



## I-25 / US 85 (Santa Fe Drive) Bridge Replacement and Interchange Improvements

■ Critical safety and mobility improvements for Denver, Colorado

A TIGER II Discretionary Grant Request for \$10 Million  
Submitted by the Colorado Department of Transportation

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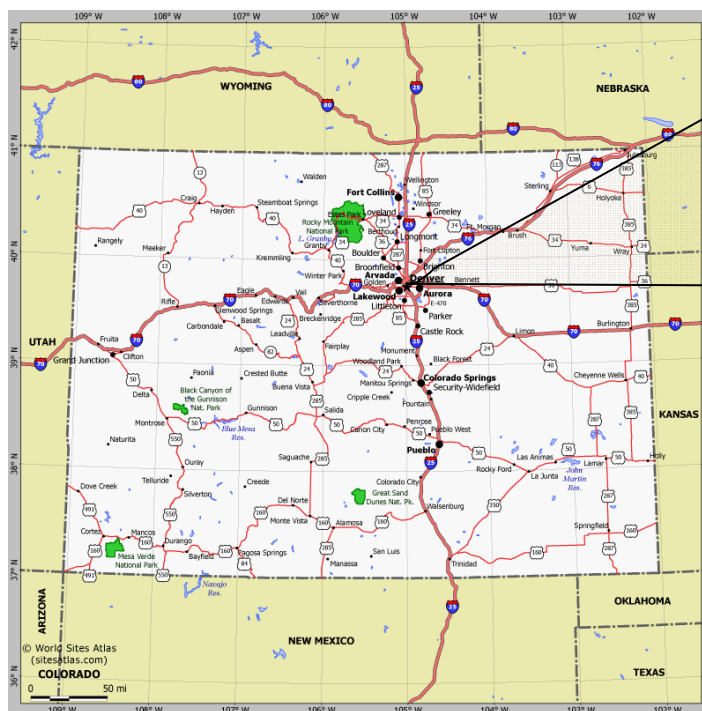
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# I-25 / US 85 (Santa Fe Drive) Bridge and Interchange Reconstruction

## Executive Summary

The Colorado Department of Transportation (CDOT) is seeking a \$10 million TIGER II Discretionary Grant for the Interstate-25 / Santa Fe bridge and interchange reconstruction project in Denver, Colorado. A \$10 million grant would complete the State's funding package for a \$61 million improvement, expediting reconstruction of two seriously deficient bridges in this busy metropolitan area. Until now, CDOT has been unable to identify sufficient funding at any one time to bring this project so close to reality. Funding this important safety project will allow CDOT to advance the project's completion by two years, at a reduced cost, creating jobs and with immediate benefit to the hundreds of thousands of people who use the facility every day.

The proposed project is located at the intersection of Interstate-25 and US 85 (locally known as Santa Fe Drive). I-25 is the primary north/south route across the state of Colorado and is the interstate connection into downtown Denver – the State's capital city. This stretch of I-25 is heavily travelled, carrying nearly 210,000 vehicles on an average day.<sup>1</sup> It is an 8-lane facility north and south of this location that reduces to a 6-lane bottleneck at the Santa Fe interchange. Santa Fe Drive (US 85) is also a critical north/south connector for Denver serving as the main link to I-25 for those who live and work in the Southwest Denver suburbs. Santa Fe Drive carries approximately 80,000 vehicles a day.<sup>2</sup> Both facilities currently operate above 90% capacity and are projected to exceed 100% capacity in the next 20 years.<sup>3</sup>



Project Location

A \$10 million grant will leverage \$61 million in Interstate improvements. Each dollar spent will result in \$4.25 of benefit to the travelling public. 290,000 vehicles travel over or under this facility every day.

The twin bridges at I-25/Santa Fe were built in 1958 and have long exceeded their useful lives. With sufficiency ratings of 20.2 and 22.8 (out of a possible 100) they are two of the four worst bridges in the entire state of Colorado,<sup>4</sup> and carry more than 50 times the number of vehicles than the other two poorest bridges combined.<sup>5</sup>

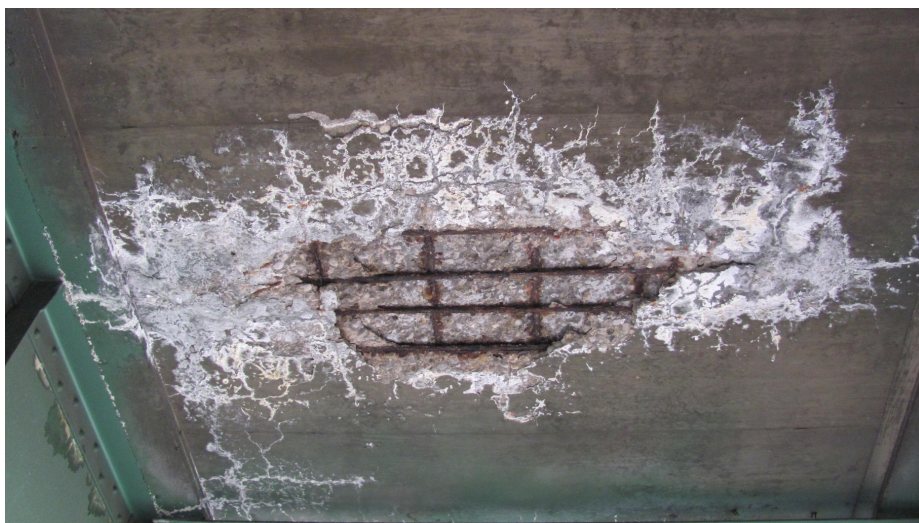


Built in the 1950's this stretch of I-25 has exceeded its useful life. The project will replace two of the worst bridges in the State.



Photos: <sup>6</sup>

In April 2010, an inspection of the bridges resulted in emergency repairs to the bridge deck due to deteriorating concrete. Several lanes were closed while CDOT repaired a 5-foot by 5-foot hole that appeared overnight in the northbound bridge. The bridge deck was shored with wooden timbers, and remains shored today. The inspection further revealed that additional repairs would be needed over the next three to five years if the bridges could not be replaced immediately. This month, CDOT will complete additional repairs costing approximately \$400,000. Future repairs costing the Department several million dollars are likely if full-funding to replace the bridges is not secured soon.<sup>7</sup> Safety of these bridge structures is paramount to CDOT and the 290,000 vehicles that travel on or under them every day.



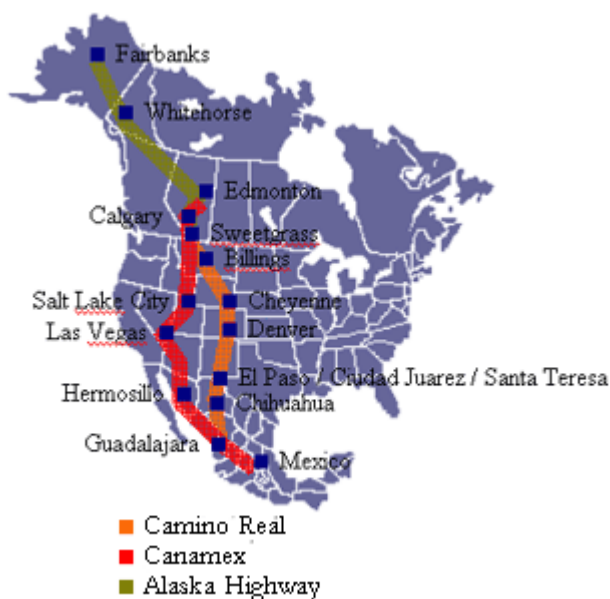
Emergency repairs in April 2010 patched a 5-foot X 5-foot hole that appeared in the northbound bridge deck overnight. A \$10 million grant will repair the facility two years ahead of schedule.

Photos: <sup>8</sup>

Proposed improvements at the interchange will also address congestion and high crash rates. Studies have identified this location to be one of the worst traffic bottlenecks in the State, with traffic slowing to less than 20 miles per hour during peak travel periods.<sup>9</sup> The interchange is the site of nearly 100 vehicle crashes per year<sup>10</sup> – an unusually high rate for facilities of this same type and size.<sup>11</sup>

I-25 is a vital link in the regional, national and international highway network. I-25 is designated as High Priority Corridor No. 27 within the National Highway System.<sup>12</sup> It is also an integral part of Camino Real international trade corridor,<sup>13</sup> connecting Mexico, the U.S. and Canada along I-25 through New Mexico, Colorado and Wyoming, and northward via various routes into Canada. Approximately 6% of traffic on I-25 and 8% of traffic on Santa Fe are commercial trucks.<sup>14</sup> Safe and efficient operation of this facility is critical to the United States, Colorado and Denver Metro Area economies.

I-25 is a critical route for people and goods movement, impacting the regional, state and national economy.



The \$61 M project is almost fully funded. In May of 2010 the Colorado Transportation Commission allocated transportation funding from the HIRE Act to its six engineering regions. That action provided CDOT Region 6 with \$51 million for projects in the Denver Metro Area, \$39 million of which the Commission directed to the I-25 / US 85 bridge replacements.<sup>15</sup> Region 6 is prepared to exceed the Commission's goal and direct its entire \$51 million allocation to this project, leaving an unfunded gap of only \$10 million. With this application, CDOT requests U.S. DOT assistance to fill that gap with TIGER II Discretionary Grant funds.

Source:<sup>16</sup>

The benefits of completing this project now outweigh the cost by a factor of four. This project will provide travelers with a safer, structurally sound interstate facility two years earlier than planned. It will reduce travel delay for businesses and the general public by more than 700 vehicle hours every day,<sup>17</sup> reduce greenhouse gas emissions, and provide safe and efficient access to adjacent light rail transit stations and new proposed high-density sustainable redevelopment projects in the immediate vicinity. Construction of the improvements is proposed in such a way that both construction and long-term maintenance costs are minimized. This project will result in creation of an estimated 650 near term jobs spurring the American economy.

The proposal is consistent with adopted state, regional and local transportation improvement plans and programs.<sup>18</sup> The project scope received environmental clearance with the Phase I Valley Highway Record of Decision in June of 2007<sup>19</sup> and, if awarded a TIGER II grant, CDOT would obligate the funds by March 2011. Construction of the bridge replacement project would begin a few weeks later, with a target date for completion in the fall of 2014.



## Project Description

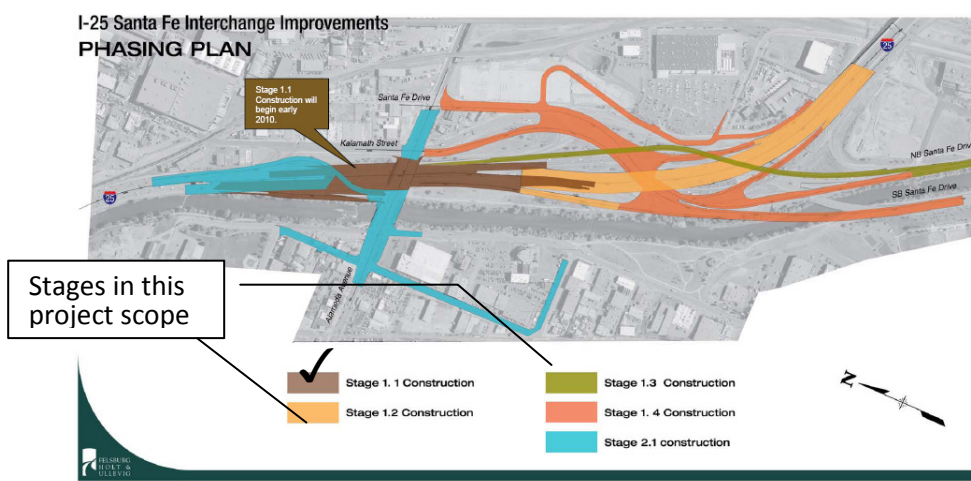
This project will replace two of the four worst bridges in the State of Colorado – fully funding the \$61 million project with a minimal \$10 million federal investment. The project is located at the intersection of Interstate 25 and US 85 (also known as Santa Fe Drive) in Denver, Colorado. I-25 is the primary north-south route through the state of Colorado, providing access to, through and from the Denver Metropolitan Area. Denver is the business, financial, government and cultural center of the state. Every day, Downtown Denver hosts 110,000 workers, 55,400 students and 63,000 residents who live within 1.5 mile radius. More than 12 million overnight visitors stay in Downtown Denver every year.<sup>20</sup> There are over 30 attractions in Downtown, including three major sports venues, an amusement park, and several world-class museums and performing arts centers, which together are visited by more than five million people each year.<sup>21</sup> Improvements will directly benefit 290,000 motorists as well as Regional Express Bus passengers who travel this intersection every day.

## Safety and Mobility Challenges for an Outdated Facility

Built in the 1950's, this section of interstate needs significant safety repairs and improvements to meet today's standards. Emergency repairs needed on the northbound I-25 / Santa Fe bridge this summer highlight the importance of completing this project as soon as possible. The repairs were completed following an inspection that revealed serious deterioration of the bridge deck resulting in a 5-foot by 5-foot hole in the northbound bridge deck that appeared overnight. The inspection also identified a series of needed repairs over the next three to five years if the bridges could not be replaced within that timeframe.

The project will replace two of the worst structurally deficient bridges in the State of Colorado. Numerous geometric deficiencies will also be corrected, and a major bottleneck at the Santa Fe interchange where I-25 narrows from eight to six lanes will be eliminated. The interstate on-ramps at this location, which currently merge with traffic on the left hand side of mainline traffic contrary to driver expectations, cause significant safety concerns and will be converted to right-hand merges. Poor sight distances and substandard curves also will be corrected.

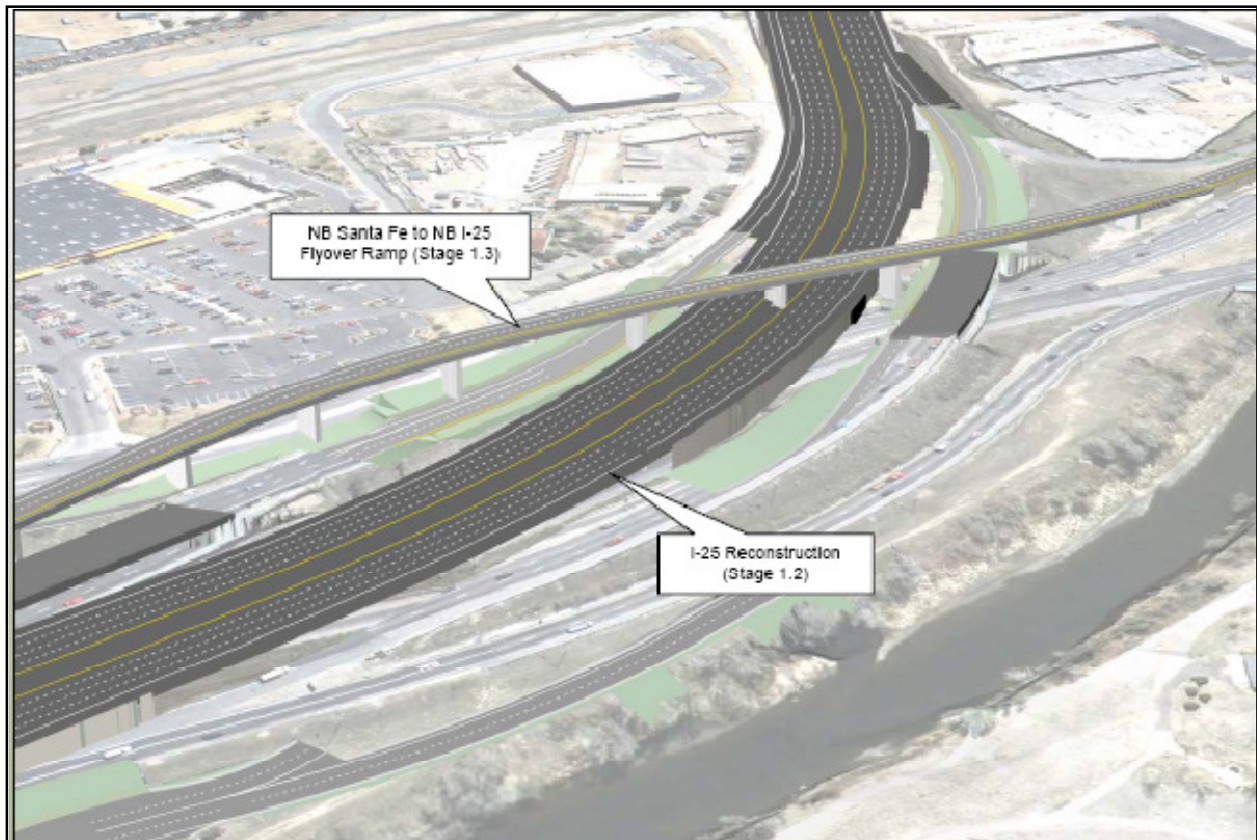
**Project is Ready to Go and Completes Priority Improvements for the Corridor** The I-25 Valley Highway Final Environmental Impact Statement (FEIS) was completed in 2006<sup>22</sup> and identified improvements for the corridor that would cost more than \$300 million. Due to limited funding only a portion of the preferred alternative was cleared in a decision document. In June of 2007, CDOT secured a Record of Decision (ROD) for the first fundable phase.<sup>23</sup> This project is within the scope of the Phase I improvements identified in the ROD as shown in the graphic below.



The project will complete the highest priority improvements in the corridor two years earlier than anticipated.

Source:<sup>24</sup>

CDOT is well underway with Stage 1.1, a \$37.4 million project, replacing the bridge at I-25 and Alameda Avenue, which for constructability reasons needed to be completed prior to the I-25 / Santa Fe interchange. Work is now underway to prepare construction ready plans for Stages 1.2 and 1.3, the elements that would be constructed with the \$61 million project referenced in this application. In future stages, CDOT will construct a single point urban interchange underneath the I-25 / Santa Fe Bridge as funding becomes available. At this time, however, CDOT is focused on completing the most critical safety improvements as its first priority.



Source:<sup>25</sup>

#### **Project Scope – Improvements Will:**

- Replace deficient bridge structures at I-25 over Santa Fe Drive (Structure numbers F-16-DT and F-16-DW, located at I-25 milepost 207.5). The new structure will have a 75 year design life.
- Relieve the current I-25 traffic bottleneck by adding one additional lane in each direction to match the adjoining 8-lane sections to the north and south.
- Construct a new flyover ramp from northbound Santa Fe to northbound I-25.
- Convert current left-hand merge ramps from US 85 to I-25 to more traditional right-hand merge ramps.
- Correct other geometric deficiencies at the interchange that currently result in poor traffic operation and hazardous driving conditions.

#### **Project Benefits (Benefit Cost Ratio of 4.25:1):**

- Improved Operations – the number of hours the facility operates at LOS F is reduced by roughly 10 hours a day saving over 700 daily hours of travel,<sup>26</sup> benefiting 210,000 vehicles that use the facility every day<sup>27</sup>

- Safer Infrastructure – 2 years sooner than anticipated and at a lower cost – impacting 290,000 vehicles per day that travel on or under the deteriorating bridges<sup>28</sup>
- Reduced Maintenance Costs – project eliminates the need for costly band-aids to extend the life of the bridges – bridge will be replaced with a new structure now<sup>29</sup>
- Reduced Crash Rates – due to operational improvements at the interchange –an estimated reduction of between 500 and 600 crashes over the next 20 years<sup>30</sup>
- Improved Access – to two nearby light rail stations and for residents and businesses at more than 80 acres of proposed transit oriented development adjacent to the interchange<sup>31</sup>
- Reduced greenhouse gas emissions due to reduced vehicle delay and idling<sup>32</sup>
- Job creation – the project will create an estimated 663 critically needed jobs<sup>33</sup>
- Delivery of an Environmentally Sound Project -- being implemented with the neighboring community interests at heart.<sup>34</sup>

### **Funding Now Will Save Time and Money**

Due to funding constraints, CDOT had anticipated building the bridge replacement and ramp improvements in two separate construction projects. The requested grant would allow these two projects to be built simultaneously with significant benefits:<sup>35</sup>

- Less expensive than separate projects – construction savings of approximately \$4 million
- Faster – combined project will be completed in 42 months instead of 60 months
- Less interruption to the travelling public
- Eliminates the need for an additional bridge structure for northbound Santa Fe to northbound I-25 – saves both construction time and cost and reduces long term maintenance

### **\$10 Million Grant Request Would Leverage \$61 Million Investment**

The estimated cost for proposed improvements is \$61 million, of which CDOT has secured \$51 million. CDOT is seeking a \$10 million TIGER II discretionary grant to close the funding gap for this critical interstate improvement project.

## **I. Project Parties**

The Colorado Department of Transportation is the I-25 / US 85 project sponsor. Extensive public and agency outreach was done during the FEIS process which identified these improvements as first priority among \$300 million of improvements corridor-wide.

The Regional Transportation District (the Region's Transit Provider), the City and County of Denver and the Denver Chamber of Commerce support CDOT's request for funding. Support letters are attached in Appendix I.

## **II. Grant Funds and Sources / Uses of Project Funds**

CDOT State funds	\$51 million	(83.5%)
<u>Proposed TIGER II Grant</u>	<u>\$10 million</u>	<u>(16.5%)</u>
Total project cost	\$61 million	(100%)



### III. Selection Criteria

#### A. Long Term Outcomes:

##### i. State of Good Repair:

The project will minimize the life-cycle costs and improve condition of existing facilities.

The project will correct serious safety and traffic congestion issues identified in the FEIS.

#### **Outdated Interstate in Poor Condition – Safety and Mobility Improvements Needed**

The I-25 / US 85 parallel bridge structures are two of the most deficient bridges anywhere in the State of Colorado. Structure numbers F-16-DT and F-16-DW have sufficiency ratings of 20.2 and 22.8 respectively out of a possible score of 100. Only two other bridges statewide are in worse shape.<sup>36</sup> With average daily traffic of nearly 210,000 on I-25 and 80,000 on Santa Fe Drive, these two bridges carry more than 50 times the traffic on an average day than the other two poor bridges combined.<sup>37</sup> This project will fully reconstruct the I-25 / US 85 structures.

Severe traffic congestion also results at this interchange due to a traffic bottleneck. In a recent national report on traffic conditions, Denver ranks 15<sup>th</sup> worst in the nation for traffic congestion. The report goes on to identify I-25 at this location to be the worst freeway bottleneck in the State of Colorado.<sup>38</sup> The report shows that during times of severe congestion the average speed of traffic at this interchange drops to 18.9 miles per hour. DRCOG, the area Metropolitan Planning

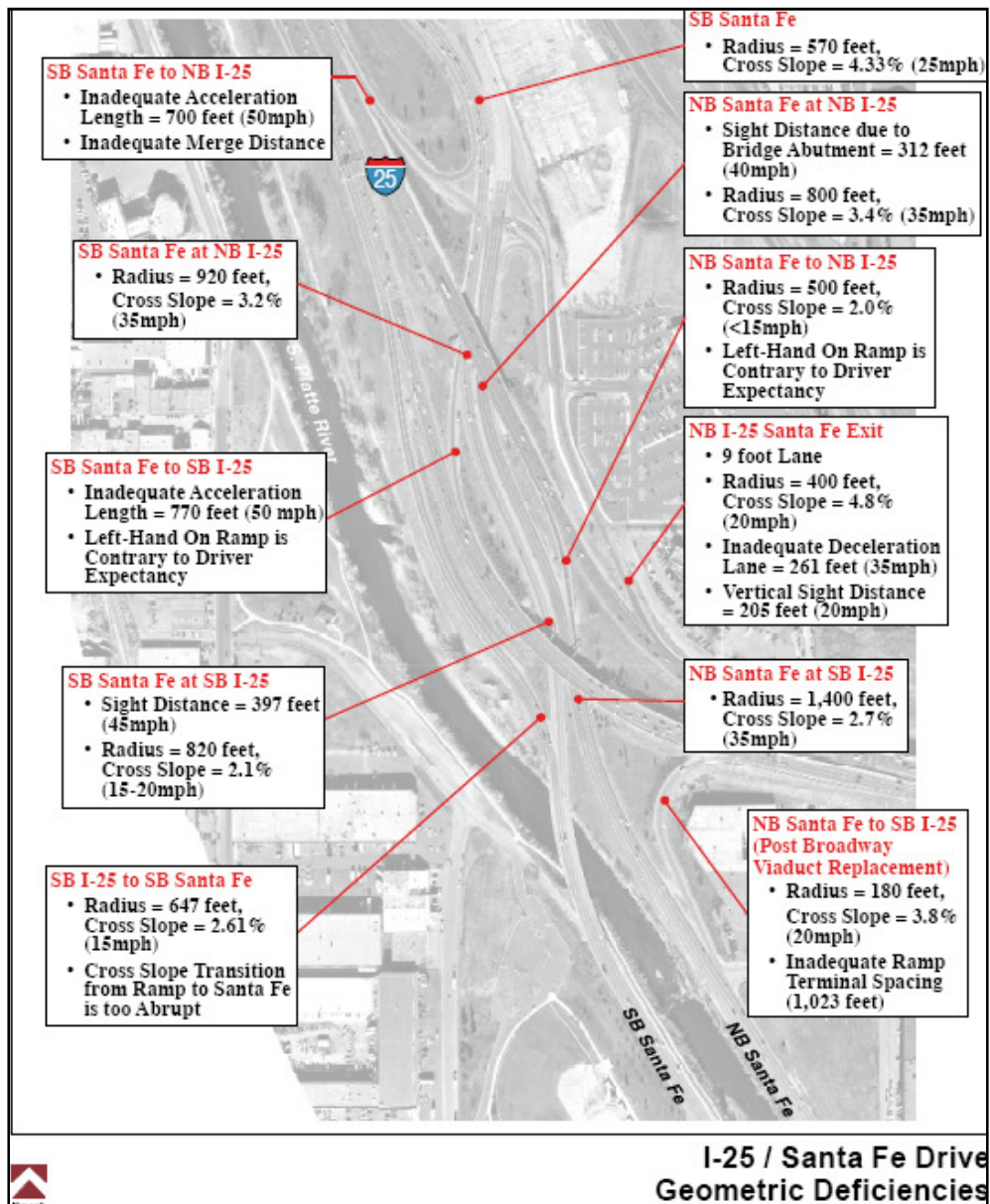
Organization, likewise consistently lists this location as one of the worst freeway bottlenecks in the Denver Metro Area.<sup>39</sup> Volume to capacity ratio for this stretch of interstate is currently at 92% and is expected to exceed 100% capacity in the next twenty years.<sup>40</sup>



Just south of this location, I-25 has seen major improvements over the last ten years with the completion of the “T-REX” project. Completed in 2006, Colorado’s Transportation Expansion Project, or T-REX, built 19 miles of light-rail transit line with 13 rail stations, and widened 17 miles of highway along the southeast corridor of Interstates 25 and 225 through Denver and neighboring communities. However, where T-REX widening ends, a major bottleneck has appeared at Broadway Boulevard, the interchange immediately south of I-25/ Santa Fe due to the reduction in the number of lanes at the Santa Fe Interchange.

This project would pick up where T-REX left off, widening the mainline I-25 to match the T-REX profile.

The project will also correct several geometric deficiencies at the interchange that currently result in poor traffic operation and hazardous driving conditions. Specific deficiencies are identified in the photograph below and include poor sight distance, left hand on ramps from Santa Fe to I-25, and substandard curve radii.<sup>41</sup>



Source: Valley Highway FEIS <sup>42</sup>

Upon completion of the project, the number of hours per day that this section of freeway operates at Level of Service F will drop from 11.75 to 2.5 hours in the southbound and 11.25 to 0 hours northbound.<sup>43</sup>

#### Current and Projected Interstate Conditions<sup>44</sup>

	Current Condition	Condition at Project Completion
Bridge Structural Sufficiency Ratings	20.2 / 22.8	100 / 100 (with a design life of 75 years)
Pavement Condition	Good	Good
Annual Number of Crashes (property damage / injury)	94 (79 / 15)	Approximately 70 (60 / 10)
Daily Vehicle Hours of Delay	3253 hours / day	2548 hours / day
Hours per Day at Level of Service F	11.75 hours southbound 11.25 hours northbound	2.5 hours southbound 0 hours northbound

**Project is Properly Capitalized Upfront** -- CDOT has identified \$51 million of the \$61 million needed to complete the proposed improvements. A \$10 million TIGER II grant will complete the full funding package. CDOT recently completed value engineering on this project consistent with FHWA's policy to do so for all projects costing over \$50 million and is confident in the estimated project cost.

**Consistent with Adopted Regional Plans** – The project is consistent with the investment priorities in the Denver Region's fiscally constrained long range transportation plan.<sup>45</sup>

**CDOT Uses Asset Management Models, Reduces Life-cycle costs, Minimizes Long-term Maintenance** -- CDOT utilizes longstanding, publicly accepted asset management programs – computer driven models that determine optimal times to repair and replace elements of our state's highway system. Those asset management systems have identified I-25/US 85 reconstruction as a statewide priority.<sup>46</sup> Future repair and maintenance of the new I-25/85 bridge would be managed consistent with these performance management systems as well, identifying the most beneficial time to complete needed repairs, maximizing the life of the structure and minimizing long-term maintenance costs. The new bridge will have a design life of 75 years.

If not replaced now, significant costs will be incurred over the next several years to repair the bridges and keep them structurally sound for the travelling public.<sup>47</sup>

Receiving a \$10 million grant now would also allow CDOT to construct the proposed bridge and ramp improvements concurrently, rather than splitting the scope into two separate construction projects due to funding limitations. Consolidating this work results in significant cost and time savings, and also eliminates the need for a bridge structure at northbound Santa Fe to northbound I-25. Eliminating the need for the additional structure reduces CDOT's long term maintenance and operating costs for this interchange.<sup>48</sup>

**A Sustainable Source of Revenue Is Available for Long-term Operations and Maintenance**

The Colorado Transportation Commission annually sets performance goals, based on optimizing value and minimizing long-term life cycle costs, guiding decisions on how to spend limited financial resources. As a result, CDOT's annual budget historically has given priority to maintenance and operation of its existing transportation system and facilities. Federal Bridge funds, coupled with state funds from the Highway Users Tax Fund (HUTF) are identified by the Commission for use in keeping existing bridges in good repair over time. A significant policy change and/or reduction in the amount of funds available for transportation activities would need to occur for priority bridge maintenance and operations not to be adequately funded in the future.

**Project Reconstructs and Improves Facilities that Threaten Future Transportation Network Efficiency, Mobility of Goods and People, Economic Growth and Stability**

– I-25 is a critical interstate corridor with a strong economic base and strong potential for future growth. In 2007, the Census Bureau estimated population of the Denver Metropolitan Statistical Area (MSA) to be 2.4 million, a 14% increase since the 2000 Census.<sup>49</sup> More than half of all Coloradans live and work in the Denver-Aurora-Broomfield MSA.<sup>50</sup> The health of the state economy relies on Denver's economic strength.



The I-25 Santa Fe bridge is located in the heart of the capital city of Denver. While CDOT will do everything it can to keep this facility open, if not repaired the bridges would ultimately need to be closed to traffic, severing the primary route into, through and from Downtown

Denver is the economic, cultural and political capitol of the state of Colorado.



Denver. Closure of this interchange would be devastating to the hundreds of thousands of people who travel by Interstate 25 in Denver every day and the businesses who serve them. Severe travel delay would result for those commuting to, from our through Denver for work, school or special events. The benefit to businesses and individuals of being able to travel safely and predictably arrive on time would disappear.

A myriad of downtown shopping, dining and entertainment venues account for a good portion of the current and anticipated travel demand on I-25. The City and County of Denver derives roughly 25%<sup>51</sup> of its annual budget from retail sales tax revenues. Denver's annual budget would take a big hit if I-25 - the main freeway connection to downtown retail – were closed.

Already congested local street networks would be burdened with the extra traffic diverted from I-25. Business would suffer as a result of reduced access, productivity and efficiency; the cost of transporting goods to and from market would markedly increase; and the regional, state and national economy would decline. If this bridge were left unimproved, poor system conditions and unmanageable congestion would result.

Patching the bridges with costly repairs over the next three to five years if the bridges cannot be reconstructed now is a possibility, but not an efficient use of limited funding. CDOT would much prefer to rebuild the bridges now, than continue to spend funds to patch these extremely deficient bridges for the foreseeable future.

ii. **Economic Competitiveness:**

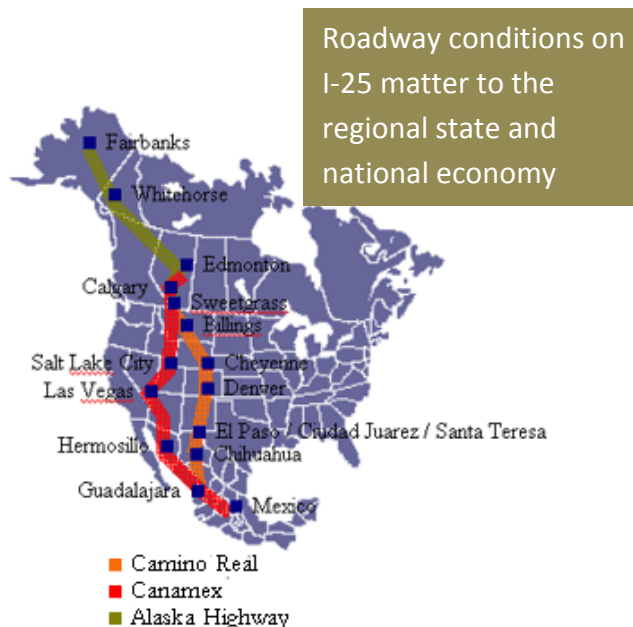
The project will contribute to the economic competitiveness of US, providing a safe transportation network and improving mobility. Project supports long-term growth in high quality employment in an area of low income populations. The project supports land use plans which increase the productivity of land at this specific location in a sustainable manner.

## Interstate 25 is Vital to National, Interstate and Regional Goods Movement

Denver's economy is based in part on its geographic position and its connection to some of the major transportation systems of the country. Because Denver is the largest city within a 600 mile radius, it has become a prime location for storage and distribution of goods and services for the Rocky Mountain Region.<sup>52</sup> An efficient transportation system that provides efficient and productive movement of goods and access to jobs, services and recreation is crucial to the Nation's economic health.

I-25 is a vital link in the regional, national and international highway network. I-25 is designated as High Priority Corridor No. 27 within the National Highway System.<sup>53</sup> It is also an integral part of Camino Real international trade corridor, connecting Mexico, the U.S. and Canada along I-25 through New Mexico, Colorado and Wyoming, and northward via various routes into Canada.<sup>54</sup> Approximately 6% of traffic on I-25 and 8% of traffic on Santa Fe are trucks.<sup>55</sup> Safe and efficient operation of this facility is critical to the United States, Colorado and Denver Metro Area economies.

Source: <sup>56</sup>



Proposed improvements to the I-25/US 85 interchange will significantly reduce congestion and hours of vehicle delay. Traffic congestion costs the nation's freight industry nearly \$8 billion annually.<sup>57</sup> For the 6% of truck trips on I-25, the yearly cost of congestion totals \$700,000.<sup>58</sup> The number of hours that I-25 in this section will operate at Level of Service F will be reduced by about 10 hours every day after project completion.<sup>59</sup> Reduced congestion will result in roughly 700 fewer daily hours of delay as a direct result of the proposed improvements, with a value of \$3.3 million per year.<sup>60</sup>

## Denver – a Nationally Significant, Growing Retail and Employment Center Served by I-25

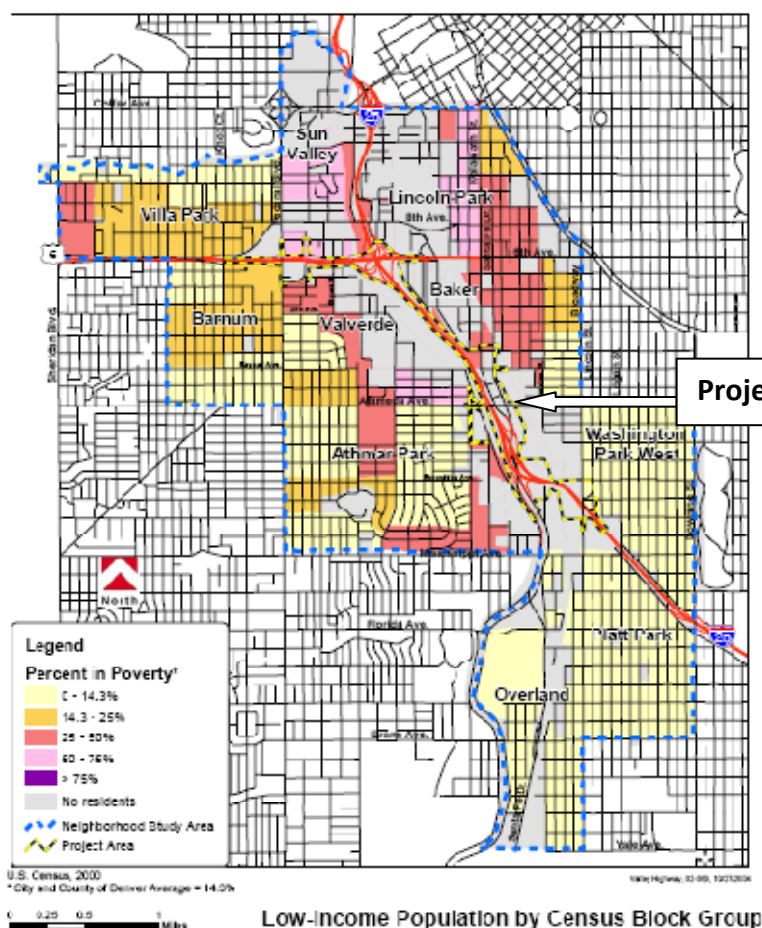
Denver is the economic engine for the State of Colorado. The safety and capacity improvements proposed at I-25 and Santa Fe will result in more efficient movement of people and goods, critical to Denver's residents and the State's economy.

For the past two decades, The Denver metropolitan region has grown substantially in population and employment. The population of the nine-county Denver region is expected to increase roughly 47% to 3.88 million in 2030. Likewise employment is expected to increase over 51% to approximately 2.36 million by 2030. More than half of all Coloradans live and work in the Denver Metropolitan Area.<sup>61</sup> The capacity improvements proposed at I-25 and Santa Fe will be needed to serve this future growth.

Jobs served by I-25 are good paying jobs that provide a base for strategic economic development. The average wage of all jobs in the Denver MSA is \$48,560 per year,<sup>62</sup> roughly 10% higher than the average national wage. Businesses that have recently located here include Conoco Phillips, announcing that it will build its new Global Technology and Corporate Learning Center in Louisville,<sup>63</sup> Colorado, a suburb of Denver. The energy company hopes to construct the new offices over the next 22 years and to open its first phase in 2013. These are new jobs, attributable to global business expansion.

### **Project Serves Economically Disadvantaged Populations and Supports New High-Density, Sustainable, Transit-oriented Development**

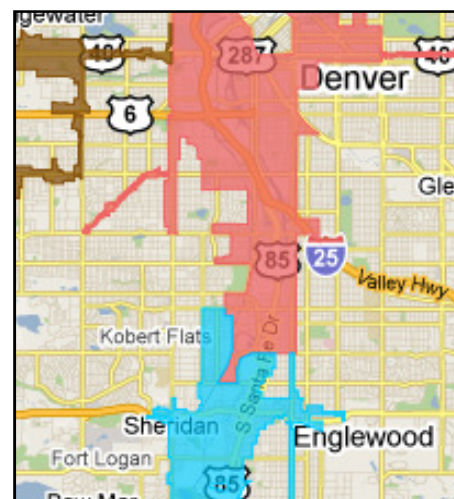
The I-25 / Santa Fe interchange is located within one of Colorado's 16 designated Enterprise Zones.<sup>64</sup> The Enterprise Zone program provides tax incentives to encourage businesses to locate and expand in designated economically distressed areas. Businesses located in an Enterprise Zone qualify for tax credits that encourage job creation and investment. Analysis for the FEIS also identified a significant concentration of low-income households in the immediate vicinity of the project.<sup>65</sup>



The I-25 improvements will benefit the residents of these disadvantaged communities and support development within them by improving safe and efficient access to the regional transportation network.

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**Project Location**

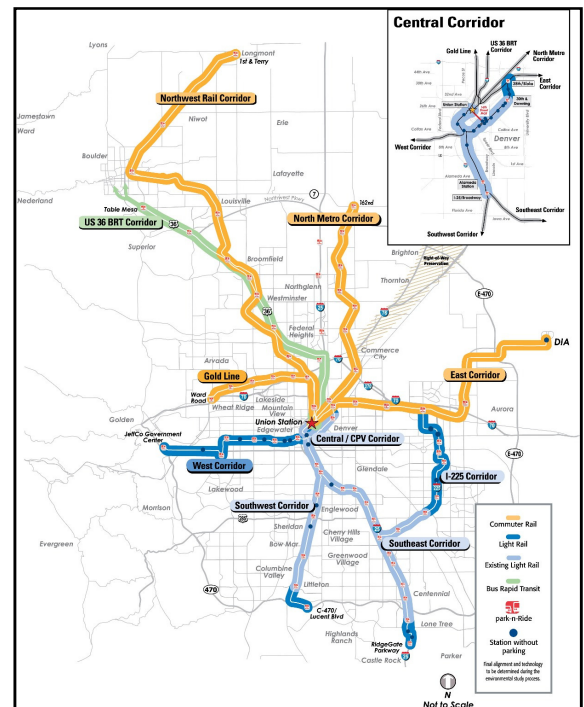


**Denver Enterprise Zones**

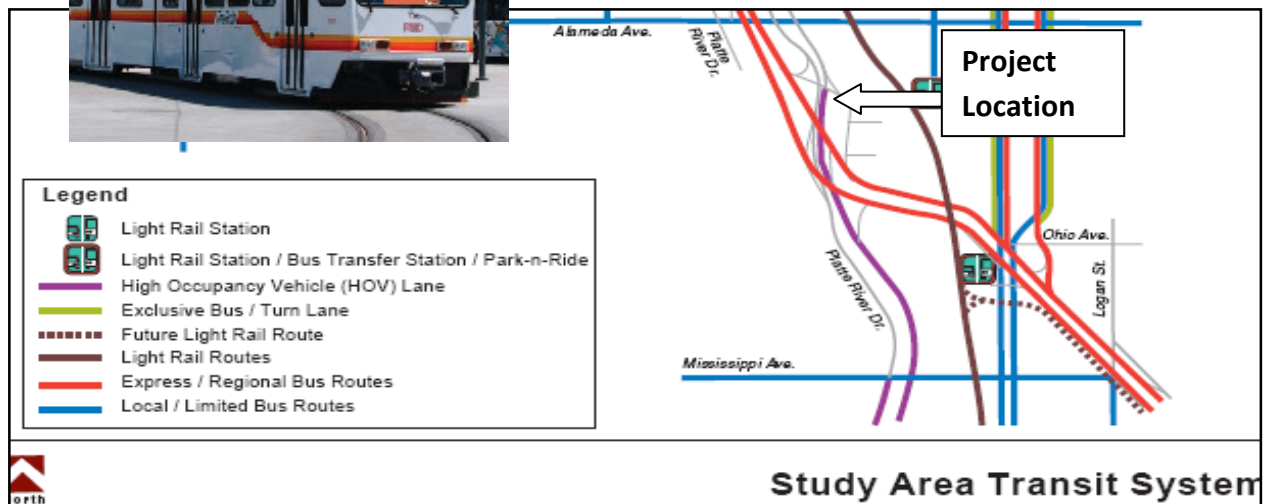
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In addition to improving access to the regional roadway network, the I-25 / Santa Fe project will also improve access to two nearby light rail stations/park-n-rides.<sup>68</sup> The improvements will provide increased modal choice for residents and improved connections to the regional transit network.<sup>69</sup> The RTD FasTracks expansion program will link to these existing stations and provide transit access to a regionwide network. Mixed use, transit-oriented development is planned for sites surrounding these transit stations, immediately adjacent to the I-25 / Santa Fe interchange (discussed further in Section iii, Livability below).



Source: RTD



Source: <sup>70</sup>

### Denver Shows Promise for a Strong Economic Recovery

While Metro Denver's economy has slumped in the current national recession, it has fared better than many regions. Employers in the seven-county region cut jobs in early 2008, but the region also added net new jobs through the first three quarters of 2008. Job loss has been higher in 2010, but is showing signs of improvement.<sup>71</sup> According to the Metro Denver Economic Development Corporation, Denver has maintained the solid fundamentals necessary to support growth once the nation's economy recovers.

The project will provide improved access to transit and future planned transit-oriented development in Denver.

- Metro Denver cities are consistently recognized for their good quality of life, affordability, cultural facilities, and highly educated workforce. In 2009, Forbes named Boulder among the 10 "Best Cities for Recession Recovery".<sup>72</sup>

- Metro Denver continues to attract businesses with the potential to support growth in the long term. The fact that businesses have moved to the region even during recession itself speaks to the region's competitive advantages. While the recovery may prove underwhelming in 2010, the rebuilding, restructuring, and repair that will happen throughout the year will set the stage for more stable growth in the long term.<sup>73</sup>

Denver's full economic recovery may not occur for another year or so, but the foundation for more stable growth in the long term is in place. Investing in the safety and efficiency of our transportation resources now will serve continued economic growth in the future. Replacing the structurally deficient bridge at I-25 /US 85 and improving operations of this interchange will improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.

### iii. **Livability:**

The Project fosters livable communities through place-based policies and investments that increase transportation choices, enhancing points of modal connectivity and reducing congestion. Project was designed with community needs in mind.

#### **Denver – A Great Place to Live**

Denver ranks first among the nation's most desirable places to live, according to a 2008 poll by the Pew Research Center. A 2009 poll by Harris Interactive showed Denver ranks with San Francisco as the nation's second-favorite place to live.<sup>74</sup>



The attractiveness and livability of Denver has not happened by accident. In recent years, Denver area jurisdictions have encouraged land use development that focuses on use of infill sites, reuse of older buildings that no longer serve their purpose, and higher-density, mixed-use developments around transit stations – all with an eye to creating walkable, sustainable and vibrant communities with improved transportation options and less impact on the environment.

#### **Connectivity to Transit Stations and Proposed Transit Oriented Development**

The proposed I-25 / US 85 project will improve travel options and connectivity for users of multiple modes. Substantial mixed use development is planned along I-25 in central Denver and would be served well by the safety and capacity improvements at Santa Fe Drive. As shown in the graphic below, roughly 80 acres of land in the immediate vicinity of the I-25 / Santa Fe interchange, former location of the Gates Rubber Company and other industrial uses, are currently zoned for redevelopment as mixed-use, transit oriented development.<sup>75</sup> The developments are anchored by two existing Regional Transportation District light rail stations. RTD transit service in Denver is well subscribed, carrying more than 330,000 passengers per day.<sup>76</sup>

As one article explained, “The tangle of tracks and confusing I-25 interchanges haven't appealed to developers searching for sites with easy access. But with the Colorado Department of Transportation planning infrastructure improvements and the city pushing forward on a plan for the neighborhood, property owners are considering what could be.”<sup>77</sup>

“... with the Colorado Department of Transportation planning infrastructure improvements and the city pushing forward on a plan for the neighborhood, property owners are considering what could be.”



Developers Lloyd Herrera, left, and Tom Wootten of Alameda Station LLC stand at the site of the old RTD bus barn at Alameda Avenue and South Santa Fe Drive. They plan to redevelop the area as a mixed-use site. (Post / Helen H. Richardson)

#### Redevelopment track

The area surrounding the Alameda station, sandwiched between a shopping center and mainline railroad tracks, has remained largely untouched. But now developers are looking for opportunities to redevelop sites surrounding the station.



Source: Denver Community Planning and Development

TMU-30 zoning on these sites would support upwards of 800,000 square feet of new office space, 500,000 square feet of retail and 4,000 residences<sup>78</sup> – all of which would be made more marketable with the I-25 improvements proposed. Ultimately, the transit orientation of the area may well result in decreased demand for vehicle trips, further reducing congestion and travel time on I-25 into Downtown Denver. A rendering from one of the early development proposals shows the desired character of development on one of the sites around the interchange.



Source: Cherokee Denver 2002



### **Benefits to Low-income, Minority and Senior Population**

Safety and mobility improvements on I-25 at Santa Fe will particularly benefit low-income, elderly and disabled and Latin American residents in the project area. By improving freeway access to the neighborhood, new offices, markets and shops will be more likely to locate in the high-density, walkable redevelopment sites identified by Denver, making goods and services more readily available to these groups.

The Denver area's elderly and disabled populations are growing at rates faster than the general population. Between 2005 and 2020, the number of residents aged 60 and older is expected to nearly double from approximately 300,000 to 575,000.<sup>79</sup> According to Smart Growth America Low income families stand to benefit the most from an improved transportation system that increases their travel options and give them better access to jobs and support services.<sup>80</sup> Studies have shown that living within a transit oriented development can bolster household income. Housing and transportation costs rank 1<sup>st</sup> and 2<sup>nd</sup> as largest expenses in households respectively. TOD can increase disposable household income by reducing driving costs – with household savings of \$3,000-4,000 a year.<sup>81</sup>

iv. **Sustainability:**

Project will improve energy efficiency, reduce dependence on oil, reduce greenhouse gas emissions and be designed to minimize impact on the environment. The I-25 / US 85 interchange project was designed in a way that minimizes impacts to the environment and will result in a more sustainable transportation system.

**Colorado's Campaign to Reduce Greenhouse Gas (GHG) Emissions** Colorado's GHG emissions are rising faster than those of the nation as a whole. The State's gross GHG emissions increased 35% from 1990 to 2005, while the national emissions rose by only 16% during the same period.<sup>82</sup> The principle sources of Colorado's GHG emissions are electricity use and transportation, accounting for about 37% and 23% respectively. This trend is largely due to rapid population and production growth within the State.

Acknowledging this significant issue, the State has adopted a Climate Action Plan and has called for new GHG emission vehicle standards.<sup>83</sup>

This project will support the State's efforts by eliminating 9,377 metric tons of GHG emissions between now and 2020.

**Project Is Designed to Minimize Impacts and Maximize Benefits to the Environment** The design chosen in the FEIS process for this project has several tangible environmental benefits.<sup>84</sup>

- minimized footprint -- thereby minimizing right-of-way acquisition and minimizing the environmental impacts to resources such as wildlife, wetlands and open water
- improved air quality – due to improved traffic flow from relieving the I-25 bottleneck
- reduced greenhouse gas emissions – due to improved traffic flow and less vehicle delay

- reduced dependence on oil -- less vehicle delay also results in less gas consumption
- improved quality of stormwater runoff – water quality retention ponds will be built where they don't currently exist

### **Commitment to Sustainable Construction Practices**

CDOT is committed to energy-saving construction practices that reuse concrete and pavement material whenever possible. Adopted CDOT paving standards allow up to 25% of asphalt to be comprised of recycled materials. This policy resulted in 80,000 tons of recycled asphalt pavement used on Colorado state highways in 2008.<sup>85</sup>

Similarly, concrete materials removed from the deteriorated structures will be recycled and used for roadway embankment and shoulders. Energy-efficient light bulbs will be used in signals and lights in the project area. And the use of more durable pavement will be considered to minimize the frequency of maintenance-induced traffic delays and material consumption. Steel pulled from the bridges will be recycled as well.

### v. **Safety:**

Project will reduce the number, rate and consequences of crashes, injuries and fatalities among drivers

### **Project Corrects Serious Deficiencies and Minimizes Emergency Repairs**

The Valley Highway FEIS identified several serious deficiencies in the freeway needing improvement for safety reasons

In 2005, a national think tank ranked I-25 in this location as the 2<sup>nd</sup> most stressful roadway in Colorado due to operational and safety issues (Heartburn Highways).<sup>86</sup> As a result of the current deficiencies, crash rates at the I-25/ US 85 intersection are much higher than other similar sections of freeway. Reported crash data from 2002 – 2004 indicated over 280 crashes occurred here, 46 of those resulting in injury.<sup>87</sup> CDOT has identified this location as being a Level of Safety Service (LOSS) IV with high reduction in crashes possible with roadway improvements.<sup>88</sup>

Upon completion of the project, CDOT estimates that the number of crashes will be reduced by about 25% at this location, avoiding both injury and property damage that would otherwise result. This reduction in accidents is estimated to save roughly \$2 million per year in auto repair and other property damage and personal injury costs.

Specifically, accident reduction is anticipated for the following reasons:

- Mainline accident reduction is expected to occur due to replacing left side merges with right side merges and removal of the 6-lane bottleneck
- Through intersection improvements, the frequency of approach turn accidents will be reduced by 100% at the northbound off ramp intersection

An estimated 24 fewer vehicle accidents per year will occur as a result of proposed improvements.

- Through merge and weaving section improvements at the northbound I-25 to northbound Santa Fe merge accidents will be reduced by 80% due to reduced lane change movements.

In April 2010, an inspection of the bridges resulted in emergency repairs to the bridge deck due to deteriorating concrete. Several lanes were closed while CDOT repaired a 5-foot by 5-foot hole that appeared overnight in the northbound bridge. The bridge deck was shored with wooden timbers, and remains shored today. The inspection revealed that additional repairs would be needed over the next three to five years if the bridges could not be replaced immediately. This month, CDOT will complete additional repairs costing approximately \$400,000. Future repairs costing the Department several million dollars are likely if full-funding to replace the bridges is not secured very soon.

## **B. Job Creation and Economic Stimulus:**

This \$61 million project is ready to proceed, and would create an estimated 660 new jobs immediately upon receipt of a TIGER II Discretionary Grant. As evidenced by the schedule in Section IV below, final design of the proposed improvements is well underway with project advertisement anticipated in early 2011. A more detailed construction schedule is provided in Appendix C and was used to calculate the number and timing of direct, indirect and induced jobs attributable to this effort. Using the methodology cited in the TIGER II Notice of Funding availability, where \$92,000 in project cost is estimated to result in one job-year this project is estimated to create 663 jobs over the next several years.

Type of Jobs Created	Number of Jobs Created
Direct or indirect jobs	424
Induced Jobs	239
<b>TOTAL JOBS CREATED</b>	<b>663</b>

The project will adhere to CDOT policies that require implementation of best practices consistent with civil rights and equal opportunity laws, maximizing small and disadvantaged business participation. Based on the type of work skills needed for this type of project, CDOT anticipates that the project DBE goal will be between 10-15%. CDOT's Business Programs Office will conduct extensive outreach to regional community-based organization, such as county workforce development centers, connecting disadvantaged workers with economic opportunities. An on-the-job training program will also be in place for this project.

## **C. Innovation:**

CDOT has recent positive experience with and will consider using innovative project delivery methods such as soliciting bids with additional requested elements. Experience shows that these innovative contracting methods ensure cost effective delivery of the desired project scope.

As earlier noted, CDOT will also consider the use of more durable pavement materials for this project in an effort to minimize material consumption and reduce traffic delays resulting from scheduled maintenance cycles.



## **D. Partnership:**

### **vi. Jurisdictional & Stakeholder Collaboration:**

#### **Project Has Significant State Funding**

The Colorado Transportation Commission and CDOT pledged a \$51 million of state funding for this project. Only \$10 million is needed to close the funding gap and deliver critical safety and mobility improvements to the heavily travelled I-25 corridor.

#### **Proposed Improvements were Identified Through Extensive Public Outreach and Participation.**

An extensive public outreach and involvement program was implemented as part of the Valley Highway FEIS process. Public outreach included periodic newsletters sent to a mailing list of over 20,000 residents and businesses in the neighborhood. Due to the high concentration of Latin American residents in the immediate vicinity of the project, newsletters were written in both Spanish and English.<sup>89</sup>

Public meetings were held at key points in the EIS process, including 13 meetings with a citizen working group, 10 public workshops and door-to-door visits with area residents. Translation services were offered at each of the public meetings, through the project hotline, and on the project website. The project team held special meetings for non-profit and community organizations providing services for low-income and minority populations.<sup>90</sup>

Every effort was made to ensure that everyone living in the project area, including low-income and minority populations, received information about the project and were afforded the opportunity to voice their questions and concerns. In particular, the project team tried wherever possible to minimize land acquisitions needed for the proposed improvements. A review of environmental justice during the FEIS process found that minority and low-income populations had full and fair participation in the NEPA process, that all populations in the project area would share equitably in the benefits of the proposed improvements, and that the project would not result in disproportionate adverse impacts to low-income or minority populations.<sup>91</sup>

#### **Project Cannot be Completed Without Federal Assistance**

Not unlike other states, CDOT has experienced a dramatic decrease in funding in recent years due to declining gas tax revenue and elimination of the state general fund for transportation. From 2005 to 2009, CDOT's budget has decreased by \$850 million, absent Recovery Act funds. The resulting budget is equivalent to the buying power the Department had in 1983.

In 2009, there was a ray of hope when the State Legislature established a Colorado Bridge Enterprise with the goal of replacing all of Colorado's "poor" bridges within an expedited timeframe. The FASTER legislation created a new funding source derived from vehicle registration and other fees to pay for the needed improvements. FASTER also gave the Bridge Enterprise authority to bond or utilize other financing mechanisms to replace the failing bridges. While portions of this project would be eligible to receive FASTER Bridge funding, the program is currently under legal challenge and may be significantly scaled back or eliminated in the November 2010 election. Given the uncertainty of the Enterprise and the immediate need to replace the failing I-25 /US 85 bridge, waiting for funds from the Bridge Enterprise program is not a viable option.

The I-25 / Santa Fe Interchange project is one of that state's highest priorities for completion. However, due to funding shortfalls, we have been unable to deliver the project on our own. Until just recently, CDOT was resigned to building the I-25 / US 85 bridges and ramp improvements in two projects over time due to lack of funding. The result – a clumsy and more costly process for completing the needed improvements.

Funding from the HIRE Act, however, recently created an opportunity for CDOT to complete these improvements in one single project saving time and money, as well as minimizing impact to the travelling public. That opportunity would deliver the important safety and mobility improvements in this corridor 2 years ahead of schedule.

- The HIRE Act provided CDOT's Metropolitan Denver Region with \$51 million.
- A TIGER II discretionary grant of \$10 million would make this \$61 million project a reality.

vii. **Disciplinary Integration.**

The proposed improvements are the result of coordinated planning between the City and County of Denver (which recently confirmed its intention for adjacent land to be developed as mixed-use transit-oriented development), the Regional Transportation District (the regional transit operator that owns and manages the adjacent light rail stations), and the Colorado Department of Transportation. CDOT has met with private developers interested in the adjoining parcels on an ongoing basis for the past several years.

Support letters from CDOT's partners in this project are attached in Appendix I.

**E. Evaluation of Projected Costs / Benefits:**

CDOT prepared a Mega-project Financial Plan for the Valley Highway FEIS Phase I ROD scope of work and received FHWA's approval of the document in the fall of 2009. Schedule and funding assumptions for the I-25 improvements addressed in this application were included in the scope of that document. In the Finance Plan, full funding for the improvements was not anticipated until after FY 2014. The financial plan also assumed that improvements proposed in this application would need to be completed as two separate construction projects over time due to funding constraints.

Due to unexpected revenue received from the HIRE Act earlier this year, CDOT has nearly closed the funding gap needed to complete these improvements ahead of its original schedule. This application requests \$10 million to complete the \$61 million funding package needed to combine the two project stages and advance their completion two years earlier than initially envisioned in the corridor financial plan.

The Benefit Cost analysis attached as Appendix B focuses on the benefits attributable to advancing the construction and combining the two construction phases. The analysis compares costs and benefits between now and 2020 of the two project delivery scenarios: 1) project advanced with TIGER funding two years earlier than planned, and 2) more costly project constructed later without TIGER funding. The difference of the costs in the two scenarios was compared to the difference in benefits of the two scenarios to determine the net benefit/cost of delivering the project sooner. The analysis yields in excess of 4:1 ratio of benefits to costs.

## Summary of Project Benefits and Costs

	With TIGER II	Without TIGER II	Difference
<b>Benefits</b>	\$52,782	\$36,058	\$16,724
<b>Costs</b>	\$29,552	\$25,622	\$3,930
<b>Benefit / Cost Ratio</b>			<b>4.26</b>

The benefits quantified between now and 2020 include:

- Advancing the project and combining the two efforts reduces the overall capital construction cost in current year dollars by \$4 million.
- 1,171,893 hours of travel time saved for personal trips, business trips and commercial vehicle trips values \$21,023,760.
- 9,377 metric tons of reduced Greenhouse gas emissions between now and 2020 valuing \$309,437.
- Fuel savings due to reduced travel times value \$2,050,095.
- Accident reductions account for \$11,328,648 in benefit due to reduced property damage and cost to treat injuries.
- Elimination of costly bridge repairs in the next 3-5 years since the bridge will be reconstructed sooner saves \$1 – 2 million.
- More than 660 jobs created at the average regional salary of \$48,650 per year, a \$32,196,863 benefit.

The analysis assumes a 7% inflation rate and 7% discount rate. The project cost with TIGER II funding reflects the immediate cost savings of advancing the project. The net present value (NPV) of the cost is slightly higher with the combined project aided with the TIGER II funds than the project in separate phases under the timeline of the financial plan. The increases in the NPV of the benefits however are also higher with the difference in benefits being more than four times the difference in costs, demonstrating value in utilizing TIGER II funds to advance this important project. The immediate cost savings due to expedited construction, improvement of the system combined with the benefits to the local economy, air-quality and safety in a highly visible location make this project an excellent candidate for TIGER II funding.

Several less quantifiable benefits will result that are not included in the benefit cost ratio. For instance, the benefits of land use changes made more likely as a result of this project are not included. Those benefits could include long term economic stimulus and job growth as well as GHG reductions due to increased transit use.

Another benefit not calculated is the reduced likelihood of having to close two major freeways due to the structures potentially deteriorating to the point of being unsafe. While CDOT does not envision this becoming necessary in the immediate future, and will continue to take all precautions to prevent this, it is possible for the structures to deteriorate more rapidly requiring a temporary closure and expensive emergency project that would have a severe impact to over 200,000 vehicles a day driving in this stretch. Other factors not quantified here include wages paid to the workers employed as a result of the construction, all of which are benefits to the public.



**F. Evaluation of Project Performance:**

CDOT is committed to providing regular monitoring and reporting on the benefits of the I-25 / US 85 intersection improvements and proposes the following performance goals and measures. The measures below are an initial proposal.

Proposed Goals, Objectives and Performance Measures for first year of full operation:

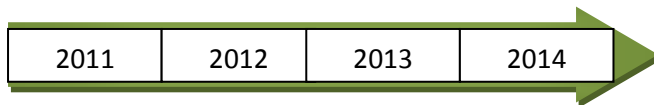
GOAL	OBJECTIVE	MEASURE	TARGET
Minimize delay to the travelling public during construction	Maintain the existing number of through lanes in each direction during construction	% of time existing number of through lanes maintained	95% of time during construction duration
	Schedule any required lane closures during off-peak periods on nights and weekends	% of time scheduled closures were during off-peak hours	95% of time during construction duration
Reduce vehicle delay to achieve time savings and reduced GHG emissions	Trip time less than current peak hour time	Current travel time compared to FEIS no-build peak hour trip time (minutes)	10 % less during first year of operation than FEIS no-build peak hour trip time
Improve safety of the bridge and interchange at I-25 /US 85	Reconstruct the bridge as one that is structurally sound	Structural Sufficiency Rating	No less than 50 for the first 50 years of 75 year design life
	Reduce Crash rates as a result of operational improvements	Current crash rates compared to most recent 3 year average Crash Rates	20-25% fewer annual crashes than recorded in most recent 3 year average.
Measure and report on performance of corridor to assist with future projects.	Provide annual reports on system performance for at least the first three years of operation.	% time annual reports are prepared and provided to FHWA for information	100% annual reports submitted

## IV. Project Readiness and NEPA

### A. Project Schedule

With TIGER grant, Stages 1.2 and 1.3 are constructed together as proposed with project completion accelerated by two years.

- Complete Final Design January 2011
- Advertise for Construction March 2011
- Notice to Proceed May 2011
- Construction Complete ~42 months later in Fall 2014



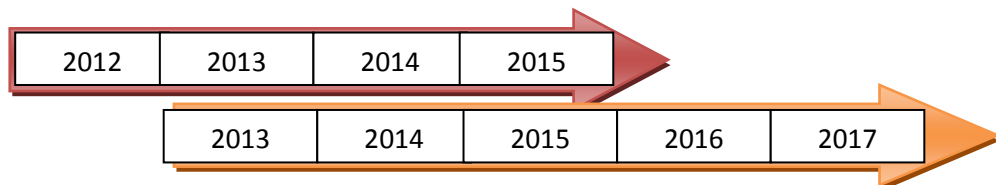
Without TIGER grant – Stages 1.2 and 1.3 constructed sequentially, takes approximately two years longer to complete.

Stage 1.2 (NB US85 to NB I-25 Flyover):

- Complete Final Design February 2012
- Advertise for Construction August 2012
- Notice to Proceed October 2012
- Complete Construction ~30 months later in Spring 2015

Stage 1.3 (Replace I-25/Santa Fe bridges):

- Complete Final Design April 2013
- Advertise for Construction November 2014 (following completion of 1.2)
- Notice to Proceed January 2015
- Complete Construction ~ 30 months later in Spring 2017



### B. Environmental Approval

The I-25 Valley Highway Final Environmental Impact Statement was signed November 2006. Phase I ROD was signed June 2007.<sup>92</sup>

An individual Clean Water Act Section 404 permit may also be required prior to construction from the U.S. Army Corps of Engineers, depending on the total area of wetlands and other waters of the U.S. that would be impacted by the project. A Clean Water Act Section 401 water quality certification will also be required if an individual Section 404 permit is required.

SB 40 certification from the Colorado Division of Wildlife may also be required based on final design plans. A Stormwater Management Plan permit from the Colorado Department of Public Health and Environment will be required along with permits for permanent water quality features prior to construction.

No other environmental clearances or permits are anticipated.

### **C. Legislative Approvals**

No legislative approvals are needed to deliver this project. The Colorado Transportation Commission is fully supportive of completing the reconstruction of this bridge and associated interchange improvements. In May of 2010, the Commission allocated \$51 million from Colorado's share of the HIRE act funding for transportation to CDOT Region 6 with the requirement that it spend at least \$39 million of that amount on this project.<sup>93</sup>

This application is for TIGER II grant funds, not for TIFIA loan funding, as the State of Colorado is prohibited from entering into debt without specific voter approval. Article X Section 20 of the Colorado Constitution prohibits governmental entities from incurring multiyear debt under most circumstances. Within the meaning of the Colorado constitution, a TIFIA loan constitutes debt. Accordingly, there are only two circumstances where a Colorado applicant can utilize a TIFIA loan. The first is the applicant has an enterprise based plan which includes a fee based repayment source. The second, if there is time between the TIFIA loan offer and subsequent regularly scheduled election prior to the September 30, 2012 obligation date the entity would have to place the question of accepting and repaying the TIFIA loan on the ballot.

### **D. State and Local Planning**

- I-25 / US 85 interchange reconstruction is included in the Denver Regional Council of Governments' (DRCOG) 2035 Fiscally Constrained Long Range Transportation Plan, as adopted January 2009 and amended January 20, 2010.<sup>94</sup> *(See page 1 of Appendix 4 to the Plan for a list of fiscally constrained highway improvements included.)*
- Action to include the project in the current DRCOG Transportation Improvement Program is in process. \$51 million will be shown as programmed to this project from the CDOT Region 6 share of HIRE act funding mentioned above. Balance of funding for this \$61 million project is requested with this grant application.
- Interchange Modification approval April 19, 2007 by the Colorado Transportation Commission.<sup>95</sup> Interstate Access Request approval by FHWA August 1, 2007<sup>96</sup> (see discussion below).

### **E. Technical Feasibility**

This Project is technically feasible, evidenced by the Colorado Transportation Commission (TC) and the Federal Highway Administration (FHWA) review and approval of the project scope in 2007. The TC approved the proposed improvements following its Policy Directive



No. 1601 for State Highway System Interchange Modification Requests on April 19, 2007.<sup>97</sup> FHWA approved the Interchange Access Request for the facility on August 1, 2007.<sup>98</sup> Both approvals were based on analysis in the FEIS and a System Level Feasibility Study that was conducted in the spring of 2007.

CDOT staff is in the process of completing final design for the project, anticipated to be fully complete at the end of 2010.

As prerequisite to beginning construction on the I-25 / Alameda Avenue Interchange project, CDOT completed a Mega-project Financial Plan for improvements identified in the Phase I ROD. The Financial Plan includes phasing and funding assumptions for this project and was approved by FHWA in October of 2009. (Appendix D)

#### **F. Financial Feasibility**

\$51 million has already been secured by CDOT for this \$61 million project. With this application, CDOT is seeking the \$10 million balance in order to close the funding gap on this important bridge replacement and interchange reconstruction project.

#### **v. Federal Wage Rate Certification**

The Colorado Department of Transportation will comply with the requirements of subchapter IV of Chapter 31 of Title 40, United States Code (Federal wage rate requirements) as required by the FY 2010 Appropriations Act.

Signed: \_\_\_\_\_  
Russell George  
CDOT Executive Director

Date: \_\_\_\_\_

#### **VI. Material Changes from the Pre-application**

None.



\$10 Million for Critical Safety and Mobility Improvements in Denver, Colorado

# ENDNOTES

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