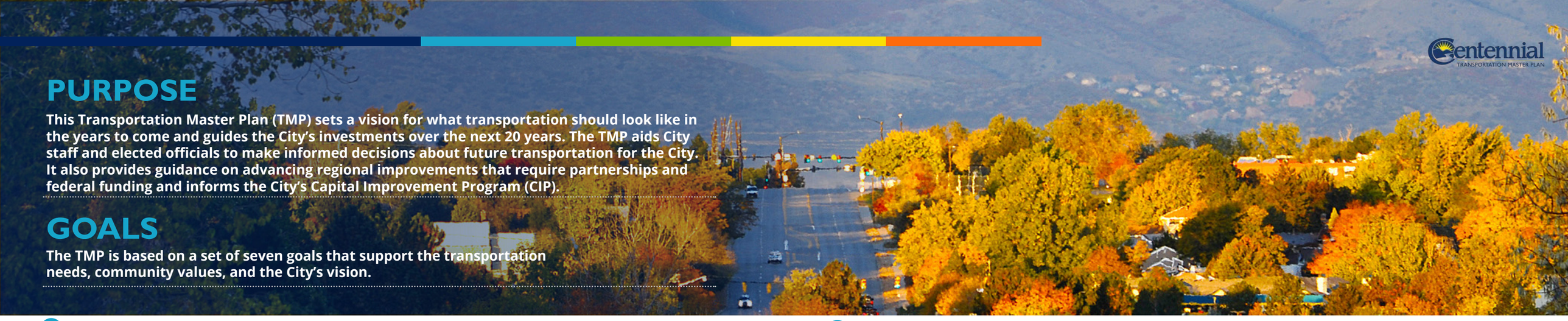
Centennial
TRANSPORTATION MASTER PLAN

EXECUTIVE SUMMARY

ADOPTED MAY 2, 2022



PURPOSE

This Transportation Master Plan (TMP) sets a vision for what transportation should look like in the years to come and guides the City's investments over the next 20 years. The TMP aids City staff and elected officials to make informed decisions about future transportation for the City. It also provides guidance on advancing regional improvements that require partnerships and federal funding and informs the City's Capital Improvement Program (CIP).

GOALS

The TMP is based on a set of seven goals that support the transportation needs, community values, and the City's vision.

GOALS

1 Safety

Transportation-related fatalities and injuries are rare, and people feel safe walking, bicycling, driving, riding public transportation, or using a mobility device.

WHAT DOES THIS LOOK LIKE IN MY NEIGHBORHOOD?

Parents take their kids on evening walks and bike rides without stressing about which streets and intersections are okay and which should be avoided – they are all safe and comfortable.

2 Flexible Mobility

People of all ages, abilities, and social identities have convenient and affordable mobility options and freedom of choice to use the travel mode that best meets their needs.

In a typical work week, a Streets at SouthGlenn worker who shares one car with their partner regularly alternates between biking, driving, and taking the bus to commute depending on each of their daily schedules and the weather – all are convenient and reliable options for reaching the shopping center.

3 Innovation

Transportation infrastructure and policies prepare for mobility technologies that enhance the user experience and reduce transportation-related emissions and environmental impacts.

A high school student rides an e-bike to school and to their after-school job along routes that include bike detection at all major intersections; the school has ample secured bike parking for students and faculty.

4 Efficiency & Reliability

The transportation network is optimized to minimize congestion and offer reliable travel times for people traveling in and through Centennial.

A Denver Tech Center employee who commutes along Arapahoe Road from east Centennial leaves their home at the same time every morning and always reaches the office on time.

GOALS

5 Fiscal Responsibility

Transportation infrastructure is designed and maintained to optimize public benefit, and investments leverage funding opportunities and demonstrate good stewardship of public funds.

WHAT DOES THIS LOOK LIKE IN MY NEIGHBORHOOD?

A retiree drives to the Civic Center to serve on the Senior Commission without concern for damage to their car from poor road conditions because all surfaces are smooth and well-maintained.

6 Regionalism & Partnerships

Centennial is a leader in working with neighboring communities and regional partners to build cohesive regional networks for all modes of transportation.

A mobility device user living in west Centennial and working in Littleton has high-quality sidewalk connections to reliable and convenient transit service on both ends of their commute.

7 Economic & Community Vitality

The City's streetscapes and transportation system support economic vitality, connect neighborhoods, and promote a vibrant community identity.

An 8-year-old can safely get somewhere to buy ice cream and then make it home before the ice cream melts.

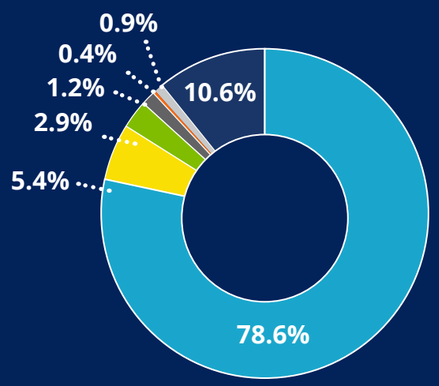
CURRENT CONDITIONS: KEY HIGHLIGHTS

POPULATION, HOUSEHOLD, & EMPLOYMENT OVERVIEW

	2020	2040
Population	111,100	128,200
Households	40,400	49,900
Jobs	68,500	106,500

HOW CENTENNIAL RESIDENTS COMMUTE TO WORK

(AMERICAN COMMUNITY SURVEY 2015-2019)



NATIONAL AVERAGE	CENTENNIAL
76.3%	78.6% - Drove Alone
5.2%	10.6% - Worked from Home
9.0%	5.4% - Carpool
5.0%	2.9% - Public Transportation
2.7%	1.2% - Walked
1.3%	0.9% - Taxicab, motorcycle, or other
0.5%	0.4% - Bike

COMMUTER INFLOW/OUTFLOW DAILY POPULATION CHANGE (2018)

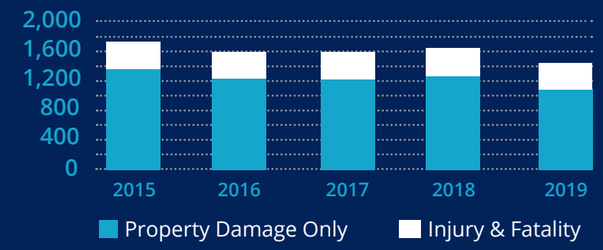
TOTAL POPULATION: 111,100
DAILY INCREASE: 10,700

LIVE & WORK IN CENTENNIAL
6,153 ····· 11%

TOP LOCATIONS CENTENNIAL RESIDENTS COMMUTE TO

DENVER	15,125	27%
AURORA	6,044	11%
GREENWOOD VILLAGE	5,357	9%
LITTLETON	2,686	5%

CRASHES PER YEAR



TOP 5 BOTTLENECK LOCATIONS

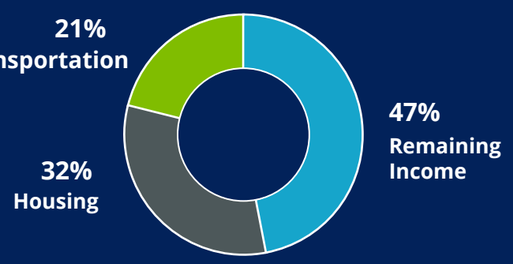
Bottlenecks, i.e., locations of significant breakdown of traffic flow, occur at multiple locations in the City.

1. ARAPAHOE ROAD @ JORDAN ROAD
2. SMOKY HILL RD @ BUCKLEY RD
3. QUEBEC ST @ DRY CREEK RD
4. SMOKY HILL RD @ LIVERPOOL ST/PICADILLY ST
5. PARKER RD @ LEWISTON WAY/E FAIR PL

HOUSING & TRANSPORTATION AFFORDABILITY INDEX

The H+T Index defines affordability as both housing and transportation costs totaling no more than 45 percent of household income. Centennial residents, on average, spend **32 percent** of their household income on housing and **21 percent** of their household income on transportation. **Combined, Centennial's H+T index is 53 percent.** Typically, a Centennial resident spends approximately $13,622 on trasportation related expenditures each year.

Centennial = 53%
National Benchmark = 45%



$13,622 in Annual Transportation Costs

CENTENNIAL MULTIMODAL NETWORKS

Walk Score is a nationally used metric that provides walk, bike, and transit scores using a variety of factors. Scores for the three modes are provided on a scale from 0-100, with 100 being the best score that can be attained by a community.

11 Miles
Shared Lanes

15 Miles
Bike Lanes

64 Miles
Trails

168 MILES (67%)
Collector & Arterial Streets with Sidewalks on Both Sides

31 Miles
Total Miles of Sidewalk Gaps

Pre-COVID: 14 Bus Routes
8 of the bus routes have seen service hour reductions due to COVID-19

3 FlexRide Options
Orchard, Dry Creek and Arapahoe FlexRide on-demand bus service

3 Lightrail Transit Lines
E Line, F Line, and R Line

BIKE SCORE

47

Measures bike lanes, trails, hills, road connectivity, and destinations

WALK SCORE

36

Measures distance to nearby places and pedestrian friendliness

TRANSIT SCORE

25

Measures proximity to and the type of nearby transit service

COMMUNITY ENGAGEMENT

ENGAGEMENT OVERVIEW

A comprehensive community engagement approach was used over the year-long planning period to engage key stakeholders and a broad cross-section of the public in the process. Importantly, community engagement was conducted during the COVID-19 pandemic, and online tools were used to engage the community and provide opportunities for input, particularly during the first phase. As COVID-19 restrictions were lifted, more opportunities for tangible, in-person community events were scheduled in the summer of 2021.

The planning process involved three phases of engagement The first phase, focused on values and needs, spanned between early-May to mid-July. Outreach through this initial phase aimed to notify the public about the Centennial TMP update and sought to understand community values and transportation gaps and needs.

The second phase, which extended from early-August to mid-September, presented community members and stakeholders opportunities to evaluate transportation and mobility tradeoffs and provide feedback on initial project ideas.

The third phase of engagement occurred in March/April 2022. This last phase of engagement centered on validation. Community members and stakeholders were asked to review and comment on the draft TMP and to confirm that the Plan reflects the community's stated values and priorities.

PHASE I - ENGAGEMENT BY THE NUMBERS

APPROXIMATELY **200** COMMENTS & SURVEY RESPONSES

IN-PERSON EVENTS

OVER **150** PEOPLE REACHED AT IN-PERSON EVENTS

STAKEHOLDER GROUP MEETINGS

5 STAKEHOLDER GROUP MEETINGS

IDEA WALL FINDINGS

- Bicycle comments focused on creating a complete and connected bike network
- Community members expressed interest in a connected and safe sidewalk network
- Transit comments focused on more accessible and reliable service
- Roads/traffic comments focused on improving safety and managing congestion
- Safety comments called for infrastructure improvements that encourage use of different mobility options
- Other comments provided input on sustainable mobility options and improving streetscape elements

TRANSPORTATION TRADEOFFS

The transportation tradeoffs survey was provided at in-person events and online. Additionally, a live polling version of the survey was presented at a Centennial Senior Commission meeting and Centennial Council of Neighborhoods. Results that emerged from these events have been aggregated and summarized in the following charts. The results of the tradeoffs activity suggest a balanced approach to implementing transportation improvements.

STREET DESIGN

Design streets to decrease travel delay for vehicles	Equal Importance	Design streets for safety and movement of all modes (cars, bikes, pedestrians, transit)

BICYCLE DESIGN

Expand the off-street trail network	Equal Importance	Expand on-street bike facilities (such as bike lanes)
Add bike facilities along local neighborhood streets	Equal Importance	Add bike facilities along major streets (e.g., Colorado Blvd or Briarwood Ave)
Add separated bike lanes (where a portion of the street is dedicated to bike lanes)	Equal Importance	Add shared bike lanes (where bikes and cars share space)

PEDESTRIAN DESIGN

Complete gaps where sidewalks are missing	Equal Importance	Improve pedestrian street crossings (e.g., where a trail crosses a major street)

TRANSIT DESIGN

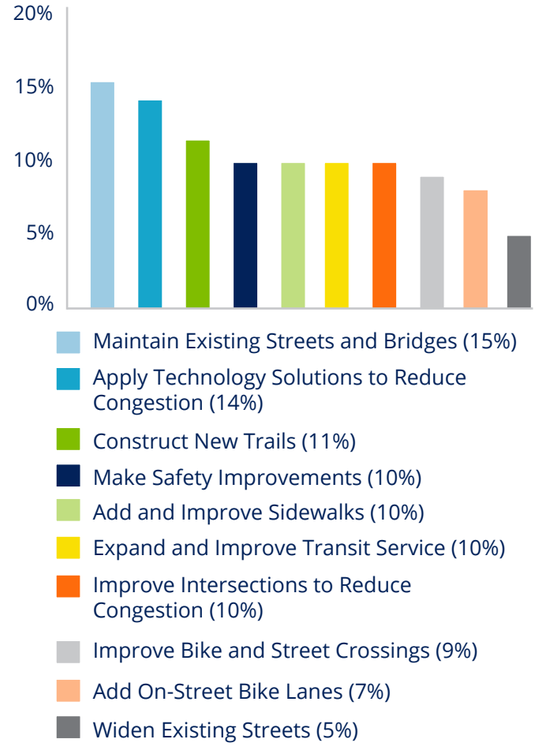
Prepare major corridors (like Arapahoe Rd) for fast and reliable transit service	Equal Importance	Focus on quality transit amenities (shelters, seating, real-time information at bus stops)
Focus on microtransit (small on-demand shuttles)	Equal Importance	Focus on fixed-route transit (specific corridors and stops)
Focus on microtransit to access bus/rail	Equal Importance	Focus on biking and walking access to bus/rail

INNOVATION & TECHNOLOGY

Apply tried and true transportation technologies (like signal timing and signal coordination)	Equal Importance	Lead the way in transportation innovations (like connected and autonomous vehicles)

The community input from in-person and online activities was critical in developing the plan recommendations. We asked community members which types of improvements Centennial should fund. The results show that all improvement types are important and suggest a balanced approach to funding transportation improvements.

FUNDING PRIORITIES FROM COMMUNITY INPUT



PLAN RECOMMENDATIONS

The street network in Centennial has historically been designed to prioritize the efficient movement of vehicles as a transportation mode rather than to balance multiple modes of travel including vehicles, transit, bicycles, and pedestrian activities. Roadway widening was used in Centennial (and throughout the United States) as the primary means to mitigate congestion. However, in recent years, there has been a considerable shift in how congestion is addressed while considering the safety for all users – including bicyclists and pedestrians, the most vulnerable users in the transportation system – and recognizing the significant costs associated with roadway widening and the decreasing buying power of transportation funding.

This Transportation Master Plan represents a more balanced and equitable approach to planning Centennial's streets. The philosophy is to maximize the existing system's capacity, making it function as efficiently as possible for moving people, while addressing critical safety issues and dedicating space for transit, bicycle and pedestrian travel modes. This includes an increased emphasis on technology such as traffic signal timing coordination, intersection congestion and safety issues, and accommodation of all travel modes, while allowing construction of critical capital projects (in some cases, roadway widening).

MULTIMODAL ROADWAY PLAN

The Multimodal Roadway Plan represents a mix of solutions to address the varied travel needs of the community. Many of the projects included in the plan are multimodal and will improve the safety and mobility for motor vehicles, transit riders, bicyclists, and pedestrians. The Multimodal Roadway Plan includes:

STREET RECONFIGURATIONS: that repurpose travel lanes to improve bicycling and walking, add medians, and provide intersection improvements for all travel modes along corridors.

INTERSECTION IMPROVEMENTS: to address localized safety and/or operational needs and improve bicycle and pedestrian crossings.

BRIDGE REPAIRS: to either repair or replace bridges with functional or structural deficiencies.

TRAFFIC SIGNALS: installation where signal warrants are met to improve vehicle, bicycle, and pedestrian movements.

SIGNAL COORDINATION: improvements, such as adaptive signal timing, to optimize the flow of traffic and reduce travel delays.

ROADWAY WIDENING: of critical corridors to address congestion and improve travel times.

BICYCLE PLAN

The Bicycle Plan identifies an on-street bike network that connects to the trail network and provides safer and low-stress bicycle commuting and recreational opportunities. This plan depicts a comprehensive system of off-street and on-street facilities to safely connect neighborhoods and destinations and encourage bicycle travel.

To attract bicycle riders of a wide range of ages and abilities, a bicycle network needs to include safe, low-stress, and high-comfort facilities that limit the interaction with motor vehicles on streets. A range of guiding factors were considered to identify facility recommendations that will enhance the City's existing bicycle infrastructure and transform it into a comprehensive network, providing community members in all parts of the City access to comfortable bicycling options.

PEDESTRIAN PLAN

Centennial includes a variety of development patterns such as residential grids, low-density residential with curvilinear streets, suburban business districts, and rural/open spaces. Pedestrians rely on sidewalks, crosswalks, and other pedestrian facilities to travel through their neighborhoods, commute to work or school, run errands, recreate, or access transit.

The Pedestrian Plan supports redundancy in the sidewalk and trail network to maximize safety, connect to adjacent land uses, and provide people of all abilities with a choice in travel mode, as well as pleasant environments for recreation.

TRANSIT PLAN

Public transit is an important public mobility option that provides access to activity centers and jobs in Centennial, as well as access to the regional public transportation system that connects Centennial to and from the larger Denver metro area.

As the primary public transportation provider in Centennial, RTD operates the Southeast Light Rail Line, which provides reliable north-south connectivity along the I-25 core. RTD also provides first- and final-mile access to the light rail stations and activity centers along the I-25 core through on-demand transit service (FlexRide). Fixed-route transit service is limited throughout the city, particularly for routes that provide east-west connectivity.

Like many transit agencies in Colorado and across the nation, RTD had to cut service – both routes and service hours - due to limited ridership, changes in travel patterns, and public health concerns that stemmed from the COVID-19 pandemic.

MOBILITY HUBS

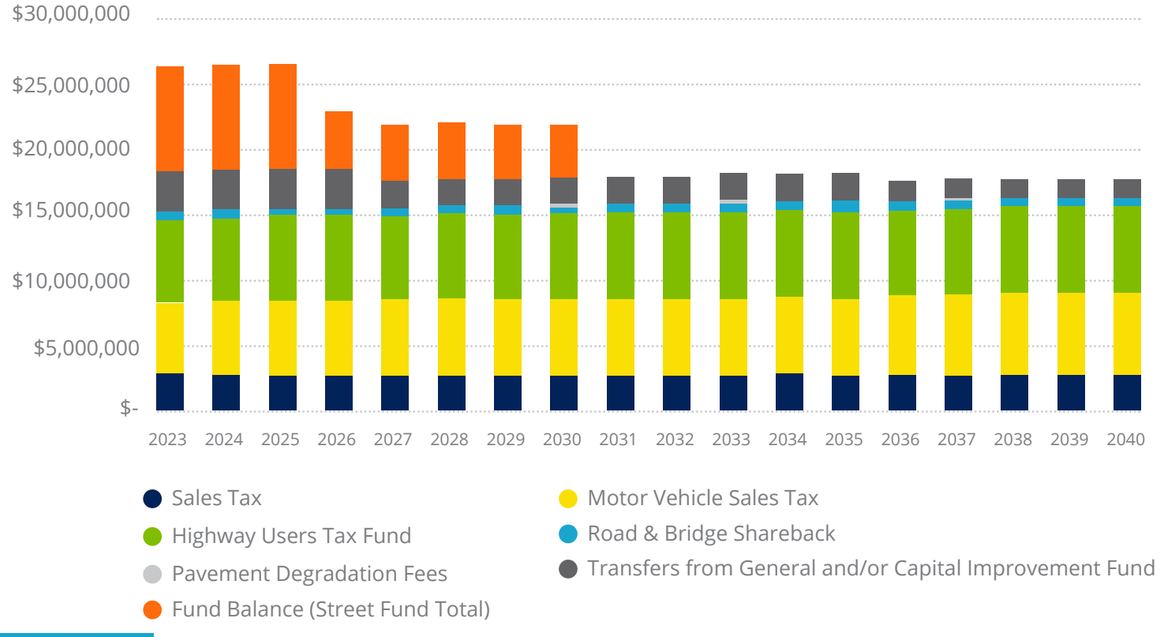
Creating seamless opportunities for integrated mobility in Centennial supports the City's desired goals of providing flexible mobility, serving as an innovator, and enhancing economic and community vitality. Mobility hubs rethink the integration of all modes and increase the availability of, and access to, a variety of mobility options.

Mobility hubs are community focal points that seamlessly integrate various transportation modes, provide supportive multimodal infrastructure, and serve as a placemaking strategy to activate activity centers. Mobility hubs can vary in size, programming, and design to respond to the context and function of each location. Factors that influence the investment level in a mobility hub include existing transit service, land use characteristics, and population and employment densities.

REVENUE FORECASTS & FUNDING PRIORITIES

Various revenue sources will be used to fund transportation projects and programs, including federal, state, local, and private resources. The revenue forecasts shown below account only for local funding sources and are based on historic funding levels. These funds can reasonably be expected over the duration of the plan. No federal, state, or other grant or private funds are assumed as part of these forecasts. As described in the Fiscally Constrained Plan section on the following page, some assumptions about additional funding sources are made for specific projects. The revenue forecasts total $371 million over the 18-year period; an average of $20.6 million per year. The revenue forecasts include the Fund Balance that has been committed to the Street Fund for completion of priority projects identified in the TMP.

TRANSPORTATION REVENUE FORECASTS



FUNDING STRATEGY

The revenue forecasts are not adequate to achieve the TMP goals and meet all of the City's transportation needs. A funding strategy is needed to optimize the use of the available revenues and respond to the community's desire for a balanced approach to transportation investments. The TMP funding strategy recommends:

Safety & Mobility Infrastructure

- Continuing to take care of the existing system by focusing on operations, maintenance and road and bridge rehabilitation
- Placing emphasis on addressing congestion and safety at intersection bottlenecks and leveraging technology to improve the efficiency of major corridors
- Increasing funding levels (compared to historic levels) for sidewalks and other bicycle and pedestrian projects to encourage active transportation modes
- Continuing to support roadside improvements and embracing opportunities to further Centennial's branding through entry monumentation and wayfinding

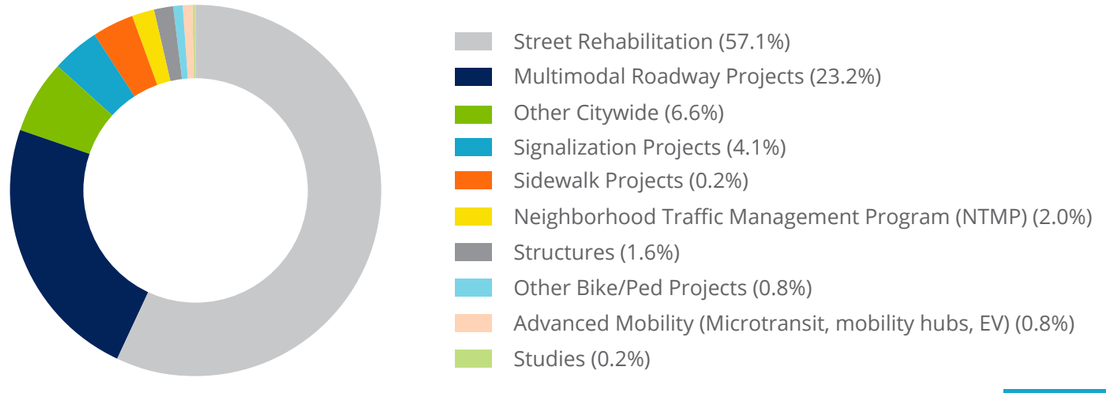
Funding & Partnership Opportunities

- Funding studies in partnership with regional and local entities to explore enhanced transit service
- Dedicating funds to partner on advanced mobility and electrification projects such as mobility hubs, microtransit, connected and automated vehicles, and EV charging stations
- Pursuing additional revenue sources through federal, state, and other grant opportunities
- Supporting community growth through public-private partnerships

Based on this funding strategy, the figure below shows the TMP recommended allocation of revenue to the various project categories and programs.

REVENUE ALLOCATION

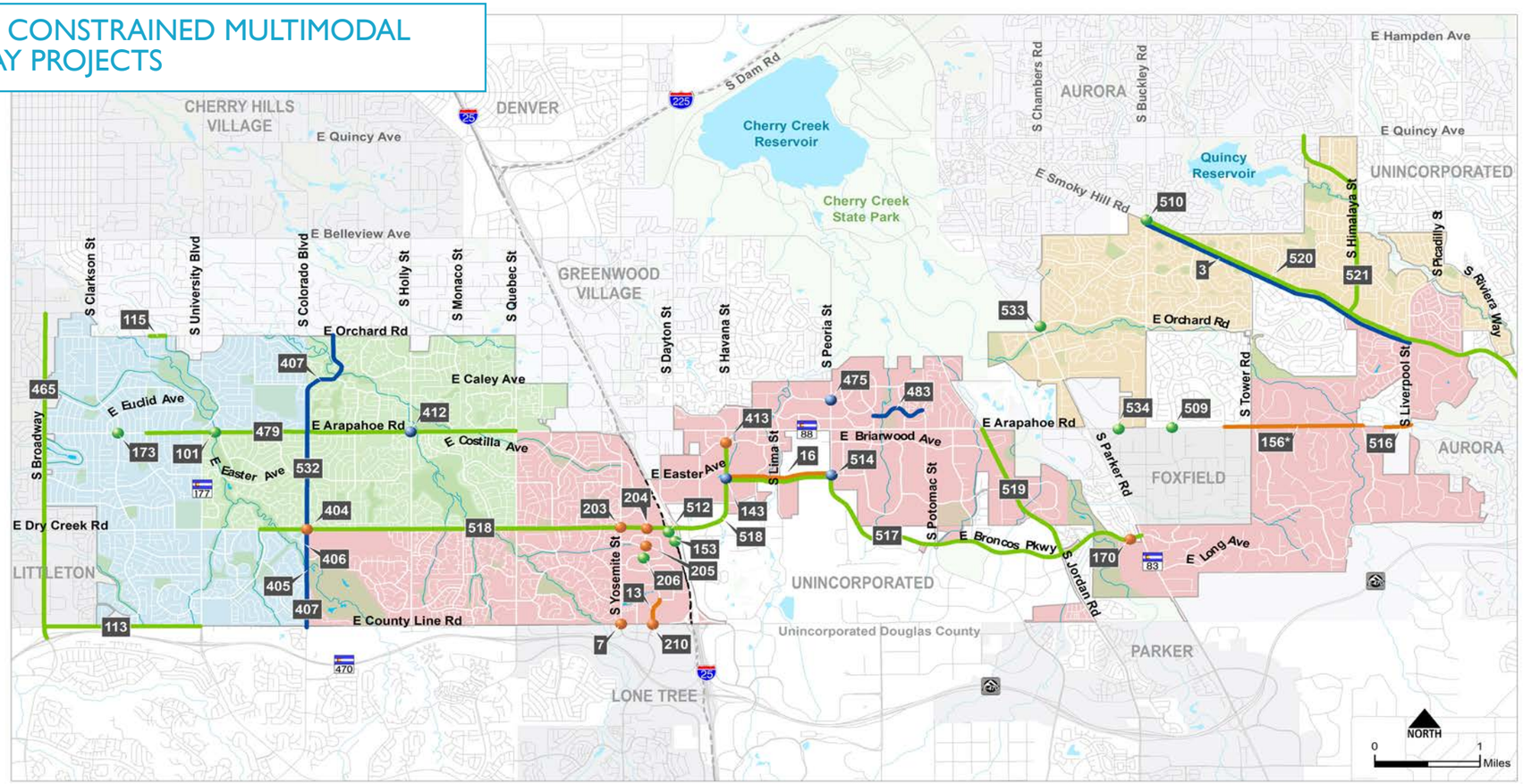
The revenue allocation represents a balanced approach to funding transportation needs in Centennial. It considers the community's input on funding priorities, along with technical evaluation and the costs associated with various project types. The revenue allocation represents an increase in funding levels, compared to historic levels, for sidewalks, bicycle and pedestrian projects, the Neighborhood Traffic Management Program, and Advanced Mobility.



FISCALLY CONSTRAINED PLAN

While there is limited funding to address all the transportation needs in Centennial, the funding strategy will optimize available funds and enable the City to provide a functional transportation system. The following maps highlight what could be completed with anticipated funding and how additional funding could further enhance the transportation system. The purpose of the Fiscally Constrained Plan is to establish a pipeline of projects to move into the CIP and annual budgeting process. While the Fiscally Constrained Plan represents the best estimate of the timing of priority projects, there remains flexibility in how the priority projects move into the CIP and annual budget. If other funds (such as a federal grant or partner contribution) become available for a particular project, the City has discretion to prioritize that project sooner than anticipated in the TMP. The TMP is intended to provide flexibility for the City to take advantage of funding opportunities as they arise.

FISCALLY CONSTRAINED MULTIMODAL ROADWAY PROJECTS



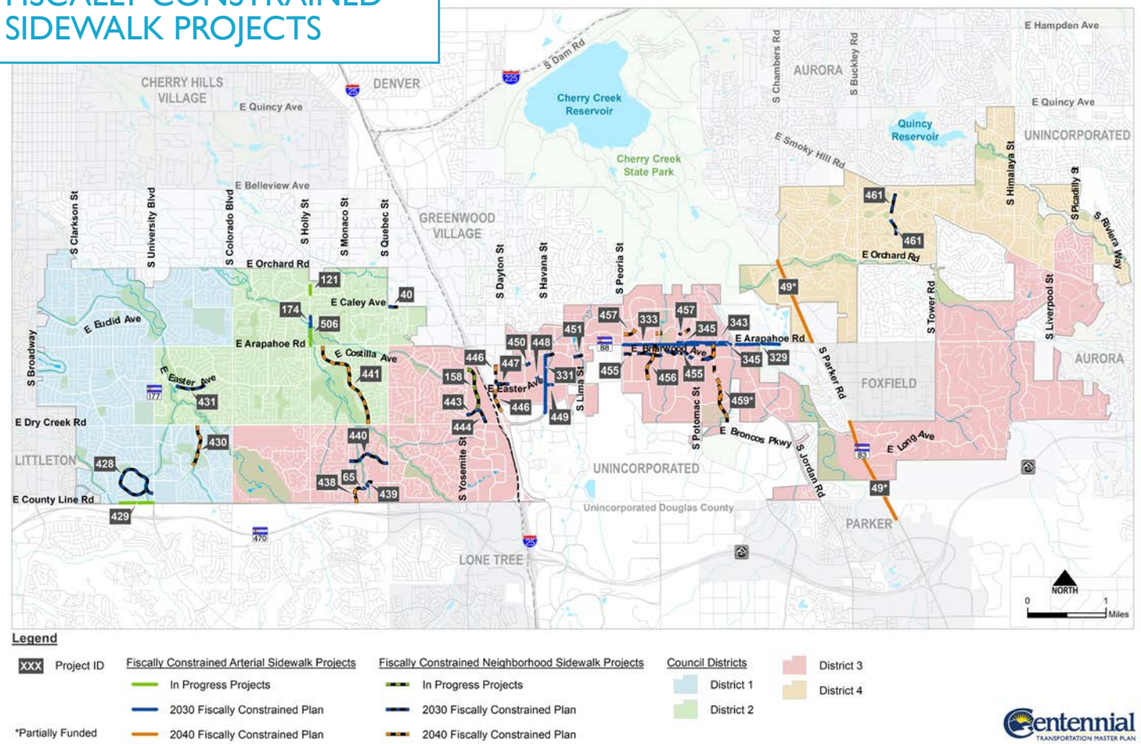
Legend

- XXX Project ID
- In Progress Projects
- 2030 Fiscally Constrained Plan
- 2040 Fiscally Constrained Plan *Partially Funded
- Roads
- Light Rail
- Rivers/Streams
- Lakes
- Parks

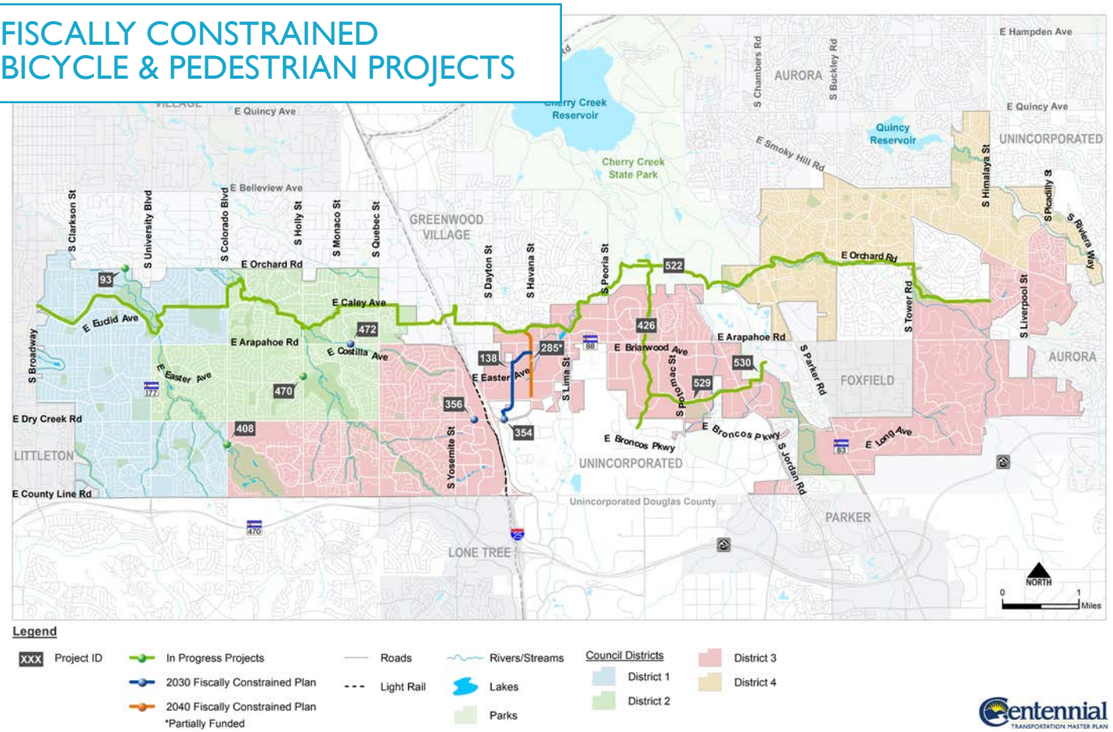
Council Districts

- District 1
- District 2
- District 3
- District 4

FISCALLY CONSTRAINED SIDEWALK PROJECTS



FISCALLY CONSTRAINED BICYCLE & PEDESTRIAN PROJECTS



STRATEGIES & POLICY RECOMMENDATIONS

Recommendations to support the vision and goals of the Centennial TMP are categorized by three primary tenets: physical, human and digital. Physical recommendations support the built environment and infrastructure that enhance the transportation system. Human-centered recommendations focus on the people – providing people with options for how to travel and enhancing quality of life. Digital recommendations focus on the technology, data, and future-ready strategies and policies to propel Centennial forward as an innovator and leading-edge city.

Within the three categories, the strategies are then broken out into four areas: planning, policy, programs, and projects. In many cases, the initial planning and policy efforts for a strategy provide the foundation needed to implement an associated program or project. Each strategy is linked to TMP goal areas to demonstrate alignment with the City's transportation vision.

THE BUILT INFRASTRUCTURE THAT KEEPS PEOPLE MOVING

THE MOBILITY SYSTEMS THAT GET PEOPLE WHERE THEY NEED TO GO

THE DATA SYSTEMS THAT IMPROVE OPERATIONS AND PEOPLE'S ACCESS TO MOBILITY

TRANSPORTATION MASTER PLAN