



# Downtown Westminster Smart City Mobility Initiative

TIGER IX DISCRETIONARY GRANT PROJECT  
FISCAL YEAR 2017

<b>Lead Applicant:</b>	City of Westminster
<b>State:</b>	Colorado
<b>Urban Area:</b>	Denver-Aurora-Lakewood (UA 23527)
<b>Total Project Cost:</b>	\$ 8,046,000
<b>TIGER Request:</b>	\$ 5,000,000 (62%)
<b>Total Non-Federal Funding:</b>	\$ 3,046,000 (38%)



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## SUMMARY AND BENEFITS

### PROJECT OVERVIEW

The *Downtown Westminster Smart City Mobility Initiative* is located in the City of Westminster, Colorado. It is a transformational project in the heart of the U.S. 36 Tech Corridor that will spur economic development, increase public-private collaboration, eliminate an at-grade trail crossing, reduce crash levels, increase transportation options and improve the quality of life.

The project includes the widening of Sheridan Boulevard to allow full utilization of the roadway that is used as a major connector to the Denver and Boulder economic centers. The project also includes the construction of a smart underpass that will connect Downtown Westminister and the U.S. 36 Bikeway to the existing Bus Rapid Transit (BRT) Station. I.T. components of this application will build the foundation for Westminister to become a Smart City.

### PROJECT LEAD

City of Westminster

### FUNDING PARTNER

Colorado Department of Transportation

### TOTAL PROJECT COST

\$ 8,046,000

### COMMITTED FUNDING

\$ 2,316,700 in local funding

\$ 729,300 in state funding

### TIGER FUNDING REQUEST

\$ 5,000,000

### RESULTS OF BENEFIT-COST ANALYSIS

- 3.0: 1 at mid-range seven percent discount rate

### PROJECT WEBSITE

[www.cityofwestminster.us/TIGERSmartMobility](http://www.cityofwestminster.us/TIGERSmartMobility)

Figure 1 - Proposed Project Improvements



### PROJECT BENEFITS

- Reconfigures Sheridan Boulevard to allow the full utilization of the bridge over U.S. 36.
- Decreases time travel delays, crashes, and congestion-related vehicle emissions.
- Eliminates an at-grade separation on the U.S. 36 Denver-to-Boulder Bikeway.
- Provides safer pedestrian and bicycle connection to RTD's Sheridan Station.
- Enhances the economic vitality of the new Downtown Westminister by improving access to all modes of transportation.
- Improves the long-term efficiency and reliability of the movement of workers and goods.
- Assists with long-term productivity growth and job creation.
- Sets the stage for the launch of autonomous vehicle shuttle for Downtown Westminister.

## I. PROJECT DESCRIPTION

The TIGER program funding sought through this application will be used to widen Sheridan Boulevard (State Highway 95) between U.S. 36 and 88th Avenue and to build a multimodal underpass that will eliminate one of only two at-grade crossings for the U.S. 36 Bikeway. The project will efficiently maximize roadway capacity and provide a safer connection for U.S. 36 Bikeway users between Downtown Westminster and the Regional Transportation District's (RTD) U.S. 36/Sheridan Station.

### TRANSPORTATION CHALLENGES

The proposed project is in response to the increased levels of congestion on Sheridan Boulevard, the fast-paced redevelopment of Downtown Westminster, the lack of direct safe connection between RTD's U.S. 36/Sheridan Station and commercial areas nearby, and the opportunity to lay the foundation for smart city solutions in Westminster.

### SHERIDAN BOULEVARD

Sheridan Boulevard is a five-lane roadway running parallel to the U.S. 36 Denver-Boulder Turnpike. It is a major north-south connector for the Denver Metropolitan Area. The completion of the U.S. 36 Express Lanes Project has increased Sheridan's role as a connecting route for area residents to reach jobs, health care, education centers, and other critical destinations.

As part of the U.S. 36 Express Lanes project, the Colorado Department of Transportation (CDOT) replaced the Sheridan Boulevard bridge over U.S. 36 in its ultimate configuration. The bridge has more travel lanes than the adjacent roadway resulting in a pinch point, creating delays and accidents.

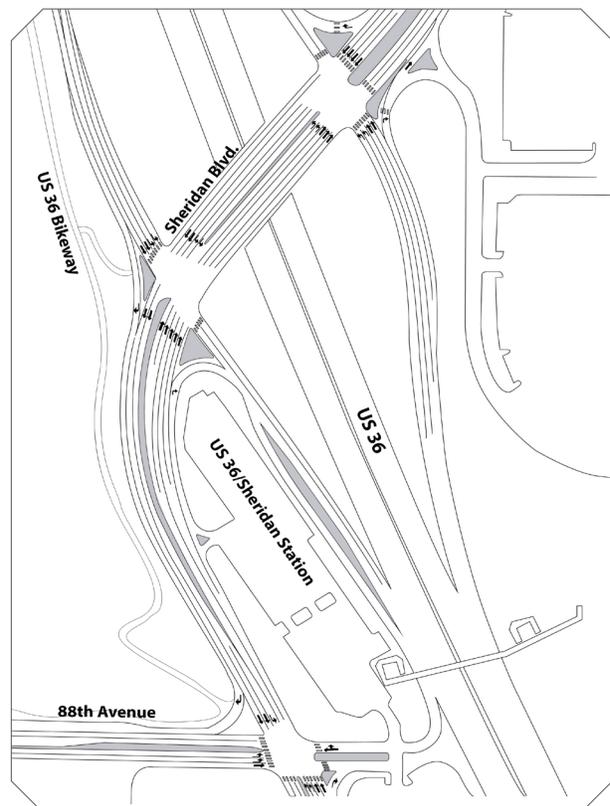
The roadway provides five to six travel

lanes between the U.S. 36 interchange and 88th Avenue. A median separating opposing traffic ends just north of the U.S. 36 interchange. Posted speeds are 40 m.p.h. and the **Average Daily Traffic (ADT) is approximately 56,000 trips per day.**

At the U.S. 36 / Sheridan overpass, southbound travel lanes are reduced from three to two, creating a choke point for motorist looking to continue traveling south. Additionally, the U.S. 36 eastbound off-ramp continuous right turn on to Sheridan presents a challenge for vehicles wishing to merge to continue straight (Figure 2).

Sheridan Boulevard and 88th Avenue currently maintain a Level of Service (LOS) C. Westminster's 2030 Roadway Plan projects that if development of the new Downtown Westminster continues at the current pace, the projected ADT is forecast to be

Figure 2 - Sheridan Blvd. Existing Roadway Alignment



62,700 trips per day. **If no improvements are made to address traffic congestion, Sheridan's LOS will decrease to an F and 88th Avenue to a D<sup>1</sup>.**



Existing conditions at Sheridan Boulevard

In addition, the U.S. 36 Bikeway runs parallel to Sheridan on this segment, intersecting at Sheridan and 88th Avenue. Trail users need to stop traffic flow on Sheridan Boulevard and 88th Avenue regularly to continue on the Bikeway. Pedestrian push-button activation data shows an average of 136 crossing activations per day. **The estimated time travel delay for motorists for this segment is 40.3 seconds.**

### U.S. 36 BIKEWAY

The U.S. 36 Bikeway is the bicycle highway of the north Denver Metro Region. The \$16.6 million Bikeway is an 18-mile shared-use trail that links Westminster to Boulder. The concrete trail is 12-foot wide, with a 2-foot wide shoulder. The Bikeway was designed as a high-speed facility that provides recreational, utilitarian, and commuter bicyclists a safe, direct, and convenient ride through the U.S. 36 corridor. It connects commuters to other bicycle paths, such as the regional Big Dry Creek trail and connecting trails to Denver, and provides convenient bike-to-bus access to all six RTD U.S. 36 stations where riders can access the Flatiron Flyer BRT or local bus routes. Bikeway counts conducted near the

Sheridan Boulevard and 88th Avenue in October 2016 showed a high number of bicycle and pedestrian users utilizing the trail. Using National Bicycle and Pedestrian Documentation Project methodology, the Sheridan intersection has an average of 117 trail users per day. It can be calculated that under existing land-use conditions, this section of the bikeway sees approximately **816 users per week, 3,611 per month, and 60,175 annually.** During weekdays, approximately **48 % of bikeway users were commuters**, signifying that the Bikeway has achieved its goal to ease congestion on U.S. 36.

Bikeway users must cross 17 travel lanes, about 300 feet, to utilize the surrounding commercial services, continue on the trail, or reach the RTD station. Each of these crossings creates traffic delays and increases the potential for accidents. **Pedestrians and bicyclists must wait an average of four minutes to fully cross the intersection.** On average, 135 pedestrian activations are triggered at the Sheridan Boulevard and 88th Avenue intersection. Sheridan southbound motorists experience higher levels of travel and delay time than



U.S. 36 Bikeway Family Event  
Photo Credit: U.S. Commuting Solutions

<sup>1</sup> Downtown Westminster Mobility Plan (2016). Appendix D-11.

northbound motorist. **Southbound travel time is 37% higher than northbound, while southbound travel delay is 57% higher.** The underpass will eliminate delays and potential accidents and improve increase Bikeway utilization.

### U.S. 36 / SHERIDAN STATION

RTD's Sheridan Station is one the busiest stations in the region. Nested in between U.S. 36, Sheridan Boulevard, and 88th Avenue, the station is able to provide transit connections to 19,590 residents and 8,130 businesses within a mile radius.

The station is serviced by 10 different bus lines including RTD's U.S. 36 Flatiron Flyer BRT service, that was added as part of the FasTracks program. The service encompasses 18 miles of express and high-frequency bus service between downtown Denver and Boulder, with six stations along U.S. 36. U.S. 36/Sheridan Station sees nearly **500 buses per day and more than weekday 1,600 boardings.**

Park-n-Ride lots are located on both sides of U.S. 36, with room for 1,310 vehicles on the surface lot and in the four-level garage. During weekdays, the garage and surface parking are, on average, at 70% capacity. It is not uncommon to see the parking facilities at full capacity during special events, such as holiday weekends, Denver Broncos or Colorado Rockies games.

Of the six Flatiron Flyer stations, four have grade-separated crossings that connect BRT users to adjacent economic centers. The two crossings without grade-separated direct connections are located in Westminster- U.S. 36 / Sheridan Station and U.S. 36 / Church Ranch Station. Westminster is committed to building the Church Ranch connection (a \$2 million investment) with local funds in the future. The Sheridan underpass and roadway widening present costly design and

construction challenge, which cannot be met solely though local funds.



U.S. 36 / Sheridan Station, east-bound platforms

### SAFETY CONCERNS

The project area has experienced an array of safety issues due to Sheridan Boulevard travel lane reductions, the U.S. 36 off-ramp merging concerns, the lack of median, and the increased exposure of pedestrians and bicyclists at the existing roadway crossings.

Currently southbound Sheridan Boulevard has two through lanes, with northbound operating with a total of three through lanes. Between 2010 and 2016, **the project area experienced a total of 511 vehicular crashes. The economic costs of these crashes totaled \$4.35 million<sup>1</sup>.** Southbound Sheridan has experienced more than double the number of same direction crashes as compared to northbound.

Southbound Sheridan had 176 combined rear-end and sideswipe accidents versus 73 total for northbound. On the Sheridan bridge segment, the crash types included a total of 92 southbound rear-end accidents as compared to only 17 for northbound. On the segment of Sheridan Boulevard south of the bridge to 88th Avenue, there were a total of 44 southbound rear-end accidents and 36 same direction sideswipe crashes.

<sup>1</sup> Blincoe, L. J., Miller, T. R., Zaloshnja, E., & Lawrence, B. A. (2015, May). The economic and societal impact of motor vehicle crashes, 2010. (Revised) (Report No. DOT HS 812 013). Washington, DC: National Highway Traffic Safety Administration.

Figure 3 - Map of Sheridan Boulevard crashes, 2010-2016



Figure 3 displays the location of these crashes.

The addition of a southbound lane will reduce the number of rear-end accidents on these segments of Sheridan. The new southbound lane to 88th Avenue will also decrease the number of sideswipe crashes by reducing the number of southbound through vehicles occupying a lane of active weaving from either vehicles exiting U.S. 36 to southbound Sheridan or vehicles changing lanes to turn right on 88th Avenue.

The lack of line-of-sight of the trail crossing has led to bicycle and pedestrian crashes as well. The area experienced **three bicycle crashes and one pedestrian crash** since 2009. In the pedestrian crash, the person was attempting to reach the RTD Sheridan Station. In the bicycle crashes, two were from right turning vehicles onto

88th Avenue and one was at the U.S. 36 / Sheridan intersection.

By building an underpass and reconfiguring the 88th Avenue intersection, the *Downtown Westminster Smart City Mobility Initiative* will also reduce the number of pedestrian and bicycle crashes and near-misses at the 88th Avenue intersection. Bikeway users will no longer need to traverse 17-lanes of traffic or wait prolonged periods of time to cross the street.

The project will reduce hundred of thousands of dollars in property damages each year and potentially reduce the number of injuries over a similar time period. This proposed improvement will improve the lives of the estimated 56,000 daily commuters that traverse this important interchange between metropolitan Denver and Boulder.

## DOWNTOWN WESTMINSTER

The City of Westminster has embarked on an ambitious journey to become the next urban center of Colorado’s Front Range. It begins with Downtown Westminster, the redevelopment of the 105-acre former Westminster Mall.

Downtown Westminster will be the center of economic, cultural, and social activity for the community. With capacity for well over 10 million square feet of development in the Downtown, and areas of future expansion to the west and south, Downtown Westminster will continue to grow and evolve in the years to come. A mix of uses are planned including office, retail and dining, hotel, residential, and cultural uses. Coupled with 18 acres of parks and public spaces, these uses will foster a dynamic, vibrant, compact, and walkable Downtown — a place for employment, living, and recreation.

**significantly in the new Downtown, with \$35 million in land acquisition and \$40 million toward infrastructure** including utilities, streets, sidewalks, bike paths, a parking structure, streetscape and park development. The city plans to double this investment over the next 15 years with completion of parks, parking facilities, and additional infrastructure.

The city’s investment is already paying off as over **one million square feet of development is underway**, including 600 residential units, 80,000 square feet of office space, 150,000 square feet of retail space including a movie complex, a fine foods grocer, a 125-room boutique hotel, and a \$5.5 million Central Square. This 1.2-acre public plaza will anchor a cultural district within the Downtown, with events and uses that will engage and attract visitors both locally and regionally. An additional 17 acres of parks are planned for Downtown Westminster to further expand the quality of life and experience in the site.

**The City of Westminster has invested**



*Downtown Westminster at full build-out. Private development that is either existing or under construction is highlighted in teal.*



Over time, Downtown Westminster is expected to comprise up to 2,000,000 square feet of office space, 750,000 square feet of retail space, 300 hotel rooms, 2,300 residential units and a vibrant cultural district. **The district will bring 4,500 new residents and 8,000 new employees.**

As the site of the former mall redevelops, so will the areas around it. The areas south and west of Downtown are already seeing interest from developers. The redevelopment potential includes 2,700 dwelling units, 1 million square feet of office space, and 500,000 square feet of retail for a total of an additional 4 million square feet of economic vibrancy.

The Westminster Downtown Specific Plan calls out the need of to build the proposed underpass to allow pedestrians, bikes, and potentially transit vehicles to access the Park-and-Ride. The underpass proposed in this application will provide a critical link to the region's public transit network. Without this underpass, the goal for

Downtown Westminster to function as a transit-oriented, multimodal development cannot be realized<sup>1</sup>.

The Downtown Westminster Mobility Plan also includes data and recommendations on improvements needed at Sheridan Boulevard and 88th Avenue to improve mobility and safety of the city's investment. The Plan estimates that **at build-out, Downtown Westminster will increase daily traffic on Sheridan Boulevard by 15%** (8,900 additional vehicles). This estimate does not take into consideration the growth in the commercial areas surrounding Downtown<sup>2</sup>.

Westminster is ready to address the current and future congestion and safety problems. The Downtown Westminster Smart City Initiative will address the issues previously described by constructing a project that helps all transportation modes achieve safety and efficiency.

<sup>1</sup> Downtown Specific Plan (2015). [www.cityofwestminster.us/DowntownWestminster](http://www.cityofwestminster.us/DowntownWestminster)  
<sup>2</sup> Downtown Westminister Mobility Study (2017). Appendix D - Traffic Analysis

## PROPOSED IMPROVEMENTS

The *Downtown Westminster Smart City Mobility Initiative* proposes to reconstruct and widen Sheridan Boulevard while building an underpass that would eliminate one of only two at-grade intersections for the U.S. 36 Bikeway.

The project includes transforming Sheridan to a typical six-lane roadway section with the appropriate acceleration/deceleration lanes and a median barrier from the U.S. 36 west-bound ramp intersection to 88th Avenue. **This segment of Sheridan Boulevard was identified as number one for congestion in the 2015 Westminster Comprehensive Plan.** The segment is 80.2% above the threshold of congestion and 55.2% over general daily traffic capacity.

The additional road capacity will improve traffic flow extending as far north as 92nd Avenue and as far south as 80th Avenue, improving efficiency not only to the roadway but also to U.S. 36, the RTD U.S. 36 / Sheridan Station parking lot access points, and the U.S. 36 Bikeway. The median will separate opposing traffic creating a safer and more efficient roadway.

As the roadway construction takes place, the project incorporates the construction of an underpass to remove the at-grade trail crossing of the U.S. 36 Bikeway. The underpass will realign the regional trail and provide a seamless connection between the U.S. 36 Bikeway, U.S. 36 / Sheridan Station, and Downtown Westminster. The underpass will be located approximately 800 feet north of 88th Avenue and is expected to be more than 150 feet in length. It will include bi-directional travel lanes to accommodate autonomous vehicle shuttles in the near future.

The project also incorporates the acquisition cost for an intelligent thermal traffic sensor for the intersection of Sheridan Boulevard

and 88th Avenue. This kind of traffic signal integrates intelligent thermal sensors to detect vehicles, pedestrians, and bicycles in the darkest of nights over a long range and in the most difficult weather conditions. This Intelligent Transportation System (ITS) technology allows a more dynamic control of the city's transportation network. It will result in reduced vehicle idling time, improved traffic flow, and improved safety and mobility for bicyclists.

The city is committed to constructing a state of the art roadway and underpass structure that is an aesthetically pleasing centerpiece to further boost the economic vitality of Downtown Westminster and surrounding areas. **Preliminary Engineering (PE) is currently underway for this project** that will produce construction plans, drainage design, identify utility locations, and develop architectural concepts and cost estimates. **The PE will bring the design of the proposed project to 30% complete.**

Figure 4 - Proposed Project Alignment

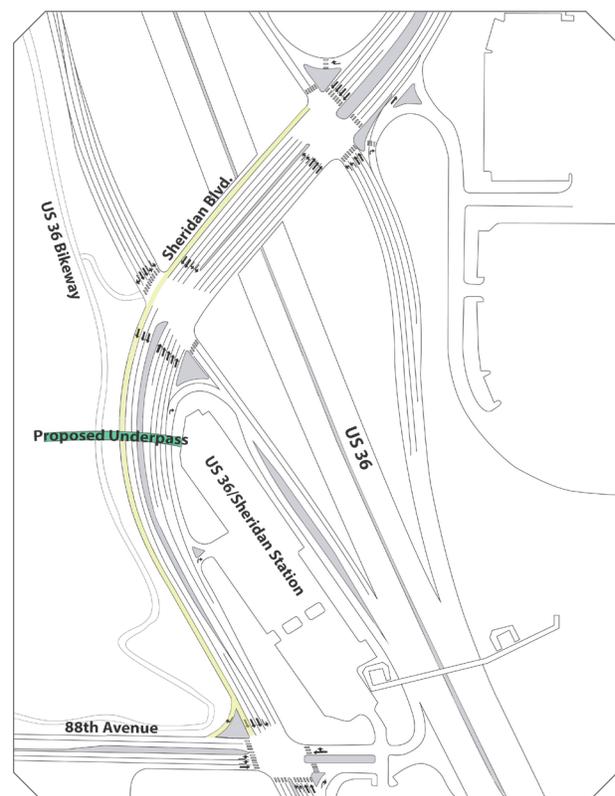


Figure 5 - Project Map



### SHERIDAN SMART UNDERPASS VISION

Westminster aims to implement technologies that integrate Information and Communication Technology and the Internet of Things, in a secure fashion, to empower citizen's digital connectivity and better manage the city's assets. The goal is to improve the quality of life of our residents and businesses by using technology to improve the efficiency of services and meet resident's needs.

Westminster's ultimate smart underpass vision is to transform an otherwise traditional underpass into a safe, comfortable, sustainable, interactive 'smart' underpass. The vision is for the underpass to incorporate adaptive LED lighting, digital wi-fi enabled informational kiosks, interactive art features, and transportation technology for the future use of autonomous transit vehicles.

Adaptive LED lighting adjusts the luminance of internal lights according to the outside ambient light. This technology creates a sense of comfort and safety for users.

Digital interactive advertisement displays relay information about news, weather, transit information, restaurant wait times, movie times, and special events to Downtown Westminster patrons.

Interactive art can use adaptive LED lights that are activated by users moving through the space, setting off pre-programmed sequences that create a stronger sense of place.

To mobilize users from the Sheridan Station to Downtown Westminster, the city will build the underpass to accommodate Autonomous Vehicles (AV). The goal is to offer on-demand, driver-less service for Downtown Westminster residents and visitors. The shuttles will move on the

roads with no predetermined guideway infrastructure. AV shuttles will provide more transportation options and a higher quality of life for people who live, work, and play in the new Downtown.

Lastly, the city is seeking to establish a Reduced Energy District. The Energy District consist of a network of underground pipes that pump hot or cold water to multiple buildings. These systems create synergies between the production and supply of heat, cooling, domestic hot water and electricity, and can be integrated with municipal systems such as power, sanitation, sewage treatment, transportation and waste.



*Rendering of the Smart Sheridan Underpass*

The city envisions a long-term public-private partnership to support this vision that will spur economic development. The city is already taken steps to achieve this vision. **Westminster is a founding member of the Colorado Smart Cities Alliance**, a public-private organization that accelerates the deployment of smart city solutions across the state.

To continue to achieve the vision of the smart underpass, the city is including fiber-optic construction components such as conduits and pull boxes in our TIGER request. The installation of these elements will leverage existing city-owned underground fiber-optic utilities that already service Downtown Westminster.

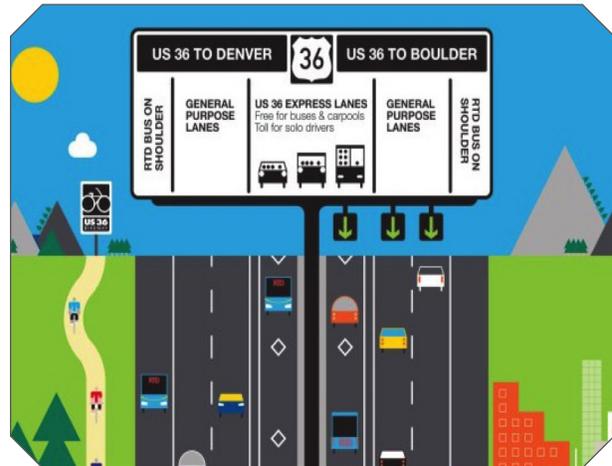
## HISTORY

When U.S. 36 was completed in 1952, it was a four-lane road with only one interchange between Denver and Boulder. In 2016, the 18-mile long U.S. 36 Express Lanes Project transformed it into a state-of-the-art multimodal facility including:

- An Express Lane in each direction of U.S. 36 for BRT, High Occupancy Vehicles (HOV) and tolled vehicles;
- A 12-foot wide, 6" thick concrete bikeway which runs adjacent to it providing connections to the BRT Stations, adjacent communities and broader trail network;
- Replacement of five bridges over U.S. 36 (including the Sheridan Bridge), reconstruction of existing pavement and widening of the highway to accommodate 12-foot-wide inside and outside shoulders; and
- State of the art Active Traffic Management (ATM), collecting and processing information about traffic conditions which inform drivers of real-time traffic conditions on digital message signs. Dynamic congestion pricing assures reliability of travel and speed in the express lanes.

The investments of U.S. DOT, the CDOT, RTD, local governments and the resulting Public Private Partnership with Plenary Roads to construct the U.S. 36 Express Lanes project lays the foundation for Westminster's Smart City Mobility Initiative. The proposed project extends the efficacy of the new infrastructure.

- The smart underpass connects the 18-mile long U.S. 36 Bikeway with the Sheridan BRT Station to provide for safe multimodal travel for bikes, pedestrians and future autonomous shuttles. The 18-mile bikeway is grade separated except for two locations.
- The roadway widening provides one



*U.S. 36 Express Lanes Project Diagram*

additional lane needed to match the Sheridan Bridge over U.S. 36 to eliminate a motor vehicle bottleneck.

The U.S. 36 Express Lanes project was years in the making.

- 1952 - Boulder Denver Turnpike (U.S. 36) opens for travel.
- 1967 - Toll receipts pay for the facility, it becomes a free highway.
- 1999 - Formation of the US 36 Mayors and Commissioners Coalition (U.S. 36 MCC).
- 2003 - RTD completes a Major Investment Study.
- 2009 - CDOT completes the U.S. 36 Environmental Impact Statement (EIS).
- 2010 - \$10 million TIGER Discretionary Grant provides seed money.
- 2011 - A \$54 million T.I.F.I.A. loan is awarded to the project.
- 2016 - U.S. 36 Express Lanes opens.

As a founding member of the U.S. 36 MCC, Westminster has worked tirelessly with our neighboring communities along to bring safe multimodal improvements to the corridor. The U.S. 36 MCC has provided a letter of strong support for this project as it support regional mobility.

## II. PROJECT LOCATION

The *Downtown Westminister Smart City Mobility Initiative* is located in the City of Westminister, Colorado. The project area lays in the heart of the City of Westminister, directly adjacent to the U.S. 36 corridor and the new Downtown Westminister. The project is located on Sheridan Boulevard between the U.S. 36 and 88th Avenue in Jefferson County, within close proximity to Adams County (Figure 7). In addition to providing connectivity to Westminister residents, the project area lies within short driving, walking, and biking distance from the City of Arvada and unincorporated Adams County (Figure 8).

The project site is within the Denver-Aurora-Lakewood Urban Area (UA23527). It connects to the Denver region through vehicular corridors, mass transit, and multi-use trails. The *Downtown Westminister Smart City Mobility Initiative* is within a 15- and 20- minute drive time to Downtown Denver and Boulder, respectively. Adjacent to Sheridan Boulevard is the busiest BRT station in the region, connecting riders non-stop to Denver Union Station, Downtown Boulder Station, and to locations across the Metro Area. Parallel to Sheridan Boulevard lies the U.S. 36 Bikeway shared-use trail that links Westminister to the cities of Broomfield, Louisville, Superior, and Boulder. The Bikeway also connects trails users to Denver, Lafayette, Arvada, and other cities across the Metro Area through trails and on-street bicycle facilities.

### ABOUT WESTMINSTER

The City of Westminister is centrally located between Denver and Boulder. The city covers 32 square miles adjacent to U.S. 36 and Interstate 25 and it offers direct access to business centers and retail and recreational destinations.

Westminister is a young, well-educated

Figure 6 - Regional Context Map

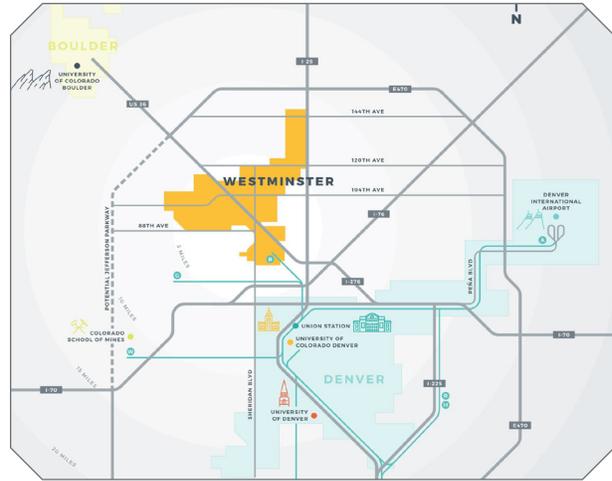


Figure 7 - County Jurisdictions



Figure 8 - Municipal Jurisdictions



city with a diverse population. The city has 115,545 residents with the average age of just over 36 years old. Population growth is fueled by proximity to four post-secondary educational institutions, access to technology businesses headquartered along U.S. 36, and direct access to Denver and Boulder.

The median household income is \$66,166, with an annual growth rate of 3%. In comparison to the national median disposable income \$59,039. The city's ample incomes stem from a concentration of two-earner households and the significant educational achievement of our residents. Over 33% of Westminster residents hold bachelor's degrees, and 11% have master's degrees.

Westminster is an economic engine in the Denver Region. **The local labor force within a 10 miles radius of Westminster is 588,024 people.** A significant number of residents and visitors travel to and through Westminster to access jobs, housing, and recreational assets in the city.<sup>1</sup>

Westminster has established itself as a city that is business-oriented and forward-thinking. Major employers in Westminster include: Digital Globe, Trimble Navigation, and Ball Aerospace, just to name a few. **Growth in key sectors like digital and biotechnology, health care, and financial industries have added over 5,000 new jobs in the past 5 years,** exceeding the region's unprecedented job growth. With over 20 major employers headquartered in the area, the functionality of the U.S. 36 corridor is essential to Westminster's growth and economy.

<sup>1</sup> According to 2014 LEHD data, there were 48,295 jobs within Westminster city limits. Of those 48k jobs, 42,619 (88.2%) were occupied by people living outside of Westminster, with just 5,676 (11.8%) of people living and working in Westminster. 51,011 people live in Westminster and work outside the city limits.

Figure 9 - Westminster 2017 Vision and Goals

City of Westminster's Vision

Westminster is the next Urban Center of the Colorado Front Range. It is a vibrant, inclusive, creative and well-connected city. People choose Westminster because it is a dynamic community with distinct neighborhoods, quality educational opportunities and a resilient local economy that includes: a spectrum of jobs; diverse, integrated housing; and shopping, cultural, entertainment, and restaurant options. It embraces the outdoors and is one of the most sustainable cities in America.

City of Westminster's Goals

- Dynamic, Diverse Economy
- Ease of Mobility
- Vibrant, Inclusive and Engaged Community
- Visionary Leadership, Effective Governance and Proactive Regional Collaboration
- Beautiful, Desirable, Safe and Environmentally Responsible City
- Financially Sustainable Government Providing Excellence in City Services

Westminster is a home-rule city that operates under the council-manager form of government. Under this form of government, the Westminster City Council serves as the legislative and governing body of the city. Six councilors and the mayor are directly elected to serve at-large.

City Council uses a strategic planning process to help achieve its long-range vision. The plan defines the city's vision, mission, core values, and goals. Each goal is further defined and specific initiatives are identified as priorities for City Council that help achieve the associated goal. The City's 2018 Vision and Goals are displayed on Figure 9.

Figure 10 - Project Area Population Breakdown by Race

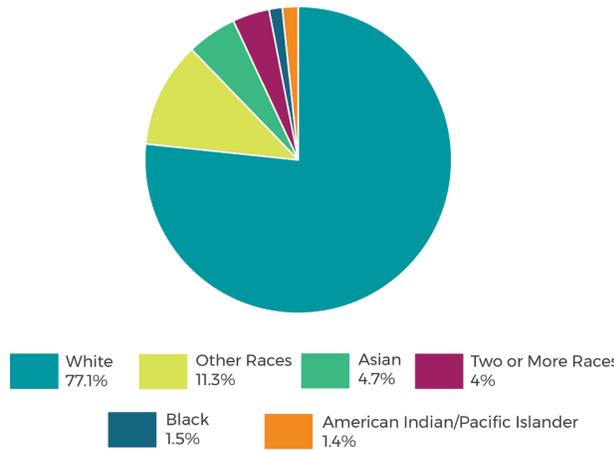
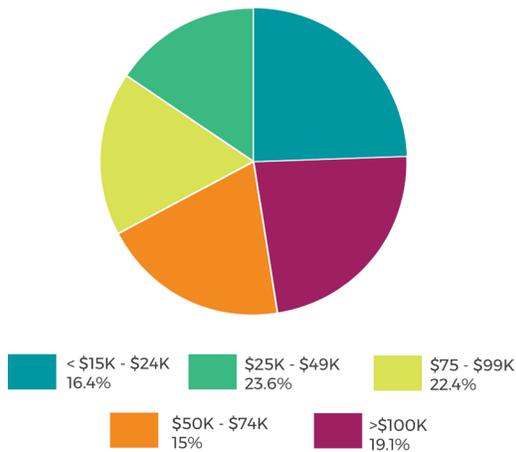


Figure 11 - Project Area Household Income Breakdown



**PROJECT AREA SOCIO-DEMOGRAPHICS**

The *Downtown Westminster Smart City Mobility Initiative* jurisdictional overlap between Jefferson and Adams counties and the proximity to the City of Arvada and unincorporated Adams County neighborhoods, has resulted in the project area holding different demographics than the rest of the city.

There are over 149,000 residents living within a three mile radius of the project area. Average median income is \$58,573, 11% less than the city’s AMI. The average age is just over 36 years old and only 17% of project area residents hold bachelor’s degrees<sup>1</sup>. The majority of the project area, 77%, identify themselves as a White, with the remaining 23% identifying as a minority. 32.4% of area residents are of Hispanic origin. Figures 10 and 11 display the project area’s population breakdown by race and income.

Key employment sectors in the project area are services (43.3%), retail trade (14.8%), construction (10%), and manufacturing (9%). All these sectors will benefit from the development in Downtown Westminster and from the safety elements of this project.

<sup>1</sup> U.S. Census Bureau, 2015-2017 American Community Survey.

**TABLE 1 - SOCIO-ECONOMIC COMPARISON**

	Population	Median Household Income	Household Units	Poverty Level	High School Degree	Bachelor’s Degree	Diversity Index
Project Area	149,003	\$58,873	58,866	16.4%	23.1%	18.6%	68.4
City of Westminster	115,545	\$66,166	45,725	13.7%	53.1%	35.7%	57.7

### III. GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

The City of Westminster is requesting \$5,000,000 in TIGER grant funds, which is 62% of the total \$8,046,000 project cost. These funds will be used for project design, construction and oversight. Details on the project costs are provided in Attachment A - Detailed Cost Estimates.

Westminster will commit \$2,316,700 (29% of the project cost) in city funds from the Capital Improvement Program (CIP) budget. The CIP uses local property and sales taxes to build major transportation projects citywide. CIP funds are allocated to specific projects on a two-year budget cycle. The city will allocate the local share of this project for the 2019-2020 budget cycle.

CDOT has pledged \$729,300 (9% of the project cost) in state funds from the Statewide Transportation Program - Metro (STP-Metro) budget. The STP-Metro is a flexible funding source used to funds transportation improvements in urban areas with population greater than 200,000. Documentation on Westminster’s and CDOT’s funding commitments are provided in Attachment B - Memoranda of Understanding

The City of Westminster and CDOT do not have any restrictions attached to its matching funds, nor compliance or a schedule for compliance attached to them. The entire match committed by the city will be available until the project is complete.

Figure 12 - Project Funding Breakdown

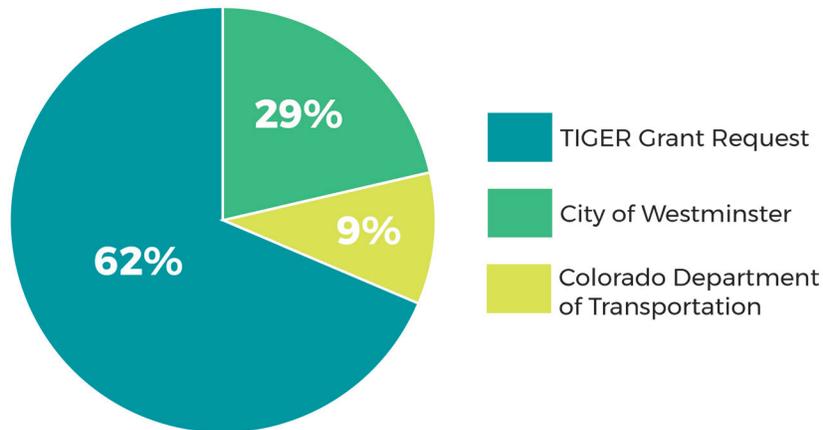


TABLE 2 - PROJECT FUNDING SOURCES

Project	Funding Sources	Funding Amount	Share
Downtown Westminster Smart City Mobility Initiative	U.S. DOT TIGER Request	\$ 5,000,000	62 %
	City of Westminster	\$ 2,316,700	29%
	Colorado Dept. of Transportation	\$729,300	9%
<b>SUBTOTAL</b>		<b>\$ 8,046,000</b>	<b>100%</b>

#### IV. MERIT CRITERIA

The *Downtown Westminster Smart City Mobility Initiative* meets the primary merit criteria outlined in the Federal Register. Long-term benefits in safety, state of good repair, economic competitiveness, environmental sustainability, and quality of life will result from the proposed improvements. The project also meets the secondary selection criteria with innovative technology and demonstrates strong regional collaboration. The following is a summary of benefits followed by an in-depth description of project benefits.

**TABLE 3 - EVALUATION CRITERIA MATRIX**

CRITERIA	SUMMARY OF MERIT CRITERIA ATTAINMENT
<b>PRIMARY CRITERIA</b>	
Safety	Proposed improvements will eliminate one of only two at-grade crossings for the U.S. 36 Bikeway and decrease the number of vehicular crashes along the project corridor.
State of Good Repair	The project is consistent with the DRCOG’s Regional Transportation Plan and Westminster’s Strategic Plan. The project will maximize roadway capacity and reduce congestion levels, maintenance costs, and ease movement of goods and services.
Economic Competitiveness	The new Downtown will include more than 3 million square feet of office, retail, and residential space. It will bring 4,500 new residents and 8,000 new employees. The road widening and the underpass will increase the economic productivity of the area, which will induce the creation of jobs and continued economic vitality.
Environmental Sustainability	The project will reduce travel delays, regional vehicle miles traveled and greenhouse gas emissions through improved roadway capacity, connectivity and access. The improved Bikeway connection will offer individuals the safe opportunity to shift vehicle trips to walking, bicycling, or transit.
Quality of Life	The project increase access to affordable and efficient transportation choices, resulting in more options to reach employment, education, healthcare and other essential services. The improvements will attract and retain employers who increasingly value diverse transportation options.
<b>SECONDARY CRITERIA</b>	
Innovation	The underpass incorporates innovative technology to create a platform for future smart cities public-private partnerships including future autonomous vehicle shuttle service. The project includes conduits and pull boxes to help the City transform an otherwise traditional underpass into a safe, comfortable, sustainable and intelligent underpass.
Partnerships	CDOT is financial partner of the project. Westminster is collaborating closely with the Denver Regional Council of Governments, RTD, private sector, non-profits, and other public entities to deliver the project on time and on budget.

**PRIMARY CRITERIA**

**Safety**

The primary goal of this project is to improve safety for all modes of travel – motorists, pedestrians, bicyclists and transit users. The project area has experienced an array of safety issues due to increasing vehicular congestion, conflicts with the U.S. 36 off-ramp merging lane, the lack of median barrier on the roadway, and the increased exposure of U.S. 36 Bikeway and RTD transit users at the existing roadway crossings.

Between 2007 and 2016, **the project area experienced a total of 511 vehicular crashes**. Sheridan Boulevard experienced 489 crashes, while the 88th Avenue intersection saw 22 crashes. Of the total, 280 were rear end crashes, 109 were side swipe, 96 broadside, 13 head on collisions, and 13 were other minor crashes. The economic costs of these crashes totaled \$4.35 million<sup>1</sup>. Included in these losses are lost productivity, medical costs, legal and court costs, emergency service costs (EMS), insurance administration costs, congestion costs, property damage, and workplace losses. Figure 3 on page 9 displays the location of the crashes .

The existing at-grade crossing conditions at Sheridan force bicyclists, pedestrians, and transit users to cross 17 travel lanes in two stages, resulting in 230 feet of increased exposure. Average annual daily traffic volume on Sheridan is 55,863 vehicles with a posted speed limit of 40 mph. **Pedestrians and bicyclists must wait an average of four minutes to cross the intersection.** This intersection holds a high level of pedestrian and bicycle level of stress.

The lack of line-of-sight on the trail crossing

<sup>1</sup> Blincoe, L. J., Miller, T. R., Zaloshnja, E., & Lawrence, B. A. (2015, May). The economic and societal impact of motor vehicle crashes, 2010. (Revised) (Report No. DOT HS 812 013). Washington, DC: National Highway Traffic Safety Administration.

has led to bicycle and pedestrian crashes at the project location. The area experienced **three bicycle crashes and one pedestrian crash** since 2009. The frequency of crashes at these locations increases the risk for bicyclists and pedestrians who must cross these intersections to continue along the U.S. 36 Bikeway.

Exposing pedestrians and bicyclists, including children and seniors, to complex crossings at locations with high-volume, high-speed traffic increases the risk of collision. According to national statistics, more than 50% of all bicycle crashes throughout the country take place at an intersection between a trail and a roadway<sup>2</sup>.

Improvements throughout the project area are needed to provide safe and efficient routes for people to access the existing commercial centers nearby and the future transit oriented, mixed-use and residential development expected of the new Downtown Westminster, no matter the mode. Design considerations must factor in vulnerable road users such as families, children, seniors, and people of

<sup>2</sup> Minnesota Department of Transportation (MnDOT) (2007). MnDOT Bikeway Facility Design Manual. MnDOT, St. Paul, MN.



*Bicyclist Crossing at Sheridan Blvd. and 88th Ave.*

all ages and abilities, who want to bicycle or walk. Reducing conflicts with motor vehicles throughout this corridor will improve efficiency of the roadway, ease congestion, enhance the economic vitality of the new Downtown, and encourage more use of the U.S. 36 bikeway and the Sheridan Station.

**State of Good Repair**

The *Downtown Westminster Smart City Mobility Initiative* supports regional and national transportation objectives to building safe, accessible, and efficient transportation network that increase the existing system’s efficiency while offering mobility choices for all users.

If left unimproved, Sheridan Boulevard and U.S. 36 are poorly positioned to accommodate a projected increase in area residents. The Denver Regional Council of Governments (DRCOG) 2040 Metro Vision Regional Transportation Plan expects Denver region’s population to increase from about 3.1 million in 2015 to 4.3 million by 2040, an increase of 37%. The number of jobs is forecast to increase from 1.7 million in 2015 to almost 2.4 million by 2040, an increase of 40%<sup>1</sup>. Along the U.S. 36 Corridor and in Westminster, employment is expected to increase by 37% by 2040. Not widening Sheridan Boulevard and not building the underpass will lead to roadway inefficiency making it harder to deliver goods and services.

The goal of the *Downtown Westminster Smart City Mobility Initiative* is to increase roadway efficiency in the existing transportation network and to provide safer connections for pedestrians and bicyclists once completed. The project is projected to reduce VMT in Westminster by 30 million miles by 2040.

This project has been in the city’s plans since the opening of the U.S. 36 Express Lanes. As such, the city has incorporated the project into the Downtown Specific Plan and the Downtown Mobility Plan. The project is also consistent with the DRCOG’s 2040 Regional Transportation Plan. As regional governments prioritize sustainable development and target increased density

REDUCED ROADWAY MAINTENANCE \$4.1 MILLION

around transit hubs and urban town centers, Westminster recognizes improved connections are needed along U.S. 36 and the Bikeway. The widening and underpass unite transportation planning goals with land use planning goals, including those specified in Metro Vision 2040:

***Efficient and Predictable Development Patterns***

Connected urban centers and multimodal corridors throughout the region accommodate a growing share of the region’s housing and employment<sup>1</sup>.

The city is capitalizing project elements upfront by conducting a Preliminary Engineering (PE). The PE will produce construction plans, drainage designs, identify utility locations, develop architectural concepts, and develop official cost estimates. The PE will bring the project to 30% complete. The project is within existing CDOT operating right-of-way and is anticipated to qualify for a Categorical Exclusion and not requiring further environmental analysis.

On average, the city allocates over \$13 million in funds for operations and maintenance of our local roadway transportation system. The funding source used for maintenance and operations is a sustainable source of

<sup>1</sup> Denver Regional Council of Governments (DRCOG), 2017. 2040 Metro Vision Regional Transportation Plan,

revenue over the long term that includes sales taxes, general revenue, and user fees.

The region's transportation system must continue to improve in order to maintain high levels of transportation network efficiency. The *Downtown Westminster Smart City Mobility Initiative* is a critical link in the transportation network in Westminster and builds upon the productivity and performance of the region's existing transportation network by increasing the system's safety, efficiency, and attractiveness.

**Economic Competitiveness**

The Metro Denver region is consistently ranked as one of the fastest-growing areas in the nation. The City of Westminster is heavily investing in the economic vitality of the Denver region by building Downtown Westminster.

In 2014, the city acquired the land and prepared a master plan to build a long-lasting urban center that is developed over time, one block at a time, by different developers and builders. The new Downtown is envisioned as a center of activity, culture and life for Westminster and the surrounding areas.

The public spaces will be made vibrant with a mix of land uses that will bring people from all over the U.S. 36 corridor to Downtown to live, work and spend time. Downtown Westminster is being developed to support walking, cycling, and transit through a fine grained network of streets with sidewalks and on-street bicycle lanes.

The city is incentivizing development by releasing fully serviced, developer-ready parcels that include water, sewer, streets, sidewalks, bike paths, street lights, telecommunication ducts, on-street and structured parking, and public parks infrastructure.

The city's investment is already leading to the **private development of over 1 million square feet of office, retail, movie theatre, hotel and residential units**. Currently under construction is 121,000 square feet of retail space, 80,000 square feet of office, hotel space (125-room hotel with 4,000 square feet of conference space), 628 residential units, 18% of them fall within affordable housing guidelines.

The *Downtown Westminster Smart City Mobility Initiative* contributes to the economic vision of the new Downtown



Rendering of Downtown Westminster

by improving access for all modes to the 105-acre site. The increased access will improve the efficiency of the movement of goods and services, thereby reducing the cost of doing business and furthering the attraction of private economic partners that look for enhanced mobility connections for their customers and employees.

The project will create, support, and retain jobs and employment not just in Westminster, but throughout the region. **More than 100 local, living-wage jobs will be directly created as a result of this construction investment.** The additional roadway efficiency and multimodal connection will encourage existing area businesses to expand and new businesses to open their doors in Downtown Westminster and surrounding areas. At build-out, Downtown Westminster is

expected to comprise up to 2,000,000 square feet of office space, 750,000 square feet of retail space, 300 hotel rooms, 2,300 residential units and a vibrant cultural district. The district will bring 4,500 new residents and 8,000 new employees. The area surrounding the Downtown is also expected to redevelop with an expected mixed-use build-out of over 4 million square feet.

The project will contribute to the economic competitiveness of the region by improving the long-term efficiency and reliability of the local transportation network, reducing private businesses transportation costs, and creating budget savings for residents, while simultaneously attracting increased investment spending to the area.



**Environmental Sustainability**

The *Downtown Westminster Smart City Mobility Initiative* provides environmental benefits with minimal negative impacts while improving the resiliency of the transportation system in the city and the Denver-Boulder region. The project will reduce regional VMT's and greenhouse gas emissions through improved roadway efficiency, connectivity and access.

The widening of Sheridan Boulevard will reduce corridor congestion and safely accommodate current and projected vehicular and trail use. The proposed project will improve the existing transportation system so that it serves more users while minimizing network life-cycle costs and environmental impacts. The reduction of vehicle miles traveled will lead to a reduction of carbon emissions, noxious emissions, and particulate matter. This VMT savings will result in significant emissions

benefits by preventing the emission of over 15,000 metric tons of greenhouse gases and other noxious emissions, for a total value of \$1 million.

Focused densification, infill, and redevelopment occurring in Downtown Westminster support sustainability initiatives to reduce sprawling land-use patterns and build more economically viable neighborhoods. The smart underpass



connecting the Downtown to Sheridan Station will offer individuals the safety to shift vehicle trips to walking, bicycling, or transit. These new riders generate a savings in pavement maintenance as they reduce their wear and tear impact on Sheridan Boulevard. The Project is projected to increase bicycle and walking trips by more than 9,000 trips per year by 2040.

The City of Westminster is committed to environmental stewardship. In Downtown Westminster, the city is establishing a Reduced Energy District. The Energy District consist of a network of underground pipes that pump hot or cold water to multiple buildings. These systems create synergies between the production and supply of heat, cooling, domestic hot water and electricity, and can be integrated with municipal systems such as power, sanitation, sewage treatment, transportation, and waste.

The city also continues to expand our electric vehicle charging station program. In 2017, the city installed 10 charging stations throughout the city including at RTD's B Line Westminster Station, and the Downtown Westminster garage.

More walking, cycling, or taking transit by Westminster and metro Denver residents

will reduce air pollution. U.S. 36 corridor transportation infrastructure projects (High Occupancy Vehicle lanes and the U.S. 36 Bikeway) and Transportation Demand Management programs have improved Westminster’s air quality.

In 2012, Westminster’s air quality was particularly poor, with an AGI rate of 108 in comparison to national average all-gas impinger (AGI) rate of 74.31. Improvements along the corridor and the elimination the at-grade crossing of the U.S. 36 Bikeway will result in less transportation-induced air pollution and improved air quality in the city and region.



Existing Levels of Congestion on Sheridan Boulevard

### Quality of Life

The *Downtown Westminster Smart City Mobility Initiative* fosters a more livable Westminster by investing in convenient and efficient transportation choices that connect residents, visitors, and workers to economic opportunity. The Project plays an important role in creating pathways to jobs, strengthening our community, and improving the livability for the Colorado Front Range.

Approximately 149,003 individuals live within 3 miles of the project area. These 57,090 households—and the many people who work, study, or play nearby—will see an improvement in their quality of life

through access to employment, shopping, entertainment, and schools. The estimated annual average of travel congestion cost savings (VTTS) for this project is \$222,812, for a total savings of more than \$5.5 million.

For residents and workers who do not own a vehicle, the smart underpass will provide safer access to low-cost options for their transportation needs. In the study area, the cost of owning and operating a car is approximately 15% of the median household income<sup>1</sup>. By not having to purchase, maintain, store, and insure a car, working families can direct their household budget to other needs, such as educational attainment.



The smart underpass will also be designed to be accessible to non-motorized users of all ages and abilities. Increasing opportunities for active transportation and physical activity does not only benefit Westminster residents, but also the adjacent communities of Arvada and unincorporated Adams County, and the U.S. 36 communities of Denver, Broomfield, Superior, Louisville, Lafayette, and Boulder.

The Project will provide area residents and visitors with an opportunity to increase their physical activity levels by walking or bicycling for exercise. Colorado may be considered one of the healthiest states in the nation; however, 60% of Colorado adults are overweight or obese<sup>2</sup>.

The U.S. 36 Bikeway offers Colorado

<sup>1</sup> AAA Colorado (2015). Your Driving Costs: How much are you really paying to drive.  
<sup>2</sup> Behavioral Risk Factor Surveillance System. 2010. Centers for Disease Control and Prevention. [www.cdc.gov/brfss/](http://www.cdc.gov/brfss/)

Front Range residents and visitors greater possibilities for meeting the U.S. Department of Health and Human Services physical activity targets of regular physical activity. Residents will more easily integrate physical activity within their daily trips, whether they are made for commuting, utilitarian, or recreational purposes.

The Project will serve to both reduce individual transportation costs and reduce state health care expenditures. Navigating across the high volume arterial road with multiple lanes of vehicular traffic is dangerous and discourages many people from using the U.S. 36 Bikeway. Investing in the underpass crossing at this location creates connectivity, continuity, and will attract more individuals to walk or bicycle more often.

Closing the Bikeway gap will save \$9.7 million in health care costs over 20 years and encourage approximately 887 thousand more bicycle and pedestrian trips per year. Leading to more people meeting the CDC's recommended amount of physical activity through walking and bicycling.

HEALTH CARE COST SAVINGS **\$9.7** MILLION



Ciclovia Event in Downtown Westminster

**SECONDARY CRITERIA**

**Innovation**

The *Downtown Westminster Smart City Mobility Initiative* represents an innovative and comprehensive solution-driven approach that combines achieving the city's vision to become the next urban center on the Colorado Front Range with the practical necessity of solving roadway congestion and an unsafe pedestrian and bicycling trail crossing.

Westminster has embarked on an ambitious journey to become the next urban center on Colorado's Front Range. The vision includes implementing technologies that will integrate Information and Communication Technology and the Internet of Things, in a secure fashion, to empower citizen's digital connectivity and better manage the city's assets. The goal of Westminster's Smart City vision is to improve the quality of life of our residents and businesses by using technology to improve the efficiency of services and meet resident's needs.

Westminster's ultimate vision is to transform an otherwise traditional underpass into a safe, comfortable, sustainable, interactive 'smart' underpass. To achieve this vision, the city is including fiber optic construction components such as conduits and pull boxes in our TIGER request. The installation of the components will leverage existing city-owned underground fiber optic utilities that are already servicing Downtown Westminster.

Once the conduits and pull boxes are in place, the city will expand the fiber-optic network through the underpass. This will allow the city to install adaptive LED lighting, digital wi-fi enabled informational kiosks on each end of the underpass, and interactive art features.

The smart underpass vision also includes

creating a public-private partnership with an Autonomous Vehicle (AV) company to establish unmanned electric vehicle shuttle service between the U.S. 36 / Sheridan Station and Downtown Westminster. AV technology no longer requires predetermined guideway infrastructure, as the sensors guide the vehicles through traditional roadways. AVs will provide more transportation options and a higher quality of life for people who live, work, and play in the new Downtown.

In addition to the conduits and pull boxes, the city is also including the acquisition costs for a smart thermal traffic sensor for the intersection of Sheridan Boulevard and 88th Avenue. This kind of traffic signal integrates intelligent thermal sensors to detect vehicles, pedestrians, and bicycles thus allowing a more dynamic control of traffic lights.

Data gathering is a crucial component of establishing an innovative concept. As

part of the evaluation process, the City of Westminster commits to obtaining before and after traffic counts, travel times, bicycle and pedestrian counts, and any additional data along the project corridor in order to conduct an assessment of the technologies implemented. The city will share the information with DRCOG, CDOT, U.S. DOT, and other agencies as case study materials for use in monitoring how effective Intelligent Transportation Systems (ITS) projects are in increasing safety, transportation network efficiency, generating mode shift and increasing multimodal demand.

The *Downtown Westminster Smart City Mobility Initiative* is an innovative project with an innovative vision. This project allows the city to continue to build the foundation to become a Smart City.



*Smart Underpass Internal Rendering*

## Partnerships

The *Downtown Westminster Smart City Mobility Initiative* is the result of a decades long regional alliance. This application is submitted by the City of Westminster in partnership with the Colorado Department of Transportation. Clear roles and responsibilities will be established between Westminster and CDOT to ensure a successful implementation of the project.

Documentation on Westminster's and CDOT's funding commitments are provided in Attachment B - Memoranda of Understanding. Letters of support from our different partners are included under Attachment C. Additional supporting documentation is available on the city's [Downtown Westminster Smart City Mobility Initiative](#) grant web page.

## FUNDING PARTNERS

### CITY OF WESTMINSTER



The City of Westminster is the lead applicant for this grant application. Westminster is a home-rule city that operates under the council-manager form of government. The city owns a portion of the project's right-of-way and maintains operational control this portion of Sheridan Boulevard.

### COLORADO DEPARTMENT OF TRANSPORTATION



CDOT a financial partner in this project. The agency managed the construction of the U.S. 36 highway and Bikeway. They own a portion of the right-of-way where the underpass will be constructed. CDOT supports the project, as evidenced by their financial commitment included in this grant application.

## PUBLIC AGENCY SUPPORTERS

The following local agencies support the project and have committed to either provide input on individual project elements or conduct additional community outreach. These partners are unable to contribute funds at this time.

- Regional Transportation District (RTD)
- Denver Regional Council of Governments (DRCOG)
- Adams County
- Jefferson County



## LETTERS OF SUPPORT

- Congressman Ed Perlmutter
- Congressman Jared Polis
- Congresswoman Diana DeGette
- Senator Michael Bennet
- Senator Cory Gardner
- U.S. 36 Mayors & Commissioners Coalition
  - Adams County
  - Boulder County
  - City of Boulder
  - City and County of Broomfield
  - City of Lafayette
  - City of Longmont
  - City of Louisville
  - Town of Erie
  - Town of Superior
- City of Thornton
- Westminster Chamber of Commerce
- Colorado Smart Cities Alliance
- Commuting Solutions
- The League of American Bicyclist
- Westminster Parks, Recreation, Libraries, & Open Space Advisory Board
- Bike Westminster
- Bike JeffCo

## V. PROJECT READINESS

### PROJECT SCHEDULE

All necessary pre-construction activities will be complete to allow for the TIGER grant funding award to be obligated well before September 30, 2020. The project will begin construction upon receipt of notice to proceed, and funds will be spent steadily and expeditiously once construction starts.

The project design and environmental analysis will take approximately 16 months, with construction expected to start in the third quarter of 2020. **No right-of-way is required to complete the project, which expedites commencement of the work.** There are no significant regulatory or legislative barriers to complete the project.

The city will assume the management for design, construction and administration of the project. The city's engineers and transportation mobility team will work closely with CDOT, DRCOG, RTD, and all local agency supporters to manage all aspects of the project including community

outreach, design and construction.

Table 4 displays more information on the project schedule, including project milestones. Additional schedule information and Standard Form 424C are provided in Attachment D - Project Schedule and in Westminster's TIGER grant application web page.

### TECHNICAL FEASIBILITY

The City of Westminster and CDOT are ready to move forward with the *Downtown Westminster Smart City Mobility Initiative*. The proposed project will benefit from a highly-collaborative team with a shared vision and experience working together on various projects.

The city is committed to constructing a functional roadway and underpass structure that is an aesthetically pleasing centerpiece of the area. **A Preliminary Engineering (PE) assessment is currently**

**TABLE 4 - PROJECT SCHEDULE**

	2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Execute agreements with US DOT / CDOT												
Preliminary Design												
Environmental Documentation												
Final Design												
Advertise for Bids												
Construction												

**underway for this project** that aims to produce construction plans, drainage design, identify utility locations, develop architectural concepts, and develop cost estimates. **The PE will bring the design of the Downtown Westminster Smart City Mobility Initiative to 30% complete**, which will allow for the design of the project to proceed to a “shovel ready” set of plans in a short amount of time. The city anticipates the completion of the PE study in Spring 2018 and will be ready to finalize design and construction as early as Fall 2018.

The city currently holds a roadway maintenance agreement with CDOT on this section of Sheridan Boulevard and on Westminster’s portion of the U.S. 36 Bikeway. As a part of this ongoing process, the city will continue to assume the operations and maintenance of both transportation facilities.

### REQUIRED APPROVALS

FHWA Division Office and CDOT staff have reviewed the project description and location for the *Downtown Westminster Smart City Mobility Initiative*. They agree that the project is within CDOT operating right-of-way and could qualify for a Categorical Exclusion as long as it is determined that the project meets all of the criteria in 23 CFR 771.117. A quick review of the project site and its surroundings, consultation with local authorities and other knowledgeable parties, and a study of pertinent background requirements is anticipated. No delay associated with NEPA is anticipated. A summary of discussions between FHWA, CDOT and Westminster staff are included in Attachment E - NEPA review.

Both CDOT and the Denver Regional Council of Governments (DRCOG) have provided letters of support for the project which are included in Attachment C - Letters of Support. If funded, the

Transportation Improvement Program will be amended. The project is classified as an operational project as it is less than 1/3 mile in length and does not impact air quality conformity.

### PROJECT RISKS AND MITIGATION STRATEGY

While every construction project contains certain elements of risk, the City of Westminster is regionally known for delivering projects ahead of schedule and under budget. The proposed project also benefits from a highly-collaborative partnership with CDOT with whom we have experience working on various roadway, transit, and urban trail projects.

Westminster has identified roadway traffic control as a possible risk that would impact the scope of work. However, the city is certain that we can overcome this potential risk in an effective and timely manner.

One of the more complex construction challenges to this project is the traffic control during the underpass installation. Sheridan Boulevard is owned by CDOT, and classified as a highway. CDOT has strict specifications on the number of lanes that must remain open during construction for highway designated roadways. This is to ensure traffic flow maintains a specific standard at all times. The project will adhere to those specifications.

Furthermore, the city will work with the contractor, project engineer, transportation and mobility planner, and CDOT to develop a construction phasing plan during the widening and underpass installation. This plan will include public notifications, advanced messaging, possible detours, and traffic control phasing for all modes of transportation (vehicular, bicycle, and pedestrian). By thoughtfully incorporating this plan into the project, the potential of substantial traffic impacts during construction is minimized.

## 

The *Downtown Westminster Smart City Mobility Initiative* generates benefits across a variety of long-term outcomes: safety, operations and maintenance, mode shift, economic competitiveness, quality of life, and environmental sustainability.

Due to the nature of the project, a Benefit Cost Analysis was conducted for four different project scenarios: no-build, lane widening, underpass and bikeway, and combined. Each scenario incorporated sensitivity analysis resulting in three impact levels (low, medium, high). For the purpose of this project, the city will be using 'medium' level of impact.

At a 7 percent real discount rate, the net present value of the proposed project is \$12.3 million, with an estimated **internal rate of return of 18.5%**. Over 20 years, the **benefits of this project exceed the cost by a factor of 3.0 to 1.0** when discounted at 7 percent. Not included in this assessment are the health and recreational benefits. Following is a summary of the undiscounted findings. Table 5 displays a summary of the Benefit-Cost findings. More in-depth information is provided in Attachment F - Cost-Benefit Analysis



*Downtown Westminster at Build-Out*

- The proposed project will **cost an estimated \$8,046,000** to construct and, on average, an estimated **\$13,000 per year to maintain** (undiscounted and rounded).
- After construction, the proposed project would encourage an estimated **reduction of between 24.6 million and 35.7 million vehicle-miles traveled (VMT)**, helping to **save the taxpayers an estimated \$2.9 million to \$4.1 million in roadway maintenance costs** over the life of the project.
- The estimated reduction in VMT could help prevent between 11,000 and 16,000 fewer metric tons of greenhouse gases and criteria pollutants from entering the atmosphere between 2016 and 2040, the equivalent of **\$0.7 million to \$1.0 million in avoided environmental damage or mitigation costs**.
- The proposed project would encourage more walking and bicycling trips. During the 20-year post-construction period an average of 280 to 380 additional people per year would meet the Centers for Disease Control's recommended amount of weekly physical activity, helping residents save **\$8.3 million to 11.2 million in healthcare expenses** over the life of the project.
- With a safer, more efficient street network for all modes of travel, Westminster residents will **save an estimated \$1.0 million to \$1.5 million in traffic congestion costs, \$6.4 million in travel time savings, and \$14.7 million to \$20.4 million in household transportation costs** over the life of the project.

**TABLE 5 - BENEFIT-COST SUMMARY**

Project Year	Year	Project Capital & Maintenance	Benefits (Undiscounted)	Annual Costs (Undiscounted)	Net Cumulative Costs and Benefits
Year -2	2018	\$238,000	\$0	\$208,000	-\$208,000
Year -1	2019	\$858,000	\$0	\$700,000	-\$908,000
Year 0	2020	\$6,950,000	\$0	\$5,302,000	-\$6,210,000
Year 1	2021	\$12,563	\$2,710,000	\$9,000	-\$3,509,000
Year 2	2022	\$12,563	\$1,139,000	\$8,000	-\$2,378,000
Year 3	2023	\$12,563	\$1,091,000	\$8,000	-\$1,295,000
Year 4	2024	\$12,563	\$1,045,000	\$7,000	-\$257,000
Year 5	2025	\$12,563	\$1,000,000	\$7,000	\$736,000
Year 6	2026	\$12,563	\$957,000	\$6,000	\$1,686,000
Year 7	2027	\$12,563	\$915,000	\$6,000	\$2,595,000
Year 8	2028	\$12,563	\$875,000	\$6,000	\$3,464,000
Year 9	2029	\$12,563	\$836,000	\$5,000	\$4,295,000
Year 10	2030	\$12,563	\$799,000	\$5,000	\$5,089,000
Year 11	2031	\$12,563	\$763,000	\$5,000	\$5,848,000
Year 12	2032	\$12,563	\$729,000	\$4,000	\$6,573,000
Year 13	2033	\$12,563	\$696,000	\$4,000	\$7,264,000
Year 14	2034	\$12,563	\$664,000	\$4,000	\$7,925,000
Year 15	2035	\$12,563	\$634,000	\$3,000	\$8,555,000
Year 16	2036	\$12,563	\$605,000	\$3,000	\$9,156,000
Year 17	2037	\$12,563	\$577,000	\$3,000	\$9,730,000
Year 18	2038	\$12,563	\$550,000	\$3,000	\$10,277,000
Year 19	2039	\$12,563	\$524,000	\$3,000	\$10,799,000
Year 20	2040	\$12,563	\$1,598,000	\$2,000	\$12,394,000
Average		\$332,000	Internal Rate of Return		18.51%
Total		\$8,297,260	Net Present Value (7% Discount Rate)		\$12,390,000
			Benefit-Cost Ratio		3.0

## VII. COST SHARE

The *Downtown Westminster Smart City Mobility Initiative* is a partnership effort between the City of Westminster and CDOT that will complete the decades-long effort to convert the U.S. 36 highway into a truly multimodal corridor, providing a diverse range of efficient transportation options for the people who live and work along it.

The region has already spent \$497 million on the U.S. 36 corridor. The highway includes express / HOV lanes, Flatiron Flyer BRT service, and the U.S. 36 Bikeway. As a result of these improvements, the corridor has become a prime example of a successful public-private partnership. Roadway ITS and active traffic management has helped improve travel times, the BRT service ridership has increased by 45%, and the Bikeway sees over 90,000 users on average per year.

Despite signs of early success, several challenges remain. The completion of the U.S. 36 Express Lanes Project has increased Sheridan's role as major connector, to reach jobs, health care, education centers, and other critical destinations. As such, Sheridan's travel times, congestion levels, and crashes have increased over the years.

The increased levels of congestion is leading Bikeway users to experience a high level of close calls with motorists. Of the six Flatiron Flyer stations along U.S. 36, four have grade-separated crossings. The remaining two crossings are located in Westminster, one at Sheridan Boulevard and the other at Church Ranch Boulevard.

Westminster is committed to building the Church Ranch underpass (a \$2 million project) with local funds. The necessity to widen Sheridan in order to accommodate the increased levels of vehicles and the construction of the underpass to provide

a safer connection for U.S. 36 Bikeway and transit users, presents additional design and construction challenges which cannot be met solely through local funds.

In addition to the Church Ranch underpass, the City of Westminster is significantly investing in Downtown Westminster, with \$35 million in land acquisition and \$40 million toward infrastructure to spur economic development in the area. Unfortunately, the economic situation of our regional partners prevents them from furthering their financial contributions.



*Downtown Westminster Construction*

CDOT faces \$9 billion in unfunded highway projects over the next decade, on top of unmet needs at the local level. RTD continues to see budget shortfalls of \$30 million to \$40 million annually as revenue from sales tax, grants, and ridership come up short. Due to the project construction cost estimates and the investments we are making nearby, Westminster is not able to complete the project solely utilizing local funds.

Westminster and CDOT staff believe that it's in the best interest of our residents and businesses to combine the roadway and underpass construction into one project. As one project, the construction could take

## CONCLUSION

place in a seamless pattern with minimal lane closures and unnecessary traffic congestion.

Combining elements into one construction project will also leverage the economies of scale with regards to supplies, labor costs, and traffic control, thus improving final project costs. Coordinating project management will also reduce the impact of any unknowns, and mitigate schedule and budget risks.

The City of Westminster and CDOT do not have any restrictions attached to its matching funds, nor compliance or a schedule for compliance attached to them. The entire match committed by the city will be available until the project is complete.

## VIII. FEDERAL WAGE CERTIFICATION

Attachment G contains certification that the City of Westminster will comply with the requirements of sub-chapter IV of chapter 31 of title 40, United States Code (Federal wage rate requirements).



Roadway Condition at Sheridan Boulevard

The *Downtown Westminster Smart City Mobility Initiative* is a regionally transformative project, which aims to provide safer transportation conditions for motorists, pedestrians, and bicyclists in the heart of Westminster's economic center.

The proposed project reconstructs and widens Sheridan Boulevard while building an underpass that would eliminate one of two remaining at-grade crossings for the U.S. 36 Bikeway. The widening of Sheridan Boulevard will capitalize on CDOT's U.S. 36 Express Lane project investment by bringing Sheridan Boulevard to its ultimate configuration and capacity. The smart underpass will provide a direct, comfortable, and safe connection to Downtown Westminster, U.S. 36 Bikeway users, and RTD U.S. 36 / Sheridan Station. A grade separated crossing will improve Sheridan Boulevard's traffic flow.

The project achieves benefits in all merit criteria. It reduces the number of crashes, improves the operations and maintenance of the roadway, it increases the economic productivity of the area, reduces greenhouse gas emissions, and increases access to jobs, education, and health care.

The innovative vision to transform an otherwise traditional underpass into an interactive 'smart' underpass that will accommodate autonomous vehicles is widely supported by all regional partners, including CDOT, RTD, and DRCOG.

The City of Westminster is ready to address the transportation challenges of this corridor. The *Downtown Westminster Smart City Mobility Initiative* is a sound, innovative investment with long-term economic benefits that support the vision of Westminster and the region.

