorganization Report. The objective of this program is to develop statewide policies, procedures, and guidelines on design, maintenance, life-cycle asset management, integration, and operation of traffic signal and ramp meters; manage various statewide funding programs and pools; and facilitate informed decision making on project prioritization. The TSRM Program is focused on implementing new and innovative technology, including CV/AV applications, deploying and integrating statewide ITS systems, incorporating automated performance measures, and extending technical resources to CDOT Regions in the areas of traffic signal and ramp metering. The TSRM Program also leads and/or participates in the development and implementation of arterial and freeway management strategies throughout the State. This includes integrating these systems and using them in conjunction with other intelligent transportation system devices to more efficiently manage our transportation system. This program works collaboratively with CDOT Regions, FHWA, metropolitan planning organizations, local agencies, and other stakeholders to develop and implement policies, standards, and operational procedures for traffic signals and ramp meters.

**Statewide Traffic Signal Pool (SGN).** CDOT’s Traffic Signal Pool Program delivers funding to each Engineering Region on an annual basis. These funds are designated specifically for signal construction or signal system improvements. The Regions rely on these funds to address, on a priority basis, safety, mobility, and operational needs at locations with existing signals or where signals are warranted but not yet constructed. In a typical application, these funds are directed to activities such as new traffic signal or ramp meter construction, equipment or system upgrades, signal expansion due to intersection widening, signal interconnect, and operational improvements including minor hardware or software upgrades to facilitate safety and improve corridor traffic operations.

**Statewide Traffic Signal Asset Management (SGA).** CDOT owns approximately 1,850 signals statewide. CDOT is responsible for the eventual replacement of these signals at the end of its useful life. The SGA pool delivers much needed capital replacement funding to each Engineering Region on an annual basis to replace the traffic signal infrastructure in poor or severe condition. CDOT’s Signal Program is leading the effort in collaborating with the Regions by establishing a process to identify, select and prioritize the replacement of statewide traffic signal infrastructure. The Signal program has established capital replacement guidelines, including performance measures and targets, focused on high-level core criteria that provide a basis for Regions to quickly evaluate, and determine a list of traffic signal capital replacement projects.

**Transportation Improvement Program (TIP) - Regional Funding Pool Administration.** This program pool was established by DRCOG in the TIP to be funded through the federal CMAQ program. CDOT’s Signal Program, in conjunction with FHWA, DRCOG, and local agencies, administers two pools under the TIP program - the Traffic Signal System Improvement Program (TSSIP) pool and the Intelligent Transportation Systems (ITS) pool. The TSSIP program delivers a capital improvement program, which provides equipment and installs communications links to improve system components, and a traffic signal timing improvement program, which provides new traffic signal timing and coordination plans to demonstrate the benefits of the capital improvements. The ITS program awards funds to ITS projects that implement the adopted Denver Regional Intelligent Transportation Systems Strategic Plan and achieve the goals and objectives of the Regional Concept of Transportation Operations.

**Current Signal Program Initiatives**

- Statewide central traffic signal control system upgrade
- Statewide traffic signal controller upgrade
- Ramp Metering system upgrade
- Implementation of Automated Traffic Signal Performance Measures (ATSPMs)
- Piloting and mainstreaming new and innovative technologies (CV/DSRC, Adaptive, etc.)
- Enhancing condition-based asset management guidelines for signal asset
- Administration of DRCOG TSSIP and TIP funding pools

**Eligible Project Categories:** Auto

**Revenue Potential:** $17.8 million (FY 2018-19), $16.1 million (FY 2019-20)

- **FASTER Safety**
  **Description:** In 2009 the General Assembly created new funding sources to aid CDOT and local governments in funding road safety projects. Per Section 43-4-803 (21), C.R.S. (2018), a "Road Safety Project" means construction, reconstruction, or maintenance projects that:
    - The Transportation Commission determines are needed to enhance the safety of a state highway.
    - A county determines are needed to enhance the safety of a county road.
    - A municipality determines needed to enhance the safety of a City street.
  
  FASTER funds flow through the Colorado Highway User Trust Fund (HUTF) and are distributed to CDOT, counties, and municipalities.
  
  In 2014, The Transportation Commission approved new administration of the FASTER Safety program. CDOT FASTER road safety funding is now allocated to two statewide programs administered by HQ: FASTER Safety Asset Management and FASTER Safety Mitigation. HQ coordinates with the Regions to select projects for Region delivery.
  
  The City of Littleton currently has one project that was awarded FASTER funding.

**Eligible Project Categories:** Auto

**Revenue Potential:** $67.4 million (FY 2018-19), $68.5 million (FY 2019-20)

- **Regional Priority Program**
  **Description:** The objective of the Regional Priority Program (RPP) is to supplement the formula-driven funding allocations to the five CDOT engineering regions with flexible funding for use at the discretion of each Regional Transportation Director in consultation with local elected officials and other stakeholders in each region. This is accomplished through the transportation planning process. RPP funds are distributed to the CDOT Regions according to a formula based on 50 percent population, 35 percent state highway system lane miles, and 15 percent state highway system truck VMT.

**Eligible Project Categories:** Auto

**Revenue Potential:** $48.7 million (FY 2018-19), $48.4 million (FY 2019-20)

- **Transportation Alternatives Program**
  **Description:** CDOT uses a call for projects approach to allocated federal Transportation Alternatives Program (TAP) funds. These federal funds are allocated under TAP to transportation improvement projects that expand travel choice, strengthen the local economy, improve quality of life, and protect the environment. Many TAP projects enhance non-motorized forms of transportation like biking and walking. The TAP provides funding for bicycle, pedestrian, historic, scenic, and environmental mitigation transportation projects.

Eligible activities include but are not limited to:
- Construction, planning, and design of facilities for pedestrians and bicyclists
- Construction of turnouts, overlooks and viewing areas, and preservation of historic transportation facilities
- Some environmental mitigation activities, including vegetation management, and archeological and storm water mitigation related to highway projects
- The recreational trails program

**Eligible Project Categories:** Active Transportation
Revenue Potential: CDOT Region 1, which encompasses the City, is projected to allocate $1.8 million per year through FY2020.

- **Surface Transportation Program—Metro**
  
  Description: The Surface Transportation Program (STP) is a federally mandated program. STP provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge, and tunnel projects on any public road; pedestrian and bicycle infrastructure; and transit capital projects, including intercity bus terminals. STP-Metro is a subprogram of STP for urbanized areas with populations greater than 200,000. Project selection for STP-Metro funds is conducted by federally designated regional Transportation Management Areas (TMAs) comprised of local governments. In Colorado, DRCOG, the Pikes Peak Area Council of Governments (PPACG), and the North Front Range Metropolitan Planning Organization (NFRMPO) select projects, and the member governments that receive funding contribute matching funds. Project finance is administered by CDOT.

  Eligible Project Categories: Auto, Transit, and Active Transportation

  Revenue Potential: $54.0 million (FY 2018-19), $55.4 million (FY 2019-20)

- **Congestion Mitigation & Air Quality**
  
  Description: CMAQ is a federally mandated program, the objective of which is to improve air quality in nonattainment and maintenance areas for ozone, carbon monoxide, and particulate matter. These include the areas of the NFRMPO, DRCOG, PPACG, portions of the Upper Front Range Transportation Planning Region (UFR TPR), Aspen, Cañon City, Pagosa Springs, Steamboat Springs, and Telluride. Funds may be used for transportation projects designed to contribute to the attainment or maintenance of national ambient air quality standards (NAAQS), with a high level of effectiveness in reducing air pollution.

  Eligible activities include:
  - Establishment or operation of a traffic monitoring, management, and control facility, including advanced truck stop electrification systems, if it contributes to attainment of an air quality standard
  - Projects that improve traffic flow, including projects to improve signalization, construct HOV lanes, improve intersections, add turning lanes, improve transportation systems management and operations that mitigate congestion and improve air quality, and implement ITS and other CMAQ eligible projects, including projects to improve incident and emergency response or improve mobility, such as real-time traffic, transit, and multimodal traveler information
  - Purchase of integrated, interoperable emergency communications equipment
  - Projects that shift traffic demand to nonpeak hours or other transportation modes, increase vehicle occupancy rates, or otherwise reduce demand
  - Complete diesel retrofits of fleet vehicles
  - Development of alternative fueling infrastructure and assistance in the conversion of public and private fleets to alternative fuel vehicles such as compressed natural gas (CNG), propane, or electric vehicles
  - Expanded authority to use funds for transit operations

  Eligible Project Categories: Auto, Transit, and Active Transportation

  Revenue Potential: $50.3 million (FY 2018-19), $50.2 million (FY 2019-20)

**POTENTIAL LOCAL DISTRICTS**

In addition to increasing the sales tax rate that was described earlier, other locally controlled revenue programs that could be considered include:

- Increase Mill Levy for Transportation: Temporarily increase the local mill levy for a specific transportation improvement. This approach would require voter approval. An example of this approach is Larimer County, which
temporarily increased the Road & Bridge Fund Mill Levy share of the total current county-wide mill levy to implement the I-25 Improvement Project.

- Regional Transportation Authority (RTA): Implementation of a multi-jurisdiction sales tax dedicated for transportation infrastructure improvements. RTAs need to establish boundaries for the proposed authority and have all participating government entities agree on the structure and tax amount. A vote is required to establish the authority and also to approve the sales tax. The RTA approach was implemented in El Paso County in 2004 to provide funding for roadway maintenance, roadway capital projects, and transit enhancements.

- Local Improvement Districts (LID): A LID allows property owners within a defined geographic area to construct and finance public streets, storm drainage, water system, or sanitary sewer improvements over a period of time so the whole cost of the improvement does not have to be paid at once. Following a referendum among the property owners within the district, the cost of the public improvements is paid by the property owners through their property taxes.

- Metropolitan District: These districts are units of local government that provide public improvements and services to its property owners and residents through property tax revenue. Voter approval is required to implement the district. A metropolitan district provides two or more types of improvements and services which could include: parks and recreation; sanitation sewer and storm water improvements; traffic and safety controls; street improvements; water system improvements; public transportation; television relay and translation systems; fiber optic communications systems; mosquito control; and fire protection.

PROJECT ALIGNMENT WITH TMP GOALS & OBJECTIVES

Each project’s overall value was determined through the aggregation of benefits, measured based upon an evaluation criteria that reflects how well a project is expected to achieve the previously-identified goals and objectives. Only the goals and objectives that translated into effective evaluation criteria for capital projects were included (25 out of 31). The remaining 6 objectives are focused on the quality of transportation projects. Those objectives should be considered through some of the City’s next steps, such as design standards, and other efforts to ensure that transportation infrastructure meets the City’s goals and objective. Table 34 illustrates the evaluation criteria used to score each project, consistent with the City’s goals and objectives:

Table 34. Evaluation Criteria

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of Life</td>
<td>Provide people with a sense of personal safety regardless of transportation mode</td>
</tr>
<tr>
<td>2</td>
<td>Quality of Life</td>
<td>Provide transportation infrastructure that meets local business needs</td>
</tr>
<tr>
<td>3</td>
<td>Community</td>
<td>Provide transportation facilities that are well integrated with land use and character</td>
</tr>
<tr>
<td>4</td>
<td>Community</td>
<td>Minimize transportation-related air quality degradation</td>
</tr>
<tr>
<td>5</td>
<td>Community</td>
<td>Minimize transportation-related water quality degradation</td>
</tr>
<tr>
<td>6</td>
<td>Community</td>
<td>Minimize transportation-related noise impacts</td>
</tr>
<tr>
<td>7</td>
<td>Mobility</td>
<td>Provide a reliable transportation system</td>
</tr>
<tr>
<td>8</td>
<td>Mobility</td>
<td>Achieve a balanced mode share</td>
</tr>
</tbody>
</table>
## TRANSPORTATION MASTER PLAN: IMPLEMENTATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Mobility</td>
<td>Provide high-quality transportation systems people can afford to use</td>
</tr>
<tr>
<td>10</td>
<td>Active</td>
<td>Provide a well-connected, direct bicycling network</td>
</tr>
<tr>
<td>11</td>
<td>Active</td>
<td>Provide a safe biking environment</td>
</tr>
<tr>
<td>12</td>
<td>Active</td>
<td>Provide a well-connected pedestrian network</td>
</tr>
<tr>
<td>13</td>
<td>Active</td>
<td>Provide a safe walking environment</td>
</tr>
<tr>
<td>14</td>
<td>Active</td>
<td>Provide healthy transportation choices</td>
</tr>
<tr>
<td>15</td>
<td>Auto</td>
<td>Provide a well-connected automotive network</td>
</tr>
<tr>
<td>16</td>
<td>Auto</td>
<td>Provide for safe automobile travel</td>
</tr>
<tr>
<td>17</td>
<td>Auto</td>
<td>Provide a resilient and responsive traffic operations system</td>
</tr>
<tr>
<td>18</td>
<td>Auto</td>
<td>Provide an efficient automotive network</td>
</tr>
<tr>
<td>19</td>
<td>Auto</td>
<td>Provide a roadway network that allows for excellent emergency response</td>
</tr>
<tr>
<td>20</td>
<td>Transit</td>
<td>Connect people effectively to the transit system</td>
</tr>
<tr>
<td>21</td>
<td>Transit</td>
<td>Provide an efficient transit system</td>
</tr>
<tr>
<td>22</td>
<td>Transit</td>
<td>Provide safe &amp; comfortable transit stops and stations</td>
</tr>
<tr>
<td>23</td>
<td>Freight</td>
<td>Provide a reliable freight network</td>
</tr>
<tr>
<td>24</td>
<td>Freight</td>
<td>Provide a well-connected freight network</td>
</tr>
<tr>
<td>25</td>
<td>Freight</td>
<td>Provide a safe freight network</td>
</tr>
</tbody>
</table>

The scores for the projects are strictly meant to be a guide for decision-makers moving forward. City staff and the Transportation Mobility Board will use the scores as they undertake the effort to prioritize projects and offer recommendations to City Council as they develop the Capital Improvement Program on an annual basis.

Score. The scoring for each evaluation criteria ranged from 0 to 5 points. A score of 5 represents the best possible score and most alignment with a given objective while a score of zero equates to a project having no positive impact on the objective.

Weight. Each criteria score was then multiplied by a criteria-specific weight. The weights applied to the criteria were developed with two goals. First, the weights balance scoring between topics in order to compensate for the fact that some topics relate to more objectives than others. For example, the “Quality of Life” topic is only associated with two scoring objectives, whereas “Community” is associated with four. The second function of the weighting system is to reflect the understanding that certain objectives may be considered of greater value based on community input or may affect more travelers. For example, in general projects that improve auto capacity or operations/safety are given the highest weight,
based on the prevalence of auto travel in Littleton. Table 35 shows the maximum possible score for each topic area based on the weighting criteria.

**Results.** The weighted scores were then summed to produce the “goal & objective alignment score.” Table 36 presents the projects ranked from highest value to lowest based on this evaluation criteria scoring method. The far right column illustrates the project value.

Reconfiguring the Santa Fe Drive/Bowles Avenue and Santa Fe Drive/Mineral Avenue intersections to grade-separated interchanges were the top two projects with scores of 429. This was followed by the South Platte River Parkway extension and Access Preservation Area and Bus Rapid Transit along the Broadway corridor.

**Table 35. Maximum Possible Score**

<table>
<thead>
<tr>
<th>Project Categories</th>
<th>Maximum Possible Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life</td>
<td>60</td>
</tr>
<tr>
<td>Community</td>
<td>80</td>
</tr>
<tr>
<td>Mobility</td>
<td>75</td>
</tr>
<tr>
<td>Active (Bike &amp; Pedestrian)</td>
<td>150</td>
</tr>
<tr>
<td>Auto</td>
<td>250</td>
</tr>
<tr>
<td>Transit</td>
<td>135</td>
</tr>
<tr>
<td>Freight</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>810</td>
</tr>
</tbody>
</table>
### Table 36. Project Ranking

<table>
<thead>
<tr>
<th>ID</th>
<th>Project Type</th>
<th>Corridor</th>
<th>Intersection or Segment</th>
<th>Description</th>
<th>Cost (Millions of 2019 Dollars)</th>
<th>Goal &amp; Objective Alignment Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A23</td>
<td>Auto Capacity</td>
<td>Santa Fe Dr</td>
<td>Bowles Ave</td>
<td>Reconfigure into grade-separated interchange</td>
<td>150.0</td>
<td>429</td>
</tr>
<tr>
<td>A24</td>
<td>Auto Capacity</td>
<td>Santa Fe Dr</td>
<td>Mineral Ave</td>
<td>Reconfigure into grade-separated interchange</td>
<td>75.0</td>
<td>429</td>
</tr>
<tr>
<td>A5</td>
<td>Auto Capacity</td>
<td>Access Preservation Area</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>Maintain and enhance mobility between Santa Fe and South Platte River</td>
<td>8.0</td>
<td>399</td>
</tr>
<tr>
<td>A44</td>
<td>Auto Capacity</td>
<td>South Platte River Pkwy</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>South Platte River Parkway extension</td>
<td>6.0</td>
<td>399</td>
</tr>
<tr>
<td>A45</td>
<td>Auto Capacity</td>
<td>South Platte River Pkwy</td>
<td>Corridor Wide (Excluding ROW)</td>
<td>Connect new South Platte River Parkway extension to Santa Fe Drive</td>
<td>1.5</td>
<td>399</td>
</tr>
<tr>
<td>T1</td>
<td>Transit</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>BRT</td>
<td>64.0</td>
<td>353</td>
</tr>
<tr>
<td>BP86</td>
<td>Active Transportation</td>
<td>City-wide</td>
<td>15.1-mi</td>
<td>Missing sidewalks</td>
<td>2.9</td>
<td>323</td>
</tr>
<tr>
<td>BP87</td>
<td>Active Transportation</td>
<td>City-wide</td>
<td>32.5-mi</td>
<td>Narrow sidewalks</td>
<td>3.9</td>
<td>299</td>
</tr>
<tr>
<td>A43</td>
<td>Auto Capacity</td>
<td>Santa Fe Dr</td>
<td>Corridor-Wide</td>
<td>Widening</td>
<td>50.0</td>
<td>289</td>
</tr>
<tr>
<td>A2</td>
<td>Auto Operations and Safety</td>
<td>Santa Fe Dr</td>
<td>Bowles Ave</td>
<td>Alternative intersection configuration</td>
<td>15.0</td>
<td>284</td>
</tr>
<tr>
<td>A3</td>
<td>Auto Operations and Safety</td>
<td>Santa Fe Dr</td>
<td>Mineral Ave</td>
<td>Alternative intersection configuration, quadrant roadway, or continuous flow intersection</td>
<td>15.0</td>
<td>284</td>
</tr>
<tr>
<td>BP31</td>
<td>Active Transportation</td>
<td>Mary Carter Greenway</td>
<td>Bowles Ave</td>
<td>Bridge widening</td>
<td>1.0</td>
<td>268</td>
</tr>
<tr>
<td>BP67</td>
<td>Active Transportation</td>
<td>Mary Carter Greenway</td>
<td>Mineral Ave</td>
<td>Bridge widening</td>
<td>1.0</td>
<td>268</td>
</tr>
<tr>
<td>ID</td>
<td>Project Type</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Description</td>
<td>Cost (Millions of 2019 Dollars)</td>
<td>Goal &amp; Objective Alignment Score</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
<td>-------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>BP21</td>
<td>Active Transportation</td>
<td>Broadway</td>
<td>High Line Canal Trail south of Arapahoe Rd to Ridge Road</td>
<td>Shared use path</td>
<td>0.2</td>
<td>263</td>
</tr>
<tr>
<td>BP22</td>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Bannock St to Caley Ave</td>
<td>Shared use path</td>
<td>0.1</td>
<td>263</td>
</tr>
<tr>
<td>BP23</td>
<td>Active Transportation</td>
<td>Belleview Ave</td>
<td>Irving St to City Limits</td>
<td>Shared use path</td>
<td>1.5</td>
<td>263</td>
</tr>
<tr>
<td>BP24</td>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Broadway to E Dry Creek Rd</td>
<td>Shared use path</td>
<td>0.5</td>
<td>263</td>
</tr>
<tr>
<td>BP25</td>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Jamison Ave to City Limits</td>
<td>Shared use path</td>
<td>0.5</td>
<td>263</td>
</tr>
<tr>
<td>BP80</td>
<td>Active Transportation</td>
<td>Rangeview Dr</td>
<td>Windermere St to Prince St</td>
<td>Shared use path</td>
<td>0.3</td>
<td>263</td>
</tr>
<tr>
<td>BP82</td>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Between Santa Fe Dr &amp; Jackass Hill Rd</td>
<td>Shared use path</td>
<td>0.2</td>
<td>263</td>
</tr>
<tr>
<td>BP44</td>
<td>Active Transportation</td>
<td>Broadway</td>
<td>High Line Canal Trail (S of Arapahoe Rd)</td>
<td>Grade-separated</td>
<td>3.0</td>
<td>256</td>
</tr>
<tr>
<td>BP45</td>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Peninsula Dr/High Line Canal Trail</td>
<td>Grade-separated</td>
<td>3.0</td>
<td>256</td>
</tr>
<tr>
<td>BP46</td>
<td>Active Transportation</td>
<td>Rio Grande St</td>
<td>Slaughterhouse Gulch Trail</td>
<td>Grade-separated</td>
<td>5.0</td>
<td>256</td>
</tr>
<tr>
<td>BP47</td>
<td>Active Transportation</td>
<td>Santa Fe Dr</td>
<td>Slaughterhouse Gulch Trail</td>
<td>Grade-separated</td>
<td>6.0</td>
<td>256</td>
</tr>
<tr>
<td>BP48</td>
<td>Active Transportation</td>
<td>Santa Fe Dr</td>
<td>Dad Clark Gulch</td>
<td>Grade-separated</td>
<td>6.0</td>
<td>256</td>
</tr>
<tr>
<td>BP74</td>
<td>Active Transportation</td>
<td>Broadway</td>
<td>Lee Gulch</td>
<td>Grade-separated</td>
<td>5.0</td>
<td>256</td>
</tr>
<tr>
<td>BP85</td>
<td>Active Transportation</td>
<td>Little’s Creek Flume Trail Connection</td>
<td>RR Tracks</td>
<td>Trail connection across flume</td>
<td>1.0</td>
<td>256</td>
</tr>
<tr>
<td>ID</td>
<td>Project Type</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Description</td>
<td>Cost (Millions of 2019 Dollars)</td>
<td>Goal &amp; Objective Alignment Score</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>----------------</td>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>T5</td>
<td>Transit</td>
<td>Santa Fe Dr</td>
<td>Corridor Wide</td>
<td>Relieve burden on parking via full light rail extension (cost shown)</td>
<td>166.0</td>
<td>255</td>
</tr>
<tr>
<td>A39</td>
<td>Auto Operations and Safety</td>
<td>Broadway</td>
<td>Corridor-wide</td>
<td>V2I and ITS</td>
<td>2.0</td>
<td>249</td>
</tr>
<tr>
<td>A40</td>
<td>Auto Operations and Safety</td>
<td>Santa Fe Dr</td>
<td>Corridor-Wide</td>
<td>V2I and ITS</td>
<td>1.0</td>
<td>243</td>
</tr>
<tr>
<td>BP9</td>
<td>Active Transportation</td>
<td>Belleview Ave</td>
<td>City Limits/ Prospect Rd to Irving St</td>
<td>Protected bike lane</td>
<td>0.3</td>
<td>231</td>
</tr>
<tr>
<td>BP10</td>
<td>Active Transportation</td>
<td>Windermere St</td>
<td>City Limits/ Layton Ave to Littleton Blvd</td>
<td>Protected bike lane</td>
<td>0.2</td>
<td>231</td>
</tr>
<tr>
<td>BP11</td>
<td>Active Transportation</td>
<td>Windermere St</td>
<td>Littleton Blvd to Ridge Road</td>
<td>Protected bike lane</td>
<td>0.1</td>
<td>231</td>
</tr>
<tr>
<td>BP12</td>
<td>Active Transportation</td>
<td>Ridge Rd</td>
<td>Prince St to Broadway</td>
<td>Protected bike lane</td>
<td>0.3</td>
<td>231</td>
</tr>
<tr>
<td>BP13</td>
<td>Active Transportation</td>
<td>Alamo Ave</td>
<td>Prince St to Court Pl</td>
<td>Protected bike lane</td>
<td>1.0</td>
<td>231</td>
</tr>
<tr>
<td>BP14</td>
<td>Active Transportation</td>
<td>Main St</td>
<td>Prince St to Court Pl</td>
<td>Protected bike lane</td>
<td>&gt;0.1</td>
<td>231</td>
</tr>
<tr>
<td>BP15</td>
<td>Active Transportation</td>
<td>Church Ave</td>
<td>Santa Fe Dr to Prince St</td>
<td>Protected bike lane</td>
<td>&gt;0.1</td>
<td>231</td>
</tr>
<tr>
<td>BP16</td>
<td>Active Transportation</td>
<td>Federal Blvd</td>
<td>Belleview Ave to Bowles Ave</td>
<td>Protected bike lane</td>
<td>0.3</td>
<td>231</td>
</tr>
<tr>
<td>BP17</td>
<td>Active Transportation</td>
<td>Lowell Blvd</td>
<td>Belleview Ave to Bowles Ave</td>
<td>Protected bike lane</td>
<td>0.2</td>
<td>231</td>
</tr>
<tr>
<td>BP18</td>
<td>Active Transportation</td>
<td>Prince St</td>
<td>Centennial Dr to Mineral Ave</td>
<td>Protected bike lane</td>
<td>0.7</td>
<td>231</td>
</tr>
<tr>
<td>BP19</td>
<td>Active Transportation</td>
<td>Southpark Ln</td>
<td>Mineral Ave to County Line Rd</td>
<td>Protected bike lane</td>
<td>0.2</td>
<td>231</td>
</tr>
<tr>
<td>BP20</td>
<td>Active Transportation</td>
<td>Centennial Dr/ Prentice Ave/ Progress Ave</td>
<td>Federal Blvd to Prince St</td>
<td>Protected bike lane</td>
<td>0.2</td>
<td>231</td>
</tr>
<tr>
<td>ID</td>
<td>Project Type</td>
<td>Corridor</td>
<td>Intersection or Segment</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>BP73</td>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Jackass Hill Rd to Broadway</td>
<td>Protected bike lane</td>
<td>0.4</td>
<td>231</td>
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<td>T3</td>
<td>Transit</td>
<td>Littleton Blvd</td>
<td>Corridor Wide</td>
<td>Circulator Shuttle</td>
<td>TBD</td>
<td>226</td>
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<tr>
<td>T8</td>
<td>Transit</td>
<td>Downtown</td>
<td>Station</td>
<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
<td>0.1</td>
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<td>T9</td>
<td>Transit</td>
<td>Mineral Ave/Santa Fe Dr</td>
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<td>Station improvements (rider information, wayfinding, parking lot reconfiguration)</td>
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<td>T17</td>
<td>Transit</td>
<td>Mineral Ave/Santa Fe Dr</td>
<td>Station</td>
<td>Parking garage (1500 spaces)</td>
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<td>A41</td>
<td>Auto Capacity</td>
<td>County Line Rd</td>
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<td>Auto Capacity</td>
<td>County Line Rd</td>
<td>Santa Fe Dr to Broadway</td>
<td>Widening</td>
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<td>Auto Capacity</td>
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<td>Active Transportation</td>
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<td>Ridge Rd to Rangeview Dr</td>
<td>Buffered bike lane and traffic calming</td>
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<td>Active Transportation</td>
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<td>Mineral Ave to Broadway</td>
<td>Buffered bike lane and traffic calming</td>
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<td>A37</td>
<td>Auto Operations and Safety</td>
<td>Windermere St</td>
<td>Corridor-wide</td>
<td>Traffic calming</td>
<td>2.0</td>
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<td>Auto Operations and Safety</td>
<td>Ridge Rd</td>
<td>Corridor-wide</td>
<td>Curb and gutter, geometry, intersections</td>
<td>5.0</td>
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<td>Auto Operations and Safety</td>
<td>Prince St</td>
<td>Corridor-wide</td>
<td>Turn lanes, curb and gutter</td>
<td>10.0</td>
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<td>Santa Fe Dr</td>
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<td>Goal &amp; Objective Alignment Score</td>
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<td>Auto Capacity</td>
<td>Mineral Ave</td>
<td>Santa Fe to Jackass Hill Rd</td>
<td>Widen to six lanes and reconstruct sidewalks under RR crossings</td>
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<td>Auto Operations and Safety</td>
<td>Prince St</td>
<td>Centennial Dr</td>
<td>Roundabout</td>
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<td>Santa Fe Dr</td>
<td>Prince St</td>
<td>Signal timing and phasing, advanced detection and geometry, NB Left</td>
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<td>Berry Ave</td>
<td>Blue Sage Dr to Federal Blvd</td>
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<td>159</td>
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<td>Shepperd Ave to High Line Canal</td>
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<td>Sterne Pkwy</td>
<td>Apache St to Broadway</td>
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<td>Tule Lake Dr</td>
<td>Sheridan Blvd/ City Limits to Federal Blvd</td>
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<td>Littleton Blvd</td>
<td>Main St/ Alamo Ave/ Court Pl/ Bemis St</td>
<td>Roundabout</td>
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<td>Auto Operations and Safety</td>
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<td>Huron St</td>
<td>Roundabout</td>
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<td>A29</td>
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<td>Apache St</td>
<td>Roundabout</td>
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<td>Elati St</td>
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<td>Gallup St</td>
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<td>Prince St</td>
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<td>Roundabout</td>
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<td>Belleview Ave</td>
<td>Prince St to Lowell Blvd</td>
<td>Access control, median</td>
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<td>144</td>
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<td>BP56</td>
<td>Active Transportation</td>
<td>Federal Blvd</td>
<td>Bowles Ave/Trail Crossing</td>
<td>Raised crossing in channelized right turn lane</td>
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<td>142</td>
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<td>BP57</td>
<td>Active Transportation</td>
<td>Prince St</td>
<td>Little's Creek Trail</td>
<td>RRFB/raised pedestrian crossing</td>
<td>0.2</td>
<td>142</td>
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<td>BP58</td>
<td>Active Transportation</td>
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<td>Federal Blvd</td>
<td>Pedestrian signal</td>
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<td>Active Transportation</td>
<td>Bega Park Trail</td>
<td>Alamo Ave</td>
<td>RRFB/raised pedestrian crossing</td>
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<td>142</td>
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<td>Bega Park Trail</td>
<td>Main St</td>
<td>RRFB/raised pedestrian crossing</td>
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<td>Active Transportation</td>
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<td>Polo Ridge Dr</td>
<td>Pedestrian signal or other improvement</td>
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<td>142</td>
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<tr>
<td>T2</td>
<td>Transit</td>
<td>Broadway</td>
<td>Corridor Wide</td>
<td>Transit speed and reliability improvements</td>
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<td>138</td>
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<td>T6</td>
<td>Transit</td>
<td>Bowles Ave</td>
<td>Corridor</td>
<td>Transit speed and reliability improvements</td>
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<td>ID</td>
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<td>Intersection or Segment</td>
<td>Description</td>
<td>Cost (Millions of 2019 Dollars)</td>
<td>Goal &amp; Objective Alignment Score</td>
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<tr>
<td>T7</td>
<td>Transit</td>
<td>Downtown</td>
<td>District</td>
<td>Transit speed and reliability improvements - transit signal priority, queue jumps, or other operational improvements</td>
<td>0.1</td>
<td>138</td>
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<tr>
<td>BP75</td>
<td>Active Transportation</td>
<td>Elati St</td>
<td>Highline Canal</td>
<td>Improve connection</td>
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<td>BP83</td>
<td>Active Transportation</td>
<td>Mineral Ave</td>
<td>Wolff St to Polo Ridge Dr</td>
<td>Trail crossing improvements</td>
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<tr>
<td>BP1</td>
<td>Active Transportation</td>
<td>Caley Ave</td>
<td>Prince St to Broadway</td>
<td>Advisory bike lane or bike lane</td>
<td>0.2</td>
<td>129</td>
</tr>
<tr>
<td>BP2</td>
<td>Active Transportation</td>
<td>Powers Ave</td>
<td>Court Pl to Delaware St</td>
<td>Advisory bike lane or bike lane</td>
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<td>BP81</td>
<td>Active Transportation</td>
<td>Geddes Ave</td>
<td>Windermere St to Elati St</td>
<td>Advisory bike lane or bike lane</td>
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<td>129</td>
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<td>A6</td>
<td>Auto Operations and Safety</td>
<td>S Platte Canyon Rd</td>
<td>Mineral Dr</td>
<td>Full movement intersection</td>
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<td>T10</td>
<td>Transit</td>
<td>Broadway</td>
<td>Littleton Blvd</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
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<td>Arapahoe Rd</td>
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<td>Mineral Ave</td>
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<td>Arapahoe Community College</td>
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<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
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<td>Cost (Millions of 2019 Dollars)</td>
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<td>Littleton Blvd</td>
<td>S Datura St</td>
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<td>S Bannock St</td>
<td>Bus stop/mobility hub improvements (amenities, wayfinding, stop connectivity)</td>
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<td>Powers Ave</td>
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<td>Active</td>
<td>Santa Fe Dr</td>
<td>Prince St</td>
<td>Bicycle intersection improvements</td>
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<td>Alamo Ave</td>
<td>Bicycle intersection improvements</td>
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<tr>
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<td>Belleview Ave</td>
<td>Bicycle intersection improvements</td>
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<td>Bowles Ave</td>
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<td>Caley Ave</td>
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<td>Apache St/ High Line Canal Trail</td>
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<td>Bicycle intersection improvements</td>
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<td>Belleview Ave</td>
<td>Protected bicycle intersection</td>
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<td>Belleview Ave</td>
<td>Protected bicycle intersection</td>
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<td>Jackass Hill Rd</td>
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<td>Mineral Ave/ Ken Caryl Rd</td>
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ADDITIONAL PLANNING

As outlined in the modal chapters previously, in addition to capital investments, the City should conduct the following plans in the near future:

1. Additional planning for major corridors identified through this process as being key to achieving the City’s goals for transportation. These corridors have been identified as those that should be improved for a variety of modes, and a study for each should be conducted to determine how best to address the needs of all users in these key areas of the City, and additional public and stakeholder outreach is required to make sure that the projects proposed are consistent with the local residents’ and businesses’ needs. They include:
   a. Santa Fe Drive—the US 85 PEL is expected to kick off in 2019 or 2020, in coordination with CDOT and other regional partners. Littleton should take a leadership role in that study.
   b. Littleton Boulevard—Littleton Boulevard represents a prime opportunity to re-envision how people move through a historic part of the City. A multimodal corridor study should be completed that identifies opportunities for enhancing the pedestrian and transit user experience along this corridor.
   c. Broadway—partnering with Centennial, Englewood, Douglas County, Arapahoe County, and RTD
   d. Prince Street
   e. Windermere Street
   f. Ridge Road
   g. Bowles Avenue—partnering with Jefferson County
   h. Belleview Avenue—building on past planning including the recently completed framework study

2. Additional planning for the intersections identified as having safety and operational issues. These should be evaluated in detail to identify cost-effective and implementable solutions.

3. Downtown Mobility Plan to determine how the City can address the parking and circulation issues in and around downtown.

4. Create a bicycle wayfinding program that includes region-wide and City-specific system maps posted in key locations, as well as comprehensive, easy-to-understand signing.

5. Consider opportunities for stop consolidation (in partnership with RTD) to improve transit speeds and maximize investments in amenities.

6. Consider circulator shuttle service east from downtown along Littleton Boulevard corridor. Route would connect downtown with Littleton High School along a future mixed-use corridor, serving vulnerable populations north of the roadway and population centers throughout. Vehicles could be City-owned and operated, managed by RTD, or provided through partnerships with private companies. Autonomous vehicle technology has been applied in similar settings in several cities across the U.S.¹⁹