

**Appendix F.**  
***Land Use, Socio-Economics, and Environmental Justice***  
***Technical Memorandum (HDR, 2015)***



**NORTH**



120TH AVENUE TO SH 7



# Land Use, Socio-Economics, and Environmental Justice

# Technical Memorandum





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## 1.0 INTRODUCTION

### 1.1 Purpose of Document

The *North I-25 Final Environmental Impact Statement* (FEIS) (CDOT, 2011) detailed the existing and future land use, social, economic, and environmental justice conditions in the North I-25 study area. Updated city, county, and metropolitan planning organization (MPO) planning documents have been reviewed to prepare this technical memorandum in support of the Record of Decision2 (ROD2) for the ROD2 Selected Alternative portion of the 2011 FEIS Preferred Alternative.

### 1.2 Description of the ROD2 Selected Alternative

The ROD2 Selected Alternative is located north of Denver, Colorado, on Interstate 25 (I-25) between 120th Avenue and SH 7. The project includes the addition of an Express Lane on I-25 in each direction between the project limits. This technical memorandum updates the findings in the *North I-25 Record of Decision1 (ROD1)* (CDOT, 2011), and documents the environmental analyses for all improvements that are a part of the ROD2 Selected Alternative. The ROD2 Selected Alternative shown in Figure 1 is described as follows:

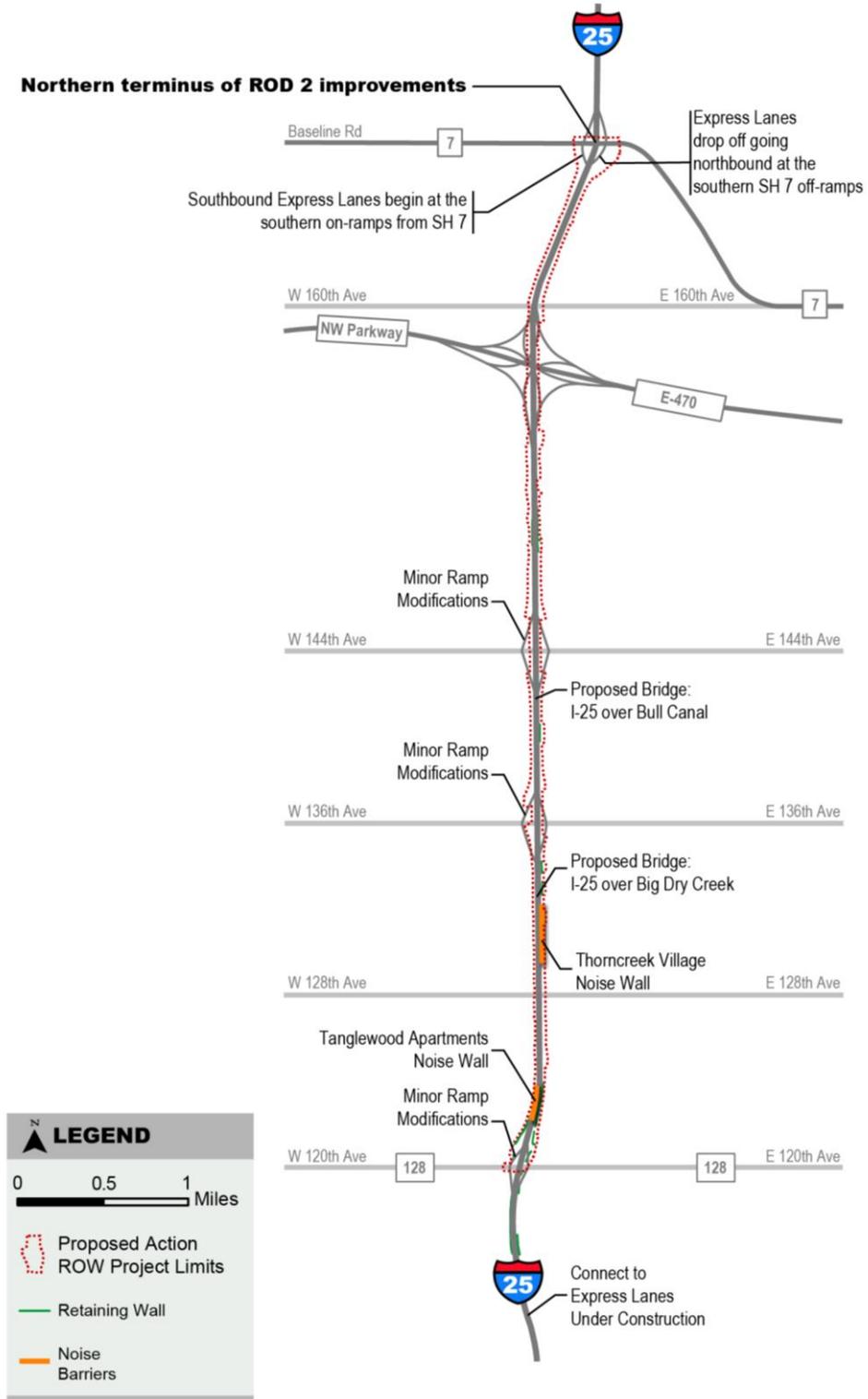
The ROD2 Selected Alternative consists of adding one buffer-separated Express Lane in each direction of I-25 from just south of 120th Avenue to SH 7. The Express Lanes would be separated from the existing general-purpose lanes by a painted 4-foot lane marking. The new Express Lanes would connect to the express lanes that are currently under construction just south of 120th Avenue. The widening of I-25 would occur to the outside shoulder because the existing cross-section does not include a median; a concrete barrier separates the northbound and southbound lanes. Interchange configurations, water quality features, drainage improvements, retaining walls, and express bus station configurations are all planned to be identical to the design developed for the Preferred Alternative in the *North I-25 Final Environmental Impact Statement* (CDOT, 2011).

## 2.0 CHANGES IN LAWS, REGULATIONS, AND GUIDANCE

There are no changes to regulations for land use, social, and economic conditions since the publication of the North I-25 ROD. However, since that publication, the 2010 U.S. Census (Census) was released and updates to social, economic, and environmental justice Census figures are included in this technical memorandum.

There have been new regulations and guidance issued for environmental justice since the 2011 FEIS. This analysis considered the following changes in guidance and regulations for environmental justice. *FHWA Guidance on Environmental Justice and NEPA*, signed on December 16, 2011, supplements FHWA Technical Advisory 6640.8A, and provides guidance on the process for addressing Environmental Justice, Title VI, and Limited English Proficiency (LEP). This guidance includes the documentation requirements for NEPA studies and directs the analysis to consider only those adverse effects that remain after mitigation is considered when evaluating disproportionately high and adverse effects. On May 2, 2012, DOT Order 5610.2(a) was issued. On June 14, 2012, FHWA Order 6640.23A was issued. The most current NEPA Manual was released in October 2014.

Figure 1. North I-25 ROD2 Selected Alternative



The DOT and FHWA Orders provided new information relative to the considerations to be used to determine “adverse impact.” In accordance with FHWA Order 6640.23A, definition 5.f of this order defines Adverse Effects as:

**5.f. Adverse Effects.** The totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of human-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of, benefits of FHWA programs, policies, or activities.

Another change in guidance has occurred according to the updated CDOT NEPA Manual. The updated Manual reflects the most current policies, regulations and processes available as of October 2014. This update includes:

*Census data should not be used as conclusive evidence that there are no affected minority or low income populations. Additional sources of information should be used to supplement census data and further refine identification of the presence of minority and low income populations.*

## 3.0 EXISTING CONDITIONS

### 3.1 Summary of 2011 FEIS Conditions

**Land Use:** The 2011 FEIS described the land uses along I-25 between Denver and SH 7 as quickly developing residential and commercial uses interspersed with the remaining agricultural land uses. Most all agricultural land uses adjacent to I-25 (between US 36 and SH 7) would likely be converted to commercial and residential uses, with some land set aside for open space or recreation. The 2011 FEIS stated this area is becoming an extension of the Denver metropolitan urbanized area.

**Zoning:** The majority of zoning along I-25 is agricultural and low-density residential, although there are enclaves of land zoned medium-density residential. Within the municipalities, there is a mix of parks and open space, industrial, commercial, and higher density residential zoning.

**Social Conditions:** The North I-25 2011 FEIS used the 2000 Census and stated the population within 0.5 mile of the I-25 corridor in the Preferred Alternative (between SH 1 and Denver) is expected to increase by 88 percent between 2005 and 2035 (from 43,536 in 2005 to 81,764 in 2035). The growth is a result of a large supply of developable land, easy access to I-25, and locally planned development.

**Economic Conditions:** The North I-25 2011 FEIS stated the largest increase in employment is expected to occur in the I-25 corridor (between SH 1 and Denver) where an increase of 301 percent is expected to occur within 0.5 mile of the highway (31,942 jobs in 2005 to 128,233 in

2035). The 2011 FEIS described substantial development in Westminster, where several commercial centers and big box retailers were currently under construction along I-25. One of these is The Orchard at Westminster, an open-air entertainment, retail, residential, and office center at 144<sup>th</sup> Avenue and I-25.

**Environmental Justice:** The 2011 FEIS stated minority populations are primarily located in and around urban areas in the regional study area, and that low-income populations residing along the I-25 corridor appeared to be concentrated in the Fort Collins and Denver County portions of the 2011 FEIS study area. Zeroing in to the segment of I-25 between 120th Avenue and SH 7, higher concentrations of minority and low-income populations appeared south of 120th Avenue. The 2011 FEIS used the 2000 Census. The City and County of Broomfield was officially formed on November 15, 2001; therefore, 2000 Census data is not available for the County of Broomfield. In the counties accessing I-25 between 120th Avenue and SH 7, minority and low-income populations in 2000 are represented as minority percent/low-income percent in the following detail: Adams County 37 percent/20 percent; Weld County 30 percent/21 percent; Boulder County 16 percent/25 percent; Denver County 48 percent/30 percent. Broomfield County percentages are not available as it was not a county in 2000. The 2011 FEIS summarized a business survey taken in the FEIS study area, which showed that approximately 17 percent were minority-owned businesses. Transportation concerns including long commutes, high fuel prices, and a need for public transportation were voiced by the minority-owned businesses.

## 3.2 Changes since the 2011 FEIS

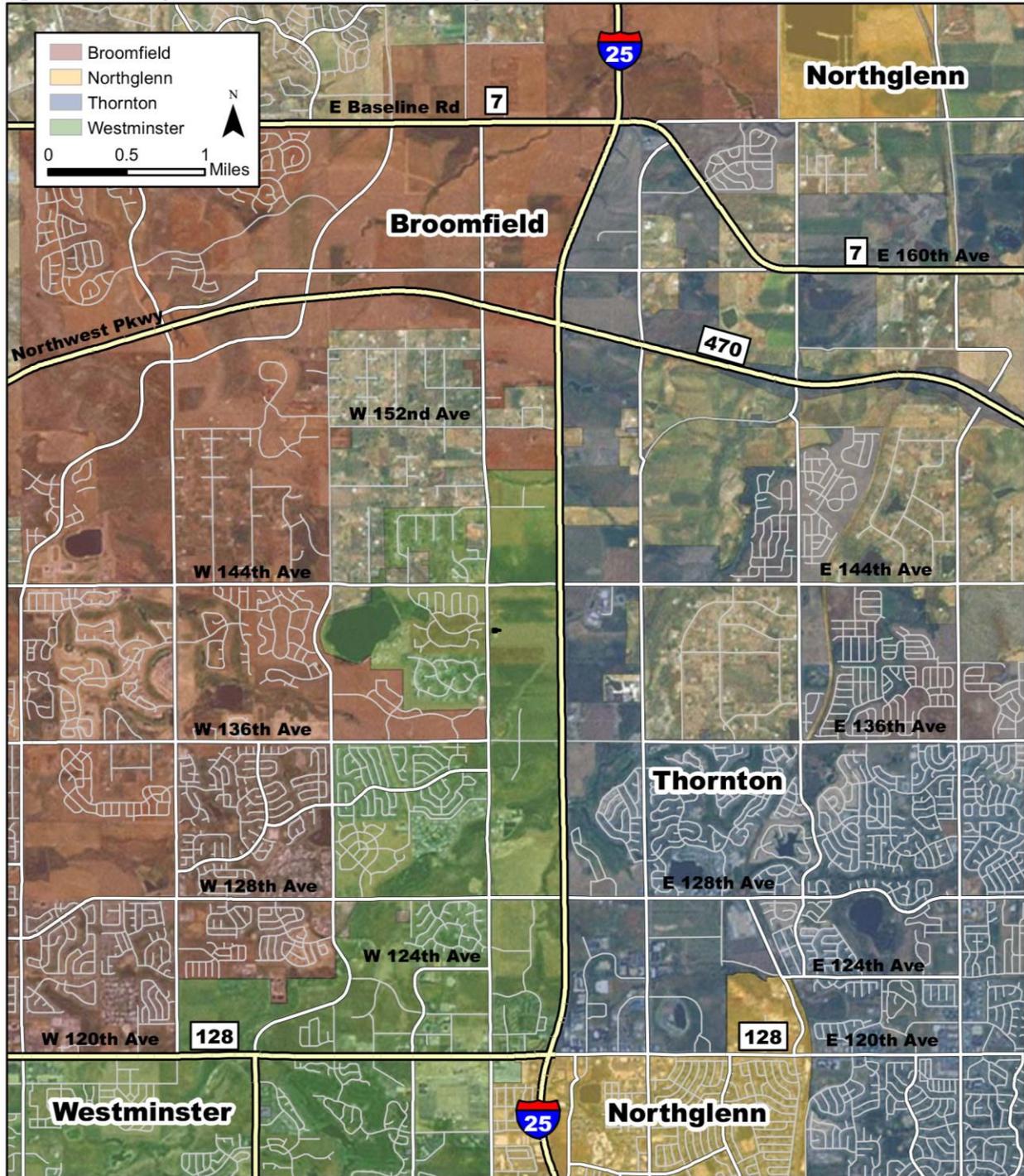
### 3.2.1 Land Use

Figure 2 shows current municipal boundaries. Compared to municipal boundaries as illustrated in the 2011 FEIS, both Westminster and Thornton have expanded their boundaries. The City and County of Broomfield, which had previously been located in four counties, passed an amendment on November 3, 1998, giving the city a three-year transition period in which to create the City and County of Broomfield. This officially took effect on November 15, 2001, when the City and County of Broomfield became Colorado's 64th county. Consequently, 2000 Census data is not available for the County of Broomfield.

The existing land uses in this segment of I-25 have changed noticeably from the existing land uses at the time the 2011 FEIS was written. There are new commercial developments on both sides of I-25 (see Figure 3 through Figure 5). There is a new hospital and medical campus that is partially open to business and partly still under construction. New residential development has already occurred. Tanglewood Creek Open Space was not documented in the 2011 FEIS but is now included in the ROD2.

Existing land use designations in the ROD2 project area generally remain the same as reported in the 2011 FEIS. An online review of city and county comprehensive plans was undertaken to develop a detailed understanding of specific land developments for the North I-25 ROD2. Table 1 summarizes the updates to comprehensive plans since publication of the 2011 FEIS. Approved and proposed developments are illustrated in Figure 6.

Figure 2. Municipal Boundaries in the ROD2 Study Area



Source: HDR Engineering, Inc.

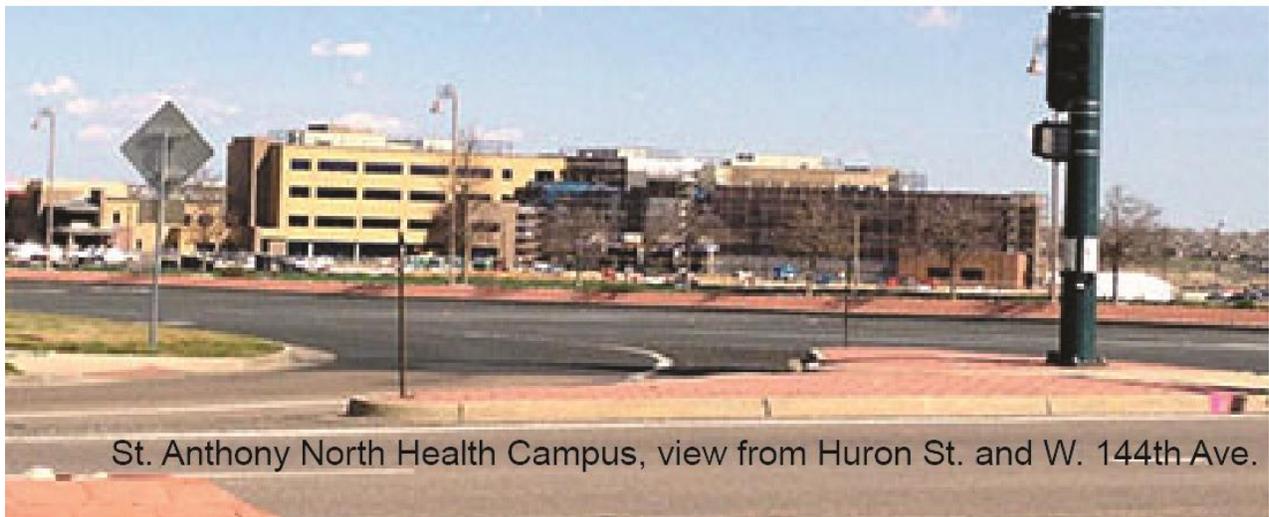
Figure 3. The Orchard (McWhinney) Residential Development near Huron Street and West 149th Avenue



Figure 4. Murphy Oil at The Grove, East 144th Avenue at I-25 in Thornton



Figure 5. St. Anthony North Health Campus at West 144th Avenue and I-25 in Westminster



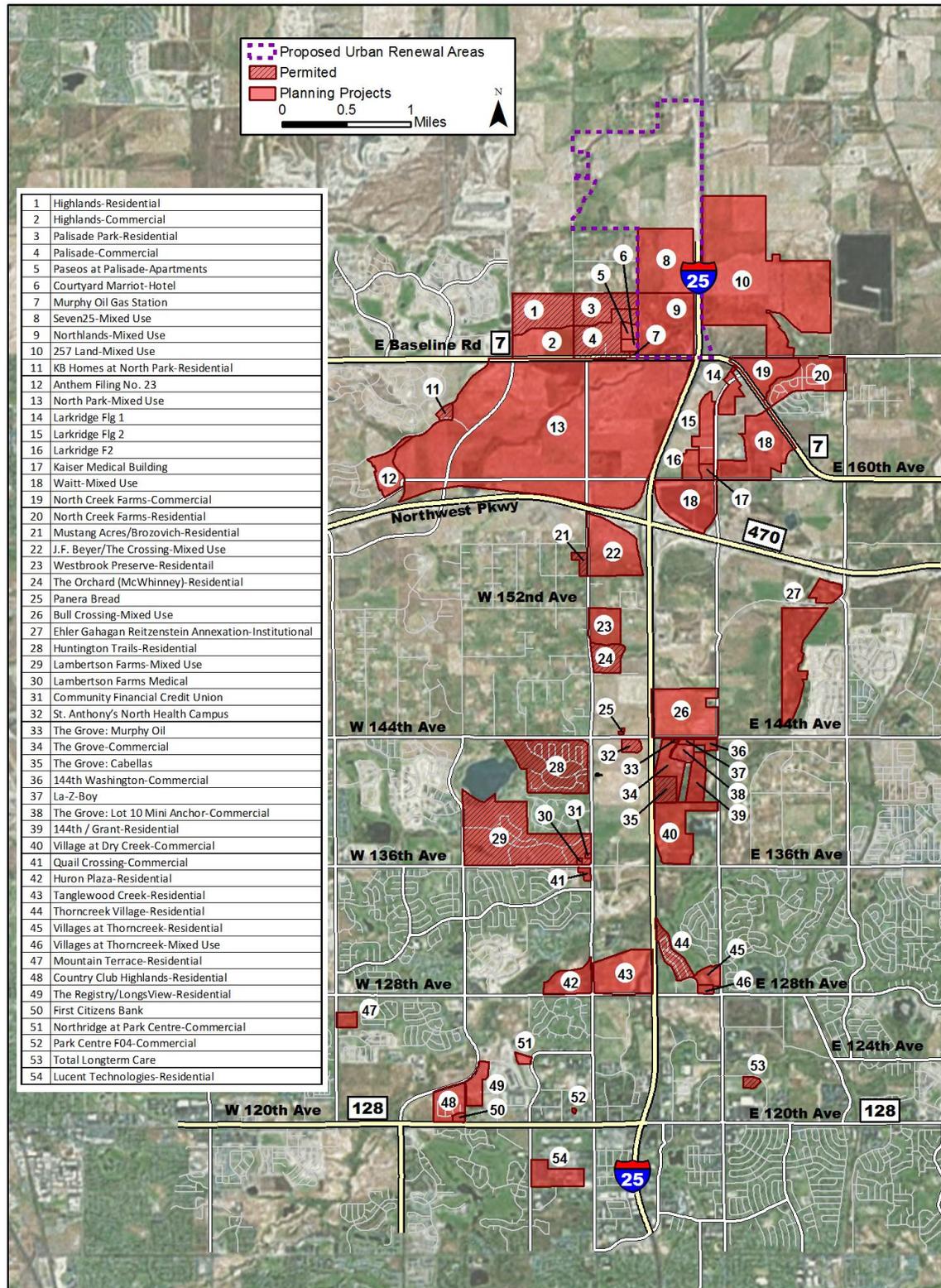
**Table 1. Comparison between the 2011 FEIS and ROD2 Comprehensive Plans**

Jurisdiction	Year of Comprehensive Plan	Changes in Land Use
Adams County	2012 Comprehensive Plan	<p>2012: No updates from 2004. Adams County’s designation of Activity Centers along Washington Street would be supported by a future Urban Village land use designated by Thornton north of E 144th at Washington.</p> <p>A 2008 study entitled Weld/Adams County Line Crossroads Alignment Study is incorporated into the 2012 Comprehensive Plan. The purpose of this study was to examine realignments of numerous north/south roads east of I-25 along 168<sup>th</sup> Avenue.</p>
Broomfield City and County	<p>2011 Comprehensive Plan Amendments</p> <p>2014 Comprehensive Plan Amendments</p>	<p>2011: The current land use designations surrounding the E-470 and I-25 interchange include Community Commercial with an Urban Growth Boundary overlay over Transitional Residential (one dwelling unit-per-acre density lots intended to provide development transitions between Rural Residential and Non-Residential sites). Per Broomfield’s Proposed Urban Renewal Map posted online in 2013, the Community Commercial land use designations remain in place. The current zoning for Urban Renewal and planned unit development (PUD) would accommodate these land uses.</p> <p>2014: In September 2014, a dozen amendments were added to the previous list of amendments. Two new PUDs are now approved:</p> <ol style="list-style-type: none"> <li>1. (8-28-2012) Approval of the Northlands PUD— Amendment No. 1, the 23<sup>rd</sup> Amendment to the Comprehensive Plan, and the I-25 Sub-Area Plan.</li> <li>2. (10-22-2013) Approval of the 31<sup>st</sup> Amendment to the Comprehensive Plan, an Amendment to the I-25 Sub-Area Plan, Palisade Park PUD Plan Amendment No. 3, Filing No. 1 Site Development Plan Amendment, Filing No. 3 Site Development Plan, Filing No. 3 Final Plat, and a Subdivision Improvement Agreement.</li> </ol> <p>Source:  <a href="http://www.broomfield.org/DocumentCenter/View/9321">http://www.broomfield.org/DocumentCenter/View/9321</a></p>
Denver City and County	<p>2000 Comprehensive Plan</p> <p>2002 Blue Print Denver</p>	<p>2002: No updates from 2000</p>
Thornton	2012 Comprehensive Plan	<p>2012: The current Vacant, Agricultural and Commercial land uses intermittently spaced immediately adjacent to the east side of I-25 between E-470 and E 120th Avenue would undergo land use changes in several areas according to the 2012 Comprehensive Plan for future land uses. Proposed are</p>

**Table 1. Comparison between the 2011 FEIS and ROD2 Comprehensive Plans**

Jurisdiction	Year of Comprehensive Plan	Changes in Land Use
		<p>Regional Commercial and Employment Center land uses east of the entire length of I-25 between E-470 and E 136th Avenue, and again between E 128th and E 120th Avenues. Between E 136th Avenue and E 128th Avenue, Gateway/Mixed Use, High Residential, and Institutional uses are proposed. Current zoning in these areas are either Regional Commercial or Business Park. The current zoning in the SE quadrant of I-25 and E-470 is Planned Development.</p> <p>Further, a future Urban Village land use replaces a current Residential Estate land use north of E 144th and east of N Washington St in an area zoned as Business Park. A Gateway/Mixed Use land use in an area zoned Business Park is proposed adjacent to Parks and Open Space land uses SE of E 136th and I-25 in the Big Dry Creek Corridor.</p>
Northglenn	2010 Comprehensive Plan	No updates since 2010
Westminster	2013 Update Comprehensive Land Use Plan (CLUP)	<p>2013: The current Commercial, Vacant, and Agricultural land uses intermittently spaced immediately adjacent to the west side of I-25 between W 152nd and W 120th Avenues over to Huron Street would undergo land use changes according to the 2013 Update to the CLUP. Proposed from north to south are Residential-18, Mixed Use, Office/RD Low, Office/RD High, Retail Commercial, Public/Quasi Public, Residential 3.5, Public Park, and more Mixed Use, ending at the north side of W 120th. South of W 120th at Huron Street, a Mixed Use Center is proposed.</p> <p>Current zoning in this strip is mostly PUD interspersed with Transitional zoning south of W 128th Avenue. Current zoning would accommodate the current and proposed land uses.</p>

Figure 6. Current North I-25 Permitted-Planned Development in ROD2 Study Area



Source: HDR Engineering, Inc. Compilation of Development in ROD2 Study Area

While the details about specific land developments were not listed in the 2011 FEIS, inclusion of them in this technical memorandum provides greater insight into the magnitude of travel demand expected in the I-25 corridor. None of these projects, except for two commercial developments in Thornton, Larkridge Filings 1 and 2, were included at the time of the 2011 FEIS.

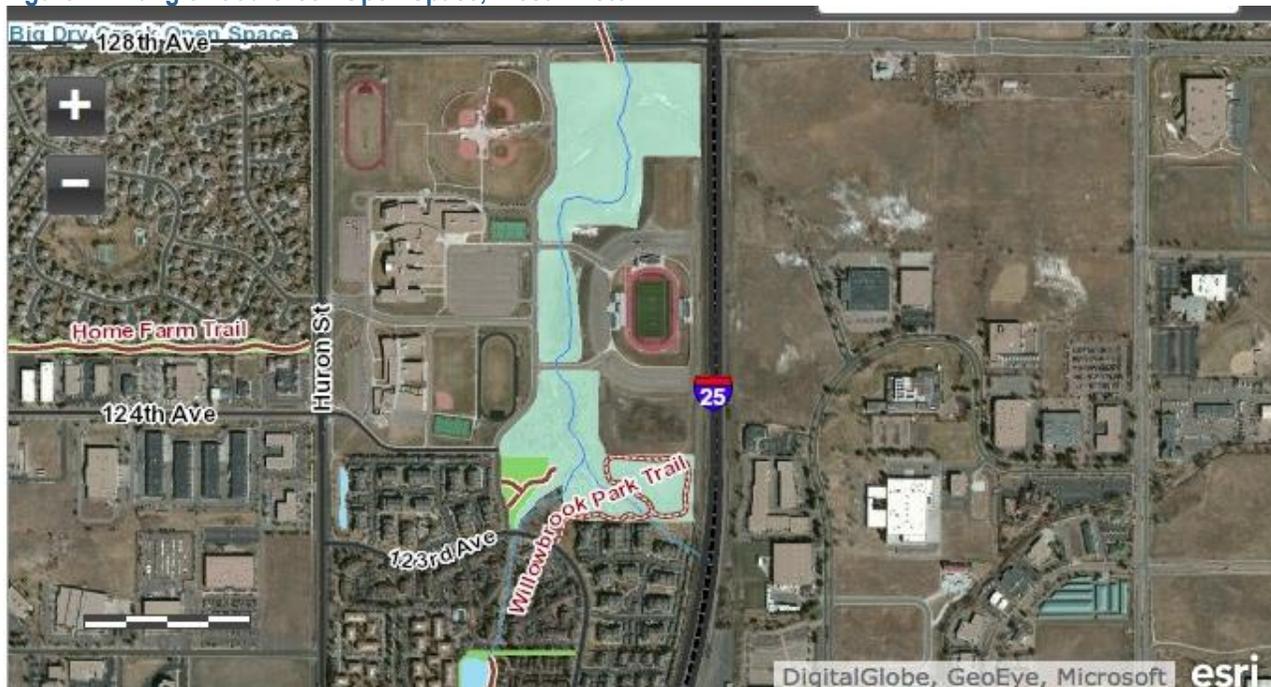
Westminster has approved more than 558 residential units, Broomfield has approved more than 12,900 residential units, and Thornton has approved more than 876 residential units. This totals more than 14,866 residential units.

Westminster has approved 424,400 square feet of commercial development, including the construction of the St. Anthony North Health Campus. Broomfield has approved 24.9 million square feet of commercial development. The square footage Thornton has approved for commercial development is presently unavailable. This totals more than 25.3 million square feet of approved commercial development.

Tanglewood Creek Open Space in Westminster was not identified as an open space land use in the *North I-25 FEIS Technical Memorandum: Land Use Conditions and Impacts* (Jacobs Engineering, 2011). This 31.6-acre open space is located directly west of I-25 and north of West 120th Avenue, and generally follows the course of Tanglewood Creek (see Figure 7). This acreage was acquired by the City of Westminster in 1971 and 2007. A portion of the property was adopted as open space in 2009.

There are no changes from zoning included in the 2011 FEIS.

**Figure 7. Tanglewood Creek Open Space, Westminster**



### 3.2.2 Social Conditions

This ROD2 uses information provided by the 2010 Census, an update from the 2011 FEIS, which used 2000 Census data that were interpolated into 2005 data for reporting in the 2011 FEIS. Table 2 presents a comparison of the 2000 and 2010 Census data.

**Table 2. Comparison of 2000 and 2010 Census Data**

	2000 Census	2010 Census	Percent Change
Population	Adams, Boulder, Denver, Jefferson, Larimer, and Weld Counties, and Broomfield City total population = 2,207,539	Adams, Boulder, Broomfield, Denver, Jefferson, Larimer, and Weld Counties total population = 2,479,215	+12.3%
	Adams County and Broomfield City total population = 402,129	Adams and Broomfield Counties total population = 497,492	+23.7%
Employment	Adams, Boulder, Denver, Jefferson, Larimer, and Weld Counties, and Broomfield City, total employment = 670,540 <sup>a</sup>	Adams, Boulder, Broomfield, Denver, Jefferson, Larimer, and Weld Counties total employment = 1,277,066 <sup>b</sup>	+90.4%
	Adams County and Broomfield City total employment = 152,718	Adams County and Broomfield Counties total employment = 243,840 <sup>b</sup>	+59.66%

<sup>a</sup>2000 Census data interpolated to 2005 in the 2011 FEIS. Broomfield became a county in 2001; therefore data for the City of Broomfield are used to calculate 2000 population and employment data.

<sup>b</sup>2010 Census data uses the 5-year estimate by the American Community Survey (2008-2012)

As can be seen from data in Table 2, both existing population and existing employment are higher in 2010 than in 2000. In particular, employment in all seven counties has grown dramatically.

### 3.2.3 Economic Conditions

ROD2 employment increases are shown below. Recently approved and planned commercial and mixed-use development along North I-25 would add more opportunities for employment. The DRCOG *2040 Metro Vision Regional Transportation Plan* supports this by showing high employment concentrations along North I-25 in the study area.

Table 3 compares the increase in employment between 2005 and 2035 for the two counties in the study area. The 2011 FEIS data are contrasted to the newest DRCOG forecasted data, which uses the 2010 Census data. As indicated, data from the 2010 Census show much greater increases than were projected using the 2000 Census data.

**Table 3. 2005-2035 ROD2 County Employment Forecasts**

County	Employment as reported in the 2011 FEIS Table 3.3-1			Employment DRCOG data using 2010 Census					
	2005	2035	Change 2005-2035	2005	2010	2015	2015	2035	Change 2005-2035
Adams County (MPO area)	122,736	228,434	+105,698 (86%)	174,745	189,827	215,356	312,380	430,893	256,148 (146%)
Broomfield County	29,982	68,523	+38,541 (129%)	34,906	33,166	44,504	67,456	95,466	60,560 (173%)

Sources:

<http://gis.drcog.org/datacatalog/content/adams-county-community-profile>

<http://gis.drcog.org/datacatalog/content/broomfield-community-profile>

<http://gis.drcog.org/datacatalog/content/county-level-employment-forecasts-2010-cycle-2>

### 3.2.4 Environmental Justice

The study team prepared a new environmental justice analysis for CDOT in accordance with *FHWA Guidance on Environmental Justice and NEPA* (December 16, 2011), and *CDOT's National Environmental Policy Act Manual, Version 4* (CDOT, 2014). This new analysis used 2010 Census data. Methodology and results from this new analysis are contained in Appendix A. The new analysis confirmed the result in the 2011 FEIS which is that the only discernable low-income or minority population in this area is located south of 120th Avenue.

## 4.0 ENVIRONMENTAL CONSEQUENCES

### 4.1 Changes in Impacts since the 2011 FEIS

Changes in impacts to Land Use, Social Conditions, Economic Conditions and Environmental Justice are described below.

#### 4.1.1 Impacts to Land Use

##### Summary of 2011 FEIS Impacts

Direct impacts discussed in the 2011 FEIS conclude that the Preferred Alternative is compatible with existing land uses, zoning, and comprehensive plans. The right-of-way for the I-25 alignment has existed for many years. While in some locations residential and commercial development has encroached to within close proximity of the alignment, they have been planned with the knowledge of adjacent transportation uses. Adding one additional northbound and southbound

Express Lane on I-25 between SH 7 and US 36 could create some land use incompatibilities. Most of the corridor is lined with commercial uses and improvements would be compatible with this use.

#### Summary of ROD2 Impacts

Impacts as described in the 2011 FEIS still apply.

### 4.1.2 Impacts to Social Conditions

#### Summary of 2011 FEIS Impacts

In the entire I-25 portion of the 2011 FEIS Preferred Alternative, the population within 0.5 mile of it is expected to increase by 88 percent between 2005 and 2035 (from 43,536 in 2005 to 81,764 in 2035). This growth is a result of a large supply of developable land, easy access to I-25, and locally planned development. The need for additional highway capacity is a response to this growth and would not in and of itself result in increases or decreases in population.

Improvements in mobility could influence the distribution of population. As incorporated communities adjacent to I-25 become more accessible, they could attract residents, especially if opportunities for lower cost housing in the urban fringe continue. In these locations, the demand for new or expanded public services and facilities would increase. Impacts to transportation-disadvantaged populations (those populations without access to private transportation because of income, age, or disability) and the associated impact of tolling, community facilities and services, and neighborhoods include increased noise, air emissions, and visual impacts to residents near frontage roads, parking lots, bus routes, transit stations, and maintenance facilities.

Benefits include regional connections between communities and overall improvements in safety and mobility, particularly with the addition of the I-25 Express Bus. The express bus locations would be located off to one side of the interstate and there is a possibility for transit oriented development, which may result in slight increases in population and housing in the vicinity.

#### Summary of ROD2 Impacts:

The primary change in social impacts between what was described in the 2011 FEIS and what is anticipated to occur as a result of the ROD2 Selected Alternative is that the mobility improvements provided as part of the addition of the Express Lanes would occur sooner than was planned in the 2011 FEIS. In the 2011 FEIS, these improvements were not planned until after 2035. These improvements would provide a reliable travel time for bus patrons, car and vanpools and single or double occupant vehicles whose drivers choose to pay a toll.

The policy change related to number of occupants needed for a toll exemption has also changed since the 2011 FEIS. Vehicles with three or more occupants can now receive a toll exemption. For the 2011 FEIS, the assumption was that only two occupants were needed to receive a toll exemption. This will reduce the number of high occupant vehicles who can use the Express Lanes for free, forcing some of these vehicles into the general purpose lanes. For more information on changes to impacts on transportation resources from the 2011 FEIS to the ROD2, refer to the Transportation Technical Memorandum (CDOT, 2015), Section 4.3: Changes in Impacts.

Noise impacts specific to the ROD2 area were reviewed and show that noise impacts would still occur. CDOT defines the noise reduction design goal as the insertion loss that is predicted to result from a barrier that results in a 7 dBA noise reduction at a minimum of one benefited receptor. The opinions and desires of the benefited receptors must be considered in the evaluation of reasonableness of a noise barrier. A benefited noise receptor survey was conducted, and greater than 50 percent of the responding benefited property owners and residents desired a noise wall. Refer to the Noise Technical Memorandum (CDOT, 2015) for more details.

The analysis that was done of noise abatement feasibility and reasonableness shows that noise walls are feasible and reasonable in two locations: one adjacent to the Thorncreek Development which was identified in the 2011 FEIS and another adjacent to Tanglewood Multifamily Development.

The new noise wall located adjacent to Tanglewood Multifamily Development north of 120th Avenue and west of I-25 would result in visual impacts to the residents looking east from the Multifamily Development toward I-25 and for motorists on I-25 looking west. This noise wall was not included in the 2011 FEIS. Refer to the Other Resources Technical Memorandum (CDOT, 2015) for more details about visual impact.

### 4.1.3 Impacts to Economic Conditions

#### Summary of 2011 FEIS Impacts

Northbound and southbound Express Lanes would be added in sections of I-25 in the 2011 FEIS Preferred Alternative. To use the new Express Lanes, Express Lane users (except for those granted an exemption as described in the social impact section) would be required to pay for their travel, which would potentially impact discretionary income. Free travel lanes would continue to be maintained along I-25 and toll lanes would most likely be used judiciously, when users need to benefit most from reduced congestion. Therefore, impacts to discretionary income would be minimal. Additional capacity and reduced congestion would improve the flow of goods and services, facilitate commuter travel, and improve access to established businesses and major employment centers.

Employment is expected to grow regardless of whether highway improvements are implemented or not. Construction of the I-25 improvements would generate 8,050 temporary jobs over the construction period. Employment would be temporarily impacted by the relocation of businesses for right-of-way acquisition.

The proposed improvements would require additional land not within the right-of-way, which would result in a loss in the tax base and tax revenues for the respective counties. In locations where access would be improved or capacity added, property values would likely increase. It is also possible that property values could decrease in locations where proximity to improved transportation facilities would result in noise impacts, increased air emissions, visual impacts, or access changes resulting in out-of-direction travel. During construction, some detours, traffic delay, and out-of-direction travel would be required to reach businesses adjacent to work areas. Construction-related impacts would be greatest for businesses adjacent to interchanges where improvements are proposed. The businesses would potentially lose customers during construction.

Summary of ROD2 Impacts

The economic impacts remain primarily the same, except that because the construction is occurring sooner than planned in the 2011 FEIS, the indirect effect of those expenditures would also occur sooner. There would be no relocation of businesses as a result of the ROD2 Selected Alternative.

4.1.4 Impacts to Environmental Justice

Summary of 2011 FEIS Impacts

As described in the 2011 FEIS Impacts to Environmental Justice Populations section, adding Express Lanes would result in similar proximity impacts (noise, visual, property value, air emissions) to minority and low-income populations as adding general purpose lanes. By riding in a bus or in a carpool or vanpool, the Express Lanes would be available for free for minority and low-income populations. However, to use the new Express Lanes as a single or double occupant vehicle, a toll is required which could potentially impact discretionary income. The 2011 FEIS determined that Environmental Justice populations would be impacted by highway improvements; however, these impacts would not result in high and adverse effects to Environmental Justice populations.

Summary of ROD2 Impacts

No discernable minority or low-income populations are present within the ROD2 study area; therefore, the ROD2 Selected Alternative would not cause disproportionately high and adverse effects on any minority or low-income populations.

4.1.5 Summary of Changes

A summary of the impacts to socio-economic resources for the 2011 FEIS Preferred Alternative compared to the ROD2 Selected Alternative is shown in Table 4.

**Table 4. Impact Comparison between 2011 FEIS Preferred Alternative and the ROD2 Study Area**

Resource	2011 FEIS Preferred Alternative	ROD2 Selected Alternative
Land Use	Impacts as stated in 3.1.2.4 Preferred Alternative (upgrades generally compatible).  Tanglewood Creek Open Space was not identified.	Change in existing conditions: Tanglewood Creek Open Space designated.
Social Conditions	Impacts as stated in 3.2.2.4 Preferred Alternative	Mobility improvements (such as reliable travel times) are provided much sooner than planned in the 2011 FEIS. The policy related to number of occupants needed for a toll exemption has changed— vehicles with 3 or more occupants can now receive a toll exemption, which will force some vehicles into the general purpose lanes. No property displacements. Noise mitigation reduces

**Table 4. Impact Comparison between 2011 FEIS Preferred Alternative and the ROD2 Study Area**

Resource	2011 FEIS Preferred Alternative	ROD2 Selected Alternative
Economic Conditions	Impacts as stated in 3.3.2.4 Preferred Alternative	impact to impacted residences. Economic benefits of the mobility improvements are provided much sooner than planned in the 2011 FEIS
Environmental Justice	Impacts as stated in 3.2.4.3 Preferred Alternative	No minority or low-income populations were identified within the ROD2 study area.

## 4.2 Mitigation

A comparison of the mitigation described in the 2011 FEIS compared to the ROD2 is summarized in Table 5.

There was a mitigation measure in the 2011 FEIS that stated, "If toll lanes are constructed, ways to make tolling more equitable will be sought. For example, payment options will be considered to enable the broadest opportunity for all economic groups to use toll facilities. Alternate payment options will be provided so that persons who do not have a credit card can still participate in the tolled express lanes. Toll replenishment using cash or employer-based payroll deductions could also be included in the tolling program."

The Express Lanes implemented as a part of the ROD2 Selected Alternative use transponders for payment collection. These can be purchased at participating King Soopers or Safeway locations using cash, check, or money order, in addition to being purchased from the E-470 Authority with a credit card or check. Motorcycle tags and switchable transponders may only be purchased through the E-470 Authority directly. Monthly billings can be paid in the same manner. This variety of payment options meets the intent of the mitigation measure described in the 2011 FEIS.

All other mitigation measures from the 2011 FEIS and ROD1 remain the same.

**Table 5. Mitigation Comparison**

<b>Resource</b>	<b>Mitigation from 2011 FEIS/ROD1</b>	<b>Mitigation for ROD2</b>
Land Use	No mitigation required.	Same
Social Conditions and Environmental Justice	CDOT will provide advance notice to emergency service providers, local schools, homeowner associations, and the public of upcoming activities that are likely to result in traffic disruption. Such notifications will be accomplished through radio and public announcements, newspaper notices, on-site signage, and CDOT's website.	Same
Economic Conditions	<p>New access will be provided for properties where existing access is removed. To avoid disruption of business activities during construction, the new access will be provided before the existing access is removed.</p> <p>To minimize disruption to traffic and local businesses, construction activities will be staged and work hours varied. Throughout the construction stage, access will be preserved for each affected business.</p> <p>Where feasible, retaining walls have been identified for construction along I-25 to minimize impacts to commercial development.</p>	Same

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## **Appendix A: Methodology for Environmental Justice Analysis**



## Methodology for Environmental Justice Analysis

The purpose of this appendix is to provide information related to the methodology used to calculate low-income and minority populations for the North I-25 Land Use, Socio-Economic, and Environmental Justice Technical Memorandum.

### Data Sources

The following data sources were used to support the environmental justice analysis:

- U.S. Census Bureau, 2010 Summary File: provides income, race, and ethnicity data at the census block level for Adams County and Broomfield County.
- U.S. Department of Housing and Urban Development: Provides 2011 income limits for housing assistance programs.

### Minority Populations

A minority population is any readily identifiable group of minority persons who live in a geographic proximity and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity. A minority is a person who is Black, Hispanic, Asian American, American Indian or Alaska Native (FHWA Order 6640.23). Hispanic or Latino heritage is considered an ethnicity rather than a racial category in Census data; therefore, the minority population is calculated by subtracting persons who are White only (not Hispanic) from the total population to avoid double counting.

Minority populations are identified in census blocks<sup>1</sup> where the proportion of minority persons exceeds the threshold defined by the area of comparison (Adams County and Broomfield County). **The proportion of the minority population is 47 percent within Adams County and 22 percent within Broomfield County; therefore, this analysis is focused on census blocks where the minority population is at or above 47 in Adams County and 22 percent in Broomfield County.**

Minority data at the block level was used in this analysis. Of the 8 blocks in the study area, none have a proportion of minority residents that exceed the county (which is 47 percent in Adams County and 21 percent in Broomfield County, as shown in Table A-1 and Figure A-1).

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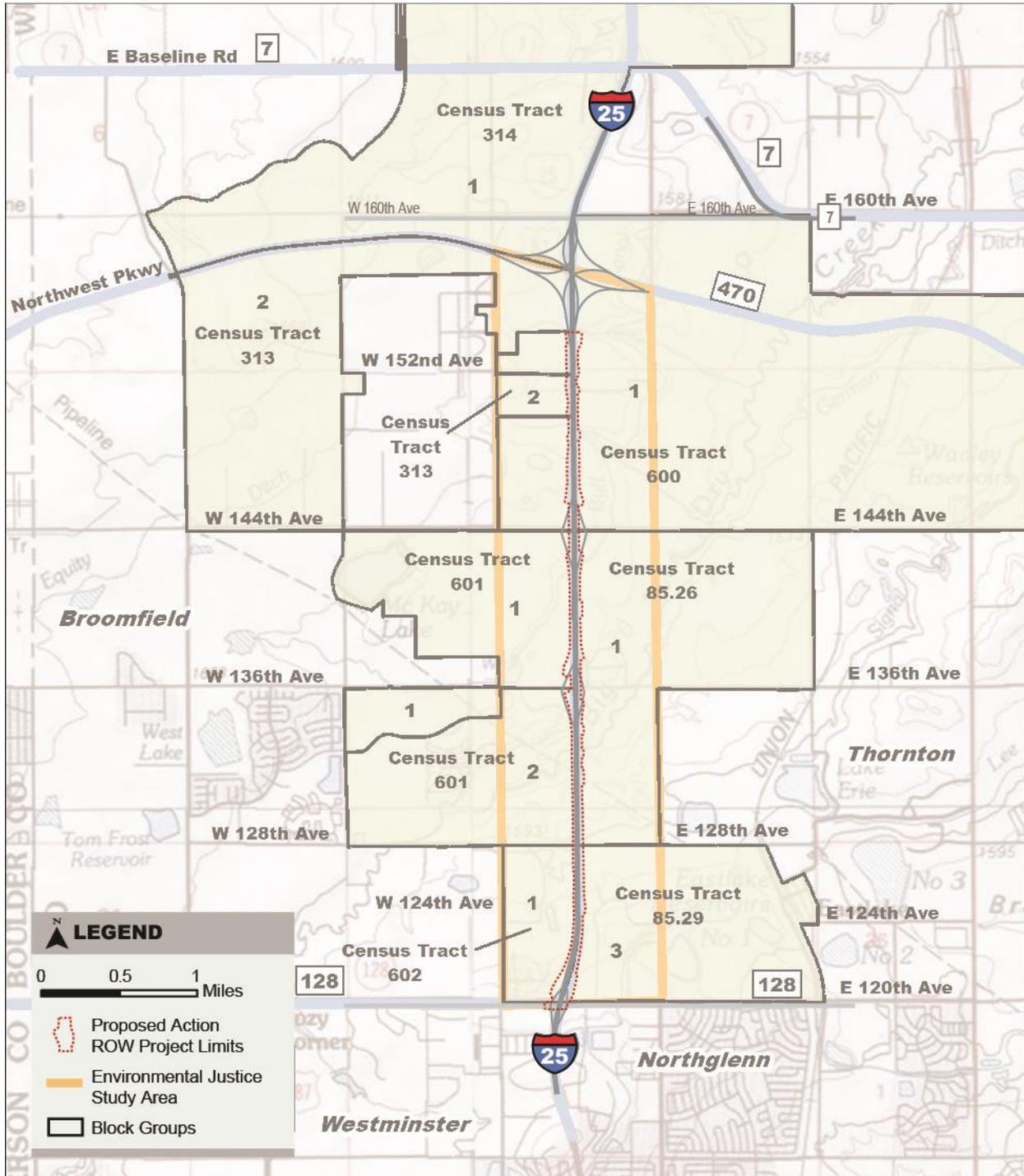
<sup>1</sup> The census block is the smallest geographic unit for which the U.S. Census Bureau tabulates 100 percent data. It is the smallest subdivision of a census tract. Census blocks are typically small and often correspond to city blocks in urban areas. In rural areas, census blocks may include several miles.

Table A-1. Minority Populations in the Study Area, 2010

Geography	Total Population 2010	Minority Population 2010	Percent Minority	Exceeds Threshold?
Colorado	5,029,196	1,508,403	30%	N/A
<b>Adams County</b>	<b>441,603</b>	<b>208,878</b>	<b>47%</b>	<b>N/A</b>
Block Group 1, Tract 85.26	1,948	489	25%	No
Block Group 3, Tract 85.29	2,331	752	32%	No
Block Group 1, Tract 600	3,563	733	21%	No
Block Group 1, Tract 601	2,745	610	22%	No
Block Group 2, Tract 601	3,425	934	27%	No
Block Group 1, Tract 602	2,717	770	28%	No
<b>Broomfield County</b>	<b>55,889</b>	<b>11,531</b>	<b>21%</b>	<b>N/A</b>
Block Group 2, Tract 313	1584	79	13%	No
Block Group 1, Tract 314	81	17	21%	No

Source: U.S. Census Bureau, 2010

Figure A-1. Census Tracts in the ROD2 Study Area



Source: U.S. Census Bureau, 2010

## Low-Income Populations

Low-income populations were identified in census block groups<sup>2</sup> where the proportion of low-income households exceeded the threshold defined by the area of comparison (Adams County and Broomfield County). Economic data is not available at the block level, so census block groups are used to determine the presence of low-income populations.

For this analysis, a combination of 2010 Census average household size data and 2011 income limits set by the U.S. Department of Housing and Urban Development (HUD) were used. HUD income limits were used because, unlike poverty thresholds provided by the U.S. Census Bureau, they are specific to a geographic region and, consequently, adjust for cost of living. HUD defines low-income as individuals or households earning less than 30 percent of the area median income (AMI) of a community; therefore, an income limit of 30 percent with an adjusted household size was used in this analysis. The average household size for Adams County is 2.85, so this was adjusted as follows:

1. The 2011 HUD Income Limit for a 2 person household (\$18,800) was subtracted from the 2011 HUD Income Limit for a 3 person household (\$21,150).  
 **$\$21,150 - \$18,800 = \$2,350$**
2. The difference from step 1 (\$2,350) was multiplied by the amount that household size exceeds a whole number (0.85).  
 **$\$2,350 \times 0.85 = \$1,998$**
3. The value calculated in step 2 was added to the 2011 HUD Income Limit for a 2 person household to determine income limit for Adams County with a household size of 2.85,  
 **$\$18,800 + \$1,998 = \$20,798$**

Income data from the U.S. Census Bureau is provided in \$5,000 increments; therefore, **the low-income threshold for Adams County is \$25,000 per year. The proportion of households within Adams County that are below \$25,000 is 14 percent; therefore, this analysis is focused on census block groups within Adams County where the proportion of low-income households is at or above 14 percent.**

The same analysis was completed for Broomfield County, which has an average household size of 2.60, so this was adjusted as follows:

1. The 2011 HUD Income Limit for a 2 person household (\$18,800) was subtracted from the 2011 HUD Income Limit for a 3 person household (\$21,150).  
 **$\$21,150 - \$18,800 = \$2,350$**
2. The difference from step 1 (\$2,350) was multiplied by the amount that household size exceeds a whole number (0.60).  
 **$\$2,350 \times 0.60 = \$1,410$**
3. The value calculated in step 2 was added to the 2011 HUD Income Limit for a 2 person household to determine income limit for Broomfield County with a household size of 2.60,  
 **$\$18,800 + \$1,410 = \$20,210$**

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<sup>2</sup> The census block group is a cluster of census blocks within a census tract (or groups of blocks). Block groups generally contain from 600 to 3,000 people; optimally they contain approximately 1,500 people.

Income data from the U.S. Census Bureau is provided in \$5,000 increments; therefore, **the low-income threshold for Broomfield County is \$25,000 per year. The proportion of households within Broomfield County that are below \$25,000 is 12 percent; therefore, this analysis is focused on census block groups within Broomfield County where the proportion of low-income households is at or above 12 percent.**

The proportion of low-income households was determined at the census tract level. Of the 7 census tracts in the study area, none have a proportion of low-income households that exceed the county (which is 19 percent in Adams County and 12 percent in Broomfield County, as shown in Table A-2).

Table A-2. Low-Income Households in the Study Area

Geography	Total Households	Percent Low-Income	Exceeds Threshold?
Colorado	1,962,753	20%	N/A
<b>Adams County</b>	<b>151,034</b>	<b>14%</b>	<b>N/A</b>
Census Tract 85.26	2,357	10%	No
Census Tract 85.29	3,136	13%	No
Census Tract 600	1,543	2%	No
Census Tract 601	2,023	10%	No
Census Tract 602	1,759	12%	No
<b>Broomfield County</b>	<b>21,375</b>	<b>12%</b>	<b>N/A</b>
Census Tract 313	601	0%	No
Census Tract 314	1,002	8%	No

Source: U.S. Census, American Community Survey Data, 2008-2012; U.S. Department of Housing and Urban Development, Federal Year 2011 Income Limits.

