EXECUTIVE SUMMARY

A Corridor Vision of Local Livability and Regional Accessibility

Best of Both: Land Use Opportunities and Regional Connectivity

The State Highway 7 (SH 7) corridor between Brighton and Boulder is well positioned to develop as a corridor of local livability and multimodal regional access. This is due in large part to the attraction of the well-established downtown areas of Brighton, Lafayette and Boulder coupled with large areas of undeveloped parcels in unincorporated areas of Adams and Boulder Counties, Lafayette, Erie, Broomfield, Thornton and the east side of Brighton.

Combine these land use opportunities with the strategic location of SH 7 in the regional transportation network, and regional Bus Rapid Transit (BRT) has been deemed an effective mobility solution to serve local and regional transportation needs. SH 7 corridor communities are intentionally planning for BRT to enhance quality of life and connect communities with a safe, fast, and reliable transit system on a vibrant multimodal corridor.

Building an Intentional Vision with Deliberate Planning

BRT & Transit-Supportive Development

Due to the rapid population and employment growth in the Denver Metro region, the relative affordability of housing throughout much of the SH 7 corridor and the availability of large swaths of undeveloped land, development pressures in the SH 7 corridor are increasing. This trend is a contributing factor to SH 7's current and projected growth further exacerbating travel demands along the corridor through 2040.

It has been well documented that building more lanes will not meet this future travel demand, nor will it resolve congestion, but will lead to unintended consequences of inducing more traffic and resulting pollution and a degraded quality of life.

Bus Rapid Transit

BRT is a high-quality bus-based transit system. It is intended to bring travel time competitive, comfortable, and cost-effective transit service to the public with a feel that is similar to light rail. It shares many similarities to light rail in the way it operates in that it provides frequent service, it inherently has travel time advantages over driving through use of exclusive or shared/managed lanes, and other transit priority features. BRT has off-board fare collection to accelerate the boarding and alighting process at stations, and enhanced transit stations that are branded, provide weather protection and offer high quality passenger amenities. Stations are also spaced further apart to limit the total number of stops, thereby saving travel time and improving reliability. While similar in these ways to light rail, BRT has some advantages that allow it to be implemented and operate at a lower cost with more flexibility. One primary advantage is that BRT is not a fixed guideway system and can offer more routing flexibility. This allows BRT to potentially provide access to more people by including route variations.

With deliberate planning, communities along SH 7 have an opportunity to create vibrant communities along SH 7 where longer trips are reduced by providing a variety of land use and travel options

along the entire corridor. Providing a mix of uses, with a focus on appropriate density and amenities at BRT station areas, will support local livability and high quality transportation options for people to travel safely and efficiently through the corridor.

As local jurisdictions strategically plan for transit-supportive development, it is crucial to integrate future access to stations via Park-N-Ride, local bus service, connected bikeways, trails and walkable neighborhoods. These efforts will complement the existing downtown areas and help to construct the crucial multimodal transportation networks necessary to build a transit ridership base.

The opportunity to create a more sustainable multimodal vision for SH 7 is now. If proactive measures are not implemented as the corridor develops, the quality of life and transportation options for existing and future residents and businesses along SH 7 will be limited. Investing in multi-modal infrastructure concurrent with new development, infill and redevelopment, is the most cost-effective strategy to achieve this vision.

Collaborative Planning for BRT

In 2015, a Coalition of elected officials was organized under the leadership of the City and County of Broomfield. Later formalized as the SH 7 Coalition, this group meets quarterly and provides a forum to coordinate and advocate for the planning and implementation of multimodal transportation improvements and transit supportive development in the SH 7 corridor between Brighton and Boulder. The SH7 Coalition support multimodal projects and programs that are consistent with plans and studies conducted in the corridor, as described here:

- RTD's 2014 *Northwest Area Mobility Study* (NAMS) – This study identifies six corridors that would be potentially viable Bus Rapid Transit (BRT) routes, including SH 7. SH 7 was one of the corridors that the NAMS found most likely to be able to support future BRT.
- CDOT's 2014 *SH 7 Planning and Environmental Linkages* (SH 7 PEL) Study – This study collected data, performed traffic analysis, and made recommendations for transportation improvements on SH 7 from US 85 on the east to US 287 on the west. The study identified "both a desire and a need for transit service along the SH 7 corridor in the future," and recommended transit priority and queue jumps at select signalized intersections, along with highway cross sections that included full depth, full width shoulders for bus-on-shoulder operation where feasible.
- RTD's 2015 *North Area Transportation Evaluation* (NATE) – Documented fatal flaw analyses for commuter rail transit (CRT), light rail transit (LRT), and certain BRT alternatives and to allow RTD, Commerce City, City of Brighton, and adjacent jurisdictions to implement strategies and funding for transit within Denver's northeast metropolitan area. The focus area for this study is generally located between US 85 and I-76, north and east of Commerce City to the Weld County line, with a future connection to the SH 7 transit service.
- Boulder County's 2017 *SH 7 PEL Study* (Boulder SH 7 PEL) – This study collected data, performed traffic analysis, and made recommendations for transportation improvements on SH 7 from US 287 to 75th Street. It also recommended infrastructure improvements to accommodate premium transit service that would tie into the City of Boulder's *East Arapahoe Transportation Plan* recommendations.
- City of Boulder's 2018 *East Arapahoe Transportation Plan* – This study collected data, performed traffic analysis and BRT ridership

forecasting, and made recommendations for multimodal transportation improvements on SH 7 between Folsom Street on the west and 75th Street on the east. The vision plan is a complete street design that includes repurposing the existing curbside general-purpose travel lanes to accommodate a combination of BRT, High Occupancy Vehicles (HOVs), right-turning vehicles, and new shared technologies such as autonomous/connected vehicles.

One of the first collaborative efforts of the SH 7 Coalition was to bring together the local jurisdictions to build on these previous studies that have considered and recommended BRT on SH 7 and further assess the feasibility of BRT service. As a result, the communities partnered, and in 2016, Boulder and Adams Counties worked in conjunction with the communities of Brighton, Thornton, Broomfield, Lafayette, Erie and Boulder to conduct the SH 7 Bus Rapid Transit Feasibility Study (Study) to evaluate the viability of BRT service along SH 7. Boulder County managed the Study, with federal funding support through DRCOG and a local match from Adams County.

This Study further validates the feasibility of BRT, as well as identified key strategies for future evaluation and implementation. The SH BRT concept and key findings are described in the following pages.

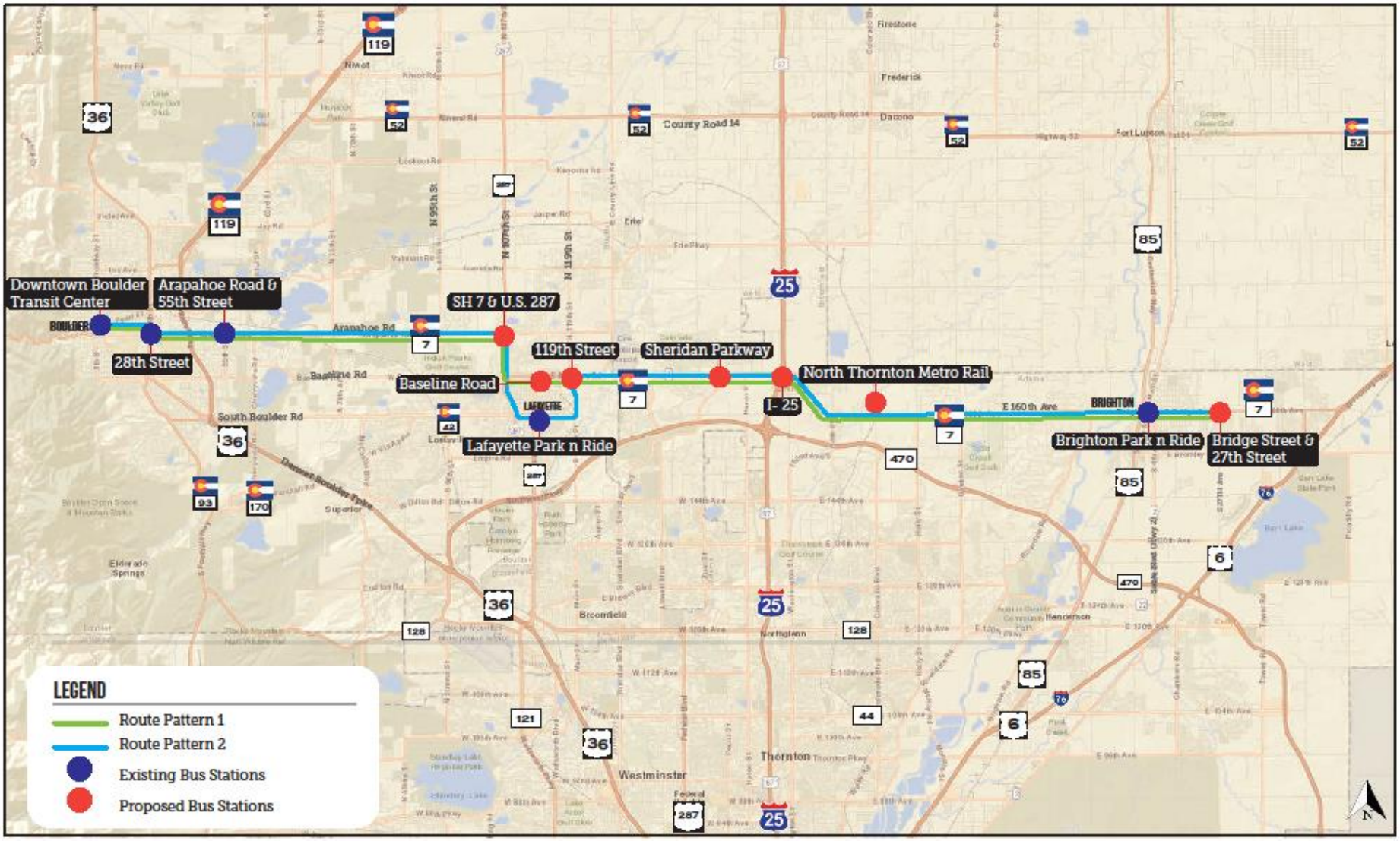
SH 7 BRT Concept & Findings

BRT Operations Concepts

Figure ES-1 illustrates the two primary BRT concepts analyzed in this study. Along the SH 7 corridor, the primary BRT scenarios modeled included two route patterns serving 12 stations. A variety of operating scenarios were tested to evaluate alternative station locations and to provide information about how BRT would perform in a mixed traffic scenario and in an exclusive or semi-exclusive right-of-way scenario. One route (Route Pattern 1) travels between Brighton and Boulder along SH 7. Another route (Route Pattern 2) travels between Brighton and Boulder with a deviation from SH 7 to stop at the Lafayette Park-N-Ride.

It is possible for the two route patterns to operate concurrently 18 hours per day, providing 7.5 and 15-minute frequencies along SH 7 with the intent to complement RTD's existing and future bus services. The operating scenarios will be further refined with future studies that will finalize operating patterns.

Figure ES-1: SH7 BRT Route Patterns 1 & 2



BRT Feasibility Findings

Travel Time

In 2040, travel time between Brighton and Boulder for the SH 7 BRT operating in a dedicated lane would be approximately 60 minutes. Contrastingly, 2040 travel time for a personal vehicle from Brighton to Boulder is projected to be 80 minutes – 20 minutes longer than travelling by BRT. If BRT were to operate in mixed traffic, travel time between Brighton and Boulder for the SH 7 BRT would be approximately 76 minutes, or 16 minutes more than if BRT operates in a dedicated lane, and comparable to travel in a personal vehicle.

This contrast highlights how BRT operating in dedicated lanes provides superior travel time savings over travel in a personal vehicle and significantly increases the competitive travel time of transit.

Ridership

Ridership in 2040 is projected to be between 7,350- 9,800 boardings per day, with the assumptions of dedicated running way, queue jump, and transit signal priority.

The projected ridership is an encouraging factor given the current threshold for competing for federal funding. One of the primary funding sources for implementing BRT is the FTA's Small Starts program. To be competitive for the Small Starts program, the transit route should demonstrate existing transit ridership of over 6,000 boardings per day to meet Small Starts warrants.

Currently, there is limited transit service on SH 7 and ridership does not meet the federal funding thresholds. However, as development occurs on the corridor in areas east of Lafayette, and local transit services are implemented on that stretch of corridor, there is a high likelihood that these ridership thresholds will be achieved within the timeline of this study and will make the corridor competitive to receive federal funding.

Annual Operating & Capital Costs

The estimated general annual operating costs for SH 7 BRT is $11.3 million per year and capital costs are $37.0 million, which include stations, Park-N-Rides, and BRT vehicles. Total investments for the multimodal roadway improvements identified in the respective SH 7 PELs and East Arapahoe Transportation Plan are $302 million (**Table ES 1: Cost Estimates**).

Table ES 1: Cost Estimates

Travel Way	Capital Cost (Millions of $)
US 85 to US 287	$155
US 287 to 75th Street	$30
75th Street to Folsom Street	$90
Shared Use Path	
US 85 to US 287	$26
US 287 to 75th Street	$4
Transit	
Stations	$5
Park-N-Rides	$6
Vehicles	$26
Total	**$342**

It is important to note that the roadway improvements on SH 7 are planned to occur even without BRT, and the mobility hub at I-25 is not included in the above costs. It is also valuable to note that a portion of capital improvements have, are, and will be constructed by private development, using the SH 7 PEL as a guide for right-of-way and infrastructure requirements.

Development Thresholds for Base Bus Service & Future BRT

Timing of BRT implementation on SH 7 largely depends on growth and its resulting travel demand. When average development density is between 3-12 residents plus employees per acre, RTD will consider implementing limited local bus service. Introducing local bus service to establish baseline ridership in the corridor is an important interim step to implementing future BRT service. This study envisions local bus service to interline with BRT along SH 7 even once BRT is implemented. This will allow for local service to accommodate for lower density areas.

An important initial opportunity will be to capitalize on Brighton, Lafayette and Boulder's unique downtown environments as transit anchors where existing transit service can be extended from, while at the same time, looking at the undeveloped areas and focusing on appropriate land uses and densities that support connectivity to the future mobility hubs. These anchors, hubs, and Park-N-Rides will extend the reach of transit throughout the corridor, and in turn connect SH 7 to other key existing and future regional multimodal facilities.

To plan specifically for BRT, the local jurisdictions can use a minimum density of 17 combined residents and employment per acre within ½ mile of station areas as a guide for initiating BRT service. Higher densities, in excess of 42 combined residents and employment per acre, can be supported at major BRT stations like the future I-25 Multimodal Hub, and are ideal for creating highly successful BRT. These higher densities should be allowed for in planning documents and zoning or overlay requirements and can be phased in over time. For initial phases of land use development, the local jurisdictions can explore developing surface lot Park-N-Rides to help offset density requirements that may later transition into structured parking as density increases.

Figure ES 2: Examples of Dwelling Unit Density

Next Steps

Table ES-2 summarizes suggested conceptual implementation steps for project enactment, along with an estimated timeline and an estimated cost of these conceptual implementation steps. These milestones are conceptual in nature and depend on local jurisdictions in the corridor continuing to work together to move this project forward in the months and years ahead.

Table ES-2: Implementation Steps

Task	Projected Timeframe to Implement Task	Status
Agreement for Jurisdictional Cooperation on Implementation	2017-2018	Completed "Statement of Purpose" to Formalize the SH 7 Coalition. This agreement should be revisited annually to ensure it meets the group needs.
Undertake the SH 7 Station Area Master Plan) Study (STAMP	2018-2019	$200K in funding has been awarded for this study. Contracting is complete and the study is set to be initiated in the spring of 2018.
Ensure SH 7 BRT & Transportation Improvements are incorporated into the Metro Vision Fiscally Constrained Regional Transportation Plan (MV FC-RTP)	2018-2021	DRCOG staff has indicated a full call for projects to be added to the MV FC-RTP will take place in the 2018-2019 timeframe.
Conduct NEPA/30% design to evaluate widening, safety and operational improvements for general traffic, bike/ped, and Bus Rapid Transit	2021-2023	Funding for this planning effort must be identified.
Initiate enabling legislation to allow for shoulder running BRT on principal rural and urban arterials	2019-2021	Monitor SH 119 BRT agreements and discussions, as well as future legislative activity.
Incorporate design, maintenance and operational needs for shoulder running BRT	2019-2021	Monitor SH 119 BRT agreements and discussions. Start initial SH 7 BRT discussion during NEPA.
Implement compatible land use policies to support high quality, high frequency transit	Ongoing	Recommendations from STAMP study – ongoing.
Build transportation improvements from the SH 7 PEL Studies and East Arapahoe	Ongoing	$302 million (FY17)

Transportation Plan (EATP)		
Implement new phased-BRT as density thresholds are met. Also incorporate new local transit service to increase ridership	**Ongoing**	
Establish policies to encourage Transportation Demand Management (TDM) strategies, for example parking management and rideshare services	**Ongoing**	**Ongoing**
Continue local route service planning coordination with RTD, including mobility hubs, right-of-entry to private development for buses, design standards required for transit access and station areas	**2018-2021**	
Identify and pursue local, regional, state and federal funding sources	**Ongoing**	
Incorporate ROW preservation through the development review process for transit improvements. Encourage private sector capital improvements in development proposals (I.e., shared parking strategies with RTD, etc.)	**Ongoing**	