

EAST ARAPAHOE (SH 7) TRANSPORTATION PLAN

APPENDIX B: PURPOSE AND GOALS REPORT

December 2016



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1 PURPOSE OF THE PLAN

Today, the East Arapahoe Corridor is one of the city's busiest regional travel corridors. As we plan for the future, exponential growth in surrounding communities will likely place additional demands on the corridor's existing transportation system. From people commuting into Boulder for work or school, traveling to Boulder for healthcare services, or simply accessing recreational and shopping amenities – forecasted regional transportation demands on the East Arapahoe Corridor will change how the corridor functions today.

Coupled with increased regional transportation demand are the changing local travel needs for people working, living and accessing services within the East Arapahoe corridor itself. East Arapahoe is no longer seen as a “pass through” corridor for in-commuters; and has, in fact, become one of Boulder's largest employment centers. People are looking for safe and convenient ways to travel between destinations along Arapahoe and other areas of the city. From students traveling between university campuses, to employees wanting to grab lunch – the need for people to move safely and conveniently via walking, biking, transit, ride sharing, and driving changes how we think about travel and transportation options in this transitioning area of the city.

Recognizing these changing regional and local conditions, the East Arapahoe Transportation Plan will be a long-range plan that considers a number of potential transportation improvements within the East Arapahoe corridor, including walking and biking enhancements, improved regional and local transit, efficient vehicular travel, as well as urban design features that work hand in hand with mobility improvements to truly transform the corridor. Importantly, transportation improvements will support the goals and objectives of the Boulder Valley Comprehensive Plan, the Transportation Master Plan (TMP) and the city's Sustainability Framework.

2 DOCUMENT ORGANIZATION AND STUDY AREA OVERVIEW

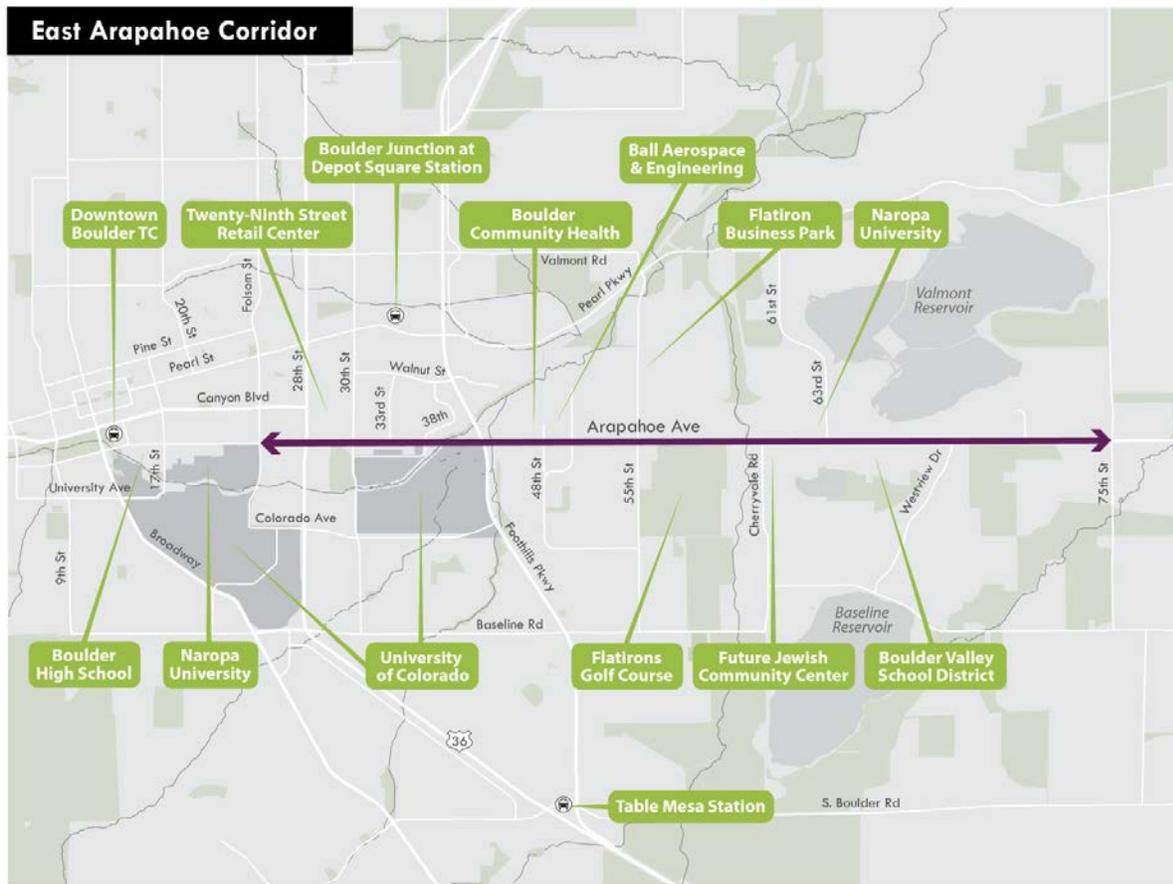
The next sections of this document describe the goals and objectives of the East Arapahoe Transportation Plan and are organized as follows:

Section 3: Summarizes the Plan goals and objectives, which are categorized by the Boulder 2014 Transportation Master Plan (TMP) Focus Areas, including Complete Streets, Regional Travel, Transportation Demand Management (TDM), Funding and Sustainability. While organized by Focus Area, each goal and associated objective is interrelated and needs to be mutually supporting to have the greatest benefit.

Section 4: Further describes each plan goal and associated objectives, including the rationale each objective will address in order to attain the goals.

Figure 1 illustrates the East Arapahoe Transportation Plan study area, which is focused primarily on Arapahoe Avenue between Folsom Street and 75th Street.

Figure 1 East Arapahoe Transportation Plan Study Area



3 SUMMARY OF PLAN GOALS & OBJECTIVES

In support of the Boulder Valley Comprehensive Plan, the Boulder Transportation Master Plan (TMP) and the city’s Sustainability Framework, a series of draft goals and related objectives have been drafted and will guide the development of the East Arapahoe Transportation Plan.

Goal 1. Complete Streets: Provide Complete Streets in the East Arapahoe corridor that offer people a variety of safe and reliable travel choices.

- Objective 1.a. Provide safe travel for all modes using the East Arapahoe corridor, including supporting the “Vision Zero” effort to eliminate fatalities and serious injuries from traffic collisions.
- Objective 1.b. Improve the ease of access and comfort for people walking in the East Arapahoe corridor, and ensure the vision contributes to placemaking.
- Objective 1.c. Broaden the appeal of bicycling along the East Arapahoe corridor to people of all ages and bicycling abilities.
- Objective 1.d. Make transit a convenient and practical travel option in the East Arapahoe corridor.
- Objective 1.e. Move drivers efficiently through the East Arapahoe corridor.

Goal 2. Regional Travel: Increase the number of person trips the East Arapahoe corridor can carry to accommodate local transportation needs and projected changes in surrounding communities.

- Objective 2.a. Improve local travel options within the East Arapahoe corridor for residents, employees, and visitors.
- Objective 2.b. Improve regional travel options between Boulder and communities to the east for work and other regional trips.

Goal 3. Transportation Demand Management (TDM): Promote more efficient use of the transportation system and offer people travel options within the East Arapahoe corridor.

- Goal 3.a. Improve first and final mile connections to help people conveniently and safely walk and bike to and from transit.
- Goal 3.b. Promote the use of multiple transportation options in East Boulder by residents and workers.

What is Transportation Demand Management (TDM)?

TDM promotes more efficient use of the existing transportation system by influencing the time, route, or mode selected for a given trip. TDM strategies increase travel choices and examples include:

- Incentives such as Eco Passes
- Modal strategies such as ridesharing, carsharing, vanpools, and teleworking
- First- and Final-Mile solutions such as bikesharing

Goal 4. Funding: Deliver cost-effective transportation solutions for the East Arapahoe corridor that can be phased over time.

- Objective 4.a. Coordinate with public and private entities, including adjacent land owners, to implement cost-effective transportation improvements.

Goal 5. Sustainability: Develop transportation improvements in the East Arapahoe corridor that support Boulder's Sustainability Framework (*desired outcomes include a community that is Safe, Healthy & Socially Thriving; Livable, Accessible & Connected; Environmentally Sustainable; Economically Vital; and provides Good Governance*).

- Goal 5.a. Reduce greenhouse gas (GhG) emissions and air pollution from vehicle travel within the East Arapahoe corridor.
- Goal 5.b. Improve travel options that promote public health for residents and workers along the East Arapahoe corridor.
- Goal 5.c. Provide access to affordable transit and other travel options to low- and moderate-income residents and workers along the East Arapahoe corridor.
- Goal 5.d. Preserve and improve economic vitality in the East Arapahoe corridor.
- Goal 5.e. Promote and improve water quality, and reduce the urban heat island effect through roadway and landscape design.

4 DESCRIPTION OF PLAN GOALS & OBJECTIVES

Goal 1. Complete Streets: Provide Complete Streets in the East Arapahoe corridor that offer people a variety of safe and reliable travel choices.

Objective 1.a. Provide safe travel for all modes using the East Arapahoe corridor.

The City of Boulder works to provide a safe transportation system for people using all modes of travel and “Vision Zero” is the city’s effort to eliminate fatalities and serious injuries from future traffic collisions. Arapahoe Avenue is one of the higher speed (posted speed limits between 35 and 45 mph) and higher volume roadways within the city. An analysis of crash data from 2012-2014 shows that crashes affect all modes of travel along Arapahoe Avenue and that several intersections have particularly high crash rates. The data indicates a need to minimize conflict points, including intersections and driveways, and identify and mitigate safety issues for people walking, biking, and driving in the corridor.

The need to provide safe travel for all modes is further described here:

High Crash Intersections

Between 2012 and 2014, three intersections in the corridor had over 100 crashes: Arapahoe Avenue and 28th Street, 30th Street, and Foothills Parkway. The predominant crash type for all three was rear end. These high-crash intersections are located in the part of the East Arapahoe corridor that also sees the most bicycle and pedestrian traffic.

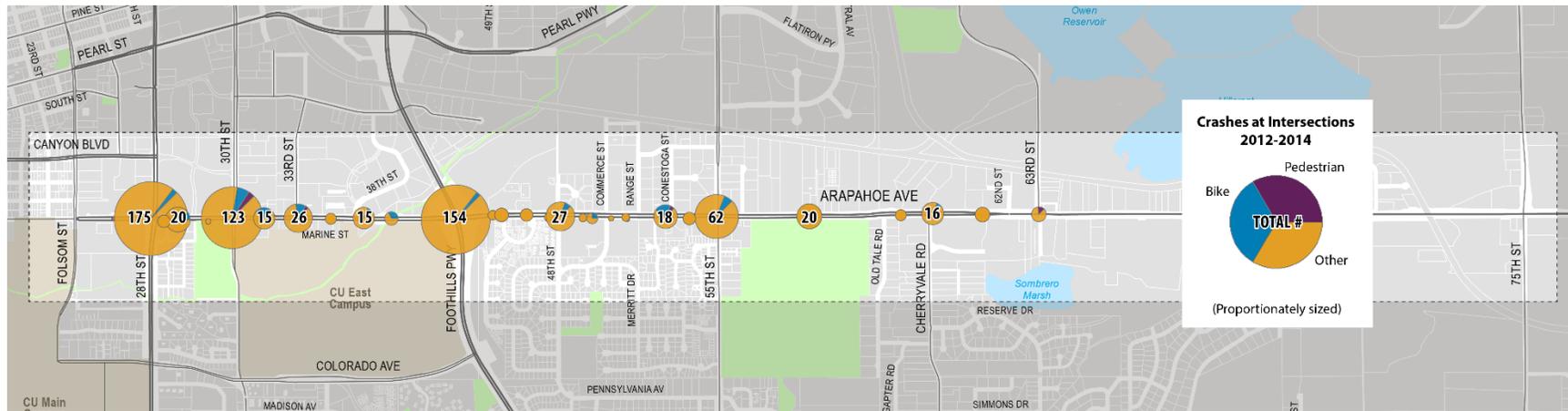
Pedestrian and Bicycle Crashes

There were 40 crashes in the corridor that involved bicycles and eight that involved pedestrians in the 2012-2014 time period. The vast majority (85%) of the bicycle crashes occurred at intersections. The intersection of Arapahoe Avenue and 30th Street had twice as many bicycle crashes as any other intersection and was the site of half of all pedestrian crashes. Of the six bicycle-involved crashes that occurred between intersections, five of them were driveway access-related. About a third of the total bike crashes along the corridor involved conflicts between eastbound bicycles on the north multi-use path and southbound vehicles turning right from side streets or driveways.

Figure 2 illustrates crash data at intersections in the corridor, categorized by type of crash.

EAST ARAPAHOE TRANSPORTATION PLAN | Appendix B: Purpose & Goals
 City of Boulder

Figure 2 Crashes at Intersections along Arapahoe Avenue, 2012-2014



Source: City of Boulder

Objective 1.b. Improve the ease of access and comfort for people walking in the East Arapahoe corridor.

The Boulder 2014 TMP prioritizes walking as the fundamental way to travel and aims to increase the share of residents living in complete neighborhoods to 80% by 2035. Currently, only 26% of Boulder's population lives in 15-minute walking neighborhoods, which means they can walk to a variety of destinations, like grocery stores, restaurants and transit stops in 15 minutes. With the East Arapahoe corridor becoming home to more and more destinations, linking residential, commercial and employment areas with continuous and safe pedestrian infrastructure is taking on even more importance. Increasing the number of complete neighborhoods within the corridor will help change long trips into short ones, making walking a reasonable option for a greater share of trips.

The need to improve the ease of access and comfort for people walking is further described here:

Insufficient Crosswalk Spacing

Several segments of the East Arapahoe corridor lack conveniently-spaced pedestrian crossings, which are about two-thirds of a mile apart between Cherryvale and 55th Street and about a third of a mile apart in several other locations. As a result, many destinations, including bus stops, are not in proximity to a safe crossing.

Gaps in the Sidewalks and Multi-Use Path Network

There are sections of Arapahoe Avenue with missing pedestrian facilities, particularly east of 55th Street, including a section without a sidewalk or path on either side of the street. Parallel and connecting streets, such as Marine Drive to the south, also lack sidewalks. In sections where the sidewalk and/or multi-use path are missing, bus stops are not Americans with Disabilities Act (ADA) accessible.¹ Enhanced facilities are needed to address challenges facing people traveling in the corridor by foot or with mobility devices. Pedestrian facilities on connecting and parallel streets also need to be completed.

Proximity of Vehicles to Pedestrians

Many parts of Arapahoe Avenue lack a buffer that separates vehicle travel lanes from pedestrians. For example, on the south side of Arapahoe Avenue between Foothills Parkway and 55th Street, sidewalks narrow to 4 feet and lack a buffer from the roadway. Vehicle speeds over 25 mph affect the perceived safety for pedestrians without such buffers. There is a need to enhance the comfort and attractiveness of pedestrian facilities along Arapahoe Avenue in the study area. For example, street trees planted between the sidewalk and the roadway physically protect pedestrians and provide shade, create a visual enclosure that encourages drivers to slow down, while also providing environmental benefits.

Figure 3 Sidewalk Abruptly Ends by Flatirons Golf Course



Source: City of Boulder

Figure 4 Vehicles Close to Sidewalk, East of Conestoga



Source: City of Boulder

¹ City of Boulder, Sustainable Streets and Center Report, 2013

Lack of a “Sense of Place”

Transportation networks should balance both placemaking as well as the movement of people – or “to” and “through” functions. While Arapahoe Avenue carries a large number of people through the corridor each day, the street itself lacks features that could promote its “to” function as an inviting place to travel and spend time. Higher traffic speeds, large parking areas fronting the street, narrow sidewalks, a lack of landscaping, and signage were all issues noted by community members who participated in a walk audit of the corridor in 2014. Each of these features makes it less attractive for people to bike, walk, and take transit in the corridor. As transportation improvements are considered for the corridor, it will be important to incorporate those urban design features that work hand in hand with mobility improvements to truly transform the corridor. From comfortable and enhanced transit stations, to landscaping, signage and public art, placemaking elements can enhance the travel experience for all users of the corridor, whether by walking, bicycling, transit or car.

And, as the East Arapahoe corridor changes, it will be important to identify land use patterns that support an improved transportation network. By coordinating the East Arapahoe transportation planning process with the ongoing Boulder Valley Comprehensive Plan update, the city can identify opportunities for integrated urban design, land use, and transportation planning.

Objective 1.c. Broaden the appeal of bicycling along the East Arapahoe corridor to people of all ages and bicycling abilities.

Public outreach for the Boulder 2014 TMP indicated that people who are “interested but concerned” about riding a bicycle do not feel comfortable or confident sharing busy roads with motor vehicles. Community input gathered in 2015 and early-2016 for the East Arapahoe Transportation Plan further underscored this concern, emphasizing that much of Arapahoe Avenue does not feel safe, comfortable or convenient for bicycle travel. Streetscape and facility improvements are needed to enhance safety for people riding bikes, particularly in areas where there are known conflict points, and to make a broader segment of the community feel comfortable traveling by bicycle along the East Arapahoe corridor.

The need to broaden the appeal of bicycling is further described here:

Gaps in the Bicycle Network

The East Arapahoe corridor includes several locations where there are gaps in the bicycle network or difficult crossings; and bicycle infrastructure varies widely through the corridor. For instance, there is no on-street bicycle facility on Arapahoe Avenue west of 55th Street, but there are bicycle lanes on a portion of the corridor between 55th and 63rd Streets. And, there are multi-use paths along both sides of the corridor that have several missing segments. The high frequency of driveways also contributes to several points of conflict for bicyclists.

Figure 5 Missing Segment of Multi-Use Path



Source: City of Boulder

Lack of Infrastructure for Long Distance Bicycle Travel

The existing multi-use path generally does not meet the needs of people commuting and traveling by bicycle for longer-distance trips along Arapahoe Avenue. These needs are similar to people driving along the corridor and include a direct, safe, and time-efficient route. There are several issues with using the multi-use path for longer-distance travel, including the lack of a continuous path on one side of the street and the lack of specialized treatments at intersections, where bicyclists must interact with pedestrians and turning vehicular traffic.

Objective 1.d. Make transit a convenient and practical travel option in the East Arapahoe corridor.

Making transit an attractive travel option for all residents and visitors is the foundation of the Boulder 2014 TMP and the Renewed Vision for Transit. A complete transit system is one that provides both high-quality transit service and high-quality transit facilities, such as stops/stations that are well coordinated with land use, pedestrian and bicycle access, and other supportive programs like EcoPasses.

Approximately 10,000 people travel via regional or local bus through the East Arapahoe corridor each day. The JUMP is the primary east-west bus route and is one of the city's most heavily used bus routes, connecting destinations such as Boulder High School, Downtown Boulder, Twenty Ninth Street, CU East Campus, the Boulder Valley School District - Arapahoe Campus with and Lafayette and Erie to the East. To provide quality service to these existing bus passengers and attract new transit riders to the East Arapahoe corridor, transit must be perceived as safe and comfortable, with reliable service and travel times that are competitive with the private automobile.

The need to make transit a convenient and practical travel option is further described here:

Figure 6 Foothills Parkways and Arapahoe Avenue Westbound JUMP Stop



Source: City of Boulder

Limited Regional Transit Ridership

High housing costs in Boulder combined with a strong and growing job base have dramatically increased the level of in-commuting in recent years. The Boulder 2014 TMP update set a goal of reducing the number of trips made by one person driving alone in a car (called "single occupant vehicle" mode share, or SOV) to 60% of work trips for nonresidents. While Boulder has achieved a remarkably high mode share for non-single occupant vehicle (SOV) trips for local travel, in-commute travel remains primarily SOV. In-commute travelers are still estimated to be driving alone at a mode share of approximately 80%.

Given the projected growth in travel demand and increased development along the East Arapahoe corridor between Boulder and Brighton, there is a need to attract more regional transit riders to the corridor. This will entail close coordination with Boulder County's SH 7 BRT Study and with the Colorado Department of Transportation (CDOT) to proactively develop a holistic plan for the overall SH 7 corridor to provide fast and reliable transit travel times in the corridor, appropriate bus service hours, and convenient first-and-last-mile travel options.

Shortage of Bus Stop Amenities

There is a need within the corridor to ensure safe access to bus stops, for both directions of travel; enhance transit amenities to provide a comfortable passenger experience at bus stops and highly legible signage to other bus routes and first-and-last-mile travel options. As shown in Figure 7, safely accessing bus stops can be challenging along Arapahoe Avenue, since many of the stops are located a distance from convenient street crossings and accessible sidewalks. Transit stops also need to include amenities such as shelters to protect people from the elements, seating to make waiting for the bus more comfortable, and trash cans to help maintain cleanliness. Within East Arapahoe corridor, the JUMP serves 57 stops of which only 26% have a shelter, 44% have a bench, and 21% have a trash can.² Another consideration is that bicycling is an important transit access mode. As most buses allow a maximum of two bicycles per bus, bike parking at stops enables more bicyclists to park their bike securely when biking to transit. Currently, 23% of the 57 JUMP stops along Arapahoe Avenue have bike parking.³

Figure 7 Inaccessible Bus Stop Landing



Source: City of Boulder

Limited Real-Time Bus Information

As part of the Boulder 2104 TMP update, community members were asked how they would improve transit and prioritize transit investments. Real-time bus arrival information was prioritized as the most important enhancement needed. Real-time information gives passengers the comfort of knowing exactly when the next bus will arrive. Passengers can look online, on their cell phones, or at a digital sign at the stop or station to know exactly how long they have to wait. In 2016, RTD implemented a pilot real-time information system for local buses – including the JUMP – that can be accessed via the Transit App smartphone application. Expanding real-time information data to regional buses will be an important next step in addressing this need within the corridor and throughout Boulder and the region.

Objective 1.e. Move drivers efficiently through the East Arapahoe Corridor.

Arapahoe Avenue is an important east-west vehicle travel corridor serving downtown Boulder, CU, Boulder Community Health, other major employers, and adjacent neighborhoods. Because there are only a few major east-west and north-south roads in East Boulder, there are limited alternative routes for many trips through and within the East Arapahoe corridor. This only underscores how important it is to increase safety, reliability and the overall person-carrying capacity of Arapahoe Avenue for all vehicle trips in the corridor. This need is also true for trucks serving the businesses in the corridor, and/or carrying freight between Boulder and the communities to the east. In most cases the trucks have no choice but to utilize Arapahoe Avenue.

The need to move drivers efficiently is further described here:

² City of Boulder

³ City of Boulder

Disconnected Street Pattern

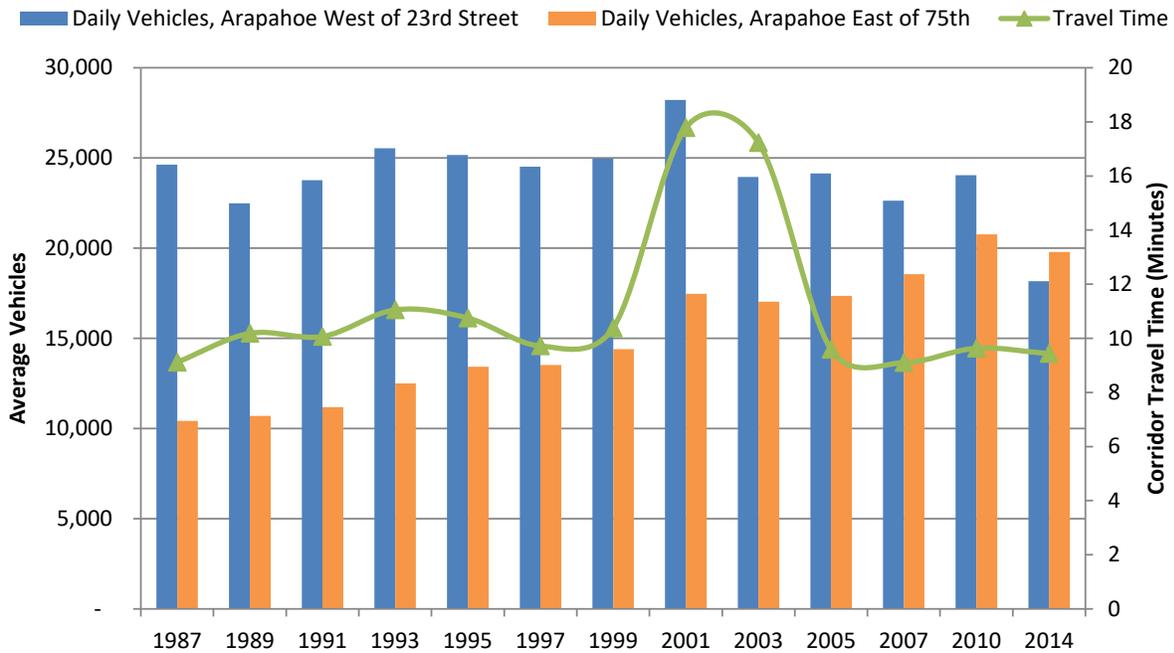
Development east of 28th Street along the East Arapahoe corridor is laid out in a fashion markedly different from downtown Boulder. Much of the north side of Arapahoe Avenue is dominated by commercial or light-industrial uses on larger lots, while the area to the south is a mix of similar larger lot commercial or light-industrial uses and suburban-style residential development. The result is a disconnected street pattern with relatively few through streets and lack of a well-established street grid. This style of development means that many local vehicular trips have few alternatives to using Arapahoe Avenue. Because Arapahoe Avenue then carries both local vehicle trips and regional through-traffic, the safe and efficient movement of vehicles becomes more important.

This disconnected street pattern and lack of an efficient roadway grid is particularly impactful to emergency service providers. Fire trucks have few response route choices except Arapahoe Avenue, and ambulances accessing the hospital have no choice at all but to use Arapahoe, as the hospital is located directly on the corridor. For this reason, it will be critical to anticipate and accommodate emergency service providers when considering alternatives for improving Arapahoe Avenue.

Corridor Travel Times

The City of Boulder 2014 Drive Time Analysis showed that peak period vehicle travel times along Arapahoe Avenue between 23rd Street and 75th Street have remained reasonably steady since 1987.⁴ As shown in Figure 8, this has occurred even as traffic volumes on the east end of the corridor have increased. Traffic volumes on the west end have remained relatively steady over time, consistent with relatively flat growth in overall vehicle travel in Boulder, despite growth in population and employment. Considering the trend of increasing traffic volumes on the east end of the corridor (as observed at 75th Street) it will become increasingly important to create an efficient transportation network that maintains efficient vehicle travel in the corridor for both local and regional trips.

Figure 8 Average Daily Traffic & Travel Time 1987-2014*



Note: *The City of Boulder assumes that 2001 and 2003 travel time increases were due to two contributing factors. First, changes in data collection methodology resulted in long observed travel periods. Second, construction at the Broadway & Arapahoe Avenue intersection likely contributed to increased travel times.

Source: City of Boulder Traffic Count Data and Drive Time, 2014

Goal 2. Regional Travel: Increase the number of trips the East Arapahoe corridor can carry to accommodate local transportation needs and projected changes in surrounding communities.

Objective 2.a. Improve local travel options within the East Arapahoe corridor for residents, employees, and visitors.

One of the Boulder 2014 TMP objectives is to increase transportation alternatives commensurate with the rate of employee growth. This is particularly relevant to the East Arapahoe corridor as it is becoming home to a number of regional employment centers and destinations. Recent and ongoing development at Boulder Community Health Foothills Hospital campus, CU East Campus, and other regional employers in East Boulder are increasing the number of employees, and demand for travel, along the East Arapahoe corridor. The area has experienced a surge in new development over the past several years and employment in East Boulder is expected to continue to grow. East Boulder has more capacity to accommodate commercial development than other areas of the city that has reached zoning capacity. It is not surprising then that the area is expected to experience 19% employment growth between 2015 and 2040 – one of the highest employee growth rates in the city.⁵

The need to improve local travel options is further described here:

Growing Local Transportation Demand

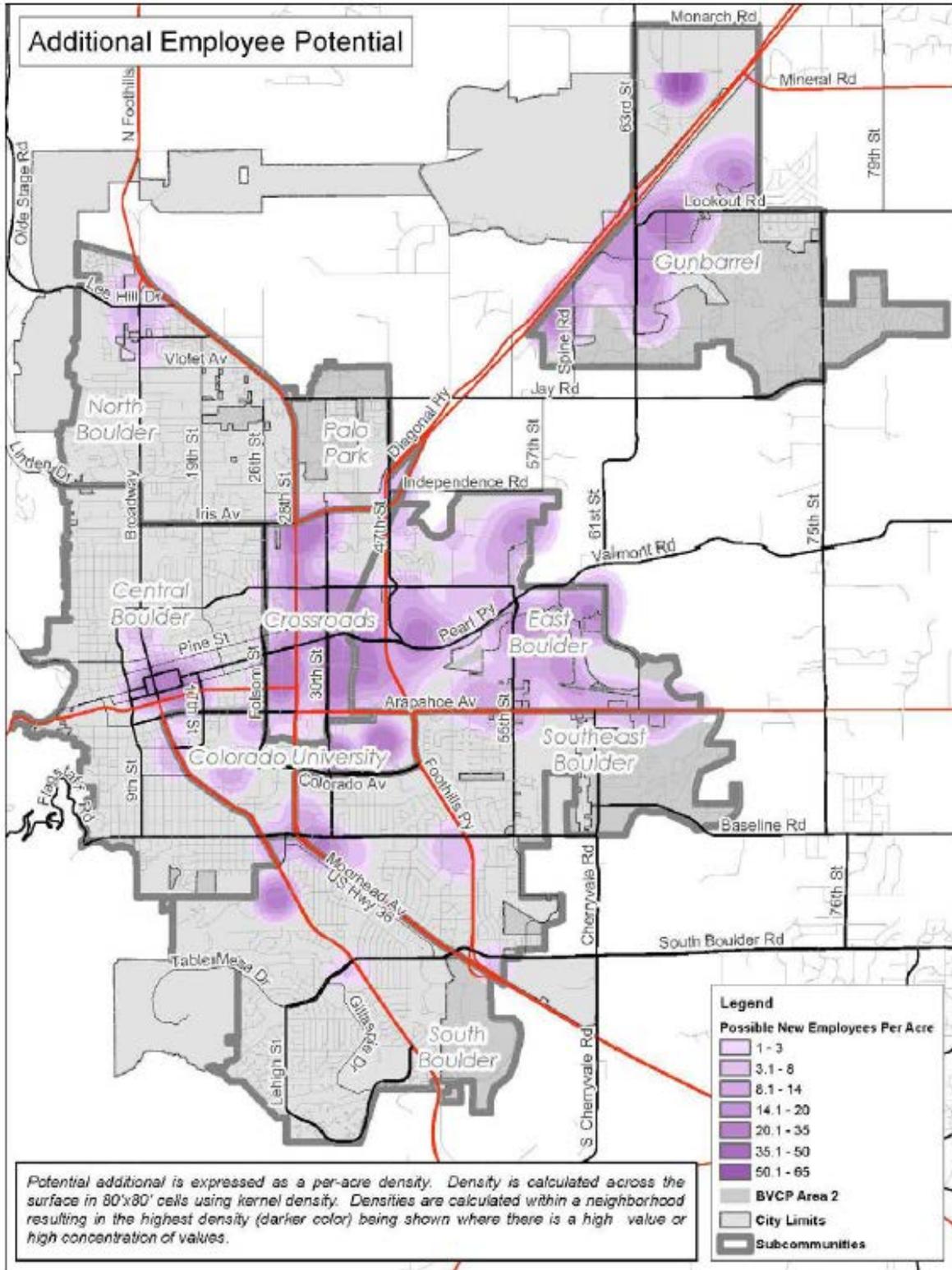
Development along the Arapahoe Avenue corridor is already growing significantly.⁶ Of the 2,200 development review applications in the City of Boulder in 2015, nearly 25% were within one-half mile of Arapahoe Avenue. And this trend is expected to continue. Figure 9 shows the potential for employee growth within the East Arapahoe corridor.⁷ By 2040, it is expected that most areas of the city will be at 90% or more of their employment capacity. By comparison, employment projections show that East Boulder will be at 61% of its employee zoning capacity in 2040 – indicating the tremendous potential for commercial growth in East Boulder and along the East Arapahoe corridor. With this employment growth, comes increasing demands on the transportation network and the need to develop an interconnected, multimodal travel network in East Boulder that enables safe and efficient access for people walking, biking, riding transit and driving.

⁵ Boulder Valley Comprehensive Plan, 2015-2040 Projections. https://www-static.bouldercolorado.gov/docs/BVCP_Projections_Summary_Formatted_082815-1-201508281637.pdf.

⁶ <https://bouldercolorado.gov/open-data/city-of-boulder-open-development-review-cases/>

Boulder Valley Comprehensive Plan 2015-2040 Projections. https://www-static.bouldercolorado.gov/docs/BVCP_Projections_Summary_Formatted_082815-1-201508281637.pdf

Figure 9 Additional Employee Potential



Source: City of Boulder, Boulder Valley Comprehensive Plan 2015-2040 Projections, Figure 2. https://www-static.bouldercolorado.gov/docs/BVCP_Projections_Summary_Formatted_082815-1-201508281637.pdf

Objective 2.b. Improve regional travel options between Boulder and communities to the east for work and other regional trips.

Regional growth is likely to increase future congestion on the limited number of regional facilities connecting Boulder with neighboring communities, including Arapahoe Avenue.⁸ As previously mentioned, the Boulder 2014 TMP update set a goal of reducing the number of SOV trips to 60% of work trips for nonresidents. Yet, regional travel is still highly dependent on SOVs. In order to achieve this goal, a larger share of future trips between Boulder and surrounding communities will need to be accommodated by alternative travel choices that are appealing, convenient, and reliable.

The need to manage regional travel demand is further described here:

Growth in Communities to the East

The past fifteen years have already seen large increases in the number of commuters traveling between Boulder and communities to the east, as well as to and from other places in the region. Between 2002 and 2014, there was a greater increase in workers commuting to Boulder from the east than from any other direction (Figure 10), but also growth in commuting from Boulder to the region (Figure 11).⁹ Regional projections shown in Figure 12 indicate significant increases in projected person trips to and from Boulder between 2010 and 2035. Figure 12 shows that trips are expected to increase significantly between Boulder and Erie (104.7%), Broomfield (38.5%), and Lafayette (15.9%) by 2035.¹⁰ This is based on the growing population of these communities and the growing interconnectedness of the region.

Figure 10 Increase in Workers Commuting to Boulder from Places in the Region, 2002-2014

Place	2002	2014	Net Increase	% Increase
Longmont	7,158	8,382	1,224	17%
Broomfield	*	4,461	*	*
Lafayette	2,994	3,985	991	33%
Erie	891	2,230	1,339	150%
Superior	1,035	1,602	567	55%
Frederick	263	782	519	197%
Firestone	208	650	442	213%

Notes: * Comparison is not possible due to data limitations

Source: US Census LEHD, 2014.

Figure 11 Increase in Workers Commuting from Boulder to Places in the Region, 2002-2014

Place	2002	2014	Net Increase	% Increase
Denver	2,652	3,838	1,186	44.7%
Louisville	617	1,009	392	63.5%
Westminster	503	839	336	66.8%
Lakewood	470	724	254	54.0%
Aurora	334	579	245	73.4%
Lafayette	283	499	216	76.3%
Longmont	923	1,137	214	23.2%
Broomfield	*	891	*	*

Notes: * Comparison is not possible due to data limitations

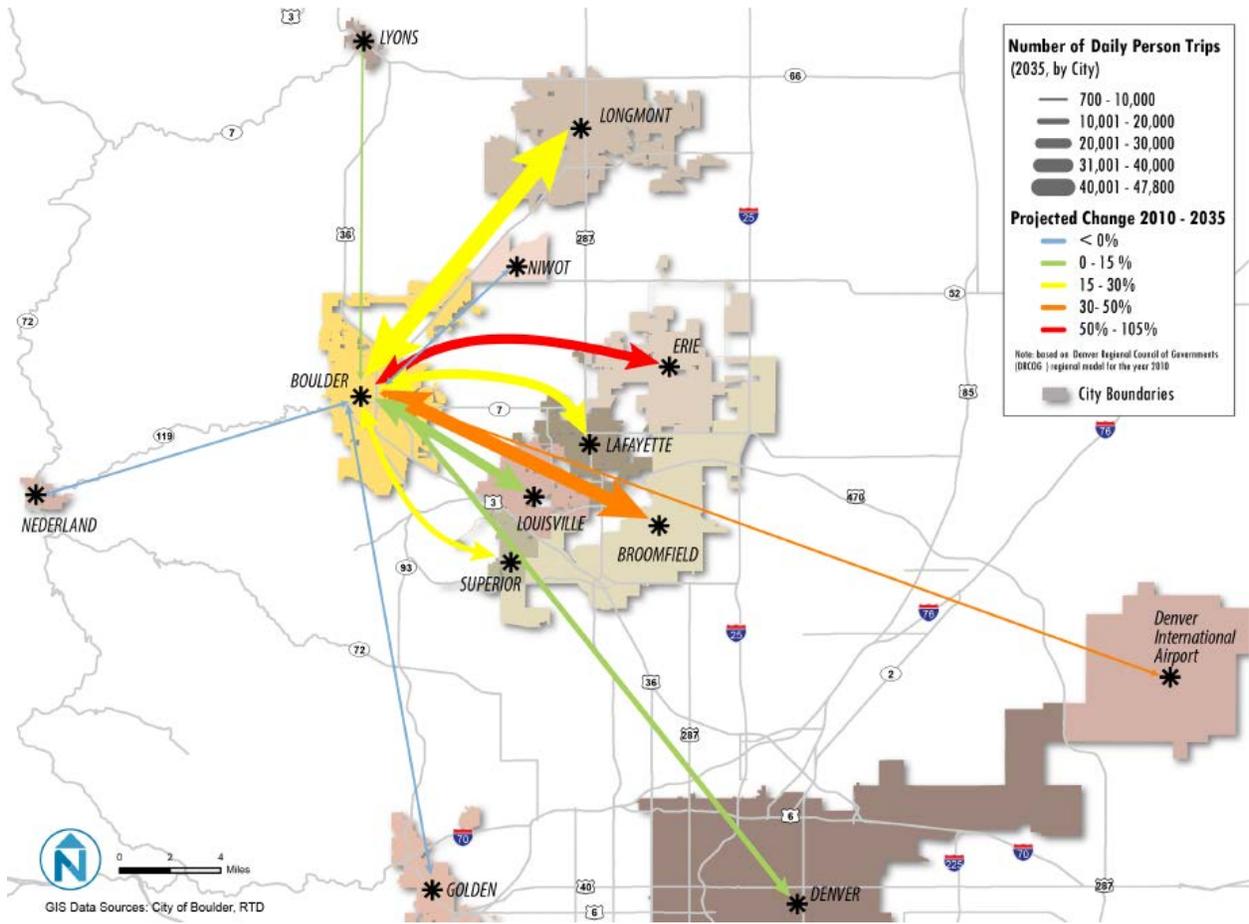
Source: US Census LEHD, 2014.

⁸ Travel Forecasts based on Regional Travel Demand Model, 2040

⁹ US Census Bureau, Longitudinal Employer-Household Dynamics

¹⁰ Boulder Transportation Master Plan, 2014. Analysis of DRCOG Regional Model, 2010-2035.

Figure 12 Origin-Destination Pairs in the Region (Projected Change 2010-2035)

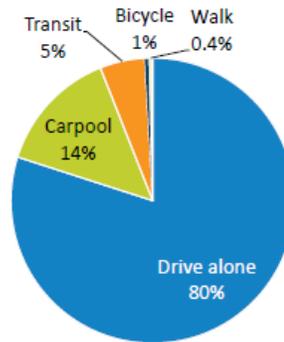


Source: City of Boulder Transportation Master Plan, State of the System Report 2014, Figure 3-22. Data from DRCOG 2010-2035 projections.

Increasing SOV In-Commute Trips

Approximately 55% of Boulder workers are estimated to travel into Boulder for work. While Boulder has achieved a low SOV mode share for local travel (approximately 48% for commute trips), in-commute travel remains primarily SOV at nearly 80% (See Figure 13). Regional travel demand projections from the Denver Regional Council of Governments (DRCOG) indicate growth in traffic volumes of 20% or more along the corridor by 2040, and over 30% on the eastern end of the corridor (east of 55th Street). If future regional travel maintains this 80% SOV mode share as traffic volume grows, the East Arapahoe corridor will see increasing congestion and will be able to carry fewer trips. Due to the distances of regional trips and the need to maintain and expand the number of trips that the East Arapahoe corridor can carry, future travel will need to be balanced among automobiles, transit, and strategies such as ridesharing and first-and-last-mile connections for transit riders.

Figure 13 Boulder In-Commute Mode Share



Source: Source: Census Transportation Planning Products (CTPP). 2006 – 2008 American Community Survey "Journey to Work." Boulder TMP State of the System Report 2014, Figure ES-10

Goal 3. Transportation Demand Management: Promote more efficient use of the transportation system and offer people travel options within the East Arapahoe corridor.

Objective 3.a. Improve first and final mile connections to help people conveniently and safely walk and bike to and from transit.

A "trip" is a journey from an origin to a destination. A transit trip most often involves a walking, biking, or other type of trip on one or both ends – in addition to the transit portion of the trip. The first and last miles of a transit trip can be challenging, especially in suburban communities and areas like East Boulder that were originally designed for motor vehicles. If walking or biking to a transit stop is too far, or connections are limited, travelers tend to avoid transit. First-and-last-mile strategies help people comfortably, conveniently, and safely bridge these gaps with solutions like bike sharing, covered and secure bike parking, shuttle and car share services and mobility on demand services like Lyft or Uber.

The 2014 Boulder TMP recommends developing "mobility hubs" throughout the city to better integrate these services, including at several locations along Arapahoe Avenue. The goal of a mobility hub is to provide seamless access between transit, pedestrian and bicycle networks, car/rideshare programs, and context-appropriate parking supply. Mobility hubs emphasize excellent pedestrian infrastructure within a quarter to half-mile of transit stops and connections to the bicycle network. A well-connected system brings people near the locations they wish to access and ensures a comfortable and safe walk to the places they wish to go.

The need to improve first-and-last-mile connections is further described here:

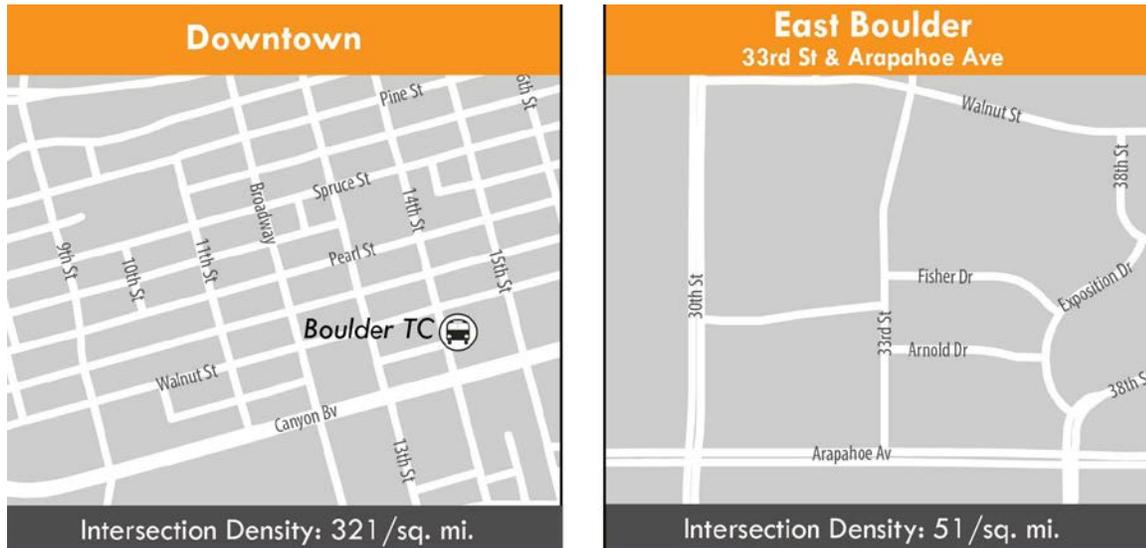
Lack of Pedestrian and Bicycle Connections

Due to the disconnected street grid and large blocks along East Arapahoe, it takes longer and is less convenient to walk or bicycle to destinations and access bus stops. The average block size east of Foothills Parkway is 15 acres, and the area has around 51 intersections per square mile, making for relatively few paths between destinations. For comparison, downtown Boulder has 321 intersections per square mile (see

Figure 14).

Additionally, very limited signage and wayfinding in the corridor mean that walking or biking to transit or other destinations can be challenging. To overcome these barriers, it will be essential to provide complete pedestrian and bicycle connections and provide clear signage to transit stops, a particularly important consideration as properties redevelop in the corridor.

Figure 14 Intersection Density, Downtown Boulder and East Boulder



Intersection density, or the number of street intersections per square mile, is a measure of street connectivity and walkability.

Source: Boulder Transportation Master Plan, State of the System Report, p. 3-6.

Objective 3.b. Promote the use of multiple transportation options in East Boulder by residents and workers.

The City of Boulder’s transportation demand management strategies, such as the EcoPass, have proven to be effective. Expanding the appeal of non-drive alone travel options in East Boulder requires policies and programs to expand access to bike and car sharing, manage the parking supply effectively, coordinate land use, and encourage use of enhanced pedestrian, bicycle, and transit facilities and services.

The need to encourage the use of multiple travel options is further described here:

Limited EcoPass Distribution

The EcoPass, a discounted annual transit pass purchased through group organizations, allows users access to all RTD services. City of Boulder surveys have found that people with an EcoPass are four to seven times more likely to use transit than those without a pass. The changes in travel behavior associated with access to an EcoPass translate into significant reductions in vehicle trips and mobile emissions. For work trips, Boulder employees with an EcoPass travel less than half the annual vehicle commute miles compared to employees without a pass. In 2012, 69,425 people who live, work, or study in Boulder had access to EcoPasses. Currently, only 25% of employees in the East Arapahoe corridor have access to an EcoPass. ¹¹

¹¹ Based on EcoPass data as of May 2016 and employment from US Census LEHD, within ½ mile of the corridor between Folsom Street and 75th Street.

Limited Bike Share and Car Share Options

Transportation options to support first-and-last-mile trips in Boulder include Boulder BCycle and eGo CarShare. In 2014, over 43,000 BCycle trips were made by approximately 7,000 riders, averaging 118 trips per day.¹² Currently, BCycle has three stations along Arapahoe Avenue in the study area – at 26th, 38th, and 48th Streets, as well as at 33rd Street & Fisher (less than ¼ mile north of the corridor). While the East Arapahoe BCycle stations do not have the highest usage from a systemwide basis, there is likely to be an increased demand as the density of employment and other destinations increases. Car sharing in Boulder is available through eGo CarShare, a nonprofit based in the Denver area. Cars are reserved hourly, and can be accessed at a home location. eGo CarShare is available at multiple locations throughout the City, including one location on Arapahoe Avenue at 48th Street.

Expanded bike share and car share options in the East Arapahoe corridor can help people overcome one of the primary concerns with commuting via transit – which is not having a car to access destinations throughout the city. These types of shared use mobility options have the potential to play an important role in bridging some of the existing transportation network gaps as well as encouraging people to use multiple transportation modes. Typically, bike share and car share are transit supportive by providing local mobility options for people who choose to use transit for longer distance commutes. For example, an employee on East Arapahoe Avenue who commutes in from Erie by transit may opt to use eGo CarShare to get to a lunchtime meeting.

Goal 4. Funding: Deliver cost-effective transportation solutions for the East Arapahoe corridor that can be phased over time.

Objective 4.a. Coordinate with public and private entities, including adjacent land owners, to implement cost-effective transportation improvements.

The Boulder 2014 TMP's Complete Streets investment strategy focuses on developing the city's system of ten multimodal corridors, which includes Arapahoe Avenue. It also calls for expanding fiscally-viable transportation options for all Boulder residents and employees, including older adults and people with disabilities. The City of Boulder focuses on delivering cost-effective transportation solutions, leveraging resources from regional, state, federal and/or private sector partners, and doing best-value construction by investing once for multiple modes.

The need for cost-effective transportation improvements is further described here:

Lack of Corridor Vision

Currently, there is no community “vision” for planned transportation improvements in the East Arapahoe corridor, which precludes coordinated public and private investment. As property along East Arapahoe redevelops, there is a need to help property owners and developers understand planned transportation improvements and the required commitment for infrastructure improvements along the corridor. Communicating a plan for short-term enhancements and Boulder's long-term community vision for the corridor to mobility service providers and Boulder's potential funding partners will also be important to ensure efficient and coordinated efforts.

¹²Boulder BCycle 2014 Annual Report

Limited Funding Resources

Implementing effective multimodal transportation investments in the East Arapahoe corridor will require a significant and sustained effort by the City of Boulder, other jurisdictions, and agency partners to identify, secure, and efficiently utilize new and creative sources of funding. Regional, state, and federal funding sources are, and appear likely to continue to be, increasingly scarce and competitive. Securing additional resources for transportation given this challenging funding environment will require heightened effort, creativity and a likely project phasing. Strong partnerships with RTD, Via, CU, Colorado Department of Transportation, Boulder County, neighboring jurisdictions, community institutions, non-profits, private sector partners, and other stakeholders will be essential to leverage the city's limited resources and secure needed funding for improvements.

Goal 5. Sustainability: Develop transportation improvements in the East Arapahoe corridor that support Boulder's Sustainability Framework (desired outcomes include a community that is Safe, Healthy & Socially Thriving; Livable, Accessible & Connected; Environmentally Sustainable; Economically Vital; and provides Good Governance).

Objective 5.a. Reduce greenhouse gas (GhG) emissions and air pollution from vehicle travel within the East Arapahoe corridor.

The City of Boulder has established a goal of an 80% reduction in greenhouse gas (GhG) emissions by 2050, which will require a multifaceted strategy. The challenge of the 80% reduction goal requires that the community increases mode shift, transitions to cleaner fuel sources for both the personal vehicle and transit fleets, houses more of our workers, and creates mixed use neighborhoods where more destinations are closer together and can be reached by walking. As one of the city's largest regional travel corridors, transportation improvements in the East Arapahoe corridor can play a pivotal part in reaching this goal.

The need to reduce GhG emissions and air pollution is further described here:

Meeting Boulder's Climate Commitment

Currently, Boulder residents account for 38% of transportation-related emissions while non-residents account for 23% of emissions. To reduce vehicle miles traveled (VMT), the City of Boulder's Climate Commitment Analysis anticipated reducing resident SOV mode share to 20% of all trips and non-resident mode share to 60% of all trips by 2035.

Achieving the Boulder 2014 TMP goal of reducing VMT by 20% from current levels implies reducing daily VMT from the current 11.2 miles per capita to 7.3 miles per capita for residents, and from 14.3 miles per capita (one-way work trip distance) to 11.4 miles per capita for non-resident employees. Achieving these reductions will require reducing SOV travel among all transportation sectors, as shown in Figure 15, and increasing walking, biking, ride sharing, and transit use.

Figure 15 Climate Commitment Inventory of VMT and GhG Emissions, 2013

Transportation Sector	Annual VMT	% VMT	Annual GhG (MT)	% GhG
Resident	323,769,600	51%	118,809	38%
Non-Resident Employee	192,192,000	30%	70,526	23%
Student	70,200,000	11%	25,760	8%
Visitor	25,550,000	4%	9,376	3%
Transit	10,435,000	2%	31,110	10%
Freight	18,250,000	3%	52,980	17%
Boulder Personal Aircraft			2,188	0.7%
Annual GhG (Metric Tons)			310,749	100%

Source: Boulder Transportation Master Plan, 2014, Figure 3-1.) Data from Climate Commitment Analysis, 2013.

Objective 5.b. Improve travel options that promote public health for residents and workers along the East Arapahoe corridor.

Use of active transportation, like walking and biking, can provide health benefits for people of all ages, helping reduce the occurrence of conditions such as obesity, asthma, and heart disease. While adults in Boulder County are currently very active, the obesity rate for children is higher than the state as a whole and the health and transportation needs of older adults is changing as their share of the population increases.¹³ Transportation facilities combined with urban design and development that supports walking, cycling, and safe access to transit can encourage East Arapahoe corridor residents and employees of all ages to stay healthy and active.

The need to improve travel options that promote public health is further described here:

Rising Obesity Rates, Aging Population and Air Pollution

Bicycling, walking, and reduced automobile traffic through neighborhoods are associated with a variety of health benefits. Increased opportunities for active transportation in the East Arapahoe corridor would provide these benefits for residents, especially children and the elderly. These include:

- Almost 90% of adults in Boulder County reported participating in physical activity in their leisure time, and, as in the rest of Colorado, adult obesity rates are low. However, the obesity rate for children ages 2 to 14 in Boulder County is 21%, higher than the state as a whole. Low-income pre-school aged children in Boulder County are more likely to be obese than in the state as a whole.¹⁴
- The population of adults over the age of 65 in Boulder County is expected to increase from 13 to 20% by 2030. The 2012 Travel Diary found that older adults were far more likely to drive than any other age group. Heart disease is the second leading cause of death for Boulder County residents.¹⁵
- Proximity to major roads is associated with an elevated risk of asthma, which is the leading cause of preventable hospital visits for children. Encouraging other modes of transportation on East

¹³ Boulder County, Trends: The Community Foundations Report on Key Indicators, 2015-2016

¹⁴ Boulder County TRENDS Report 2015

¹⁵ Boulder County Environmental Sustainability Plan, 2012

Arapahoe could reduce the exposure of nearby residents to the ambient air pollutants that are associated with asthma.¹⁶

Objective 5.c. Provide access to affordable transit and other travel options to low- and moderate-income residents and workers along the East Arapahoe corridor.

High housing costs in Boulder contribute to in-commuting from neighboring communities, and longer commutes have higher transportation costs for workers. Added to that, nearly 55% of the jobs within a half-mile of the corridor between downtown Boulder and Brighton are considered low and moderate-wage jobs that pay less than \$3,333 per month.¹⁷ By comparison, Boulder's median household income is about \$4,800 per month.¹⁸ Providing access to convenient, frequent transit service along the corridor, including early morning and later evening hours, that is integrated with well-timed transit transfers and access to a variety of first-and-last-mile mobility options, can increase access to jobs, reduce commuting costs, and improve livability for low and moderate income workers.

The need to provide affordable travel options is further described here:

Large Proportion of Low-and-Moderate Income Workers

There are over 26,000 low income jobs within a half-mile of the corridor, which is 54.7% of the total jobs in that area. Of the workers who live within a half-mile of the corridor 51% are within the two lowest income brackets. Just under 2,000 low income workers both live and work within a half-mile of the corridor, which represents about 23% of the corridor's total low-income residents. This illustrates that low income workers are making longer trips to their place of employment and likely spending larger amounts of their budget on transportation costs.

High Housing and Transportation Costs

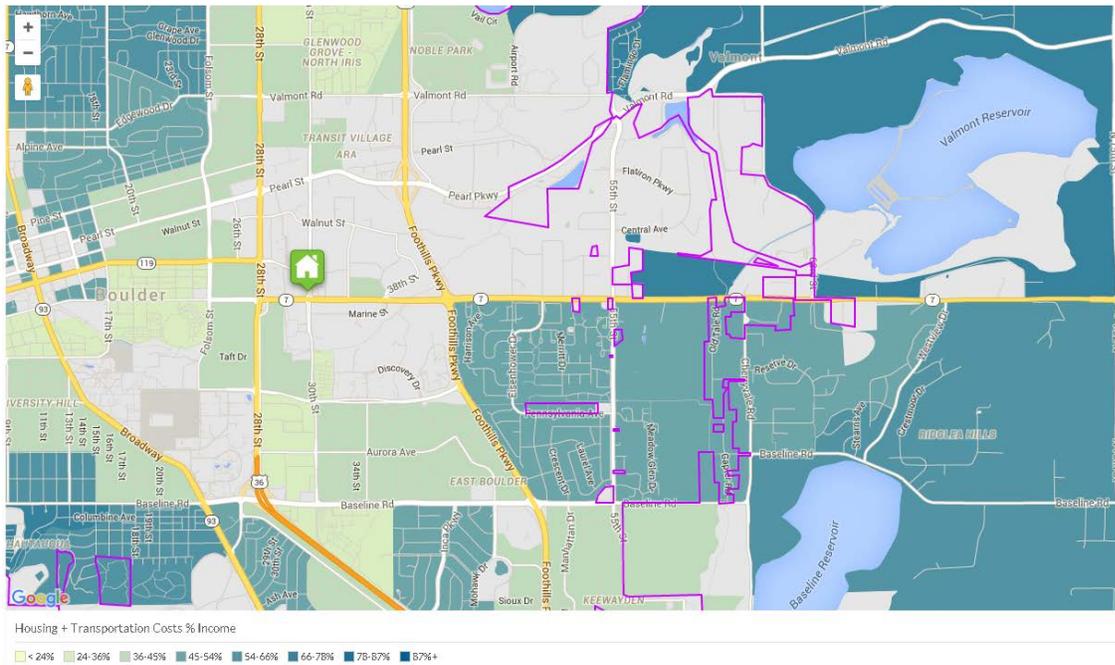
Data from the Center for Neighborhood Technology Housing and Transportation (H+T) Affordability Index for 2014 shows that the average cost of housing and transportation can be a significant burden on households within the East Arapahoe corridor. The blue shaded areas in Figure 16 below are those with combined housing and transportation costs of over 45%, which is considered the affordability threshold. High-quality public transit and other convenient travel options serving the corridor would provide affordable transportation access for low- and-moderate income workers who live and/or work in the East Arapahoe corridor.

¹⁶ Asthma exacerbation and proximity of residence to major roads: a population-based matched case-control study among the pediatric Medicaid population in Detroit, Michigan, 2011

¹⁷ US Census Bureau, Longitudinal Household Employer Dynamics (LEHD), 2013. The LEHD classifies low-to-moderate income jobs as those paying less than \$3,333.

¹⁸ U.S. Census Bureau, American Community Survey, 2014.

Figure 16 Housing and Transportation Affordability (H+T) Index, 2014



Source: Housing and Transportation Affordability Index (H+T), 2014

Objective 5.d. Preserve and improve economic vitality in the East Arapahoe corridor.

A transportation system that provides convenient, reliable, and affordable travel options for business employees and patrons is vital to supporting and retaining the growing number of local and regional businesses within the East Arapahoe corridor. Corridor projects that enhance the streetscape and improve multimodal access and connectivity have been demonstrated in cities around the country to improve economic vitality, including attracting more investment to the corridor, increasing commercial activity, and improving access to jobs.

The need to support economic vitality is further described here:

Employee Access to Travel Options

Boulder’s workforce is drawn to employment areas with a wide variety of amenities, services (e.g. restaurants, retail), recreational amenities, the arts, enhanced walkability, and increased access to public transportation, bicycle, and pedestrian facilities. While the East Arapahoe corridor has seen a diversification of amenities and services in the last several years, there remains an enormous opportunity to provide more travel options in the corridor. In dozens of conversations with businesses in the area, employers stress the importance of providing convenient, reliable and affordable travel options for their employees as an essential component of their economic vitality.