

Cherokee Natural Gas Pipeline Project

Commerce City Comparison of Route Segments

April 2012

Prepared for:



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Introduction

Public Service Company of Colorado (PSCo), an Xcel Energy Company, is proposing to construct the Cherokee Natural Gas Pipeline Project (Project). The proposed Project involves constructing approximately 34 miles of new 24-inch-diameter steel gas transmission pipeline from a new gas metering facility, the Fort Lupton Facility to the Cherokee Generating Station in Adams County, Colorado. As shown in Figure 1 (Vicinity Map), the pipeline will be located within Adams and Weld counties, near Commerce City, Brighton, Lochbuie, and Fort Lupton. The overall benefits of the proposed Project are described below, as are PSCo's pipeline safety procedures.

The purpose of this document is to compare two pipeline route alternatives within Commerce City: PSCo's preferred route within the PSCo fee-owned land along the electric transmission line south of 104th Avenue (segment numbers 27, 29, and 32) versus the route along the southern side of 96th Avenue (segment numbers 28 and 31). This comparison includes a discussion on project benefits, pipeline safety, and a comparative analysis of the two pipeline routes. This report ultimately provides a rationale for selecting the preferred route within PSCo fee-owned land along the electric transmission line south of 104th Avenue over the 96th Avenue alternative.

Project Benefits

PSCo is beginning to implement its Emissions Reduction Plan that was approved through a filing with the state Colorado Public Utilities Commission as required by the Colorado State Legislature in House Bill HB10-1365 (Clean Air–Clean Jobs Act). The bill passed by the State Legislature was in response to enforcement by the U.S. Environmental Protection Agency of the 2008 Amendment to the Federal Clean Air Act requirements for increased reduction in emissions from coal-fired power plants. The plan included retiring three of the coal-fired units at the Cherokee Generating Station, adding a new natural gas generation facility, and switching a fourth coal-fired unit to use natural gas as the fuel. A new pipeline is needed to deliver the natural gas to the Cherokee Generating Station for this conversion and to supply Cherokee Station with a continuous and reliable source of natural gas for the generation of electricity.

An economic analysis was conducted by the Leeds School of Business, University of Colorado-Boulder, Business Research Division (September 19, 2011), relating to the compliance with the Clean Air–Clean Job Act. The analysis objectively measured the economic impacts to the state of Colorado by examining expected changes from business as usual in construction, operating expenditures, employment, wages, and capital expenditures. PSCo further examined the specific impacts of the Project to the local economy. The result of this more specific economic analysis is that the proposed Project will result in a net economic benefit to the local economy. The benefit is generated primarily through construction, with

additional fiscal benefits associated with pipeline operations. The construction and capital spending phase of the Project will be the source of economic opportunity for the state of Colorado as well as for Commerce City.

From 2010 to 2026, the proposed Project is expected to have a positive economic impact on the state of \$74.5 million (discounted to 2010). The local economy will also benefit from a portion of the positive economic impacts to employment and labor income and to related industry sectors of the local economy. From an employment perspective, the average statewide total employment related to the planning, construction, and capital expenditures from 2011 through 2014 is 121.2 employees. The proposed Project is expected to employ 29 Colorado construction-related workers in 2013 and 64 workers in 2014. Following 2014, no construction activities are planned related to the pipeline. Using Adams County's share of statewide employment by industry as a proxy for the share of economic activity generated by the pipeline buildout, Adams County is likely to see a \$5.1 million increase in output. Based on the composition of the Commerce City economy relative to the statewide economy, Commerce City is likely to see a \$1.3 million increase in economic benefit over this period, primarily due to construction-related activity. From a labor income perspective, total labor incomes associated with the proposed Project are estimated to be \$31.3 million from planning to buildout (2011 to 2014). Adams County's share of labor income, based on employment distribution throughout the state, will be \$1.3 million. Additionally, construction workers are likely to spend money in the local area such as Commerce City for food, temporary housing, and other support services. Currently, property tax revenue for Adams County has been estimated to be approximately \$2.7 million.

Safety

The primary threats to underground natural gas lines include third-party damage, equipment failure, material failure, corrosion, natural forces, and operation of the pipeline.

No fatalities have resulted from pipeline incidents associated with PSCo natural gas transmission pipelines in the past 5 years (PHMSA 2012). The Pipeline and Hazardous Materials and Safety Administration (PHMSA) define significant incidents as those incidents reported by pipeline operators when any of the following specifically defined consequences occur: (1) fatality or injury requiring in-patient hospitalization, (2) \$50,000 or more in total costs, measured in 1984 dollars, (3) highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more, or (4) liquid releases resulting in an unintentional fire or explosion.

The Project would be designed, constructed, and operated to meet federal and state standards and safety requirements applicable to the proposed facilities. The entire length of the proposed pipeline will be designed and constructed as required by PHMSA, Part 192—Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192). Safety measures would include mainline valves, all of which are to be remote controlled, and continuous telemetered monitoring of the pipeline and all facility operations by

PSCo's manned Gas Control Center. During pipeline installation, PSCo would install a corrosion prevention system designed to better eliminate metal loss during the life of the pipeline, and a third party will x-ray all pipe welds to verify their integrity prior to the pipe being lowered into the trench. Before the pipeline is put into service, it will undergo hydrostatic pressure testing during which it would be filled with water and tested at a pressure 1.5 times the design maximum allowable operating pressure to verify that there are no leaks. A baseline In Line Inspection Tool (ILI) of the entire pipeline will also be conducted as a reference for future ILI runs to be conducted as part of PSCo's ongoing Integrity Management Program.

After being put into service, the pipeline would be patrolled on annual, semi-annual, and quarterly intervals to check for leaks and cathodic protection levels. How often a specific section of the pipeline would be patrolled would be based on legal requirements that are linked to the pipeline's location and population density. The entire pipeline would be inspected at least every seven years with ILI tools such as pipeline inspection gauges or "pigs."

An emergency response plan would be developed for the construction and the operations phases of the Project. The plans would be written to include elements of the emergency response departments near the Project area, including how and when to communicate with the Commerce City Police Department and the South Adams County Fire Protection District.

To better protect the pipeline from third-party damage, PSCo has proposed to construct the pipeline within PSCo fee-owned fee land and existing easements to the greatest extent possible. Currently, more than 70 percent of the preferred route is within PSCo fee-owned land or existing easements. In PSCo's long history as a gas supplier and pipeline operator in Colorado, the majority of pipeline safety incidents result from third-party damage when other parties fail to call and locate a gas pipeline before they begin digging or excavation work. Locating the pipeline within existing fee-owned land along and existing electric utility corridor south of 104th Avenue will minimize this possibility of third-party damage to the pipeline. To further protect the pipeline, PSCo would install pipeline markers to indicate the location of the buried pipeline. The PHMSA's "call before you dig" program also helps with protecting the pipeline from third-party damage. Upon receiving a request to locate natural gas lines, PSCo will send a professional to identify the lines in the work area.

Comparative Analysis

PSCo's Integrity Management Program was presented to Commerce City Council in May 2011 and the proposed Project was presented to Commerce City Management staff in June 2011. The proposed Project was also presented to the public. Two public open houses were held in Commerce City at the end of June 2011, and two more public open houses were held in Commerce City in December 2011. Input was received from community residents and stakeholders. Follow-up and consultation meetings with Commerce City were held in August 2011, and a pre-application meeting for the Conditional Use Permit was held with Commerce

City in October 2011. PSCo presented information about the Project purpose and need, background, gas pipeline safety, and the routing process. City staff provided feedback on the specific route segments. The input received from these meetings was used to broaden or narrow the scope of the evaluation criteria defined by PSCo in the opportunities and constraints and comparative analysis. PSCo has thoroughly evaluated viable alternative pipeline routes to achieve the Project objectives, incorporating public and governmental feedback and maintaining PSCo's vision, mission, and values. Resource data such as land use/land cover, communication towers, land jurisdiction, zoning, roads, railroads, pipelines, electric transmission lines, vegetation, wetlands, wildlife habitat, slopes, floodplains, and soil types were analyzed to determine areas of opportunity and constrained areas for routing the proposed natural gas pipeline between the Cherokee Generating Station and the Fort Lupton Facility. The areas of opportunity and areas of constraint were defined based on compatibility of the proposed Project with land use and environmental resources.

A data matrix comparing key data along the route segments and end-to-end routes identified for analysis was created using a geographic information system (GIS) database. The matrix was used as a tool for quantifying impacts associated with route segments and end-to-end routes. The matrix compared the numerical results of key routing criteria such as length paralleling existing linear features, length crossing PSCo fee-owned land and PSCo easements, number of residences in proximity to route segments, length crossing specific types of land cover and land uses, number of water crossing, biological resources, soil erodibility, and cultural resources across all routes. Based on these criteria routes were evaluated and ranked.

After the meetings, and completing the opportunities and constraints analysis, comparative matrix of routes, and more detailed engineering, PSCo made changes along the preferred route. Specifically, one of these changes resulted in the preferred route being moved from along 80th Avenue to 84th Avenue.

For the purpose of this report, a subset of route segments was pulled from the above-described comparative matrix so that only route segments associated with the alternative route along 96th Avenue and the preferred route along the electric utility easement south of 104th Avenue would be compared. Route segments associated with the preferred route along the electric utility easement south of 104th Avenue are segments 29 and 32 and route segments associated with the 96th Avenue alternative are segments 26, 28 and 31 (Figure 2). A comparison of key characteristics associated with each route alternative is provided in Table 1.

The total lengths of the preferred route and the 96th Avenue alternative were the same (5.7 miles). Eighty-eight percent of the preferred route is adjacent to existing linear features, while only 75 percent of the 96th Avenue alternative is adjacent to existing linear features. A total of 5.0 miles (88 percent) of the preferred route is located within PSCo fee-owned land or easements, while only 2.7 miles (47 percent) of the 96th Avenue alternative is within PSCo-owned land or easements.

Table 1:
Comparative Matrix of 104th Avenue Alternative and 96th Avenue Alternative

Route Characteristics	104th Avenue	96th Avenue
Engineering		
Overall length (miles)	5.7	5.7
Length paralleling existing Electric Transmission	4.8	0.2
Length paralleling existing linear disturbance (transmission lines, roads, pipeline)	5.0	4.3
Land Use		
Length within PSCo-owned easements	5.0	2.7
Number of residences within 300 feet of the centerline	23	48
Number of residences within 600 feet of the centerline	166	156
Number of schools within 600 feet of the centerline	0	0
Length crossing agricultural zoning	4.6	3.4
Length crossing Planned Unit Development zoning	0.8	1.3

The preferred route crosses a greater length of agricultural zoning than the 96th Avenue alternative (4.6 miles vs. 3.4 miles). The preferred route crosses a shorter length of Planned Unit Development zoning than the 96th Avenue alternative (0.9 mile vs. 1.3 miles).

Zoning adjacent to the 96th Avenue alternative is predominantly high- and mid-density residential; commercial zoning is located near the E-470 Interchange according to the Commerce City Future Land Use Plan (Commerce City 2010). The preferred route has fewer residences located within 300 feet of the route centerline when compared with the 96th Avenue alternative (Figure 2). The preferred route, however, has a greater number of residences located within 600 feet of the route centerline when compared with the 96th Avenue alternative (Figure 2).

Neither the preferred route nor the 96th Avenue alternative is within 600 feet of an existing school. PSCo also analyzed whether the two alternatives had the potential to impact future land use in Commerce City. To do this, the preferred route and the 96th Avenue alternative were overlaid on the Commerce City Future Land Use Plan (Figure 3). The preferred route is adjacent to commercial, low- and medium-density industrial, mixed use (commercial or corridor and E-470), and office/flex future land uses. As shown on Figure 3, there is one school planned along the 96th Avenue alternative and, depending on the final location of the school, it may be within 600 feet of the 96th Avenue alternative corridor. According to the Future Land Use Plan Map, the 96th Avenue alternative crosses commercial, medium- and high-density residential, park, and office/flex future land uses.

If the 96th Avenue alternative is constructed, the pipeline route would be located within the 100-foot right-of-way (ROW) that is owned by Commerce City on the northern side of the Rocky Mountain Arsenal up to Buckley Road. The Commerce City Public Works Department informed PSCo that the 96th Avenue road ROW between Chambers Road and Buckley Road has been dedicated to Commerce City; however, not all of the road ROW has been dedicated

along 96th Avenue between Tower Road and E-470. The 96th Avenue ROW width is currently 60 feet, and the road is centered in the existing ROW. Commerce City has plans to widen 96th Avenue to a width of 120 feet. PSCo would need to acquire an easement on the southern side of the widened 96th Avenue road ROW so that road construction would not affect the pipeline. This location would place the pipeline in commercial, medium- and high-density residential, park, and office/flex future land uses.

PSCo refined the comparative matrix to evaluate the preferred route and the 96th Avenue alternative. The results of the comparative route matrix ranked the preferred route higher than the 96th Avenue alternative (Appendix A).

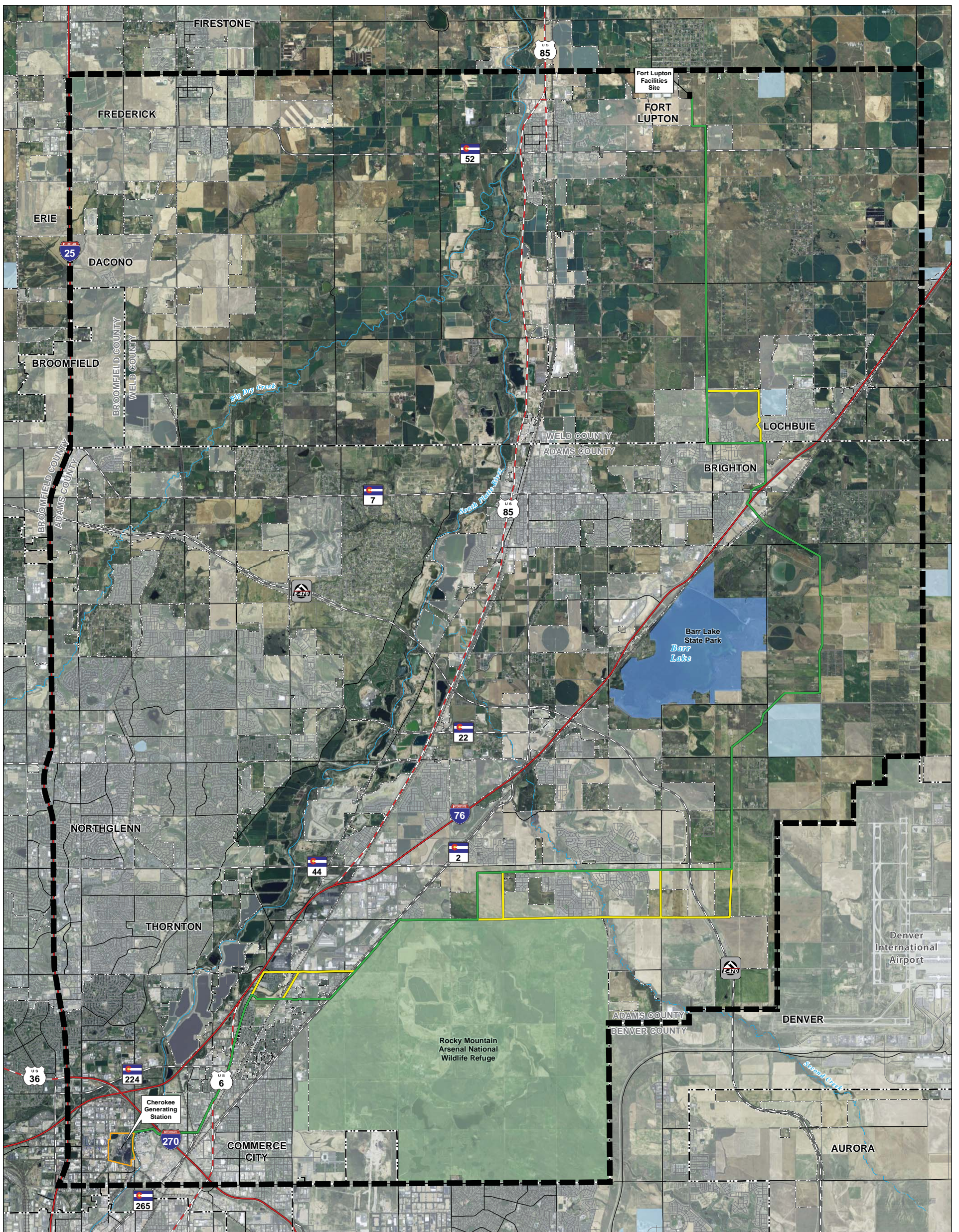
Conclusion

PSCo has evaluated the preferred route and many alternatives and recommends the preferred route along the electrical utility easement south of 104th Avenue, because it is constructible, meets the Project objectives, and is within PSCo's vision, mission, and values. The preferred route (1) utilizes existing PSCo fee-owned land, thereby reducing exposure to third-party damage; (2) is less likely to be relocated when compared to the 96th Avenue alternative; (3) considers future land use planning issues; and (4) was ranked higher in the comparative matrix because it is adjacent to existing linear features, its location within PSCo-owned land or easements, and zoning.

References

- Commerce City. 2010. Commerce City Future Land Use Plan. Available: <http://www.ci.commerce-city.co.us/DocumentView.aspx?DID=467>. Accessed December 21, 2011.
- Leeds School of Business. 2011. Socioeconomic Report for Adams County and Weld County. University of Colorado-Boulder, Business Research Division. September 19.
- PHMSA (Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation). 2012. Significant Pipeline Incidents. Available: <http://primis.phmsa.dot.gov/comm/reports/safety/SigPSI.html?nocache=5094>. Accessed April 26, 2012.

Figures



CHEROKEE NATURAL GAS PIPELINE PROJECT

Project Overview

Legend



- Proposed Pipeline Route
- Alternative Pipeline Route

Boundaries

- County
- Municipal

Transportation

- Interstate
- U.S. Highway
- State Highway
- Major Road
- Local Road
- Railroad

Hydrology

- Perennial Stream
- Intermittent Stream

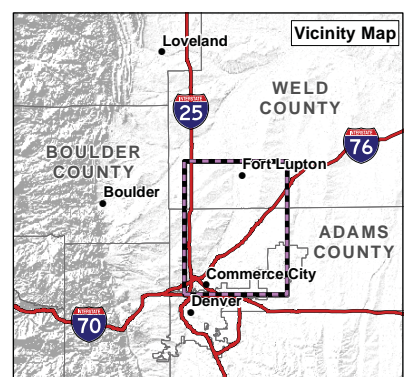
Jurisdiction

- U.S. Fish and Wildlife Service
- State of Colorado
- State Park



Scale 1:54,000
1 inch equals 4,500 feet
(when printed at 22" X 34")

Source: CDDT, MAP (2009), USGS, NHD, BTS, Verityx and BLM
Name: Basemap_Aerial
Revised: 4/25/2012



Path: P:\4360_Cherokee_Pipeline\GIS\Layouts\Resource_Maps\Oct_Resource_Maps\Basemap_Aerial.mxd

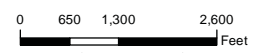
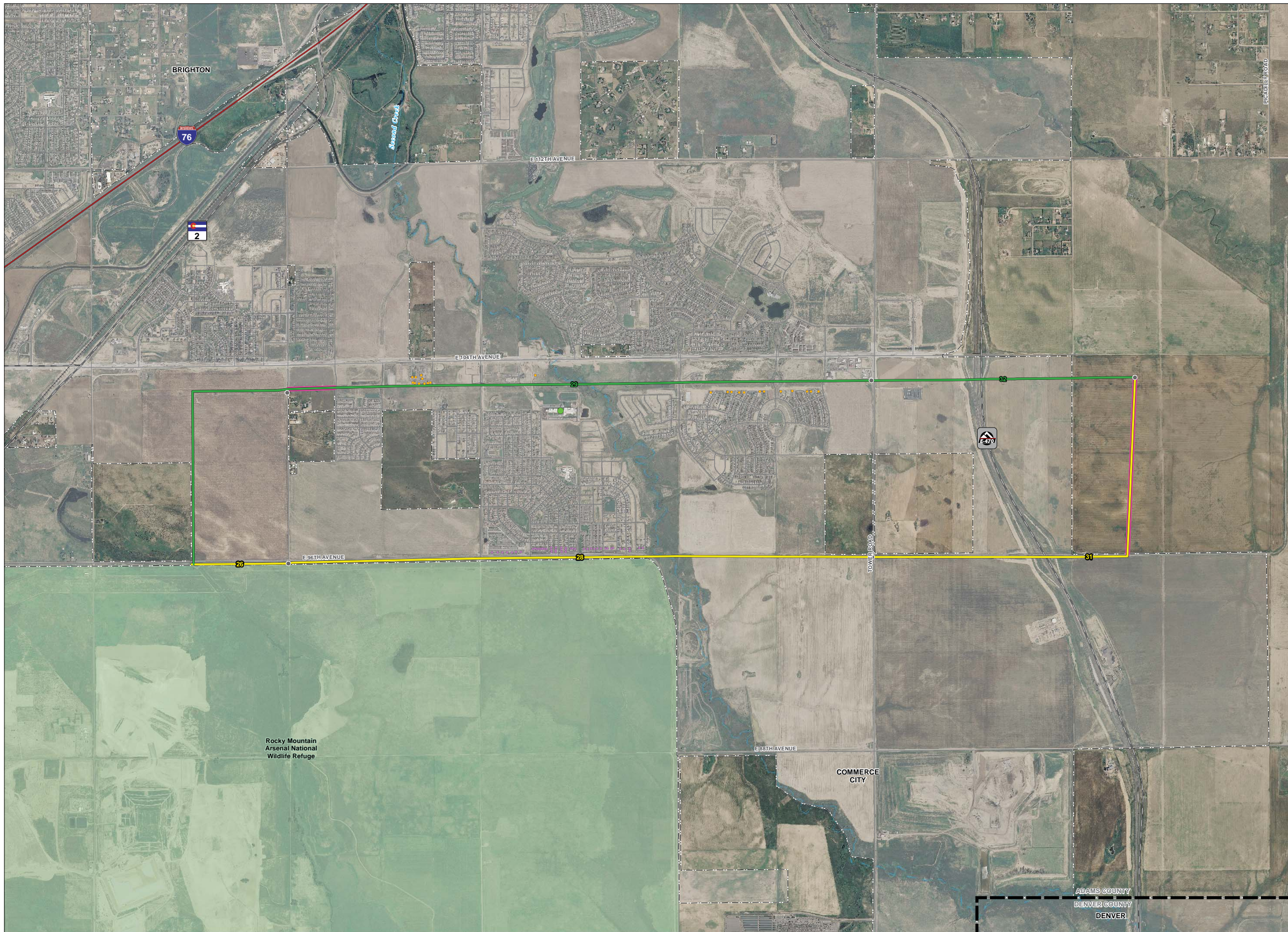
Figure 1

Cherokee Natural Gas Pipeline Project

COMMERCE CITY OVERVIEW

Legend

- Project Features**
- Study Area
 - Proposed Pipeline Route
 - Alternative Pipeline Route
 - Adams County Segments
- Project Features**
- Otho E. Stuart Middle School: 622ft
- Residences**
- Proposed Route Residences: 300ft
 - Alternate Route Residences: 300ft
- Boundaries**
- County
 - Municipal
- Transportation**
- Interstate
 - U.S. Highway
 - State Highway
 - Major Road
 - Local Road
 - Railroad
- Hydrology**
- Perennial Stream
 - Intermittent Stream
- Jurisdiction**
- U.S. Fish and Wildlife Service



1:11,000 (when printed at 22x34)

Source: COOT, NADP (2009), USGS, NHD, BTS, Verity and BLM
 Name: Commerce City - Alternatives
 Revised: 4/25/2012

* Preliminary alternative corridors and route options are subject to revision and may be added or removed.

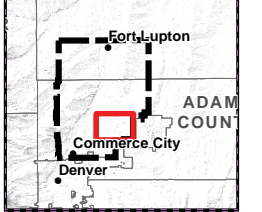
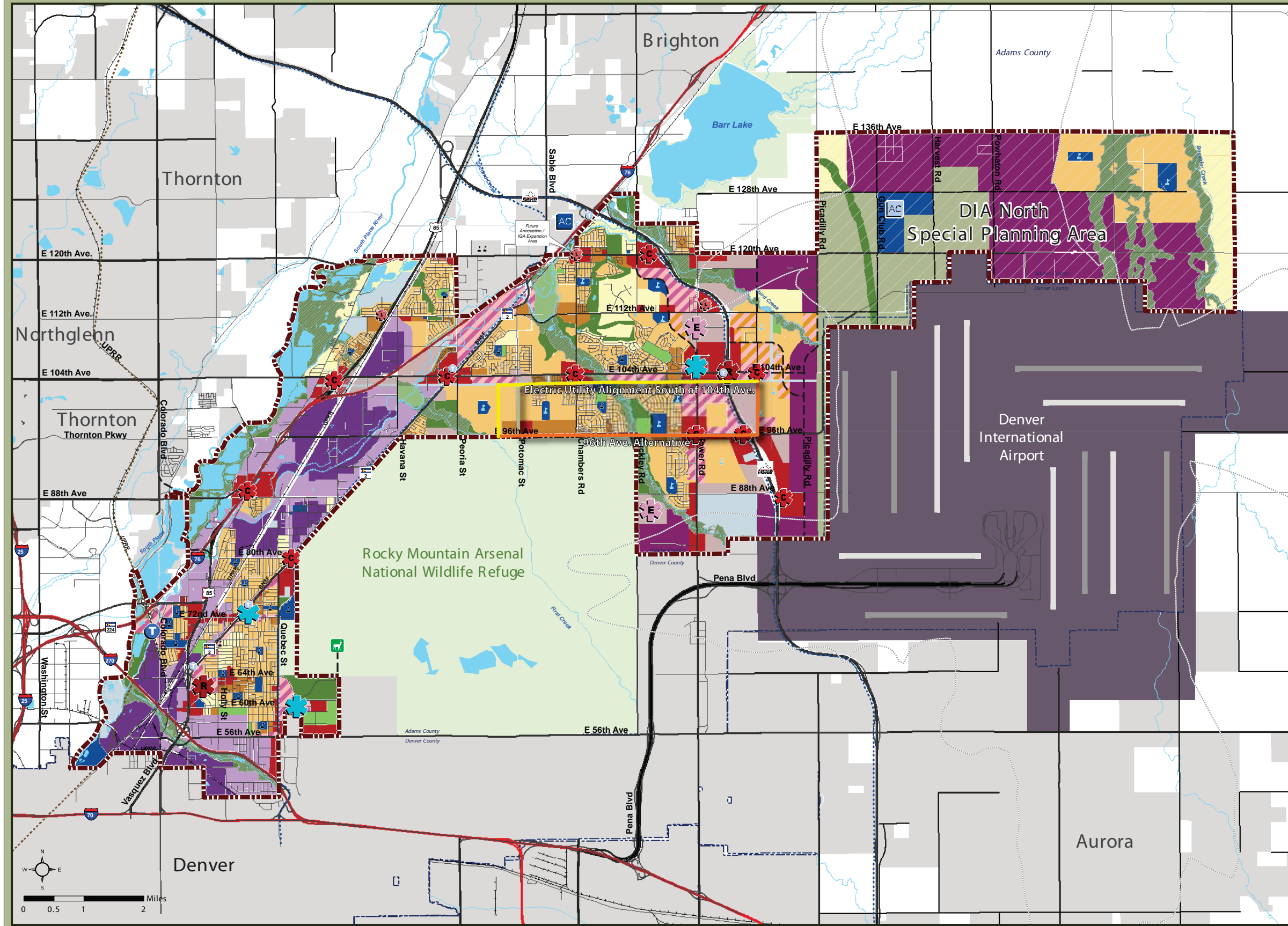


Figure 2

Future Land Use Plan



- ### Legend
- IGA Growth Boundary
 - County Boundary
 - Denver International Airport
 - DIA Noise Contours - 60 LDN
 - Current Runway
 - Future Runway
 - National Wildlife Refuge, Barr Lake State Park
 - Wildlife Refuge Visitors Center
 - 100 Year Floodplain
 - Future Roads
 - Planned Transit Station
 - Possible Transit Station
 - Future Transit Line
 - Future Light Rail Line
 - Future Adams County Government Administrative Complex
 - Future Adams County Regional Public Safety Training Center
 - Existing School
 - Future School Site
- ### Centers
- Activity Center
 - Employment Campus / Business Center
 - Regional Commercial Center
 - Community Commercial Center
 - Local Commercial Center
- ### Future Land Use
- Residential - Low
 - Residential - Medium
 - Residential - High
 - Mixed-Use - E-470
 - Mixed-Use (Corridor and Commercial)
 - Commercial
 - Office / Flex
 - DIA Technology
 - Industrial / Distribution
 - General Industrial
 - DIA Reserve
 - Utility
 - Public/State
 - Park
 - Open Space
 - Electric Utility Alignment South of 104th Ave.
 - 96th Ave. Alternative

Source: Adams County Tax Assessor, Adams County GIS, Commerce City GIS, U.S. Census TIGER files, Clarion Associates, 2008

Figure 3

Appendix A: Comparative Route Matrix

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Cherokee Project Natural Gas Pipeline—Commerce City Comparison of Route Segments

ENGINEERING			
Route Comparison		Electric Utility Alignment South of 104th Avenue	96th Ave Alternative
ENGINEERING			
Overall Length (miles)		5.7	5.7
	Low	1	1
Length Adjacent to (within 200ft) Existing Electric Transmission Line (miles)		4.8	0.2
Length Adjacent to (within 200ft) State Highways (miles)		0.1	0.1
Number of State Highway Crossings		1	1
	High	1	1
Length Adjacent to (within 200ft) County and Local Roads (miles)		0.8	4.2
Number of County and Local Road Crossings		9	3
	Low	2	1
Number of Ditch/Canal Crossings		0	0
	Low		
Length Adjacent to (within 200ft) Existing Gas Transmission Pipelines (miles)		5	2.5
Total Segment Length Adjacent to Existing Linear Features (t-lines, railroad, road, pipeline) (miles)		5	4.3
	High		
Percent of Length Adjacent to Existing Linear Features (t-lines, railroad, road, pipeline)		87.7%	75.4%
	High		
Length Within PSCo-owned land or easements (miles)		5	2.7
	High	1	2
Percent of length within PSCo-owned easements		87.72%	47.37%
	High	1	2
	Total Score	6	7
	Overall Engineering Rank	1	2

Cherokee Project Natural Gas Pipeline—Commerce City Comparison of Route Segments

LAND USE and JURISDICTION		
Route Comparison		
LAND USE and JURISDICTION		Electric Utility Alignment South of 104th Avenue
		96th Ave Alternative
Number of oil and gas wells within 250 feet of the centerline		0
	Low	1
Number of schools within 600 feet of the centerline		0
	Low	1
Length Crossing high density residential (zoning)		0
	Low	1
Length crossing agricultural (zoning)		4.6
	High	1
Length crossing open space (zoning)		0
	High	1
Length crossing industrial (zoning)		0
	High	1
Length crossing PUD (zoning)		0.8
	Low	1
Length Crossing Commerce City (miles)		5.2
Length Crossing Adams County (miles)		4.4
Length Crossing Private Land (miles)		5.2
	High	2
	Total Score	9
	Overall Land Use and Jurisdiction Factors Rank	1

RESIDENCES		
Route Comparison		
RESIDENCES		Electric Utility Alignment South of 104th Avenue
		96th Ave Alternative
Total Residences Within 300ft of Centerline		23
	Low	1
Residences within 600 feet of Centerline		166
	Low	2
	Total Score	3
	Overall Residence Factors Rank	1

Cherokee Project Natural Gas Pipeline—Commerce City Comparison of Route Segments

ENVIRONMENTAL FACTORS		
Route Comparison		
WATER RESOURCES	Electric Utility Alignment South of 104th Avenue	96th Ave Alternative
Number of Perennial or Intermittent Stream/River Crossings	2	2
Low	1	1
Length Crossing Riparian Communities (miles) (CDOW)	0	0
Low	1	1
Length Crossing 100-year Floodplain (miles)	0.2	0.2
Low	1	1
Subtotal Score	3	3
Route Comparison		
BIOLOGICAL RESOURCES	Electric Utility Alignment South of 104th Avenue	96th Ave Alternative
Length Crossing Mule Deer Concentration Area (miles)	0	0.5
Low	1	2
Length Crossing Black-tailed Prairie Dog Habitat (miles)	0.3	0.5
Low	1	2
Number of Active Bald Eagle Nests within 1/2 mile of Route	0	0
Low	1	1
Length Crossing Bald Eagle Forage Areas (winter and summer), roost sites, winter range and winter concentration (miles)	0.5	0.5
Low	1	1
Subtotal Score	4	6
Total Score	7	9
Overall Environmental Factors Rank	1	2

CULTURAL RESOURCES		
Route Comparison		
CULTURAL RESOURCES	Electric Utility Alignment South of 104th Avenue	96th Ave Alternative
Number of NRHP-listed Sites Within 1/4 mile of Route	0	0
Low	1	1
Total Score	1	1
Overall Cultural Resource Factors Rank	1	1

Route Comparison		
	Electric Utility Alignment South of 104th Avenue	96th Ave Alternative
Total Score	23	27
Overall Rank	1	2