Boulder County Transportation Master Plan

TECHNICAL VERSION

ADOPTED FEBRUARY 18, 2020

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

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PLAN OVERVIEW

Boulder County Transportation seeks to meet future public travel needs in an affordable, efficient, and environmentally sensitive manner through the creation of facilities and services for all travel modes with a goal of moving more people.

INTRODUCTION

Boulder County is responsible for about 670 miles of public roads in the unincorporated county, approximately 400 miles of which are paved and 270 miles are gravel. Paved roads include 145 miles in 110 county subdivisions. The system also includes 81 major bridges, 445 large culverts or smaller bridges and approximately 8,500 small culverts. The county owns and operates 19 traffic signals.

The transportation system serving Boulder County is managed by many different agencies and jurisdictions. Each municipality in the county is responsible for the system within its boundary. The Colorado Department of Transportation (CDOT) is responsible for the state highway system. The Regional Transportation District (RTD) is primarily responsible for the regional transit system. Via Mobility (Via) is the primary provider of mobility for the elderly and disadvantaged community. In addition, other smaller human service, non-profit, and private businesses provide mobility services. In addition to maintaining the Boulder County transportation system, Boulder County also coordinates with these local, regional, state, and federal partners to work towards a comprehensive regional multimodal transportation system.

Growing population, changing demographics, rising construction costs, and rapidly changing technologies continuously affect transportation in Boulder County and as a result, affect the needs and capabilities of the system to meet those needs. The TMP is an effort to examine the way we currently provide projects and services, identify needed changes to those services, and chart a course for our transportation systems and infrastructure over a 20-year planning horizon.

PLAN UPDATE DEVELOPMENT AND PURPOSE

Boulder County first adopted a Transportation Master Plan (TMP) in December 2012. Since that time, there have been changes in the community that impact how people use the county's transportation system. Changes include local and regional land use, travel patterns, demographics, and emerging changes to transportation-related technology. In addition, the 2013 flood damaged a significant amount of transportation infrastructure across the county. As a result, the Transportation Department has dedicated significant time and resources to repairing roadways, bridges, culverts, and trails that were damaged or destroyed in the flood. The 2013 flood highlighted the need for Boulder County to focus on improving the resilience of the county's transportation infrastructure to prevent damage from future disasters.

The primary purpose of the 2019 TMP is to update the current plan to reflect the work that has been completed since 2012 and include new or trending transportation-related technology and address changes in demographics, land use, and travel patterns, opportunities for infrastructure and economic resiliency, and funding challenges and opportunities.

The goal of the 2019 TMP is to provide a clear short, medium, and long-term vision for the Transportation Department. The TMP serves as a guide for the Transportation Department when determining how to seek and invest funding and deploy staff resources. The recommendations in the TMP are consistent with the Boulder County Comprehensive Plan and other county plans relevant to the multimodal transportation system. The TMP promotes human-centered mobility and access strategies by removing barriers and increasing transportation system capacity for all community members including older adults, people with disabilities, low-income households, and families and youth. The TMP prioritizes safety and includes recommendations based on detailed analysis of recent crash data. Performance metrics and specific investment priorities are included to help measure progress towards the transportation vision. The Board of County Commissioners is the adoption body for the TMP.

To stay relevant as new trends and issues emerge, Boulder County will review and update the TMP periodically. The Boulder County TMP is intended for use by elected officials, agency staff, and the public. The TMP:

- Communicates the county's desires and intent for service and facility development
- Provides guidance into the regional planning process
- Identifies projects for funding opportunities
- Helps develop future capital improvement programs
- Guides county resource and investment decisions

The TMP was developed through a collaborative effort with the stakeholders such as local communities, partner agencies, and transportation organizations. Guidance from the Boulder County Planning Commission and public input also influenced the strategies and implementation actions included in the plan.

WHAT'S NEW

The 2019 TMP includes updated data, a greater level of information and analysis where needed, and new, more detailed recommendations for the strategies outlined in the 2012 TMP to confirm and/or update the trends, assumptions, and implementation actions.

Updated Data:

- **Demographics and Socioeconomics (current and 2040):** Modeling of anticipated population growth over time by age, income, and location. Regional and population employment projections.
- **Travel Patterns (2040):** Modeling of anticipated travel patterns over time given demographics, socioeconomics, and land use patterns
- **Land Use Patterns (2040):** Modeling of planned and anticipated development and impact on transportation, including origin-destination analysis
- **Public Feedback:** The TMP update included many opportunities for the public to provide feedback throughout the project. Information from public feedback will be highlighted with the icon at the beginning of this bullet.

New Information and Analysis:

- **Travel Pattern Analysis (current):** Use of "big data" to establish current travel patterns including origin/destination analysis as pertinent to a 20 year planning horizon
- Level of bicycle traffic stress analysis
- School transportation
- Transportation-related technology considerations
- Resiliency considerations in the event of natural or economic disasters (i.e. flood, fire, recession)

- Vision Zero policy adoption
- Crash data analysis and safety recommendations

PLANNING CONTEXT

COMPREHENSIVE PLAN

Adoption of the *Boulder County Comprehensive Plan* (BCCP)[1] in 1978 marked the beginning of Boulder County's commitment to a sustainable transportation system. The 2009 update to the BCCP identified a vision and objectives for the county's transportation system consistent with the vision and policy direction provided in the original comprehensive plan. The 2009 BCCP *Transportation Element* draws upon the vision to provide high quality, safe, sustainable, and environmentally responsible infrastructure and services across all modes, to meet the mobility and access needs of all users. The following goals were established for the county's transportation system:

- **Goal 1 – Ensure Effective and Efficient Management of the Existing Transportation System:** Manage and maintain existing transportation infrastructure and services in a cost-effective manner
- **Goal 2 – Minimize Environmental Impacts:** Minimize the negative environmental impacts of the transportation system such as air pollution, greenhouse gas (GHG) emissions, noise pollution, water pollution, land and wildlife habitat fragmentation, land disturbance, and resource consumption
- **Goal 3 – Ensure Safety for All Modes:** Provide for transportation system development and operations that result in safe and secure travel by all modes and that enable prompt and effective emergency response
- **Goal 4 – Support a Healthy and Sustainable Economy:** Develop a transportation system that supports a robust economy and increases resiliency to economic fluctuations
- **Goal 5 – Ensure Equitable Access to the Transportation System:** Ensure that adequate transportation exists for all users regardless of age, income, or ability
- **Goal 6 – Enhance County Identity and Community Character:** Promote a transportation system that preserves, highlights, and enhances the county's diverse rural character and the history and culture of its unique communities

[1] Available online at: https://www.bouldercounty.org/property-and-land/land-use/planning/boulder-county-comprehensive-plan/

These goals, along with the policies that accompany them, guide transportation planning for Boulder County. They provide the framework to help meet and manage the demands placed on the county's multimodal transportation system—in a way that recognizes transportation's important role in creating sustainable ways of living. All recommendations in the TMP are consistent with the transportation goals and objectives outlined in the BCCP.

BOARD OF COUNTY COMMISSIONERS STRATEGIC PRIORITIES- 2019-2023

The Boulder County Board of County Commissioners (BOCC) has identified five strategic priorities[2] for the county for 2019-2023. The 2019 TMP is consistent with and supports the goals and objectives outlined in the strategic priorities where relevant. The strategic priorities identified by the BOCC are:

1. Affordable Living
2. Climate Action
3. Equity and Justice
4. Land and Water Stewardship
5. Organizational and Financial Stewardship

RESILIENCY

The Boulder County Transportation Department works to improve the resilience of our community through management of flood risk and infrastructure improvements. Since the devastating floods of September 2013, the Transportation Department has invested time and resources to achieve long-term flood recovery for public infrastructure and private property through its road and bridge improvements, capital planning processes, and floodplain management programs. These efforts have created lessons-learned and generated ideas for future improvements.

The county recently completed the "Boulder County Transportation Department Floodplain Management and Transportation System Resiliency Study and Action Plan[3]" (Resiliency Study) to better understand future hazard risk related to climate change and to identify potential actions that the Transportation Department could implement to improve resiliency of its transportation system. Using both qualitative and quantitative analysis, the potential actions were evaluated to determine which would have the greatest

[2] Available online at: https://www.bouldercounty.org/departments/commissioners/strategic-priorities/
[3] Available online at: http://www.bocoresiliencystudy.org/

impact on attaining Transportation Department's resiliency goals and objectives. The result of the Resiliency Study is a list of recommended actions that will help the county improve transportation infrastructure, institutionalize resilience, and increase community preparedness. The Transportation Department will consider the Resiliency Study's recommended actions during its planning and implementation of projects. The actions outlined in the Resiliency Study are consistent with the goals and objectives of other Boulder County plans, including this TMP.

REGIONAL PLANS

Regional plans were reviewed to provide an overview of current travel patterns, the future of transportation, current funding, and summarizes the projects and programs identified in other studies and plans. Together this information sets the foundation of this update and provides a starting point to recommend future projects and programs to meet identified needs. The overall funding picture illustrates the large funding gap for implementation of the identified improvement projects and on-going maintenance necessary for the transportation system. Major regional reviewed plans include:

- Floodplain Management and Transportation System Resiliency Study
- Boulder County Sustainability Plan[4]
- Northwest Area Mobility Study (NAMS)[5]
- SH 7 BRT Feasibility Study[6]
- SH 7 Planning and Environmental Linkages (PEL)[7]
- SH 119 BRT Corridor Study[8]
- Boulder County Communitywide EcoPass Feasibility Study[9]

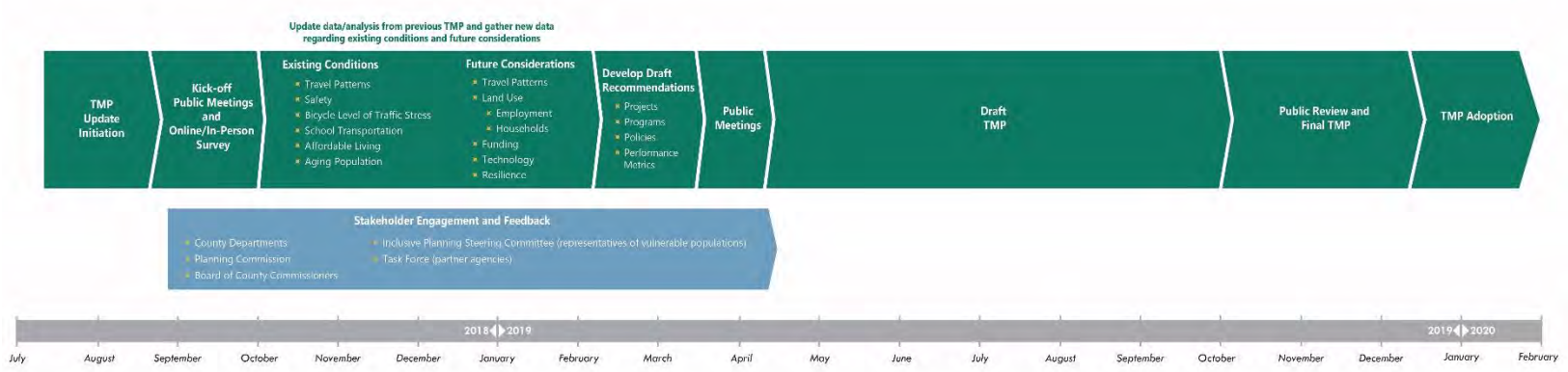
For the full list and details of planning documents considered for the TMP, reference the State of the System Report, which can be found in Appendix A.

4 Available online at: https://www.bouldercounty.org/environment/sustainability/sustainability-plan/
5 Available online at: http://www.rtd-fastracks.com/nams_1
6 Available online at: https://www.bouldercounty.org/transportation/multimodal/bus/sh7-brt-study/
7 Available online at: https://www.codot.gov/library/studies/study-archives/sh7pel
8 Available online at: https://www.sh119brt.com/
9 Available online at: https://www.bouldercounty.org/transportation/multimodal/bus/ecopass/community-ecopass/

TMP PROCESS

The TMP planning process began in July 2018 and the final plan was adopted in January 2020. The project began with public meetings and a community survey to ask Boulder County residents, employees, and visitors about concerns and priorities related to transportation. The project team analyzed existing conditions and future considerations, which provided the foundation for the draft recommendations. These draft recommendations were then presented at public meetings and online for public review. After reviewing feedback from the public, stakeholders and Boulder County staff, the initial recommendations were modified, and the plan was developed. After review by Boulder County staff, the TMP Technical Report was finalized and the TMP Summary, a shorter document focused on future improvements, policies, and programs was developed. This phase included a final opportunity for the public to comment on the draft plan online or through the public hearing as part of the Planning Commission meeting. The plan was then adopted by the Board of County Commissioners (BOCC). Figure 1 illustrates the TMP process with the corresponding timeline.

FIGURE 1: TMP PROCESS AND SCHEDULE



Several data sets were analyzed to create a comprehensive view of the factors directly and indirectly affecting the county's transportation system. Table 1 summarizes the data utilized within this project to help create the TMP recommendations.

TABLE 1: DATA POINTS FOR ANALYSIS

Data Set	Description	Current	Future
Travel patterns	Analysis is a combination of existing and forecasted values to provide a comprehensive look at community, in-county, and regional trips. Existing data comes from StreetLight Data and the Denver Regional Council of Governments (DRCOG) Regional Travel Model. Forecasted data comes only from the DRCOG Regional Travel Model.	✓	✓
Land use	DRCOG Regional Travel Model also produces information about household and employment locations. The data is based on Transportation Analysis Zones (TAZs) and does not provide exact location of these two different land use types.	✓	✓
Crash information	Focus on unincorporated crashes resulting in severe injury or fatality, regardless of the type of roadway.	✓	
Bicycle level of traffic stress	Analysis to determine the level of comfort for bicyclists in relation to vehicular traffic.	✓	
School transportation	Based largely on survey responses from participants in current school-based transportation programs.	✓	
Socioeconomic/demographics	Review of major socioeconomic considerations directly and indirectly related to how people use the transportation system (older adult, limited English proficiency, zero vehicle households, low-income households).	✓	
Funding	Review of existing funding sources as well as possible funding sources in the future.	✓	✓
Technology	Review of current transportation technologies available for transportation as well as how to consider future technologies yet to be integrated into the transportation system.	✓	✓
Resiliency	Consideration of policies and components to improve resiliency of the transportation system to better absorb shocks.	✓	✓

STAKEHOLDER ENGAGEMENT AND COMMUNITY OUTREACH

Stakeholder engagement and community outreach informed the TMP recommendations. Collaborating with stakeholders and the general public provided an understanding of community needs and a vision for a sustainable and inclusive transportation network. The project consisted of three major phases of engagement and outreach: 1) the first phase gathered input on transportation needs and priorities for current and future transportation; 2) the second phase gathered feedback on draft recommendations; and 3) the third phase gathered feedback on the draft plan.

Coordination occurred with community partners and agency stakeholders, such as local municipalities, CDOT, RTD, chambers of commerce and cycling advocacy organizations, throughout the planning process. Several meetings were held with staff representatives from various county departments, including: Public Health, Land Use, and Parks and Open Space. Several meetings were held with to facilitate coordination with cities and towns located within Boulder County and other agency partners.

Efforts were tailored to inform and involve all types of transportation users throughout the county. Multiple outreach methods were used, including in-person and electronic engagement options. In addition to TMP-specific meetings, efforts were made to reach people where they were already gathering such as other planned meetings or at the local public library. The overall outreach strategy was to provide multiple opportunities and formats for the public to provide input on the plan to broaden the amount and variety of input received. The county reached out to many groups, including vulnerable populations, to make sure their voices were heard.

COMMUNITY SURVEY

A survey was developed to engage the general public during the early stages of the TMP update to gather input on transportation needs and priorities for the current and future transportation. The online version of the survey included an interactive map commenting tool, resulting in spatially linked comments. The survey was also mobile-friendly and provided a way for people to engage at their convenience. It was distributed electronically, in paper copy, and via telephone, and was available in English and Spanish. Additional efforts were made to receive feedback from people with disabilities, older adults, and Hispanic or Latinos by placing targeted Facebook advertisements and direct phone calls to members of these populations. Out of the approximately 2,000 respondents, the following were completed by people within these populations: 150 people with disabilities, 350 older adults, 135 self-identified as Hispanic or Latino, 91 Spanish speakers, and 350 with household income less than $50k. See Appendix B for a full summary of the survey results.

IN-PERSON ENGAGEMENT

There were several opportunities to provide comments during in-person meetings. Meetings were conducted to provide multiple opportunities for engagement for members of the public and stakeholders: open houses throughout the county, Planning Commission meetings, inclusive planning committee meetings, Community Conversations (in Spanish and English), and cycling - focused meetings.

Open Houses and Community Conversations

Project-specific and joint community planning meetings were held during the first and second phases of engagement, and in various locations across the county as a convenience for residents on the following dates:

- Phase 1
  - September 25, 2018: Public Meeting (in Louisville)
  - September 26, 2018: Public Meeting (in Longmont)
  - October 5, 2018: Public Meeting (in Boulder)
  - October 11, 2018: Grupo Latina Community Conversation (Sister Carmen Community Center in Lafayette)
  - October 22, 2018: Mountain Community Conversation (Nederland Community Center)
  - October 23, 2018: Spanish Language Community Conversation (at Longmont Senior Center)
  - October 30, 2018: Bilingual Community Conversation (Lafayette Public Library)
- Phase 2
  - March 21, 2019: Joint TMP Meeting with Colorado Department of Transportation (CDOT), University of Colorado, Boulder Chamber of Commerce, City of Boulder, and Boulder County (in Boulder)
  - April 2, 2019: (in Louisville)
  - April 4, 2019: (in Longmont)
  - April 8, 2019: Cycling-focused public meeting (in Louisville)
  - April 8, 2019: (in Nederland)

BOCC/Planning Commission Meetings

Presentations were made to the Board of County Commissioners and Planning Commission to keep them apprised of the planning process and receive direction on the following dates:

- Phase 1
  - October 17, 2018: Planning Commission Update
  - December 12, 2018: Board of County Commissioners
- Phase 2
  - March 20, 2019: Planning Commission Update
- Phase 3
  - October 16, 2019: Planning Commission Update

Stakeholder Meetings

Presentations were made to stakeholder organizations to keep them informed and obtain feedback:

- October 8, 2018: Local Coordinating Council
- October 17, 2018: Peak 2 Peak Human Services Alliance
- November 8, 2018: Boulder Chamber of Commerce
- December 10, 2018: Local Coordinating Council
- December 11, 2018: Commuting Solutions

Municipality and Agency Meetings

Boulder County hosted two Municipality and Agency meetings for local municipalities, agencies partners (i.e. RTD, CDOT), and partner organizations (i.e. Commuting Solutions) to gather input. The following agencies were invited to these meetings: Adams County, Boulder, Boulder Chamber, Boulder Valley School District, City and County of Broomfield, CDOT, Community Solutions, CU Boulder, DRCOG, Erie, Intermountain Alliance, Jamestown, Lafayette, Larimer County, Longmont, Louisville, Lyons, Nederland, RTD, St. Vrain Valley School District, Superior, Urban Drainage and Flood Control District, Via, Ward, and Weld County. Meetings were held on the following dates:

- November 15, 2018
- March 28, 2019

Inclusive Planning Steering Committee Meetings

A task force made up of 17 older adults, people with disabilities, caregivers, and 6 community partner organizations was formed to make sure mobility challenged individuals and their caretakers had a meaningful voice in the planning process. The task force represented a diverse range of ages, ability levels, and income levels from across the county. These facilitated meetings required a high level of involvement from task force members and generated valuable plan guidance. Meetings were held on the following dates:

- Phase 1
  - August 24, 2018
  - September 11, 2018
  - October 26, 2018
  - December 4, 2018
- Phase 2
  - March 22, 2019

Cycling Working Group Meetings

Members of this group provided bicycling-specific feedback regarding existing issues and needs, as well as input on the draft recommended improvements. Organizations represented included: Bicycle Longmont, Community Cycles, and Cycles 4 Communities. Meetings were held on the following dates:

- Phase 1
  - November 28, 2018 (in Boulder)
- Phase 2
  - April 9, 2019 (in Boulder)

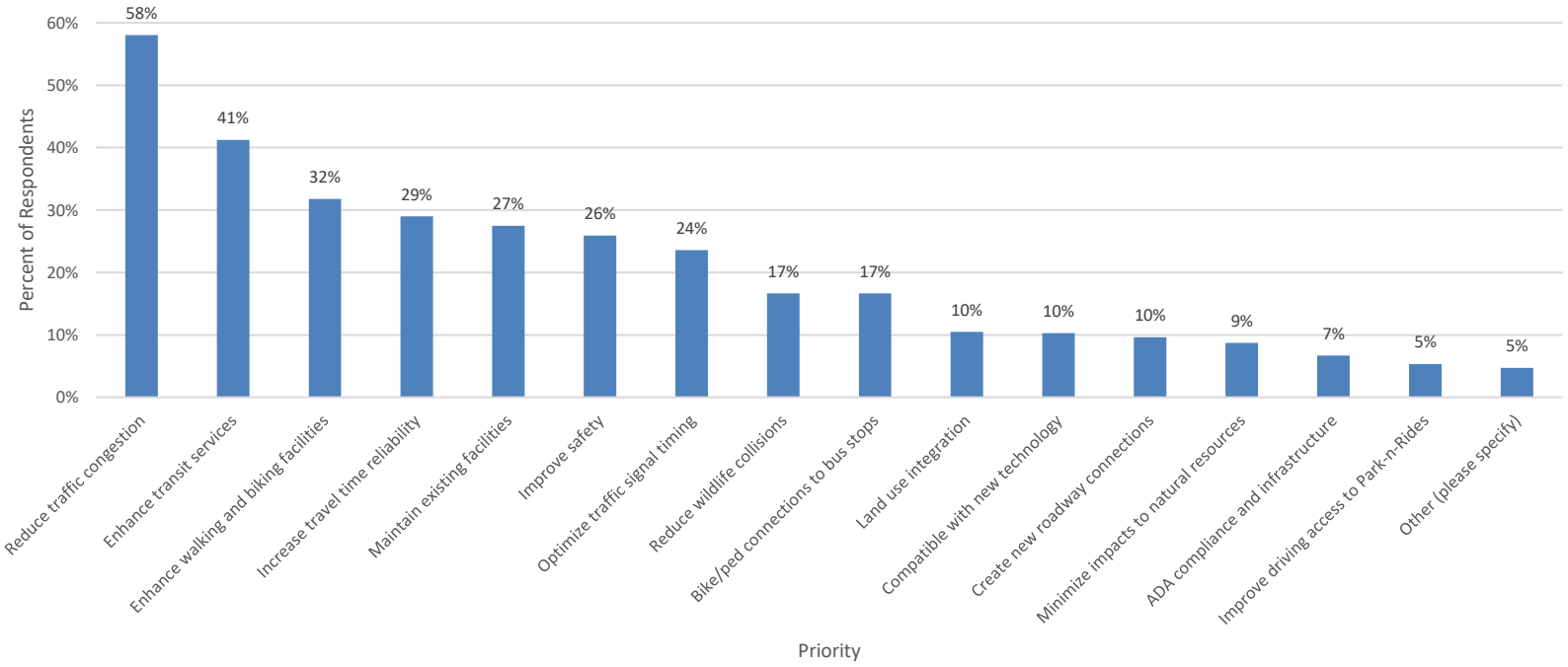
PUBLIC COMMENT THEMES

Public comments guided the development of TMP recommendations and provided feedback on the recommendations. This section outlines the common themes that emerged through the public outreach efforts.

Phase 1

As part of the first phase of engagement, survey respondents were asked to select their top three priorities for improving transportation in Boulder County. Almost 60 percent of respondents indicated reducing traffic congestion as a top priority. The next top priorities were: enhance transit services (approximately 40 percent) and enhance walking and biking facilities (just over 30 percent). The next highest priorities were selected by about a quarter of respondents: reliability, maintenance, safety, and signals. Figure 2 shows more response details.

FIGURE 2: TRANSPORTATION PRIORITIES



Source: Community Survey

Phase 2

After draft recommendations were developed, the county sought feedback from the public and other stakeholders. Members of the public and stakeholders were able to participate by attending their choice of four public meetings and/or filling out an online comment form to provide feedback. Comments received were considered and addressed in the plan recommendations, thereby helping shape the future of transportation in Boulder County. Over 150 public comments were received during this phase. Comments primarily included topics addressing bicycle facilities (i.e. shoulder, bike lane), safety, shared use/regional trails, intersections, bus facilities/service, and vehicular congestion.

Phase 3

The third phase of public input was the final opportunity to obtain feedback on the draft of the final document. Both the Technical and the Summary TMPs were available for staff, municipalities, agency partners, and members of the public. The amount of public feedback was much lower for the third and final phase than the other two previous phases. Most of the feedback received was from non-profit groups, agency partners, and other county departments. A total of 35 comments were received providing feedback on both the Technical and Summary TMPs.

CURRENT AND FUTURE CONDITIONS

While much of the land use has remained the same since the 2012 TMP, development continues within both incorporated and unincorporated Boulder County area, leading to higher demands on the transportation system. Increased population and employment will continue to put stress on the transportation system. In addition to growth within Boulder County, surrounding areas continue to grow, which will change how the transportation system in Boulder County is used.

BOULDER COUNTY, COLORADO

The population of Boulder County in 2018 was approximately 326,000 people, with about 90 percent of the population living within the incorporated communities. Based on information from the Colorado State Demography office, the county's population is expected to increase about 30 percent to 403,077 in 2040. Households (includes all types of housing) are projected to increase by 33 percent, from approximately 132,000 to just over 175,000. Full details can be found in Table 2.

TABLE 2: POPULATION AND HOUSEHOLDS

	2018	2040	2015–2040 Percent Change
Population	326,189	403,077	24%
Households	131,900	175,792	33%

Source: Colorado Demography Office

COMMUNITIES IN EASTERN PLAINS

Most of Boulder County's residents live in incorporated areas of the county east of the mountains. The City of Boulder (including the incorporated portion of Gunbarrel) is the county's most populated city followed closely by the City of Longmont. The six incorporated communities in eastern Boulder County include: City of Boulder, Town of Erie, City of Lafayette, City of Longmont, City of Louisville, and Town of Superior. Although most residents live in incorporated areas, residents also reside in unincorporated areas. This includes the Census Designated Place (CDP) of Niwot and the historic community of Hygiene.

COMMUNITIES IN WESTERN BOULDER COUNTY

The western portion of Boulder County is home to a small percentage of Boulder County's population that live in incorporated and unincorporated areas.

The four incorporated areas in western Boulder County are: Town of Lyons, Town of Nederland, Town of Jamestown, and Town of Ward. In addition, there are several historic communities which include Allenspark, Eldorado Springs, Eldora, and Gold Hill.

TRAVEL CHARACTERISTICS

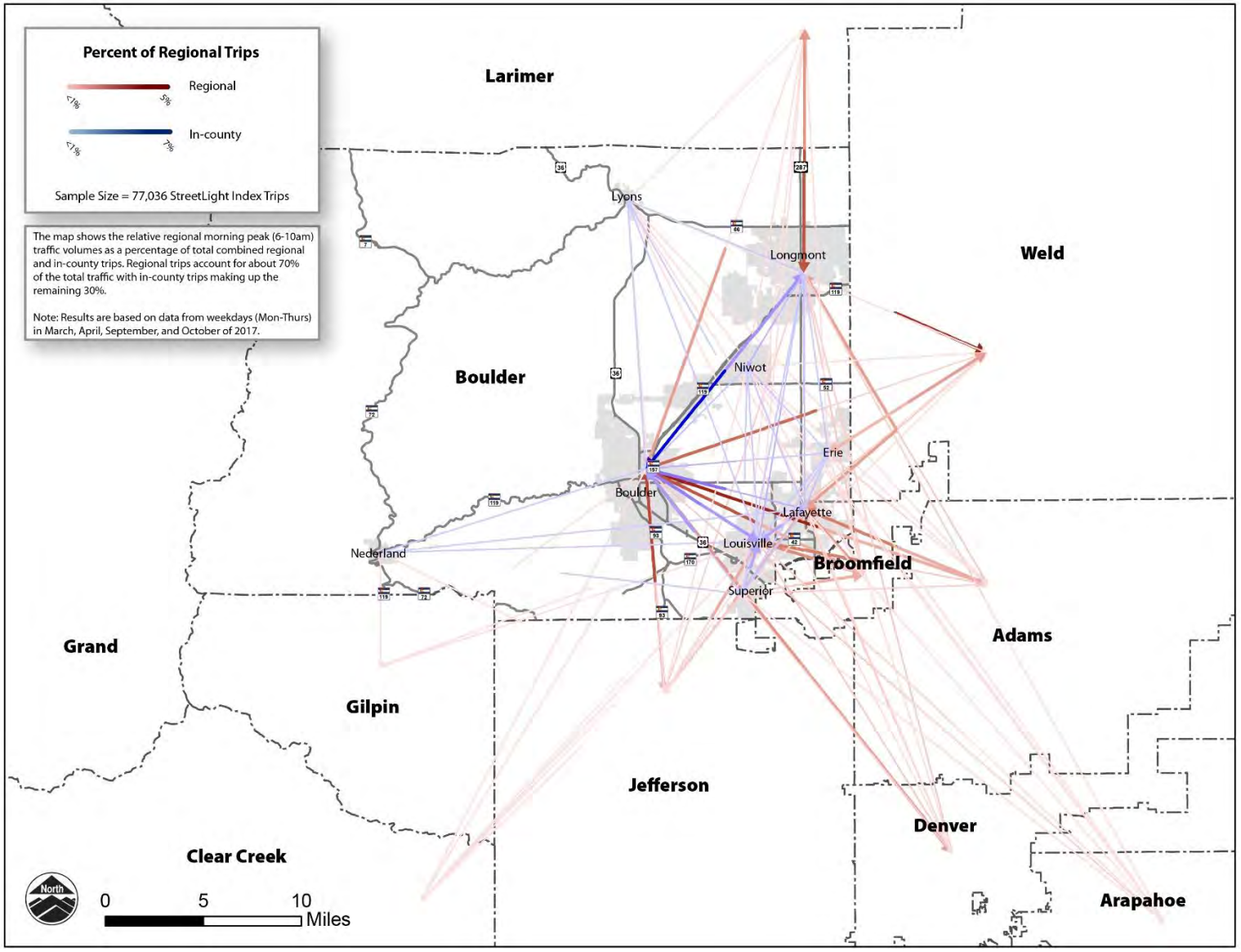
Travel characteristics illustrate how and where travel takes place in Boulder County—both today and in the future. This information helps identify where enhancements and additions to the transportation system are needed to meet future travel demand and provide relied-upon functions.

Trips are described in the following categories:

- **Community trips:** Trips that start and end within a given community (i.e. travel within Longmont)
- **In-county trips:** Trips with an origin within one area of Boulder County and a destination elsewhere within the county (i.e., travel between Boulder and Longmont)
- **Regional trips:** Trips with one trip end (origin or destination) within Boulder County and the other trip end outside of the county (i.e. trips from Broomfield to the City of Boulder)

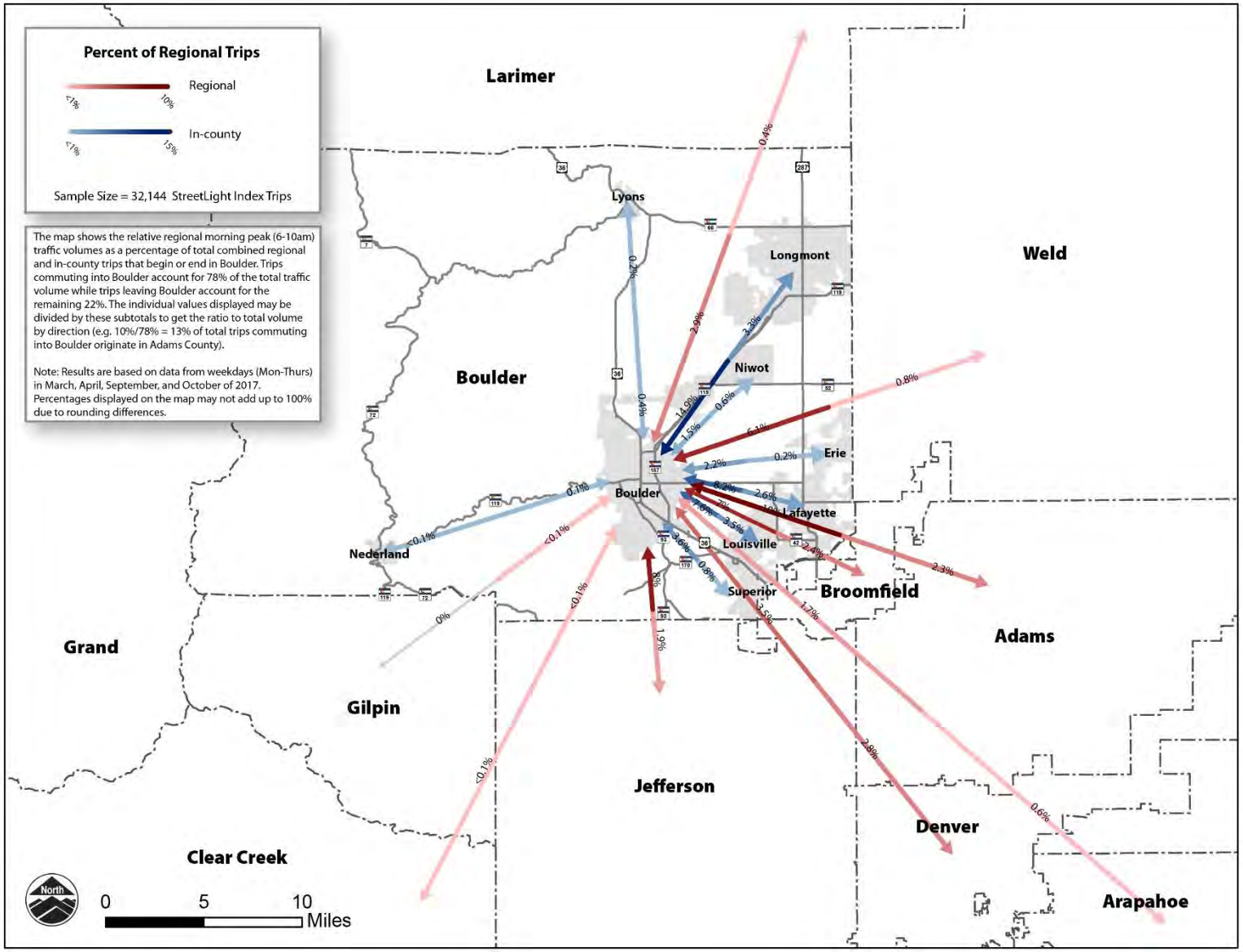
The TMP focuses on in-county and regional trips. As Figure 3 shows, there is a strong concentration of trips into the City of Boulder from communities across the county as well as surrounding counties. The City of Longmont also experiences a strong concentration of trips to and from Larimer County. Figure 4-Figure 12 show regional trips by community. These maps helped inform the existing conditions and recommendations. Additional maps used for informing existing conditions and recommendations can be found in Appendix C.

FIGURE 3: CURRENT REGIONAL TRIPS



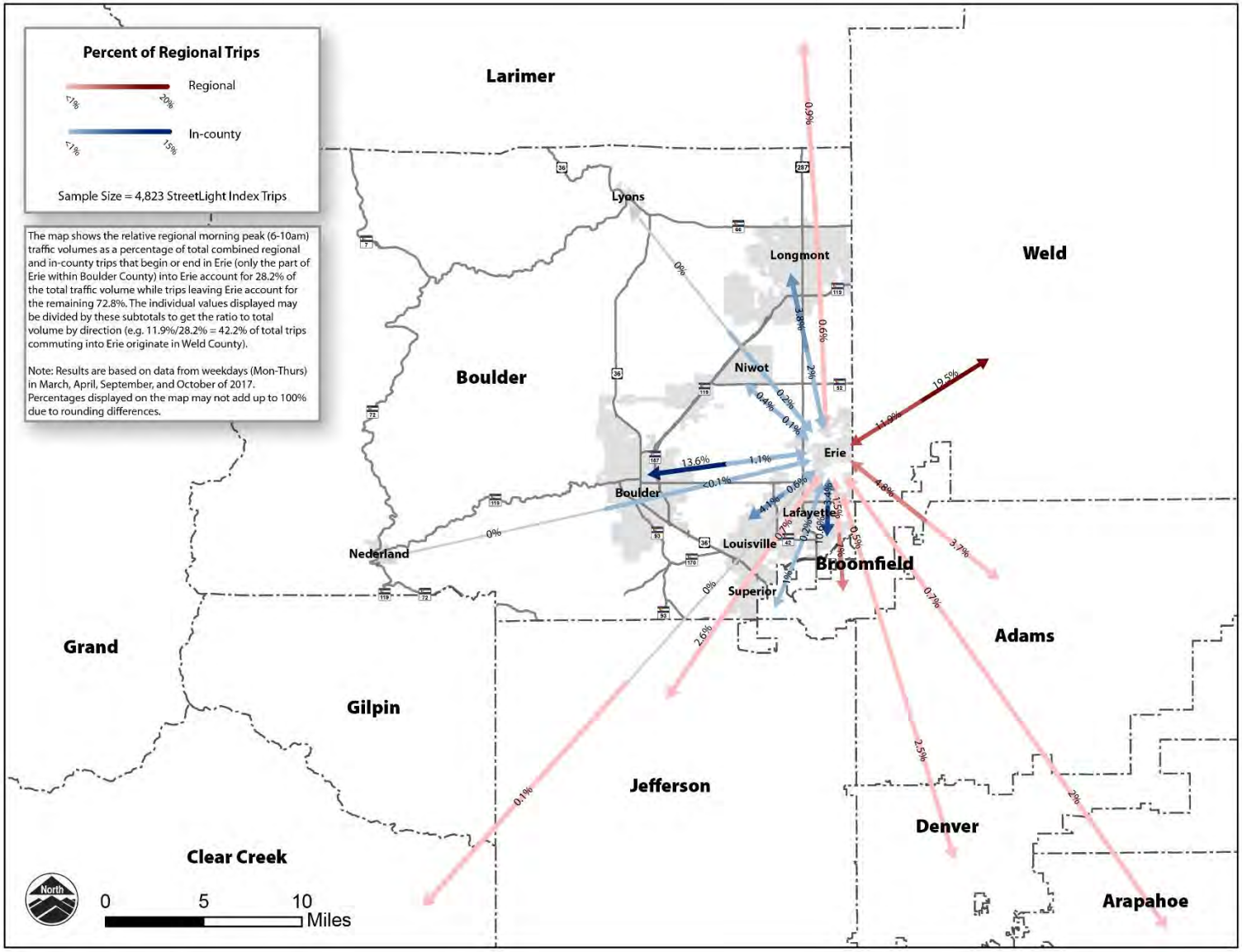
Source: StreetLight Data and Boulder County Transportation

FIGURE 4: REGIONAL TRIP PATTERN MAP – TO AND FROM BOULDER



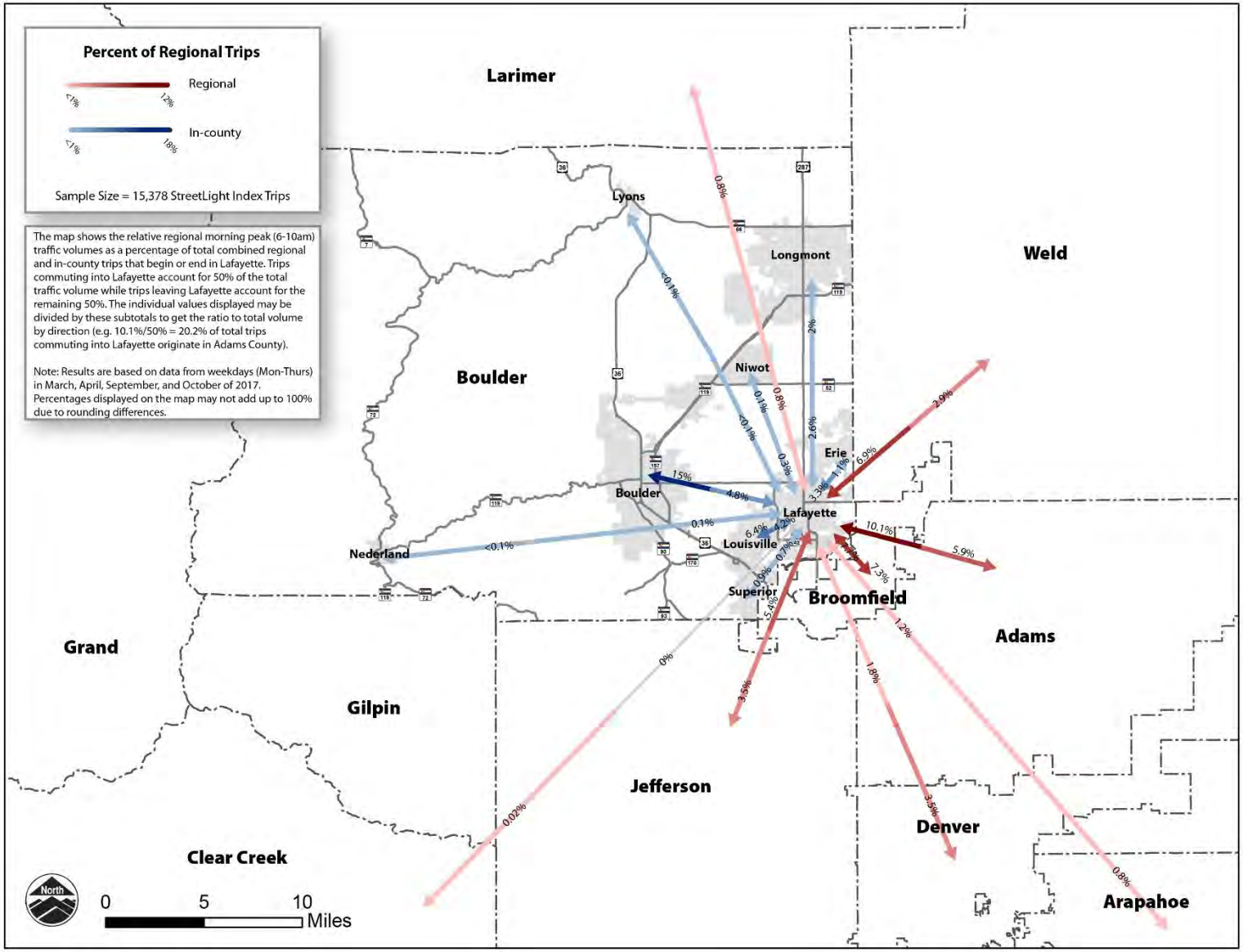
Source: StreetLight Data and Boulder County Transportation

FIGURE 5: REGIONAL TRIP MAP – TO AND FROM ERIE



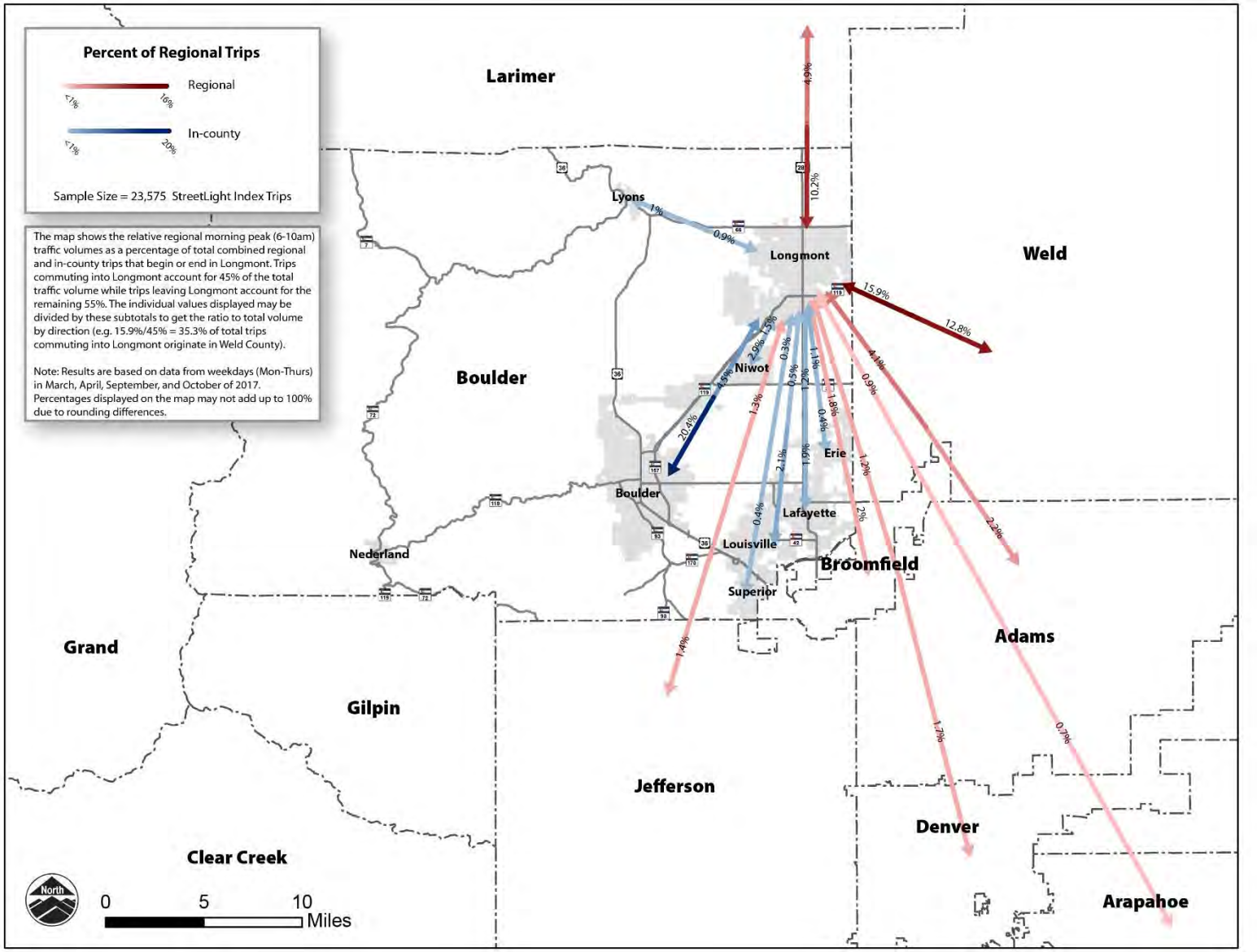
Source: StreetLight Data and Boulder County Transportation

FIGURE 6: REGIONAL TRIP PATTERN MAP – TO AND FROM LAFAYETTE



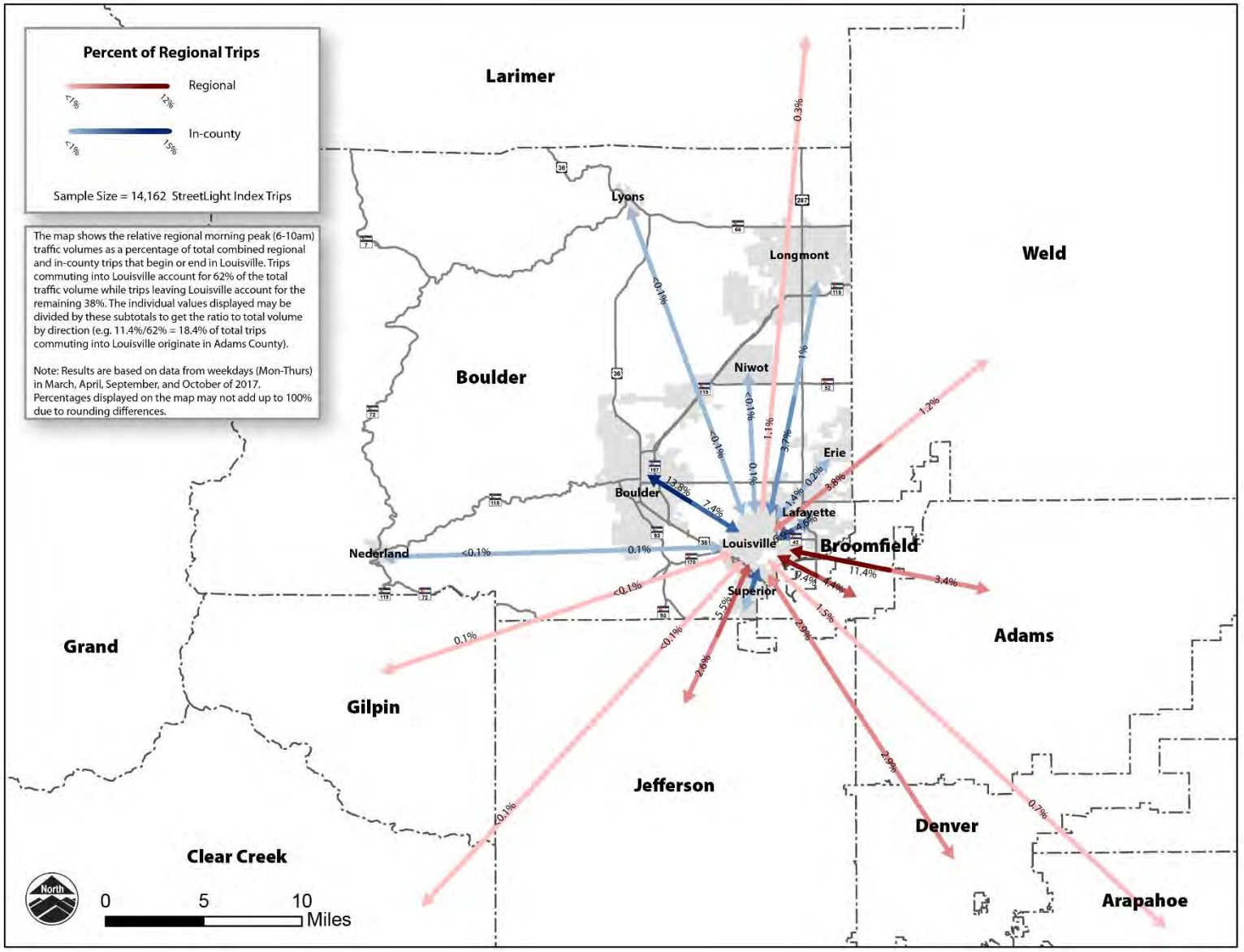
Source: StreetLight Data and Boulder County Transportation

FIGURE 7: REGIONAL TRIP PATTERN MAP – TO AND FROM LONGMONT



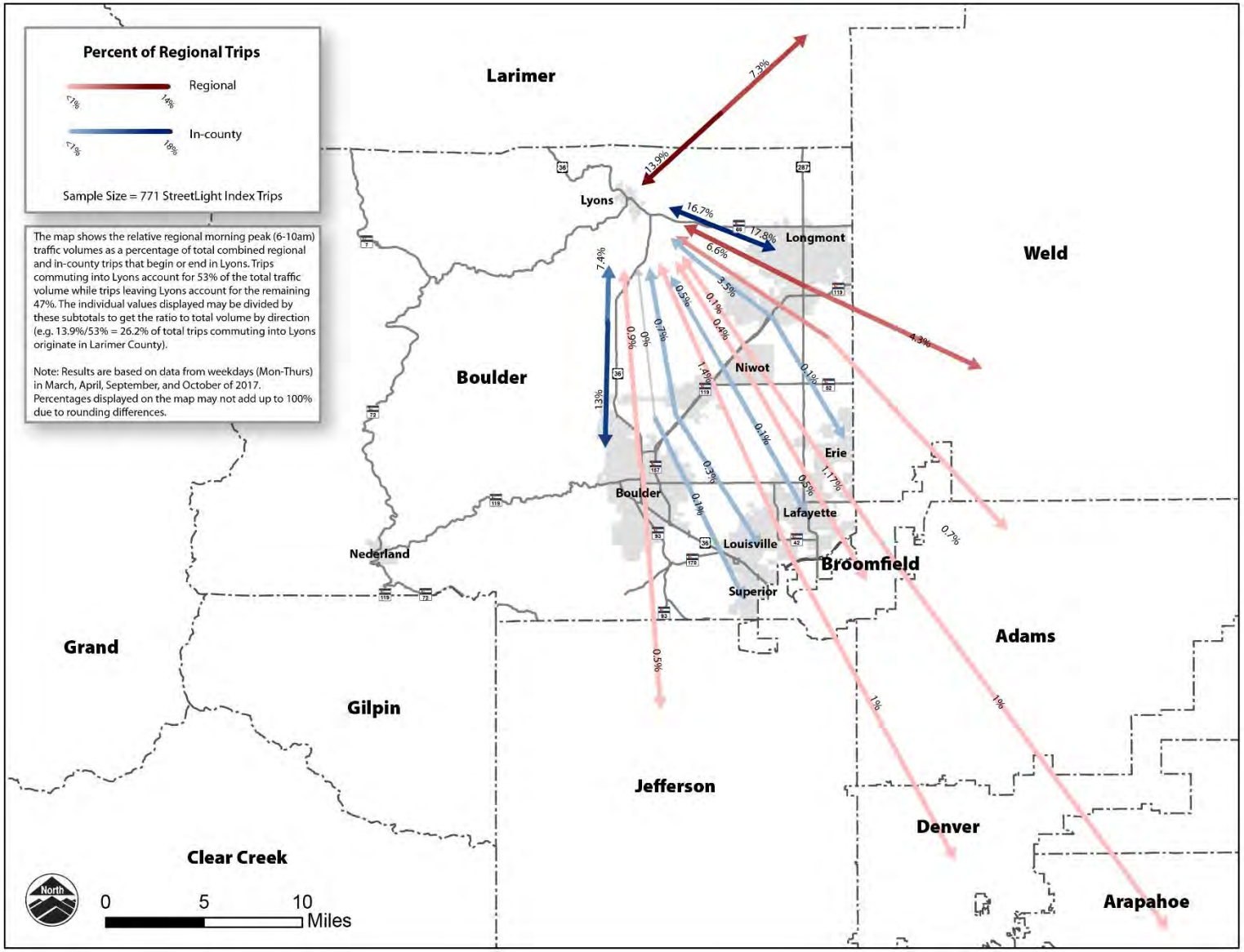
Source: StreetLight Data and Boulder County Transportation

FIGURE 8: REGIONAL TRIP PATTERN MAP – TO AND FROM LOUISVILLE



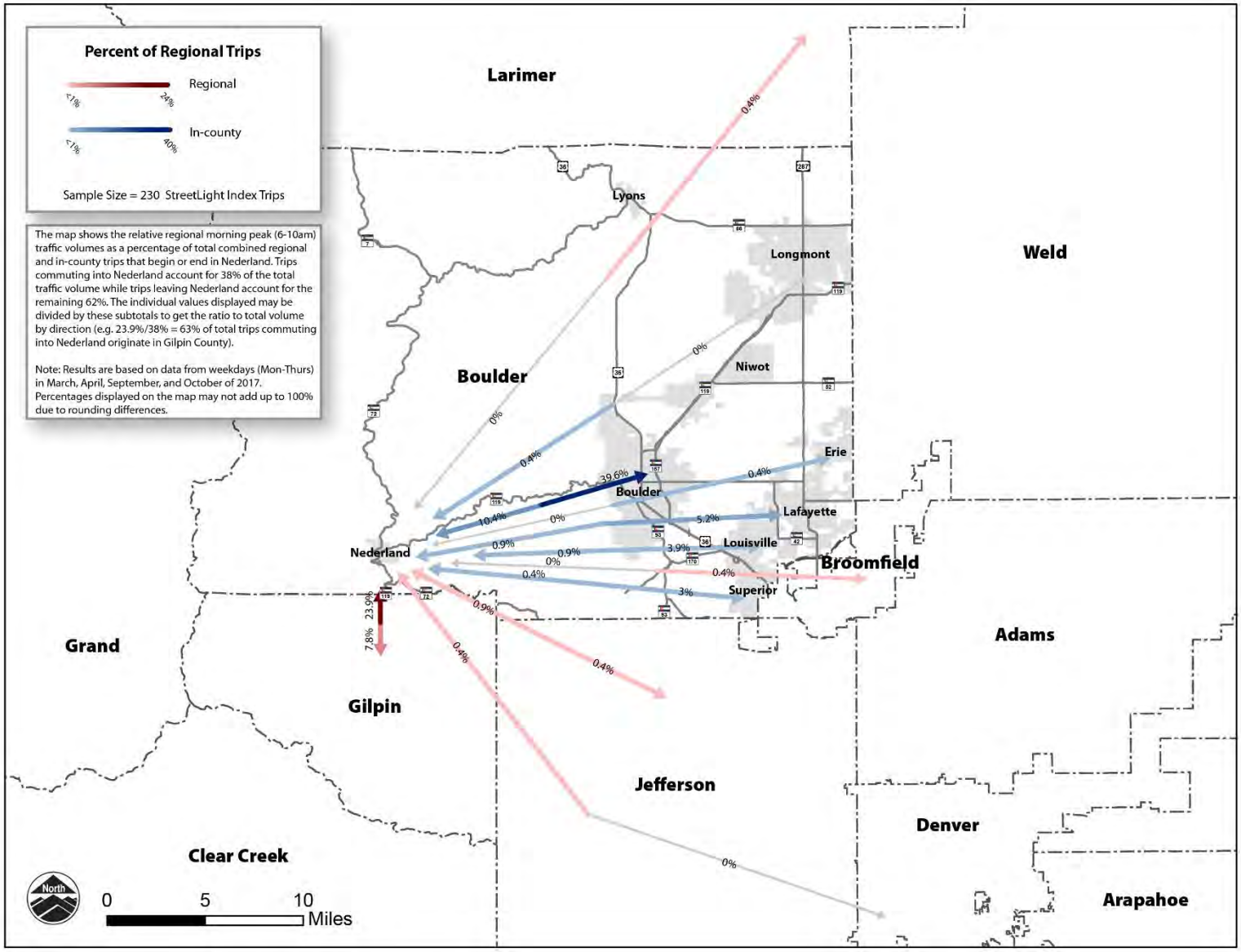
Source: StreetLight Data and Boulder County Transportation

FIGURE 9: REGIONAL TRIP PATTERN MAP – TO AND FROM LYONS



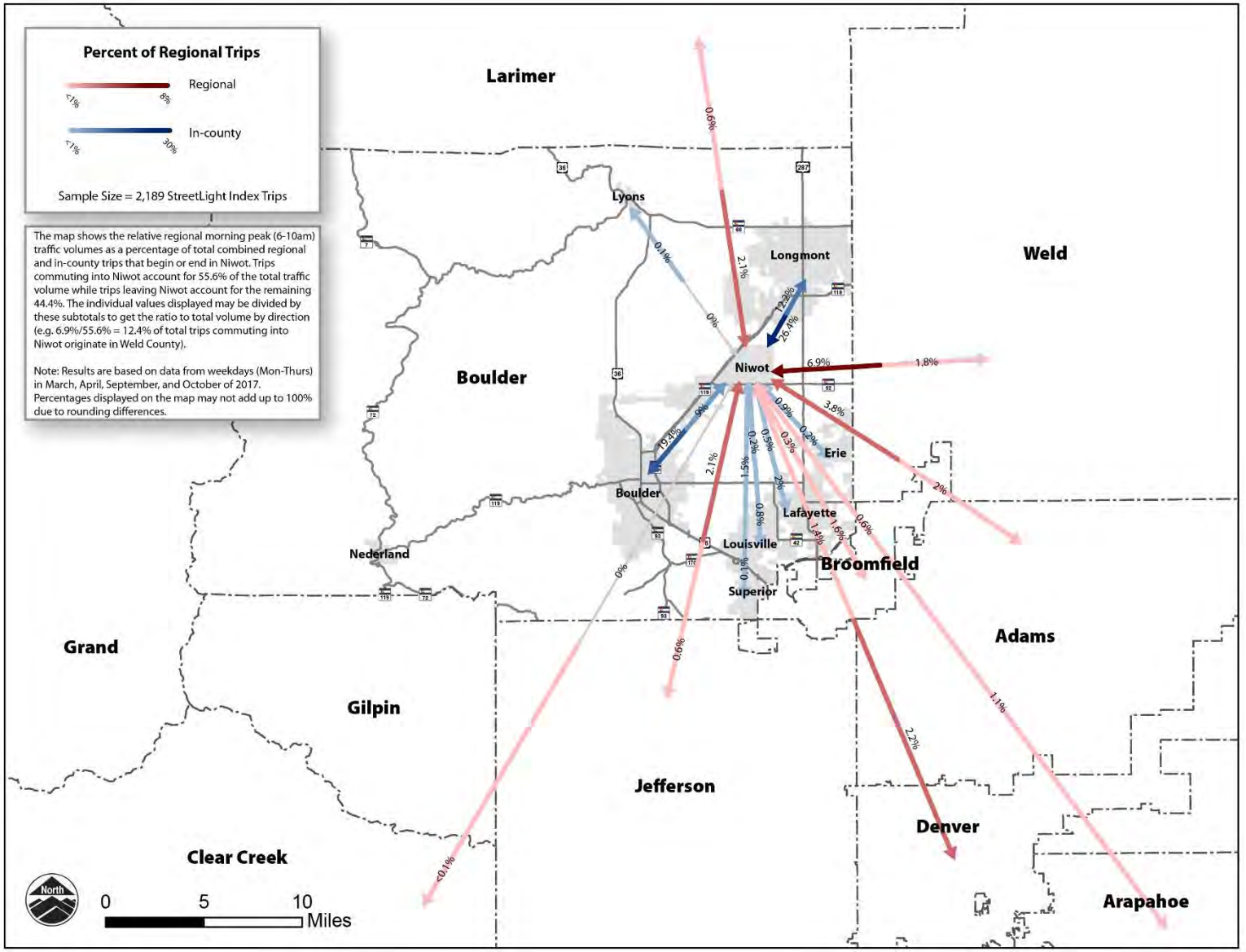
Source: StreetLight Data and Boulder County Transportation

FIGURE 10: REGIONAL TRIP PATTERN MAP – TO AND FROM NEDERLAND



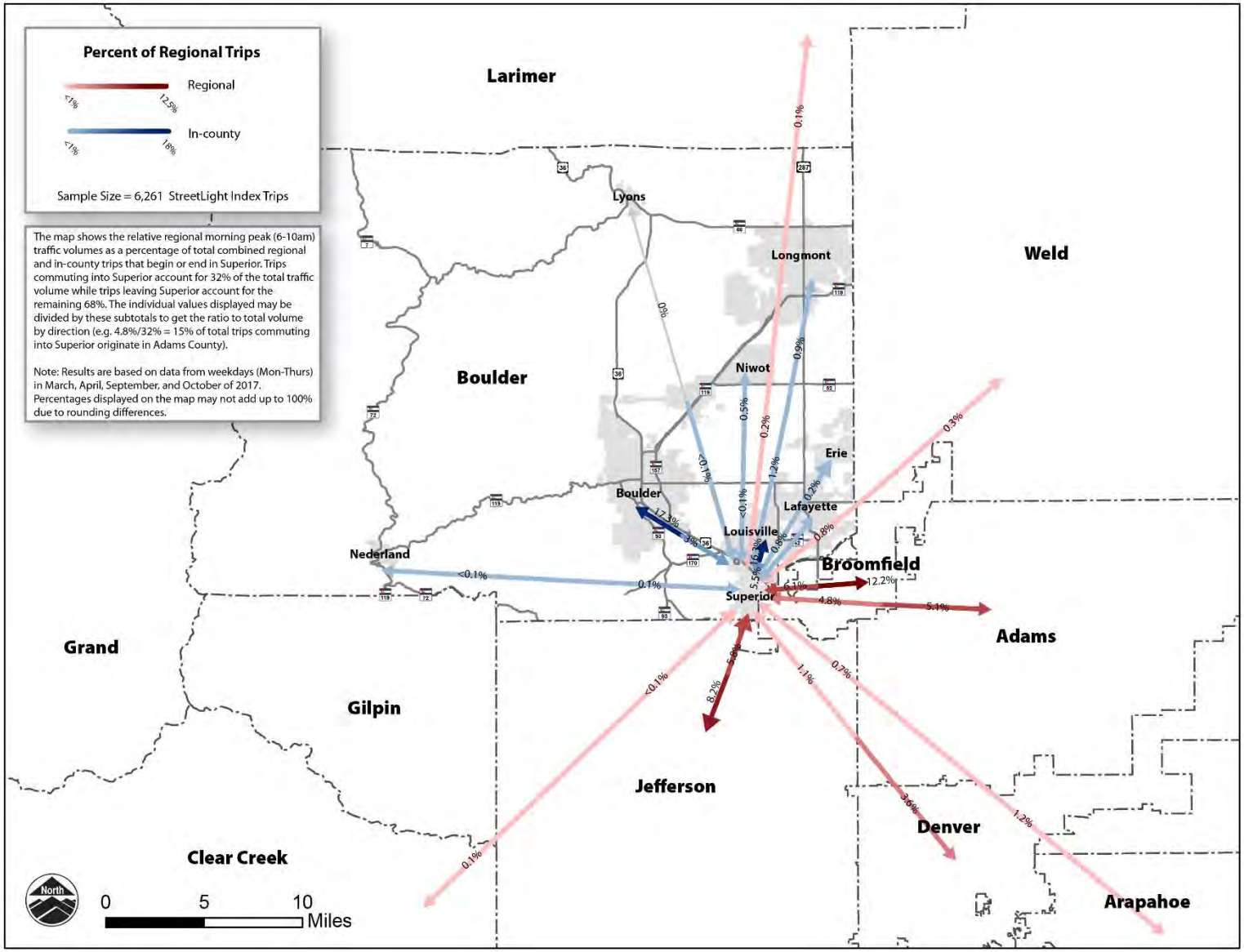
Source: StreetLight Data and Boulder County Transportation

FIGURE 11: REGIONAL TRIP PATTERN MAP – TO AND FROM NIWOT



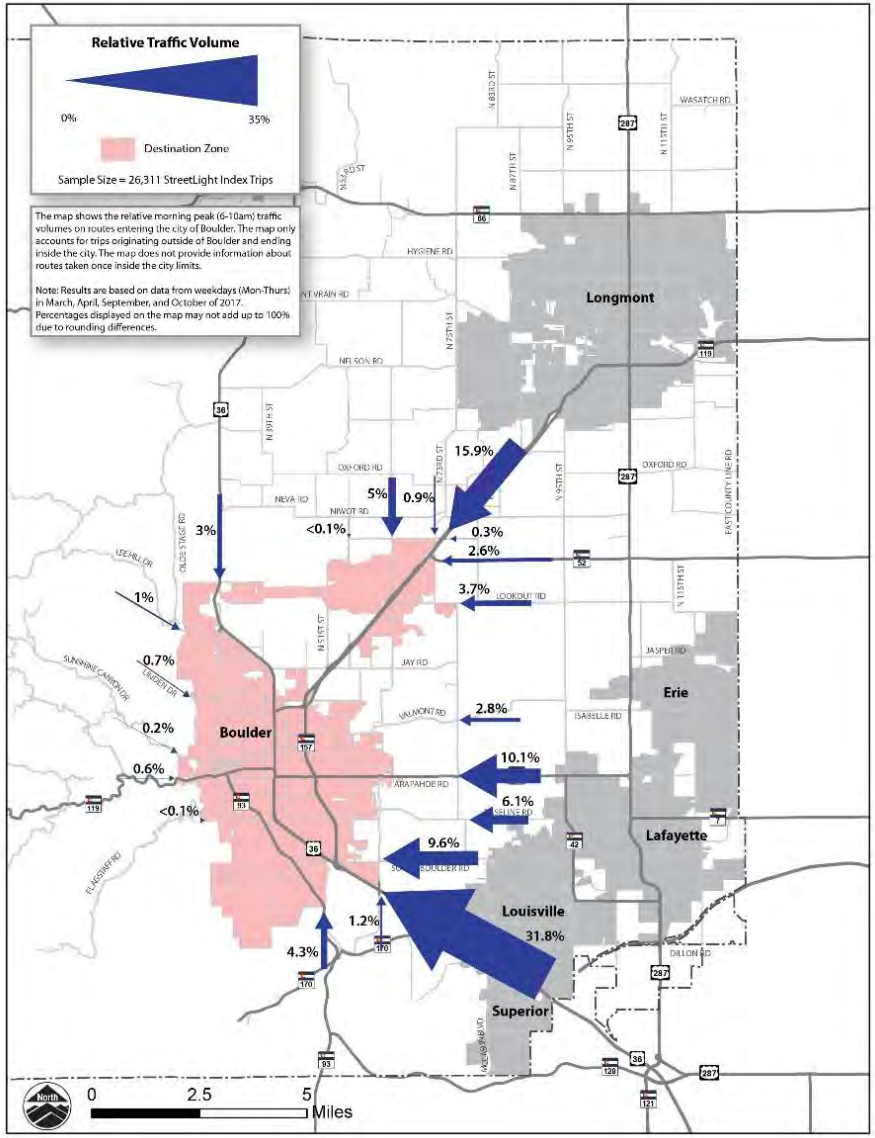
Source: StreetLight Data and Boulder County Transportation

FIGURE 12: REGIONAL TRIP PATTERN MAP – TO AND FROM SUPERIOR



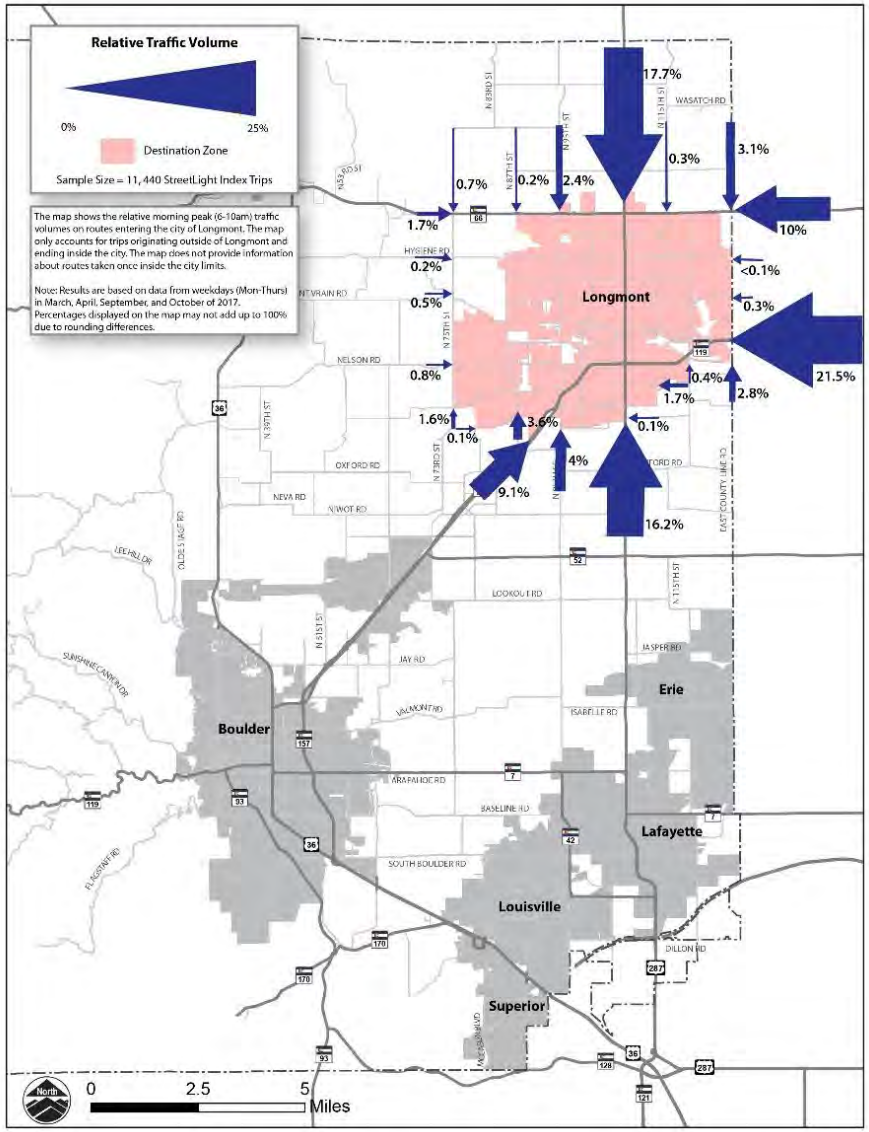
Source: StreetLight Data and Boulder County Transportation

FIGURE 13: RELATIVE TRAFFIC VOLUME ENTERING BOULDER



Source: StreetLight Data and Boulder County Transportation

FIGURE 14: RELATIVE TRAFFIC VOLUME ENTERING LONGMONT



Source: StreetLight Data and Boulder County Transportation

CURRENT AND PROJECTED TRIP PATTERN COMPARISON

Travel forecast models show that between 2015 and 2040 there will be large increases in the proportion of trips that cross into and out of Boulder County. The majority of Boulder County residents and employees will continue to live and work in different communities, with particular increase from Weld, Broomfield, and Adams counties. The increase can likely be attributed to people moving to these areas, based on housing costs and land use patterns. Figure 15 illustrate in-county and regional trip patterns for the current (2015) and 2040 time periods. The magnitude of travel demand within Boulder County will continue to increase, although at a lower rate than the overall Denver metropolitan region. As shown in Table 3, in-county trips and regional trips are expected to increase from 2015 to 2040. Details for each county is shown in Table 4.

TABLE 3: BOULDER COUNTY DAILY PERSON TRIPS

Trip Type	2015	2040	2015–2040 Percent Change
In-county	127,480	163,325	+ 28%
Regional	377,800	604,100	+ 60%
Total	**505,280**	**767,425**	**+ 52%**

TABLE 4: REGIONAL TRIPS

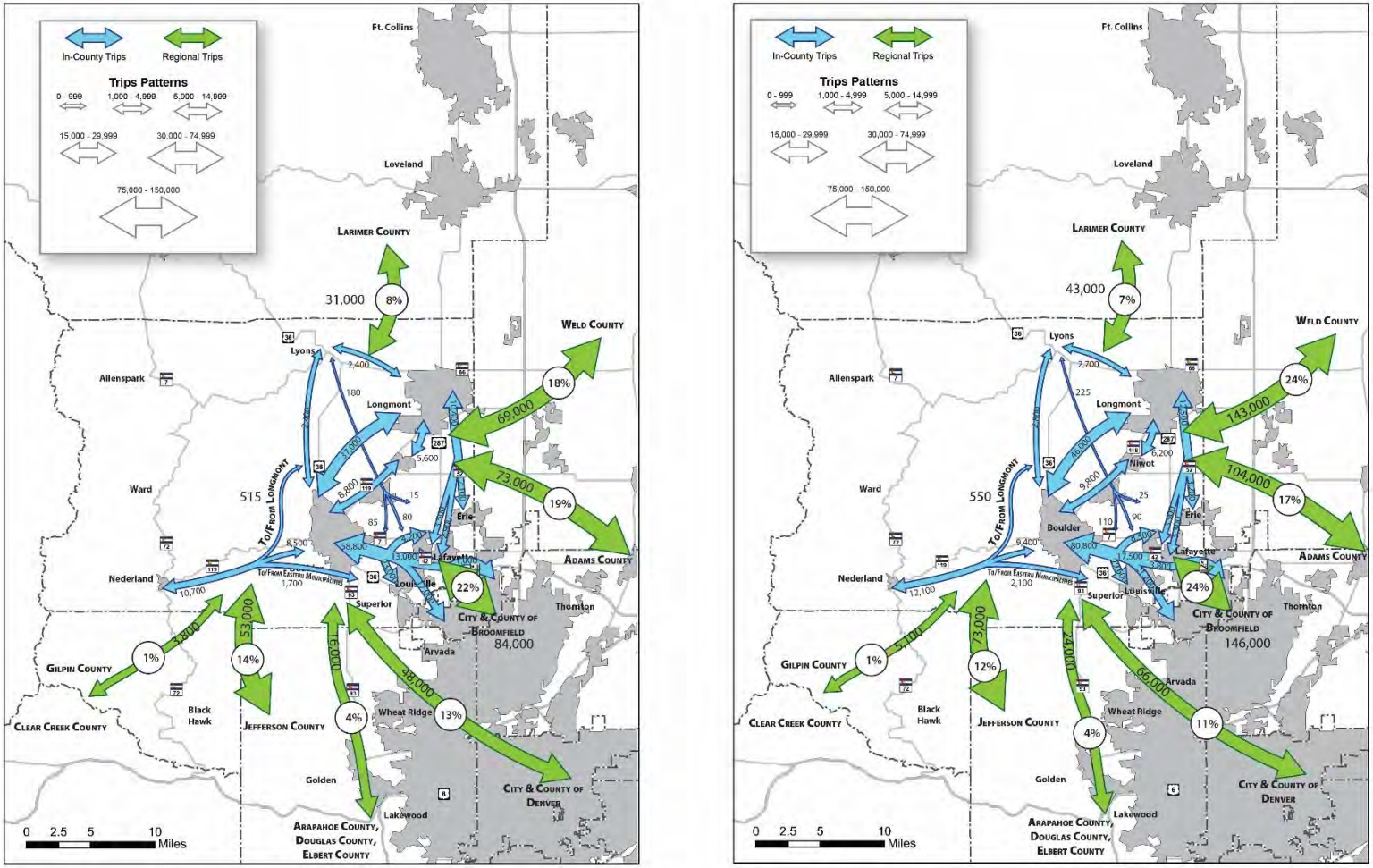
County	2015		2040		Percent Increase
	Trips	Percent	Trips	Percent	
Adams	73,000	19%	104,000	17%	42%
Arapahoe	16,000	4%	24,000	4%	50%
Broomfield[10]	84,000	22%	146,000	24%	74%
Denver	48,000	13%	66,000	11%	38%
Gilpin	3,800	1%	5,100	1%	34%
Jefferson	53,000	14%	73,000	12%	38%
Larimer[11]	31,000	8%	43,000	7%	39%
Weld	69,000	18%	143,000	24%	107%
Total	**377,800**	**100%**	**604,100**	**100%**	**60%**

Source for both tables: DRCOG 2015 and 2040 Regional Travel Demand Model, FOUCS statewide model, and David Evans and Associates, Inc.

[10] The majority of trips within Broomfield County are located in "South Broomfield", TAZs located south of 144th Avenue.
[11] This data comes from the FOCUS statewide model. The 2040 numbers were interpolated from the 2015 and 2045 model runs.

FIGURE 15: 2015 BOULDER COUNTY TRIP PATTERNS

2040 BOULDER COUNTY TRIP PATTERNS



Source: DRCOG 2015 and 2040 Regional Travel Demand Model, FOCUS statewide model, and David Evans and Associates, Inc.

The key takeaways of the current and projected trip patterns for the 2019 TMP update are:

- Regional trips will account for a greater percentage of trip types in Boulder County in 2040 than in 2015
- The greatest increase in regional trips will be between counties to the east (Weld, Adams and Broomfield County)
- The greatest increase in in-county trips will be between Boulder and eastern Boulder County communities (most notably between Boulder and Erie)
- By 2040, the number of person trips starting, ending, or remaining within Boulder County is projected to increase by about 50% to just over 750,000 trips per day

MODE SHARE

According to 5-Year Estimates (2013-2017) *American Community Survey* (ACS) data Boulder County has the following mode share:

- 65 percent of commuters drive alone to work
- 8 percent of commuters carpool
- 27 percent of commuters utilize transit, walk/bike, or work at home (or "other")

Comparatively, within the entire DRCOG region, approximately 75 percent of commuters drive alone to work, 8 percent carpool, and the remaining 17 percent utilize transit, walk/bike, or work at home (or "other"). Compared to the DRCOG region as a whole, person trips via single-occupancy vehicles occur at a lower rate in Boulder County. Since the 2012 TMP, there has been a slight decrease in driving alone to work and small increases in walking to work and working at home. Full details are shown in Table 5.

According to the 5-Year Estimates (2013-2017) *American Community Survey* (ACS), 95 percent of Boulder County households have access to at least one vehicle. This means that access to vehicles is widespread throughout the county, but there is an important five percent of households that do not have access to a vehicle. This does not have many transportation implications if households are located in more urban areas where other alternatives are readily available. However, households located in more rural areas (as many areas of unincorporated Boulder County), living without a vehicle poses more challenges.

TABLE 5: MODE SHARE

Travel Mode	2008-2012		2013-2017	
	Boulder County	DRCOG	Boulder County	DRCOG
Drove alone	66%	75%	65%	75%
Carpooled	8%	9%	8%	8%
Public transportation (excluding taxicab)	5%	5%	5%	4%
Bicycle	4%	1%	4%	1%
Walked	4%	2%	5%	2%
Other	1%	1%	1%	1%
Worked at home	11%	7%	12%	8%
Total	**100%**	**100%**	**100%**	**100%**

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

TRANSPORTATION AND EQUITABLE ACCESS, ECONOMY, AND ENVIRONMENT

The Boulder County multimodal transportation system aims to safely and efficiently move people and goods between communities within the county and between the county and the surrounding region. The county's historic orientation and current policies emphasize transportation's important role in creating sustainable ways of living from an economic, environmental, and equity perspective. By identifying how transportation interacts within these three overlapping realms, Boulder County can more effectively consider the implications of its decisions and actions.

Combined, the Transportation and Sustainability Elements of the *Boulder County Comprehensive Plan* create a strong policy foundation to address how the transportation system affects how people live, impacts the natural environment, and influences economic activity. In implementing these policies, Boulder County is challenged to expand traditional approaches and identify transportation investments that are responsive to all three dimensions.

EQUITABLE ACCESS

Transportation plays a critical role in how people live, by providing efficient and reliable transportation to participate in life's activities and have access to vital services. As a result, transportation planning must consider how adequate transportation investments exist for all users regardless of age, income or ability.

Boulder County wants to provide an easily accessible transportation system. However, access barriers that exist include:

- High cost of transportation
  - Affordable living is generally considered achieved if a maximum of 45 percent of monthly income is spent on household and transportation costs. While there are many programs to support housing costs, there are not many programs to subsidize transportation costs.
- Inopportune location of housing (including affordable housing)
- Inopportune location of employment centers (lower income jobs are more dispersed)
- Limited physical ability (vision, hearing, mobility, etc.)
- Driver's license status
- Limited transportation options for specific needs (i.e. older adults, vulnerable populations)
- Limited education or outreach on available transportation options

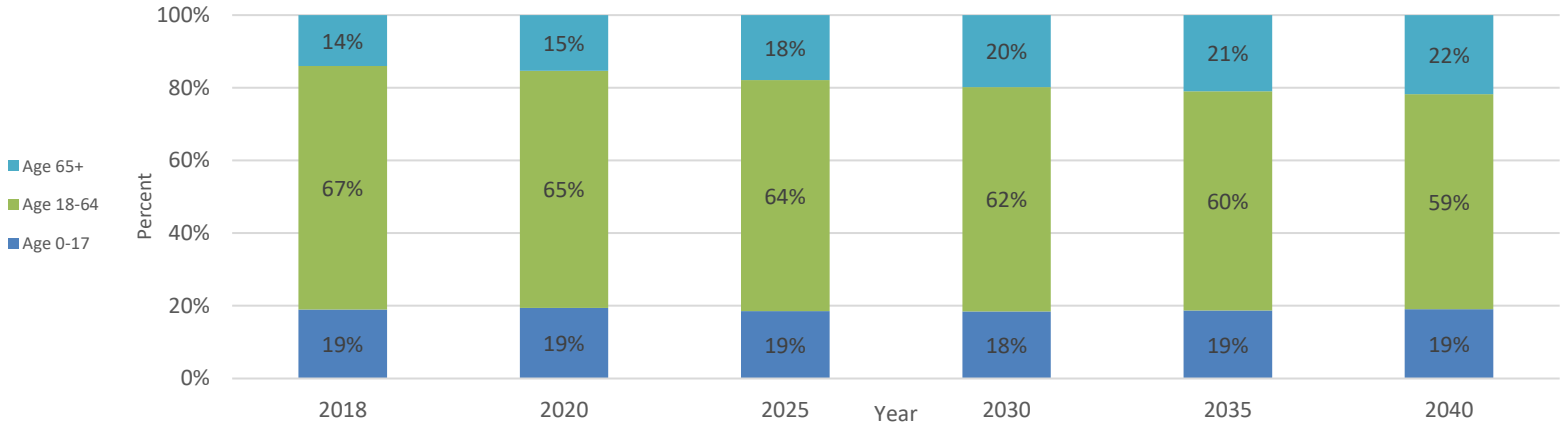
➲ Reference *Strategy 4 – Increase Accessibility* to learn more about increasing accessibility to vulnerable populations.

VULNERABLE POPULATIONS

Boulder County's vulnerable population is comprised of those with low-incomes, minorities, youth or those with limited physical abilities. Based on available data by the Colorado State Demography Office, forecasted information is available for minorities and youth. By 2040, minorities are forecasted to comprise of 32 percent of the Boulder County population. This includes all race categories except white non-Hispanic. In 2018, minorities comprise of approximately 23 percent of the population.

Similar to many areas in the United States, Boulder County is experiencing a large increase in the number of older adults living in the community. According to the State Demography Office, by 2040, 22 percent of Boulder County residents will be 65 years old or older. The percentage of the population under 18 stays consistent at 19 percent and the 18-64 age category will reduce to be less than 60 percent of the population. This increase in proportion of the population that is elderly will create changing demands on the transportation network and transportation services, particularly increasing demand for alternatives to driving alone (see Figure 16).

FIGURE 16: POPULATION BY AGE GROUP



Source: Colorado State Demography Office

ECONOMY

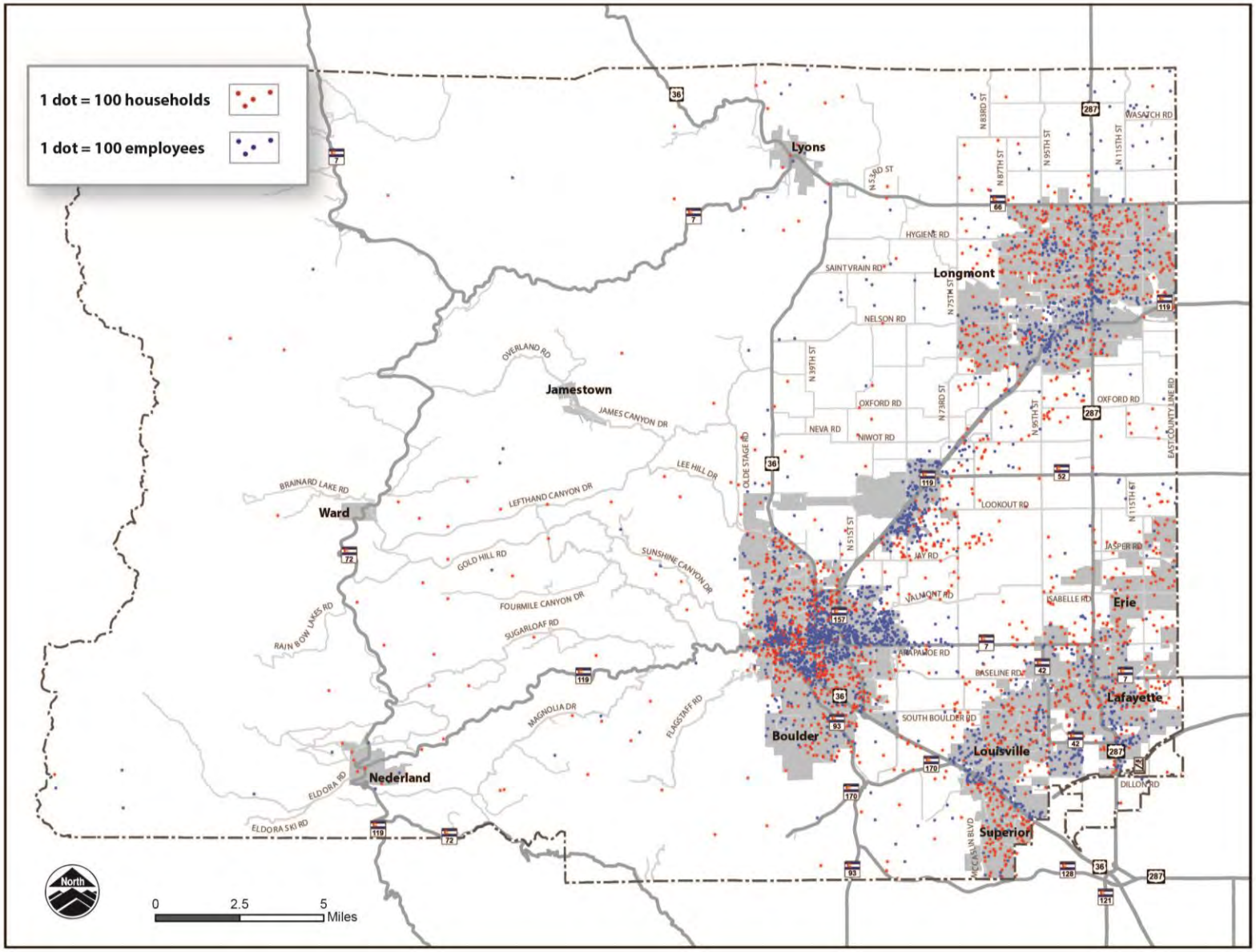
Transportation is important to support a healthy and sustainable economy. Transportation allows people to engage in economic activity, whether through employment or as consumers. As shown in Table 6, there were approximately 177,000 people employed within the county (both incorporated and unincorporated) in 2015. The county is forecast to have 229,826 people employed in 2040, with 173,305 households. The 2040 forecasted patterns from the DRCOG model for household and employment locations within Boulder County are illustrated in Figure 17. As shown, population and employment densities will remain focused in and around the incorporated communities.

TABLE 6: POPULATION AND EMPLOYMENT

DRCOG Socioeconomic Data	2015	2040	2015–2040 Percent Change
Households	130,520	173,305	33%[12]
Employment	177,081	229,826	30%

[12] This is the same increase projected by the Colorado State Demography Office (33%).

FIGURE 17: 2040 BOULDER COUNTY HOUSEHOLD AND EMPLOYMENT PATTERNS



ENVIRONMENT

In addition to supporting the economy and maintaining equitable access, the goals of the Boulder County transportation system are to:

- Minimize the negative environmental impacts of the transportation system such as air pollution, greenhouse gas emissions, noise pollution, water pollution, land and wildlife habitat fragmentation, land disturbance, and resource consumption
- Provide facilities that result in safe and secure travel environment for all modes that also enables prompt and effective emergency response
- Enhance Boulder County's identity and community character
- Facilitate active transportation modes by creating an environment that encourages physical activity
- Provide transportation options that reduce the environmental footprint of travel
- Enhance Boulder County's quality of life and community character

Environmental and public health concerns will increase the need to reduce barriers to active living and transportation. Boulder County is committed to continued improvement of environmental and health concerns by providing a multimodal system that promotes activity and positive contributions to health outcomes. The county is also aware of ground level ozone, which is anticipated to increase with more pollution and hotter temperatures, will result in hazardous air quality for people walking and bicycling.

CLIMATE CHANGE

The transportation sector's contributions to Greenhouse Gas (GHG) emissions are influenced by three factors: vehicle fuel efficiency, fuel type, and vehicle miles traveled (VMT). Combatting climate change and reducing fossil fuel reliance is a top priority for Boulder County, and the county will appropriately plan for new technologies to promote that priority. This includes supporting the public and private

Transportation Electrification

Boulder County supports the adoption of electric vehicles for the county fleet and the general public through policies, technology, infrastructure, and partnerships:

- Policies to promote the purchase and use of zero-emission vehicles and investment in related technology and infrastructure.
- Support the public adoption of EVs and assist in the installation of public charging stations, through public and private partnerships.
- Support EV adoption and charging station access for low-income and multifamily residences.
- Reduce the greenhouse gas emissions from the county fleet by promoting hybrid, plug-in hybrid electric vehicle (PHEV), and battery electric vehicles (BEV) and developing EV charging stations for fleet at county locations.

infrastructure needed for larger-scale acceptance of electric vehicles, electric bicycles, and other low-carbon mobility options. Boulder County's 2018 Sustainability Plan includes goals for the electrification of Boulder County's vehicle fleet as well as encouraging adoption of electric vehicles among its residents. According to our most recent greenhouse gas (GHG) emission inventory completed in 2016, commercial and residential building energy use accounts for 60% of emissions and transportation accounts for 30% of emissions countywide. Boulder County adopted bold goals to reduce community GHG emissions 45% below 2005 levels by 2030 and 90% below 2005 levels by 2050. While reaching these goals will be a significant challenge, Boulder County is committed to transitioning to a low-carbon future and a clean energy economy.

In addition to supporting increased use of vehicles with reduced GHG emissions, Boulder County will continue to promote programs that reduce VMT, such as increased transit options and first and final mile connections.

PLAN ORGANIZATION

The TMP lays out five key strategies to accomplish the transportation vision and goals identified in the Comprehensive Plan:

- **Strategy 1:** Develop a Multimodal Transportation System
- **Strategy 2:** Create the Complete Trip
- **Strategy 3:** Invest in Key Transportation Corridors
- **Strategy 4:** Increase Accessibility
- **Strategy 5:** Enhance Mountain Area Connections

Strategy 1 is focused on individual transportation modes (roadway, transit, bicycle facilities). Strategies 2-5 focus on programmatic improvements, corridors, and regions throughout Boulder County to create a comprehensive transportation system.

The Boulder County transportation system consists of local roads, bicycle and pedestrian facilities, regional trails, state and federal highways, and transit service operated by RTD, Via, and other similar private and nonprofit human services transportation providers.

County residents and visitors do not differentiate between the jurisdictions that are responsible for each element of the transportation system; they expect all agencies to work together to provide a coordinated, efficient, and well-maintained transportation system that provides cost-effective mobility for both current and future generations. The TMP includes strategies and implementation actions that will, in many cases, require the cooperation and commitment of multiple communities and agencies to realize.

STRATEGY 1—DEVELOP THE MULTIMODAL TRANSPORTATION SYSTEM

Boulder County's transportation network consists of roadways, on-street bicycle facilities, transit services and facilities, sidewalk/pedestrian facilities, multiuse paths and structures that together move people safely and efficiently between communities within Boulder County and to the surrounding region. As part of its commitment to cost effectiveness, efficiency, and minimizing community impacts, Boulder County will identify and implement appropriate low-cost interim solutions before implementing more expensive and disruptive measures. The implementation actions for developing the multimodal system include plans for improvements to the roadway, bicycle, and pedestrian facilities and transit networks. It is imperative to continue on-going facility improvements to meet current and future network demands.

ROADWAY NETWORK VISION

The Boulder County roadway network, including bridges and intersections, provides the infrastructure backbone for mobility throughout both the plains and mountains. Residents, commuters, recreational travelers, and deliveries of goods and services utilize the county road system. County facilities are multimodal and enable travel by both motorized and non-motorized means. Boulder County transportation investments focus on maintaining quality, improving safety, and expanding multimodal capabilities of the roadway system.

ROADWAY NETWORK

The roadway network within the entire county contains over 1,800 miles of city, county, and state roads and highways, as illustrated in Table S1-1.

TABLE S1-1: ROADWAY JURISDICTIONS

Roadway Jurisdiction	Length of Roadway	Percent of Total
State Highways	200 miles	11%
Municipal Roads	900 miles	49%
Boulder County Roads	738 miles	40%
Total	**1,838 miles**	

Source: Boulder County Transportation

Half of Boulder County owned and maintained roads are paved, including 81 miles of the arterial network and a majority of the collector roads. Table S1-2 lists the miles of county roads by road classification and surface type.

TABLE S1-2: BOULDER COUNTY ROADS

Classification	Paved	Unpaved	Total
Arterial Roads	81 miles	0 miles	81 miles
Collector Roads	103 miles	34 miles	137 miles
Residential Collector Roads	16 miles	0 miles	16 miles
Local Roads – Primary Network	63 miles	165 miles	228 miles
Local Roads - Subdivisions	135 miles	70 miles	205 miles
"J" Jeep Roads	0 miles	71 miles	71 miles
Total	**398 miles**	**340 miles**	**738 miles**

Source: Boulder County Transportation

ROADWAY CLASSIFICATIONS

County roads are categorized into a hierarchy of functional classes based on their role in connecting and providing access between origins and destinations throughout the county. Higher functional classifications are devoted to moving larger numbers of people, goods, and services over longer distances, while the lower classifications provide access to and serve adjacent land uses.

Boulder County categorizes these different purposes as follows:

- **Regional Travel:** The ability to move over large distances to connect regions
- **Local Circulation:** The ability to move within areas and to connect land uses
- **Local Access:** The ability to enter and make use of specific land uses and sites

State and federal highways are classified by the responsible agency and may include freeways, expressways, or toll roads. The *Boulder County Multimodal Transportation Standards* further describes the functional classifications for county roadways that are summarized in Table S1-3.

TABLE S1-3: ROADWAY CLASSIFICATIONS

Purpose	Roadway Classification	Modal Features
Regional Travel Corridor	Principal Arterial Minor Arterial	Vehicle travel, fixed route and frequent transit service, regional shared use paths, bikeable shoulders, marked bicycle lanes
Local Circulation Corridor	Collector Residential Collector	Vehicle travel, fixed route and frequent transit service, non-fixed route/demand response transit, shared-use paths, bikeable shoulders, marked bicycle lanes, sidewalks
Local Access Corridor	Local – Primary Local – Subdivisions	Vehicle travel, on-street parking, fixed route transit service (infrequent), non-fixed route/demand response transit, sidewalks, signed bicycle routes, shared roadways

Source: Boulder County Transportation

ROADWAY NETWORK MAINTENANCE

The Transportation Department is responsible for maintaining the county's transportation facilities. Routine maintenance and rehabilitation of the entire network enables safe passage for roadway users. It includes snow removal, mowing, sweeping, asphalt patching, tree trimming, chip sealing, crack filling, road grading, cleaning of culverts and roadside ditches, bridge rehabilitation, guardrail replacement and repair or replacement of traffic signs and pavement markings. The Boulder County Road Map[13] lists maintenance and snow removal priority for each county road.

ROADWAY MAINTENANCE

The Road Maintenance Division of the Transportation Department is responsible for maintaining the county's transportation facilities. Boulder County performs routine maintenance activities on both paved and gravel roadways in order to maintain surface quality and maximize safe passage for roadway users. Boulder County tracks annual routine maintenance costs for county roadways, because, over time, these costs help to determine when a roadway has a more significant rehabilitation need.

MAINTAINING PAVEMENT LIFE

Ongoing maintenance of county roads is critical to preserve the long-term usability of the system and to manage the costs of facility reconstruction. Boulder County's maintenance priorities focus on chip sealing, crack sealing, asphalt patching, roadside mowing, and the asphalt paving program to extend pavement life before full reconstruction.

[13] The Boulder County Road Map is available at: https://www.bouldercounty.org/transportation/maps/roadmap/

ROADWAY REHABILITATION - ASSESSING PAVEMENT QUALITY

Boulder County surveys pavement quality of each of its paved roads every three years to systematically assess the surface condition of the roadway network. This helps determine long-term roadway rehabilitation needs. The pavement survey uses a pavement quality index (PQI) ranging from 1 (poor) to 10 (good). Figure S1-1 shows the pavement conditions of each of the county paved road, based on the 2018 survey.

Roadway Rehabilitation - Resurfacing and Reconstruction

Boulder County uses a life-cycle analysis to schedule surface treatments to maintain the long-term pavement quality of its primary road network and reduce the long-term costs of the county's road resurfacing needs. The county uses a scheduling method to best balance the cost of surface maintenance with the needs of the traveling public.

Table S1-4 shows the assumed life-cycle resurfacing schedule for each of the county's road classifications. The plan assumes a full asphalt overlay followed by an interim surface treatment such as chip seal at various intervals within the life cycle. Following these resurfacing targets results in annually overlaying approximately eight miles of roads and placing an interim surface treatment on approximately 25 miles of roads.

TABLE S1-4: RESURFACING PLAN

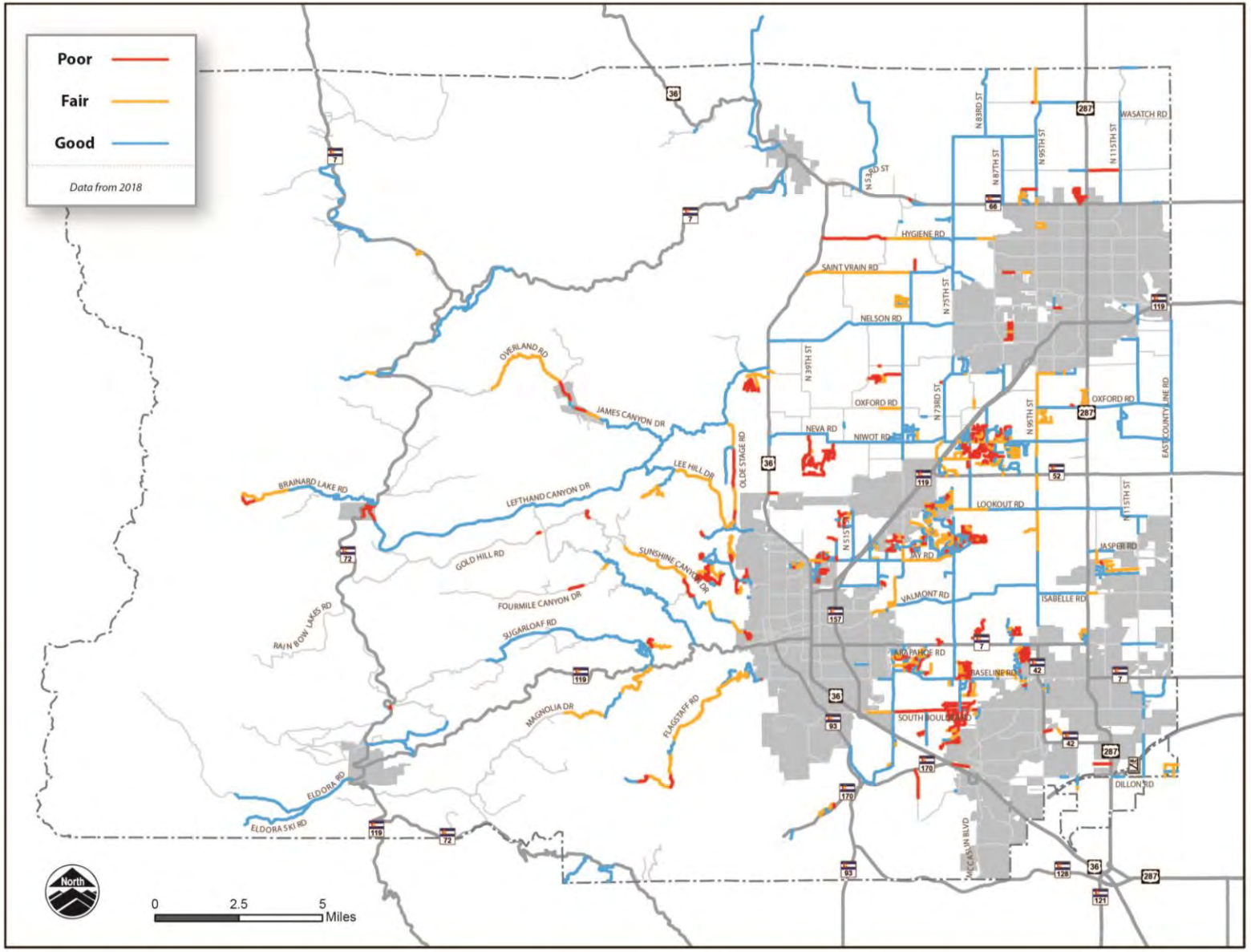
Roadway Classification	Estimated Life Cycle	Resurfacing Targets		
		Interim Treatment	Interim Treatment	Overlay
Arterial Roads	20 years	Year 6	Year 12	Year 20*
Collector Roads	26 years	Year 6	Year 16	Year 26*
Local Roads	30 years	Year 6	Year 16 & 26	Year 30*

*as needed.
Source: Boulder County Transportation

Asphalt overlays are programmed through the annual overlay program funded by the Road and Bridge Fund and as part of reconstruction projects funded by federal grants and the Countywide Transportation Sales Tax program. Annual road resurfacing is part of regular maintenance and is not included with the specific list of projects listed in this plan.

The county uses interim surface treatments to maintain the pavement quality between overlays. The interim application of quarter-inch chip seal maintains a rideable surface for cyclists.

FIGURE S1-1: ROADWAY VISION – PAVED ROADS PAVEMENT CONDITION (2018)



Subdivision Paving

In recent decades, 115 subdivisions have been built within unincorporated Boulder County, that together have added approximately 145 miles of paved roads to the county road network.

As directed by the Boulder County Comprehensive Plan (BCCP), Boulder County Transportation is responsible for the maintenance of local access roads within county subdivisions. Maintenance activities are defined in the BCCP to include: pothole repair, snow removal, ditch and culvert clearing, crack sealing, and other work necessary to maintain public safety. Maintenance does not include resurfacing or rehabilitation of the roadway surface. According to the BCCP, this work is the responsibility of the local property owners who are served by those roads.

Over the years, pavement quality of subdivision roads has deteriorated beyond the capabilities of the Transportation Department to maintain, requiring numerous miles of this infrastructure needing to be rebuilt.

Rehabilitation of roadways can be an expensive project, which is why subdivision property owners are encouraged to work together to form a method to collect funds for roadway repair in order to share the expense of the work. These methods include forming a Public Improvement District (PID) or collecting additional HOA dues.

By Colorado Revised Statute § 30-20-505(1), organization of a PID must be initiated and undertaken by a petition, which has been signed and filed with the Board of County Commissioners by the registered electors residing within the area of the district to be created. Boulder County is permitted to encourage the formation of a PID, but it cannot take part in the petition signing or submission process. Once a petition meets the requirements of the state statute, the county will set a public hearing on the formation of the proposed district and there will be an election in which the majority of voters must vote in favor of forming the district for the PID to be approved.

Property owners are permitted to form a PID within their subdivision and may also work together with property owners in other subdivisions to form a district that extends over several subdivisions' borders. Extending a PID beyond the boundaries of a single subdivision can help disperse costs of the work by creating economies of scale, as unit costs could decrease by including more roads in the planned paving operations.

➲ For more details on other maintenance activities see *Strategy 1 – Develop the Multimodal System, Transit Vision* and *Regional Trails, Bicycle and Pedestrian Vision*.

INTERSECTIONS

Boulder County currently maintains 18 signalized intersections. The county has not added any traffic signals since 2009, however there are several intersections where signals are warranted given traffic flows and safety concerns. As traffic volumes increase, these needs are likely to increase. The design of county signalized intersections considers vehicle flow, safety, transit flow, pedestrian and bicycle mobility, and the character of surrounding land uses.

Intersection improvement criteria includes capacity constraints that cause vehicular and transit passenger delay, the number and nature of vehicular, pedestrian, or bicycle crashes, and operational or geometric constraints that hinder efficient vehicular, transit, pedestrian, or bicycle movements.

Intersections with highest potential for future signalization or roundabout installation are listed alphabetically below and do not preclude signalization or roundabout installation at other intersections in the future. Each must be individually evaluated by assessing industry traffic signal requirements, community input, environmental impacts, and ability to meet the intersection improvement criteria.

- Cherryvale Road and Baseline Road (south)
- Cherryvale Road and Highway 170 (with CDOT)
- East County Line Road and Oxford Road
- East County Line Road and Pike Road (with Weld County)
- Lookout Road and 75th Street (with City of Boulder)
- Nelson Road and 63rd Street
- Oxford Road and US287 (with CDOT)
- Plateau Road and 75th Street (with City of Longmont)
- Valmont Road and 95th Street

ROAD SHOULDERS

Road shoulders are defined in the *Multimodal Transportation Standards* in the following way:

> *Roadway shoulders are the portion of the roadway contiguous with the traveled way that accommodate stopped vehicles and emergency use, and provide structural support for roadway components. Shoulders are often surfaced with gravel, crushed rock, asphalt, or concrete pavement to provide better all-weather load support.*
>
> *Paved (asphalt or concrete) shoulders can decrease roadway maintenance costs and run-off-the-road vehicular crashes. Paved shoulders are also an appropriate facility for accommodating bicycle travel. Bikeable shoulders can reduce passing conflicts between motor vehicles and bicycles and provide increased separation in locations where speed differentials are high.*

➲ Reference the *Bicycle and Pedestrian Vision* section to see the recommendations associated with bicycle and pedestrian infrastructure.

BRIDGES & STRUCTURES

Boulder County owns and maintains ninety-two major structures (bridges) and 420 minor structures (i.e. culverts) all of which require upkeep and monitoring, and some of which are due for replacement. Figure S1-2 shows the location of the County's 92 bridges.

Major Structures, as are defined by the Federal Highway Administration's (FHWA) National Bridge Inspection Standards (NBIS) to be structures greater than 20 feet in length at the roadway centerline.

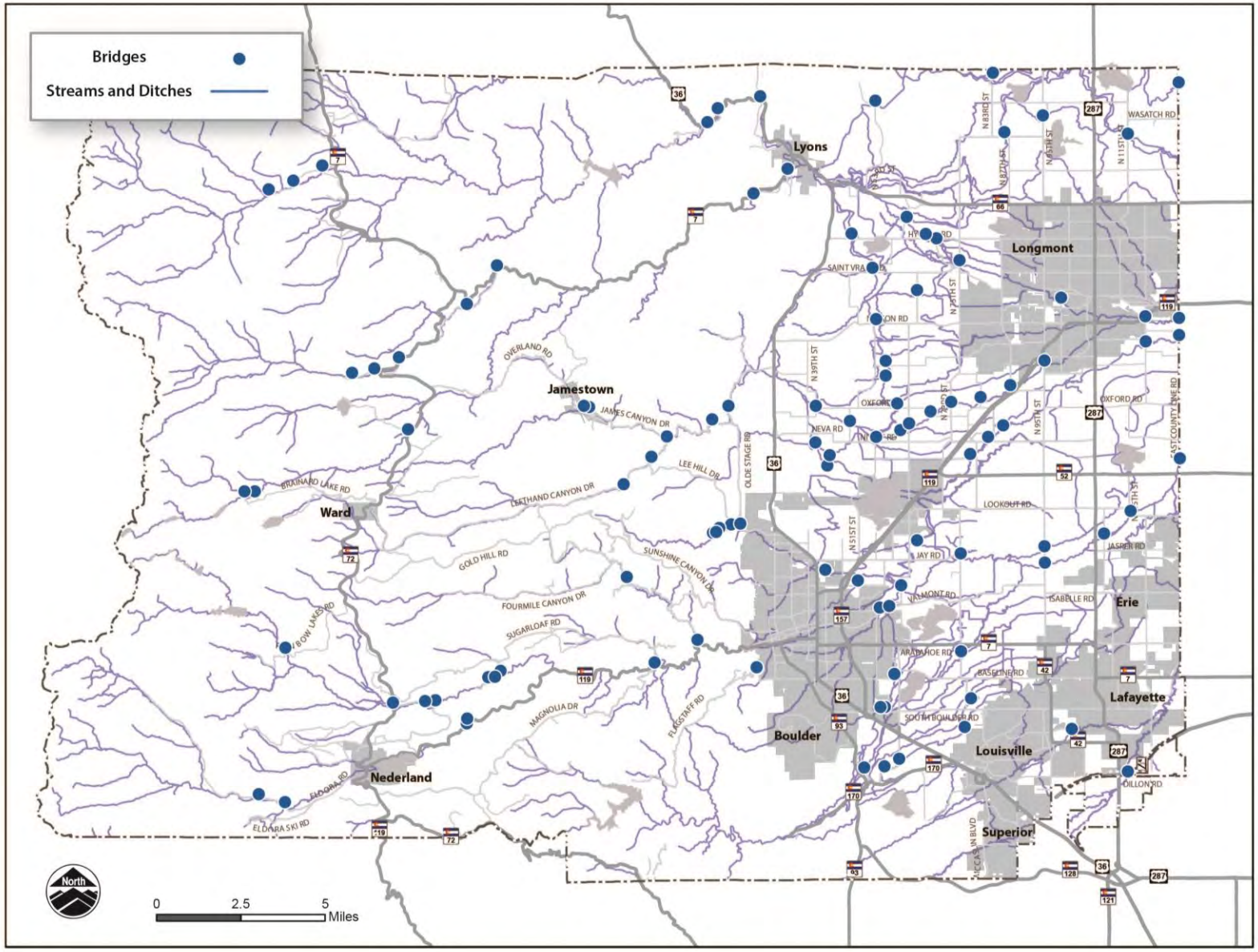
- Major Structures are inspected every two years by the State Bridge Inspector. Each inspection report includes load and resistance factor ratings to determine a need for load posting and sufficiency ratings for individual structures and are provided by the state at no cost to the county.
- The most recent bi-annual inspections of the county's major bridges were completed in the first quarter of 2019 and shows the majority of the county's bridges to be in good structural condition. Boulder County uses these bridge inspection reports to prioritize bridge repairs, rehabilitation, and replacement.

Minor Structures Program are those structures that span less than 20 feet but are greater than 4 feet in diameter.

- Minor structures are inspected periodically based on visual observations of transportation staff. This includes frequent inspection and maintenance of over 400 structures on county roads and within subdivisions in unincorporated Boulder County. Minor structures consist of small bridges and large culverts with a minimum rise or span of 4 feet, up to a maximum span of 20 feet.
- The Minor Structures Program works differently than the Major Bridges Program in that the county is solely responsible for funding inspections and maintenance of the minor structures inventory. Also, complete inspection reports are not prepared every two years. Instead, each year, staff in the Road Maintenance and Engineering Divisions work together to identify a list of minor structures that may need professional inspections. Road Maintenance personnel conduct cursory level inspections of all minor structures every two to three years, collecting data and updating inventory records in GIS. When these cursory inspections reveal deficiencies that require further inspection a follow-up inspection is completed and any deficiencies added to the needs list for repair, rehabilitation or replacement.
- The 2018 inspection looked at 55 structures and recommended repair or replacement of 16 that have been added to the list of capital needs.

While the county's current inspections focus primarily on structural condition, the functional capacity of these structures in terms of road width, the ability to carry bicycles and pedestrians and the ability to adequately convey floodwaters is also important. On-going efforts to extend our multimodal network for bicycles and pedestrians has also been considered when evaluating the need for new structures. Recent efforts to evaluate and identify ways to improve the county's transportation infrastructure resiliency may also play a role in future structure replacement prioritization efforts.

FIGURE S1-2: ROADWAY VISION – MAJOR BRIDGES



SAFETY

Boulder County incorporates safety standards into all of its capital projects. Vision Zero is a goal of achieving zero deaths or serious injuries that are the result of traffic crashes. See Table S1-5 for full details about the County's Vision Zero policy.

Implementing Vision Zero efforts on travel corridors within Boulder County includes addressing traffic crashes on state highways that are managed by the Colorado Department of Transportation (CDOT) along with co-owned intersections. In order to achieve the proposed Vision Zero goals, Boulder County will work collaboratively with CDOT and other local jurisdictions to achieve our collective safety goals.

The recent Boulder County Traffic Crash Analysis (published in January 2018) included a comprehensive review of crash data in Boulder County for the years 2006 – 2015. This summary focused on fatal and serious injury crashes and formed the basis for developing a Vision Zero policy.

TABLE S1-5: VISION ZERO PROGRAM

Category	Strategy
Goal	▪ Achieve zero serious injury or fatal traffic crashes in unincorporated Boulder County including State Highways by 2035
Planning	▪ Complete safety report including crash analysis and recommendations for improvements approximately every five years ▪ Review progress made on recommendations approximately every 2 years ▪ Prioritize safety when developing the Capital Improvement Program (CIP) ▪ Place an emphasis on safety improvements for vulnerable roadway users- pedestrians and cyclists ▪ Review and update Multimodal Transportation Standards (MMTS) to incorporate Vision Zero best practices for road design
Collaboration	▪ Work with CDOT to coordinate safety improvements ▪ Work with other local jurisdictions and RTD to coordinate common safety goals, including Vision Zero ▪ Outreach to all road users to inform project design and as a conduit for education on new road designs
Engineering	▪ Evaluate safety improvements as part of design of capital projects and programs ▪ Use crash data to find the causes of crashes to identify trends and work systemwide to mitigate for that type of crash ▪ Work with relevant partners to have draft crash reports (blotters) sent to the department in a timely manner ▪ Work with partners to develop a plan for review and debrief of every fatal crash ▪ Evaluate county speed limits

LAND USE – TRANSPORTATION RELATIONSHIP

GROWTH MANAGEMENT AND LAND USE PATTERNS

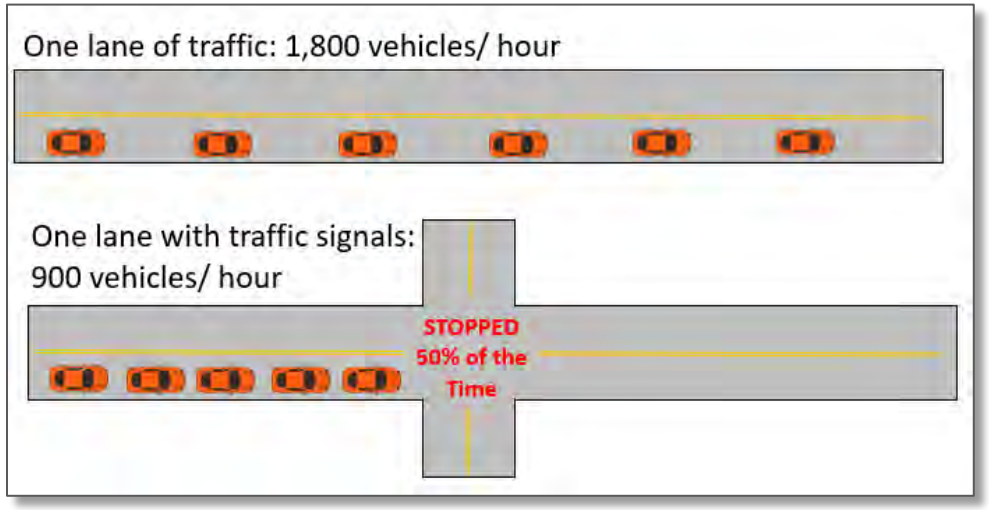
For over forty years, Boulder County land use patterns have focused growth *inside* the municipalities and preservation of open space and agricultural lands *between* the municipalities. As discussed in the Boulder County Comprehensive Plan, this has led to numerous benefits including distinct urban growth boundaries. There are several tools that continue to shape and stabilize the land use patterns in Boulder County:

- **Intergovernmental Agreements (IGAs):** Boulder County has land use IGAs with nearly all of the municipalities in the county and the City and County of Broomfield. The IGAs function like localized comprehensive plans and are legally binding contracts between governmental entities. While some of these IGAs have expired, their effect on defining urban and rural growth boundaries has been lasting. As regional trips increase, creating IGAs will be more important to coordinate planning with agency partners.
- **Boulder County Open Space:** Boulder County Parks and Open Space Department's number one goal is to preserve rural lands and maintain open space buffers between population centers. This has been possible through direct purchases of key properties as well as creation of conservation easements – the purchasing of the development rights of these properties. Boulder County owns or controls over 100,000 acres of land throughout the county.
- **Zoning:** Boulder County stopped approving subdivisions back in the early 1990's. Undeveloped properties in unincorporated Boulder County can still be developed but must have a minimum of 35 acres per single family home.
- **Municipal Open Space:** In addition to Boulder County, several of the municipalities within the county have open space programs in place to help preserve rural lands and open space buffers between communities.
- **Federal Open Space:** Boulder County is surrounded by forest lands, wilderness areas and Rocky Mountain National Park, all of which have some restrictions on land use.

These land use policies significantly impact where trips begin and end, and how the regional transportation system is used. Open space, agricultural fields and large lot single family homes generate (and attract) very few trips. Due to this, the driveways that connect these properties to the regional transportation corridors do not trigger the need for traffic control on the regional corridor. This is distinctively different than regional corridors in urban areas where cross streets typically have very heavy traffic volumes which necessitate traffic signals.

As an example, on SH 7 between 75th Street and 95th Street—a four-mile section surrounded by open space and agricultural lands—there are no traffic signals. A four-mile section of this same State Highway inside the City of Boulder has fifteen traffic signals. The result is that traffic flow on a two-lane rural corridor with no stopping can equal that of a four-lane urban corridor with traffic signals every quarter mile. Figure S1-3 shows how traffic flow (vehicles per hour) is impacted by traffic signals.

FIGURE S1-3: TRAFFIC FLOW IMPACTED BY TRAFFIC SIGNALS



To maximize the traffic capacity of the entire corridor, the Boulder County Transportation Department's policy is to focus vehicle capacity expansion at intersections. Specifically, consideration should be given to widen two-lane signalized intersections to four-lanes immediately approaching and leaving the intersections. The corollary of this policy is that no new lanes should be added *between* the intersections. Doing so would not actually increase vehicle capacity on the corridor unless the intersections were simultaneously widened to eight-lanes—something that is not desirable or even possible in most locations. Figure S1-4 shows how widening an intersection can maximize traffic capacity on the corridor.

FIGURE S1-4: TRAFFIC FLOW IMPACTED BY WIDENING AN INTERSECTION

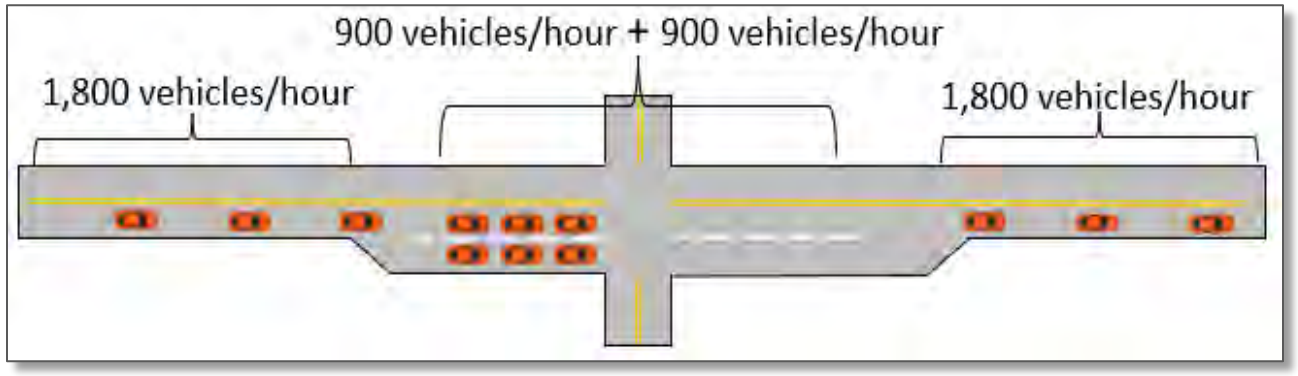


Figure S1-5 depicts speeds of a pilot vehicle travelling eastbound on SH 7 during the afternoon commute. The corridor is generally a two-lane road which widens to a four-lane intersection at 75th Street. It can be seen at the 75th Street intersection the vehicle waits at the traffic signal only once and then proceeds east at maximum speed. At the 95th Street intersection – still a two-lane intersection – the vehicle sits through several signal cycles because the intersection can't handle the arriving traffic. The 2018 SH 7 Planning and Environmental Linkages Report recommends widening the 95th Street intersection to four lanes.

FIGURE S1-5: AFTERNOON EASTBOUND TRAFFIC SPEEDS ON SH 7 (CHERRYVALE ROAD TO US 287)

For these reasons, Boulder County will focus on operational improvements at intersections, including vehicle capacity expansion. This can include additional turn lanes and through lanes. In addition, Boulder County will not add any additional general purpose travel lanes between intersections on county roads. Boulder County will also encourage CDOT to avoid adding general purpose travel lanes on regional corridors within unincorporated Boulder County and instead consider additional managed lanes on all corridors in the Northwest Area Mobility Study that can be used for transit and high occupancy vehicles (HOVs). Managed lanes are dynamic lanes that can be restricted to non-paying high occupant vehicles (HOV) and/or toll-paying single occupant vehicles (SOV).

ROADWAY RECOMMENDATIONS

PROJECTS

Figure S1-6 identifies the locations of 31 potential road projects that would support the goals and objectives of the Transportation Master Plan. Projects listed in Table S1-6 include intersection treatments, road reconstructions, structure replacements, and restriping recommendations on both county roads and state highways.

FIGURE S1-6: ROADWAY VISION FACILITY PLAN

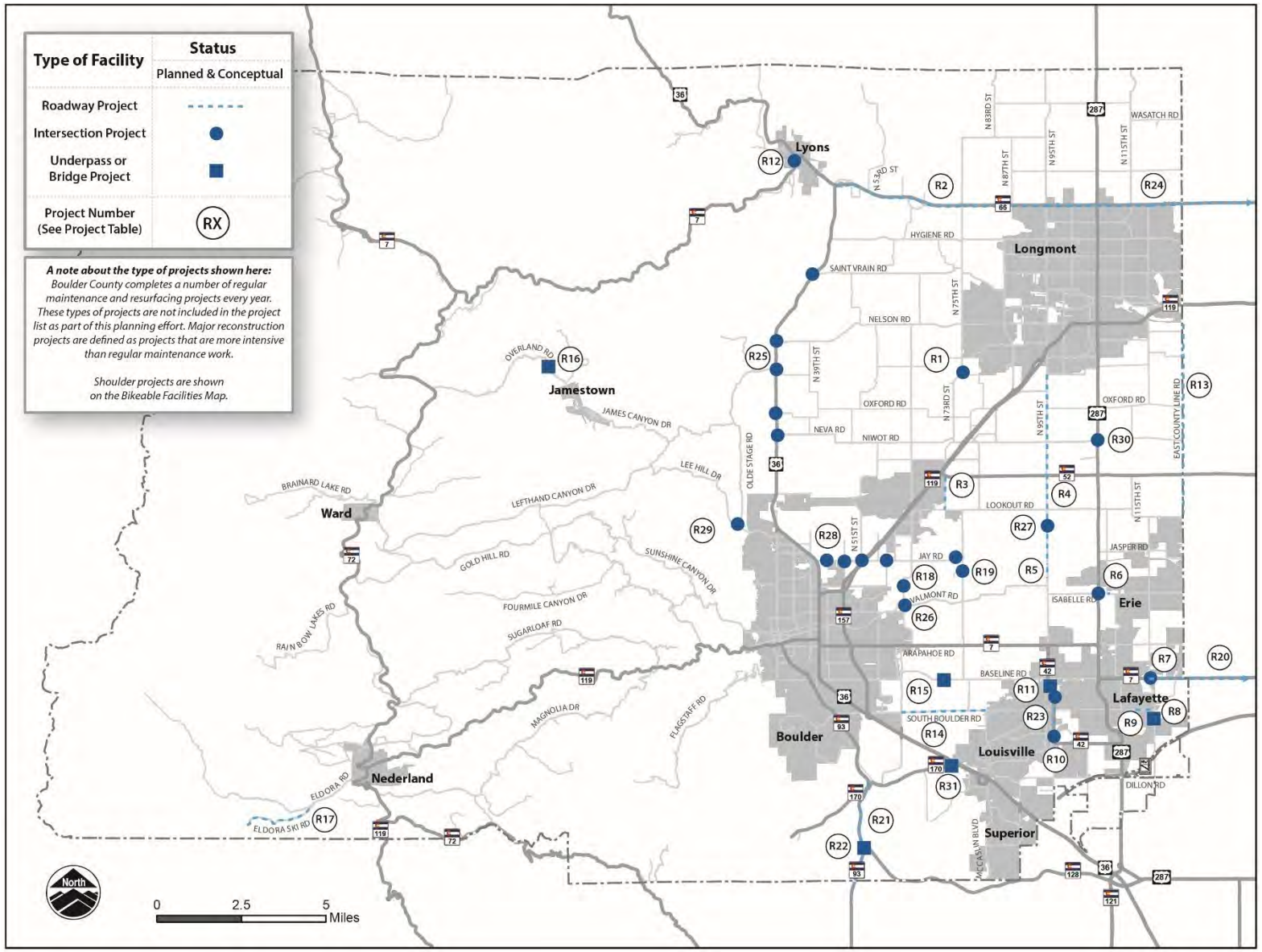


TABLE S1-6: ROADWAY PROJECTS

Map ID	Project Name	Project Description	Project Status	Funding Status	Potential Funding Source+	Cost++
R1	75th Street/Plateau Road Intersection Improvements	Safety improvements to realign curves and reduce bottle-neck that transitions to 75th Street.	Conceptual	Not Funded	CST	$$
R2	SH 66 Improvements – Main Street to Hover Street	Widen 1.5 miles of SH 66 from Main Street to Hover Street and reconstruct SH 66/East County Line Road intersection.	Conceptual*	Programmed in CST	Muni, Fed, CST	$$$$$
R3	71st Street Reconstruction – Lookout Road to SH 52	Reconstruct 71st Street to improve safety, create shoulders, add a multiuse path, and improve multimodal crossings.	Current Project-Under Const.	Programmed in CST	CST	$$
R4	95th Street Reconstruction – Lookout Road to City of Longmont	Reconstruct 95th Street to improve user safety and mobility.	Current Project-Under Const.	Costs associated with current projects can be found on the county website		
R5	95th Street Resiliency Improvements – Boulder Creek to Lookout Road	Elevate 95th Street out of the Boulder Creek 100-year events. Requires 220 foot long bridge.	Conceptual	Not Funded	Resiliency	$$$$
R6	US 287/Isabelle Road Intersection Improvements	Reconstruct CDOT intersection to improve safety, widen Isabelle Road and add shoulders.	Conceptual – In Design	Funded	Muni, Fed, CST	$$$
R7	SH 7/119th Street Intersection improvements (Lafayette)	Reconstruct City / CDOT intersection to improve safety and operations.	Conceptual – In Design	Partially Funded	Muni, State, CST	$$$$$
R8	South Boulder Road Reconstruction – Mallory Drive to 120th Street (Lafayette)	Widen South Boulder Road, signalize intersection and add 10-foot multiuse path along south side of the roadway.	Current Project-Under Const.	Costs associated with current projects can be found on the county website		
R9	120th Street Bridge over Coal Creek (Lafayette)	Replace current three span bridge with larger structure to pass the 100-year event and allow for improved multimodal access.	Conceptual	Programmed in CST	CST, Fed, Muni	$$$$
R10	SH 42 Improvements – Lock Street to Hecla Drive (Louisville)	Widening of SH 42, including intersection safety and pedestrian access.	Conceptual – Some Phases in Const.	Partially Funded	Muni, State CST	$$$$$
R11	SH 42 Pedestrian Underpass – South of Paschal Drive	Pedestrian underpass of SH 42 to improve safety and access.	Current Project-Under Const.	Funded	Muni, CST	$
R12	SH 7/US 36 Intersection Improvements (Lyons)	Reconfigure intersections and striping on CDOT highway to accommodate bike lanes through downtown Lyons.	Conceptual	Not Funded	CST, Muni, Fed	$$
R13	East County Line Road Reconstruction – Longmont to Erie	Reconstruct East County Line Road to improve user safety, access and resiliency. Includes three bridge replacements.	Conceptual – Master Plan in Process	Partially Funded	Muni, CST	$$$$$
R14	South Boulder Road Reconstruction – City of Boulder to Cherryvale Road	Reconstruct south boulder road from City of Boulder to Cherryvale Road including operational and safety improvements at the intersection.	Conceptual – In Design	Not Funded	CST	$$$$$
R15	Baseline Road Regional Trail Underpass – at Dry Creek Trailhead	Replace existing structure with new facility large enough to accommodate larger storm events and potentially the future East Boulder Regional Trail.	Conceptual – In Design*	Not Funded	CST, Muni, Fed	$$

Map ID	Project Name	Project Description	Project Status	Funding Status	Potential Funding Source[+]	Cost[++]
R16	Overland Road Bridge Replacement – St Vrain Creek (west of Jamestown)	Replace existing structure that floods often with larger structure to accommodate larger storm events.	Conceptual – In Design*	Not Funded	Resiliency	$$
R17	Eldora Ski Road Reconstruction – County Road 130 to Eldora Ski Hill	Reconstruct road to reduce erosion damage and road stability.	Conceptual – In Design*	Not Funded	CST	$$$$
R18	61st Street Bridge over Boulder Creek	Replace existing structure to improve functionality and accommodate larger flood events.	Conceptual*	Not Funded	Resiliency	$$$
R19	75th Street Bridge over Boulder Creek	Replace existing structure and improve flood channel to improve resiliency.	Conceptual*	Not Funded	Resiliency	$$$$
R20	SH 7 Widening – 119th Street to County Line Road	Road widening to have four travel lanes with widened shoulder and shared use path.	Planned - SH 7 PEL	Not Funded	Fed, Muni, CST	$$$$$
R21	SH 93/SH 170 Intersection Improvements	At-grade intersection improvements: bus queue jump and transit signal priority, bus stop improvements and improved crossings for pedestrians/bicyclists.	Planned - WestConnect PEL Study	Not Funded	Fed, Muni, CST	$$$$
R22	SH 93/SH 128 Underpass	Pedestrian/bicycle underpass.	Planned - WestConnect PEL	Not Funded	Fed, Muni, CST	$
R23	SH 42 Improvements – Pascal Drive to Lock Street	Hwy 42 improvements from Pine to Lock Street, including a roundabout at Lock Street.	Planned - 42 Gateway PEL	Not Funded	Fed, Muni, CST	$$$
R24	SH 66 Widening – Lyons to Weld County Road 19	Passing lanes (center turn lane) and frontage road with bike facility.	Conceptual – Preferred Alternative in SH 66 PEL	Not Funded	Fed, Muni, CST	$$$$$
R25	US 36 Intersection Safety North of Boulder	Striping and/or green pavement treatments to assist motorists and bicyclists at intersections.	Conceptual*	Not Funded	CST, Fed	$
R26	61st Street/Valmont Road Intersection Improvements	Reconstruct intersection to improve user safety.	Conceptual*	Not Funded	County R&B, CST	$$
R27	95th Street/Gunbarrel Ridge Intersection Improvements	Signage and striping improvements.	Conceptual*	Not Funded	CST	$
R28	Jay Road Improvements – 63rd Street to 75th Street	Signage and green striping primarily at intersections.	Conceptual*	Not Funded	CST	$
R29	Lee Hill Drive/Olde Stage Road Intersection Improvements	Striping and paint a triangle to create the illusion of a more constrained intersection.	Conceptual*	Not Funded	County R&B	$
R30	US 287 Intersection Improvements (exact locations to be determined)	Intersection improvements to make east-west bicycling crossings of US 287 more comfortable.	Conceptual*	Not Funded	County R&B	$
R31	SH 170 Underpass - US 36 Davidson Mesa Underpass to south of Marshall Road	This project would construct an underpass of Marshall Road to accommodate a pedestrian/bicycle facility.	Planned - TIP	Funded	DRCOG Subregional, Muni	$$

Notes: Planned projects are recommended in an approved facility master plan or capital program. Conceptual projects are new ideas or concepts introduced in the TMP or elsewhere.
[+] The following potential funding sources have been identified: CST: Countywide Transportation Sales Tax formed in 2007 to fund road, transit and trails projects throughout the county. Includes both current list of project and potential future projects that fit the goals and objectives of the program. Fed: State, federal, and/or other outside agencies such as urban drainage and flood control districts and the Regional Transit District (RTD). Muni: Local project partners including incorporated jurisdictions and/or other Counties.
[++]The costs are broken into five different categories: $: less than $500,000 | $$: $500K-$2 million | $$$: $2 million- $5 million | $$$$: $5 million- $10 million | $$$$$: Over $10 million

* Indicates that more study needs to be completed to evaluate the feasibility of implementation.

IMPLEMENTATION ACTIONS - ROADWAY

- Focus on operational improvements – including vehicle capacity expansion – at intersections. This can include additional turn lanes and through lanes [Included within Strategies 1 & 3]
- Working through CDOT, consider additional managed lanes on all corridors in the Northwest Area Mobility Study to be used for transit and high occupancy vehicles (HOVs) [Included within Strategies 1 & 3]
- Improve intersections to assist with user safety and convenient access to transit stops and bike and pedestrian facilities
- Integrate comprehensive project considerations such as safety, resiliency, advanced mobility, and equity into planning and design of capital projects
- Implement Vision Zero Policy to increase safety
- Add planned and conceptual facilities to corridors shown on Multiuse Paths and Bikeable Shoulders vision map. Adding shoulders to identified corridors does not preclude adding them to other county roadways.

IMPLEMENTATION ACTIONS - REHABILITATION AND MAINTENANCE

- Maintain roadways, bicycle and pedestrian, and transit facilities with the highest priority on regional connections, destinations, and corridors that serve the most people
- Repair, rehabilitate and replace bridges in a cost effective manner with a goal of preserving current structurally sufficiency and improving the functionality in regards to road width and flood resiliency
- Maintain safety for all travel modes on the county's transportation system
- Maintain a five-year Resurfacing Plan with the goal of pavement quality index (PQI) of 7 on a scale of 1 (poor) to 10 (excellent) on primary county connections
- Adequately maintain county road shoulders, drainage systems, and regional trails in partnership with state and local agencies
- Pursue electrification of county vehicle fleet as new vehicles are purchased

TRANSIT VISION

Boulder County's transit system strives to connect communities with key activity centers including education, employment, healthcare, human services, recreation and retail and gives travelers a reliable and convenient transportation option for everyday travel needs. Boulder County's transit network provides more than eight million annual trips across all of its local and regional transit services. These services included fixed-route bus service (regional, local, and express) and FlexRide service.

When asked about transit priorities, survey respondents identified increased frequency and expanded service area as the top two priorities.

REGIONAL ROUTES AND TRANSIT SERVICE PROVIDERS

Regional bus service—fixed routes that serve multiple municipal areas—within Boulder County is currently provided by several local and regional transit agencies:

- **RTD:** Operates most of the bus routes in Boulder County, serving communities within Boulder County and surrounding counties. Funding for the RTD base transit system comes from a 0.6 percent district-wide sales tax with additional funding from Federal Transit Administration (FTA) grants and fare box revenues. FasTracks projects are funded through a separate 0.4 percent sales tax.
- **Via:** Operates the CLIMB route that serves rural areas in the western portion of Boulder County. The CLIMB is funded by VIA operating funds, private contributions, fare box revenues, and the countywide Transportation Sales Tax.
- **Transfort:** Based in Fort Collins, operates the FLEX route that serves communities along the northern Front Range between Fort Collins, Loveland, Longmont, and Boulder. The FLEX is funded by local, state and federal funding.

INVESTING IN BOULDER COUNTY'S TRANSIT SYSTEM

Boulder County invests in the transit system in the following ways:

- Transit service enhancements and service buy-ups
- Transit passes and fare subsidies
- Infrastructure and operational enhancements
- Infrastructure maintenance

TRANSIT SERVICE ENHANCEMENTS

Boulder County provides resources for transit service enhancements to strengthen existing bus service and create new service that otherwise would not be created without county involvement. These enhancements take the form of new route development, service buy-ups on existing routes, and operations support.

When making decisions on transit service investments, Boulder County uses the following criteria:

- Current or potential ridership
- Current or potential Vehicle Miles Traveled (VMT) savings
- Areas that are either unserved or underserved by transit
- Opportunities to form partnerships with local agencies and transit service providers
- Likelihood that the transit service will meet minimum RTD service standards

Boulder County typically provides support for transit service enhancements for a trial period to assess the viability of the service and the effectiveness of the service enhancement. After this time period, if the service is adopted by RTD or another transit service provider, Boulder County will often reduce its financial contribution to the route. If not, Boulder County may continue its support or direct its resources elsewhere.

➲ For more information about the performance measures tracking progress, see *Plan Implementation, Performance Metrics*.

New Route Development

Boulder County seeks funding, invests county funds, and assists in the implementation of new routes to establish new connections between communities. New routes are identified and tested to determine whether they will demonstrate sufficient productivity for RTD to adopt within the base service or become self-sufficient through another service provider. During the trial period, Boulder County monitors the performance of the new transit route to assess its long-term feasibility. The JUMP extension from Lafayette to Erie, initially funded by Boulder County through a federal grant and implemented on a trial basis, is now fully operated by RTD.

Service Buy-ups on Existing Routes

Boulder County directly funds service buy-ups on RTD routes to increase frequencies and provide service at certain times of the day. Similar to new routes, service buy-ups occur on those routes that the county believes will demonstrate sufficient productivity for RTD to adopt within the base service. Boulder County may also buy up routes that would otherwise be eliminated due to cuts by the route operator. However, RTD currently does not have enough drivers to meet any additional buy-ups on existing service.

Operations Support

Boulder County provides resources to support the establishment of new routes implemented by other local agencies and transit service providers. This support is not directed towards service buy-ups, but instead provides financial and staff support for marketing and operations of a transit route. This type of assistance helps to make the route more financially viable for the service operator. The CLIMB and FLEX routes are currently receiving operations and transit subsidy support from Boulder County. This includes providing staff assistance, funding for route marketing, and pass support on the routes.

Transit Subsidies

The success of transit is linked to marketing, education and incentive programs that encourage ridership. One of the most effective approaches is providing subsidized or free transit passes, such as RTD EcoPasses. Boulder County provides transit subsidies through its County Transit Education and Pass Support Program.

➲ More on the Boulder County transit programs can be found in *Strategy 2 – Create the Complete Trip*.

Improved Service- Bus Rapid Transit Elements

When thinking about how transit can be improved, Boulder County considers a service enhancement to improve bus service, known as Bus Rapid Transit (BRT). BRT is high-frequency bus service intended to operate in a manner similar to a fixed-rail system. Elements of a fully-developed BRT system include:

- *User experience* elements, such as fare collection, real-time communication, and "next bus" technologies at bus stops and on vehicles
- *System recognition* elements, such as service and vehicle branding
- *Service* elements, such as high frequencies, types of service, and vehicles
- *Operational efficiency* elements, such as lane priority, exclusive right of way, low floor boarding, and signal priority
- *Infrastructure* elements, such as exclusive running ways, queue jumps and in-line stations (which do not require buses to merge back into traffic)

Bus Rapid Transit (BRT) on US 36

As part of the US 36 improvements, multiple agencies coordinated together to improve regional transportation between Boulder and Denver. These improvements have resulted in a 45 percent increase in ridership. Improvements include:

- Slip ramps at McCaslin Boulevard that allows buses to serve the stop without getting off and back on the highway
- Managed lanes
- Shoulder usage when traffic drops below 35 mph
- Transit signal priority and queue jump lanes along the corridor
- Queue jump lanes include auxiliary bus queue lanes and/or accommodating bus-bypass lanes along the US 36 corridor

INFRASTRUCTURE AND OPERATIONAL ENHANCEMENTS

Transit Signal Priority

Transit Signal Priority (TSP) is an operational system installed at signalized roadway intersections to time local traffic signals. The purpose of a TSP system is to reduce regional bus travel times, increase schedule reliability, and reduce bus operating costs. Once fully implemented, a TSP system can either extend signal green times by a few seconds or bring a green phase sooner every time a bus approaches an equipped intersection. Buses utilizing TSP will emit a unique frequency to intersection traffic signals, triggering a change in the signal phasing and allowing more time for the bus to pass through the intersection.

Queue Jump Lanes

A queue jump lane provides preference to buses at signalized intersections. This design consists of an additional travel lane on the approach to the intersection that is dedicated exclusively to transit vehicles (and bicycles in some cases). Buses using the queue jump lane receive a head start over other vehicles lined up at the intersection when the light turns green. After passing through the intersection, the bus may merge into the primary lanes of traffic and the queue jump lane ends.

BUS STOP ENHANCEMENTS

One of Boulder County's priorities is to support bus stop facilities that are safe, comfortable, dignified, easy to access, and designed to minimize dwell time. It is one of the most important issues for the transit system, because the condition of facilities and accessibility barriers are often cited as reasons for not using transit. Bus stop enhancements include:

- Benches
- Concrete pads
- Shelters
- Bike racks
- Route and schedule information

Enhancements to existing bus stops will be different for individual locations, depending on the existing features of each stop and site-specific needs.

When considering bus stop improvements, Boulder County uses the following criteria to determine which stops to improve and what type of improvements to make:

- Daily ridership at the bus stop
- Public feedback
- Recommendations from municipalities, CDOT, Boulder Valley School District (BVSD), St. Vrain Valley School District (SVVSD) and other agencies
- Locations along regional transit routes
- Existing connections to transit and trail networks
- Safety needs and enhancements
- Physical constraints and right-of-way needs

Infrastructure Maintenance

Maintaining bus stops in proper condition is another important aspect of enabling access and ensuring rider safety and comfort. Bus stops located in Boulder County are maintained by different entities depending on their location and daily ridership:

- Boulder County maintains any bus stop located within unincorporated Boulder County with less than 40 boardings per day
- RTD maintains bus stops with more than 40 boardings per day throughout their service area, (per RTD service standards)
- Local communities maintain stops located within municipal boundaries

The majority of bus stops located in unincorporated Boulder County are stops with sign posts only, containing no amenities. These bus stops do not require any maintenance. For those stops with shelters and other amenities, Boulder County has seasonal maintenance activities:

- Replacing damaged furniture and shelter panels
- Cleaning shelters
- Removal of graffiti
- Sweeping of debris
- Emptying trash receptacles
- Removing snow

TRANSIT: PLANNED SYSTEM

Boulder County's transit vision reflects and updates several decades of regional, countywide, and corridor-level transit planning efforts. The Consortium of Cities developed the most recent transit system vision for Boulder and Broomfield counties. Since this multiagency plan was completed, Boulder County has continued to engage with RTD, CDOT, other communities, and citizens to further develop the county's transit service network. Figure S1-7 and Figure S1-8 show Boulder County's long-term vision for the transit system. It includes the county's current regional bus routes, along with future bus, BRT, and rail routes.

Boulder County's transit vision includes a complete network of transit routes with different types of regional transit service, supporting infrastructure, and operational systems:

- Expanding existing network of local, regional, and BRT bus services and future commuter rail
- Transit infrastructure will accompany these new service types in the form of roadway infrastructure designed to provide bus-exclusive running ways, an improved rail corridor, and enhanced transit stations
- Implementation of operational enhancements such as TSP will continue

Together with route additions, these new types of service, infrastructure, and technologies will form the future Boulder County transit system.

The following plans form the basis of Boulder County's Transit Vision:

- RTD FasTracks Plan (2004)
- RTD Northwest Area Mobility Study (NAMS) (2014)
- Boulder and Broomfield Counties Transit Service Enhancement Plan (2006)
- Boulder County Mountain Transit Feasibility Study (2011)
- Corridor Plans:
  - CDOT/RTD US 36 Environmental Impact Statement (2009)
  - RTD Northwest Rail Environmental Evaluation (2009)
  - SH 119 BRT Corridor Study
  - SH 7 Bus Rapid Transit Feasibility Study (2018)
- Envision Longmont
-

CDOT NORTH I-25 ENVIRONMENTAL IMPACT STATEMENT (2011) LOCAL TO REGIONAL CONNECTIONS

In addition to supporting regional transit routes, Boulder County's vision also includes the creation of new transit services in order to help strengthen the regional transit network. This includes support of local bus routes and FlexRide services that will serve as "feeder" routes to the regional transit network.

CONNECTIONS TO THE FRONT RANGE

Boulder County's vision also continues and enhances north-south transit connections along the Front Range, from Longmont to Fort Collins, and east-west connections from communities in eastern Boulder County to the I-25 corridor. This includes the current project on I-25 North to build express lanes in each direction along a six-mile stretch between 112th Avenue and Northwest Parkway.

TRANSIT RECOMMENDATIONS

PROJECTS

The following projects and implementation actions are recommended for transit projects in Figure S1-7 and Table S1-7.

FIGURE S1-7: TRANSIT PROJECTS

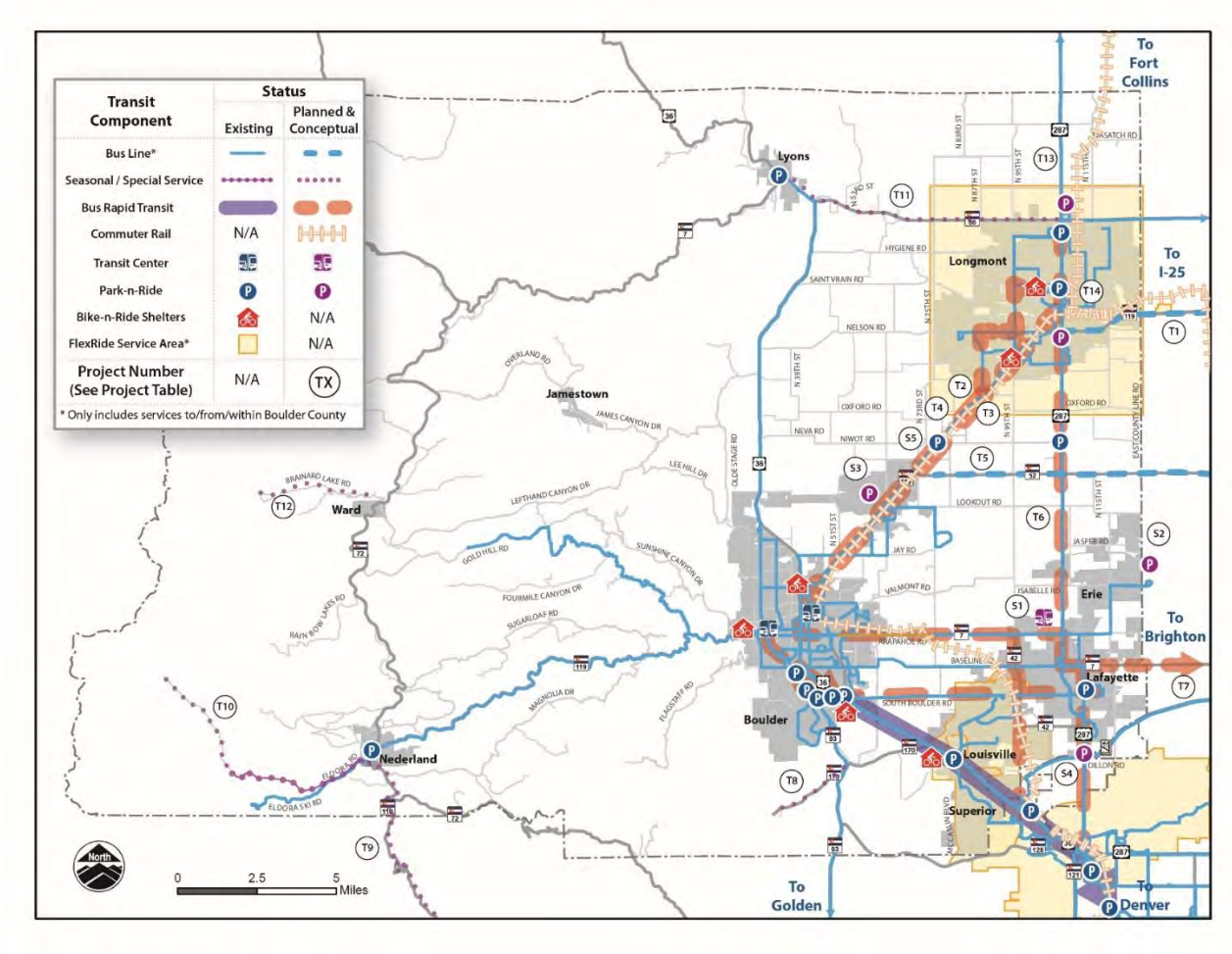


FIGURE S1-8: TRANSIT VISION – REGIONAL TRANSIT SYSTEM

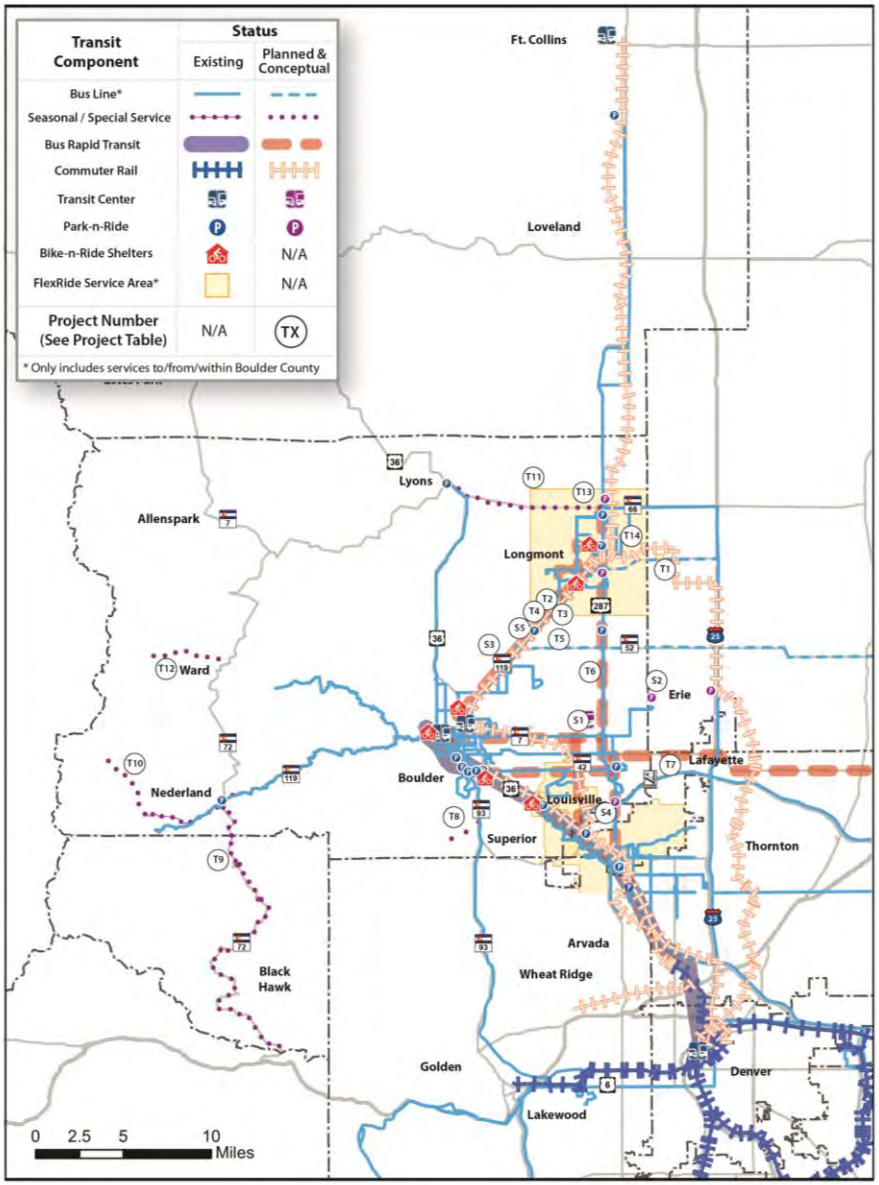


TABLE S1-7: TRANSIT PROJECTS

Map ID	Project Name	Project Description	Project Status	Funding Status	Potential Funding Sources+	Capital Cost++	Cost (Annual Operating)+++
T1	SH 119 Regional Service Extension – US 287 to SH 119 and I-25 Park-n-Ride	Extend regional bus service east along SH 119 to I-25 Park-n-Ride.	Conceptual*	Not Funded	CST, Muni	$	$$ (highly dependent on service levels)
T2	Northwest Corridor Commuter Rail – Denver to Longmont	Commuter rail service that provides service between Denver, Boulder, to Longmont.	Conceptual – In NAMS	Not Funded	CST, Muni, RTD, Fed	$$$$$+	$$$$$
T3	Peak Service for Northwest Corridor Commuter Rail – Denver to Longmont	Limited rail service along the northwest corridor commuter rail.	Conceptual – In Analysis	Not Funded	CST, Muni, RTD, Fed	$$$$$+	$$$$$
T4	SH 119 BRT – Boulder to Longmont	Implementation of BRT between Boulder and Longmont.	Conceptual – In NAMS, In Design	Partially Funded	CST, TIP Regional Share, RTD, Muni, Fed	$$$$$	$$$$ (BRT + expanded Longmont local)
T5	SH 119 Regional Service Extension to I-25 via SH 52 – I-25/SH 52 via SH 52 then SH 119	Extend regional bus service to I-25 along SH 52.	Conceptual	Not Funded	CST, Muni, Fed	$	$$ (highly dependent on service levels)
T6	US 287 BRT – Broomfield to Longmont	Implementation of BRT between Broomfield and Longmont.	Conceptual – In NAMS	Not Funded	CST, Muni, RTD, Fed	$$$$$	$$$$
T7	SH 7 BRT – Lafayette to east of county boundary	Implementation of BRT between Lafayette and Brighton.	Conceptual – In NAMS	Not Funded	CST, Muni, RTD, Fed	$$$$$	$$$
T8	Eldorado Canyon Seasonal Shuttle – City of Boulder to Eldorado Canyon State Park	Shuttle service between City of Boulder and Eldorado Canyon State Park during weekends.	Conceptual*	Not Funded	CST, Muni, Fed	$	$
T9	Nederland to Black Hawk Special Service	Limited/on-demand service to and from Nederland.	Conceptual*	Not Funded	CST, Fed	$	$$ (highly dependent on service levels)
T10	Hessie Trailhead Fourth of July Seasonal Shuttle Extension – extension past current shuttle terminus	Extend service to provide seasonal service to Fourth of July Campground.	Conceptual*	Not Funded	CST	$	$$ (assuming same level of service as existing Hessie)
T11	Lyons to Longmont Special Service	Limited/on-demand service to and from Lyons to Longmont.	Conceptual*	Not Funded	CST, Muni	$	$$ (highly dependent on service levels)
T12	Brainard Lake Seasonal Shuttle	Seasonal service from Brainard Lake Winter Lot to Brainard Lake.	Conceptual*	Not Funded	CST, Muni, Fed	$	$$$$
T13	FLEX service expansion – Fort Collins to Boulder via Longmont	Increase existing service.	Conceptual*	Partial Funding	CST, TIP Regional Share), Muni, Fed	$	$$$$ (highly dependent on service levels)
T14	Northwest Extension Commuter Rail	Commuter rail service that provides service between Longmont and Thornton.	Conceptual – In North I-25 EIS	Not Funded	CDOT, Muni	$$$$$+	$$$$$

Map ID	Project Name	Project Description	Project Status	Funding Status	Potential Funding Sources[+]	Capital Cost[++]	Cost (Annual Operating)[+++]
S1	US 287 and Arapahoe Park-n-Ride	Creation of a new transit center.	Conceptual*	Not Funded	CST, RTD, Muni, Fed	$$	$
S2	Erie Park-n-Ride – Erie Community Center	Formalization of Park-n-Ride at the Erie Community Center.	Conceptual*	Not Funded	CST, RTD, Muni, Fed	$$	$
S3	SH 119/63rd Street Park-n-Ride	Creation of a Park-n-Ride at the intersection.	Conceptual – (SH 119 project)*	Not Funded	CST, RTD, Fed	N/A**	$
S4	US 287/Northwest Parkway Park-n-Ride	Creation of a Park-n-Ride at the intersection.	Conceptual*	Not Funded	CST, RTD, Muni, Fed	$$	$
S5	Niwot Park-n-Ride Expansion – at existing PnR at Niwot Rd or 2nd Ave	Increased vehicle and bicycle parking at the existing Park-n-Ride.	Conceptual – (SH 119 project)*	Not Funded	CST, RTD, Fed	N/A**	$

Notes: Planned projects are recommended in an approved facility master plan or capital program. Conceptual projects are new ideas or concepts introduced in the TMP or elsewhere.
[+] The following potential funding sources have been identified: CST: Countywide Transportation Sales Tax formed in 2007 to fund road, transit and trails projects throughout the county. Includes both current list of project and potential future projects that fit the goals and objectives of the program. Fed: State, federal, and/or other outside agencies such as urban drainage and flood control districts and the Regional Transit District (RTD). Muni: Local project partners including incorporated jurisdictions and/or other Counties.
[++]The costs are broken into five different categories: $: less than $500,000 | $$: $500K-$2 million | $$$: $2 million- $5 million | $$$$: $5 million- $10 million | $$$$$: Over $10 million
[+++]These estimates depend greatly on service details associated with the transit service. The cost estimates here are assumed to be a 20 year operating life span.
* Indicates that more study needs to be completed to evaluate the feasibility of implementation.
**Indicates that cost is already included within the cost of a larger transit project.

IMPLEMENTATION ACTIONS - TRANSIT

- Invest in transit improvements that are likely to increase countywide transit ridership
- Invest in county transit service through new route development, service buy ups, technological enhancements and operations support while promoting long-term stability of the existing transit system
- Support development of BRT in regional corridors connecting Boulder County communities to the region
- Focus on completion of Northwest Commuter Rail, including analysis of Peak Service Plan
- Focus transit investments on programs that reduce vehicle miles traveled, provide service to underserved communities, and enhance corridor service in key travel corridors
- Enhance north/south transit connections along the Front Range, connecting the Denver metro area to the communities along US 36 and Interstate 25 (I-25) corridors, extending north to Northern Colorado communities
- Enhance east/west connections from communities in east and central Boulder County to the I-25 corridor

- Implement transit service and other mobility services, improvements, and expansion to and among mountain communities and recreational destinations
- Enhance bus stop facilities, including benches, concrete pads, shelters, bike racks as well as route or schedule information to increase safety, comfort, and utilization
- Investigate additional seasonal/special services to meet travel demands that have concentrated peaks of demand
- Work with transit providers to optimize bus stop locations, which may include adding, removing or relocating stops
- Develop partnerships with communities with anticipated increased travel to and from Boulder County (i.e. Larimer, Weld, Adams Counties, and the municipalities within them) to improve mobility
- Evaluate and pursue alternate transit service delivery options to provide increased transit service within the RTD service area and in areas outside of the RTD service area

REGIONAL TRAILS, BICYCLE AND PEDESTRIAN VISION

Boulder County's bicycle and pedestrian network provides a physical environment and convenient opportunities for travel and recreation, both of which promote active lifestyles and sustainable travel. Boulder County's bicycle and pedestrian networks are a combination of on-street facilities (bikeable shoulders, intersection/crossing treatments and off-street facilities (multiuse paths, regional trails, and sidewalks). These facilities are located in neighborhood, rural, and semi-rural environments and allow for mobility by foot, bicycle, and in certain locations, horseback. Together the different types of facilities provide opportunities for individuals with various comfort, skill, and ability levels. The *Transportation Multimodal Standards* defines different bicycle and pedestrian facilities.

Separating bicyclists from vehicle traffic was the most popular priority identified from survey respondents. Over half of respondents identified physically protected/separated bikeways as one of their top three bicycling priorities.

BOULDER COUNTY'S BICYCLE AND PEDESTRIAN NETWORK

Boulder County's bicycle and pedestrian facilities provide different types of connections within the county's bicycle and pedestrian network, as described in Table S1-8:

- **Regional Connections:** On-street bikeable shoulders, off-street multiuse paths, and regional trails provide long-distance recreational and commuting opportunities
- **Local-Regional Connections:** Multiuse paths and sidewalks provide accessible links from residents' homes or neighborhoods to the regional transportation system
- **Local Connections:** Multiuse paths and sidewalks enable travel within neighborhoods

TABLE S1-8: TYPES OF BICYCLE AND PEDESTRIAN FACILITIES

Facility	Definition	Type of Connection	Location	User Groups	Surface Type
On-street Shoulders	Buffered and non-buffered shoulders suitable for biking	Regional	On-street	Bicycle, pedestrian	Hard surface
Multiuse Paths	Plowable and maintained for winter use	Regional Local-Regional Local	Off-street	Bicycle, pedestrian, equestrian	Primarily hard surface
Regional Trails	Primarily recreational facilities that are not maintained for winter use	Regional	Off-street	Bicycle, pedestrian, equestrian	Primarily soft surface
Sidewalks	Hard surface sidewalks within neighborhoods	Local-Regional Local	Off-street	Bicycle, pedestrian	Hard surface

Boulder County Bicycle Program

The goal of Boulder County's Bicycle Program is to develop a complete bicycle network that provides for safe, convenient, and efficient bicycle travel throughout the county for people of all ages and ability levels. The program will achieve these goals by:

- Constructing and maintaining a network of on-street and off-street facilities
- Providing education, encouragement, and information
- Conducting annual bicycle traffic counts on selected roads, paths, and trails
- Sweeping shoulders and conducting snow removal on all bicycle facilities
- Outreach and education for cyclists and motorists on laws and safety best practices
- Supporting community and county initiatives to encourage bicycling

MULTIUSE PATHS AND BIKEABLE SHOULDERS

Boulder County has a vision to have a full network of bicycle connections to communities within the county. While the surface of these facilities will be determined through project development, facilities will be maintained year-round. This includes a number of different facility types:

- Bikeable shoulder and/or bike lanes
- Buffered shoulder and/or buffered bike lanes
- Multiuse paths

Shoulder width is determined by the roadway classification, physical constraints, and expected volumes of bicycles. Figure S1-11 illustrates the existing and planned bikeable shoulders on county roads and state highways within the county.

INVESTING IN BOULDER COUNTY'S BICYCLE NETWORK

Boulder County is committed to improving the experience for bicyclists while making it safer for both people that are bicycling and people that are driving. A complete bicycle network will provide a designated space for each mode, improving safety for all road users.

Separation from Vehicles

According to public comment and crash data, the greatest improvement for bicycle facilities is separation from vehicles. In many cases where the annual average daily traffic (AADT) and the speeds are not low, this can be obtained by building shoulders, widening shoulders and installing pavement markings to create buffer zones and when possible, building an off-road facility is the ideal remedy.

Bikeable Shoulders

Shoulders provide many benefits, one of them is space for bicyclists to ride safely out of the vehicle lane.

Buffered Shoulders

Although there is no vertical separation for buffered shoulders, it acts as a different type of facility than just a wider shoulder since there is a space where both bicyclists and motorists are discouraged from occupying.


Source: http://ruraldesignguide.com/visually-separated/paved-shoulder)

Off-Street Multiuse Paths and Regional Trails

Comfort and safety increase as the separation between bicyclists and drivers increases, either with space or a physical separation. When designing these facilities, the county will consider projected volume and type of use to determine if exceeding our width standards is warranted.

Green Pavement Markings

A relatively inexpensive improvement strategy is to apply green pavement markings in areas with conflicts between bicyclists and motorists. It does not require detailed engineering or financial commitment but does require regular maintenance to remain effective.

Green pavement markings communicate to bicyclists and motorists where to expect bicyclists and gives cyclists a designated location for the safest passage when navigating a difficult intersection or roadway corridor.

Intersection Improvements

Strategies that improve intersection configurations for bicycle travel include but are not limited to: signal phasing changes, signing changes, and pavement markings to give a cyclist a designated place to be. Signal phasing changes can be adjusted based on different times of the day, day of the week, and integration of right turn or left turn restrictions.

Pavement markings and signing changes communicate to motorists, bicyclists, and pedestrians a designated space for each mode, improving safety for all road users to navigate through the intersection.

Grade-Separated Crossings

Underpasses and overpasses allow bicyclists and pedestrians to cross a roadway or intersection without any interaction with vehicles. In addition to removing the conflict potential with motorists, bicyclists and pedestrians no longer impact the traffic signal cycle phasing, causing less delays.

BICYCLE LEVEL OF TRAFFIC STRESS

Bicycle Level of Traffic Stress (BLTS) is a planning tool that is used in combination with other factors such as public input and crash data to identify needed improvements and gaps, (see Figure S1-9). The applied methodology was modified from existing methodologies created by CDOT and the Oregon Department of Transportation (ODOT). These methodologies were utilized based on the more rural, nature of county roads. For this reason, the low-stress definitions/facility types defined by the National Association of City Transportation Officials (NACTO) are slightly different and more urban-oriented. For more details about this methodology, please reference the BLTS Methodology document, which can be found in Appendix D.

By looking at elements such as shoulder width and traffic speeds, the BLTS identifies the areas where bicyclists are likely to feel more or less safe in relation to vehicle traffic. The goal is to make the network more accessible to more people by lowering the level of traffic stress.

Facilities are ranked on a scale of 1 to 4, with 1 being the lowest stress and 4 being the highest stress:

- **BLTS 1:** Low traffic stress and suitable for all cyclists, including children
- **BLTS 2:** Little traffic stress, but requires more attention, especially for children
- **BLTS 3:** Moderate traffic stress – suitable for confident cyclists
- **BLTS 4:** High traffic stress

The following data points were used for this analysis:

- Daily traffic volume
- Paved shoulder width (no shoulder is entered as zero)
  - 3-4 feet
  - 4+ feet (these will be assumed to be 4 ft to < 6 ft)
- Speed limit (assumed to be at least 40 mph or greater due to limited spatial speed data available)
- Truck percentage (equal or greater than 10 percent of all traffic based on Boulder County 2018 traffic counts)
- Multiuse paths are rated BLTS 1 due to no interaction with motorized traffic

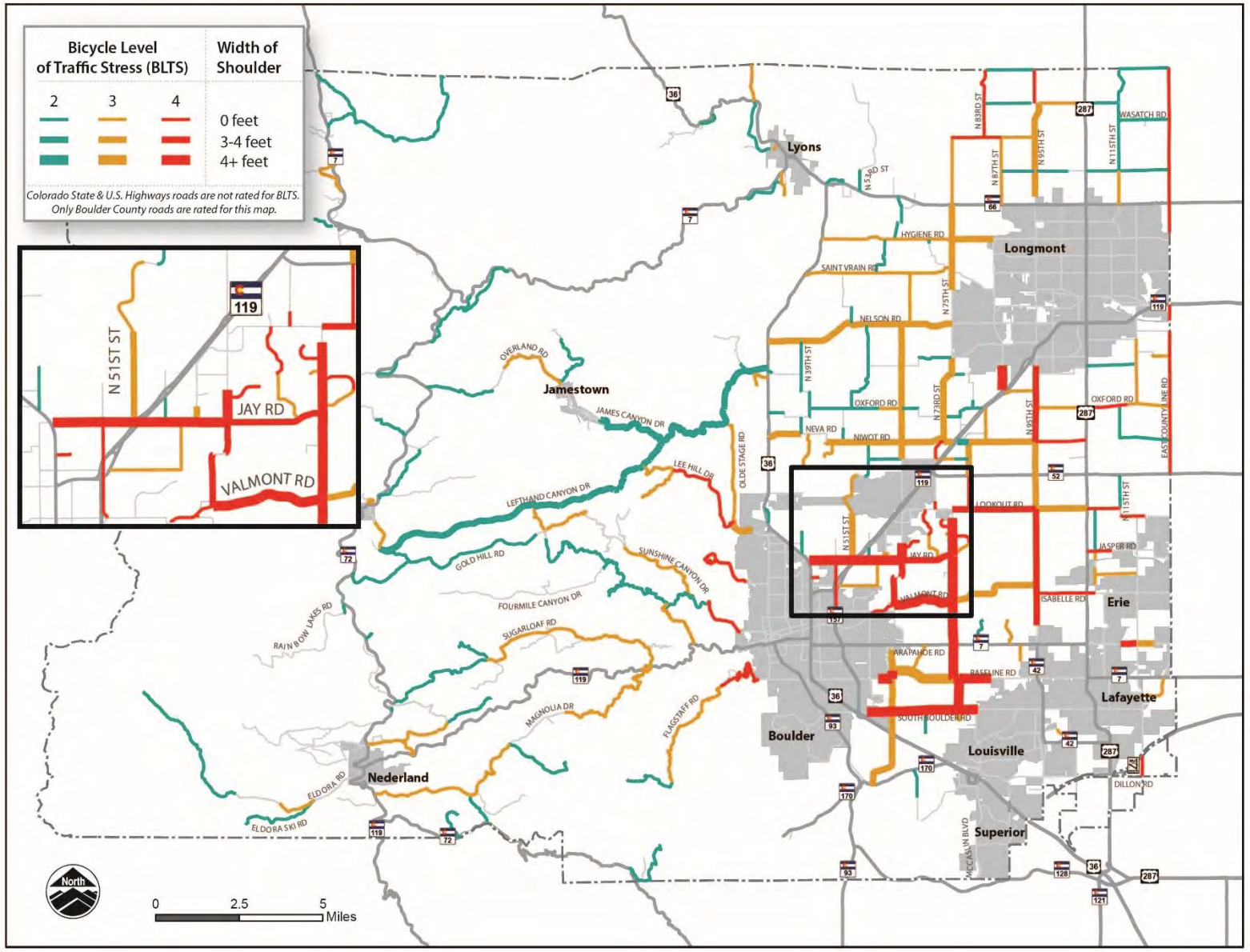
Table S1-9 was used to score the level of traffic stress for Boulder County roads:

TABLE S1-9: COUNTY ROADS; TRUCK PERCENTAGE ≥ 10%

Daily Volume	Paved Shoulder Width			
	0 ft to < 2 ft	2 ft to < 4 ft	4 ft to < 6 ft	≥ 6 ft
< 400	LTS 2	LTS 2	LTS 2	LTS 2
400 to 1,500	LTS 3	LTS 2	LTS 2	LTS 2
1,500 to 7,000	LTS 4	LTS 3	LTS 3	LTS 3
> 7,000	LTS 4	LTS 4	LTS 4	LTS 4

Source: David Evans and Associates, Inc. based on methodologies from Colorado Department of Transportation (CDOT) and Oregon Department of Transportation (ODOT)

FIGURE S1-9: MAP OF BLTS



REGIONAL TRAILS

Boulder County has developed forty-three miles of regional trails over the past 30 years in partnership with state and local agencies, that together form a network of trail connections between multiple communities. Regional trails are distinguished by their connectivity purpose and their recreation users. Regional trails are physically separated from motor vehicle traffic by a buffer or barrier and are either within the road right-of-way or on public lands and are designed for multiple user types including bicyclists, pedestrians, and equestrians of varying comfort, skill, and ability levels.

Priorities for the Regional Trails Program were first compiled in 2003. Although each of the projects has been separated into phases and have been refined over time, the fundamental priorities established in 2003 remain in place today. Figure S1-10 illustrates the county's regional trails program. Once fully implemented, the county's regional trails network will total almost 86 miles.

About half of the existing miles of trails lie within incorporated areas of the county, and these are managed and maintained in partnership with other jurisdictions.

Regional Trails Vision

Boulder County's Regional Trails Program will result in an off-street network of primarily soft-surface trail connections for recreational purposes. Boulder County's long-term vision is to extend the network into the western portion of the county and enhance the regional system on the plains.

Regional Trails Crossings

Regional connections are required to span not only roads, but water channels, irrigation ditches, and railroads. Major crossing treatments of roads or highways within Boulder County follow the guidelines set forth in the *Boulder County Multimodal Transportation Standards*, which generally recommend enhanced at-grade or grade-separated crossings.

There are approximately 140 existing or planned at-grade and grade-separated regional trail crossings within Boulder County, in both incorporated and unincorporated areas. Of these 140 crossings:

- 105 crossings are improved and maintained through the Regional Trails Program
- 30 of the 105 crossings are major crossings
- Treatments are planned for 12 of the major crossings in the program
- Treatments for the other 15 major crossings will be identified with additional corridor planning

Regional Trails Program Implementation Schedule

The Regional Trails Program is an ongoing effort to plan, design, and construct new regional trail connections. Updates on the progress of current and future trail projects is posted annually on the county website[14]. Funding for implementing the Regional Trails Program is provided through the countywide Transportation Sales Tax, 15 percent of which is dedicated to Regional Trails Program implementation.

SUBDIVISION SIDEWALKS

Sidewalks within unincorporated Boulder County are typically constructed as part of land development either directly adjacent to incorporated areas or in Community Service Areas (CSAs) such as Niwot and Gunbarrel area. The county's rural character and low-density development patterns focuses this infrastructure where neighborhood-level pedestrian activity occurs and on connections to transit stops and stations. Sidewalks support neighborhood pedestrian activity by connecting residences to one another and to neighborhood destinations such as schools, churches, parks, and commercial services.

The county maintains approximately 67 miles of sidewalks and 10 miles of concrete multiuse paths between and within 14 subdivisions. Table S1-10 shows the total miles of county facilities within each of four primary geographic areas of the county. Since 2008, the county has been working through each subdivision to repair damage and bring the pedestrian network up to standards set in the American with Disabilities Act (ADA). To date, 40 miles of sidewalk have been evaluated and repaired and 37 miles remain.

Boulder County Pedestrian Facilities

Boulder County's pedestrian network is comprised of three main types of facilities:

- **Regional Trails** are a network of primarily soft-surface trails used to connect communities for recreation travel
- **Multiuse Paths** provide hard-surface connections between neighborhoods along the county's arterial and collector roads. County-maintained bikeways along state highways are also considered part of the pathway network.
- **Subdivision Sidewalks** assist neighborhood residents with travel within developed subdivisions

[14] The Regional Trails Program can be referenced for this information, available at: https://www.bouldercounty.org/transportation/plans-and-projects/trails/

TABLE S1-10: SIDEWALK MAINTENANCE & REPAIR

Existing Sidewalk	Existing Sidewalks & MUPaths	Percent of total Network	Repaired since 2008	Remaining
Gunbarrel Area Subdivisions	40 miles	53%	16 miles	24 miles
Niwot Area Subdivisions	15 miles	19%	10 miles	5 miles
Boulder Area Subdivisions	13 miles	16%	8 miles	5 miles
Lake Valley Estates / Willis Heights	9 miles	12%	6 miles	3 miles
Total	**77 miles**	**100%**	**40 miles**	**37 miles**
			52%	**48%**

Source: Boulder County Transportation

In addition to repairing damaged sidewalks, Boulder County actively identifies missing pedestrian links and works to fill the missing gaps between the existing sidewalk networks within subdivisions. The county uses walking audits, inspections, and community feedback to prioritize and include sidewalk projects in its annual concrete program.

BICYCLE AND PEDESTRIAN FACILITY MAINTENANCE

Boulder County uses a variety of processes, programs, and partnerships to maintain its multiuse paths, sidewalks, and regional trails. Multiuse paths are cleared of snow after each storm and swept to keep them clear of road sand and vegetation. Both sidewalks and paths are inspected and repaired on an on-going basis to comply with federal ADA requirements. Many of the regional trails are maintained by either the state or other local agencies with assistance from the county's regional trails fund as funds are available.

BIKEABLE SHOULDERS

During the summer months, Boulder County routinely sweeps roadway shoulders, focusing efforts on mountain corridors and other roadways that are heavily used by cyclists.

REGIONAL TRAILS AND MULTIUSE PATHS

During implementation of new regional trails and multiuse paths, the county assesses maintenance and operational needs in coordination with other agencies both internal and external to the County:

- Regional trails are maintained and patrolled by the County Parks and Open Space Department. Maintenance of the county's multiuse paths follows a Pathways Maintenance Plan that identifies locations and service levels for snow removal, summer sweeping, and tree trimming along those facilities. The maintenance plan also addresses patrolling, weed control, mowing, and minor repair.
- The majority of the regional trail network lies within incorporated areas and/or on property owned by agencies outside of the county organization. Each jurisdiction maintains and patrols their own facilities.
- Many of the pathways and bikeways on CDOT highways, such as the US 36, SH 7, and US 36, are maintained by other agencies under license agreements. Boulder County is currently responsible for paths along SH 119, SH 7, and US 36.

REGIONAL TRAILS, BICYCLE AND PEDESTRIAN RECOMMENDATIONS

PROJECTS

The following projects and implementation actions are recommended for regional trails (Figure S1-10, Table S1-11) and multiuse paths and bikeable shoulders (Figure S1-11, Table S1-12). Note, there is some duplication of proposed projects on the below figures and tables. It is Boulder County's intention to pave projects on the multiuse paths and bikeable shoulders map (Figure S1-11). The vision for multiuse paths and bikeable shoulders is that they are plowable and maintained year round. If a proposed regional trail meets that criteria, then an additional facility is not required.

FIGURE S1-10: BICYCLE AND PEDESTRIAN VISION – REGIONAL TRAILS PROGRAM

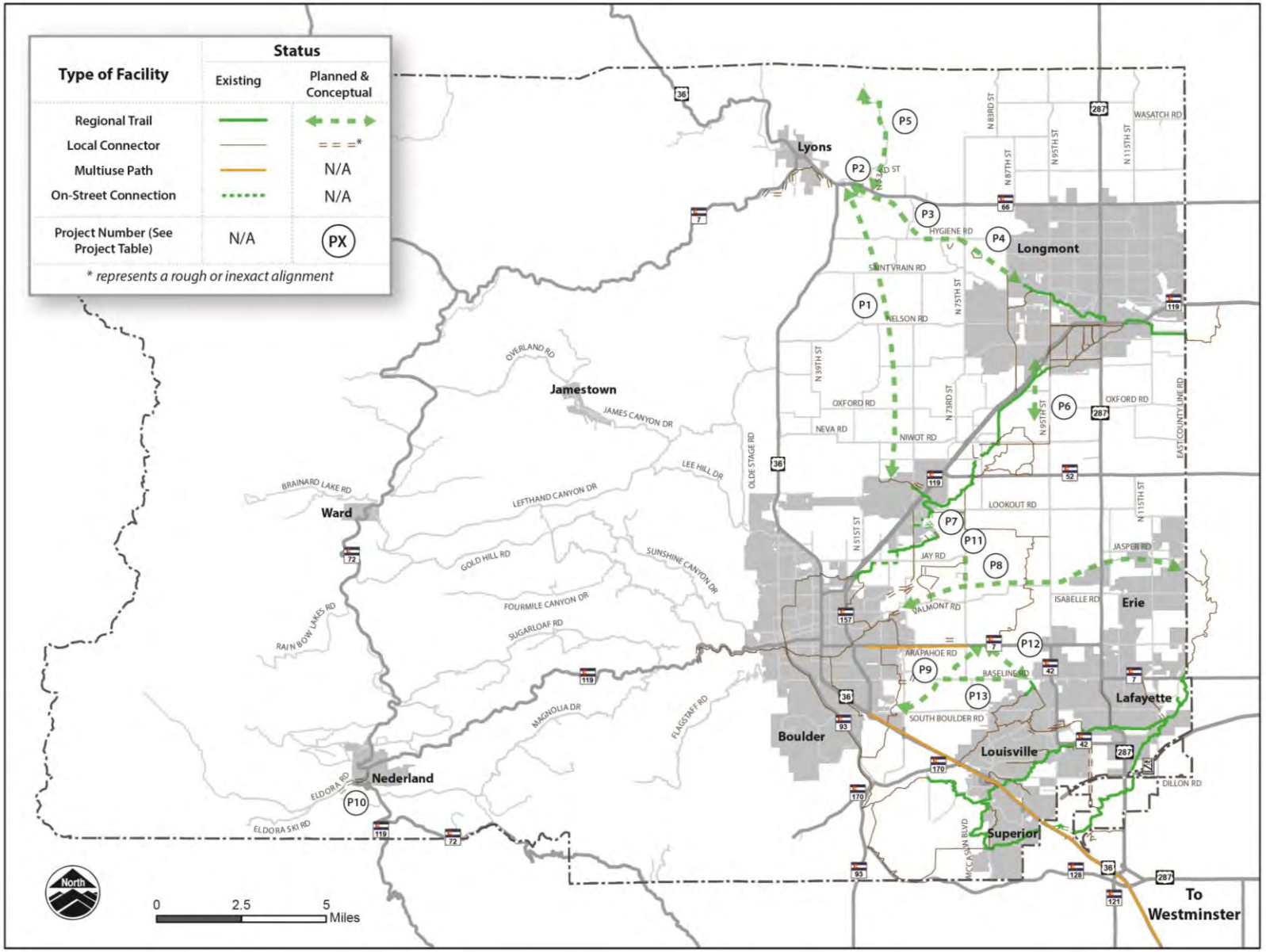


FIGURE S1-11: ROADWAY VISION – MULTIUSE PATHS AND BIKEABLE SHOULDERS

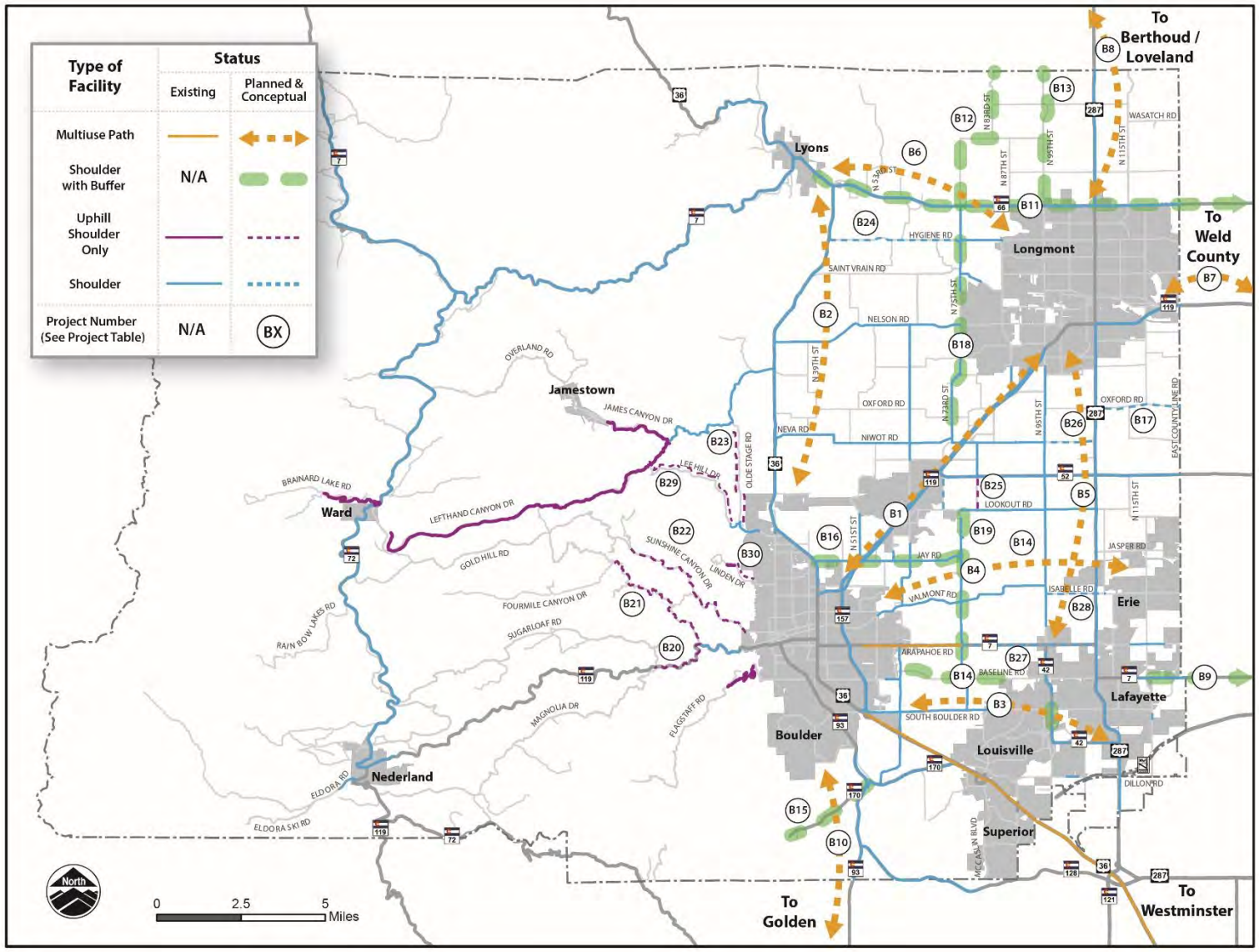


TABLE S1-11: REGIONAL TRAIL PROJECTS

Map ID	Project Name	Project Description	Project Status	Funding Status	Potential Funding Source[+]	Cost[++]
P1	Lyons Trail Connection	Trail between Lyons and Gunbarrel.	Conceptual*	Not Funded	CST, Muni, Fed	$$
P2	St. Vrain Greenway – Phase II: 61st Street to US 36	Connection of the St. Vrain Greenway.	Conceptual*	Funded	CST	$$
P3	St. Vrain Greenway – Phase III: Pella to 61st Street	Connection of the St. Vrain Greenway.	Conceptual – On-hold*	Not Funded	CST	$$
P4	St. Vrain Greenway: Phase I: Golden Ponds to Pella	Connection of the St. Vrain Greenway.	Planned – In Design	Funded	CST, Muni	$$
P5	Rabbit Mountain Open Space Link	Connection to Rabbit Mountain Open Space from US 36 and Hwy 66.	Conceptual*	Not Funded	CST	$$
P6	Dry Creek Extension	Connection from local connectors to the LOBO Trail.	Planned	Not Funded	CST	$$
P7	LOBO Trail - William's Fork Connector	Connection of the LOBO Trail.	Planned – In Design	Funded	CST, Fed, Muni	$$$
P8	RTD Rail Trail – Erie to Boulder	Trail between Erie and Boulder.	Planned	Funded	CST, Fed, Muni	$$$$
P9	East Boulder Trail	Trail between south Boulder and east of Lafayette.	Conceptual	Not Funded	CST, Fed, Muni	$$$$
P10	County Road 130 Trail – Nederland to Nederland High School	Trail connection.	Conceptual	Not Funded	CST, Fed	$$
P11	75th Street Trail Connection – RTD tracks to Jay Road	Trail connection from RTD Rail Trail to Heatherwood Trail and 75th Street facilities.	Conceptual	Not Funded	CST	$$
P12	Callahan Trail Extension – Baseline Road to East Boulder Trail	Connection from Lafayette to East Boulder Trail.	Conceptual	Not Funded	CST	$$
P13	Trail Connection via Baseline Road	Trail connection between north Louisville/Lafayette and Boulder.	Conceptual	Not Funded	CST	$

Notes: Planned projects are recommended in an approved facility master plan or capital program. Conceptual projects are new ideas or concepts introduced in the TMP or elsewhere.
[+] The following potential funding sources have been identified: CST: Countywide Transportation Sales Tax formed in 2007 to fund road, transit and trails projects throughout the county. Includes both current list of project and potential future projects that fit the goals and objectives of the program. Fed: State, federal, and/or other outside agencies such as urban drainage and flood control districts and the Regional Transit District (RTD). Muni: Local project partners including incorporated jurisdictions and/or other Counties.
[++]The costs are broken into five different categories: $: less than $500,000 | $$: $500K-$2 million | $$$: $2 million- $5 million | $$$$: $5 million- $10 million | $$$$$: Over $10 million
* Indicates that more study needs to be completed to evaluate the feasibility of implementation.

TABLE S1-12: MULTIUSE PATH AND BIKEABLE SHOULDER PROJECTS

Map ID	Project Name	Project Status	Funding Status	Potential Funding Source+	Cost++
Multiuse paths					
B1	Boulder to Longmont	Conceptual*	Not Funded	CST, Muni, Fed	$$
B2	Boulder to Lyons	Conceptual*	Not Funded	CST, Muni, Fed	$$$$
B3	Boulder to north Louisville/Lafayette	Conceptual*	Not Funded	CST, Muni, Fed	$$$
B4	Boulder to Erie	In Planning	Not Funded	CST, Muni, Fed	$$$
B5	Lafayette/Erie to Longmont	Conceptual*	Not Funded	CST, Muni, Fed	$$$
B6	Longmont to Lyons	Conceptual*	Not Funded	CST, Muni, Fed	$$$
B7	Longmont to Weld County	Conceptual*	Not Funded	CST, Muni, Fed	$$
B8	Longmont to Berthoud/Loveland	Conceptual*	Not Funded	CST, Muni, Fed	$$$
B9	SH 7 Multi-use Path – 119th Street to East County Line Road	Conceptual – SH 7 PEL	Not Funded	CST, Muni, Fed	$$$
B10	SH 93 Multi-use Path – SH 170 south past the county boundary	Conceptual – WestConnect PEL	Not Funded	CST, Muni, Fed	$$$
B11	SH 66 Frontage Road/Bike facility – Lyons to County Road 19	Conceptual – Preferred Alternative in SH 66 PEL Study	Not Funded	CST, Muni, Fed	$$$$$
Shoulders with Buffer					
B12	Hygiene to Larimer County – 83rdStreet/75th Street	Conceptual*	Not Funded	CST	$$$$
B13	95th Street Shoulder – Yellowstone Road to county boundary	Conceptual*	Not Funded	CST	$$
B14	Baseline Road – Cherryvale Road to 95th Street	Conceptual*	Not Funded	CST	$$$$
B15	Eldorado Springs Drive/SH 170 – SH 93 to Eldorado Springs	Conceptual*	Partially Funded	CST	$$$$
B16	Jay Road – US 36 to 75th Street	Conceptual*	Not Funded	CST, Muni	$$$$
B17	Oxford Road – US 287 to East County Line Road	Conceptual*	Not Funded	CST	$$$
B18	73rd Street/75th Street – Niwot Road to Hygiene Road (includes Longmont section and assumes that bridge structures remain in place)	Conceptual*	Not Funded	CST, Muni	$$$$
B19	75th Street – Lookout Road to Baseline Road	Conceptual*	Not Funded	CST, Muni	$$
Shoulders					
B20	Boulder Canyon Uphill Shoulder – Fourmile Canyon Drive to Sugarloaf	Conceptual*	Not Funded	CST	$$$$$
B21	Fourmile Canyon Drive Uphill Shoulder – Boulder Canyon to Salina	Conceptual*	Not Funded	CST	$$$$$
B22	Sunshine Canyon Drive Shoulder – Boulder to County Road 83	Conceptual*	Not Funded	CST	$$$$
B23	Olde Stage Road Uphill Shoulder – Top of hill to Lefthand Canyon Drive (includes reconfiguration of Six Mile Creek)	Conceptual*	Not Funded	CST	$$$
B24	Hygiene Road Shoulder – US 36 to 75th Street (reconstruct road to include paved shoulders and replace three stream crossings	Conceptual*	Funded	CST	$$$$

Map ID	Project Name	Project Status	Funding Status	Potential Funding Source+	Cost++
B25	79th Street Shoulder – SH 52 to Lookout Road	Conceptual*	Not Funded	CST	$$
B26	Niwot Road Shoulder – 95th Street to US 287	Conceptual – In Design	Funded	CST	$$$
B27	SH 7 Shoulder – 75th Street to US 287	Conceptual*	Not Funded	CST	$$$
B28	Isabelle Road Shoulder –95th Street to Erie (includes safety improvements to US 287/Isabelle Road Intersection)	Conceptual*	Funded	CST	$$$
B29	Lee Hill Road Uphill Shoulder – end of current shoulder to Deertrail Drive (add paved shoulder to uphill lane to improve safety for all users)	Conceptual*	Not Funded	CST	$$$$
B30	Linden Avenue Shoulder – Boulder to North Cedar Brook (includes reconstruction of road)	Conceptual*	Not Funded	CST	$$$

Notes: Planned projects are recommended in an approved facility master plan or capital program. Conceptual projects are new ideas or concepts introduced in the TMP or elsewhere.
+ The following potential funding sources have been identified: CST: Countywide Transportation Sales Tax formed in 2007 to fund road, transit and trails projects throughout the county. Includes both current list of project and potential future projects that fit the goals and objectives of the program. Fed: State, federal, and/or other outside agencies such as urban drainage and flood control districts and the Regional Transit District (RTD). Muni: Local project partners including incorporated jurisdictions and/or other Counties.
++The costs are broken into five different categories: $: less than $500,000 | $$: $500K-$2 million | $$$: $2 million- $5 million | $$$$: $5 million- $10 million | $$$$$: Over $10 million
* Indicates that more study needs to be completed to evaluate the feasibility of implementation.

IMPLEMENTATION ACTIONS – REGIONAL TRAILS, BICYCLE AND PEDESTRIAN FACILITIES

- Update the bikeways plan map as part of the comprehensive plan based on the multiuse path and bikeable shoulders map
- Modify the *Multimodal Transportation Standards* to include design standards (specifically: buffered shoulders, protected shoulders, green pavement markings, and managed lanes) and clarify multiuse path, regional trail, and shared use path
- Prioritize roadway safety, signage and shoulder improvements to address unsafe conditions on primary on-road cycling corridors that separate bikes from cars and lower bicycle level of stress
- Improve intersections for safe and convenient access to transit stops and bike and pedestrian facilities
- Add/improve shoulders, trail connections, bike and pedestrian infrastructure to provide safe connections to primary cycling corridors, transit facilities, and park-n-rides
- Develop a network of bicycle facilities that are plowable and maintained for winter use that connect regional destinations

- Continue implementation of the regional trails priorities as adopted in 2003 and modified annually, as listed in the most recent Transportation Sales Tax phasing plan[15]
- Improve on-street bicycle facilities, trail connections, bike and pedestrian infrastructure as opportunities arise, to provide safe and convenient connections to transit facilities and park-n-rides
- Pave downhill pull outs and small sections of downhill shoulder to allow low stress passing lanes where possible
- Build uphill shoulders on roadways with limited right-of-way where feasible
- Work with open space property owners to identify strategies to best support recreational and commuter uses of regional trails and multiuse paths
- Collaborate with county, state and municipal agencies to improve wayfinding signage along regional trails with a priority on wayfinding signage on the county's regional trails and local connectors

[15] Available online at: https://www.bouldercounty.org/transportation/plans-and-projects/transportation-sales-tax-project-list/

STRATEGY 2—CREATE THE COMPLETE TRIP

Boulder County improves infrastructure, supports regional transit, connects the first and final mile portions of trips, and establishes transportation demand management programs. These investments strive to provide county residents with complete mobility options, providing people with a viable option to driving alone. Making bicycle, bus, and pedestrian travel more convenient reduces greenhouse gas emissions and roadway congestion, conserves natural resources, lessens dependence on fossil fuels, promotes public health, and increases the mobility of youth and elderly population groups.

THE ELEMENTS OF A TRIP

When people consider how to travel without driving alone for the entirety of a trip, the logistics and details can get complicated. While there are a number of ways to make the whole trip come together, the trip is usually anchored by transit, with shorter trips on either end completed by driving, biking, walking, and/or another transit route. In order to make this type of trip viable, there are many components that need to work successfully together:

- **Main trip:** The service and facilities necessary for the main component of the trip to be completed
  - Regional transit: Service that provides access to another part of the county or outside the county altogether. Examples include: Flatiron Flyer, BOLT, JUMP, and DASH.
  - Infrastructure improvements: Infrastructure that allows the main component of the trip. Examples include: roadway maintenance, bikeable shoulders, multiuse paths, sidewalks, wayfinding signage, etc.

  ➲ More information about the main component of the trip can be found in *Strategy 1 – Develop the Multimodal System*.
- **First and final mile connections:** Improvements that support the connection between regional transit and infrastructure improvements. Examples include: Park-n-Rides, drop-off/pick-up zones, secure bike parking, and new mobility technologies such as electric scooters.
- **Travel demand management (TDM):** Incentive programs that make it easier for people to make this trip. Examples include: transit pass support, free ride home in case of an emergency, and educational materials.
- **Wayfinding:** Signage and striping that provides guidance to users to specific routes and/or facilities

MAIN TRIP

REGIONAL TRANSIT

Boulder County's land uses shape its trip patterns. Boulder County residents typically begin their daily commute within areas of more highly concentrated population in municipal areas, Niwot, or subdivisions. They typically end these commute trips at employment locations in municipal areas, along highway corridors, or outside of Boulder County. The typical return trip goes from the place of employment back to the residential area, with the potential for diversion for personal business.

Based on these typical travel patterns, transit can serve as the backbone of the daily commute trip in Boulder County, because routes exist between residential and employment areas. Yet transporting residents from their trip origin to their trip destination via regional transit is challenging for several reasons:

- In places where homes are not within walking or bicycling distance, people must drive to get to a transit station, bus stop, or park-n-ride. Unless there are recognized benefits to taking transit, it is often more convenient to continue the vehicle trip.
- In situations where people are reliant on transit for the entire trip or one end of it, making the connection between local and regional services can be challenging. Transfers, whether between fixed-route services or between on-call and fixed-route services, can be time-consuming and inconvenient.
- In places where homes and neighborhoods are within walking or bicycling distance to transit, appropriate physical infrastructure is often missing or physical barriers exist.
- At the end of the transit trip, the distance from the bus stop to the final destination can be too long to walk or bicycle, and vehicle options likely do not exist. If the distance is reasonable, the physical infrastructure may be missing or a bicycle option may not be available.

Addressing these barriers is necessary to connect local communities, residential neighborhoods, and employment areas to regional transit and to make travel by transit accessible and convenient.

➲ The Boulder County Regional Transit Map is included and discussed in the *Strategy 1 – Develop the Multimodal System, Transit Vision* section.

INFRASTRUCTURE IMPROVEMENTS

Boulder County plans sidewalk and multiuse path connections to link origins and destinations across the county. These first and final mile connections improve access to regional transit route bus stops, neighborhood destinations, regional recreational facilities, schools, and employment center destinations.

Boulder County identifies first and final mile infrastructure needs by assessing existing infrastructure and evaluating the number of residences and destinations within reasonable distances that would be served by an added connection. A quarter to one-half mile is generally considered to be a reasonable walking distance, while a reasonable bicycling distance is one to three miles, provided that appropriate infrastructure exists. When bus riders must walk or bike farther than those distances to get from their stop to their final destination, another option for connection is needed.

In an effort to make connections to and from regional transit easier, the county seeks to:

- Increase the ability of commuters to use regional transit by improving physical connections
- Promote active living by providing infrastructure that enables walking and bicycling to and from transit

➲ Neighborhood sidewalk networks located in unincorporated Boulder County are discussed as Local Connections in the *Strategy 1– Develop the Multimodal System, Bicycle and Pedestrian Vision* section.

FIRST AND FINAL MILE CONNECTIONS

First and final mile services make it easier to connectto transit. In an effort to make connections to and from regional transit easier, the county seeks to:

- Increase the ability of commuters to use regional transit by improving modal connections
- Decrease travel time delays on regional transit associated with loading and unloading bicycles
- Increase bike carrying capacity on buses

Depending on the distance and physical features of the area, modal connections can include:

- Car share
- Bicycle share
- Park-n-ride
- Bicycle parking shelter (Bike-n-Ride)
- Shuttle service
- Connecting local bus service
- FlexRide (formerly known as Call and Ride)
- Transportation Network Company (TNC), such as Uber and Lyft, that help provide a service without the actual vehicles

Many final mile destinations are located in municpal areas where local permissions are needed to site facilities that provide modal connections. For this reason, partnerships among local communities, businesses, and neighborhoods are needed for Boulder County to successfully implement these types of connections. Likewise, because it is desirable to locate final mile facilities near regional transit route bus stops or park-n-rides, CDOT and RTD are important program partners.

Bike-n-Ride Shelters

Bike-n-Ride shelters provide long-term bicycle parking at transit stops so bus riders have a bicycle available to them to complete their trip. These facilities enable commuters to ride transit and then bike the final distance between the bus stop and their destination (or vice versa). They also eliminate the need for riders to take their bicycles on the bus, which do not always have the bike carrying capacity needed, loading bikes can be physically difficult, and can lead to delays. Shelters are located at the following locations:

- Boulder
  - 30th St and Iris St
  - US 36 and Table Mesa Station (westbound)
  - Downtown Boulder Station
- Longmont
  - 8th Ave and Coffman St
  - Hover St & Hwy 119/Diagonal
- Louisville
  - US 36 and McCaslin Station (westbound) under construction
- Superior
  - US 36 and McCaslin Station (eastbound)

Real-Time Marketing Program

Boulder County is committed to working with partners to promote and educate people about transit options. During the summer of 2017, the county worked with Boulder Transportation Connections and Commuting Solutions to promote the download of the Transit App. Through this campaign, the following list of educational marketing tools was created as the most effective:

- BuffBus ads
- Social media ads and posts
- Interior RTD ads
- Exterior RTD ads
- Print materials that do not require substantial staff time
- Focused employer engagement
- Coordination through EcoPass Network

ADVANCED MOBILITY

Transportation is constantly changing and adapting to users' demands and preferences. This evolution and innovation has resulted in many new tools since the TMP was adopted in 2012. There are many new and emerging mobility technologies that have the potential to significantly change the way that people travel. Examples of new and emerging technologies (as outlined in the Mobility Choice Blueprint study[16]) include:

- **Dockless bike and/or scooter sharing:** A service in which bicycles or scooters are made available for shared use to individual on short-term basis. Bicycles or scooters are located at docking stations, or dockless systems allow bicycles to be parked anywhere.
- **Ridehailing:** Procuring a ride from a "for-fare" driver pools accessible through an app-based platform (i.e. Uber, Lyft).
- **Autonomous Vehicles:** Vehicles with automated driver assistance features, up to and including driverless vehicles.
- **Adaptive Ramp Metering:** Deploys traffic signal(s) on freeway ramps to dynamically control the rate vehicles enter a freeway. This smooths the flow of traffic onto the mainline, efficiently using existing freeway capacity.
- **Transit Signal Prioritization:** Adjust traffic signal green and red times if possible as buses approach to improve bus travel time and reliability.

[16] Full details of emerging mobility systems can be found in the report available online at: http://www.mobilitychoiceblueprintstudy.com/assets/docs/MCB_Final_Report_.pdf

- **Mobile Transit Apps-** An app that allows users to see real-time arrival information for transit services. Could evolve to include all forms of on-demand/scheduled transport in a unified format.

When asked about future modes, 60 percent of survey respondents indicated they were "Very interested" or "Interested" in electric cars, while about 40 percent of survey respondents selected "Very interested" or "Interested" for electric bikes, autonomous cars, and autonomous buses each.

There is much uncertainty associated with these new technologies surrounding cost, negative externalities, longevity of the product and/or company, as well as community reception. New mobility technologies offer opportunities to provide new mobility options, but also present challenges to achieving Boulder County's transportation goals. Table S2- summarizes some of the opportunities and challenges associated with these new technologies.

TABLE S2-1: MOBILITY TECHNOLOGY OPPORTUNITIES AND CHALLENGES

Mobility Technology	Opportunities	Challenges
Electric bicycles/Electric Scooters	• Accessible for people with a wider range of physical abilities than non-electric bicycles • Longer range than non-electric bicycles could increase use as a method of transportation	• Users traveling at faster speeds than pedestrians could lead to conflicts and safety concerns • Facility considerations such as width of multiuse paths
Electric Vehicles	• Reduce greenhouse gas emissions • Improve air quality	• Does not improve congestion • Impact to road infrastructure without gas tax revenue
Autonomous Vehicles	• Improve safety • Provide mobility for older adults, people with disabilities, and others with mobility challenges	• Potential to increase Vehicle Miles Traveled (VMT) • Potential for inequitable access
Ridehailing	• Provide mobility for older adults, people with disabilities, and others with mobility challenges	• Potential for inequitable access • Increase in VMT

Boulder County will need to be flexible to accommodate new technologies and develop policies to encourage the use of new technologies in ways that are consistent with the goals outlined in the Boulder County Comprehensive Plan, including efficiency,

climate mitigation/resilience, equity, safety and community character. The Boulder County Transportation Department will consider the use of new technologies when developing new programs and projects and will pilot use of new technologies when appropriate.

TRAVEL DEMAND MANAGEMENT (TDM)

Boulder County's Travel Demand Management (TDM) programs help residents and employees complete their trips by providing resources and incentives to use all the other components discussed (regional transit, infrastructure improvements, and first and final mile connections). TDM is the approach of increasing and influencing travel choices to manage growing travel demand. By implementing TDM programs, transportation agencies are able to provide mobility while avoiding the costs and environmental impacts of large construction projects, such as new roadway construction or roadway widening.

TDM programs provide alternatives to single-occupancy vehicle travel, incentivize travel by other modes, encourage mode shift, and help to make more efficient use of existing and future roadway infrastructure. TDM programs and approaches generally fall into the following categories:

- Employer-based programs
- Residential-based programs
- School-based programs
- Pricing programs
- Land use and smart growth implementation
- Communication and marketing strategies
- Education programs
- Incentive programs
- Parking management
- Intelligent Transportation Systems (ITS)
- Travel support programs

For TDM services and resources to have a meaningful impact on site-specific mode split, they need to be implemented in places where multimodal travel opportunities exist. In Boulder County, this includes employment areas, human services, schools, neighborhoods, and activity centers—both existing and planned—within municipal areas and along highway corridors. These are the places in Boulder County that have access to regional bus services, connecting pedestrian facilities, and the regional trails system.

BOULDER COUNTY TRAVEL PROGRAMS AND SERVICES

Boulder County directly and indirectly supports a variety of programs that encourage residents, visitors, and employees to travel by non-single occupancy vehicle.

COUNTY TRANSIT EDUCATION AND PASS SUPPORT PROGRAM

Boulder County created its County Transit Education and Pass Support (CTEPS) Program to provide additional access to transit through pass support for people who live or work in Boulder County. Through the CTEPS Program, at a much smaller cost than adding additional transit services or building new transportation facilities, Boulder County increases transit ridership and makes full use of the capacity on existing bus services.

Marketing and Outreach

Boulder County conducts education, marketing and advertising, public and business outreach, and information campaigns to promote the transit network. The CTEPS Program directs the campaigns to increase the visibility of specific routes and encourage transit use.

Pass Support

Transit pass programs and fare-free zones are effective in changing travel behavior, when accompanied by marketing and outreach. The CTEPS Program provides transit pass assistance in the following ways:

- **Business EcoPasses:** Businesses located in the RTD are able to purchase RTD EcoPasses for all of their employees through an annual contract with the transit agency
  - Business EcoPasses can be paid for by the employer, the employee, or a combination of the two. Boulder County provides support to Boulder County businesses that want to create self-sustaining, long-term EcoPass programs for their employees
  - Through the CTEPS Program, Boulder County provides a two to three-year subsidy and technical support to businesses to establish new EcoPass programs
- **Neighborhood and Community EcoPasses:** The RTD Neighborhood EcoPass is a discounted annual transit pass purchased by a neighborhood or community organization for members of its participating households. Through the CTEPS Program, Boulder County provides a two to three-year subsidy and technical support to new neighborhoods signing up for the Neighborhood EcoPass.

- The Town of Lyons and the Town of Nederland have community-wide neighborhood EcoPass programs. These programs make an EcoPass available to all full-time residents within the Town of Lyons or Nederland EcoPass District. In addition to providing a subsidy and technical support, Boulder County acquired federal funds to establish these programs.
- Boulder County partnered with the City of Longmont to create a fare-free zone in the city for all local transit routes, called Ride Free Longmont. After a successful pilot period where ridership more than doubled, the City of Longmont fully funded the farebox buy-down.

In addition to continuing support for a number of different programs, the county will continue to pursue an unlimited and all-access transit pass program, county-wide EcoPass program, that will be available to everyone who lives and/or works within the county, or a countywide fare-free zone. EcoPass programs have increased transit ridership. In the future, Boulder County hopes to further apply this TDM tool to all residents and employees in Boulder County. TDM supported by the county may be used to help bolster use of these services, thereby further strengthening the services themselves and creating more support for implementing a county-wide EcoPass program.

PARTNERS FOR A CLEAN ENVIRONMENT (PACE)

Partners for a Clean Environment (PACE) provides free expert advisor services, financial incentives and a certification program to help businesses measure and gain recognition for their energy, waste, water, and transportation achievements. Below are some examples of how advisors support businesses with sustainable transportation:

- **Services:** Act as a resource to businesses on issues of implementation
  - Bike rack placement
  - EcoPass outreach
  - Referral to Transportation Management Organizations for commute consultation
  - Trip Tracker
- **Financial:** Providing financial support for sustainable transportation capital
  - Electric vehicle (EV) charging stations
  - Electric vehicles

- Bike racks
- Certification program for businesses if more employees commute via sustainable transportation than the community average

TRIP TRACKER

In 2014, Boulder County expanded the existing Trip Tracker program currently in practice within Boulder Valley School District (BVSD) to St. Vrain Valley School District (SVVSD). Trip Tracker is a program that rewards staff and students (with help from their parents) for making green trips to and from school instead of travelling only by car. When participants walk, bike, bus or carpool, they can earn Tracker Bucks to spend at participating locally-owned businesses. The program then buys back the dollars from the businesses at $0.50 for every dollar. As a result, the cost of the program is split between local businesses, Boulder County, and school-based sources (school districts, PTAs, school budgets).

MOBILITY MANAGEMENT

Mobility for All is a mobility management program with the goal of promoting and expanding accessible, affordable, and equitable multimodal transportation options for all community members through transportation assistance, education & outreach, cross-sector collaboration, and inclusive planning practices. Mobility management is a human-centered approach to designing and delivering transportation services that starts and ends with the customer. It begins with a community vision in which the entire transportation network—public transit, private operators, cycling and walking, volunteer drivers, and others—works together with customers, planners, and stakeholders to deliver the transportation options that best meet the community's needs.

TRANSPORTATION MANAGEMENT ORGANIZATIONS

Transportation Management Organizations (TMOs) are independent, nonprofit organizations, funded by Way to Go and stakeholder groups from a geographic area (government agencies, major employers, developers, neighborhoods groups, etc.). TMOs directly implement TDM programs and services, facilitate communication between the public and private sectors, and promote transportation community goals. A primary benefit of TMOs is the ability to move TDM efforts from a site-specific application—such as within an individual business—to a more flexible and effective area-wide application, such as along a travel corridor.

Way to Go

Way to Go is a regional commute option program offered through DRCOG as a resource for employers, commuters, local governments, and other TDM service providers to reduce traffic congestion and improve air quality in the region. The centralized services help residents find transportation options that can save them money and find easier, greener commute modes. In July 2011, DRCOG Way to Go, along with the established TMOs in the region, entered into a formal partnership to collaborate on a comprehensive and coordinated effort to attack traffic congestion and poor air quality in the Denver region by promoting and implementing a suite of TDM services. The partnership couples the proven successes of the region-wide Way to Go program with the subarea knowledge demonstrated by the TMOs. DRCOG and the TMOs will work closely together to maximize both the service throughout the DRCOG region and the return on investments of projects funded by DRCOG, while minimizing or eliminating the duplication of efforts.

Commuting Solutions

Commuting Solutions is a nonprofit membership coalition whose mission is to enhance the mobility of commuters along the US 36 corridor. Members include Boulder, Boulder County, Longmont, Superior, Louisville, Broomfield, and Westminster as well as 60 private-sector corporations. The organization advocates for multimodal investments to regional transportation corridors in the northwest Denver metropolitan areas. In particular, Commuting Solutions advocates for the full build out of the Northwest Area Mobility Study (NAMS) and completion of the RTD FasTracks program. In addition to corridor-specific advocacy, Commuting Solutions has a series of programs to inspire employers and employees to use active commute options.

Boulder Transportation Connections

Boulder Transportation Connections TMO (formerly known as Boulder East) is a membership organization composed of business, resident, and City of Boulder leaders who are partnering to enhance travel in and around east Boulder. Membership includes businesses and residents located in its district, which is located from Folsom Street east to N. 63rd Street and Iris Avenue south to Arapahoe Avenue. The TMO members are dedicated to shaping policies and programs that improve access to east Boulder's business and residential centers and, at the same time, reduce traffic congestion. The goal of the TMO is to create, support, and promote an array of transportation options for commuters.

Smart Commute Metro North

The Smart Commute Metro North TMO was established in 2011. The TMO is a partnership of public and private entities in the North I-25 corridor area that are working to identify, develop, advocate for, and lobby for transportation solutions that will enhance mobility, drive economic development, and reduce traffic congestion in the north Denver metro area. Smart Commute North Metro serves member communities generally located south of the Boulder/Larimer County line, extending along the US 85/SH 2 corridor, north of I-70, and east of US 287.

COMPLETING THE TRIP RECOMMENDATIONS

IMPLEMENTATION ACTIONS

- Add/improve shoulders, multiuse path and trail connections, bike and pedestrian infrastructure to provide safe and convenient connections to transit facilities and park-n-rides
- Partner to support shuttles to recreation destinations/first and final mile improvements
- Provide accessibility and compliance with the Americans with Disabilities Act
- Adopt project considerations process to consider possible improvements within the project development phase for all modes
- Develop policy for addressing technology considerations within projects
- Expand and supplement existing Boulder County Business and Community EcoPass programs with the goal of a countywide community pass program serving all county residents and employees
- Support RTD in the implementation of a low-income pass program
- Install variable message signs and smartphone applications that provide real-time transit information
- Increase bicycle carrying capacity on transit vehicles
- Conduct marketing and outreach activities to educate the public on available travel options
- Support new fare payment options and RTD's development of mechanisms for governments to subsidize passes via these new fare payment methods
- Encourage transit and bicycle connections by providing Bike-n-Ride Shelters and bicycle facilities at identified locations

- Support communities, TMOs and other service providers to coordinate service delivery, share resources, collaborate on marketing & outreach, and offer multimodal corridor services
- Support chambers of commerce and large employer TDM programs
- Promote active living, and associated public health benefits, by providing infrastructure that enables walking and bicycling to and from bus stops and local destinations
- Support TDM services along multimodal travel corridors, prioritizing geographic areas and major employers without existing programs or services
- Coordinate with housing authorities to consider transportation in new housing development
- Incorporate the Transportation strategies identified in the Sustainability Plan into the Transportation Department processes, program, policies, etc. as appropriate

STRATEGY 3 – INVEST IN KEY REGIONAL CORRIDORS

Boulder County travel corridors include local and regional transportation elements that form an integrated transportation system. The implementation actions draw from existing regional planning documents and visions achieved through interagency coordination. Boulder County considers each travel corridor as a geographic area encompassing all available and future modes. These multimodal corridors create the backbone of the Boulder County transportation system and play a critical role in addressing the 20-year travel demand.

REGIONAL PLANNING

In addition to improving transportation facilities on Boulder County facilities, the county also works with its local and regional partners to improve transportation between communities both within and outside of Boulder County. When thinking about regional transportation, the county has a comprehensive corridor approach. These corridors include many municipalities, and many of them are located on State Highways. The approach for key regional corridors is slightly different than recommendations on Boulder County facilities since there are multiple agencies involved. The regional transportation planning process includes three major components:

- **Long-range multimodal Regional Transportation Plans (RTPs):** RTPs are developed and adopted by Metropolitan Planning Organizations (MPOs) and integrated into the Statewide Transportation Plan.
- **Long-range multimodal Statewide Transportation Plan:** This plan sets the vision for transportation in the state. The long-range Statewide Transportation Plan outlines a comprehensive, multimodal transportation vision. CDOT prepares the plan, and it incorporates all of the RTPs in the state.
- **Statewide Transportation Improvement Program (STIP):** The STIP identifies short-term project needs and priorities.

A number of major regional partners are involved within these components and are part of regional coordination with Boulder County:

- DRCOG
- CDOT

- Agencies outside of Boulder County
  - Surrounding counties
  - North Front Range Metroplian Planning Organization (NFRMPO)

The *DRCOG Metro Vision 2040 Plan* (Metro Vision) presents a comprehensive planning framework for policy and planning decisions that integrate regional growth and development, transportation, and environmental management. It presents the vision for a multimodal transportation system that is needed to respond to future growth, as well as to influence how the growth occurs, for the entire DRCOG region. This vision is unconstrained by financial limitations.

The *2040 DRCOG Regional Transportation Plan* is an element of Metro Vision. The RTP identifies the needs, corridor strategies, and projects anticipated to be constructed by 2040. It includes components of the vision and fiscally constrained components. The *Fiscally Constrained 2040 Regional Transportation Plan*, a federally required component of the RTP, defines the specific transportation elements and services that can be provided over the next 20 years based on reasonably expected revenues. The projects included in the fiscally constrained RTP are included in DRCOG's regional travel demand model, which is used to meet federal and state air quality conformity requirements.

COLORADO DEPARTMENT OF TRANSPORTATION (CDOT)

The 2040 Statewide Transportation Plan created by CDOT presents the statewide transportation planning strategies based on key trends such as energy development, population increases, and employment growth. Because of the regional connectivity it provides for the mountain and plains communities, the State Highway System is the backbone of the roadway network within Boulder County.

AGENCIES OUTSIDE OF BOULDER COUNTY

Boulder County is part of multiple regional areas, being connected to multiple metropolitan areas, including: Denver-Aurora-Broomfield, Greeley, and Fort Collins-Loveland. Although Boulder County is included in the DRCOG planning area, it is not included within the North Front Range Metropolitan Planning Organization to the north or Weld County to the east, even though they are regionally connected. Boulder County recognizes it is important to maintain these partnerships even though formal organizations may not be established, based on the regional transportation connection.

COMPREHENSIVE CORRIDOR PLANNING

Boulder County recognizes that implementation of its sustainability strategies surrounding transportation needs to occur within a regional context in partnership with local, state, and federal agencies. A regional approach could substantially impact the shared sustainability goals of the region. Local participation in regional strategies to locate new growth in areas served by transit is particularly essential to provide access to the regional multimodal transportation system. It is also important that new growth and redevelopment be designed to enable the use of nearby transit service.

Reducing traffic congestion was the number one transportation priority of survey respondents.

Regional planning objectives for Boulder County are centered on the need for regional planning decisions and tools that are tied to the DRCOG regional sustainability goals. Boulder County's objectives include:

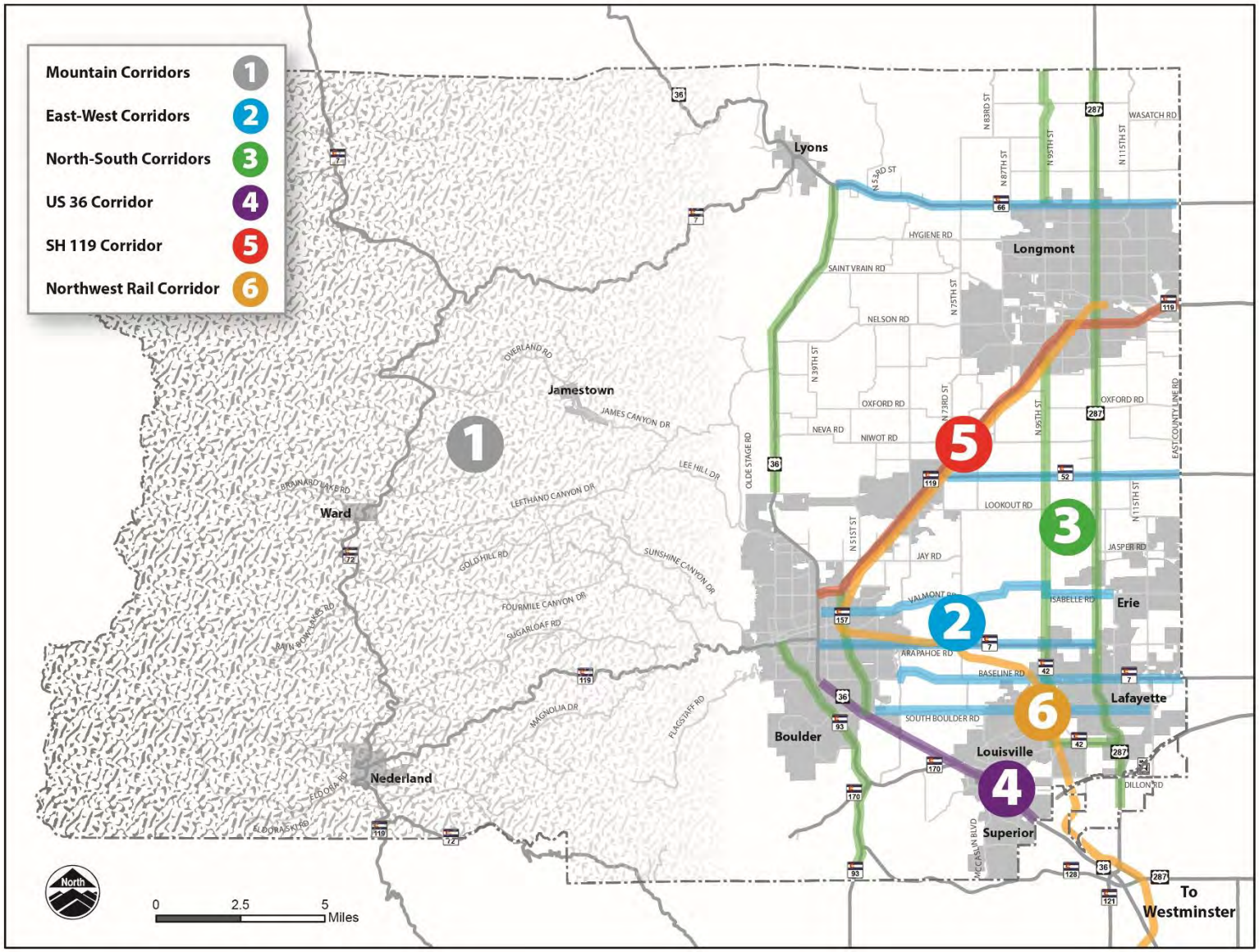
- Update the current Metro Vision to 2045 and subsequent regional plans to implement regional sustainability goals and include performance measures to indicate progress toward achieving them
- Enhance the RTP to include multimodal corridors, Transit Oriented Development (TOD), and other projects that implement the sustainability principles included in the Metro Vision 2035 and the Metro Vision 2040
- Strengthen Transportation Improvement Program (STIP) funding allocation policies and criteria to incentivize individual projects and communities that promote Smart Growth principles, invest in TOD, actively implement regional sustainability goals, and seek to develop multimodal transportation corridors
- Seek opportunities to integrate a transportation demand management (TDM) commitment into the STIP point system
- Identify funding opportunities from the federal Fixing America's Surface Transportation (FAST) Act
- Ensure that efforts to secure new transportation revenue streams are available to fund multimodal transportation needs

Six primary travel corridors are identified as key regional corridors in this plan. Each corridor consists of facilities and programs that serve different modes and trip types. The transportation system for each corridor consists of a unique combination of different types of roadways and/or facilities for multimodal users. The transportation system relies on the land use and development decisions made by local governments both within and outside of the county. While the vision and strategies identified for these corridors were developed in collaboration with each agency, none of these agencies have necessarily adopted or committed to implementing the strategies or improvements identified.

The following key travel corridors, as shown on Figure S3-1, are the areas that provide the best opportunities to develop multimodal corridors to serve internal travel between county communities and regional travel that begins or ends outside the county:

1. Mountain Corridors
2. East-West Corridors
   - SH 66
   - SH 52 (Mineral Road)
   - SH 7 (Arapahoe Road)
   - Valmont Road/Isabelle Road
   - Baseline Road
   - South Boulder Road
3. North-South Corridors
   - SH 42 (N. 95th Street)
   - US 287
   - N Foothills Parkway/SH 93
4. Southeast Corridors
   - US 36
5. SH 119 (Diagonal Highway)
6. Northwest Rail

FIGURE S3-1: KEY REGIONAL TRAVEL CORRIDORS



1 - MOUNTAIN CORRIDORS

The strategies and implementation actions for the key travel corridors within the county's western mountain areas are discussed in *Strategy 5 – Mountain Area Connections*.

2 - EAST-WEST CORRIDORS

East-west travel in Boulder County is constrained by a lack of roadway, transit, and bicycle facilities that provide safe and convenient travel between destinations with growing demand. Three state highways, SH 66, SH 52 and SH 7 carry the majority of the east-west traffic, and are already at capacity during the peak hours, as are alternative routes through the county that are used to avoid the state highways. The following future conditions are important to note:

- Regional travel models predict significant growth in both population and employment in the southeast area of Boulder County, as well as areas east of Boulder County
- Enhanced transit along many of the east-west corridors has been identified for many of the east-west corridors
- Boulder County and many of the local jurisdictions have plans for future trail connections through the area, which will enhance connectivity to the regional trails network
- The Northwest Rail Line is part of RTD's 2004 voter-approved FasTracks plan to expand transit across the Denver metro region. The proposed 41-mile diesel commuter rail corridor would operate between Denver's Union Station and Longmont, passing through north Denver, Adams County, Westminster, Broomfield, Louisville, Boulder and Boulder County [Included within Corridors East-West, US 36 and SH 119].

STATE FACILITIES

State Highway 52 (Mineral Road) is a two-lane state highway that carries primarily car traffic from the Diagonal Highway out to southern Longmont, I-25 and the residential communities in Weld County. The current highway has paved shoulders but travel by bicycle is constrained by high traffic volumes and lack of facilities through its major intersections. The following future conditions are important to note:

- The highway is projected to exceed capacity over time and will likely require operational and safety improvements at signalized intersections and major trail crossings

State Highway 7 (SH 7; Arapahoe Avenue/Baseline Road) is a two-lane highway carrying multiple modes of travel through multiple incorporated areas including the cities of Boulder, Lafayette, Erie, Broomfield and out to Hwy 76 in Brighton. The highway has a multiuse path along a two-mile section constructed in 2009 and the JUMP bus route operates between the Boulder, Lafayette, and Erie. The following current and future conditions are important to note:

- Two recent planning studies examine future conditions along Highway 7 and identify improvements along the entire stretch of highway from Boulder to Brighton. A second study—the SH 7 Planning and Environmental Linkages Study (PEL)—looked at potential future safety and capacity improvement projects over the next forty years. The SH 7 Bus Rapid Transit (BRT) Feasibility Study looked at options to provide BRT service between Boulder and Brighton and recommends implementing BRT service given current projections of population, employment and travel demand between now and 2040.
- Five intersections along SH 7 are of interest to Boulder County. Improvements to the intersections with 75th Street, 95th Street, US 287, 119th Street and East County Line Road would have large safety and operational benefits and help reduce the increased use of parallel county facilities.
- The highway crosses Dry Creek east of North 75th Street. This structure would need to be replaced if widening occurs. There are significant functional issues in regard to accommodating bikes and pedestrians on the structure as well as a potential trail underneath the highway due to resiliency concerns during future flood events.
- In 2018 a regional coalition applied for and was awarded $6M in federal funding to complete preliminary engineering and environmental clearances for specific project components in the corridor. This $6M in federal funding is matched with $4M in local funding for a total of $10M.
- RTD's Station Area Master Plan for the SH 7 BRT was completed in 2019

COUNTY FACILITIES

Valmont Road/Isabelle Road Corridor is a two-lane minor arterial that carries multiple modes between Boulder and Erie. Use of the corridor is constrained by two off-set intersections at 95th Street that limit the ability to provide safe and convenient east-west travel along the corridor and safety concerns at the intersection with US 287. The following current and future conditions are important to note:

- Since 2001, the county has widened 5.5 miles of the corridor including bridge replacements over Boulder Creek and South Boulder Creek to improve capacity between 55th Street and 61st Street and improve vehicle and bicycle safety along the

remaining stretches of county road. An additional half mile is scheduled for widening in 2020 and the remaining 1.5 miles of Isabelle Road scheduled sometime before 2025.

- The corridor intersects with several pedestrian trails and pathways including the South Boulder Creek Path, Teller Lake Trail, and a potential future parallel trail facility that would run from Valmont Road out to Erie north of Valmont Road.
- The Valmont/Isabelle corridor study was completed in 2007 to look at options for widening and/or realignment of the Valmont/Isabelle Corridor. The study recommends against the realignment of Isabelle Road to a four-way signalized intersection at Valmont Road due to concerns about impacting private properties and agricultural land uses and instead recommended focusing on improving the existing off-set intersections with 95th Street.
- Following the feasibility study, both 95th Street intersections were reconstructed in 2017 to improve safety and operations for motor vehicles and bicycles. Improvements were limited due to private property and historic property considerations.
- The 2017 intersection project does accommodate a future traffic signal at Valmont Road and 95th Street should it be warranted due to safety and/or additional capacity concerns.
- Boulder County is working with CDOT Region 4 to improve safety and operations of the US 287/Isabelle Road intersection. The project will replace the existing sub-standard traffic signal, add pedestrian crossings of both the highway and the county road and a widening of Isabelle Road with paved shoulders and turn lanes. The ability to add capacity to that facility was limited by the impacts that additional throughput would have on the stop-controlled intersection at 95th Street.

Baseline Road is a two-lane minor arterial extending between Boulder and Lafayette. The road varies in width and capacity, accommodates cyclists with wider than standard shoulders and the 225 transit service operates between Boulder and Broomfield. The corridor is constrained at Cherryvale Road which is controlled by two three-way stops that cause significant operational problems during the peak hours. The following current and future conditions are important to note:

- Past intersection studies have shown that a roundabout at the south intersection with Cherryvale Road would improve the ability of the corridor to handle traffic and would improve access to the City of Boulder's adjacent Bobolink Trailhead
- Baseline Road provides access to the Dry Creek Trailhead as well. Access into and out of that facility is constrained by a crossing of Dry Creek #3 and the lack of turn lanes along Baseline Road. The culvert carrying Dry Creek under the road needs to be replaced and may offer opportunity to improve access for all users.
- The county has identified an extension to the Callahan Trail from Baseline Road to East Boulder Trail

South Boulder Road provides a direct route between Boulder, Lafayette and Louisville. The road is four-lanes for much of its length but narrows to two-lanes along the final mile from downtown Lafayette to 120th Street. Bike lanes and/or shoulders provide access for bicyclists along the whole corridor. The DASH bus service operates along this roadway, providing service between Boulder, Louisville, and Lafayette. The following future conditions are important to note:

- The county is working with Lafayette on the final design to improve the eastern portion of the roadway by reconstructing South Boulder Road to accommodate bike lanes, new sidewalks, a multi-use path and intersection improvements of 120th Street/South Boulder Road and 120th Street/Emma Street, along with a new multimodal bridge over Coal Creek.

SUMMARY

The current capacity for east-west travel along both state highways and local county roads is far lower than the demand for east-west travel. As such, any operational or capacity improvement to one corridor will likely draw additional peak-hour traffic, but subsequently increase the traffic and the associated impacts of traffic, especially on the county facilities. Identifying actions that will improve safety and expand multimodal mobility must also consider the negative impacts of facility expansion. Recommendations need to acknowledge the potential impacts on parallel facilities and focus mobility improvements on the two state highways while improving multimodal safety improvements on the county network.

3 - NORTH-SOUTH CORRIDORS

Similar to the east-west corridors described in Section 2, state highways carry the majority of traffic for the north-south corridors. Only one corridor within this category is a county facility and thus partnerships and collaboration are critical to work toward improvements. All corridors can accommodate bicyclists but all roadways only provide a shoulder. Limited transit operates on some of the corridors, operating to serve peak regional trips between Boulder-Lyons and Denver-Longmont.

STATE FACILITIES

Highway 42 is a minor two-lane arterial facilitating trips within Louisville and Lafayette. The roadway does not have a consistent bike facility throughout, and instead there are a number of different types of facilities. The 228 and DASH bus routes operate along segments of this roadway. The 228 operates between Boulder and Broomfield. The DASH operates between Boulder and Lafayette.

The following current and future conditions are important to note:

- Led by the City of Louisville, a corridor study was completed in 2013, leading the development of a multimodal design and implementation plan, with Boulder County and CDOT providing funding as project partners. The study includes the conceptual design of a pedestrian underpass of Highway 42 near Paschal Drive, which is part of the Transportation Sales Tax project list.
- The subsequent "Highway 42 Conceptual Design Plan for the Reconfiguration of Highway 42: Including Highway Access Control, Multimodal and Intersection Improvements. This will be a comprehensive reevaluation for the SH 42 between Empire Road and Arapahoe Road.

US 287 serves as a major regional arterial, facilitating longer-distance regional trips and feeding statewide connections to the north of Boulder County. US 287 serves as a local Main Street as it passes through Longmont. A number of bus routes operate along this roadway within Longmont, including: 324, BOLT, J, LD1/LD2/LX2. The 324 provides local access within Longmont, while the remaining provide regional service (the BOLT and J to Boulder and LD1/LD2/LX2 to Denver). The corridor is projected to experience moderate population and employment growth, especially in the northern section of Boulder County. The following future conditions are important to note:

- The City of Longmont is currently completing the Main Street Corridor Plan, which will set a vision for the future of this corridor
- The 1st & Main Station Transit Revitalization Plan created a vision for the future station, first accommodating buses with anticipation of rail

North Foothills Highway (US 36) is a two-lane highway that provides access between Boulder, Lyons and Rocky Mountain National Park. The highway is an important regional connection with wide shoulders for road safety and high use from bicyclists. High vehicle speeds and traffic volumes make this a stressful corridor for both motorists and bicyclists. RTD provides peak-hour transit service between Boulder and Lyons along the Y route. The corridor is a popular route with cyclists with a high number of bike injuries and has been identified for an enhanced bicycle facility. Intersection improvements such as roadway striping and/or green pavement treatments at intersections could assist motorists and cyclists as an interim treatment. The following current and future conditions are important to note:

- Past studies have evaluated the feasibility of additional grade-separated interchanges at Arapahoe Road and Baseline Road, but the studies recommended at-grade intersection improvements at these major intersections in lieu of new interchanges
- The City of Boulder has funding to complete an underpass at Colorado Avenue

- Boulder has identified the corridor as a potential future trail corridor to link the boulder reservoir with the Jodder Trail and Lefthand Canyon

Highway 93 is a two-lane major regional arterial with passing lanes providing access between south of Boulder and Golden. The shoulder provides access for bicyclists. The GS bus route provides transit service between Boulder and Golden. The following future conditions are important to note:

- The WestConnect Coalition PEL Outlines the following improvements: Roadway improvements to reduce congestion (but not widening to a four-lane highway in the section within Boulder County), improve highway speeds, provide more transit, and continuous separate trail. The study also recommends at grade intersection improvements at SH 128 and SH 170, including a channelized-T intersection at SH 128.

COUNTY FACILITIES

95th Street is a two-lane minor arterial providing access between Longmont, Lafayette and Louisville. The roadway accommodates bicyclists on widened shoulders but has no transit service. Incremental improvements to the paved shoulders and at select intersections have improved safety. Crossings at Boulder Creek is subject to flooding and could warrant improvements to resiliency against future flood events.

SUMMARY

The north-south corridors are located throughout the county, providing important regional access within the county as well as areas to Jefferson and Larimer Counties. Recommendations need to address the challenges that two-lane roadways present, while respecting the more rural character of most of these corridors.

4 - US 36

Growth in population and employment within southeast Boulder County, Broomfield, and areas east of Broomfield, (including southwest Weld County and northwest Adams County), will result in significant increased travel demand along the southeast border of Boulder County. The travel corridor is a key connection for Boulder County communities to access the greater metropolitan region.

Even though major improvements along US 36 were completed in 2016, Boulder County will continue to actively participate with partners along the corridor to monitor implementation and make additional improvements identified in the US 36 Environmental Impact Statement Record of Decision. Partners include CDOT, RTD, and other federal, state, and regional entities, including the US 36 Mayors and Commissioners Coalition (US 36 MCC) and Commuting Solutions Transportation Management Organization (TMO). The following existing conditions are important to note:

- The FF bus services provides a variety of slightly modified routes with service between Boulder and Denver
- The Northwest Rail Line is part of RTD's 2004 voter-approved FasTracks plan to expand transit across the Denver metro region. The proposed 41-mile diesel commuter rail corridor would operate between Denver's Union Station and Longmont, passing through north Denver, Adams County, Westminster, Broomfield, Louisville, Boulder and Boulder County [Included within Corridors East-West, US 36 and SH 119].

US 36 Highway Improvements

A major construction project occurred along US 36 to improve access for multiple modes. Improvements included:

- Reconstruction of US 36 to add a new buffer-separated managed lane in each direction from Pecos Street to Table Mesa
- Improvements to side-loading Bus Rapid Transit (BRT) stations, park-n-rides and roadways, including the addition of queue jump lanes, to facilitate BRT service
- Intelligent Transportation Systems (ITS) for transit and tolling operations
- Roadway reconstruction and bridge replacement (Lowell Boulevard, 112th Avenue, and Wadsworth Parkway)
- Corridor-wide commuter bikeway
- Transportation Demand Management (TDM) program during construction

5 - SH 119 (DIAGONAL HIGHWAY)

SH 119 is a four-lane limited access highway providing access between Foothills Parkway (SH 157) in Boulder and Ken Pratt Boulevard (SH 119) in Longmont. In addition, it also provides access to Boulder from communities north and east of Longmont. The BOLT and J bus routes provide service along the corridor, and the Niwot Park-n-ride is located at Niwot Road. A large part of the Longmont-Boulder (LOBO) Regional Trail is constructed along the travel corridor, and the highway has bikeable shoulders. The following future conditions are important to note:

- Boulder County supports multimodal intersection improvements at SH 52, including queue jump lanes
- RTD is currently leading a study to determine details of a BRT system that would operate between Boulder and Longmont along SH 119. A preferred alternative has been identified that includes two route options, providing similar access to the current BOLT and J routes. The service is proposed to operate in the center of the roadway in managed lanes, sharing the lanes with carpoolers and solo drivers willing to pay a toll.

6 - NORTHWEST RAIL

The Northwest Rail line is part of RTD's 2004 voter-approved FasTracks plan to expand transit across the Denver metro region. The proposed 41-mile diesel commuter rail corridor would operate between Denver's Union Station and Longmont, passing through north Denver, Adams County, Westminster, Broomfield, Louisville, Boulder and Boulder County [Included within Corridors East-West, US 36 and SH 119].

KEY REGIONAL CORRIDOR RECOMMENDATIONS

IMPLEMENTATION ACTIONS

- Prioritize moving people, not cars
- Explore options to increase revenue necessary to implement the identified regional project priorities
- Provide alternatives/choice on major corridors
    - Improved transit service
    - Bicycle infrastructure improvements
    - Managed lanes
    - Shoulders
- Focus on operational improvements—including vehicle capacity expansion—at intersections. This can include additional turn lanes and through lanes. [Included within Strategies 1 & 3]
- Working through CDOT, consider additional managed lanes on all corridors in the Northwest Area Mobility Study to be used for transit and high occupancy vehicles (HOVs). *[Included within Strategies 1 & 3]*
- Support Northern Area Mobility Study (NAMS) corridor recommendations for:
    - Hwy 119
    - Hwy 7
    - Hwy 287
    - Hwy 42
    - South Boulder Road
    - Northwest Rail

The following tables outline recommendations by corridor (see Table S3-1-Table S3-4).

TABLE S3-1: EAST-WEST CORRIDOR IMPLEMENTATION ACTIONS

Implementation Actions	Valmont Rd/ Isabelle Rd	SH 66	SH 52 (Mineral Rd)	SH 7 (Arapahoe Rd)	Baseline Rd	South Boulder Road	Implementation Notes
Transit							
BRT/High frequency bus service				●	●	●	
Commuter rail				●			Commuter rail identified in FasTracks and NAMS
Local transit connections			●	●	●	●	Includes transit continuation from SH 119
New Park-n-Ride facilities		●	●				Park & Ride facilities located at SH 66/US 287 and I-25
Park-n-Ride capacity improvements				●	●	●	
Bus stop enhancements/First and final mile amenities						●	
Queue jump lanes				●	●	●	
Bike storage							
Transit signal priority (TSP)							
Feasibility study							
Regional Trails, Bicycle and Pedestrian							
Regional trail connections	●	●	●	●	●	●	Regional trail connections along the RTD Rail Corridor (Boulder-to-Erie) and St. Vrain, (include primary network bicycle connection from Lafayette/N Louisville to Boulder via SH 7, Baseline and/or BNSF corridor)
Bikeable shoulders	●	●	●	●	●		
Multiuse paths							
Grade-separated crossings for bicyclists and pedestrians	●	●	●	●	●	●	Grade separations at key roads and rail crossings and connections to local system
Study for preferred alignment	●	●	●	●	●		Study for preferred alignment for east-west low stress bicycle and pedestrian facilities (Baseline, Arapahoe, BNSF)

Implementation Actions	Valmont Rd/ Isabelle Rd	SH 66	SH 52 (Mineral Rd)	SH 7 (Arapahoe Rd)	Baseline Rd	South Boulder Road	Implementation Notes
System Management							
Intersection improvements for multimodal safety and operations	●	●	●	●	●	●	Operational improvements to both 61st and US287 to improve intersection safety on Valmont Rd/Isabelle Rd. Signal timing on SH 52.
Signal detection	●	●	●	●	●	●	
Crossing improvements	●	●	●	●	●	●	
Frontage road / Cycling area	●	●	●	●	●		
Turn lanes	●	●	●	●	●	●	
Managed lanes							
Evaluate existing conditions							

TABLE S3-2: NORTH-SOUTH CORRIDOR IMPLEMENTATION ACTIONS

Implementation Actions	North Foothills Hwy/US 36	SH 42 (N. 95th St)	US 287	South Foothills Hwy/SH 93	Implementation Notes
Transit					
BRT/High frequency bus service		●			BRT identified in NAMS
Commuter rail		●	●		Commuter rail identified in FasTracks, NAMS, and North I-25 EIS
Local transit connections		●	●	●	Improved transit between Golden and Boulder
New Park-n-Ride facilities			●	●	Park-n-Ride at SH 93 & SH 170
Park-n-Ride capacity improvements		●	●	●	
Bus stop enhancements/ First and final mile amenities		●	●	●	
Queue jump lanes		●	●	●	
Bike storage		●	●	●	
Transit signal priority (TSP)		●	●	●	
Feasibility study			●		Feasibility study for bus rapid transit/North Front Range Connection
Regional Trails, Bicycle and Pedestrian					
Regional trail connections					
Bikeable shoulders		●	●	●	
Multiuse paths	●	●	●	●	Separated bikeway from SH 170 to Golden
Grade-separated crossings for bicyclists and pedestrians		●	●	●	Includes waterways, roads, and highways
System Management					
Intersection improvements for multimodal safety and operations	●	●	●	●	
Signal detection		●	●	●	
Crossing improvements		●	●	●	
Frontage road / Cycling area					
Turn lanes					
Managed lanes					
Evaluate existing conditions					

TABLE S3-3: US 36 CORRIDOR IMPLEMENTATION ACTIONS

Implementation Actions	US 36	Implementation Notes
Transit		
BRT/High frequency bus service		
Commuter rail	●	Commuter rail identified in FasTracks and NAMS
Local transit connections	●	
New Park-n-Ride facilities		
Park-n-Ride capacity improvements	●	Improvements to Table Mesa Park-n-Ride
Bus stop enhancements/First and final mile amenities	●	Downtown Boulder Station improvements
Queue jump lanes	●	Queue jump/transit lanes within City of Boulder
Bike storage	●	
Transit signal priority (TSP)	●	TSP in coordination with local governments and CDOT
Feasibility study		
Regional Trails, Bicycle and Pedestrian		
Regional trail connections		
Bikeable shoulders		
Multiuse paths		
Grade-separated crossings for bicyclists and pedestrians	●	Grade separations at key roads and rail crossings and connections to local system
Evaluate existing conditions	●	
System Management		
Intersection improvements for multimodal safety and operations		
Signal detection	●	
Crossing improvements		
Frontage road / Cycling area		
Turn lanes		
Managed lanes		
Evaluate existing conditions	●	

TABLE S3-4: SH 119 (DIAGONAL HIGHWAY) IMPLEMENTATION ACTIONS

Implementation Actions	SH 119 (Diagonal Highway)	Implementation Notes
Transit		
BRT/High frequency bus service	●	
Commuter rail	●	Commuter rail identified in FasTracks, NAMS, and North I-25 EIS
Local transit connections	●	
New Park-n-Ride facilities	●	
Park-n-Ride capacity improvements	●	
Bus stop enhancements/ First and final mile amenities	●	
Queue jump lanes		
Bike storage	●	
Transit signal priority (TSP)	●	
Feasibility study		
Regional Trails, Bicycle and Pedestrian		
Regional trail connections	●	Longmont-to-Boulder Trail connections (William's Fork/Twin Lakes, Jay Road, Four Mile Creek)
Bikeable shoulders		
Multiuse path	●	Paved, plowed, and separated bikeway, parallel to SH 119
Grade-separated crossings for bikes and pedestrians	●	
System Management		
Intersection improvements for multimodal safety and operations	●	Support for a cost effective solution at SH 52 Intersection enhancements to improve safety for all modes and reduce congestion
Signal detection	●	
Crossing improvements	●	
Frontage road / Cycling area		
Turn lanes		
Managed lanes	●	
Evaluate existing conditions		

TABLE S3-5: NORTHWEST RAIL IMPLEMENTATION ACTIONS

Implementation Actions	Northwest Rail	Implementation Notes
Transit		
BRT/High frequency bus service		
Commuter rail	●	Commuter rail identified in FasTracks, NAMS, and North I-25 EIS
Local transit connections	●	
New Park-n-Ride facilities	●	
Park-n-Ride capacity improvements		
Bus stop enhancements/ First and final mile amenities	●	
Queue jump lanes		
Bike storage	●	
Transit signal priority (TSP)	●	
Feasibility study		
Regional Trails, Bicycle and Pedestrian		
Regional trail connections		
Bikeable shoulders		
Multiuse path		
Grade-separated crossings for bikes and pedestrians		
System Management		
Intersection improvements for multimodal safety and operations	●	
Signal detection		
Crossing improvements	●	
Frontage road / Cycling area		
Turn lanes		
Managed lanes		
Evaluate existing conditions		

STRATEGY 4—INCREASE ACCESSIBILITY

Boulder County implements transportation strategies to expand personal mobility, improve job and educational access, and increase transportation options. Boulder County will expand support programs to make transportation more accessible to mobility-challenged and vulnerable populations.

ACCESSIBILITY NEEDS

The BCCP Transportation Element guides Boulder County to create transportation system access for low-income, elderly, and mobility-impaired populations. Boulder County will work to create a transportation system that provides affordable, accessible, equitable, and convenient transportation options for all income levels and special mobility populations. All populations need reliable transportation, and there is a significant need to improve overall access to the transportation system in Boulder County for vulnerable populations. These groups include:

- People with low incomes
- People with disabilities (cognitive and physical)
- Older adults
- Youth and families
- People who do not drive or have access to a personal motor vehicle

People in these population groups may experience a variety of barriers to using existing transportation options. Additionally, some may have personal limitations accessing transportation due to physical or cognitive disabilities. Challenges may include: limited service hours, inconvenient pickup and drop-off locations, the cost of public and private transportation, technology barriers, lack of wheelchair accessibility, and reliability of public and community-based transit.

ADDRESSING HUMAN SERVICES NEEDS

Transportation is a social determinant of health[17] and the linchpin for access to human services. All people, regardless of age or disability, should be able to live independently and participate fully in their communities and transportation is an essential component to community living. In recent years, Boulder County human services agencies have undertaken several planning and program development initiatives to address demographic trends, enhance service delivery among different agencies, and develop creative approaches to meeting individual and community needs.

One focus of recent efforts has been the anticipated increase in the number of older adults in the county and the way it will influence Boulder County's communities and residents. As noted in the introduction, according to the State Demography Office, by 2040, 22 percent of Boulder County residents will be 65 years old or older. Community discussions and research indicate that the county's older adult population will have needs and desires that have direct implications for the transportation system:

- Older adults want to stay in their own homes for as long as possible
- Older adults want to be involved in and contribute to the life of their community
- Older adults need access to services

When driving is no longer an option for the older adult population, meeting all of these needs becomes more difficult. This is particularly problematic for Boulder County mountain community residents, because they live in remote areas and are farther away from activities and services than residents who live in the plains communities. Several Boulder County human services plans identify recommendations for addressing these transportation issues and increasing access to the transportation system for older adults and other special needs populations.

HUMAN SERVICES TRANSPORTATION

Human services transportation in Boulder County is generally divided into Medicaid-funded services, non-Medicaid-funded services, and complementary paratransit. Coordination of non-Medicaid-funded human services transportation occurs primarily through Via. Via is a private nonprofit organization established in 1979 to coordinate and provide transportation for older adults, people with disabilities, low-income individuals, and others with special needs in Boulder County. Via provides transportation for multiple human services agencies, senior centers, community health centers, housing authorities, and residential care facilities both directly and

[17] The Office of Disease Prevention and Health Promotion (ODPHP) identifies transportation as a social determinant of health. Resource available online at: https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health

through coordination with other service providers such as RTD, zTrip, and Cultivate. Medicaid-funded transportation is coordinated by IntelliRide, the contracted Medicaid broker for the region.

RTD operates Access-a-Ride as the complementary ADA paratransit service for certified individuals with disabilities. The complementary paratransit service must be provided within three quarters of a mile of a bus route or rail station, at the same hours and days, for no more than twice the regular fixed route fare. The Access-a-Ride certification process can be complicated to navigate for some people with disabilities or Limited-English Proficiency populations.

While Via and IntelliRide help many people access appropriate transportation options throughout the county, there are significant challenges to adequately meeting the current and projected mobility needs of the county's residents, including:

- Majority of available federal funding is for older adults and people with disabilities
- Limited funding for transportation assistance to low-income, minority, and youth populations
- Existing paratransit system is financially unsustainable
- Service limitations:
  - Weekend and evening services are minimal
  - Regional trips are limited to certain days and hours
- Coordination is necessary among transportation service providers, schools, veterans' services, and human services agencies
- Public knowledge and understanding of available transportation options is limited and fragmented
- Inadequate resources to meet the diverse transportation needs of clients

BOULDER COUNTY ACCESSIBILITY PROGRAMS

Boulder County promotes independent living and social engagement by expanding personal mobility options for residents with mobility challenges. Boulder County actively engages with older adults, persons with disabilities, representatives of public, private, and nonprofit transportation organizations and human services providers in accessibility planning and program activities through its Mobility for All Program (M4A) and Local Coordinating Council (LCC), a human-centered transportation coalition. These accessibility programs support agencies that serve special needs populations in order to:

- Identify and develop solutions for regional and cross county travel, including links between local services
- Provide opportunities to coordinate service delivery and to efficiently use public and private funding for transportation among different transportation and human services agencies
- Increase the accessibility of public information about the availability of existing programs and about how to use them through education and outreach
- Advocate for accessible, affordable, and equitable transportation options
- Overcome technology barriers to accessing transportation services, such as Uber, Lyft, RTD Mobile Ticketing, and Google Maps multimodal trip planning

MOBILITY FOR ALL PROGRAM

Boulder County created the Mobility for All program to provide transportation-related assistance to low-income residents of Boulder County. The purpose of this support is to enable access to jobs, job training or education, and job interviews to support the achievement of financial self-sufficiency. The program coordinates with number of human service programs to provide support to people within the following programs:

- Transitional housing
- Domestic violence safehouses
- Workforce development and family
- Children's services

Through Mobility for All, Boulder County provides the following services and assistance to low-income individuals and families throughout the county:

- Subsidized transit passes
- Housing-based EcoPasses
- Peer and case manager travel training
- Expanded and personalized transportation solutions
- Bike-to-transit workshops and earn-a-bike program
- Transportation Network Companies (TNC) travel education programs

Partnering with county human services case managers and nonprofit agencies, Mobility for All provides transportation support as part of a comprehensive package of services designed to help low-income persons achieve self-sufficiency.

PROGRAM ACTIVITIES

Although originally established to provide transportation assistance to low-income individuals and families, Mobility for All has expanded to address the accessibility needs of other vulnerable population groups, including youth, older adults, and residents with mobility challenges. The program's focus—to increase affordable, accessible, and reliable transportation options—remains the same.

Mobility for All program activities will continue in the following four areas:

- **EcoPass Program:** Boulder County's current housing EcoPass program provides transit passes to residents in housing communities—two in Longmont and one in Lafayette. Program expansion in this area includes implementing pass programs at additional housing sites or on a community-wide basis. Implementing an EcoPass program for participants in human services programs is another way to expand Mobility for All's EcoPass program.
- **Mobility Options:** Boulder County contracts with Via through its Aging Services, Community Services, and Health and Human Services departments to impact and influence service offerings. Expanded services could include increased capacity for door-through-door driver-assisted services, community or volunteer-based services, and expanded transit service times and routes. They would include a number of different strategies, including connected/autonomous vehicles, scooters, e-bikes, apps, and additional technologies as they become available.

- **Culturally Responsive and Inclusive Education and Outreach Strategy:** Boulder County Mobility for All completed a comprehensive Latino outreach strategy in 2016. Mobility for All will continue to expand Latino and Limited English Proficiency engagement to provide information to underserved populations throughout Boulder County so they are aware of the accessible, affordable, and equitable transportation services.
- **Technology Education:** Boulder County Mobility for All has started an inclusive planning process to develop transportation-related technology workshops for underserved populations who may experience technological barriers to accessing new smartphone application-based services, such as Uber, Lyft, Google Maps, RTD Mobile Ticketing, Transit Apps, etc. These workshops will be used as the foundation for a broader peer-to-peer Technology Mobility Ambassador project to build community capacity and resiliency in an era of rapidly changing advanced mobility options.

SUPPORTING SCHOOL TRANSPORTATION

Transportation associated with school contribute to the overall regional travel picture within Boulder County. School choice (or open enrollment) in public and private Pre-Kindergarten through 12th grade, allows families to select the school that is best for them, even though it may not be their neighborhood/zoned school. Families agree to get the student to and from the choice-school on their own, since school bus service is only provided for zoned public schools. Private schools may or may not be able to provide transportation for students. This option within both school districts in Boulder County (St Vrain Valley School District and Boulder Valley School District) has many regional transportation implications but also equity implications, which need to be better understood.

Boulder County currently supports a number of programs operating within both school districts, encouraging youth and families to use multimodal transportation options when possible to travel to and from school. A number of school-based non-infrastructure and infrastructure-based programs or projects have been implemented.

- Non-Infrastructure
  - Trip Tracker program (implemented in both school districts independently): encourages students and staff to get to school using a mode other than driving/being driven alone. Participants earn points that then turn into Tracker Dollars that they can use like real money at local businesses. The program buys back the Tracker Dollars at $0.50 for every dollar.
  - Trip Tracker school participation maps

- Walkability and/or bikeability assessments of a school's surrounding geography
- Safe routes to school evaluation tools: parent surveys and teacher tallies that identify travel modes and associated behavioral data
- Educational events: pedestrian and bikes safety skills practice (Rodeos)

- Infrastructure: Identifying infrastructure as a result of identified needs in walkability/bikeability assessments. The following infrastructure improvements have been completed as a result of this analysis:
  - Niwot Cycletrack (SVVSD)
  - Morton Heights concrete improvement plans surrounding Niwot Elementary (SVVSD)
  - Heatherwood Elementary sidewalk and crosswalk improvements

PROGRAM EXPANSION

Using the Safe Routes To School 6E's Framework as a guide, Boulder County will provide a robust package of options to support local families and community partners in addressing school based travel impact. Boulder County will continue to support existing programming, as well as, asses local needs to identify new initiatives that will support families with school transportation options.

- Encourage families to transport children to school through walking, bicycling, or other forms of green and/or active transportation via Trip Tracker Program, coordinating with both local school districts and partners
- Conduct walkability and bikeability assessments along routes to schools to identify opportunities and needs for infrastructure improvements (e.g. assess presence and quality of sidewalks and low-stress bicycle facilities, assess safety of crossings, and evaluate ability to take routes with low traffic)
- Support public and private schools in collecting, analyzing, and assessing their data about current travel behaviors and their resulting potential for behavior change
- Support funding for school-based programs and bicycle and pedestrian facilities

LOCAL COORDINATING COUNCIL

Together, Boulder County and Via established a Local Coordinating Council (LCC) in 2012 to examine transportation resources and needs throughout the county and to improve human services transportation coordination and services. The LCC's purpose is to foster working relationships among human services and transportation agencies in order to decrease overall costs and increase the ability of agencies within the county to provide transportation services to special needs populations. By coordinating individual human services transportation programs, the LCC seeks to most efficiently use limited transportation resources and create more options for county residents.

The LCC's vision is to promote and provide accessible, affordable, and equitable transportation options for Boulder County through collaboration and coordination between service providers. The objectives of this effort are to:

- Identify existing transportation needs, resources, and gaps
- Share and distribute information about transportation resources and options
- Develop solutions to specific transportation challenges
- Pursue additional transportation funding opportunities
- Integrate and expand existing transportation programs into the human services transportation network
- Develop an organizational structure for collaborating and coordinating human services transportation resources and needs
- Advocate for expanding accessible, affordable, and equitable transportation options
- Strive for an accessible network of transportation options to get people where they need to go

LCC Member Agencies

The LCC includes a number of different agencies, including:

- Local agencies (City of Longmont, City of Boulder)
- Cultivate
- Safehouse Progressive Alliance for Nonviolence
- Bridge House
- OUR Center
- Emergency Family Assistance Association
- Association for Community Living (ACL)
- Community Cycles
- Boulder Housing Partners
- Boulder County Housing & Human Services
- Focus Reentry
- Boulder County Area Agency on Aging
- Denver Regional Mobility and Access Council (DRMAC)
- Service operators (RTD, Via, zTrip, eGo Car Share)
- Colorado Community Health Alliance Center for People with Disabilities
- Peak to Peak Housing and Human Services Alliance
- Boulder Transportation Connections (BTC)

ACCESSIBILITY PRIORITIES

Mobility impairments include financial, physical, and cognitive challenges and can occur at any phase of life. The ability to navigate the community in a safe, efficient, and comfortable manner is the key to maintaining livability and independence for all county residents. As Boulder County's demographics change, it will become even more important for transportation infrastructure to include features that are designed to assist persons with mobility challenges.

Boulder County was awarded an Inclusive Planning Grant from the US Administration of Community Living in partnership with Federal Transit Administration and administered by the Community Transportation Association of America. These funds were used to expand public engagement about the TMP with a specific focus on older adults, people with disabilities, and their caregivers.

➲ Infrastructure improvements will need to consider elements that address potential mobility challenges, as shown in *Strategy 1 – Develop a Multimodal Transportation System*.

The concepts and improvements identified here include considerations and recommendations specifically from the inclusive planning community member and stakeholder task force as well as public feedback.

The online survey revealed a number of top priorities, some of which were similar to the overall priorities of the general population. The top three priorities of all survey respondents were: reducing traffic congestion, enhance transit services and enhance walk/biking facilities. Reducing traffic congestion was also the top priority for population groups discussed here, with most groups identifying enhancing transit services or improving safety as the additional top priorities.

Overall, members of the inclusive planning stakeholder group identified the importance of transportation in their daily lives. Cautiously open about the benefits technology can bring, they also highlighted the importance of improvements to the existing system as well, including:

- Support for traditional intersections
- Extended intersection crossing time for pedestrians
- Separated bike facilities
- Better access to/from bus stops
- Signage improvements

- Cheaper fares/more access to transit passes
- Improved intersection safety

When asked specifically about transit priorities, the top three responses of all survey respondents were: increase frequency, expand service area, and a three-way tie for third (faster travel time, more evening weekend service, and cheaper fares/more access to passes). Expand service area and increase frequency were the top priorities for the population groups discussed here, with a mix of increase frequency, expand service area, and more evening/weekend service identified for the additional top priorities.

In one of the inclusive planning stakeholder group meetings, participants were asked to engage in a dot voting exercise. The top priority was evening and weekend bus service. The second priority was cheaper fares/more access to passes.

When asked specifically about bicycling priorities, the top three choices of all survey respondents were: adding bikeable shoulders, increasing number of separated facilities, and improving intersection safety. Adding bikeable shoulders was also the top priority for population groups discussed here, with increase in separated facilities, and improved intersection safety as addition top priorities.

Participants in the inclusive planning stakeholder group reiterated the need for some separation between vehicles and bicyclists, whether that means bikeable shoulders or a separated facility. The benefits of e-bikes and trikes were also discussed and received support from many of the members as a viable way for some people to get around.

INCREASE ACCESSIBILITY RECOMMENDATIONS

IMPLEMENTATION ACTIONS

- Incorporate affordable transportation in affordable living programs
  - Consider access to affordable transportation options when developing affordable housing
  - Improve access to more affordable fuel efficient vehicles for low-income households
  - Pursue mobility-as-a-service options for low-income and mobility disadvantaged populations

- Expand transportation options
  - Expand and enhance accessible, affordable, and equitable mobility options for youth and families, older adults, people with disabilities, individuals with low income, and others living with mobility limitations
  - Increase bike-to-transit workshop and earn-a bike programs to provide transportation options and make bus travel more accessible
- Increase transportation education
  - Provide individual and group travel training to teach people with limited mobility how to safely and confidently use public transportation
  - Publish and distribute maps and other information to educate all groups about the availability of transportation options
  - Create centralized trip booking and dispatch center for coordinated human services transportation providers
  - Support 'one-call' information and referral services to help those faced with mobility challenges
  - Develop technology curriculum for older adults and people with disabilities to access transportation-related mobile applications, such as RTD Mobile Ticketing, Google Maps Multimodal Trip Planning, Uber, Lyft, etc.
- Provide transit pass assistance
  - Community-wide EcoPasses to enable more transit use
  - Support RTD in the creation of a low-income pass program
- Support schools in their efforts to promote non-Single Occupancy Vehicle transportation by incorporating multimodal and active transportation education into curriculum
- Support youth multimodal transportation
  - Conduct a needs assessment/gaps analysis focused on school travel to evaluate how current transportation systems are meeting demand
  - Conduct a crossing guard inventory to conduct an equity analysis, which will result in recommendation to local partners on how to improve safety of routes to schools
  - Assess affordability of subsidizing ride-sharing or mobility on demand options for school related travel needs

  - Collaborate with local governments and school districts to identify local, regional, state, and federal funding sources for infrastructure and non-infrastructure improvements
- Conduct Spanish-language outreach and public engagement
- Help individuals with disabilities navigate the RTD Access-a-Ride certification process

STRATEGY 5—MOUNTAIN AREA CONNECTIONS

Transportation connections are vital for Boulder County communities to function and prosper and for residents and visitors to enjoy the county's recreational opportunities. The Boulder County Transportation Master Plan highlights Boulder County's role in addressing local and regional transportation needs in the western portion of the county in several ways. The Transportation Master Plan identifies major recreational destinations and suggests ways to enhance multimodal access to them. The Transportation Master Plan also identifies strategies to address the unique transportation challenges for residents of the mountain communities.

MOUNTAIN AREA COMMUNITIES

In western Boulder County, numerous mountain communities are home to thousands of residents. These communities are categorized as one of three types in the Transportation Master Plan: gateway communities, historic communities, or canyon communities. The Towns of Lyons and Nederland are gateway communities, located at an entry or access point to the recreational opportunities of western Boulder County. Allenspark, Eldora, Eldorado Springs, and Gold Hill are historic communities, characterized by physical and cultural elements linked to past periods and events. Jamestown and Ward are canyon communities, characterized by their constrained locations within James Canyon and Lefthand Canyon, respectively.

These mountain communities provide services to their residents and those who live in surrounding areas. However, these communities cannot provide all of the services that are available in eastern Boulder County and beyond. Transportation connections within, to, and from these communities are needed to provide travel options and greater connectivity to the larger region. This need will become greater as the population of the area ages, growing more reliant upon alternative transportation modes, and residents require services that are only available on the plains. Other issues for the mountain communities include:

- Effect of regional travel to recreational destinations in western Boulder County, both beneficial (increased visitation and tourism dollars) and negative (increased traffic congestion and other impacts from pass-through trips)
- Conflicts along the main travel corridors between residents and cyclists who ride along the roadways for recreation and during special events. Though residential growth in western Boulder County is expected to be minimal in the future, these user conflicts may increase due to population growth expected in eastern Boulder County and the Denver metropolitan area.

In developing implementation actions to support local communities, Boulder County is committed to addressing local and regional transportation needs in the western portion of Boulder County. Transportation strategies developed to address area-specific issues must be compatible with local needs and goals, balancing both community and transportation goals.

MOBILITY SOLUTIONS

Given the conditions within the mountain communities, traditional transit is not a viable option in many cases. However, Boulder County is still committed to improving mobility to and from the mountain communities, especially for the residents who need to travel to larger communities for services. A number of potential solutions have been identified and are described below.

VOLUNTEER DRIVER PROGRAM

The mountain communities are aging faster than other areas of Boulder County and many older adults want to age in place, which can pose mobility challenges. Mobility for All is working with mountain community residents and stakeholders to develop a volunteer driver program business plan to address human services transportation gaps in mountain communities. A volunteer driver program would provide flexibility and the individual connection many underserved populations in the mountain communities need. Mobility for All was awarded an Inclusive Planning Grant from the US Administration of Community Living in partnership with Federal Transit Administration and administered by the Community Transportation Association of America to develop the business plan.

BUS SERVICE

The Climb is a fixed-route, fixed-schedule bus route providing service between mountain communities and Downtown Boulder with one run in the morning and one run in the afternoon. Boulder County started the service in 2009 and Via took over the operation of the service in 2012. This service provides mobility for people in the mountains who have a consistent need to travel to and from Boulder.

VANPOOL

Boulder County has offered financial support to create vanpools for mountain community resident to other parts of the region. Vanpooling is a great mobility option when there is a small group of people who generally have the same origin and destination locations. Vanpooling is more flexible than a traditional shuttle and/or bus service, allowing the group of people to make decisions that works for them instead of always adhering to a set schedule. This mobility option works especially well if everyone works at one destination.

VIA FRIENDS AND FAMILY PROGRAM

Via offers a Family & Friends Mileage Reimbursement Program in the rural areas of Boulder County. This program reimburses Via riders for the mileage expenses of family members, friends, or neighbors who provide a qualifying trip when Via cannot. If Via cannot fit clients into the regular paratransit schedule or if they are in an area with limited paratransit access, they will be offered this option. All requests must be made in advance through Via's Call Center and Via sends the passenger a mileage reimbursement check once a month, which the passenger can then pass along to the driver.

GATEWAY COMMUNITIES

The Towns of Lyons and Nederland are found at access points to the recreational opportunities of western Boulder County. These communities also provide connections for mountain area residents to regional services, including the transportation system. Traffic congestion continues to increase within these communities, resulting in conflicts between local residents and visitors destined for areas beyond the communities. Boulder County will work with the gateway mountain communities to implement aspects of their existing plans that address regional and local transportation needs.

TOWN OF LYONS

The Town of Lyons is located in the foothills of northern central Boulder County at the confluence of the North and South St. Vrain Creeks. Lyons is known as the *Double Gateway to the Rockies*, with US 36 leading to Estes Park and the Rocky Mountain National Park to the northwest of town and SH 7 leading to the Indian Peaks Wilderness and mountain communities along the Peak to Peak Highway to the southwest. To the east of Lyons, SH 66 leads to the City of Longmont and US 36 leads to the City of Boulder. Lyons has a total area of just over one square mile and is home to approximately 2,000 residents.

Boulder County partners with the Town of Lyons to implement improvements that support the town's transportation goals and objectives, and that help meet regional travel needs. These include:

- Increasing route frequencies on the RTD Lyons-Boulder Y route
- Lyons Community EcoPass Program, which provides Lyons' residents with free RTD EcoPasses and unlimited usage of RTD transit services

Initial funding for these transit system enhancements has come from a variety of sources, including the countywide Transportation Sales Tax, federal grants, and state funds. A significant issue is identifying ongoing sources of funding for these programs.

TOWN OF NEDERLAND

The Town of Nederland is located next to Barker Reservoir in the mountains of southwest Boulder County. The town is home to approximately 1,500 residents at an altitude of over 8,200 feet. The junction of SH 72 (the Peak to Peak Highway) and SH 119 is located within downtown Nederland. The two highways provide valuable access to the community and are important to the tourism industry in Nederland.

The town's Comprehensive Plan identifies the following additional transportation-related goals that have regional implications:

- Continue to lead the planning and design of highway improvements from the roundabout (2nd St. and Highway 119/Bridge St.) through the Big Springs intersection (Bridge St. and Big Springs Dr.) to provide pedestrian access and safety, to facilitate the flow of vehicles through town and decrease traffic congestion, and to minimize impacts to the Middle Boulder Creek corridor.

- Access control should be implemented by discouraging driveway cuts on all state highways and requiring new developments to minimize the number of access points to the highway systems, consistent with the CDOT Access Management Plan
- Continue to support bus service in coordination with RTD, including considering additional midday service
- Coordinate with CDOT to optimize traffic flow
- Establish a functional street classification system to facilitate maintenance and improvement prioritization
- Provide convenient parking to minimize unnecessary traffic

Boulder County partners with the Town of Nederland to implement improvements that support the town's transportation goals and objectives and that help meet regional travel needs. These include:

- Nederland EcoPass Program, which provides all residents with a free RTD EcoPasses and unlimited usage of RTD transit services
- Possible expansion of regional transit service to-from Nederland, which is provided by the RTD N route, serving Nederland-Boulder (this route has proven to be consistently productive and is under consideration for expansion by Boulder County)

RTD N Service

RTD provides regional service between Boulder and Nederland on weekdays, Saturdays, and Sundays/holidays.

The service provides access to stops along Boulder Canyon as well as Nederland High School, and Eldora Mountain Resort (seasonally).

According to RTD's Service Standards Analysis Report published in 2019, the N experienced about 116,000 boardings during 2017, with an average of 20 boardings per hour, slightly less than the average boardings of all regional routes (as classified by RTD) per hour of 29. The subsidy per boarding was about $10.50, which the average subsidy among all regional routes is $6.68. The regional service also includes highly efficient routes including the 104X, 120X, AB, AT, and FF series, which greatly affect the averages.

HISTORIC COMMUNITIES/TOWNSITES

Many communities in the unincorporated county were platted with small lot sizes and face challenges as their popularity grows, including parking and emergency vehicle access. Oftentimes, tradeoffs need to be made between preserving historical character and meeting new mobility demands.

The historic communities of western Boulder County provide access to recreational destinations while serving as destinations themselves. These communities are generally found in remote settings with limited accessibility, resulting in congested roadways and limited transportation options. Limited multimodal connectivity increases the dependence upon personal vehicles for access to and from these communities. This creates challenges for individuals that cannot, or choose not, to operate a car. To address these populations, Boulder County plans to implement Volunteer Driver Program and Via's Friends and Family Program in the western part of Boulder County. The Mobility for All program is leading to effort to expand these programs beginning in Winter of 2019-2020.

MOUNTAIN AREA RECREATIONAL DESTINATIONS

Boulder County is home to many recreational destinations on Boulder County lands as well as private, state, and federal lands. Boulder County Parks and Open Space properties include more than 110 miles of trails open to the public throughout the county. There are 12 Parks and Open Space properties in the mountains and foothills that are managed in part for recreational use and that include visitor amenities.

In western Boulder County, recreational destinations are often found in remote settings with access via dirt roads or trails. The increasing popularity of many of these destinations, combined with their remoteness and limited accessibility, creates unique challenges. Specific issues include:

- Lack of available parking at destinations results in a degradation in performance of the roadway system, potentially unsafe conditions for visitors, and impacts to local communities as visitors seek other parking opportunities
- Illegal parking on county roadways constricts vehicle movements and can delay emergency vehicle response times
- Lack of multimodal connectivity increases the dependence upon personal vehicles for access to these areas, creating parking issues and presenting a challenge to the county's goal of reducing the environmental impacts of transportation

Increasing access to all crowded trailheads would be both extremely costly and possibly undesirable. Limited non-motor vehicle access coupled with constrained vehicle parking effectively limits the amount of use a trail or recreational facility gets. Establishing

new transportation connections can increase usage to beyond the natural carry capacity of the resource, thus degrading the recreational experience for all users.

Boulder County works closely with the affected stakeholders and land managers to determine when shuttle service should be provided. Considerations include, safety, facility capacity, and available funding.

During the peak summer months, weekend visitation to the Hessie Trailhead is extremely high. Increased traffic and lack of available parking is a growing problem, resulting in vehicles parking along Fourth of July Road. This narrow roadway is extremely difficult to navigate when there are high numbers of vehicles parked along the roadside.

Since 2012, Boulder County has operated a weekend, summer shuttle taking visitors to and from the Hessie Trial and the Town of Nederland. The shuttle has been very successful, with approximately 5,700 boardings in 2012 to 8,700 boardings in 2017, with about a third of all Hessie Trail visitors using the shuttle to access the area.

BETASSO PRESERVE

The Betasso Preserve is located about three miles west of the City of Boulder along SH 119 north of Boulder Canyon. The preserve covers approximately 1.8 square miles of land and had approximately 83,000 annual visitors in 2017.

To access some of the Betasso Trails cyclist and hikers use parts of Boulder Canyon Drive which has high-speed traffic, limited visibly and little to no shoulder. The county is interested in extending the off-street travel network in lower Boulder Canyon in support of better connectivity between Boulder and existing recreational amenities such as the Boulder Canyon Trail and the Betasso Preserve. Alignments under consideration include:

- Boulder Canyon Trail extension from the existing terminus at Four Mile Canyon Drive west to Chapman Drive
- Boulder Canyon Trail extension from Chapman Drive west to the Betasso Link Trail (the Betasso Link Trail, located immediately east of the SH 119 tunnel, provides access to the Betasso Preserve and all preserve trails)
- A potential new trail from Betasso Preserve to Boulder Canyon Trail, which would require securing a new access point in the southeastern portion of the preserve from Boulder Canyon near the Four Mile Canyon junction, and which would replace the existing alignment that currently terminates east of the tunnel, thus creating a more sustainable trail

These new connections, if feasible, would eliminate the need to hike or bike on Boulder Canyon Drive to access Betasso Preserve and would provide a continuous off-street connection between the City of Boulder and Betasso Preserve.

MOUNTAIN AREA RECOMMENDATIONS

IMPLEMENTATION ACTIONS

- Incorporated communities
  - Support strategies in local agency comprehensive plans that provide a regional travel benefit and support Boulder County transportation policy goals
  - Support the Towns of Lyons and Nederland to identify and implement a permanent funding mechanism for their EcoPass programs
- Consider providing connections to mountain area recreational destinations
- Identify areas within Boulder County where increased access to recreational destinations has decreased visitor safety or increased emergency vehicle response rates to dangerous levels
  - Explore a combination of illegal parking enforcement, expanded parking facilities, and new acccess shuttles to improve safety
- Implement mobility solutions that are tailored to the unique needs of the county's mountain communities
  - Develop a volunteer driver program business plan and consider pilot program
  - Continue to offer Vanpool incentives and information
  - Implement the Via Friends and Family program

PLAN IMPLEMENTATION

Boulder County funds improvements and maintenance of its multimodal transportation system with a mix of federal, state, and local funding mechanisms. This diversified mix of funding sources best provides the flexibility required to build, maintain, and operate an accessible transportation system serving all modes.

IDENTIFYING PRIORITIES

The Transportation Master Plan outlines the strategies and priorities for Boulder County to implement and maintain its multimodal transportation system. These principles will guide the county in identifying and prioritizing projects for county funding each year. Prioritization of improvements may be based on several criteria, including:

- **Multimodal operations:** Improvements that would address current critical multimodal congestion would rank high in project prioritization
- **Multimodal safety:** Improvements that would address a documented safety issue would rank high in project prioritization
- **Cost/benefit and available funding:** Projects with low to moderate cost that could be initiated with known county, local, and/or regional agency funding could rank higher in project prioritization than high cost projects requiring new and/or multiple funding sources
- **Partnership opportunity:** Multi-jurisdictional and agency support are important criteria
- **Approval requirements:** Timely approval through local, regional, state, and federal approval and permit requirements would allow projects or programs to be implemented when needed without costly delays
- **Resiliency:** Improvements that help the county to prevent or respond to shock events such as natural disasters or other stressors

PERFORMANCE METRICS

System performance indicators help monitor and assess the effectiveness of TMP strategies in achieving the county's environmental, social, and economic goals for its transportation system. These goals are included in the *Boulder County Comprehensive Plan* and discussed at the beginning of this document. Full details associated with the methodology to evaluate metrics can be found in Appendix E.

BEHAVIORAL PERFORMANCE METRICS

These behaviors are outcomes that Boulder County can influence, but not directly control.

CAP VEHICLE MILES TRAVELED (VMT) PER CAPITA

Minimizing environmental impacts and addressing climate change are key priorities for Boulder County, and VMT is a proxy for the transportation sector's greenhouse gas emissions.

- **Goal:** Cap Countywide VMT per Capita at 2005 levels
- **How to measure:** Use traffic counts from CDOT and Boulder County to measure countywide VMT. Use Census, Department of Labor, and other federal data to track Boulder County population and employment.

INCREASE TRANSIT RIDERSHIP

Even with the growth of electric, autonomous, and shared vehicles, transit remains the only mode that can transport large numbers of people long distances in a small space. Transit allows for economic growth without adding congestion, and helps reduce the transportation sector's reliance on fossil fuels.

- **Goal:** Growth in transit ridership will outpace growth in population and employment by 2:1 ratio
- **How to measure:** Use transit boardings data from RTD, and Census, Department of Labor, and other federal data to track Boulder County population and employment. Transit ridership / (population + employment). If population and employment is growing 2% per year, the goal is for transit ridership to grow 4% per year.

ELIMINATE SERIOUS INJURY AND FATAL TRAFFIC CRASHES

Improving safety for all modes of travel is a key priority for Boulder County.

- **Goal:** Zero serious injury or fatal traffic crashes in unincorporated Boulder County by 2035

- **How to measure:** Colorado State Patrol and CDOT provide local governments with traffic crash data.

INFRASTRUCTURE PERFORMANCE METRICS

These are outputs that Boulder County can directly control, but do not indicate any behavior change.

MAINTAIN COUNTY ROADS[18]

Maintaining the county road network in good condition is important for a healthy economy, and is much more cost effective repairing degraded roads.

- **Goal:** Maintain Pavement Quality Index (PQI) of at least 7 out of 10 for each of the three road networks.

MAINTAIN COUNTY BRIDGES[18]

Maintaining safe travel throughout the county, bridges can withstand flooding, keep emergency access routes open, etc.

- **Goal:** All major structures on the Boulder County road network have a sufficiency rating of 70 or higher.

COMPLETE THE BIKE VISION NETWORK

Complete low stress bicycle facilities between destinations within Boulder County.

- **Goal:** Complete all miles of planned in-county low stress bicycle network regional connections.

AFFORDABLE LIVING

Affordable living (defined as spending no more than 15% of a household's income on transportation and no more than 30% on housing) has increasingly become a challenge for many county residents. Reducing the transportation cost burden is a critical step on the path to self-sufficiency and accessing health and human services.

- **Goal:** 100% of Boulder Housing Partners, Longmont Housing Authority, and Boulder County Housing Authority property residents and housing voucher-holders have access to affordable transit and mobility options through programs such as EcoPass, MyRide, or Ride Free Longmont

[18] This includes only roads and bridges on the road network that Boulder County is responsible for maintaining, not all roads and bridges within the geographic boundaries of Boulder County (which would include city, CDOT, etc)

SUMMARY

It will be important for Transportation Staff to monitor the progress of the transportation system to determine whether the vision and implementation actions outlined in this plan are actually being implemented. Table 7 describes the details associated with performance metrics available to the county at this time.

TABLE 7: PERFORMANCE METRIC SUMMARY

Metric	Current	Year of Current	Goal	Lead Program
Daily VMT/capita	N/A	N/A	Cap at 2018 levels	Multimodal Division
Annual weekday transit boardings/capita	N/A	N/A	Increase from 2018 levels	Transit Manager
Severe crashes	49 severe crashes	2015	0 Severe Crashes by 2035	Multimodal Division
Maintain Boulder County roads	Weighted Avg PCI = 79 for primary network	2018	Average PQI > 70 for primary network	CIP Manager
Maintain Boulder County bridges	5 of 92 have sufficiency rating below 70	2017	SR > 70 for each bridge	Bridge Engineer
Accessibility of Boulder County sidewalks	38 of 76 miles are ADA compliant (50%)		100% accessible	CIP Manager
Complete multiuse path and bikeable shoulders network	6.5 miles	2018	59 miles	Bike Program Manager
Affordable living- percent of housing clients with affordable transportation	N/A	N/A	100% have access	Mobility for All Manager

COST ESTIMATES

The magnitude of costs for the projects recommended as part of this plan are listed within *Strategy 1—Develop the Multimodal Transportation System*. More detailed cost estimates have been developed for specific county programs and selected key regional corridors where completed studies have identified improvement recommendations. The Boulder County funding gap for these projects is approximately $150 million, while the key regional corridor total is almost $550 million not including Northwest Rail. Including Northwest Rail, the key regional corridor total funding gap is over $2.1 billion. Details about these cost estimates can be seen in Table 8. For more details about proposed projects and costs, please reference the State of the System Report, which can be found in Appendix A.

TABLE 8: COST ESTIMATES

	Program	Project/Program Estimate (in Millions)	Anticipated Funding (in Millions)	Gap (in Millions)
Boulder County System	Boulder County 5 Year Capital Improvement Program (CIP) 2018-2023	$83	$46	$37
	Boulder County Sales Tax (sunsets 2024)	$62	$47	$15
	Subdivision Local Road Paving	$100	$0	$100
	Boulder County System Total	**$245**	**$93**	**$152**
Selected Key Regional Corridors	SH 119 BRT/Managed Lanes/Bikeway	$230	$93	$137
	SH 7 BRT/Managed Lanes/Bikeway	$172	$12	$160
	SH 287 BRT/Intersections/Bikeway	$57	$6	$51
	SH 42/95th	$27	$7.8	$19.2
	SH 93 Mobility/Safety Improvements	$133	$0	$133
	SH 66 Mobility/Safety Improvements*			
	Subtotal	**$619**	**$118.8**	**$500.2**
	Northwest Rail	$1,600	$0	$1,600
	Key Regional Corridor Total	**$2,219**	**$118.8**	**$2,100.2**
Grand Total		**$2,464**	**$211.8**	**$2,252.2**

Note: Cost estimates will be updated periodically as more detailed information becomes available
* Planning and Environmental Linkages Study in progress

FUNDING SOURCES

Boulder County receives transportation funding from five primary sources. Each funding source is allocated in a different manner and includes specific spending limitations. The funding is categorized into two primary purposes: transportation system maintenance and rehabilitation, and specific projects, operations, and expansion.

Current and forecasted funding is insufficient to implement all of the actions outlined in this plan. As a result, Boulder County must establish priorities. Daily maintenance is considered the highest priority of the county transportation system, because maintaining current facilities is the most efficient use of limited resources.

Revenues from restricted sources such as sales tax and grant revenue are used to implement specific programs and projects and are used to leverage additional grant funding to the extent possible. Boulder County must also address construction costs that increase much faster than revenue, meaning that existing revenue builds less each year due to inflation.

Overall, as costs increase more quickly than revenue, existing funding sources will not be sufficient, and Boulder County must seek additional funding sources to maintain its current system and implement the vision identified in this plan.

Funding of rehabilitation and reconstruction of subdivision paved roads, is the responsibility of those who benefit, generally local property owners, through creation of improvement districts.

SYSTEM MAINTENANCE AND REHABILITATION

Revenue from the state Highway Users Trust Fund (HUTF), Specific Ownership Tax (SOT), and Property Tax Road and Bridge mill levy are dedicated to daily maintenance and reconstruction of the county transportation system. These activities include:

- Snow Removal
- Road Patching and pothole repairs
- Crack sealing
- Cleaning ditches and culverts
- Replacing road signs
- Sweeping and clearing shoulders
- Dust suppression

- Grading and replacing gravel on unpaved roads
- Repairing sidewalks
- Clearing and sweeping multi-use paths and transit stops
- Rehabilitation of bridges and culverts

These funds are also used for rehabilitation and reconstruction of the paved roads, with the priority placed on roads that connect communities and other major destinations and serve the most users.

SPECIFIC PROJECTS OPERATIONS AND EXPANSION

Revenue from a 0.1 percent sales tax for transportation, first approved by the voters in 2001 and extended for 15 years in 2007, is dedicated to specific projects and programs that were identified in the ballot resolution. Fifteen percent of these funds are dedicated to implementation of the regional trails program, as identified in the ballot resolution. The revenue generated from sales tax has been used to leverage additional funding from other local, state, and federal sources that help implement the listed projects and programs. These projects include construction of shoulders on roads and highways that improve safety for all users, new lanes, bike and pedestrian underpasses, intersection improvements, construction of regional trails, and support for improved transit services and programs.

COST INFLATION AND REVENUE TRENDS

Between 2012-2018, the Colorado Construction Cost Index rose 72 percent, while the county's transportation revenue increased by only 53 percent over that same time frame. Construction costs have increased by more than three times the revenue that can be used for road maintenance and rehabilitation. Despite this trend, the county has managed to meet many of its repair and replacement goals primarily due to the fact that revenue from the 2007 Countywide Transportation Sales Tax has kept pace with inflation and due to additional federal revenues resulting from the 2013 Flood. Both have together funded many miles of road reconstruction and structure replacements that would have otherwise gone unfunded. However, the federal flood funding was temporary influx, the sales tax sunsets in 2024, and neither can be used for on-going maintenance needs.

TRANSPORTATION REVENUE SOURCES

The five categories of revenue that currently fund the county transportation system come from different sources, are allocated in different ways, and as a result must be evaluated separately to forecast future trends. Each revenue category is identified below, as well as the anticipated trend (increasing, decreasing, or flat) and the factors that influence the trend.

STATE HIGHWAY USERS TRUST FUND (HUTF)

The combined state gas tax and vehicle registration fee revenue is allocated to counties in part based on growth-related variables. Since Boulder County is not growing as quickly as many other counties, it is likely to receive a decreasing proportion of available revenue.

State Gas Tax

Trend: Decreasing

Factors:

- Gas tax has not increased since 1992
- Gas tax revenue does not increase as gas prices increase, only as more fuel is used
- Vehicles are more fuel efficient, more people are driving electric vehicles, resulting in less gas is being used and less tax revenue is generated

Vehicle Registration Fee/FASTER

Trend: Increasing

Factors:

- Vehicle registration fee is based on the age and value of the vehicle
- As more vehicles are purchased, revenue will increase

SPECIFIC OWNERSHIP TAX (VEHICLE REGISTRATION TAX)

Trend: Increasing

Factors:

- Specific Ownership Tax (SOT) is related to the age and value of the vehicle and the number of vehicles purchased
- SOT is allocated based on the proportional share of total property tax mill levy in the county (as school districts increase their share of property tax relative to the county, the county receives a smaller share of the total revenue)
- The county share is not dedicated to transportation; but instead it is allocated at the discretion of the Board of County Commissioners

PROPERTY TAX – ROAD AND BRIDGE MILL LEVY

Trend: Increasing

Factors:

- This tax is based on assessed value of property in Boulder County
- The revenue changes as property assessments change
- The Road and Bridge mill levy must be split with cities within the county

STATE/FEDERAL GRANTS – FEDERAL, STATE, LOCAL FUNDING PROGRAMS

Trend: Flat/Decreasing

Factors:

- Federal gas tax has not changed since 1993
- Funding is unlikely to increase due to federal budget deficit concerns
- This funding is dedicated to specific projects/programs, and may not be used for long-term operating expense or local road maintenance
- Since the cost of gas is increasing, vehicles are more fuel efficient, and more people are driving electric vehicles, less gas is being used and less tax revenue is generated

COUNTYWIDE TRANSPORTATION SALES TAX (0.1 PERCENT SALES TAX FOR TRANSPORTATION)

Trend: Increasing

Factors:

- The current sales tax sunsets in 2024
- The revenue from this source changes as the economy changes

Appendix A: State of the System Report

Boulder County

Transportation

OCTOBER 2018

TRANSPORTATION MASTER PLAN UPDATE

FINAL

STATE OF THE SYSTEM REPORT

SUBMITTED BY:

DAVID EVANS AND ASSOCIATES INC.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

STATE OF THE SYSTEM REPORT

Boulder County adopted its first Transportation Master Plan (TMP) in December 2012 to plan and prepare improvements to the county's facilities for all transportation modes and connections among modes (multimodal transportation system). This State of the System report summarizes the current conditions facing transportation for Boulder County, with a look to future projects planned for the system. Information from this report will be used to inform the update of Boulder County's TMP, which is expected to be complete in spring 2019.

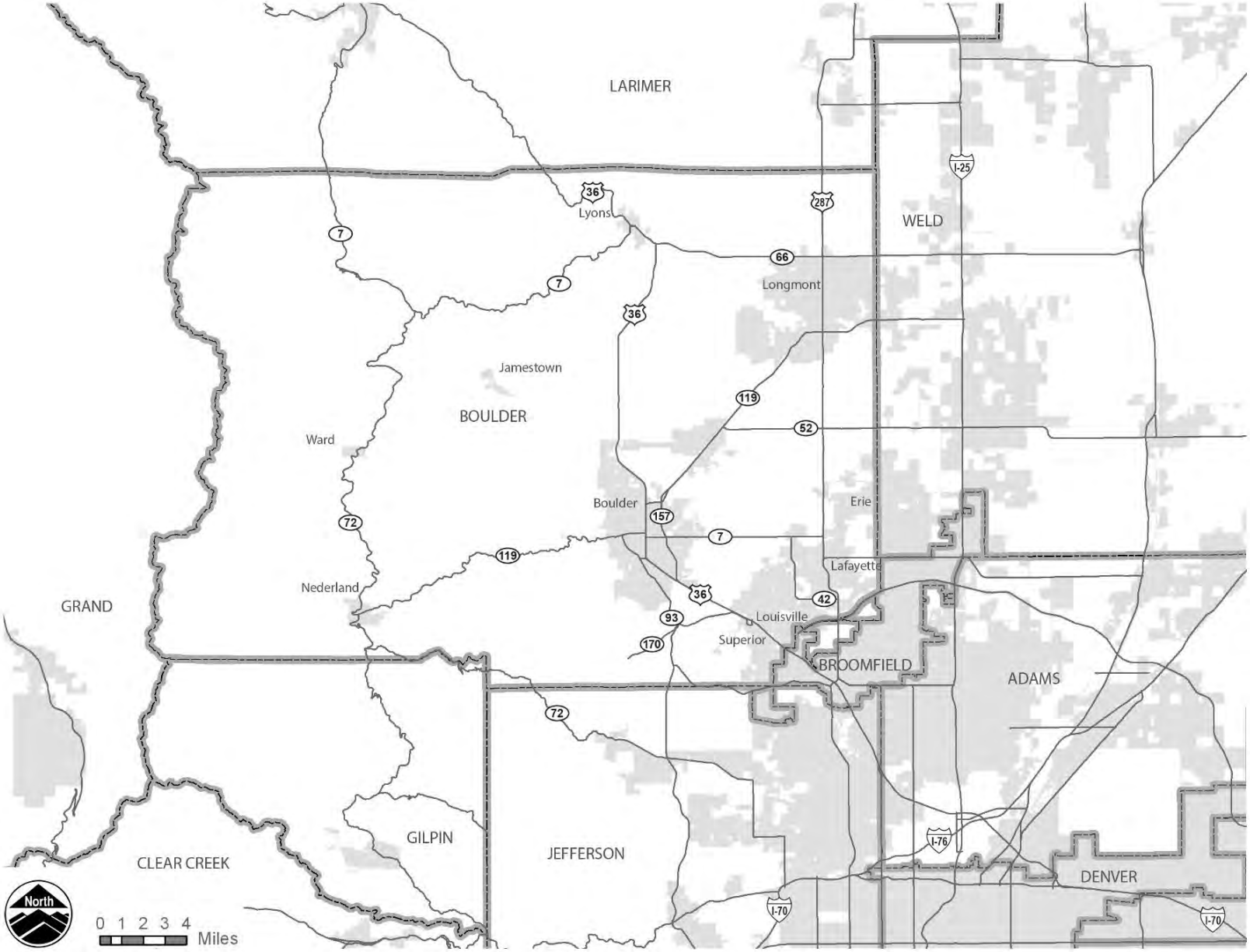
INTRODUCTION

Growing population, changing demographics, rising construction costs, and rapidly changing technologies continuously effect transportation in Boulder County and as a result, affect the needs and capabilities of the system to meet those needs. The TMP is an effort to examine the way we currently provide projects and services, identify changes to those services, and chart a course for our transportation systems and infrastructure over a 25-year planning horizon. Boulder County started the TMP Update process in summer 2018.

This State of the System report provides an overview of current travel patterns, the future of transportation, current funding, and summarizes the projects and programs identified in other studies and plans. Together this information sets the foundation of the TMP Update and provides a starting point to recommend future projects and programs to meet identified needs. The overall funding picture illustrates the large funding gap for implementation of the identified improvement projects and on-going maintenance necessary for the transportation system. Figure 1 is a map of Boulder County and the surrounding counties.

Longmont-Boulder Trail near 63rd Street

FIGURE 1: MAP OF BOULDER COUNTY AND SURROUNDING COMMUNITIES



CURRENT TRAVEL PATTERNS

Peak-period travel patterns in Boulder County are influenced by the location of employment centers relative to housing availability. Boulder County employment opportunities draw workers from within the county and from surrounding areas. The relatively high cost of housing in Boulder County pushes employees to find more affordable housing outside of the county. This commute pattern contributes to congestion along the limited regional corridors into the county such as North 95th Street, State Highway 7, Dillon Road, State Highway 52, Valmont/Isabelle Roads, State Highway 119, State Highway 66, State Highway 93, and US36 both south and north of the county. While some of these work trips occur on major corridors where transit and/or bicycle and pedestrian connections exist, the current lack of alternative modes and/or connections along other corridors make non-driving modes difficult for many commuters.

Out of the approximately 154,000 primary jobs[1] within Boulder County, about 58 percent of workers live outside Boulder County. The top 15 home locations (Table 1) show the largest cities and towns within Boulder County (Boulder, Longmont, Lafayette, Louisville, Erie, and Superior) and also show a large group of people residing southeast of the county (Denver, Broomfield, Westminster, Thornton, and Aurora). Smaller percentages of workers are traveling from the north (Larimer and Weld Counties), as well as from the south (Arvada).

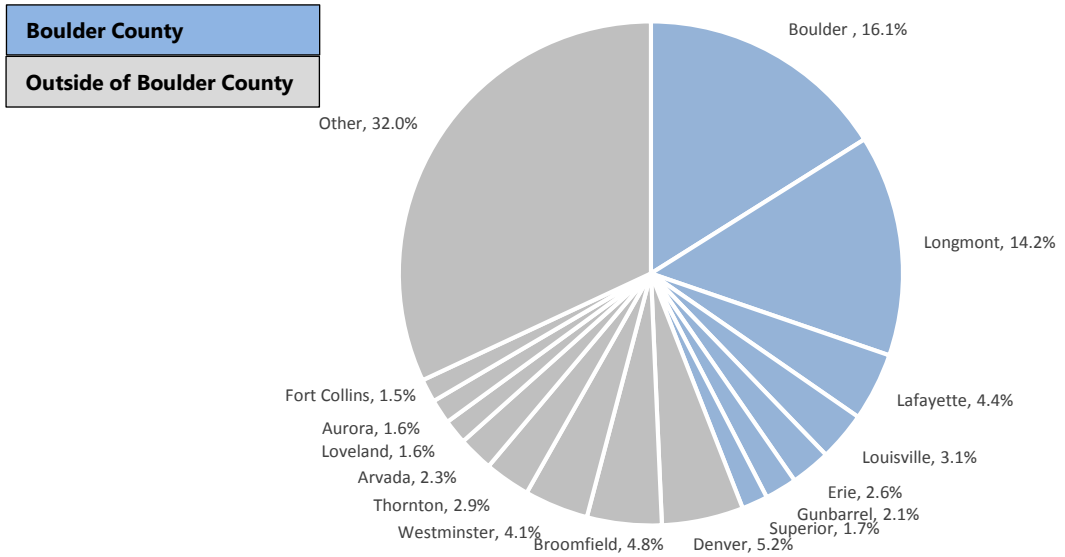
Pedestrian and Bicyclist Underpass on CO 119


Longmont Coffman Park and Ride

[1] Primary job as defined by the US Census Bureau: "A primary job is the highest paying job for an individual worker for the year."

TABLE 1: TOP 15 HOME LOCATIONS OF EMPLOYEES THAT WORK IN BOULDER COUNTY

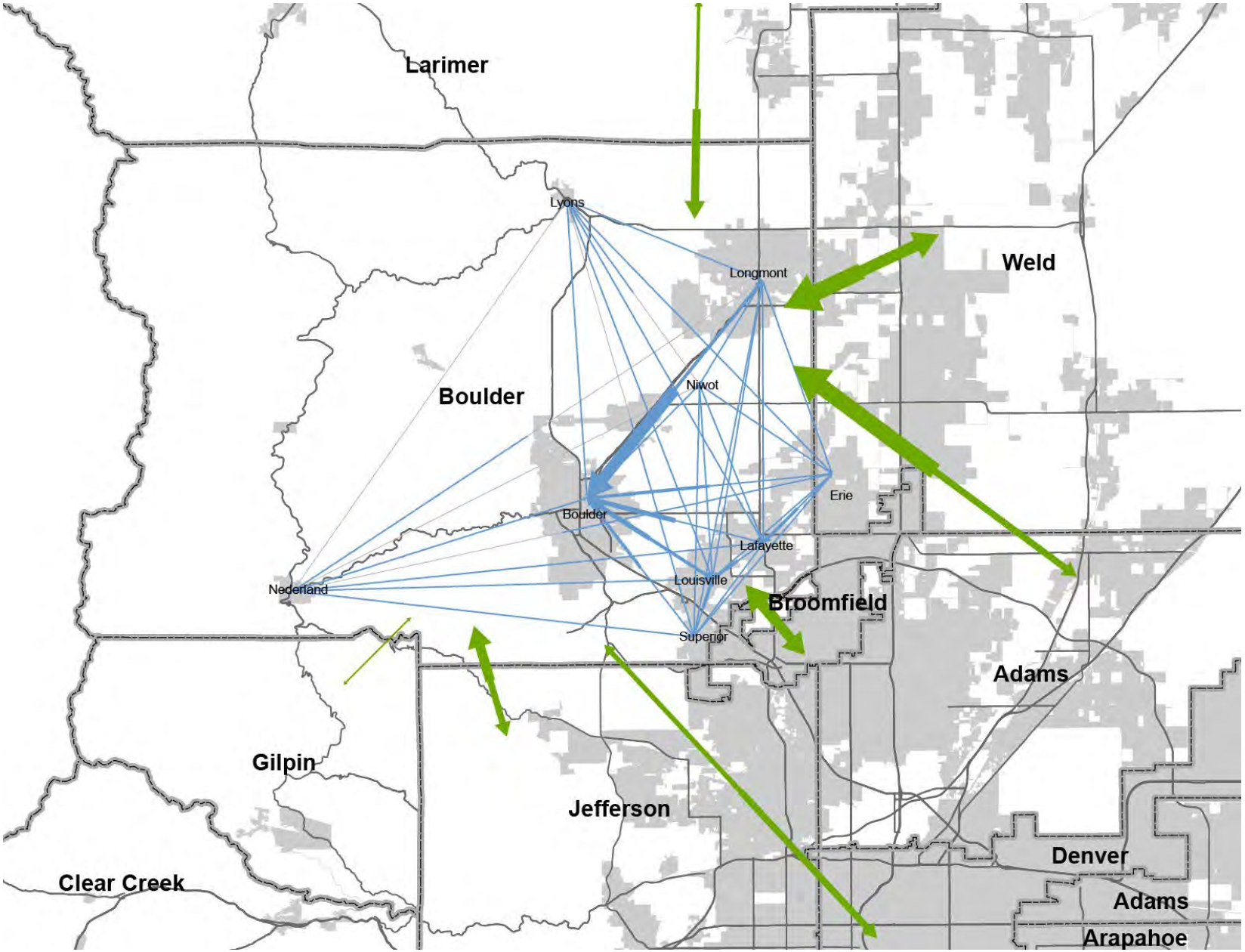
Place	Count	Share
Boulder	24,701	16.1%
Longmont*	21,815	14.2%
Lafayette	6,720	4.4%
Louisville	4,834	3.1%
Gunbarrel	3,154	2.1%
Superior	2,570	1.7%
Denver	8,045	5.2%
Broomfield	7,358	4.8%
Westminster	6,317	4.1%
Thornton	4,513	2.9%
Erie*	3,936	2.6%
Arvada	3,466	2.3%
Loveland	2,428	1.6%
Aurora	2,418	1.6%
Fort Collins	2,292	1.5%
Other	49,117	32%



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2015).
*Municipality within both Boulder County and Weld County.

Overall travel pattern analysis shows travel patterns across Boulder County and from communities outside of the county. Overall, there is a major concentration of trips from all communities to Boulder, especially from Longmont, Louisville, Lafayette, Erie, and Superior. There are strong regional patterns to/from Weld County, Adams County, and Broomfield County. Figure 2 shows all these patterns on the map.

FIGURE 2: CURRENT REGIONAL TRAVEL PATTERNS



THE FUTURE OF TRANSPORTATION

Growth and technology changes will shape the future transportation system of Boulder County. The Colorado Department of Local Affairs forecasts that the county population will grow by 85,800 people (26%) from 329,200 in 2018 to approximately 415,500 by 2040[2]. The county transportation system will need to accommodate these additional residents. Population of the surrounding areas are also projected to increase, leading to increased commuting, congestion, and need for additional overall mobility choices.

Technology changes will also affect our transportation system. Automated vehicles, shared ride vehicles, mobility as a service, working at home, electric vehicles, and electric bicycles are all potential future technology changes that could impact our transportation system. Although it is difficult to determine exactly how our transportation system might shift given these new technologies, it is critical that we discuss and evaluate potential implications of these changes for the transportation system and our communities. Change will happen, and it has already started altering the way people get around. Users of rideshare services don't need a parking space at their destination. Users of the dockless bike and scooter systems need space for safe travel within the right-of-way as well as space to park the equipment after the ride is complete. A number of considerations can help integrate known technology into planning now:

- Pick-up/drop-off areas
- Striping and signing visibility
- Roadway surface improvements
- Parking flexibility
- Energy implications
- Dedicated lanes for specific modes
- Right-of-way tradeoffs between vehicles and bicyclists/pedestrians
- Integrating vehicle improvements to transit service

To prepare for technology yet to arrive, it is important to have a process to respond effectively and in a timely manner, whether the response is new regulations, standards, and infrastructure, to ensure the new technology and innovation is consistent with community values and goals.

[2] Colorado Department of Local Affairs Components of Change forecasts. Available at: https://demography.dola.colorado.gov/births-deaths-migration/data/components-change/

THE TRANSPORTATION SYSTEM

The transportation system serving Boulder County is managed by many different agencies and jurisdictions. Each municipality in the county is responsible for the system within its boundary. The Colorado Department of Transportation is responsible for the state highway system. The Regional Transportation District is primarily responsible for the regional transit system. Via is the primary provider of mobility for the elderly and disadvantaged community. In addition, other smaller human service, non-profit, and private businesses provide mobility services. A great challenge that we all face is coordination and collaboration to provide a useful, flexible, sustainable, and cost effective transportation system that provides mobility choices to all members of our community.

The infrastructure that is the responsibility of Boulder County's includes over 650 miles of public roads in the unincorporated county, approximately 400 miles of which are paved and 270 miles are gravel. Paved roads include 145 miles in 110 county subdivisions. The system also includes 81 major bridges, 445 large culvers or smaller bridges/access points, and approximately 8,500 small culverts. The county owns and operates 19 traffic signals. Over 110 miles of trails can be found on county open space properties.

The Capital Improvement Program (CIP) is an on-going effort to plan, program, and implement work on all components of Boulder County's transportation system.

CAPITAL IMPROVEMENT PROGRAM (CIP)

The CIP links transportation policies and plans with projects and programs that fulfill those needs. To succeed, the CIP continuously examines both costs and outcomes to ensure both cost-efficient and cost-effective implementation given existing budgetary constraints.

The CIP:

1. Leverages county funding with state and federal grants, partnerships with local funding agencies, and collaboration with other agencies and jurisdictions.
2. Includes performance measures that tracks results of past implementation and forecasts impacts of current plans onto the future condition of the infrastructure.
3. Prepares for future implementation by preparing both short-term (5-year) and long-term (15-year) plans for future implementation of multiple programs.

Capital projects are funded through one of three primary sources of county funds:

- **The Road and Bridge Fund**: Supports the annual programmatic costs of repairing and replacing the county's transportation infrastructure, as well as other mobility improvements. The State Gas Tax, Specific Ownership Tax, and a small amount of property tax from the Road and Bridge Mill levy and miscellaneous revenue sources are deposited in the Road and Bridge Fund.
- **The Countywide Transportation Road .01% Sales Tax (RST)**: 85% of the sales tax is dedicated to funding improvements to the countywide system of roads, transit, and pedestrian infrastructure. The RST program focuses on improvements beyond the maintenance and repair of existing facilities. The program emphasizes projects and programs with a countywide multimodal benefit that are consistent with the ballot measure approved by voters.
- **The Regional Trails Sales Tax Fund**: Similar to the RST fund, 15% of the .01% sales tax revenue is for the construction and management of regional trails that link communities.


Jay Road

WORK COMPLETED SINCE 2012 TMP

Over the past six years (2012-2018) the county has spent over $178 million improving, repairing, and operating the transportation system. Half of these costs are for **programmatic** infrastructure repairs and operations such as plowing and grading roads, bridge repairs, and asphalt overlays on current facilities. The other half has been spent on **reconstruction** of transportation infrastructure over the seven-year period from the first TMP. A majority of the new infrastructure category consists of costs associated with recovery from the 2013 flood. Figure 3 shows the overall breakdown between programmatic and reconstruction infrastructure projects and Tables 2 and 3 show the details associated within these two types of infrastructure projects.

FIGURE 3: 2012-2018 TRANSPORTATION COSTS – OPERATIONS, FACILITY REPAIR, AND NEW INFRASTRUCTURE

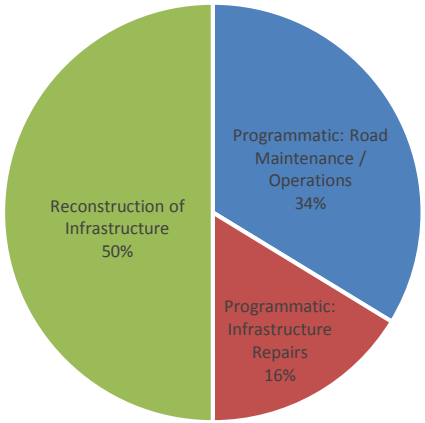


TABLE 2: 2012-2018 PROGRAMMATIC COSTS (IN MILLONS)

Project	2012-2018 Cost	%
Road Maintenance / Operations	$60.420	67%
Overlays / Road Resurfacing (non-reconstruction)	$9.750	11%
Capital Equipment Replacement	$8.580	10%
Safety / Guardrail / Striping, etc.	$5.910	7%
Program Administration	$2.020	2%
Sidewalk Repairs	$1.830	2%
Bridge and Structure Repairs	$1.080	1%
TOTAL PROGRAMMATIC:	**$89.590**	**100%**
% of total transportation costs	**51%**	

Note: Costs for 2018 include projects that will be complete as of December 2018 and do not include any in-progress projects. Does not include $75 million spent as part of the 2013 flood recovery.

TABLE 3: 2012-2018 INFRASTRUCTURE RECONSTRUCTION COMPLETED (IN MILLIONS)

Roads Reconstructions	Cost	%
Lefthand Canyon Dr – US 36 to Lickskillet Rd (Flood)*	$24.00	
James Canyon Dr – Lefthand Canyon Dr to Ballarat (Flood)*	$14.90	
Wagonwheel Gap Rd (Flood) *	$11.45	
Brainard Rd Reconstruction – CO 72 to USFS trailhead	$4.20	
95th St Reconstruction – Lafayette to Boulder Creek	$4.10	
North 83rd St Reconstruction – Niwot Rd to CO 119	$1.30	
51st St Reconstruction – Jay Rd to Boulder Reservoir	$0.45	
Total New Roads / Reconstructions	**$60.4**	**67%**
Bridge Replacements / Construction		
83rd St over Little Thompson (Flood)	$5.35	
East County Line Rd over St Vrain Creek (Flood)	$4.25	
Sunset St over St Vrain Creek (Flood)	$4.20	
Logan Mill Rd over Four Mile Creek (Flood)	$3.25	
Old South over St Vrain Creek (Flood)	$2.75	
115th St Bridge and Culvert	$0.45	
119th St over Dry Creek #2	$0.45	
Total Bridges	**$21.5**	**24%**
Minor Structures		
Four Mile Canyon Dr @ Gold Run (Flood)	$3.10	
Dillon Rd @ Rock Creek (Flood)	$1.60	
83rd St @ Dry Creek 2	$1.40	
Monarch Road @ Dry Creek 2	$0.55	
Lee Hill Drive @ Six Mile Creek	$0.45	
N 53rd St @ Supply ditch	$0.25	
95th Street @ Dry Creek 2	$0.25	
65th St @ Lykins Gulch	$0.20	
Total Minor Structures	**$7.80**	**9%**
TOTAL RECONSTRUCTED INFRASTRUCTURE:	**$89.6**	**100%**
% of total	**49%**	

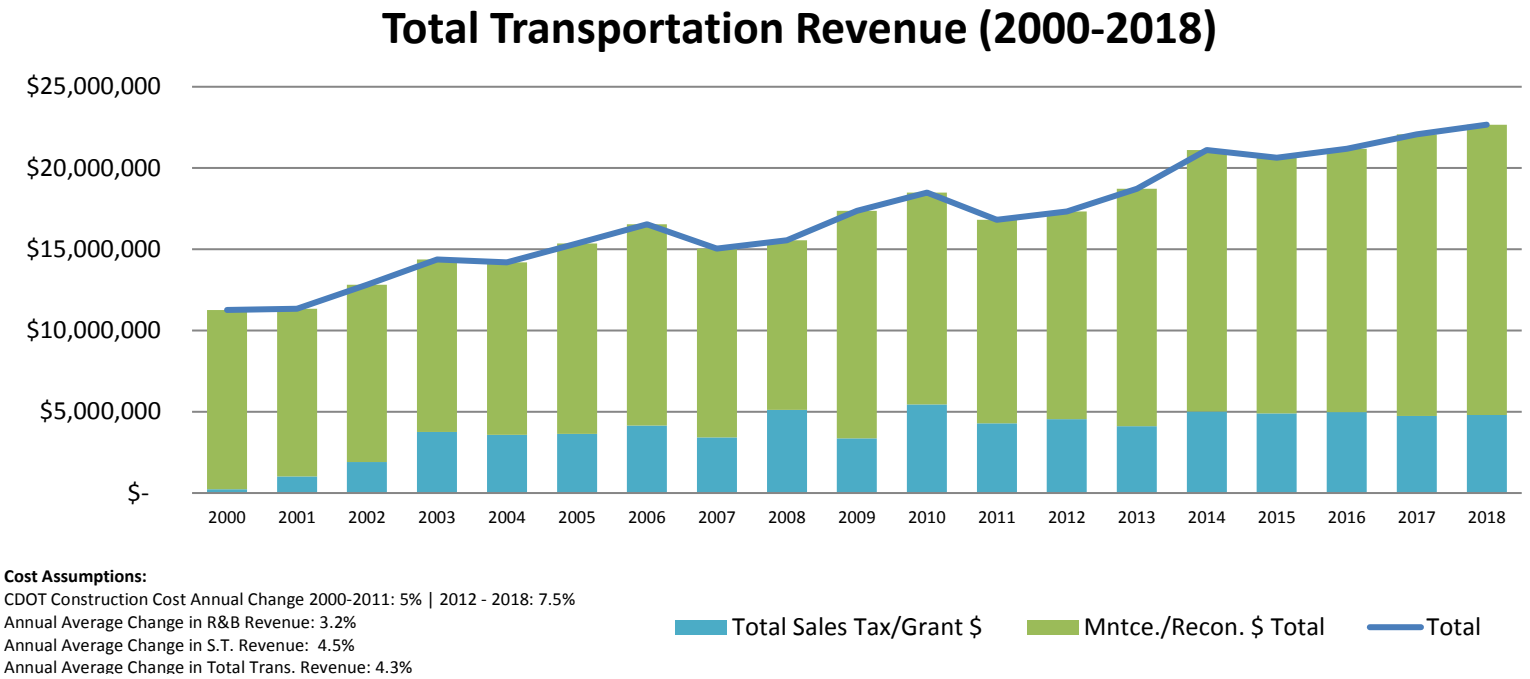
Note: Costs for 2018 only include completed projects as of December 2018 and do not include any in-progress projects.
*Includes cost for multiple structures such as bridges and culverts.

BOULDER COUNTY PLANNED PROJECTS AND FUNDING SOURCES

Boulder County's funding comes from a variety of funding sources, including state gas tax revenue, the specific ownership tax (an auto registration fee), a small amount of property tax, and other minor categories which are deposited in the Road and Bridge fund. In addition, in 2007, county voters approved a 15-year extension of a .01% transportation sales tax and state and federal grants, which are dedicated to specific projects and programs and cannot be used for ongoing road maintenance and construction.

Total transportation revenue has increased on average 4.3% per year from 2000 through 2018. Road and Bridge revenue has increased at an average of 3.2% annually, and sales tax revenue has increased on average 4.5% annually. The Colorado Department of Transportation (CDOT) Construction Cost Index, which measures change in CDOT construction costs has increased at an average rate of 5% per year for 2000 through 2011, and 7.5% per year from 2012 through the first half of 2018. On average, construction costs have increased at a greater rate than revenue (CDOT changed the methodology for calculating the construction cost index in 2012).

FIGURE 4: 2000-2018 FUNDING SOURCES



Cost Assumptions:
CDOT Construction Cost Annual Change 2000-2011: 5% | 2012 - 2018: 7.5%
Annual Average Change in R&B Revenue: 3.2%
Annual Average Change in S.T. Revenue: 4.5%
Annual Average Change in Total Trans. Revenue: 4.3%

ROAD AND BRIDGE CAPITAL FUND - FIVE YEAR PLAN

The Boulder County CIP includes a schedule of Road and Bridge projects extending five years into the future. The five-year plan includes both project needs and costs along with the programmatic components required to repair and maintain existing infrastructure. The five-year plan is fiscally constrained and includes the following categories:

- Capital Equipment Replacement: Snow plows, graders, and other equipment needed to repair and maintain the roads
- Traffic and sidewalk safety program
  - Annual traffic safety, guardrail repairs, and striping
  - Annual sidewalk repairs for compliance with the Federal Americans with Disabilities Act
- Annual Asphalt Road Overlays
- Bridge and Structure Repairs
- Subdivision Paving – Community Use Roads
- Subdivision Paving – Incentive Program
- Special Projects: Large capital improvements too large or unique to be programed elsewhere, such as the Eldora Ski Road or 95th Street Bridge replacement

FIVE-YEAR PROJECT NEEDS AND AVAILABLE FUNDING

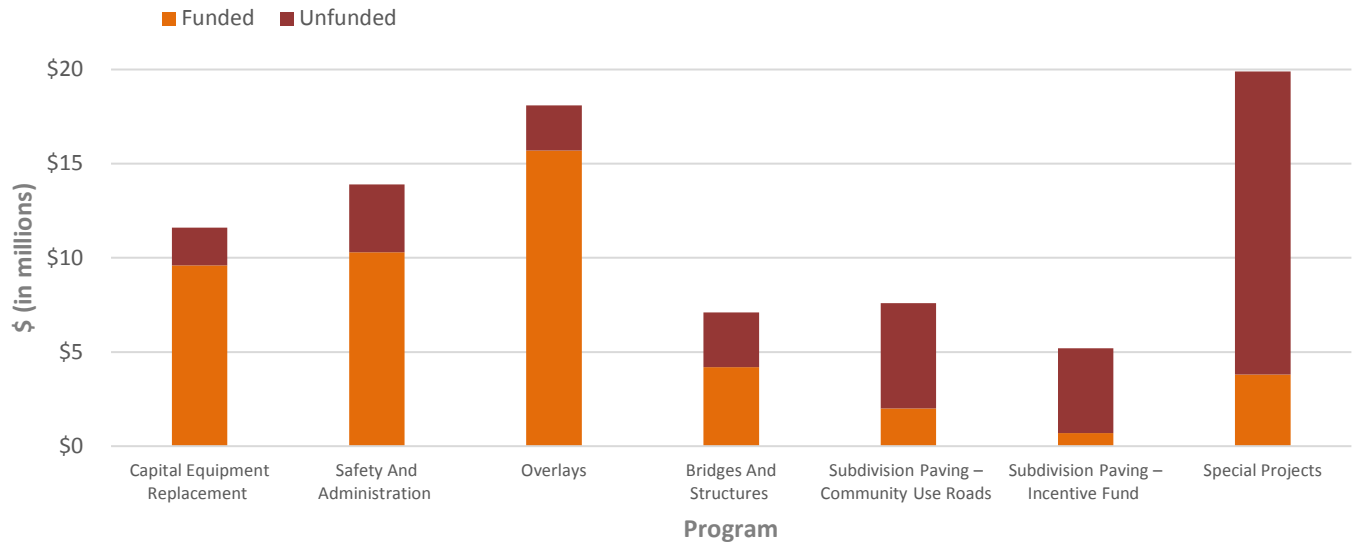
Boulder County's capital projects and programs are funded through multiple sources. Table 4 and Figure 4 show the summary of costs and available funding for the 2018-2022 CIP. The total project estimates for the next five years is $83.4 million, while there is an estimated $46.4 million available to fund proposed projects, resulting in a shortfall of $37 million.

TABLE 4: CIP FIVE-YEAR PROJECT NEEDS AND AVAILABLE FUNDING (IN MILLIONS)

	Estimate	Funded	Shortfall
Capital Program	2018 - 2022		
Capital Equipment Replacement	$11.6	$9.4	-$2.2
Safety And Administration	$13.5	$9.8	-$3.7
Road Resurfacing	$18.1	$15.7	-$2.4
Bridges And Structures	$7.1	$4.2	-$2.9
Subdivision Paving	$12.8	$2.7	-$10.1
Special Projects	$19.9	$3.8	-$16.1
Total Capital Costs Constrained	**$83.0**	**$46.4**	**-$37.4**

Source: 2018 CIP Report to Board of County Commissioners, July 2018.

FIGURE 5: CIP FUNDED AND UNFUNDED ESTIMATES



COUNTYWIDE TRANSPORTATION SALES TAX & TRAILS SALES TAX FUNDING

In 2007, Boulder County voters approved an extension of an existing countywide sales tax measure to fund a specific list of 44 projects that includes 10 roadway improvements, 13 road shoulder projects, six transit projects, a large Transportation Demand Management (TDM) program, five pedestrian improvement projects, and nine countywide regional trail projects. Collections began in July 2009 with current 15 percent separated out for use on regional trail connections, 15 percent allocated to projects and programs that helped the regional transit and travel demand management (TDM), and the remainder allocated to road and shoulder improvements and pedestrian access and safety projects.

COUNTYWIDE SALES TAX PROJECTED COSTS AND FUNDING AVAILABILITY

The original 2007 ballot issue was expected to collect $59.7 million over 14 years and fund $93.2 million in projects when combined with funding from state, regional, and local partnerships. Cost inflation along with increased spending by sales tax contributors has increased the revenue estimate to $81.8 million (an increase of 37%) and the total cost estimate to $95.2 million needed in sales tax funds alone (an increase of 59%).

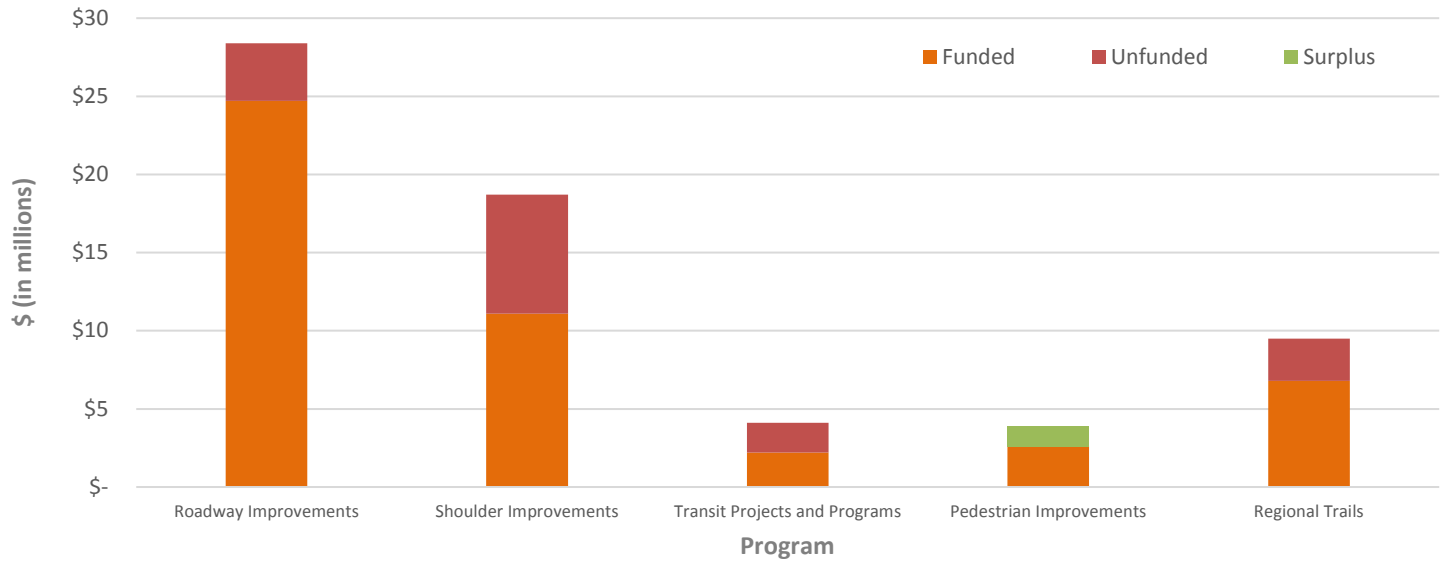
With total sales tax expenditures to-date of $33.2 million, there is approximately $47.4 million in remaining revenues to fund $62.0 million in remaining projects, which leaves a shortfall of $17.2 million. Table 5 and Figure 5 show the summary of costs and available funding. Full details of the estimated sales tax program expenditures and revenue is available in the county's *Transportation Sales Tax Seven Year Update Report* (2017).

TABLE 5: COUNTYWIDE TRANSPORTATION SALES TAX NEEEDS ASSESSMENT (IN MILLIONS)

Projects	2007 Estimate (adjusted)*	Spent to date (2009-2016)	Remaining 2007 Estimate (adjusted)	Remaining Funds Available (2017-2024)	Shortfall or Surplus
Roadway Improvements	$36.0	$7.5	$28.4	$24.7	$-3.7
Shoulder Improvements	$29.9	$11.3	$18.7	$11.1	$-7.6
Transit Projects and Programs	$9.2	$5.2	$4.1	$2.2	-$1.9
Pedestrian Improvements	$3.6	$2.3	$1.3	$2.6	$1.3
Regional Trails	$16.4	$7.0	$9.5	$6.8	$-2.7
Total Sales Tax	**$95.2**	**$33.2**	**$62.0**	**$47.4**	**$-17.2**

* 2007 estimates were adjusted to 2017 dollars based on the CDOT construction cost index at the time of construction.
Source: Countywide Transportation Sales Tax Seven Year Update, Boulder County Transportation, April 2017

FIGURE 6: SALES TAX PROGRAM FUNDED AND UNFUNDED ESTIMATES



Bus then bike shelter at Table Mesa Park and Ride

STUDIES AND PLANS ON THE REGIONAL AND STATE SYSTEM

A number of planning efforts led by regional, state, and local agencies have developed recommendations for roadways that influence Boulder County, even if they are not located on roadways maintained by the county. For this report, the following plans were reviewed to identify proposed projects and estimated costs:

Regional

- US 36 First and Final Mile Study (Commuting Solutions)
- 2040 Metro Vision Regional (Denver Regional Council of Governments [DRCOG])
- Active Transportation Plan (DRCOG)
- Jefferson County Bicycle and Pedestrian Plans (Jefferson County)
- Jefferson Countywide Transportation Plan (Jefferson County)
- First and Last Mile Strategic Plan (RTD)
- Northern Area Mobility Study (NAMS) (Regional Transportation District [RTD])
- University of Colorado TMP Update (CU)

State

- CO 7 Planning and Environmental Linkages (PEL) (Brighton – CO 287) (CDOT)
- CO 66 PEL Study (CDOT)
- CO 7 PEL Study (CO 287 - 75th) and Bus Rapid Transit (BRT) Feasibility Study (CDOT)
- Colorado Front Range Trail Comprehensive Implementation Plan (Colorado State Parks)
- WestConnect Coalition PEL Study (CDOT)

Local

- Canyon Boulevard Complete Streets Study (City of Boulder)
- East Arapahoe Plan (City of Boulder)
- North Boulder Mobility Hub (City of Boulder)
- Transportation Master Plan Update (City of Boulder)
- Transportation Report on Progress (City of Boulder)
- Transportation Delivery Option Study (Boulder)
- Erie Transportation Plan (City of Erie)
- Erie Parkway Corridor Study (City of Erie)
- 120th and South Boulder Road Master Plan (City of Lafayette)
- 1st and Main Station Plan (City of Longmont)
- Enhanced Multi-Use Corridor Plan (City of Longmont)
- Main Street Corridor Study (City of Longmont)
- Parks, Recreation and Trails Master Plan (City of Longmont)
- 42 Gateway Alternative Analysis Report (City of Louisville)
- South Boulder Road Small Area Plan (City of Louisville)

The following projects/plans were reviewed but did not have specific project recommendations:

Regional

- Gilpin County Transportation Master Plan (Gilpin County)
- Grand County Transportation Master Plan (Grand County)
- Larimer County Transportation Master Plan (Larimer County)
- CO 287 Plan (North Front Range MPO)

Local

- Boulder Valley Comprehensive Plan (City of Boulder)
- Open Space and Mountain Parks Master Plan (City of Boulder)
- Envision Longmont (City of Longmont)
- Environmental Assessment: Resilient St. Vrain (City of Longmont)
- Highway 42 Revitalization Area Urban Renewal Plan (City of Louisville)
- Lyons Master Plan (Town of Lyons)
- Parks, Recreation, Open Space and Trails Master Plan (Town of Superior)
- Transportation Plan 2014 Update (Town of Superior)

CO 119 and 63rd Street

ESTIMATED PROJECT COSTS, AVAILABLE FUNDING, AND FUNDING GAP

Out of the approximately 60 identified projects with cost estimates, the county has identified five regional priority corridors for improvement. The total estimate of costs for improvements along these corridors is approximately $791 million, with about $64.8 million identified. An additional $726.2 million of funding would be needed for full implementation.

All of the studies/plans summarized in Table 7 have specific projects identified and the following information is included:

- Overall Policy/Vision: Brief description about the overall policy/vision for the study/plan.
- Project Location: Description of location for proposed projects identified.
- Proposed project(s): Details associated with the project at that location.
- Cost estimate: Estimated cost estimate in the millions from the study/plan of the year of completion. It is assumed that these project costs include planning, design, and construction costs associated with the project. Projects without cost estimates may not have been developed yet due to the ongoing nature of the study or because cost estimates were not developed as part of the study/plan. Some cost estimates have been updated since the plan and those are indicated as such.
- Funding source: Funding source listed from the study/plan for project completion.

TABLE 6: PROJECT PLANS AND REPORTS WITH PROPOSED PROJECTS

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
Regional Priority Corridors			
CO 119- Boulder and Longmont	Operation improvements and BRT	$509 M ($470 M unfunded)	RTD and local agencies
CO 7- Boulder and Lafayette	Operation improvements and BRT	$172 M ($160 M unfunded)	RTD and local agencies
CO 287- Longmont and Broomfield	Operation improvements and BRT	$57 M ($51 M unfunded)	RTD and local agencies
CO 42/95 St- Longmont and Louisville/Lafayette	Operation improvements and BRT	$27 M ($19.2 M unfunded)	RTD and local agencies
28th St/Broadway- Boulder	Operation improvements and BRT	$26 M	TBD

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
Regional			
US 36 First and Final Mile Study, Commuting Solutions (2013)			
Identifies suitable options to complete transit trips without single-occupancy vehicle travel in the US 36 corridor.			
Throughout the US 36 corridor	Bus then bike shelters	No estimate	N/A
	EcoPasses	No estimate	N/A
US 36 and Table Mesa Park and Ride	Improved pedestrian connection/underpass from Thunderbird Dr to the park and ride, improved kiss and ride, shuttle service to/from Regent/Colorado, mini transportation hub, S. Loop Rd path connection, Foothills Pkwy shuttles	No estimate	N/A
US 36 and McCaslin Park and Ride	Mini transportation hub, priority parking locations, sidewalk connections, trail crossing at Dillon Rd, ramps for pedestrian bridge, employer based shuttles, enhanced bike connections	No estimate	N/A
2040 Metro Vision, DRCOG (2017)			
Presents the region's vision for a multimodal transportation system needed to respond to future growth and demographic trends. Includes vision and fiscally constrained elements.			
Throughout Boulder County and the DRCOG region	Includes system category expenditures and regionally significant projects	No estimate	N/A
	6 lanes on CO 119	No estimate	N/A
	CO 119 interchange at CO 52	$30 M	CDOT/local
	BRT on CO 119	$57 M	Not funded
	Widening CO 66 – Hover St to Main St	$19 M	CDOT/local
	BRT station at Nelson Rd	No estimate	N/A
	Park-n-ride lot at US 287 and CO 66	No estimate	N/A
	Managed lanes on CO 119	No estimate	N/A
	Northwest Rail	No estimate	N/A
Active Transportation Plan, DRCOG (currently ongoing)			
The first ever regional active transportation plan.			
Throughout Boulder County and the DRCOG region	TBD	TBD	N/A
Jefferson County Bicycle and Pedestrian Plans, Jefferson County (2012)			
Safe and efficient with a regional approach and continuous facilities.			
CO 93	Paved shoulder	No estimate	N/A
Indiana St	Shared use path	No estimate	N/A

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
Jefferson Countywide Transportation Plan, Jefferson County (2014)			
Unified multimodal transportation plan for the efficient, cost effective movement of people and goods.			
CO 93 and Indiana St Corridors	Roadway capacity improvements	No estimate	Not funded
First and Last Mile Strategic Plan, RTD (currently ongoing)			
Address the issue of transit accessibility and improve connectivity to RTD services.			
Throughout RTD system	TBD	TBD	N/A
Northern Area Mobility Study (NAMS), RTD (2014)			
Mobility improvements for the Northwest area of the RTD service area and comprises of five areas: northwest rail, north metro rail line, US 36 BRT, Arterial BRT, and reverse commute between Denver Union Station and the US 36 corridor.			
US 287/CO 66 PnR to US 36 Broomfield PnR	US 287 BRT	$56.4 M	Not funded
Wadsworth to ADCOGC	120th Ave BRT	$31.8 M	Not funded
Boulder Transit Center to Lafayette PnR	South Boulder Rd BRT	$36.6 M	Not funded
City of Boulder on arterial BRT roads	Boulder System Improvements that improve BRT service within city limits	$22 M	Not funded
9th St in Boulder to I-25	Arapahoe Ave/CO 7 BRT	$45.4 M	Not funded
US 287/Arapahoe to US 36 Broomfield PnR	CO 42 BRT	$27.4 M	Not funded
Unknown	Maintenance/Storage Facility	$50.9 M	Not funded
University of Colorado (CU) TMP Update, University of Colorado, Boulder (currently ongoing)			
Define innovative possibilities and set a vision for current and future travel to, between, and through the CU Boulder locations.			
CU Boulder Locations	TBD	TBD	N/A
State			
CO 7 PEL (Brighton – CO 287), CDOT (2014)			
Improve safety, reduce existing and future congestion, provide efficient access, improve multimodal mobility and connectivity.			
Boulder County and Lafayette	Intersection improvements at 119th St/CO 7	$7.5 M[2]	Partially funded
CDOT and Boulder County and Erie	Intersection improvements at US 287/CO 7	$0.9 M	Not funded
Erie and Boulder County	CO 7/County Line Rd intersection relocation and roundabout	$6.9 M	Not funded
Boulder County	Cross-section improvements	$3.6 M	Not funded

[2] Cost estimate is an update from amount in original report based on additional project design / implementation.

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
CO 7 PEL (CO 287 - 75th) and BRT Feasibility Study, CDOT (2018)			
Address current and future traffic congestion issues, proactively plan for a BRT system in this corridor.			
Boulder County	BRT system	$30 M	Not funded
	Shared Use Path	$4 M	Not funded
CO 66 PEL, CDOT (currently ongoing)			
Identify challenge areas, safety concerns, and operational needs for short- and long-term transportation priorities.			
Lyons and Longmont	TBD	TBD	N/A
Colorado Front Range Trail Implementation Plan, Colorado State Parks (2007)			
Develop a five-year Colorado Front Range Trail (CFRT) Comprehensive Implementation Plan (CFRT Plan) for Colorado State Parks (State Parks).			
Lyons to Niwot	Planned trail linking Lyons to Niwot	No estimate	N/A
South of Superior to Jefferson County	Planned trail continuing the Front Range Trail into Jefferson County	No estimate	N/A
WestConnect Coalition PEL, CDOT (2018)			
Overall goal to reduce congestion, improve operational performance/safety, and address future transportation needs.			
CO 93 from Boulder County border to CO 72	Roadway improvements to reduce congestion, improve highway speeds, provide more transit, and continuous separate trail.	$161 M	Not funded
CO 93 and CO 128	At grade intersection improvements	$1 M	Not funded
	Channelized-T intersection	$1 M	Not funded
CO 93 and CO 170	At grade intersection improvements	$5 M	Not funded
Local			
Canyon Boulevard Complete Streets Study, City of Boulder (currently ongoing)			
Travel improvements along Canyon Blvd along with urban design, landscaping and placemaking enhancements.			
Canyon Blvd between 9th and 17th St	TBD	TBD	N/A
East Arapahoe Plan, City of Boulder (2018)			
Complete street creation to accommodate all transportation modes.			
Folsom St to 75th St	Side running BRT and other bicycle, pedestrian and transit improvements	$91 M	Not funded
North Boulder Mobility Hub, City of Boulder (currently ongoing)			
Multimodal transit center as a gateway into the city. A number of transportation options will provide multiple transportation options.			
US 36 and Broadway	TBD	TBD	N/A

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
Transportation Delivery Option Study, City of Boulder (currently ongoing)			
Determine transit service delivery for Boulder and surrounding areas.			
Boulder	TBD	TBD	N/A
Transportation Master Plan Update, City of Boulder (currently ongoing)			
Guiding policy for complete streets, regional travel, TDM, funding, and sustainability.			
Boulder	TBD	TBD	N/A
Transportation Report on Progress, City of Boulder (2018)			
Focus on progress since 2016 and identifies priority action items for the next few years.			
US 36 and Broadway	North Broadway reconstruction	TBD	N/A
Erie Parkway Corridor Study, City of Erie (2017)			
Identify, and eventually implement, multimodal transportation improvements to enhance mobility and safety along Erie Parkway, as well as define streetscape design elements that will support local economic vitality, retain the small-town character, and enhance the identity of Erie.			
US 287 to 119th St	Reconstruction and restriping to narrow travel lanes/widen bike lanes (restriping between Baxter Farm Ln to Meadowview Pkwy)	$21.5 M	Not funded
US 287 to 111th St	Addition of 2nd EB thru lane and improvements to the sidewalk and landscape area	$4.4 M	Not funded
119th St to County Rd 5	Restriping to narrow travel lanes/widen bike lanes and widen sidewalk and intersection enhancements	$3.5 M	Not funded
Coal Creek Bridge	Bridge replacement, reconstruction and trail improvements	$15.1 M	Not funded
County Rd 5 to I-25	Reconstruction	$49.4 M	Not funded
Erie Transportation Plan, City of Erie (2018)			
Create a safe, efficient, innovative system to reduce neighborhood isolation, connecting all areas, accommodates modes, and facilitates regional travel.			
CO 7	Widen from 2 to 4 Lanes – Boulder County Line to Sheridan Pkwy	No estimate	N/A
I-25	Extend JUMP and add bus service from CO 7/I-25 to Lafayette Park and Ride until BRT operates	No estimate	N/A
US 287 and CO 7	BRT	No estimate	N/A
US 287 and CO 7	Mobility hub	No estimate	N/A
County Line Road and CO 7	New signalized three-quarters movement intersection	$0.3 M	Not funded
Erie Pkwy (Botany Lane to 109th St)	Add bike lane	$0.1 M	Not funded
Arapahoe Road east of 107th St	Add bike lane	$0.1 M	Not funded

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
120th and South Boulder Road Master Plan, City of Lafayette (2014)			
Widening of South Boulder Road to accommodate bike lanes, new sidewalks, a multi-use path; intersection improvements of 120th / SBR and 120th/Emma, along with a new multimodal bridge over Coal Creek.			
South Boulder Rd from Malory St to 120th St and 120th St from Emma St to Horizon Ave	South Boulder Rd multimodal improvements and intersection signalization	$10 M[2]	Boulder County, City of Lafayette, CDOT TIP & TAP Funds
	120th St north of South Boulder Rd roadway and sidewalk	$3.7 M	Not funded
	120th St south of South Boulder Rd roadway, sidewalk, and bridge	$6.80	Not funded
	120th St Bridge replacement over Coal Creek	$4.3 M	UDFCD, Lafayette, and Boulder County
1st and Main Station Plan, City of Longmont (2017)			
Create a transit center for local, regional and BRT transit service with anticipation of serving the Northwest Rail Line.			
Surrounding area around station area	Offsite floodplain mitigation improvements	$47.8 M ($18.65 M unfunded)	Longmont, RTD
Onsite station area	Onsite infrastructure improvements	$19.6 M ($4.6 M unfunded)	RTD
Enhanced Multi-Use Corridor Plan, City of Longmont (2014)			
A planning level document to propose designs for each enhanced multi-use corridor.			
Highway 66 between Airport Rd and County Line Rd	Multi-use path	No estimate	N/A
Main Street Corridor Study, City of Longmont (currently ongoing)			
Improvements to Main St within Longmont outside of the downtown area.			
Main St in Longmont	TBD	TBD	N/A
Parks, Recreation and Trails Master Plan, City of Longmont (2014)			
Establishes a vision for the system of parks, recreation facilities, and trails.			
Continuation of St. Vrain Greenway west of Golden Ponds	Complete St. Vrain Greenway	$2.5 M	Not funded

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
Highway 42 Gateway Alternative Analysis Report, City of Louisville (2013)			
Complete CO 42 as a context sensitive, multimodal, three lane highway supported by enhanced local street network connections.			
CO 42 from Paschal Dr to Hecla Dr	Removal of southbound acceleration lane at Paschal Dr, sidewalks, and bike lanes	$0.05 M	Not funded
Hecla Dr intersection	Signalized full movement intersection	$0.425 M	Not funded
Hecla Dr to South Boulder Rd	Creation of two south bound lanes north of Hecla Dr with a southbound left turn separated by a median at Hecla Dr and bike lanes	$1.4 M	Not funded
South Boulder Road intersection	Raised crosswalks for right turns with pedestrian island	$0.05 M	Not funded
South Boulder Rd to Cannon Cir	One lane northbound with midblock crossing north of Cannon Cir	$1 M	Not funded
Griffith St intersection	Unsignalized, 3/4 movement with midblock crossing north of Griffith St	$0.1 M	Not funded
Griffith St to Short St	One lane southbound with reduced turn lanes for both directions, bike lanes, and sidewalk	$2.45 M	Not funded
Short St intersection	Signalized intersection and east intersection leg to access Louisville Sports Complex	$2.525 M	CDOT, City of Louisville and Boulder County
Short St to South St	One lane southbound with sidewalks	0.65 M	Not funded
South St to Pine St	Sidewalks, bike lanes, and landscaped median	$2.6 M	Not funded
Pine St Intersection	Intersection approach changes for north, south and west legs and southbound right turn lane with pedestrian island	$0.425 M	Not funded
Pine St to Lock St	Two lanes in each direction with bike lanes	$1 M	Not funded
Lock St intersection	Roundabout	$3 M	Not funded
Transit route alignment along CO 42	Transit route along 96th St between Lafayette and US 36 and Flatiron Park and Ride	No estimate	Not funded

Project Location	Proposed project(s)	Cost Estimate	Funding Source(s)
South Boulder Road Small Area Plan, City of Louisville (2016)			
Intended to define desired community character, land uses, and public infrastructure priorities to provide a reliable roadmap for public and private investments in the corridor. The South Boulder Rd small area plan translates the broad policies of the Comprehensive Plan into the specific actions and regulations that will achieve those policies.			
CO 42 and trail connecting to Hecla Lake	Underpass connecting North End and Kestrel between Hecla Dr and Summit View	$1 M	Not funded
South Boulder Rd and Via Appia Wy	Underpass connecting Cottonwood Park and Centennial Park	$1 M	Not funded
South Boulder Rd and Main St	Underpass under South Boulder Rd near Main St	$1 M	Not funded
Highway 42 between Paschal Dr and Harney/Lastoka Open Space underpass	Trail	$0.4 M	Not funded
South Boulder Rd between Centennial Dr and Steel St	Trail	$0.4 M	Not funded
Via Appia and South Boulder Rd	With underpass, remove crosswalk and extend left-turn storage	$0.1 M	Not funded
Garfield and South Boulder Rd	Remove acceleration and deceleration lanes, install offset left	$0.5 M	Not funded
Jefferson and South Boulder Rd	Close north-south through movement	$0.1 M	Not funded
Main St and South Boulder Rd	Add pedestrian island in eastbound right turn lane, create offset left, tighten geometrics	$0.1 M	Not funded
Plaza and South Boulder Rd	Introduce protected left phase	$0.1 M	Not funded
Blue Star and South Boulder Rd	Allow un-signalized full movement	$0.1 M	Not funded
Westbound South Boulder Rd	Remove continuous acceleration/deceleration lane	$0.5 M	Not funded


McCaslin Boulevard and US 36 Interchange

FUNDING GAP

Based on review of relevant Boulder County programs and regional plans, a large gap exists between identified projects and available funding. Approximately $940 million in projects have been identified as "high priority" for Boulder County roadways or corridors affecting regional transportation within the county, and $158 million has been identified for funding from CDOT, RTD, the county or other sources, which leaves a total shortfall of $778.2 million (Table 8). This funding gap does not include costs or potential funding for other regional, state, or local projects, including Northwest Rail or Peak Northwest Rail. It is quite possible for the cost estimate to be larger than what is calculated here including inflation and additional costs associated with planning and design.

TABLE 7: ESTIMATED COSTS (IN MILLIONS)

Program	Total Project Costs for Projects with Cost Estimates	Identified Funds	Shortfall
Boulder County CIP	$83	$46	-$37
Boulder County Sales Tax	$62	$47	-$15
CO 119	$509	$39	-$470
CO 7	$172	$12	-$160
CO 287	$57	$6	-$51
CO 42/95th St	$27	$7.8	-$19
28th St/Broadway	$26	-	-$26
Total	**$936**	**$158**	**-$778.2**
Northwest Rail	$1.6 billion	-	$1.6 billion
Peak Northwest Rail	?	?	?

CONCLUSION

Boulder County is faced with a number of factors that will likely affect the future transportation system. Although many improvements have been identified for both county roadways and roadways with regional impact on Boulder County transportation, the Transportation Master Plan update will be focused on how we should address significant changes in demographics, travel patterns, technology, and funding challenges and constraints as we plan for and develop our transportation system. The county will have to navigate the following considerations for implementing projects:

- Travel Patterns: Many employees within Boulder County work in different communities than they live, in addition to employees traveling from outside Boulder County.
- Growing Population: Population forecasts estimate the Boulder County population will grow from 329,200 in 2018 to approximately 415,500 by 2040.
- Changing Technology: Although it is difficult to determine exactly how our transportation system might shift given these new technologies, there are some ideas about how to integrate new technology.
- Funding Shortage: With the funding shortfall close to $1 billion from planned projects, creative funding sources are necessary to create a transportation system to meet the growing demands from increased population.

The Transportation Master Plan Update will help set priorities given these considerations to make improvements across the entire Boulder County transportation system.

Walk and Wheel week at Heatherwood Elementary

Appendix B: Online Survey Summary

Online Survey Summary

DATE:	December 7, 2018
TO:	Stacey Proctor and Angel Bond
FROM:	Leah Langerman and Hannah Polow, AICP
SUBJECT:	Community Survey Summary
PROJECT:	Boulder County Transportation Master Plan Update

INTRODUCTION

Growing population, rising construction costs, and technologies have changed transportation in Boulder County and the Transportation Master Plan (TMP) is being updated for the current 25-year planning horizon. Boulder County started the TMP Update process in summer 2018. In order to adequately plan for a sustainable and inclusive multimodal transportation network, community members were involved in the planning process.

A survey was developed to engage the general public during the early stages of the TMP update (see **Appendix A**), and was distributed in multiple ways. The purpose of the survey was to gather input regarding thoughts and opinions on transportation needs and priorities for current and future transportation funding. The comments and ideas presented will be considered by the project team as the 2040 Transportation Plan is developed.

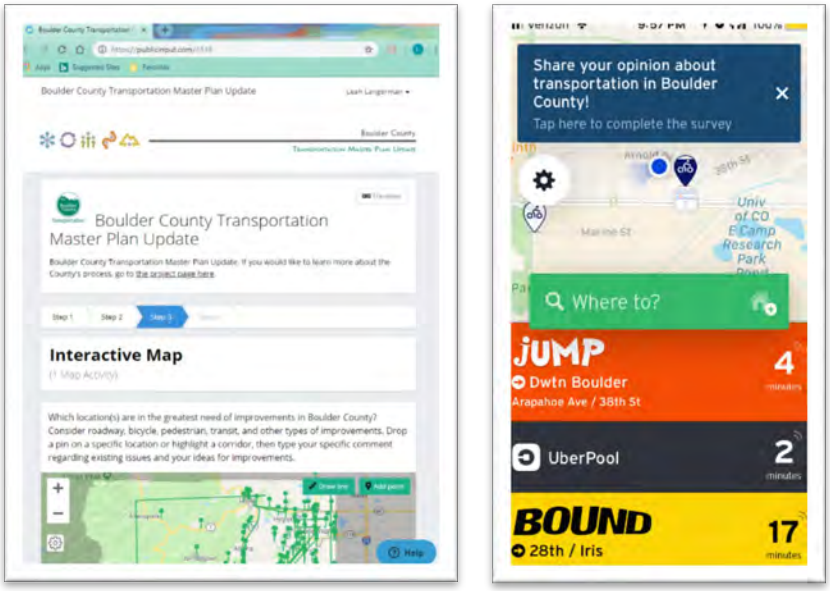
This document summarizes the survey effort, including methods of distribution, availability, and responses received.

SURVEY DISTRIBUTION AND ADVERTISEMENT

The survey was available in electronically, in paper copy, and via telephone. The county used a variety of forums to initially distribute and advertise the survey, including:

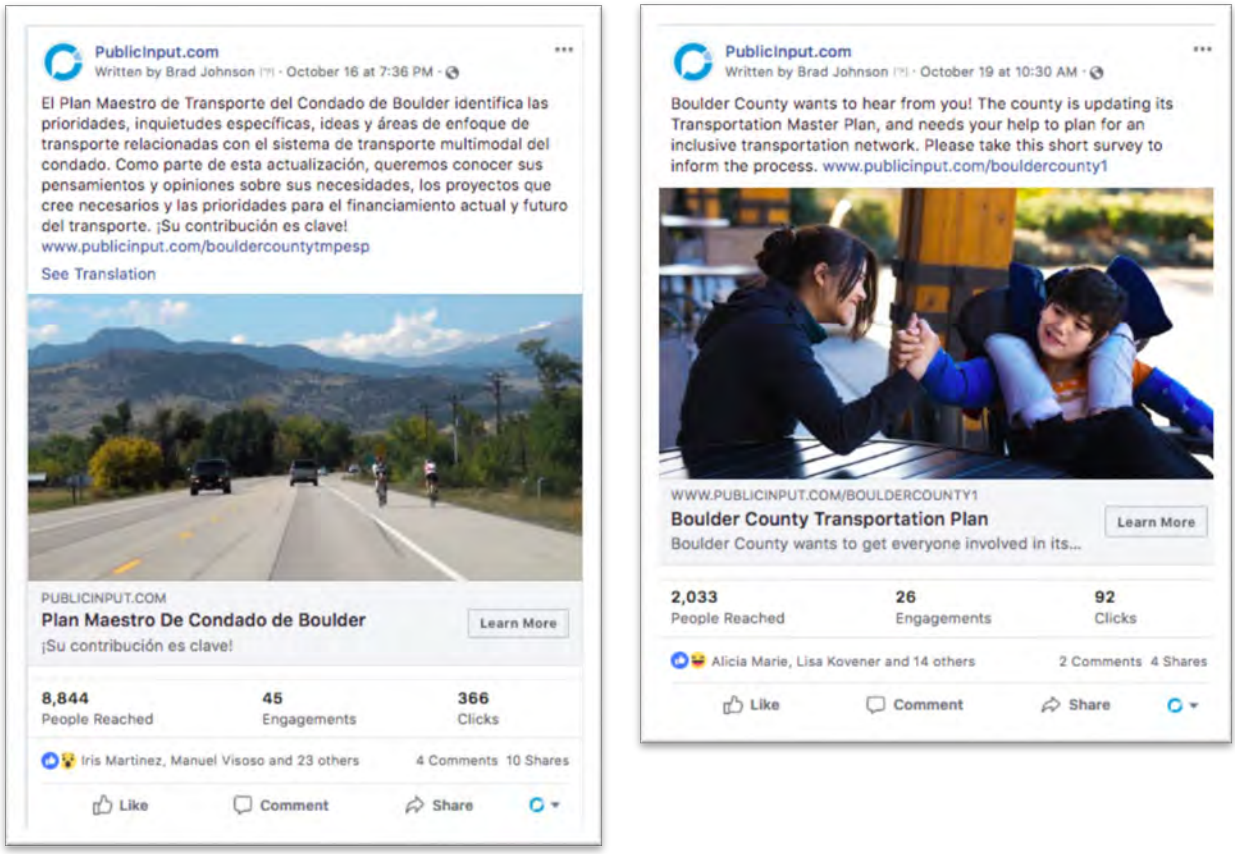
- News releases on September 10 and October 23
- Email to the county's list of interested citizens through GovDelivery
- Availability on the TMP Update page on the county's website (www.BoCoTMP.com)
- Distribution to project partner agencies and organizations with a request to forward to their contacts
- Inclusive Planning Steering Committee meeting, and member distribution to their organizations
- Link in banner within Transit App, which appeared for anyone opening the application within Boulder County during the survey timeframe (**Figure 1**)
- Outreach on social media platforms, including delivery to 79,251 NextDoor members
- Article on Boulder County Connect

FIGURE 1: SCREENSHOT OF ONLINE SURVEY FROM THE WEBSITE (LEFT) AND TRANSIT APP (RIGHT)



To increase the number of responses from underrepresented groups, Facebook advertisements targeting Spanish speakers and people with disabilities (**Figure 2**) in Boulder County ran between October 15 and October 22.

FIGURE 2: FACEBOOK ADS



Spanish speaking focused advertisements had the following impact:

- Impressions (views): 31,954
- Reach (unique views): 9,564
- Clicks: 427

Disability focused advertisements had the following impact:

- Impressions (views): 11,546
- Reach (unique views): 3,666
- Clicks: 149

The number of impressions was much higher than the reach, which indicates there was a relatively small Facebook-assumed user audience size for these populations within Boulder County. Therefore, the advertisement appeared in the news feed of the target population multiple times to increase the chance they would complete the survey. The number of clicks indicates the number of people who chose to click the link to view the survey.

Survey Availability

Online

The survey was made available through an interactive online platform hosted by PublicInput.com. A link to the user-friendly online survey was placed on the county's TMP Update web page and was available from September 10 through October 24.

The Spanish language version of the survey was available online between September 21 and October 24. To increase Spanish-speaker response rates and to provide them a better understanding of the TMP background, current update, and public participation opportunities before they completed the survey, the project web page was made available in Spanish on October 11.

In-Person

Public Meetings

A series of three project kick-off meetings were held in late September and early October 2018 to introduce the TMP Update, present information, and gather feedback. The survey was available in hard copy and on laptops provided at the meetings.

- Louisville at the Kestrel Housing Community Room – September 25
- Longmont at the St. Vrain Community Hub – September 26
- Boulder at the Chamber of Commerce – October 5

In addition to these public meetings, the TMP was discussed with the general public at other meetings, listed below. The survey was advertised to attendees and available during the meetings:

- Planning Commission – October 17
- Community Conversation at the Longmont Senior Center – October 23

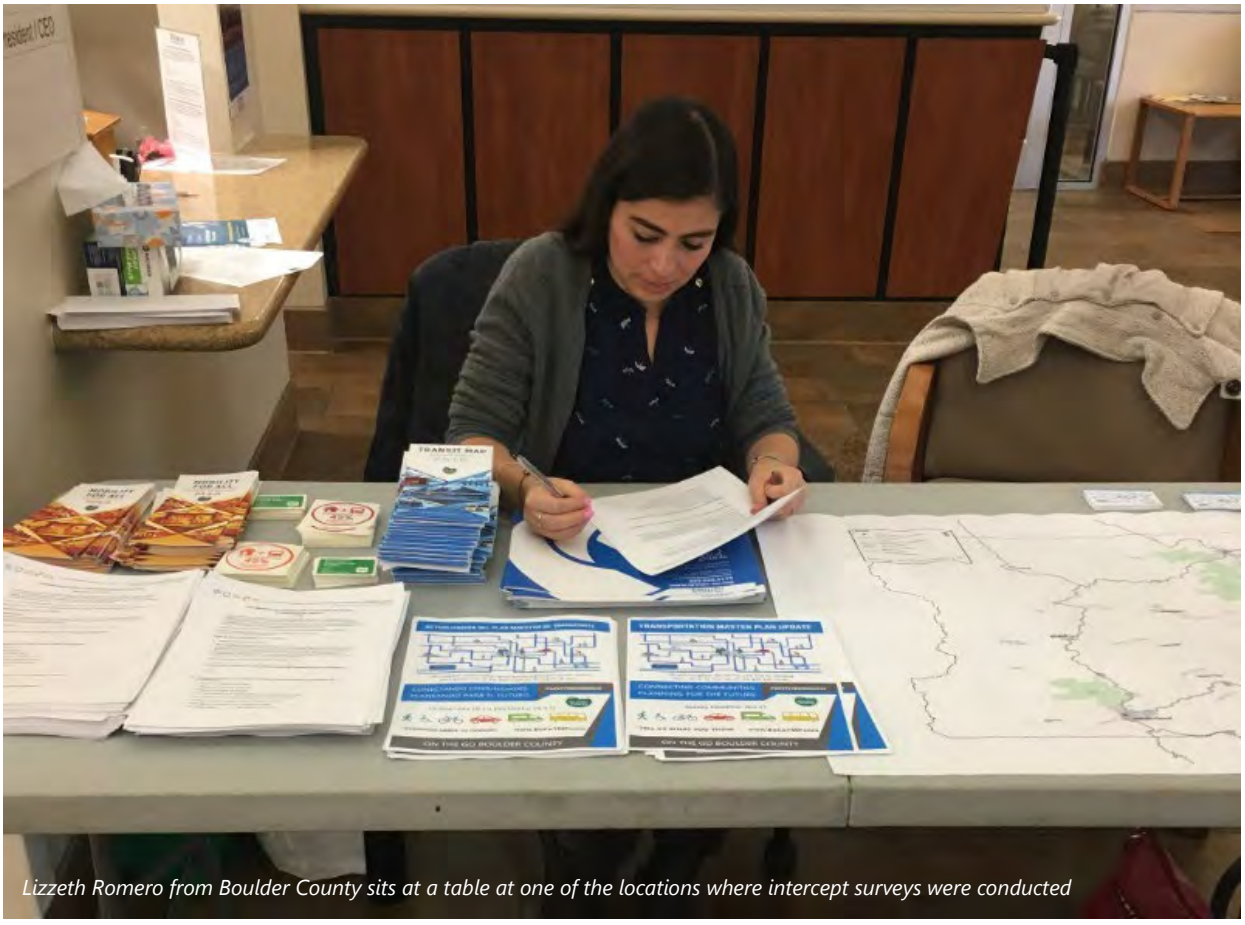
Telephone

Via Mobility Services partnered with Boulder County to conduct surveys of their past customers over the phone. Four staff members of Via's call center placed calls between September 24 and October 10. Each of the Via staff members placing calls were bilingual and could translate into Spanish as needed. Most of Via's riders are at least 60 years old, low income, and have a range of disabilities. Efforts were made to achieve geographic and demographic diversity with the customers surveyed.

Intercept Surveys

In an effort to capture feedback from people who may have missed the other opportunities to provide feedback. Bilingual staff visited two different locations to capture more individuals, primarily Spanish speaking:

- Salud Health Center – October 9
- Sister Carmen – October 10
- Lafayette – October 30

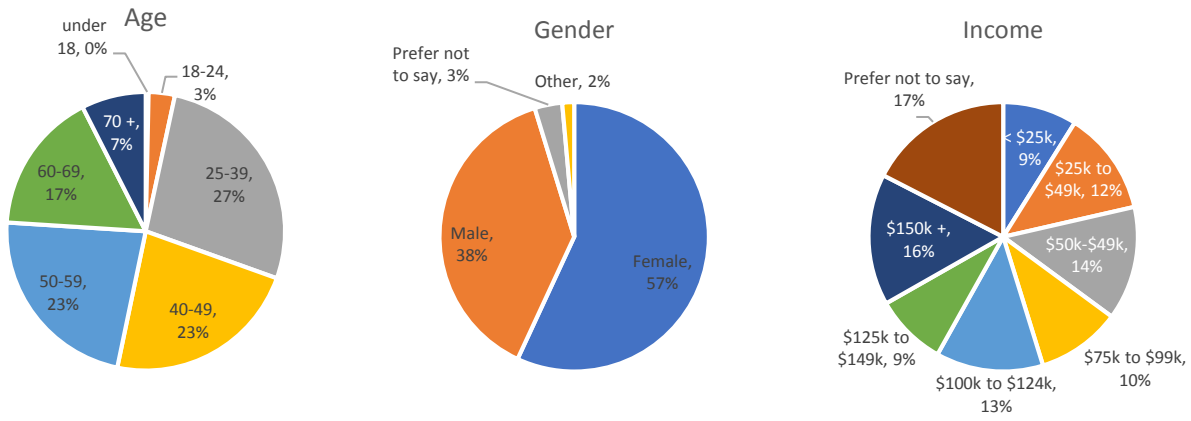


Lizzeth Romero from Boulder County sits at a table at one of the locations where intercept surveys were conducted

Respondent Demographics

A total of 1,955 respondents completed the English or Spanish survey. Most respondents completed English surveys, with 76 surveys in Spanish completed. Every effort was made to capture input from as many population groups as possible. Respondents represented all age categories, with the under 18 category under representing the actual population present in Boulder County with only five respondents[1]. About half of all respondents were 50 years old or older. Slightly more females responded to the survey than are represented in Boulder County. Based on Census information, approximately 50 percent of the Boulder County population is female[1]. All income levels were represented, with about 45 percent making a household income of less than $100k. **Figure 3** shows the pie charts for age, gender and income for respondents. **Figure 3** shows the overview of respondent demographic information.

Figure 3: Respondent Age, Gender, and Income



Disadvanted Populations

As part of the inclusive planning grant received by the county, additional efforts were made to receive feedback from people with disabilities, older adults, and Hispanic or Latinos. Ensuring the voices of these individuals were heard and their needs were understood was a critical component of the initial public outreach for the TMP Update.

Although efforts were not made to specifically encourage people with low incomes to participate, the survey results do contain that information for respondents who answered the income question.

People with Disabilities

Approximately 150 people (144) completed the survey who identified as having a disability, or about 7 percent of the respondents. Sixty-three respondents identified as being a caretaker of someone with a disability.

[1] Boulder County QuickFacts. US Census Bureau. Accessed November 2018 from: https://www.census.gov/quickfacts/fact/table/bouldercountycolorado/RHI725217

Older Adults

Older adults was defined as those over 60 years old for the purposes of this survey. Over 350 respondents (353) identified as an older adult. This represents 18 percent of the respondents. Ninety-four respondents identified as being a caretaker of an older adult.

Hispanic or Latinos

Via staff completed 80 surveys of their past riders via phone calls. Despite efforts to engage Spanish speakers, only 15 Spanish speaking individuals completed Via's phone survey. Via reported that many Spanish-speaking riders didn't wish to participate in the survey. In total, 76 people completed the Spanish language version of the survey. One hundred thirty five respondents self-identified as being Hispanic or Latino across both the English and Spanish surveys.

People with Low Incomes

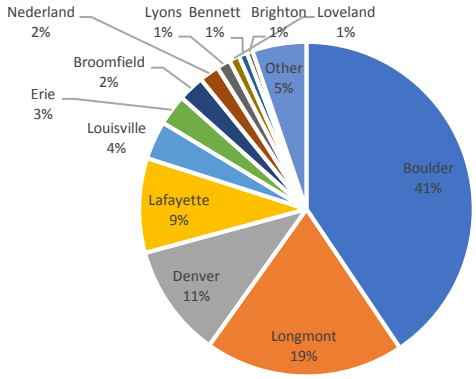
For respondents who selected their household income, 350 respondents indicated that their yearly household income is less than $50k. While this is not a direct measure of poverty, it does provide some insights on people who are "low-income".

Respondent Information

Home Location

Most respondents live in Boulder (41 percent of respondents who gave their home location). Longmont was the second most frequent home location, encompassing 19 percent of respondents. Other Boulder County communities Lafayette, Louisville, Erie, and Lyons also participated with at least one percent of all respondents. Lafayette represented 9 percent of all respondents. People from outside Boulder County also responded to the survey, with 11 percent from Denver and 3 percent from Broomfield. **Figure 4** shows all home locations for communities with at least 1 percent of respondents.

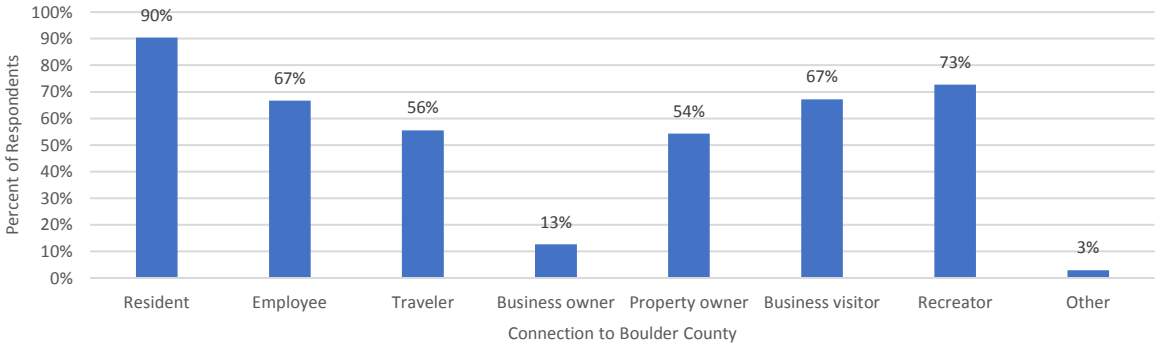
Figure 4: Respondents Home Location



Connection to Boulder County

When asked about the connection to Boulder County, most respondents identified as a resident (90 percent). The next most popular answer is as a recreator at 73 percent. The two next most popular answers are employee and business visitor (both at 67 percent). A lower percentage of respondents identify as a traveler through Boulder County or a property owner (56 percent and 54 percent, respectively). Only 13 percent of respondents are business owners. **Figure 5** shows the breakdown of respondents by connection.

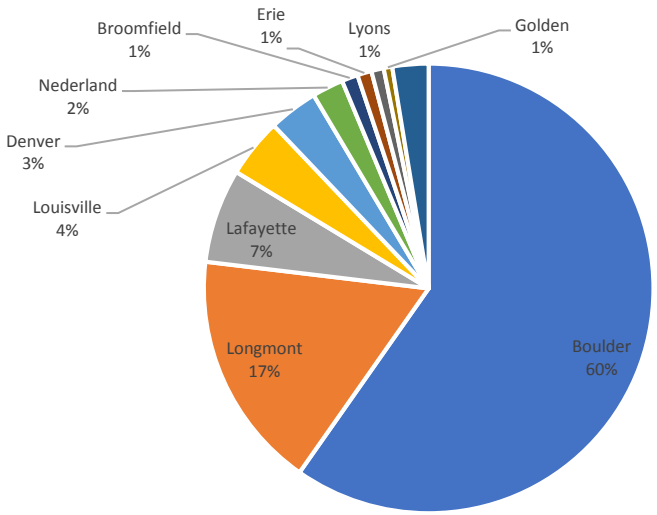
Figure 5: Connection to Boulder County



Work/School Location

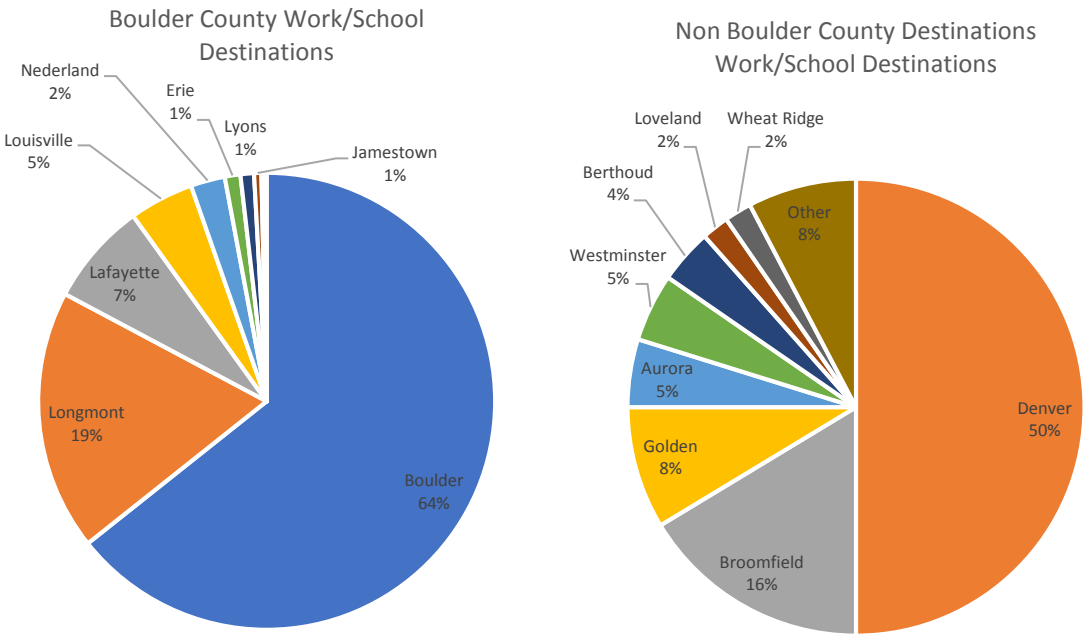
Overall, 60 percent of respondents claimed Boulder as their main work or school destination. The next three most popular cities are also within Boulder County (Longmont, Lafayette, and Louisville). The remaining cities that have at least 1 percent are within Boulder County as well as the surrounding area (Denver, Broomfield, and Golden). The breakout for all communities that have at least 1 percent of respondents is shown in **Figure 6**.

Figure 6: Overall Work/School Destinations



When separated by Boulder County destinations and non-Boulder County destinations, Boulder remains the most popular destination for Boulder County destinations and Denver is the most popular non-Boulder County destination (**Figure 7**).

FIGURE 7: BOULDER COUNTY DESTINATIONS VS. NON BOULDER COUNTY DESTINATIONS



Current Mode

Respondents were asked to select all transportation modes they regularly use at least once per week. Approximately 80 percent of all respondents indicate that they drive alone at least once per week (**Figure 8**). Other modes involving personal vehicles were also popular, with carpool/vanpool at 11 percent, getting a ride at 20 percent, and ridehailing at 10 percent. The next two most popular options are walk (43 percent) and bike (39 percent). Thirty-six percent of respondents indicate that they use transit at least once a week.

Population Groups

People with Disabilities

A little over half of respondents with disabilities drive alone at least once a week. A high percentage of respondents also indicated that they carpool/vanpool, get a ride, ridehail, ride transit, or use paratransit at least once a week. When compared to other population groups, respondents with disabilities get a ride, ridehail, and use paratransit more.

Older Adults

While older adult respondents are similar to the rest of the population in the highest mode being drive alone, they are less likely to carpool/vanpool or ridehail. Approximately a quarter of older adult respondents claim that they get a ride at least once a week.

Hispanic or Latino Ethnicity

A little over 65 percent of respondents who identified as Hispanic or Latino drive alone at least once a week. A high percentage of respondents also get a ride and ride transit at least once a week.

People with Low Incomes

For respondents who have a household income of less than $50k, a little over 60 percent of respondents indicate they drive alone at least once a week. This population group also has high percentages for getting a ride, ridehailing, riding transit, and using paratransit.

Association with Boulder County

Similar to the breakout of population groups, regardless of respondents' association with Boulder County, the highest mode used at least one day a week is drive alone. Business owners are the most likely to drive alone at least one day a week, at 86 percent. Respondents who only work in Boulder County and business owners in Boulder County differ the most. Respondents who only work in Boulder County are less likely than other groups to get a ride, ridehail, use paratransit, bike, or walk. Respondents who are business owners in Boulder County are most likely to get a ride and less likely to ride transit. **Figure 9** shows the breakout by multiple associations with Boulder County.

Figure 8: Mode by Population Group

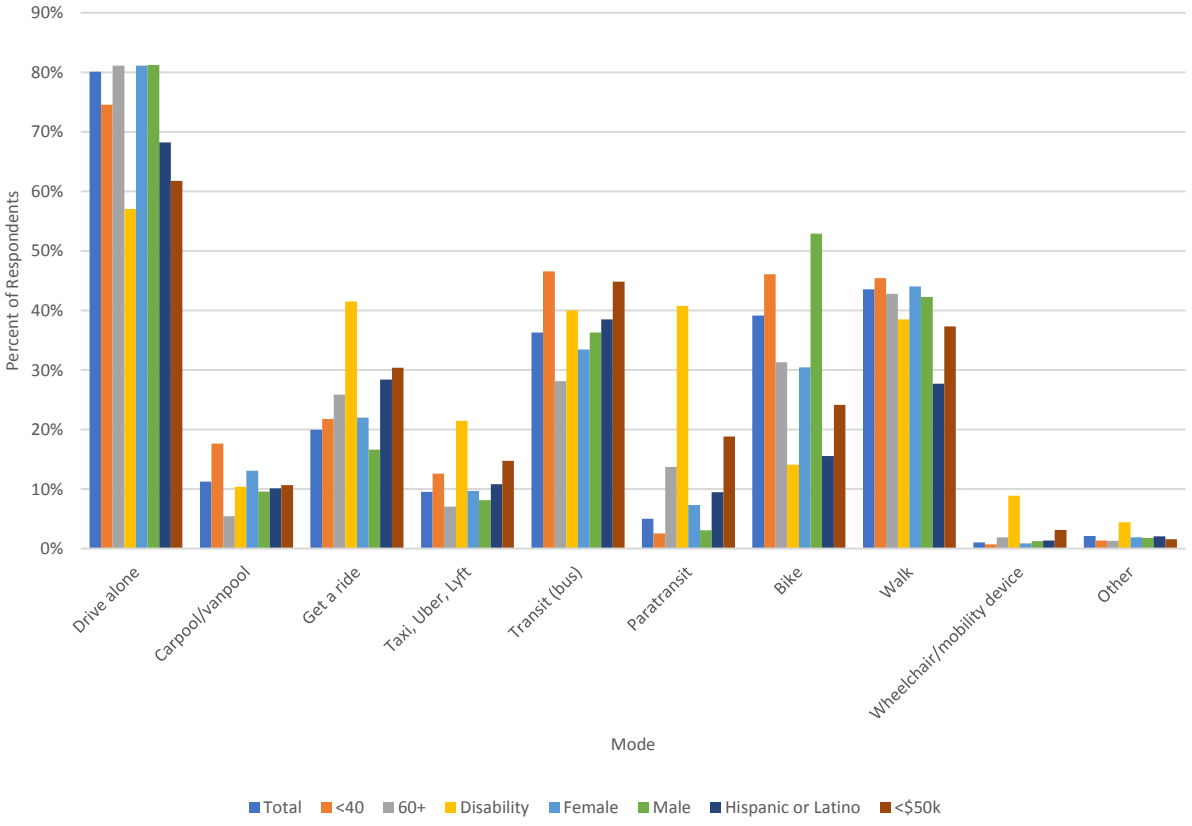
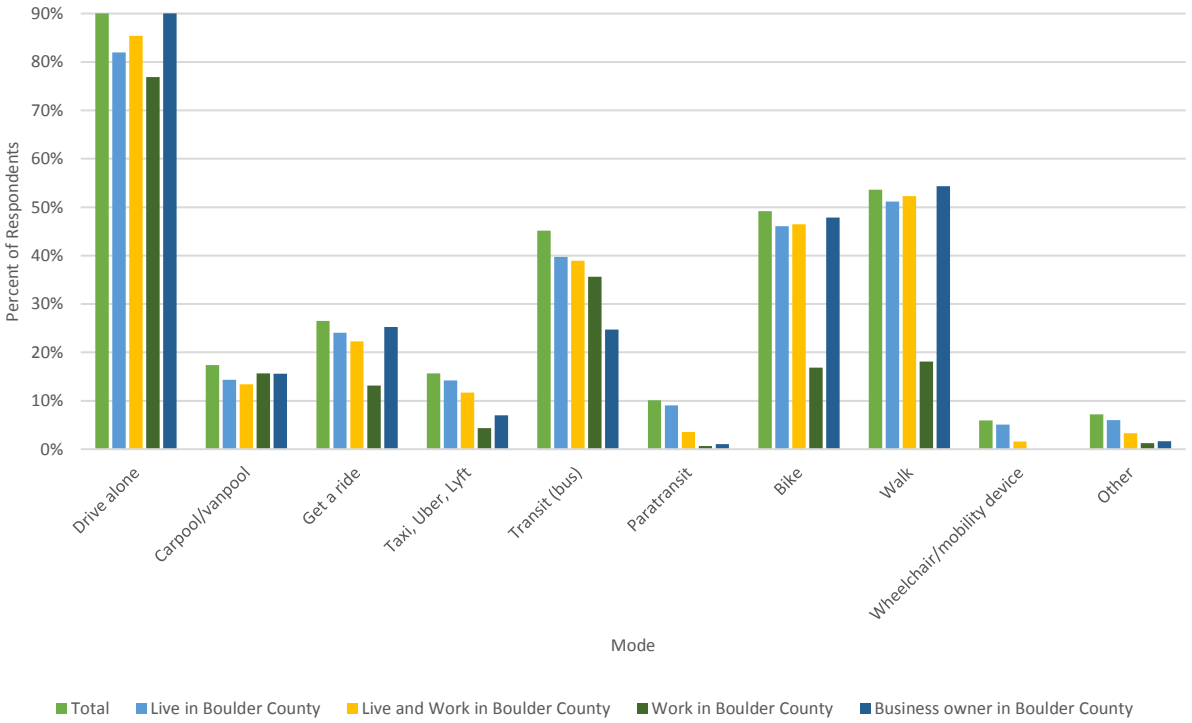


Figure 9: Mode By Connection to Boulder County



New Transportation Technology

Respondents were asked about their willingness to use new transportation technologies (e-bike, electric car, autonomous car, autonomous bus). Respondents indicated their willingness based on the following categories: very interested, interested, neutral, not interested, or not sure/don't know. When asked about willingness[2] for future transportation modes, the most popular answer was the electric car. Respondents under 40 and males are the two most interested population groups for all new transportation technologies. Full details can be seen in **Figure 10**.

Population Groups

People with Disabilities

A low percentage of respondents with disabilities are interested in new transportation technologies. For every mode except the electric car, less than 30 percent of respondents claim they are interested.

Older Adults

Similar to people with disabilities, most older adult respondents are not interested in new transportation technologies. About 30 percent or less of respondents claim they are interested in using that mode (except the electric car).

Hispanic or Latino Ethnicity

Hispanic or Latino respondents also indicate the highest interest for electric cars, and a lower interest for e-bikes, autonomous cars, and autonomous buses. More Hispanic or Latino respondents are interested in autonomous cars and autonomous buses than the other population groups summarized here.

People with Low Incomes

Similar to people with disabilities and older adults, most respondents with low incomes are not interested in new transportation technologies with the exception of the electric car.

Connection to Boulder County

A similar trend occurs with respondents most interested in electric cars when the data is grouped by connection to Boulder County. While all groups are similarly interested in autonomous cars and autonomous buses, respondents who only work in Boulder County are less interested in e-bikes and electric cars. **Figure 11** shows the breakout detail associated with association with Boulder County.

[2] For the analysis purposes here, responses for "Very interested" and "Interested" have been combined to be considered "Interested".

Figure 10: New Transportation Modes by Population Group

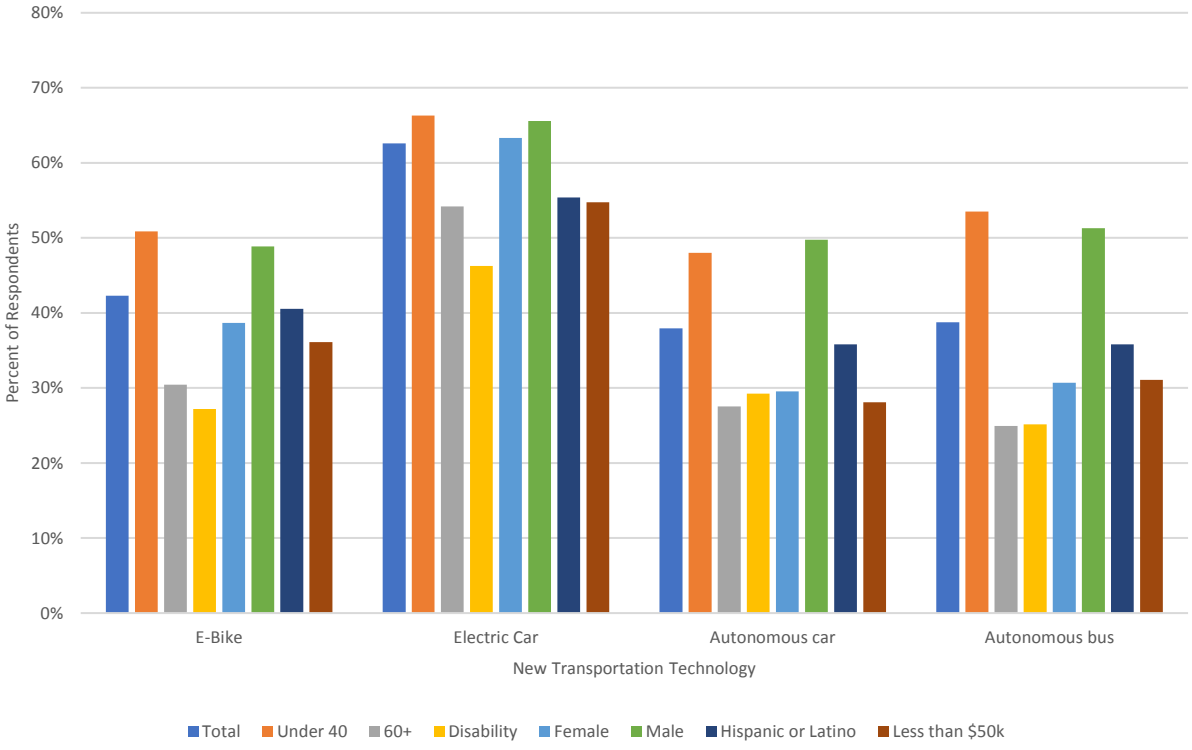
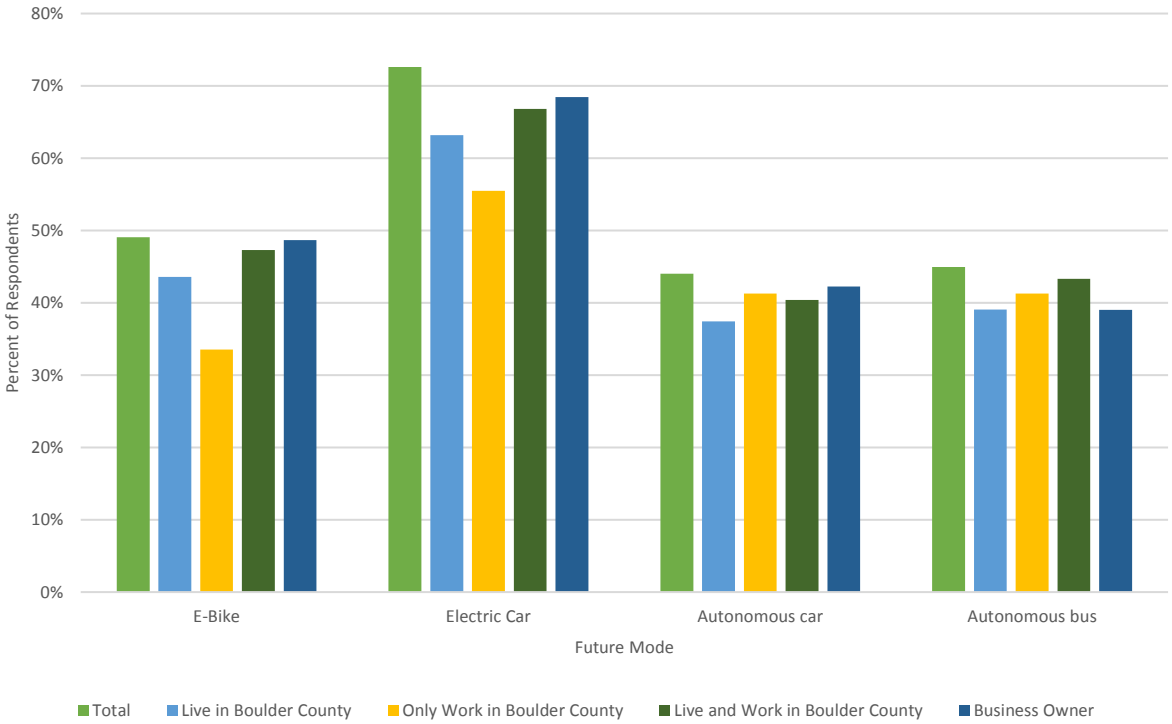


Figure 11: New Transportation Modes by Connection to Boulder County



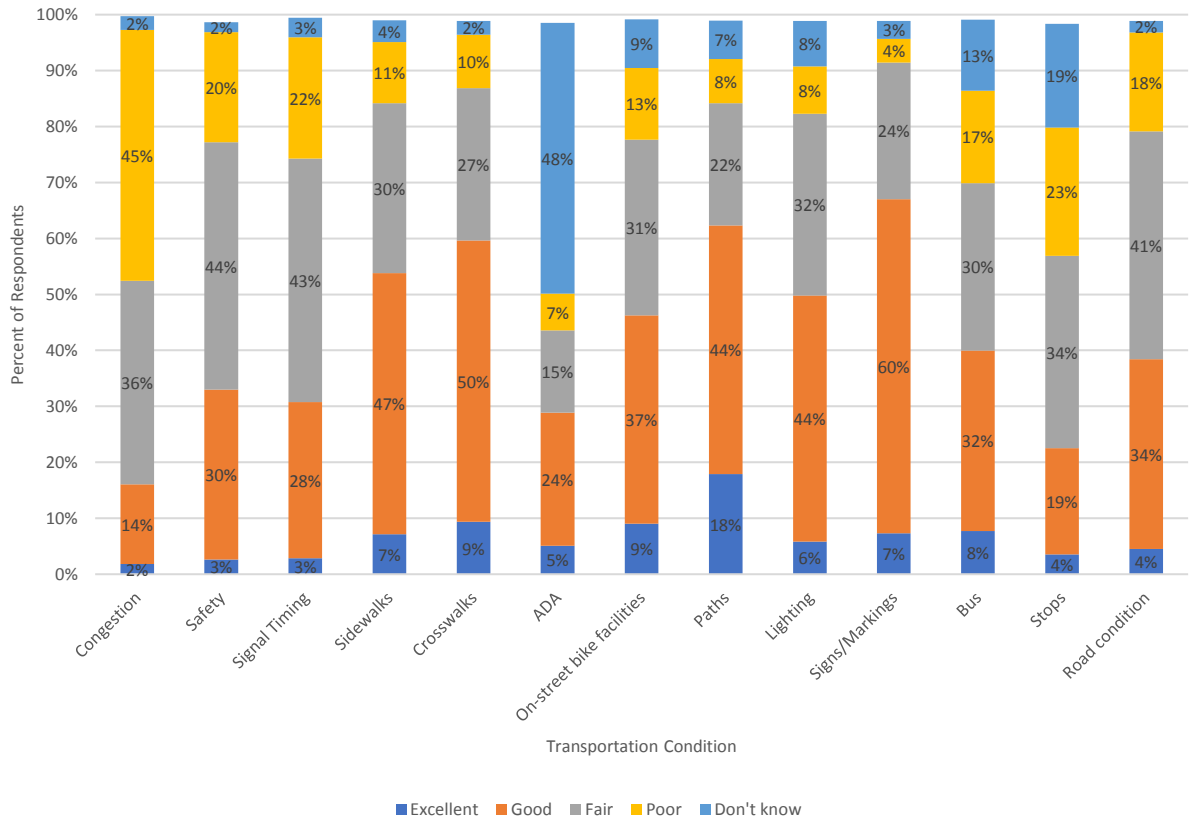
TRANSPORTATION CONDITIONS

Respondents were asked to rate transportation conditions excellent, good, fair, poor, or don't know (**Figure 12**). Many respondents gave transportation conditions a score of good or fair, but top ratings and low ratings emerged:

- Five Top Ratings
  - Signs/Markings
  - Paths
  - Crosswalks
  - Sidewalks
  - Lighting
- Five Low Ratings
  - Congestion
  - Stops
  - Signal Timing
  - Safety
  - Road Condition

Although the question specifically asks respondents about the county's transportation system, respondents could have been thinking about a specific part of the county that may or may not actually be unincorporated Boulder County. The responses for this question provide insight on opinions about the current transportation system, but it is important to note the limitations of the data.

FIGURE 12: TRANSPORTATION CONDITIONS OVERALL RATING



Top Priorities

Respondents were asked to select their top three priorities for improving transportation in Boulder County. Overall, almost 60 percent of respondents indicated reducing traffic congestion as a top priority. The next most popular answers were enhance transit services (approximately 40 percent) and enhance walking and biking facilities (just over 30 percent). The next priorities were selected by about a quarter of respondents: reliability, maintenance, safety, and signals. **Figure 13** shows full details.

Population Groups

People with Disabilities

Respondents with disabilities indicated reducing congestion, enhancing transit services and improving safety as the top priorities. Lowest priorities include: improve compatibility with surrounding land uses, improve bike/pedestrian access to bus stops, and improve driving access to park and rides.

Older Adults

Older adult respondents indicated reducing congestion, maintaining the existing system, and enhancing transit service as the top priorities. Lowest priorities include: creating roadway connections, improve compatibility with surrounding land uses, and improve driving access to park and rides.

Hispanic or Latino Ethnicity

Hispanic or Latino respondents indicated reducing congestion, enhancing transit service, and improving safety as the top priorities. Lowest priorities include: improve driving access to park and rides, improvements compatible with new technology, and reduce wildlife collisions.

People with Low Incomes

Respondents with low incomes indicated reducing congestion, enhancing transit service, and improving safety as the top priorities. Lowest priorities include: improve compatibility with surrounding land uses, improvements compatible with new technology, and improve driving access to park and rides.

Connection to Boulder County

The biggest differences arise in the respondents based on whether they only work in Boulder County or if they live and work in Boulder County. Respondents who only work in Boulder County indicate the following as top priorities: reducing congestion, increase travel time reliability, and enhance transit services. A higher percentage of respondents selected these as top priorities than other population groups. **Figure 14** shows full details.

FIGURE 13: TOP PRIORITIES BY POPULATION GROUP

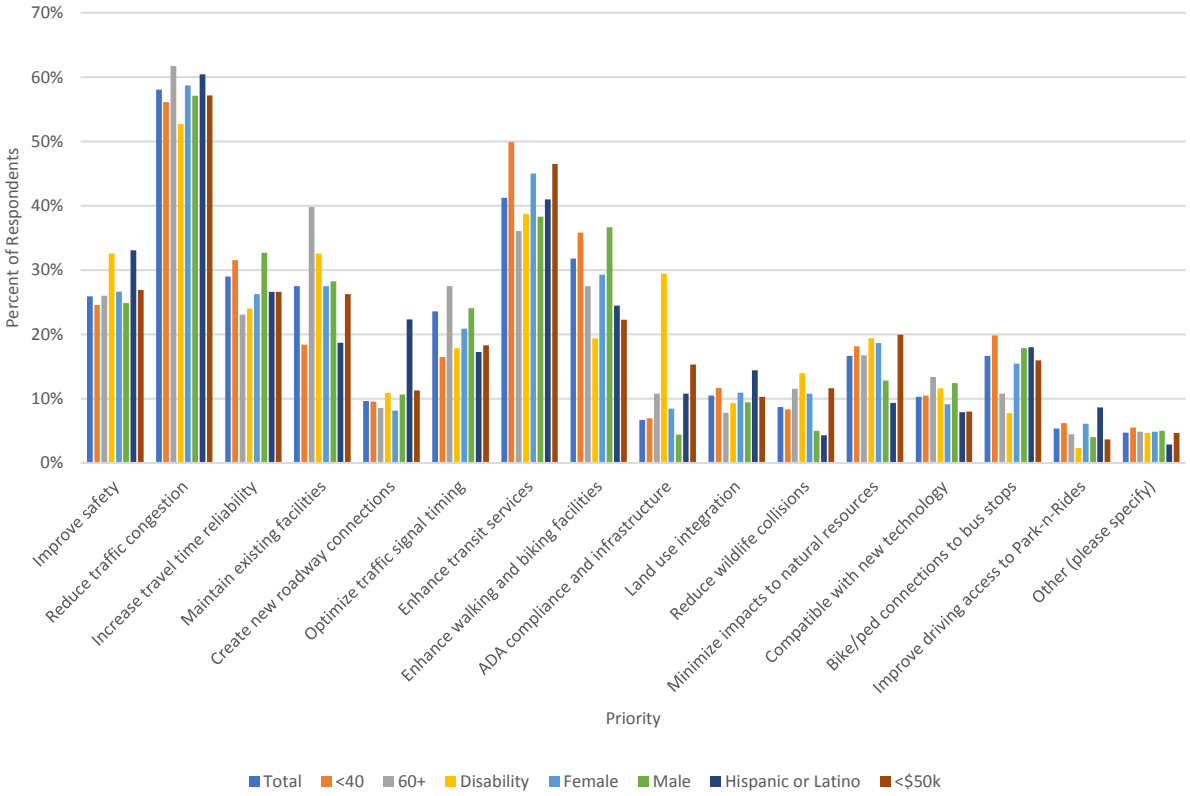
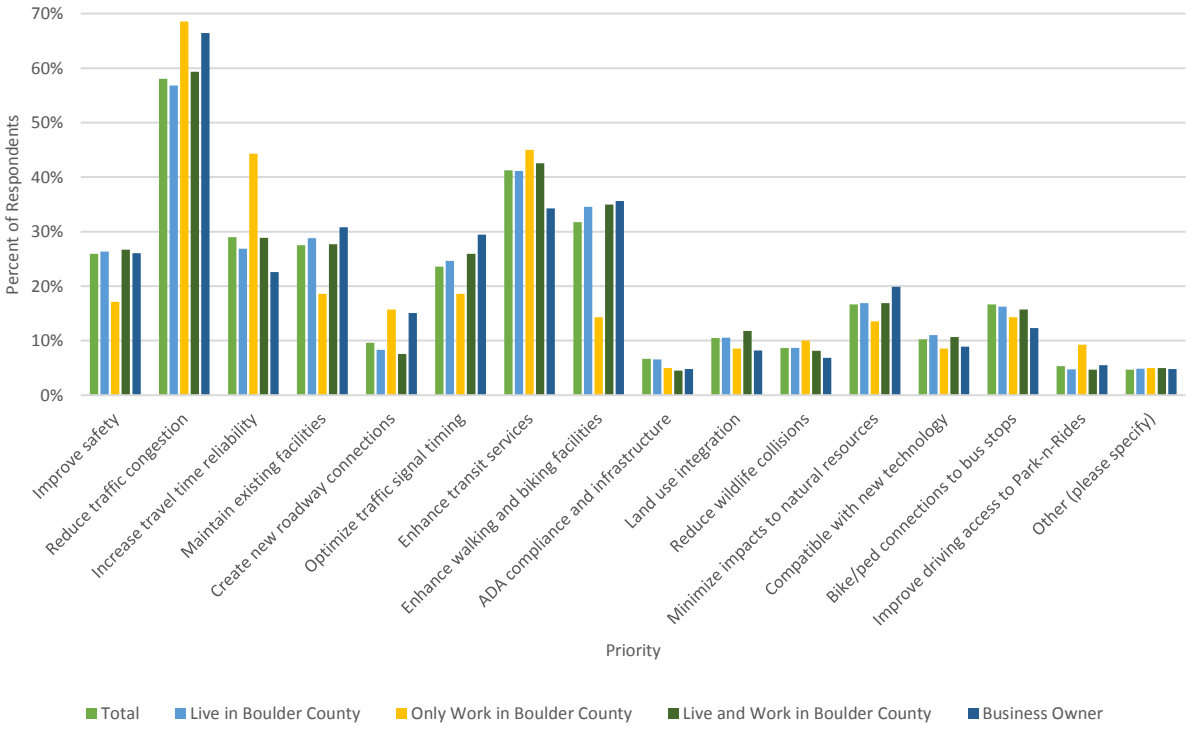


FIGURE 14: TOP PRIORITIES BY CONNECTION TO BOULDER COUNTY



Transit Priorities

Respondents were asked to select their top three priorities for improving transit in Boulder County. The top priority identified by respondents was increased frequency. Expand service area was a close second top priority. A little over a quarter of all respondents identified the next top priorities: faster travel time, more evening/weekend service, and cheaper fares/more access to passes. **Figure 15** shows full details.

Population Groups

People with Disabilities

Respondents with disabilities indicated expand service area, increase frequency, and more evening/weekend service as the top priorities. Lowest priorities include: speeding up the boarding process, more park and ride capacity, and more bus stop amenities.

Older Adults

Older adult respondents indicated expand service area, increase frequency, and more evening/weekend service as the top priorities. Lowest priorities include: speeding up the boarding process, more park and ride capacity, and more bus stop amenities.

Hispanic or Latino Ethnicity

Respondents with Hispanic or Latino indicated increase frequency, expand service area, and more evening/weekend service as the top priorities. Lowest priorities include: more paratransit, speeding up the boarding process, and more park and ride capacity.

People with Low Incomes

Respondents with low incomes indicated increase frequency, more evening/weekend service, and expand service areas as the top priorities. Lowest priorities include: speeding up the boarding process, more bus stop amenities, and more park and ride capacity.

Connection to Boulder County

The biggest differences arise in the respondents based on whether they only work in Boulder County or if they live and work in Boulder county. Respondents who only work in Boulder County indicate the following as top priorities: faster travel times, increased frequency, and expand service area. Respondents who only work in Boulder County rate faster travel times as a top priority more than other populations. Reliability is also more important to this population group than others. Full details can be seen in **Figure 16**.

FIGURE 15: TRANSIT PRIORITIES BY POPULATION GROUP

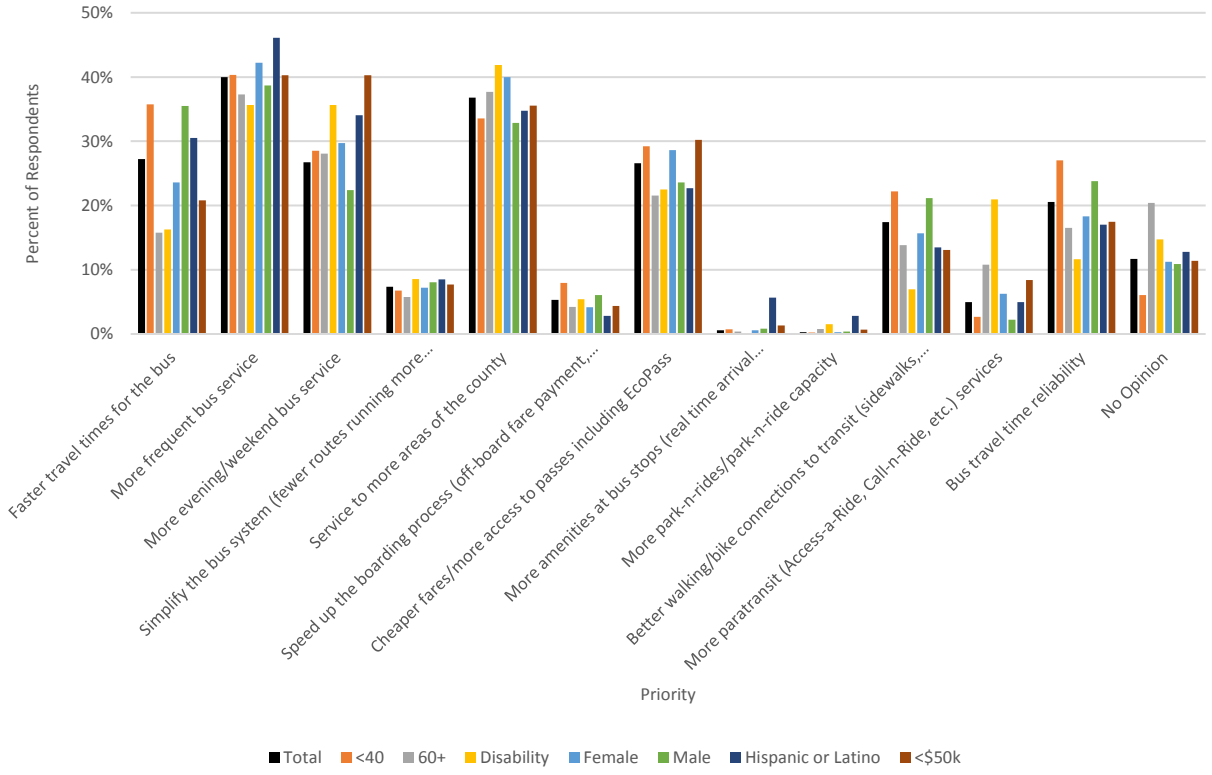
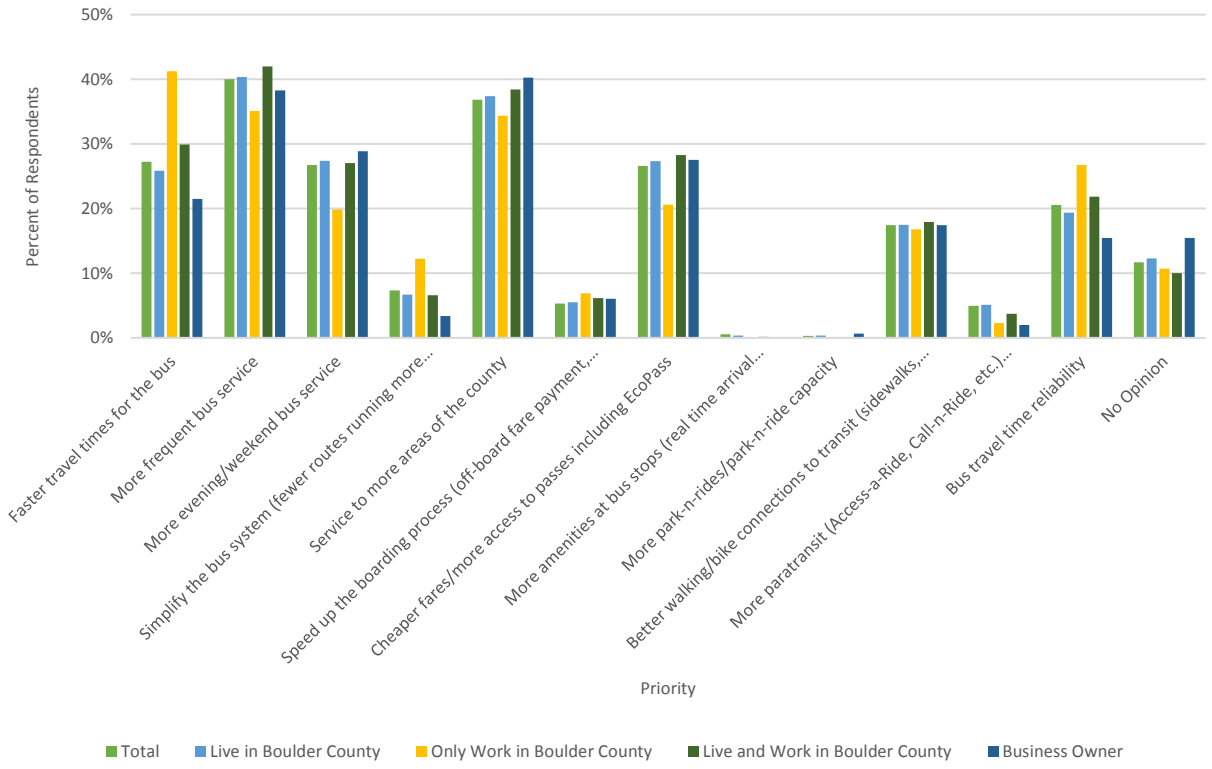


FIGURE 16: TRANSIT PRIORITIES BY CONNECTION TO BOULDER COUNTY



Bicycling Priorities

Respondents were asked to select their top three priorities for improving bicycling in Boulder County. Over half of respondents selected adding bikeable shoulders or increasing the number of separated facilities as one of their top three priorities. The next top priority is improving intersection safety and improving maintenance. Increasing the number of soft-surface trails ranked a close fifth. Full details can be seen in **Figure 17**.

Population Groups

People with Disabilities

Respondents with disabilities indicated add bikeable shoulders, increase separated facilities, improve maintenance, and improve intersection safety as top priorities. Lowest priorities include: expand bike share, improve bike parking, and improve bicycle/transit connections.

Older Adults

Older adult respondents indicated the same top priorities as people with disabilities (add bikeable shoulders, increase separated facilities, improve maintenance, and improve intersection safety). Lowest priorities were also the same (expand bike share, improve bike parking, and improve bicycle/transit connections).

Hispanic or Latino Ethnicity

Hispanic or Latino respondents identified add bikeable shoulders, improve intersection safety, and increase separated facilities as their top priorities. Lowest priorities are similar to people with disabilities and older adults: promote e-bikes, expand bike share, and improve bike parking.

People with Low Incomes

Respondents with low incomes indicated the same top priorities as people with disabilities and older adults (add bikeable shoulders, increase separated facilities, and improve intersection safety). Lowest priorities include: improve bicycle/transit connections, expand bike share, and improve bike parking.

Connection to Boulder County

The biggest differences arise in the respondents based on whether they only work in Boulder County or if they live and work in Boulder County. Respondents who only work in Boulder County did select add bikeable shoulders and increase separated facilities as the top two priorities, but a lower percentage of respondents have indicated this than other population groups (and thus a higher percentage of respondents indicated that they have no opinion). Full details can be seen in **Figure 18**.

FIGURE 17: BICYCLING PRIORITIES BY POPULATION GROUP

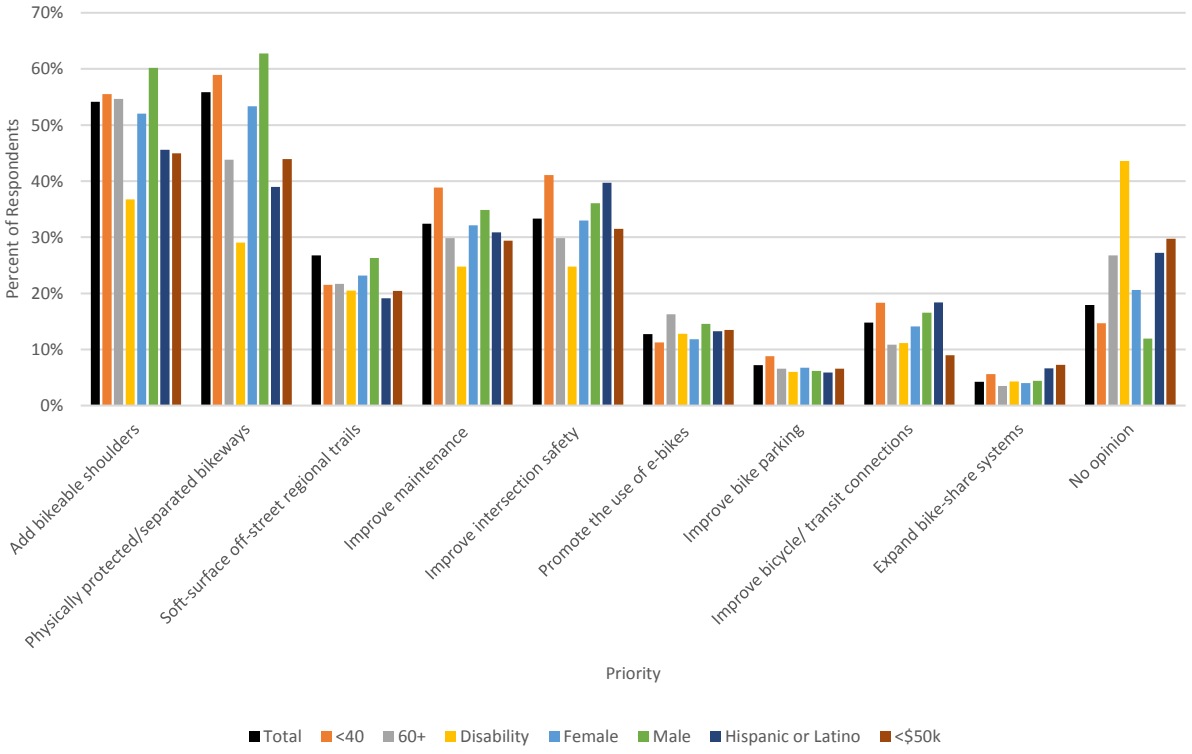
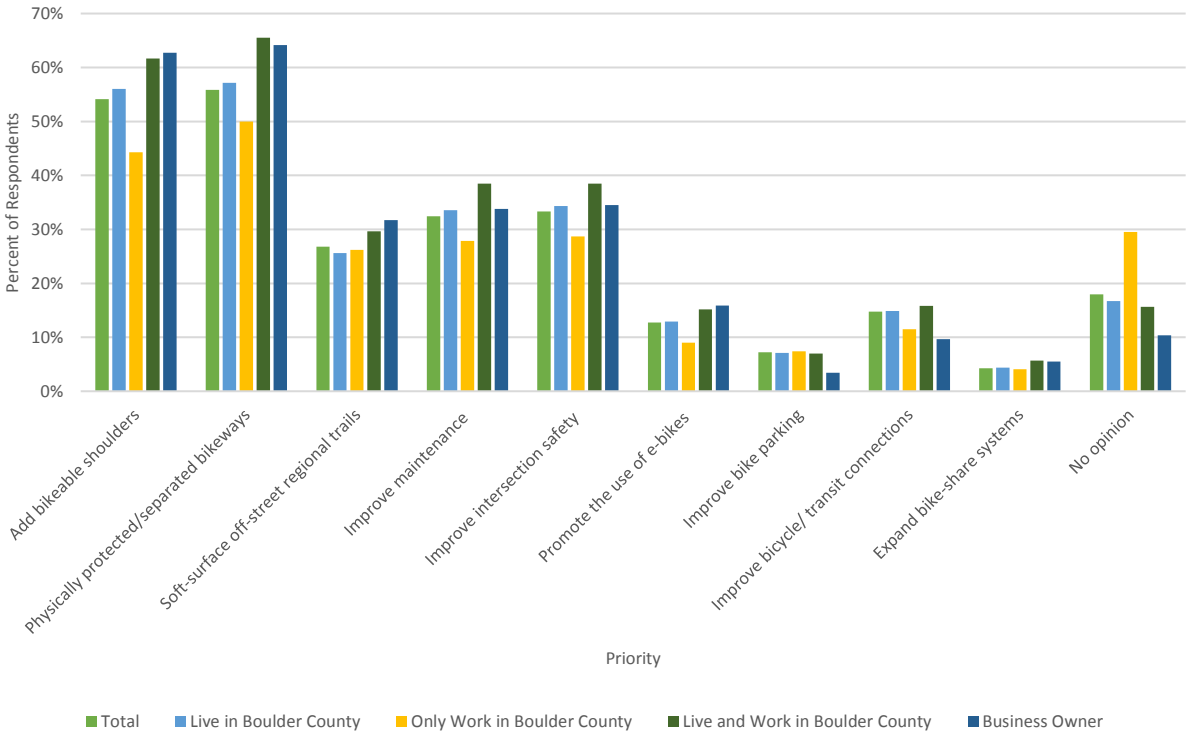


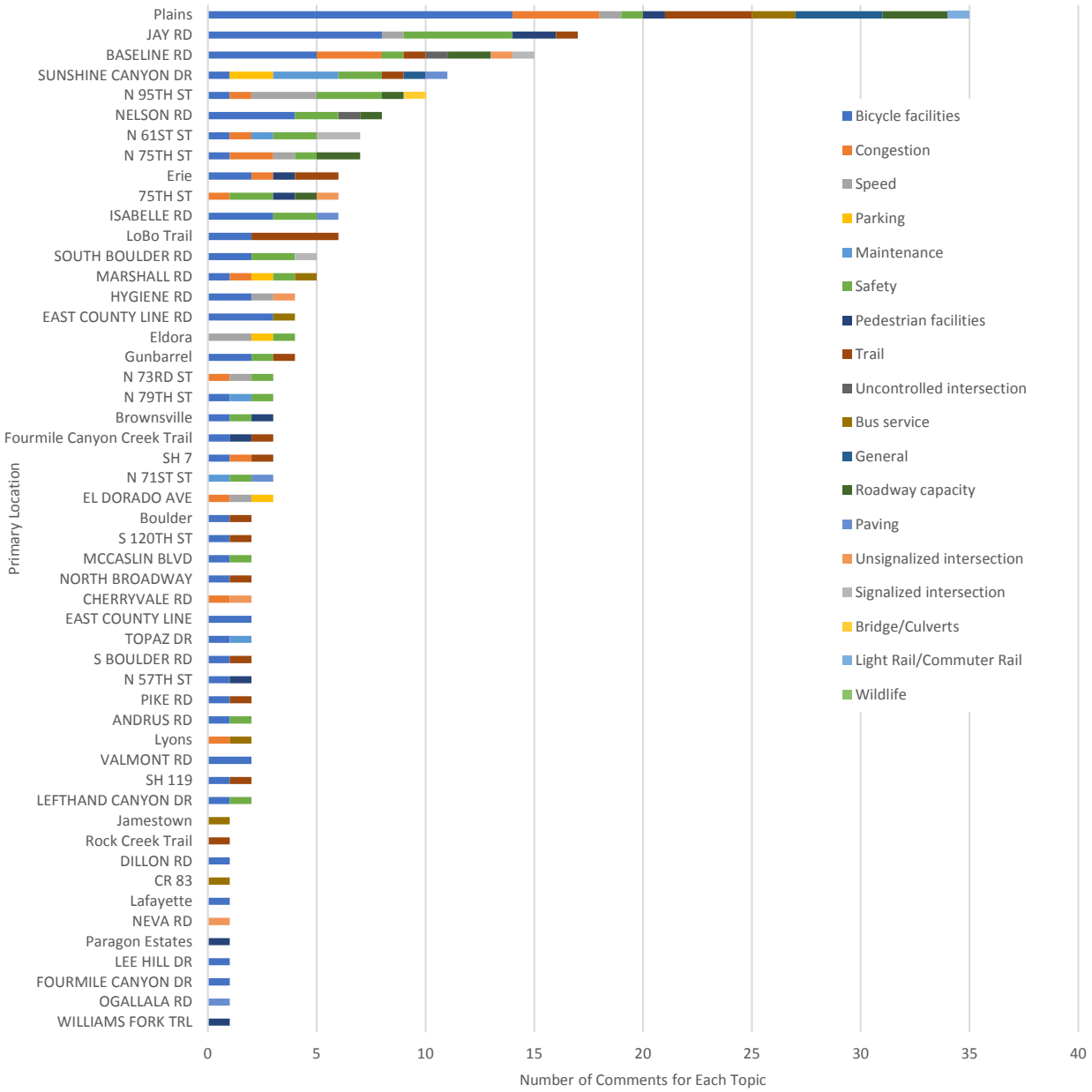
FIGURE 18: BICYCLING PRIORITIES BY CONNECTION TO BOULDER COUNTY



Map Comments

In addition to established questions, respondents had the opportunity to mark comments on a map. The survey tool did not limit people to making comments only within unincorporated Boulder County (**Figure 19**). However, the comments included in this analysis are only comments related to unincorporated Boulder County. Comment topics spanned across all modes and varied in their level of detail. The plains received the most topics, with many related to bicycle facilities and congestion. Jay Road, Baseline Road, and Sunshine Canyon Drive also receive a number of comments.

Figure 19: Map Comments by Location



Overall Themes

While there are common trends and popular answers from all respondents, nuances about different population groups can assist in the implementation actions that will be considered for the TMP Update. A number of themes became apparent within the online survey and can be carried forward into the next phase of the TMP Update project in data analysis and identifying draft implementation actions.

- Future Modes
  - Across population groups, the highest percentage of respondents are interested electric cars, with lower percentages of respondents interested in using e-bikes, autonomous cars and buses.
  - Over 40 percent of respondents who work but don't live in Boulder County are interested in autonomous cars and buses.
- Lowest Five Transportation Conditions Ratings
  - Congestion, Bus Stops, Signal Timing, Safety, Road Condition
- Highest Five Transportation Conditions Ratings
  - Signs/Markings, Paths, Crosswalks, Sidewalks, Lighting
- Top Transportation Priorities
  - Across population groups, the highest priority is reducing traffic congestion. Enhancing transit is the second most likely condition respondents selected.
- Top Transit Priorities
  - The top priority identified by respondents was frequency. Expand service area was a close second. A little over a quarter of all respondents identified the next top priorities: faster travel time, more evening/weekend service, and cheaper fares/passes.
- Top Bicycling Priorities
  - Two very clear priorities from respondents: shoulder improvements and separated facilities. Intersection safety and improving maintenance were also top priorities from a higher percentage of respondents.

APPENDIX A: ONLINE SURVEY

Boulder County 2040 Transportation Master Plan Survey

September/October 2018

The Boulder County Transportation Master Plan identifies transportation priorities, specific concerns, ideas and areas of focus related to the county's multimodal transportation system. As part of this update, we want to hear your thoughts and opinions on your needs; projects you think are needed; and priorities for current and future transportation funding. Your input is key!

Please contact us if you have any concerns about this survey or the master plan study.

Boulder County Transportation Department 303-441-3900 or bouldercountytmp@publicinput.com.

Part 1: Overview (12 questions)

1. Email address

Providing your email is not required. Of course, if you want us to add it to our email list for this project, just mark "Yes" below and we'll update you on public meetings, draft reports, etc. Your email will not be used for any other purposes.

Email address: _____

2. Would you like to receive email updates on the Transportation Master Plan?

- o Yes
- o No

3. What is your connection to Boulder County? (Select all that apply)

- o I live in Boulder County
- o I work in Boulder County
- o I travel through Boulder County
- o I am a business owner in Boulder County
- o I am a property owner in Boulder County
- o I frequent businesses in Boulder County
- o I recreate in Boulder County
- o Other (please specify)_____

4. Where do you live? (Please provide your home address or zip code)

_____

5. Work/school zip code (or most frequented destination) _____

6. **What modes of transportation do you regularly use (at least once per week) when you travel to/from or within Boulder County? (Select all that apply)**
   - o Drive alone in a personal vehicle
   - o Walk
   - o Bike
   - o Transit (bus)
   - o Carpool/Vanpool
   - o Get a ride from friend, family member, or caregiver
   - o Paratransit (Access-a-Ride, Via Mobility Services, Call-n-Ride)
   - o Taxi, Uber, Lyft
   - o Wheelchair/mobility device
   - o Other _____

7. **My transportation choices are based on (Choose up to three)**
   - o Travel time
   - o Options that are available
   - o Sustainability/environmental impact
   - o Cost
   - o Physical accessibility
   - o Comfort
   - o Safety
   - o Reliability

8. **How willing are you to use the following modes of transportation, if it were available?**

	Very interested	Interested	Neutral	Not interested	Not sure/ Don't know
E-bike					
Electric car					
Autonomous (driverless) car					
Autonomous (driverless) bus					

9. How do you rate the following components of the county's current transportation system?

	Excellent	Good	Fair	Poor	Don't know
Traffic congestion					
Traffic safety					
Traffic signal timing					
Sidewalks					
Crosswalks					
Americans with Disabilities Act (ADA) compliance and infrastructure					
On-street bike facilities (bike lanes, shoulders)					
Bicycle/pedestrian multi-use paths					
Roadway lighting					
Signs/roadway markings					
RTD public transit (bus)					
RTD bus stop amenities					
Road condition (maintenance)					

10. Please select your top priorities for improving transportation in Boulder County (Choose up to three):

- o Improve safety
- o Reduce traffic congestion
- o Increase travel time reliability
- o Maintain existing facilities (sweeping, plowing, striping, repaving, and miscellaneous repairs)
- o Create new roadway connections
- o Optimize traffic signal timing and progression
- o Enhance transit services
- o Enhance walking and biking facilities
- o Americans with Disabilities Act (ADA) compliance and infrastructure
- o Improve compatibility between transportation systems and surrounding land uses
- o Minimize impacts to natural resources
- o Reduce wildlife collisions by creating crossings
- o Implement improvements that will be compatible with new technology (i.e. smart cars)
- o Improve bicycle/pedestrian connections to bus stops
- o Improve driving access to Park-n-Rides
- o Other (please specify)_____

11. What are the most important ways to improve bus/transit service in Boulder County? (Choose up to three)

- o Faster travel times for the bus
- o More frequent bus service
- o More evening/weekend bus service
- o Simplify the bus system (fewer routes running more frequently)
- o Service to more areas of the county
- o Speed up the boarding process (off-board fare payment, low floor buses, etc.)
- o Cheaper fares/more access to passes including EcoPass
- o More amenities at bus stops (real time arrival information, bus shelters, etc.)
- o More park-n-rides/park-n-ride capacity
- o Better walking/bike connections to transit (sidewalks, crosswalks, bike lanes, bike parking, etc.)
- o More paratransit (Access-a-Ride, Call-n-Ride, etc.) services
- o Bus travel time reliability
- o No opinion

12. What are the most important ways to improve bicycling conditions in Boulder County? (Choose up to three)

- o Add bikeable shoulders to roads that currently do not have them
- o Increase the number of physically protected/separated bikeways (like the US 36 Bikeway) that connect regional destinations
- o Increase the number of soft-surface off-street regional trails (i.e. Rock Creek, Coal Creek, LoBo Trail, etc.)
- o Improve maintenance of the county's bike facilities
- o Improve intersection safety for cyclists
- o Promote the use of e-bikes (policies, discounts, e-bike share, etc.)
- o Improve bike parking
- o Improve bicycle/ transit connections
- o Expand bike-share systems
- o No opinion

Part 2: About You (10 questions)

Please note that Boulder County will not share any personal information of any survey respondent. We will only use this data in the aggregate to help inform the Master Plan, ensure we reach a diversity of voices, and for grant reporting purposes. Answering questions is voluntary. You may decide not to answer any specific question.

1. Do you have access to a credit/debit card?

- o Yes
- o No

2. Do you have a smartphone?

- o Yes
- o No

3. Where do you typically access the internet? (Check all that apply)

- o Mobile phone
- o Home
- o Work
- o Library
- o Café
- o Friend's or family's house
- o Public WiFi
- o Other

4. Age

- o Under 18
- o 18-24
- o 25-39
- o 40-49
- o 50-59
- o 60-69
- o 70+
- o Prefer not to say

5. Do you identify as someone with a disability?

- o Yes
- o No
- o Prefer not to say

6. Are you a caregiver of: (check all that apply)

- o Someone with a disability
- o Someone over 60 years of age
- o None of the above

7. Please self-identify your gender identity

- o Female
- o Male
- o Transgender Female
- o Transgender Male
- o Nonbinary
- o Genderqueer
- o Genderfluid
- o Agender
- o Another identity not listed here
- o Prefer not to answer

8. Please self-identify your ethnicity

- o Hispanic or Latino
- o Not Hispanic or Latino
- o Prefer not to answer

9. Please self-identify your race

- o American Indian or Native Alaskan
- o Asian
- o Black or African American
- o Hispanic or Latino
- o Native Hawaiian or Pacific Islander
- o Two or more races
- o White
- o Not listed

10. What was your total household income last year?

- o Less than $25,000
- o $25,000 to $49,999
- o $50,000 to $74,999
- o $75,000 to $99,999
- o $100,000 to $124,999
- o $125,000 to $149,999
- o $150,000 or more
- o Prefer not to say

Part 3: Need for Improvements (1 question)

Which location(s) are in the greatest need of improvements in Boulder County? Consider roadway, bicycle, pedestrian, transit, and other types of improvements. Please note specific location(s) associated with your comment(s) regarding existing issues and your ideas for improvements.

Part 4: Additional Comments (3 questions)

1. **Please share additional comments regarding the existing Boulder County transportation system and improvements most important to you.**

2. **Thank you for completing this survey! Boulder County values your input, and would like to thank you by entering you into a drawing to win one (1) of ten (10) $50 gift cards. Would you like to be entered into the drawing?**

   o Yes

   o No

3. **If you would like to be entered into the drawing, please provide your contact information below. (Providing this information does not require you to be added to the project mailing list.):**

   Name _____

   Phone number _____

   E-mail _____

Please contact us if you have any questions or concerns about this survey or the master plan study.

Boulder County Transportation Department 303-441-3900 or bouldercountytmp@publicinput.com.

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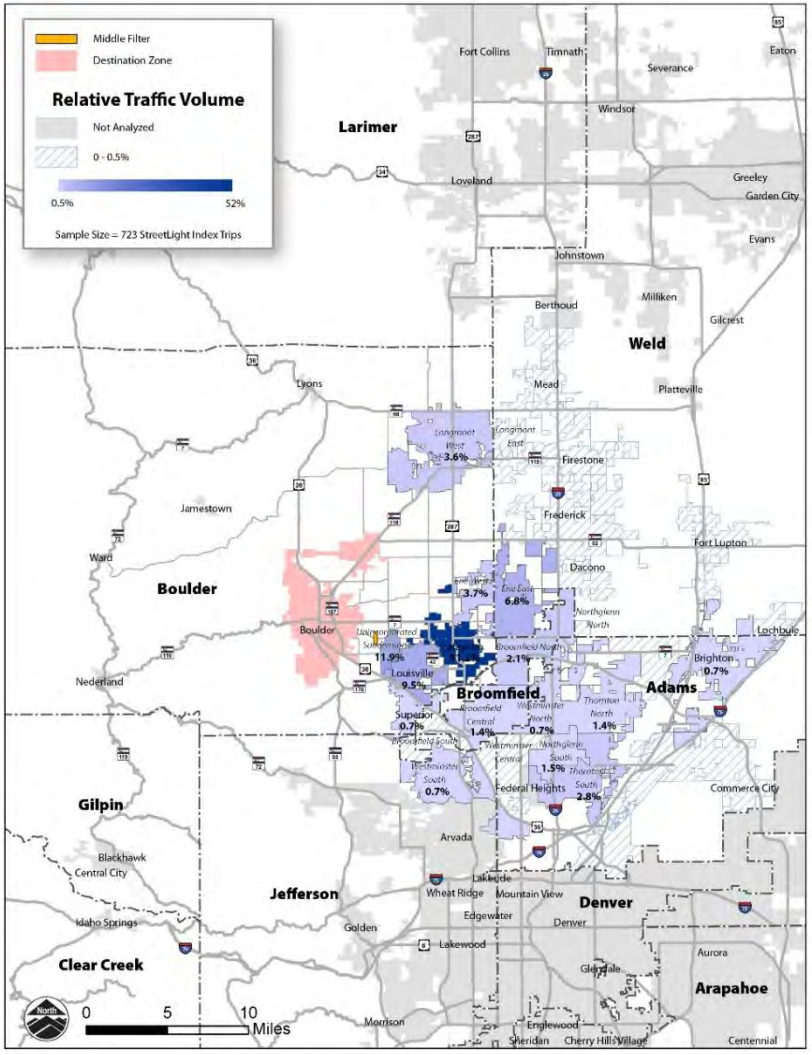
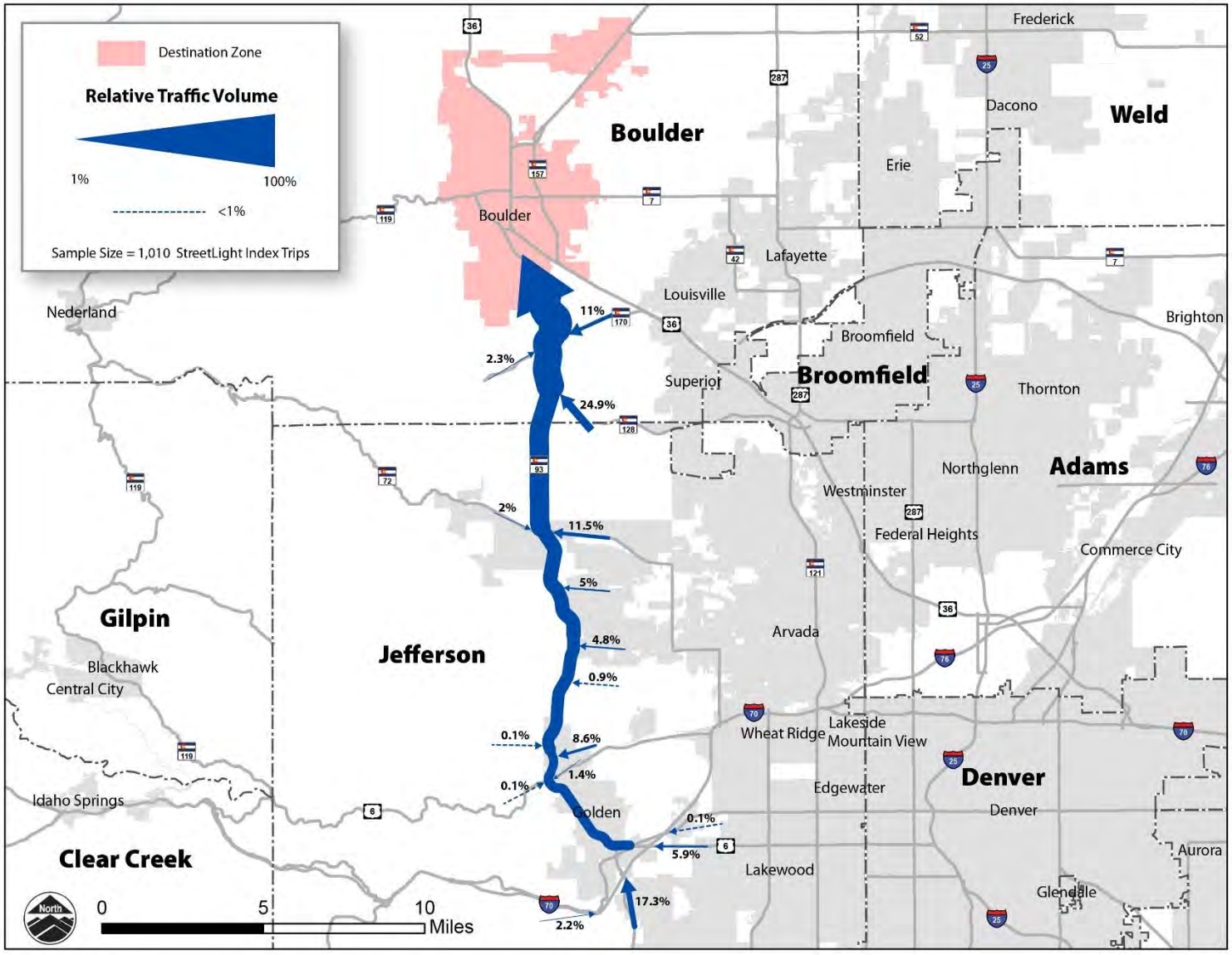
Appendix C: Detailed Travel Pattern Maps

Figure A-1: Baseline Road into City of Boulder



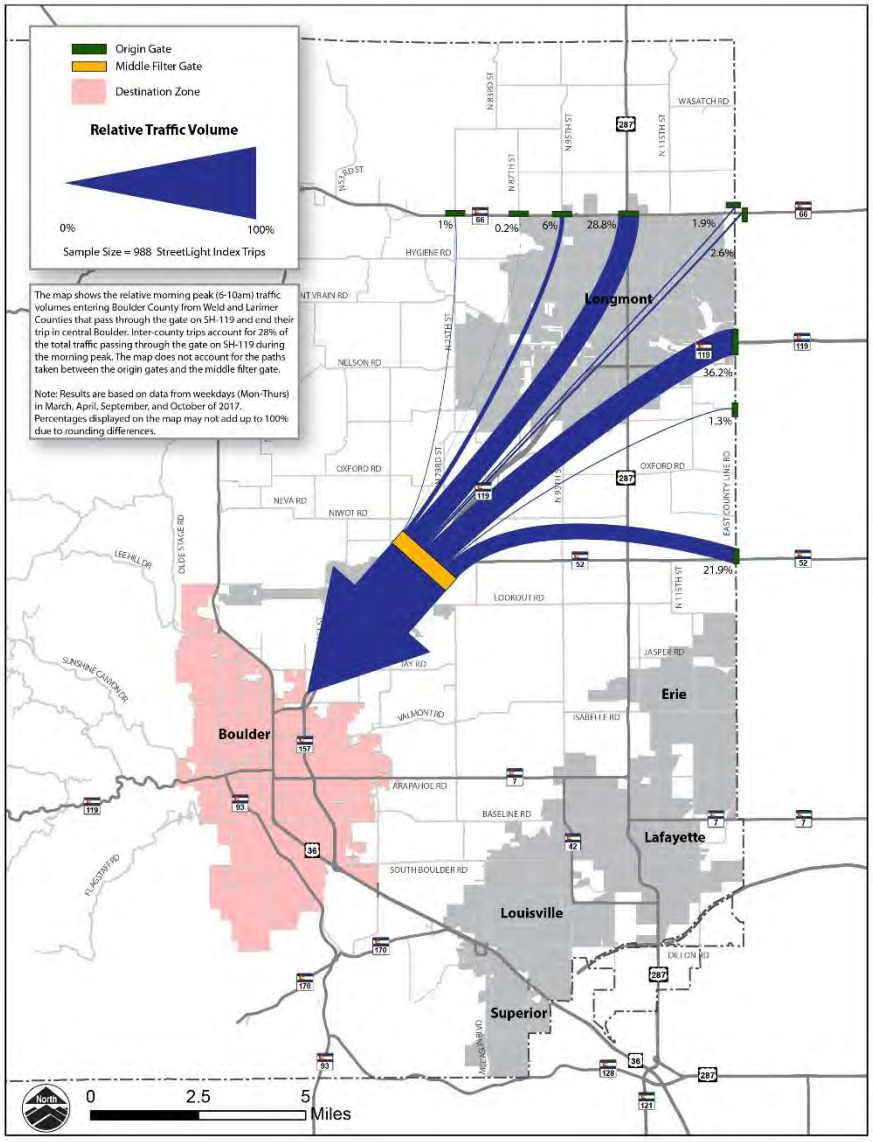
Source: StreetLight Data and Boulder County Transportation

FIGURE A-2: SH 93 INTO CITY OF BOULDER



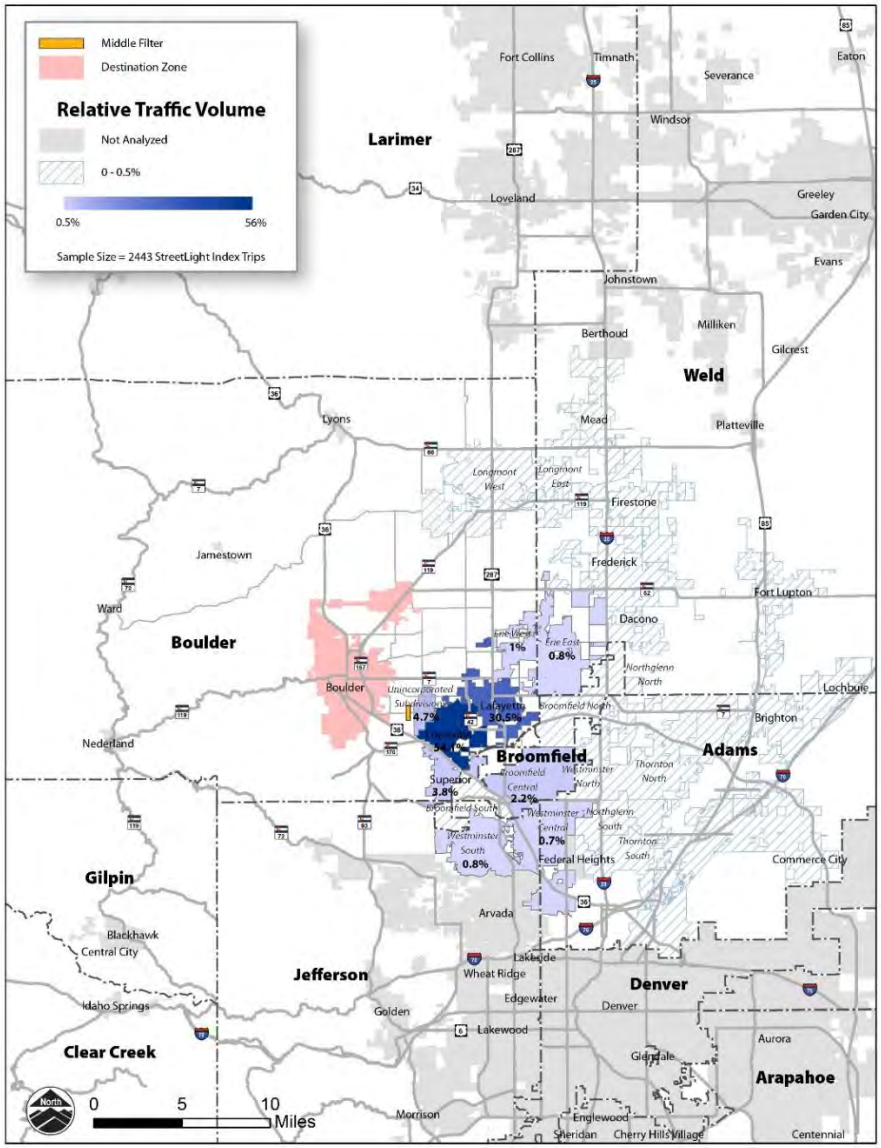
Source: StreetLight Data and Boulder County Transportation

FIGURE A-3: SCREENLINE AROUND NORTHEAST LONGMONT



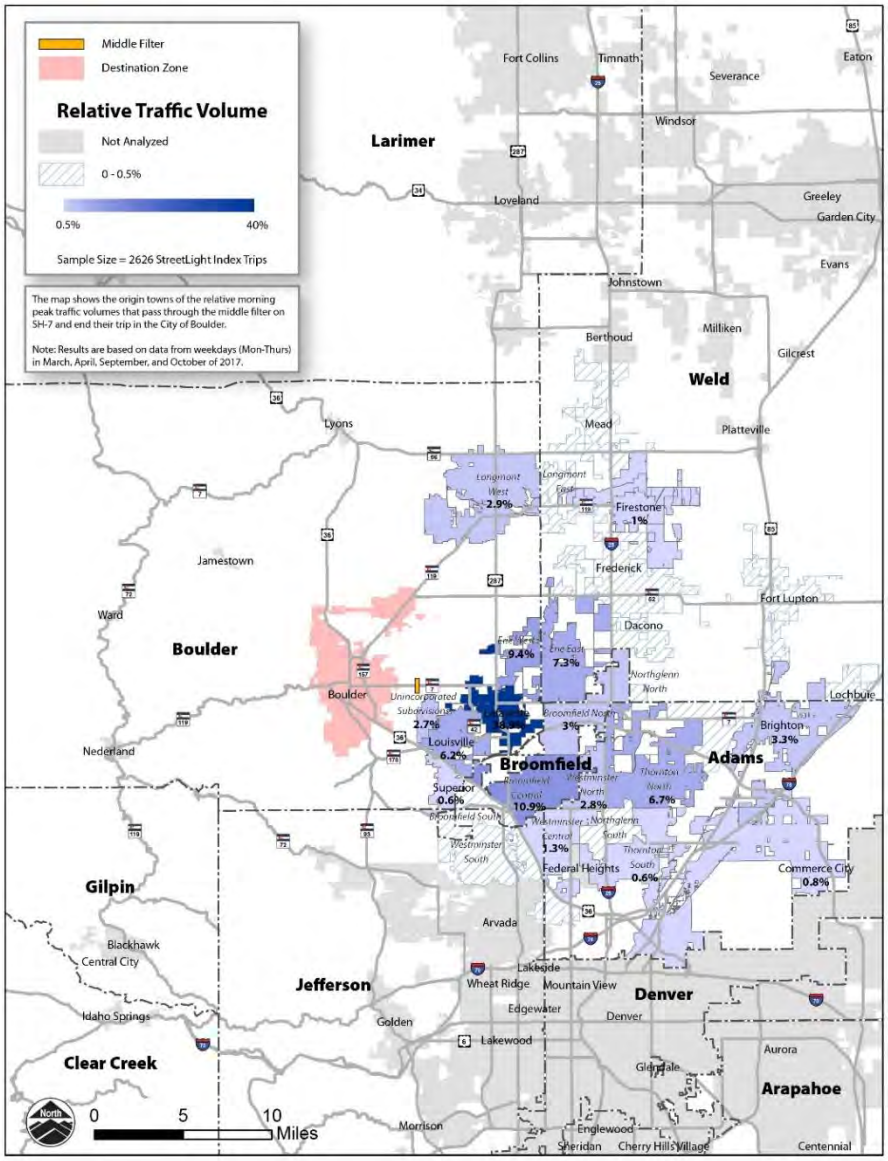
Source: StreetLight Data and Boulder County Transportation

FIGURE A-4: SOUTH BOULDER ROAD INTO CITY OF BOULDER



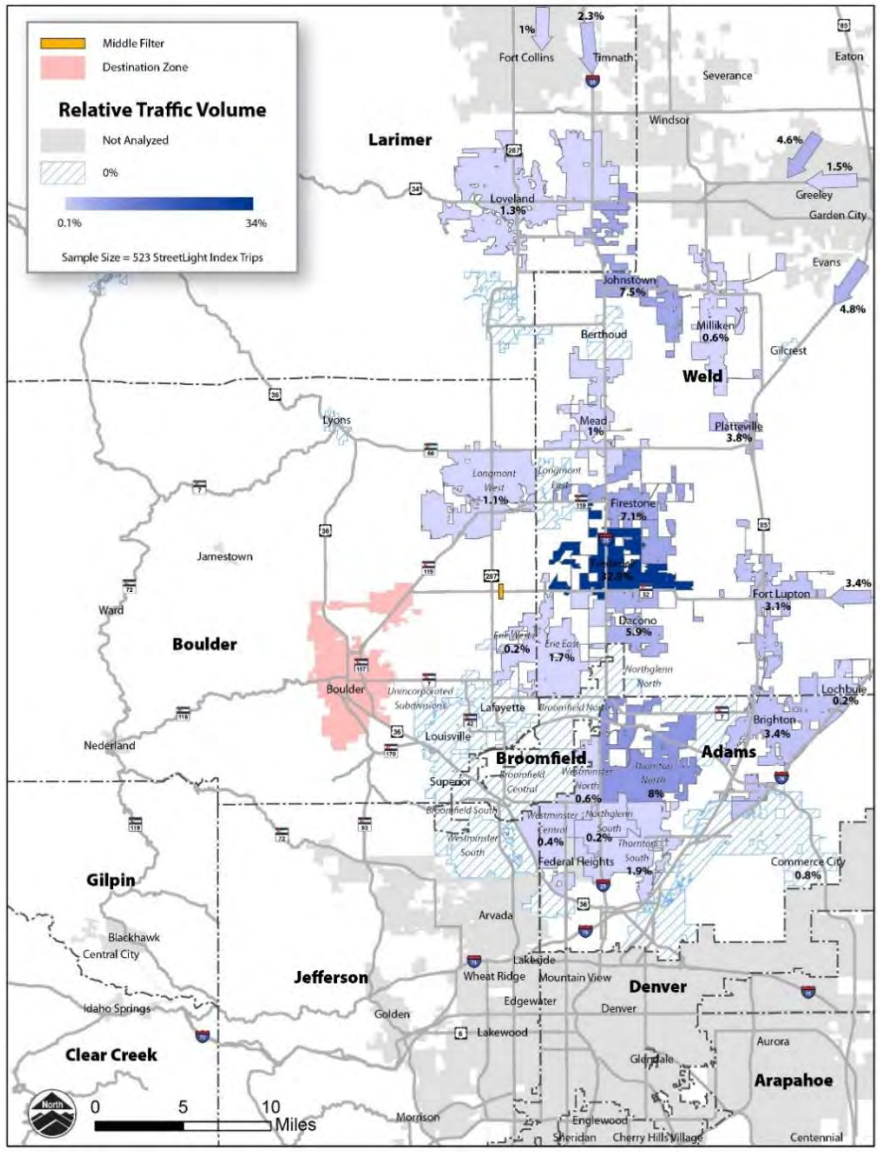
Source: StreetLight Data and Boulder County Transportation

FIGURE A-5: SH 7 CORRIDOR INTO CITY OF BOULDER



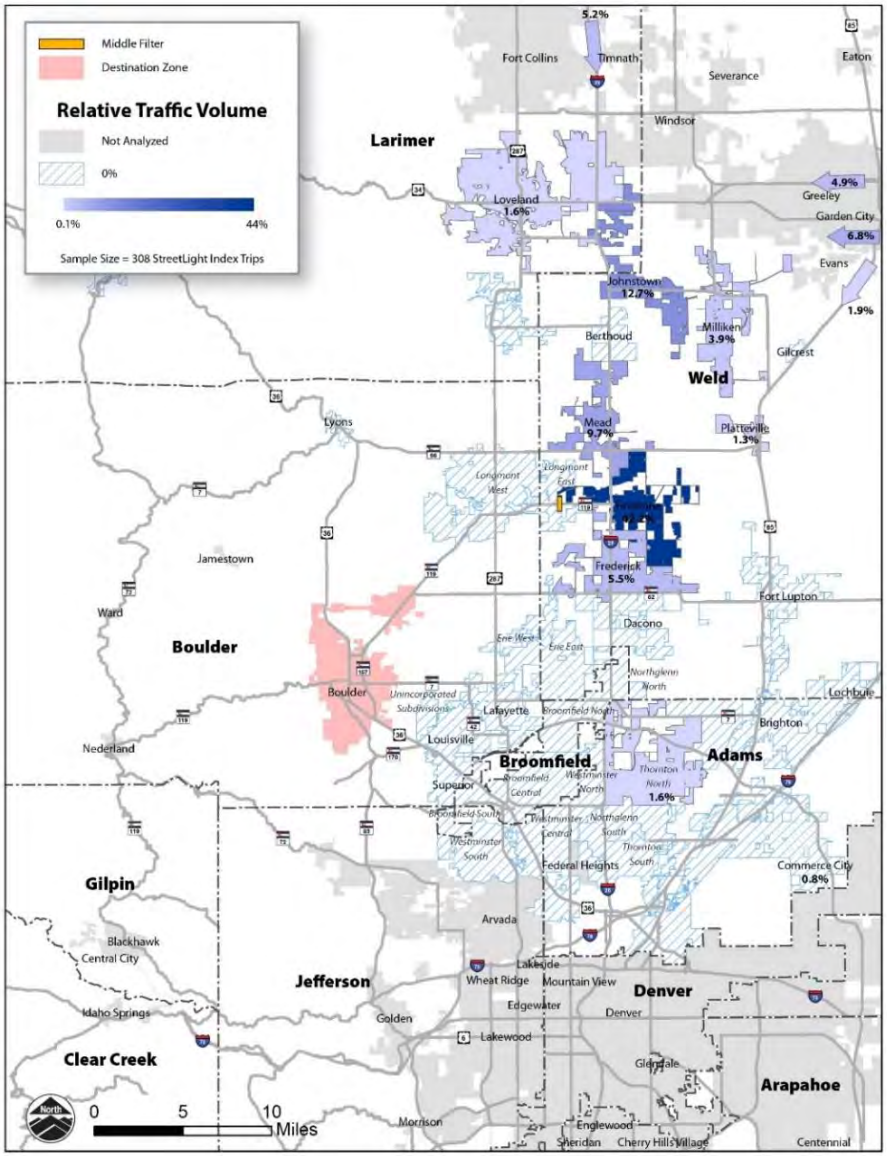
Source: StreetLight Data and Boulder County Transportation

FIGURE A-6: SH 52 INTO CITY OF BOULDER



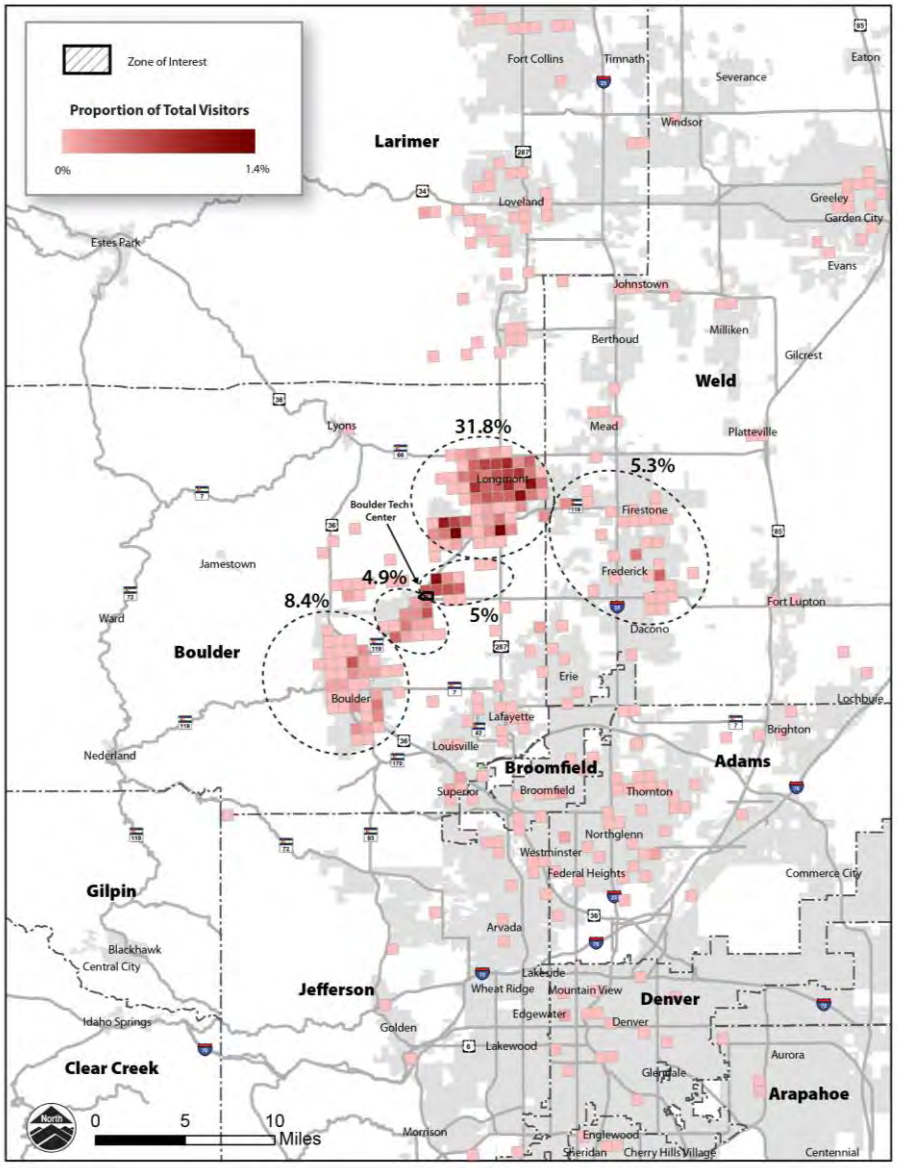
Source: StreetLight Data and Boulder County Transportation

FIGURE A-7: SH 119 INTO CITY OF BOULDER



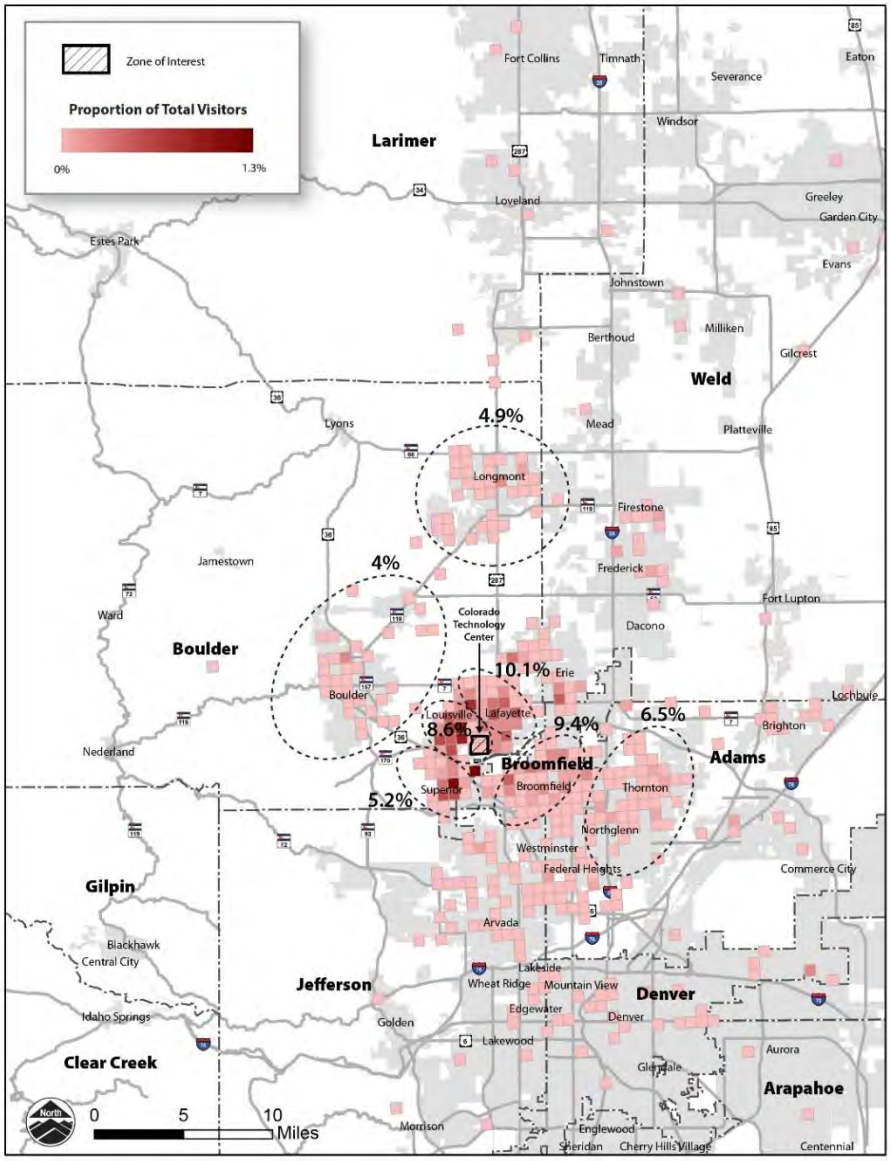
Source: StreetLight Data and Boulder County Transportation

FIGURE A-8: HOME GRID TRAVEL PATTERNS – BOULDER TECH CENTER



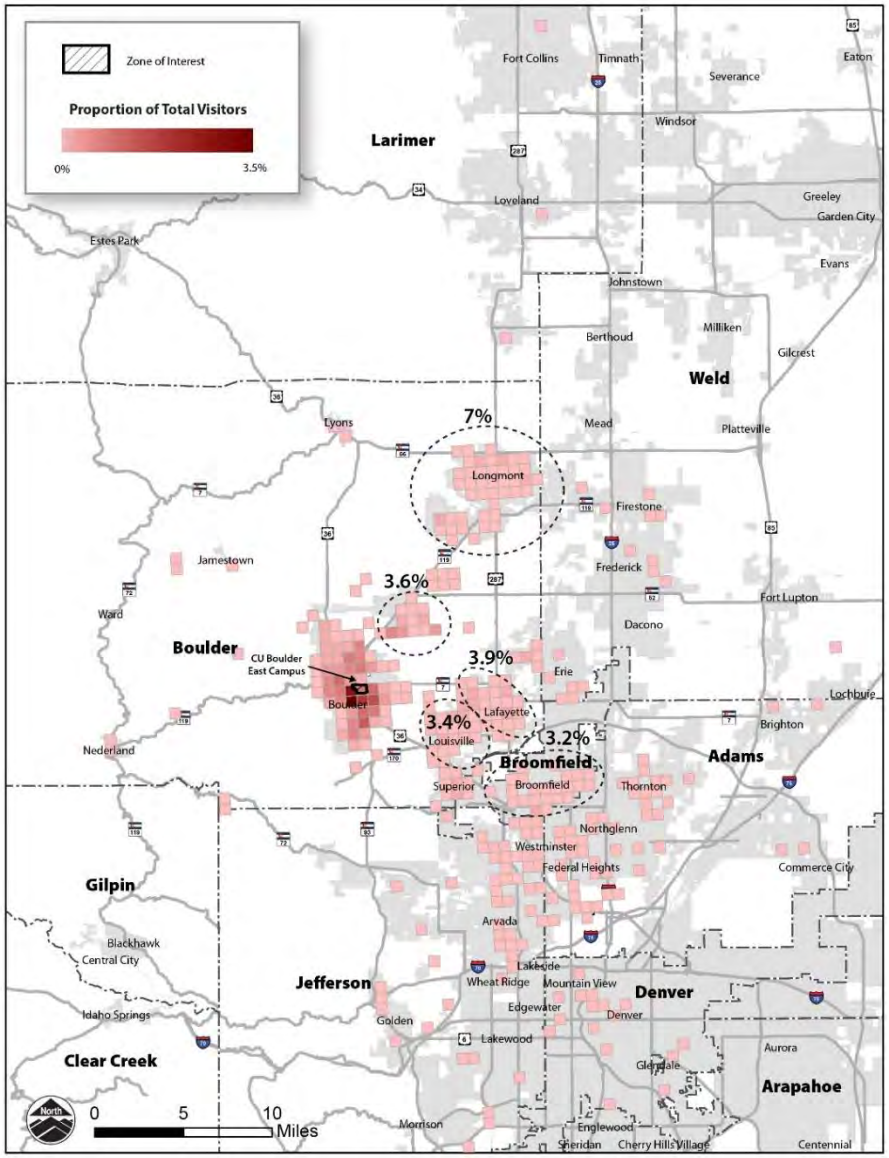
Source: StreetLight Data and Boulder County Transportation

FIGURE A-9: HOME GRID TRAVEL PATTERNS – COLORADO TECHNOLOGY CENTER



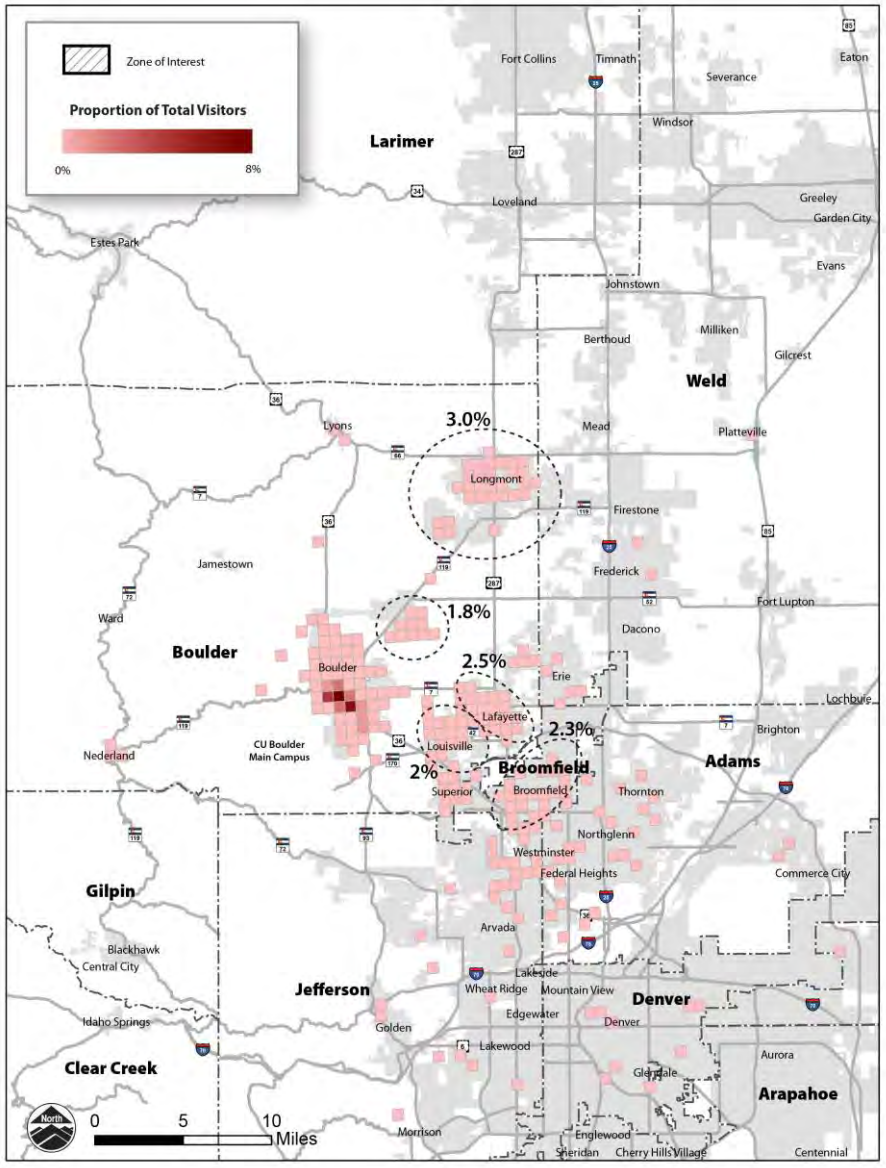
Source: StreetLight Data and Boulder County Transportation

FIGURE A-10: HOME GRID TRAVEL PATTERNS – UNIVERSITY OF COLORADO, BOULDER EAST CAMPUS



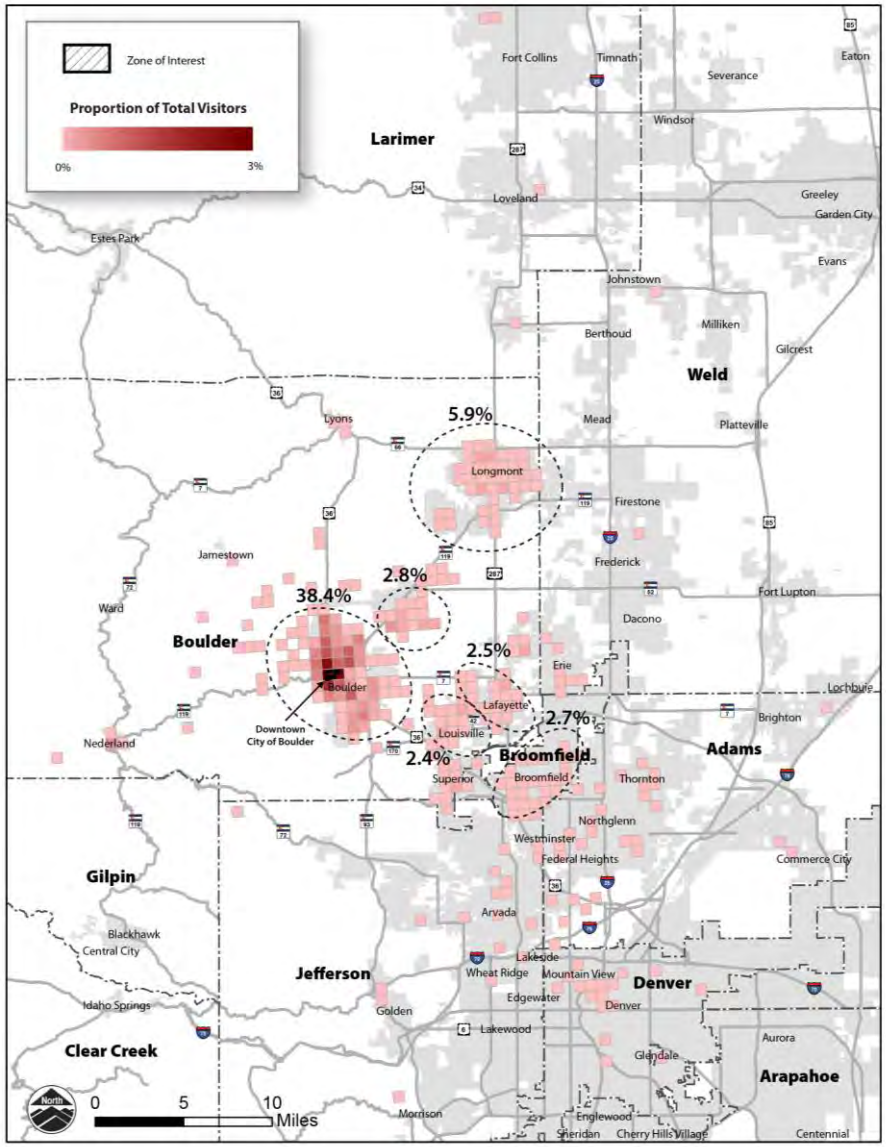
Source: StreetLight Data and Boulder County Transportation

FIGURE A-11: HOME GRID TRAVEL PATTERNS – UNIVERSITY OF COLORADO, BOULDER MAIN CAMPUS



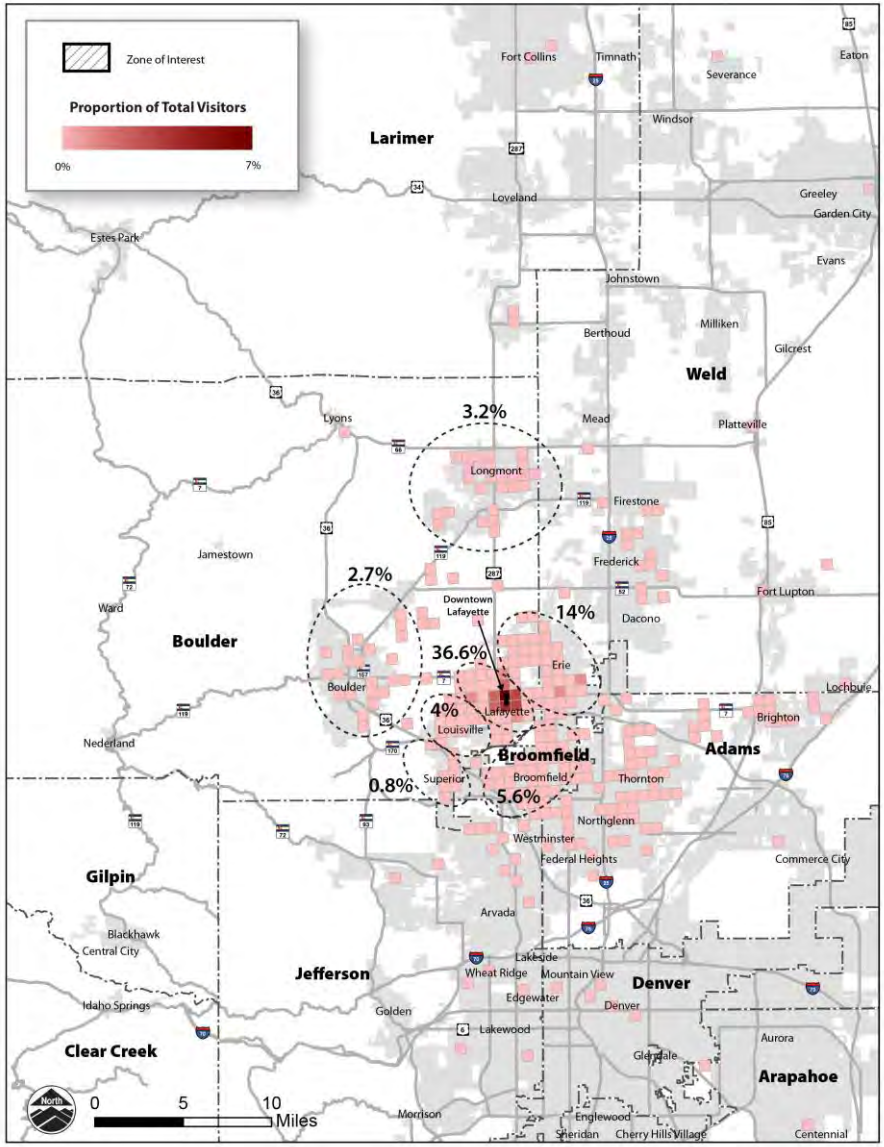
Source: StreetLight Data and Boulder County Transportation

FIGURE A-12: HOME GRID TRAVEL PATTERNS – DOWNTOWN CITY OF BOULDER



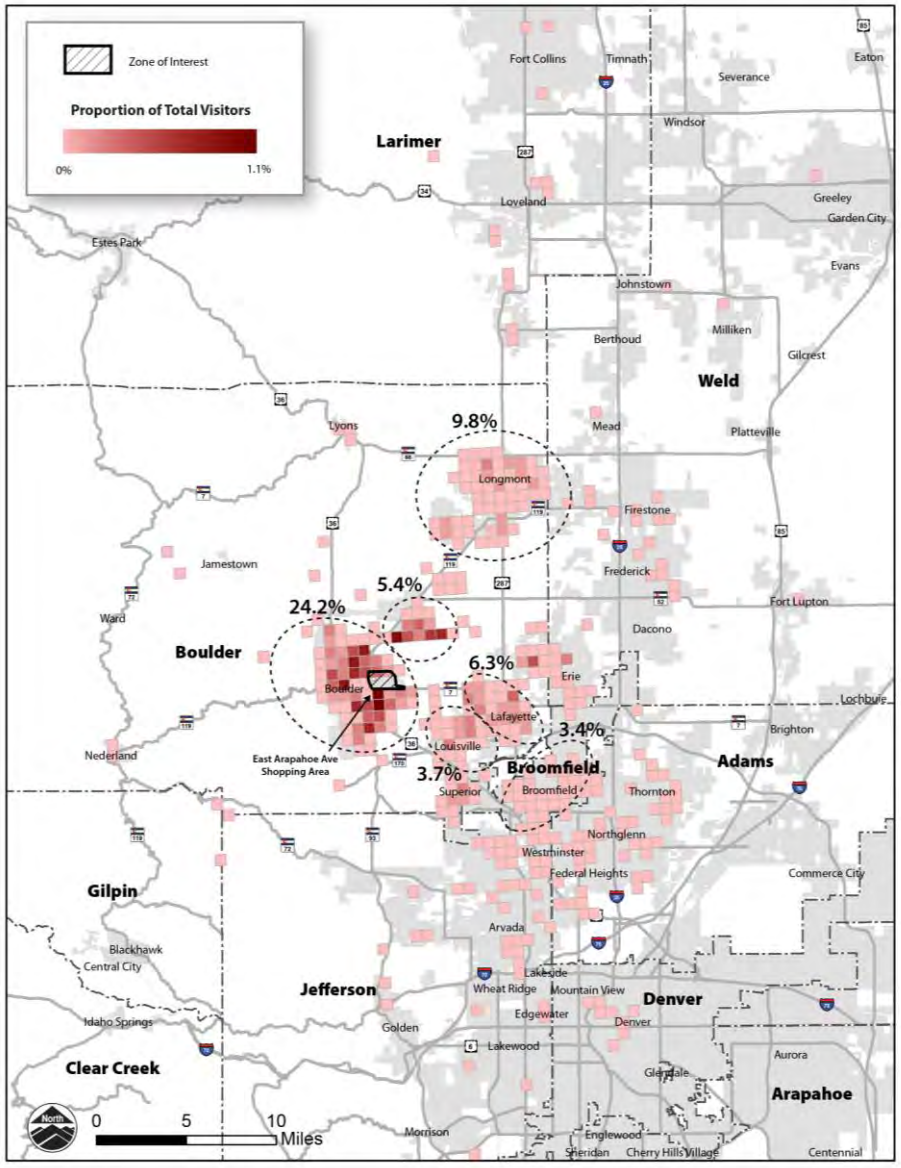
Source: StreetLight Data and Boulder County Transportation

FIGURE A-13: HOME GRID TRAVEL PATTERNS – DOWNTOWN LAFAYETTE



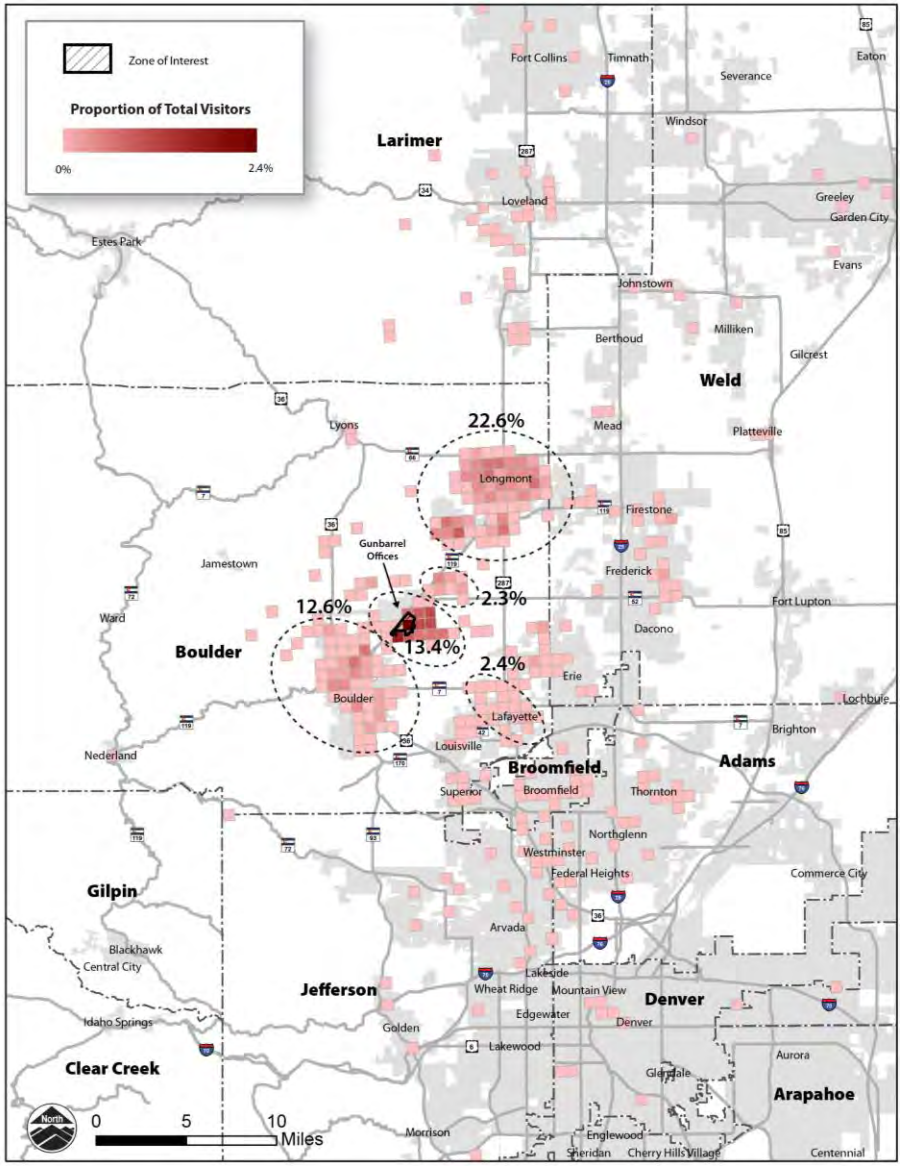
Source: StreetLight Data and Boulder County Transportation

FIGURE A-14: HOME GRID TRAVEL PATTERNS – EAST ARAPAHOE AVE SHOPPING AREA



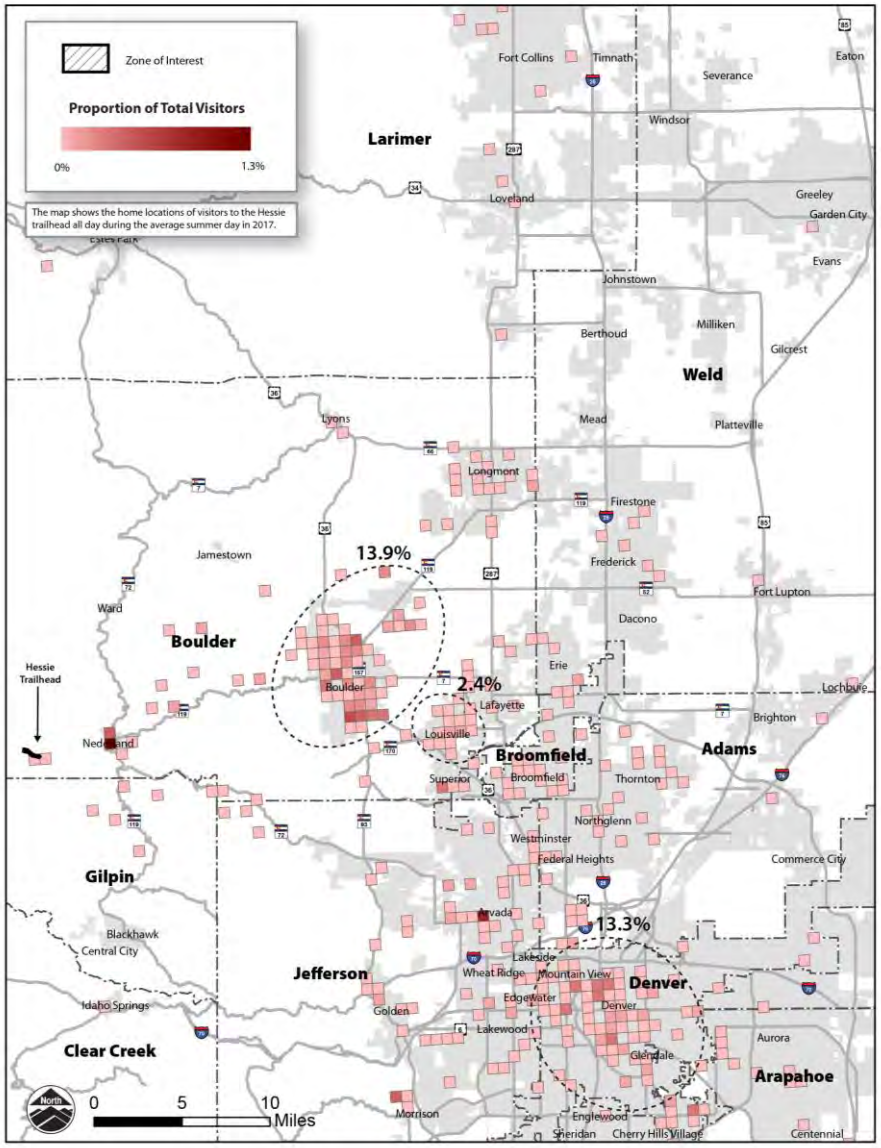
Source: StreetLight Data and Boulder County Transportation

FIGURE A-15: HOME GRID TRAVEL PATTERNS – GUNBARREL OFFICES



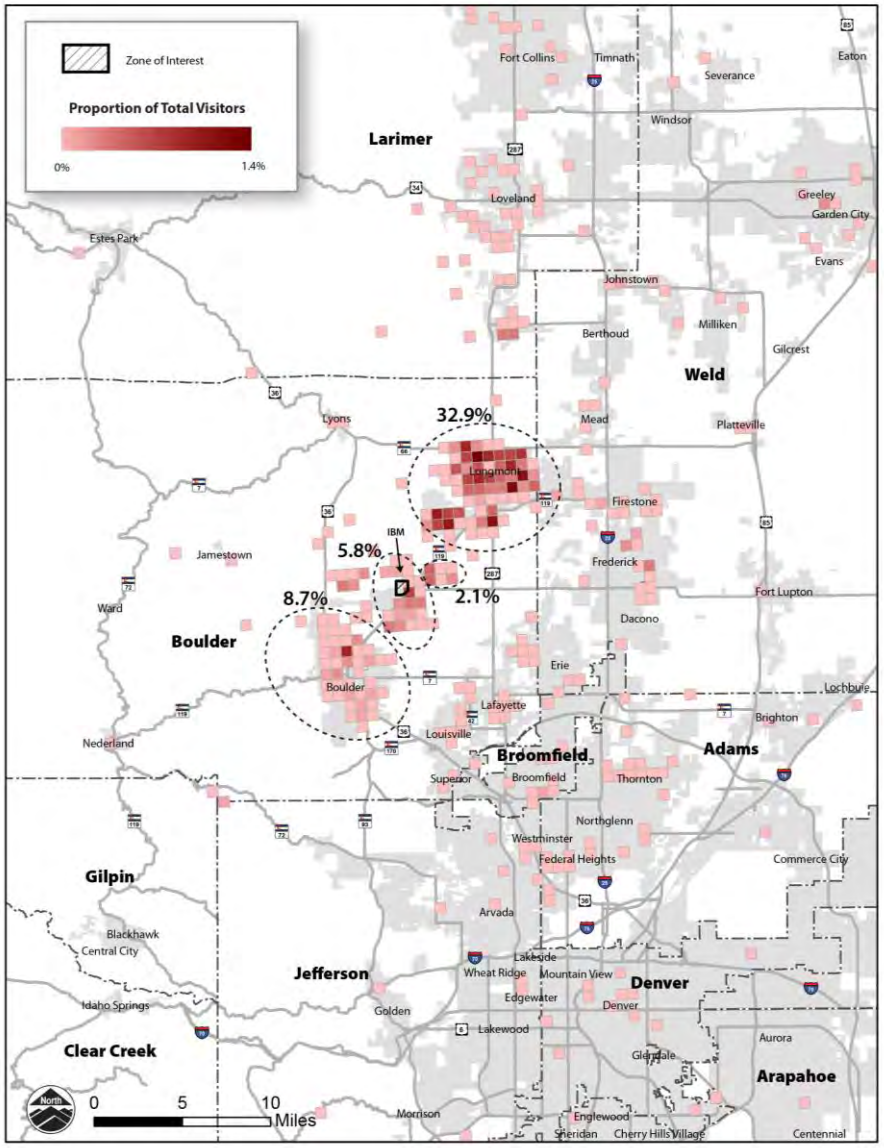
Source: StreetLight Data and Boulder County Transportation

FIGURE A-16: HOME GRID TRAVEL PATTERNS – HESSIE TRAILHEAD



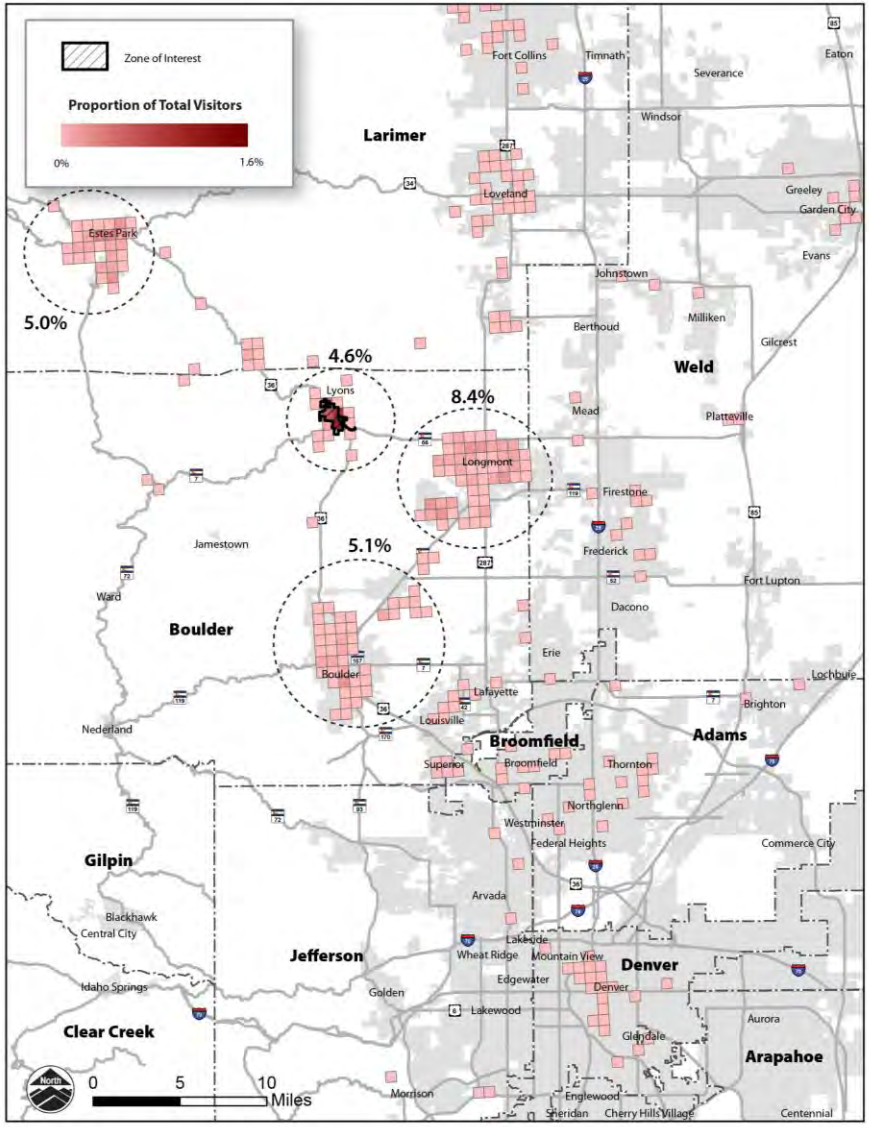
Source: StreetLight Data and Boulder County Transportation

FIGURE A-17: HOME GRID TRAVEL PATTERNS – IBM



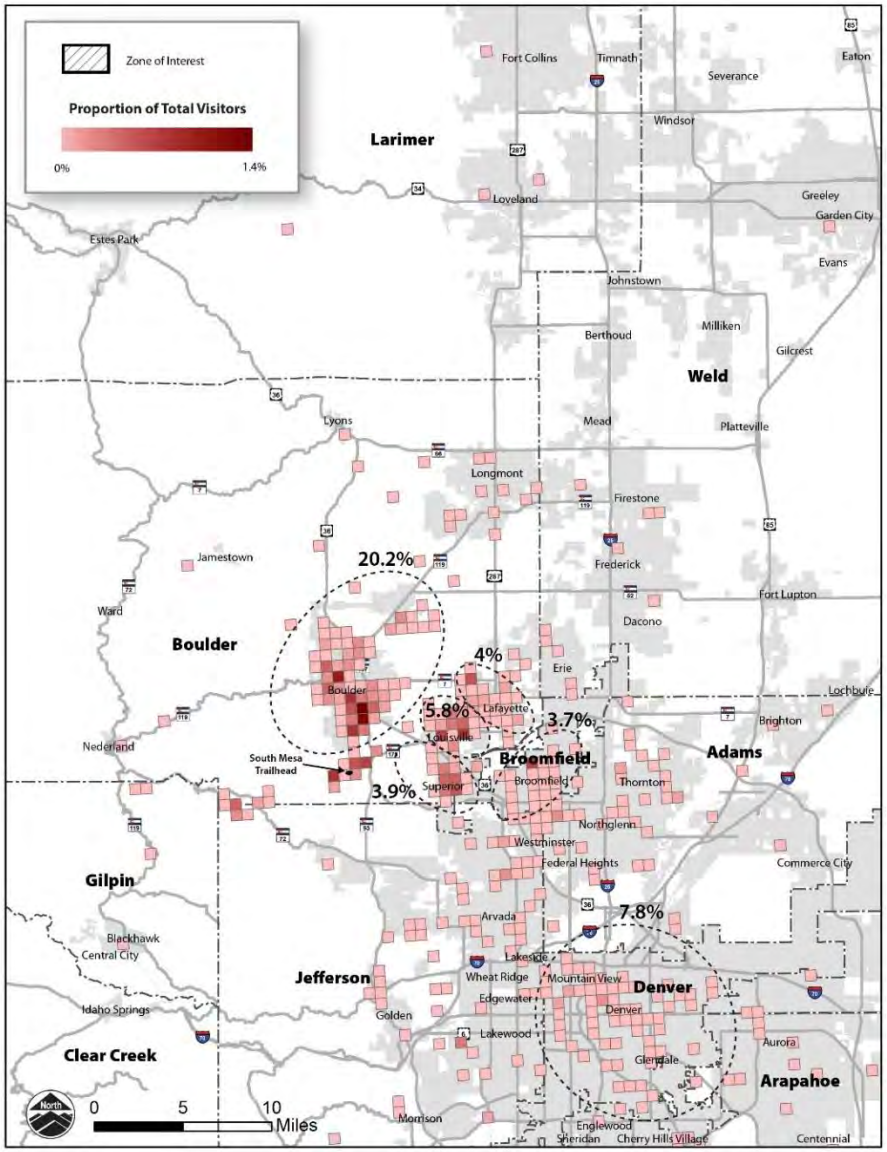
Source: StreetLight Data and Boulder County Transportation

FIGURE A-18: HOME GRID TRAVEL PATTERNS – LYONS



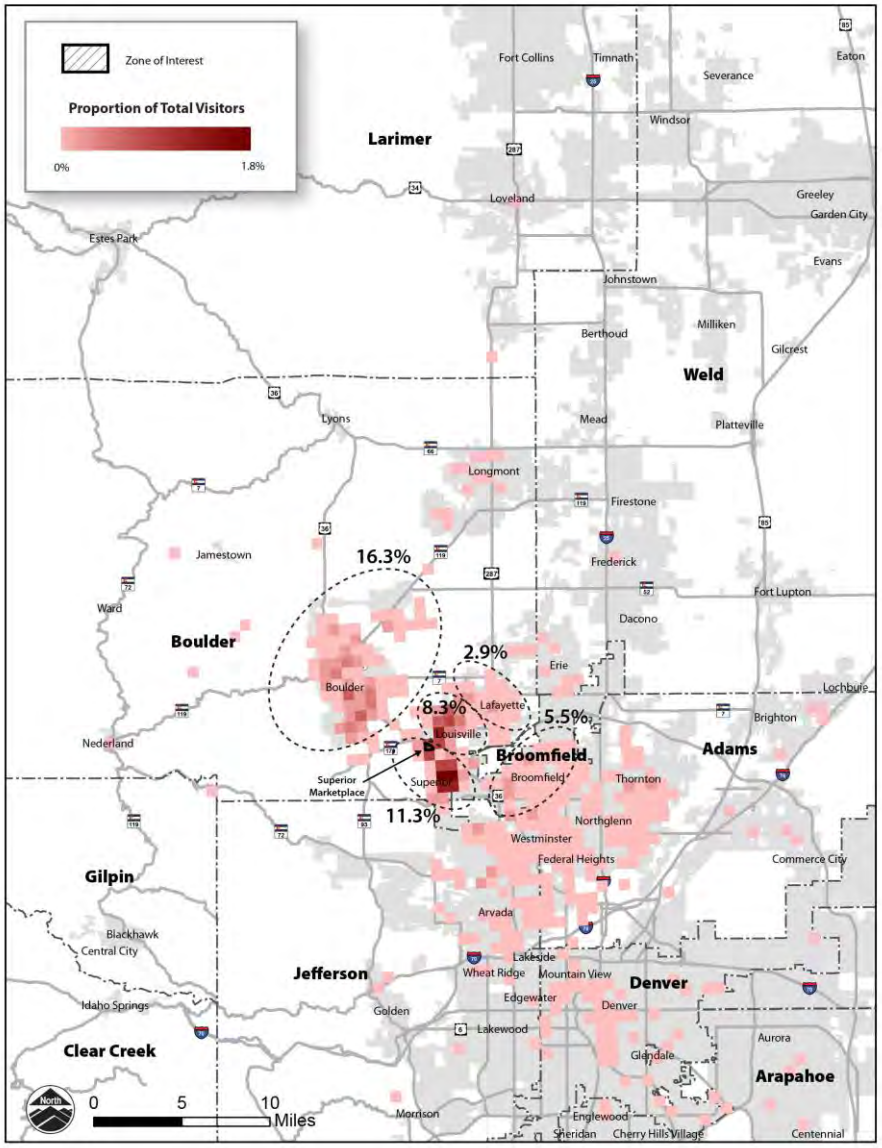
Source: StreetLight Data and Boulder County Transportation

FIGURE A-19: HOME GRID TRAVEL PATTERNS – SOUTH MESA TRAILHEAD



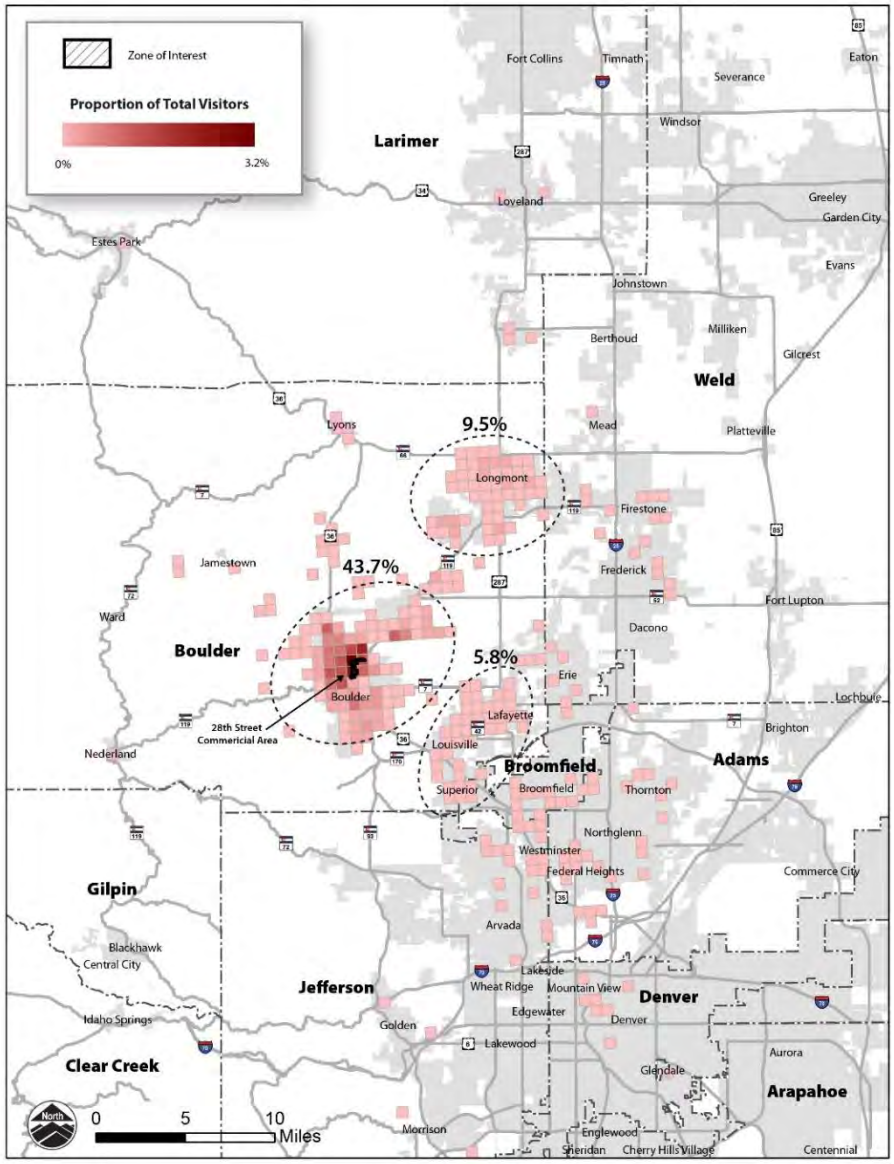
Source: StreetLight Data and Boulder County Transportation

FIGURE A-20: HOME GRID TRAVEL PATTERNS – SUPERIOR MARKETPLACE



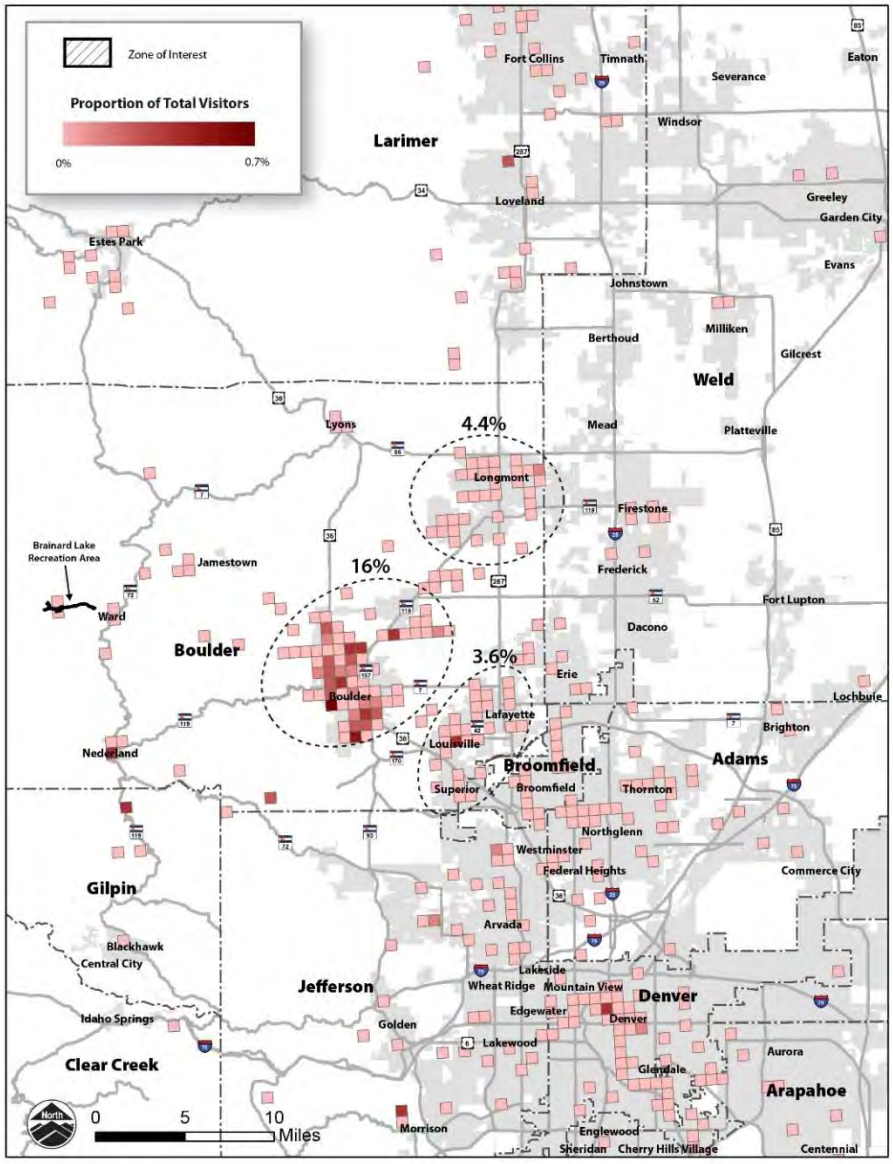
Source: StreetLight Data and Boulder County Transportation

FIGURE A-21: HOME GRID TRAVEL PATTERNS – 28TH STREET COMMERCIAL AREA



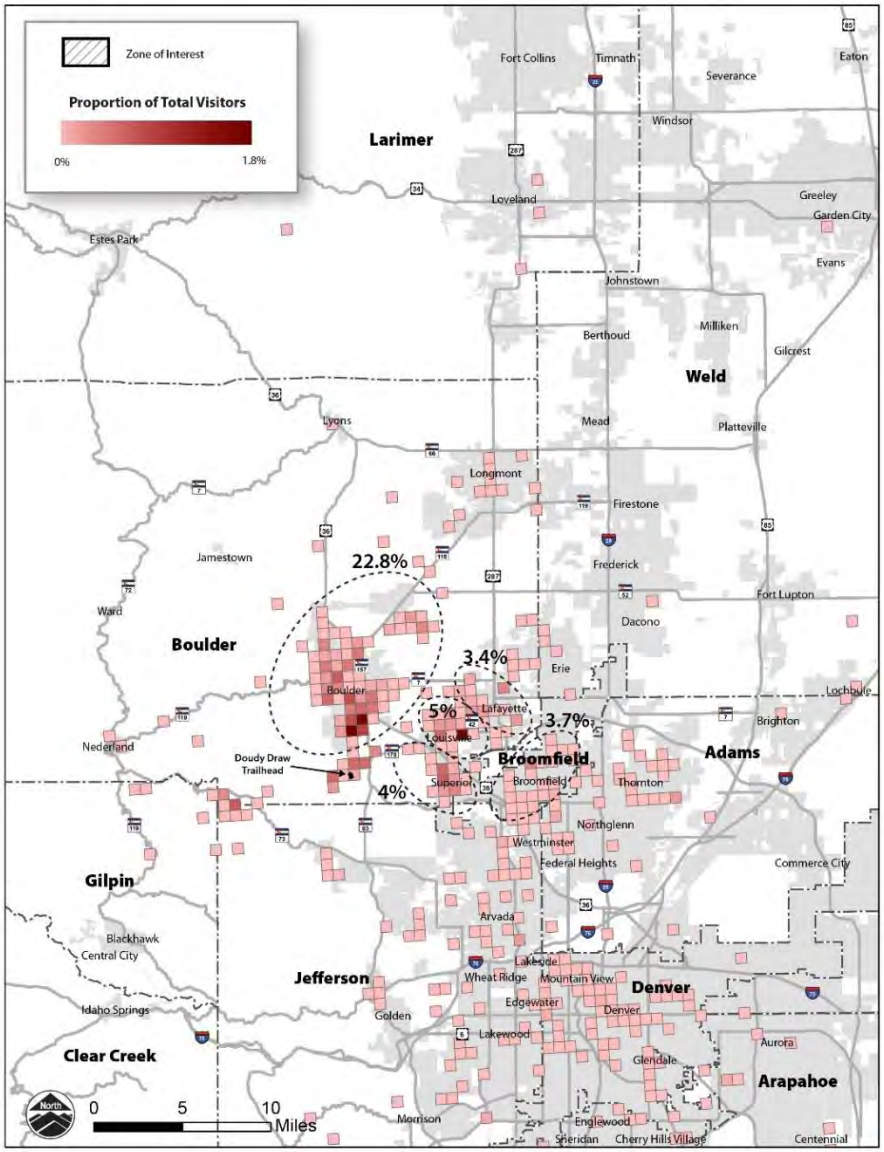
Source: StreetLight Data and Boulder County Transportation

FIGURE A-22: HOME GRID TRAVEL PATTERNS – BRAINARD LAKE RECREATION AREA



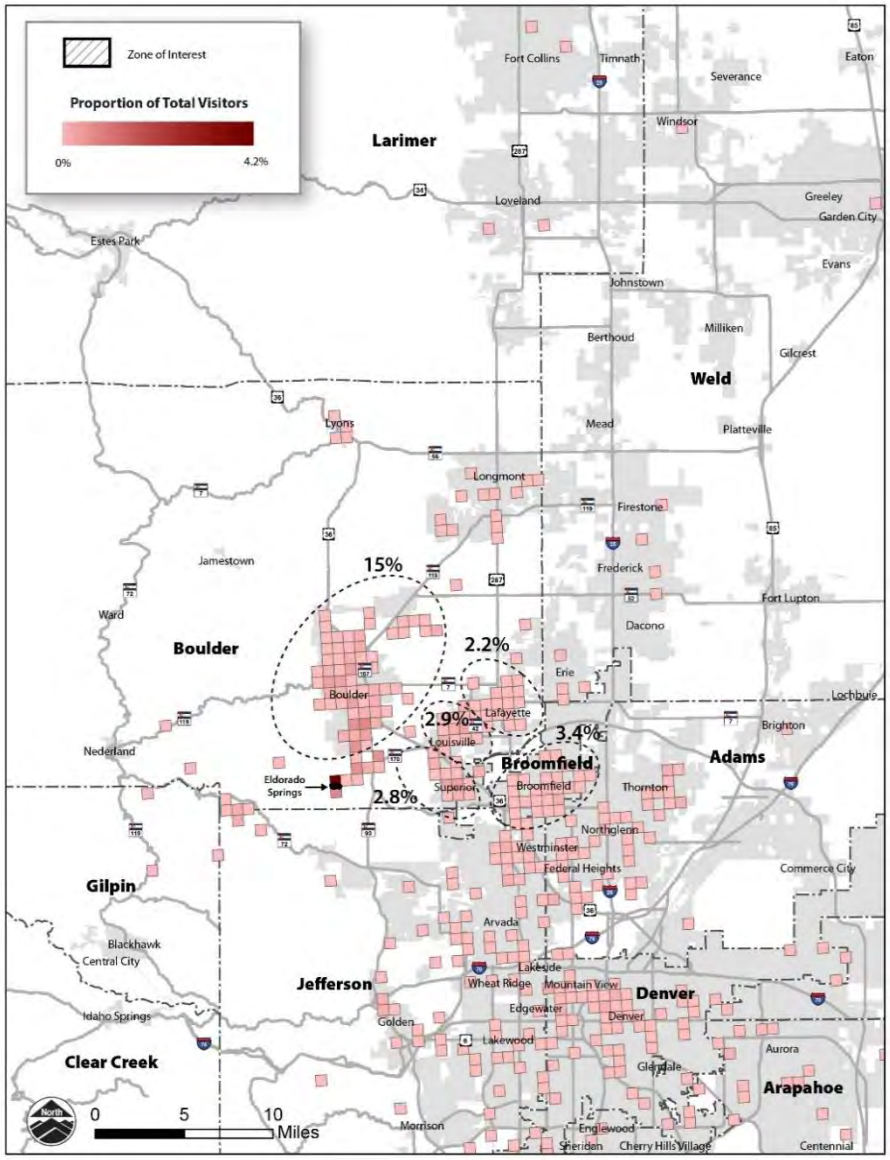
Source: StreetLight Data and Boulder County Transportation

FIGURE A-23: HOME GRID TRAVEL PATTERNS – DOWDY DRAW TRAILHEAD



Source: StreetLight Data and Boulder County Transportation

FIGURE A-24: HOME GRID TRAVEL PATTERNS – ELDORADO SPRINGS



Source: StreetLight Data and Boulder County Transportation

Appendix D: Bicycle Level of Traffic Stress (BLTS) Methodology

Bicycle Level of Traffic Stress (BLTS)

Methodology

The TMP Update will follow a segment methodology with components taken from the CDOT and Oregon Department of Transportation (ODOT) methodologies for state highways as outlined for BLTS. Although the rural segment is traditionally applied to roadways with speed limits of 40 miles per hour or greater, DEA proposes using Tables 5 and 6 as labelled within the methodology document given available data and the rural nature of most county roads, even if they are less than 40 miles per hour. The following data points are needed for this analysis:

- Daily volume
- Paved shoulder width

Boulder County shoulder width is categorized into the following widths:

- No value (these will be assumed to be 0)
- 3-4
- 4+ (these will be assumed to be 4 ft to < 6 ft)

For roadways with speeds 40 mph and greater, the following tables are recommended:

TABLE 1: COUNTY ROADS; TRUCK PERCENTAGE < 10%

Daily Volume	Paved Shoulder Width			
	0 ft to < 2 ft	2 ft to < 4 ft	4 ft to < 6 ft	≥ 6 ft
< 400	LTS 2	LTS 2	LTS 2	LTS 2
400 to 1,500	LTS 3	LTS 2	LTS 2	LTS 2
1,500 to 7,000	LTS 4	LTS 3	LTS 2	LTS 2
> 7,000	LTS 4	LTS 4	LTS 3	LTS 3

TABLE 2: COUNTY ROADS; TRUCK PERCENTAGE ≥ 10%

Daily Volume	Paved Shoulder Width			
	0 ft to < 2 ft	2 ft to < 4 ft	4 ft to < 6 ft	≥ 6 ft
< 400	LTS 2	LTS 2	LTS 2	LTS 2
400 to 1,500	LTS 3	LTS 2	LTS 2	LTS 2
1,500 to 7,000	LTS 4	LTS 3	LTS 3	LTS 3
> 7,000	LTS 4	LTS 4	LTS 4	LTS 4

Reference Methodology Tables (CDOT)

Table 5. Rural Segment Criteria (40 mph or greater); Truck Percentage <10%

Daily Volume (vpd)	Paved Shoulder Width			
	0 ft to < 2 ft	2 ft to < 4 ft	4 ft to < 6 ft	≥ 6 ft
< 400	LTS 4		LTS 2	LTS 2
400 to 1,500			LTS 2	LTS 2
1,500 to 7,000			LTS 2	LTS 2
> 7,000			LTS 3	LTS 3

Table 6. Rural Segment Criteria (40 mph or greater); Truck Percentage ≥10%

Daily Volume (vpd)	Paved Shoulder Width			
	0 ft to < 2 ft	2 ft to < 4 ft	4 ft to < 6 ft	≥ 6 ft
< 400	LTS 4		LTS 2	LTS 2
400 to 1,500			LTS 2	LTS 2
1,500 to 7,000			LTS 3	LTS 3
> 7,000			LTS 4	LTS 4

*The higher number should be used when heavy truck traffic volumes exceed 10 percent.

Reference Methodology Table (ODOT)

Exhibit 14-11 Rural Segment Criteria with posted speeds 45 mph or greater[1,2,3]

Daily Volume (vpd)	Paved Shoulder Width			
	0 – <2 ft	2 - <4 ft	4 – <6 ft	≥ 6 ft
<400	LTS 2	LTS 2	LTS 2	LTS 2
400 - 1500	LTS 3	LTS 2	LTS 2	LTS 2
1500 - 7000[4]	LTS 4	LTS 3	LTS 2	LTS 2
> 7000	LTS 4	LTS 4	LTS 3	LTS 3

[1] Based on p1-3 & Table 1-2 from the Oregon Bicycle and Pedestrian Design Guide, 2011.
[2]Adequate stopping sight distances on curves and grades assumed. A high frequency of sharper curves and short vertical transitions can increase the stress level especially on roadways with less than 6' shoulders. Engineering judgment will be needed to determine what impact this will have on the LTS level on a particular segment.
[3]Segments with flashing warning beacons announcing presence of bicyclists (typically done on narrower long bridges or tunnels) may, depending on judgment, reduce the LTS by one, but no less than LTS 2.
[4]Over 1500 AADT, the Oregon Bicycle and Pedestrian Design Guide indicates the need for shoulders.

Applied Methodology

To apply the proposed methodology listed in Tables 1 and 2 the counts (points), shoulders (line), and roads (line) geometries were combined into one road line geometry. Since the shoulder and road lines were not aligned spatially the shoulder information was attached to the count points before merging all information into the road line file from the points.

To make count points intersect both shoulder and line shapes they were buffered by 25 feet (it was confirmed that stations are greater than 25 feet from intersections). Since not all count stations occur on roads with shoulders this data was split into 2 datasets via Select by Location: Counts_OnShoulder and Counts_NotOnShoulder.

Counts_NotOnShoulder were assigned a shoulder width of 0.

To assign widths to Counts_OnShoulder the Near tool was used to give Counts_OnShoulder and Shoulders a corresponding NearID before performing a Join based on this ID. Note: Shoulders with a Null value were assigned a width of 0.

After all shoulders have an assigned width value Counts_OnShoulders and Counts_NotOnShoulders were merged back into one dataset (point) that now contains count station information and shoulder information (Counts_2018v03_withShoulders).

Counts_2018v03_withShoulders was used with a Select by Location on Road_Map_Roads to export a road dataset that only contains roads with count stations (Roads_withCounts). The Near tool was applied to give both points and road lines a corresponding NearID. A Join was performed based on this ID to create a line feature containing all information (Roads_Counts_Shoulders).

- This process only assigns one value to road segments that may have more than 1 station on them. If this was the case and the counts were in the same Daily Volume range (Table 2) this was left as-is since the end score will not be affected. If the counts fall into different categories the roads were manually split and assigned the proper count (this only occurred in 5 places).
  - 21: Split at Logan Road. Southern segment assigned 820
  - 81: Split at Niwot Rd. Southern Segment assigned 6200
  - 133: Split at approximately middle. Northern Segment assigned 650
  - 151: Split at Vermillion Road. Northern segment assigned 290
  - 236: Split at Vermillion Rd. Northern segment assigned 380

Assigning LTS Scores

All truck volume percents were greater than 10% so only Table 2 methodology was applied.

Shoulder data came broken down into 0-3ft, 3-4ft, and 4+ft. Table 3 below displays how Table 2 was applied to conform to the shoulder data. Scores were assigned by Select By Attribute as the model is being developed for further application.

TABLE 3: COUNTY ROADS; TRUCK PERCENTAGE ≥ 10%

Daily Volume	Paved Shoulder Width			
	0 ft to < 3 ft	3 ft to < 4 ft	4 ft +	≥ 6 ft
< 400	LTS 2	LTS 2	LTS 2	N/A
400 to 1,500	LTS 3	LTS 2	LTS 2	N/A
1,500 to 7,000	LTS 4	LTS 3	LTS 3	N/A
> 7,000	LTS 4	LTS 4	LTS 4	N/A

Boulder Co. LTS-Final Count Methods

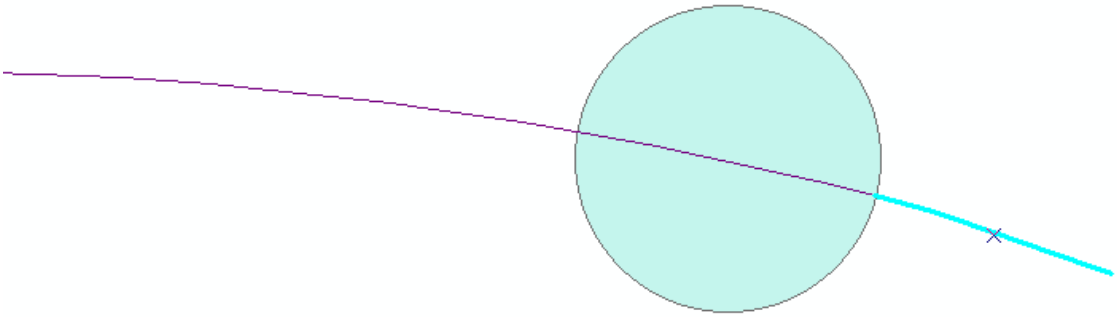
Begin with new gdb called BLDR_BLTS_FinalCountOutputs.gdb

Begin with new ArcMap document called BLDR_BLTS_FinalCountAnalysis.mxd

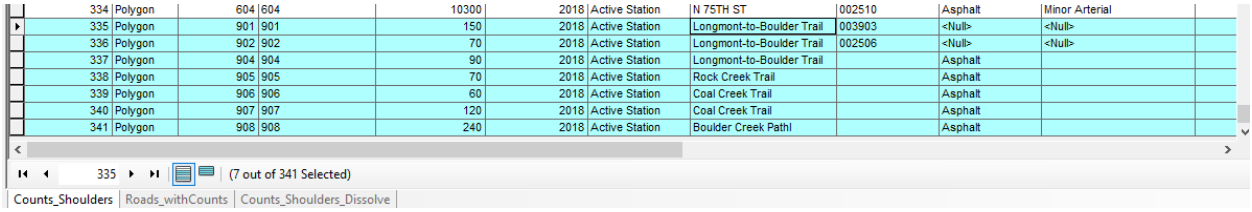
Export base layers to new gdb: Shoulders, Map_Roads (ROAD_MAP_ROADS from boco.gdb), Final_Counts_2018 (Traffic_Counts_Up_Through_20181128_Final_Final.lpk)

- Remove Stations with Null Count Values (Stations 609 & 612) = Final_Counts_NoNull
- Buffer Final_Counts_NoNull by 25ft = Count_Stations_25ft
- Select by location for all stations that intersect a shoulder (141 of 341 stations) = CountStation_OnShoulder
- Switch Selection to export stations with no shoulder (200 of 341) = CountStation_NoShoulder
- Add field to CountStation_NoShoulder Called BIKE_WIDTH and Field Calculate value of 0
- Near: Input = CountStation_OnShoulder, Near Features = Shoulders (2ft, no parameters checked)
- Field Calculate 0 BIKE_WIDTH to shoulders with Null values
- Join Field: Input = CountStation_OnShoulder, Input Join Field = Near_FID, JoinTable = Shoulders, Output Join Field = Objectid, Join Fields = BIKE_WIDTH
- Merge: CountStation_NoShoulder + CountStation_OnShouler = Counts_Shoulders
- Select Map_Roads by location to get only roads that have been counted = Roads_withCounts
- Delete NearID, and NearDist from Counts_Shoulders

- Near: Input = Counts_Shoulders, Near = Roads_withCounts (radius 2)
- Join Field: Input = Roads_withCounts, Input Join Field = ObjectID, Join Table = Counts_Shoulders, Output Join Field = Near_FID, Join Fields = Traffic, Count, Year_Counted, BIKE_WIDTH
- This join resulted in 4 road segments without values (Roads_withCounts OBJECTID's= 189, 190, 215, 230). These 4 roads mimic the example below. In this example, the road segment highlighted is actually that short length and the unselected road segment actually continues to the west)



- Dissolve: Input: Counts_Shoulders, Dissolve Fields: NearID, Stats Field: ObjectID, Stat Type: Count = Counts_Shoulders_Dissolve
  - This step was added to determine which road segments intersect multiple count stations (65)
  - Field "checked" was added to Counts_Shoulders_Dissolve to mark 'y' for no split needed, 'change' for split needed, and 'check' for questionable numbers
  - 3 features marked check: all are trails and will be removed. (The figure below marks these 3 trails as well as the trails removed due to location)
  - 10 lines to be split: point file of split locations will be delivered along with data



334	Polygon	604	604	10300	2018	Active Station	N 75TH ST	002510	Asphalt	Minor Arterial
335	Polygon	901	901	150	2018	Active Station	Longmont-to-Boulder Trail	003903	<Null>	<Null>
336	Polygon	902	902	70	2018	Active Station	Longmont-to-Boulder Trail	002506	<Null>	<Null>
337	Polygon	904	904	90	2018	Active Station	Longmont-to-Boulder Trail		Asphalt	
338	Polygon	905	905	70	2018	Active Station	Rock Creek Trail		Asphalt	
339	Polygon	906	906	60	2018	Active Station	Coal Creek Trail		Asphalt	
340	Polygon	907	907	120	2018	Active Station	Coal Creek Trail		Asphalt	
341	Polygon	908	908	240	2018	Active Station	Boulder Creek Pathl		Asphalt	

335 (7 out of 341 Selected)

Counts_Shoulders | Roads_withCounts | Counts_Shoulders_Dissolve

  - Export these edited roads as Counts_Roads_Shoulders
  - Export as LTS_Roads_Input, Add Field = LTS (text), Change Traffic_Count attribute field to Count_ for model parameters. This is the layer that is ready to run through the tool
  - Model Ran Successfully! Final Output/Scored Roads = **LTS_Roads_Output**

Appendix E: Performance Metrics Methodology

Methodology

Cap (regional) VMT/capita at 2018 Levels

- To calculate the numerator for each calendar year:
  - Utilize data from all CDOT traffic stations within Boulder County. For stations that apply to CDOT highway segments completely within Boulder County, use the full segment length provided by CDOT, and multiply the AADT for each station by the segment length to obtain the VMT from each station segment. Use the most recent AADT count available for each station. For stations that apply to CDOT highway segments partially within Boulder County, determine the segment length for that station that is within Boulder County, and multiply the AADT for each station by the segment length to obtain the VMT from each station segment. Use the most recent AADT count available for each station.
  - Utilize data from Boulder County traffic stations: that are located on Boulder County Principal or Minor Arterials. Determine segment length for each traffic station and multiply the AADT by the segment length to obtain the VMT from each station. Use the most recent AADT count available for each station.
  - Sum the VMT from all CDOT and Boulder County traffic stations.
- To calculate the denominator, the capita used in this metric shall be the population of Boulder County plus the number of "in-commuters" (non-resident employees who work in Boulder County). Use the July 1 population estimate for each year from the US Census Bureau for population. For jobs, use employment data from the Bureau of Labor Statistics for July of each year. Use Census On the Map data to get the percent of Boulder County jobs where the person is employed in Boulder County but living outside Boulder County (filter = primary jobs, which means 1 person:1 job). Multiply the BLS employment by the On the Map percentage to get the number of Boulder County in-commuters.
  - Add the population and in-commuters, and divide the VMT by this number to obtain VMT/capita.

Increase annual transit boardings/capita

- To calculate the numerator:

- Use data provided by RTD for all routes operated by RTD within Boulder County. Sum the average weekday boardings across all routes for all stops within Boulder County for the January, May and August runboards. Multiply each runboard total by the number of weekdays in each runboard, and sum these three numbers
- Use data provided by Via, to sum annual weekday boardings for the Climb route.
- Use data provided by the City of Boulder to sum annual weekday boardings for the HOP route.
- Use data provided by TransFort to sum annual weekday boardings the FLEX route.
- Use data provided by the University of Colorado to sum annual weekday boardings for BuffBus, late night transit, or other routes operated by CU-Boulder.
- Sum all weekday boardings data from all agencies to obtain the number of annual transit boardings within Boulder County each year.

- To calculate the denominator, follow the same steps used to calculate the denominator for the VMT/capita metric.
- Divide the numerator by the denominator to obtain the Annual Weekday Transit Boardings/ capita metric for each year.

Eliminate serious injury and fatal crashes in unincorporated Boulder County by 2035:

- For each calendar year, obtain countywide traffic crash data from CDOT (who in turn receive it from the State Department of Revenue, who in turn receive it from Colorado State Patrol and other law enforcement agencies)
  - Clean the data, determining if there are crashes coded to Boulder County that should have been coded to a different county, crashes coded to unincorporated Boulder County that should have been coded to a municipality or vice versa.
  - Select all injury level 4 (obvious incapacitating injury) & 5 (fatal) crashes within Boulder County outside of the municipalities to obtain the number of severe crashes.
- Include all crashes that occur on US 36 between Jay Rd & N Broadway (exclusive of the intersection of Jay Rd & US 36), all crashes that occur on SH 119 "the Diagonal" from SH 157 to Longmont city limits (including crashes at SH 52 and at 63rd St), and obtain Weld County crash data to accurately capture all crashes that occur on East County Line Rd (aka WCR 1).

Maintain Boulder County Roads

- Convert current pavement forecasting tool into PaVer program and update with current five-year resurfacing plan for all three networks.

- Run forecasts to show annual budget needs and work program to best meet the PCI 70 rating for each of the three networks. Also look at resultant pavement index with current five-year plan.
- Use forecasting software to update annual overlay and chip seal targets for each network and include new targets in CIP reporting.

- Continue to use Geotechnical investigation to develop cost-effective long-lasting pavement designs and follow those recommendations for all projects.

Maintain Boulder County Bridges

- Boulder County follows the Federal Highway Administration's (FHWA) National Bridge Inspection Standards (NBIS) classification system, whereby major structures are assigned a sufficiency rating between 0 and 100.
- In order to provide for the efficient and safe travel of people, goods, and services throughout the county, Boulder County's goal is to maintain all major structures (bridges or culverts greater than 20 feet in span length at the roadway centerline) with a Sufficiency Rating of 70 or higher.
- Use CDOT's bi-annual Off-System Bridge Inspections to track the number of bridges with a structural sufficiency rating below 70. Record and track number that are rated functionally obsolete.
- As of 2017, the most recent year in which a full bridge inspection report exists and was submitted to Boulder County, 5 out of 92 major structures on the Boulder County road network had a sufficiency rating less than 70.
- Inspect a subset of the county's 420 minor structures on a regular periodic basis and develop an implementation plan for those needing repair or replacement. Track back-log of needed replacements as part of the annual capital program assessment.

Complete the Bike Network Vision

- Divide the number of completed miles of the Bike Network Vision by the total number of miles of the Bike Network Vision (59).

Affordable Living

- Work with local housing authorities to determine the percentage of clients receiving housing assistance have access to additionally subsidized transit.