Denver International Airport

April 2024

PEÑA BOULEVARD TRANSPORTATION AND MOBILITY MASTER PLAN

DENVER INTERNATIONAL AIRPORT

Project Management Team

Denver International Airport

Lisa Nguyen, Project Manager
Brodie Ayers, Planning & Design
George Hohlacov, Planning Director

Denver's Department of Transportation & Infrastructure

Dana Hoffman, DOTI Project Manager

Steering Committee

Denver International Airport

Andrea Albo, Strategy and Innovation
Rita Aguilar, Govt Affairs & Global Public Policy
Ken Cope, DEN Real Estate
Tracy Davis, Legal Services
Brandon Gainey, Design, Engineering & Construction
Dave LaPorte, Airport Operations
Kyle Lester, Maintenance
Scott Morrissey, Sustainability
Bill Poole, Planning & Design
Mark Nagel, Parking and Transportation
Stacey Stegman, Global Communications & Marketing

Denver's Department of Transportation & Infrastructure

Emily Gloeckner, Transit & Traffic
Jennifer Hillhouse, Transportation Business

Technical Advisory Committee

Denver International Airport

Rich Brannan, Field Maintenance
Barry Burch Jr., Govt. Affairs & Global Public Policy
Elise Brenninkmeyer, DEN Real Estate
Shellee Casiello, Former Global Communications & Marketing
Carolina Flores, Former Govt. Affairs & Global Public Policy
Kevin Forgett, Govt. Affairs & Global Public Policy
Rick Gabel, Design, Engineering & Construction
Rachel Gruber, Airline and Commercial Affairs
Will MacDonald, Parking and Transportation
Debra Overn, Legal Services
Ramundo Perez, Terminal Operations
Jose Salas, Former Global Communications & Marketing
Sara Scott, Culture & Strategy
Khurram Qadri, Sustainability

Denver's Department of Transportation & Infrastructure

Maggie Thompson, DOTI Project Manager

Special Thanks

Councilwoman Stacie Gilmore & Staff
DEN Center of Equity & Excellence in Aviation
DEN Special Events
Evie Garrett Dennis Campus
Green Valley Ranch Farmer Market
Montbello 2020
STRIVE Prep – Noel Middle School

Consultant Team

AtkinsRéalis

Dan Liddle, Project Manager
Adam O'Brien, Deputy Project Manager
Tom Cotton, Design Manager
Devin Louie, Traffic Task Lead
Mohan Garakhalli, Traffic Task Lead
Tina Brand, Graphics Lead

LS Gallegos

Maribeth Sarnecki, Outreach Manager

Triunity

Nadia Soto, Project Administrator

OV Consulting

Beth Vogelsang, Gateway Study Lead
Reese Shaw, Land Use Planning

C&S Companies

Alexandra Davis, Aviation Sustainability

Ricondo

Jim Jarvis, Mobility Study Project Manager
Mark Richter, Mobility Study Lead

UrbanTrans

Matthew Kaufman, Mobility Study Lead
Emily Haar, Mobility Study Lead

Corona Insights

David Kennedy, Passenger Survey Lead

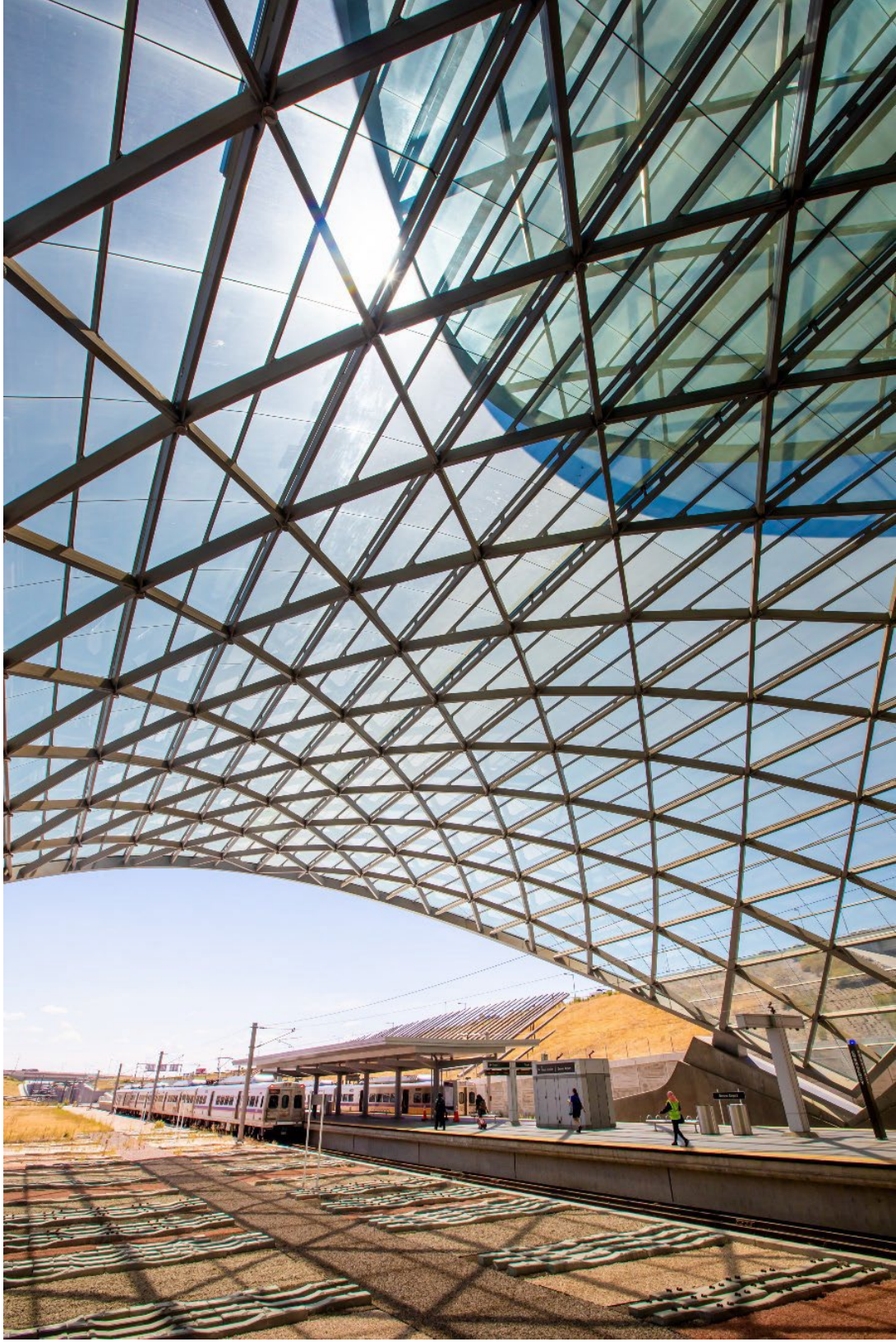
Contents

Supplemental Reports

The Peña Boulevard Transportation and Mobility Master Plan (Peña Master Plan) was developed over an almost 2-year period from May 2022 to March 2024. This development period is herein referred to as "the Study". Throughout the Study, technical memoranda and reports were developed that informed the development of the Peña Master Plan and are supplemental to this document:

- Attachment A. Existing Conditions Assessment Report
- Attachment B. Public & Stakeholder Engagement Summary
- Attachment C. Traffic Conditions Technical Report
- Attachment D. Alternatives Evaluation Report

The Peña Master Plan includes a Transportation Demand Management (TDM) Plan which developed solutions to complement potential improvements to the Peña Boulevard corridor by improving access to Denver International Airport (DEN) through more sustainable modes of transportation and reducing drive-alone trips along Peña Boulevard. An overview of the TDM Plan can be found within this document, with the full plan available on the Study website (FlyDenver.com/Peña_Plan). The Study website includes supplemental information, including frequently asked questions and monthly updates for the Study.



Acronyms/Glossary

2050 MVRTP	2050 Metro Vision Regional Transportation Plan
ADT	Average Daily Traffic
CCD	City and County of Denver
C-D	Collector-Distributor
DEN	Denver International Airport
DOTI	Denver Department of Transportation and Infrastructure
DRCOG	Denver Regional Council of Governments
IGA	Intergovernmental Agreement
ISI	Institute for Sustainable Infrastructure
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
Gateway Study	Denver Moves Gateway Area Travel Study
GP	General Purpose
GVR	Green Valley Ranch
HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle
ML	Managed Lane
MOE	Measures of Effectiveness
NEPA	National Environmental Policy Act
Peña Master Plan	Peña Boulevard Transportation and Mobility Master Plan Study
PEL	Planning and Environmental Linkages
RTD	Regional Transit District
SOV	Single Occupancy Vehicle
SWG	Stakeholder Working Group
TAC	Peña Master Plan's Technical Advisory Committee
TIP	Transportation Improvement Program
TDM	Travel Demand Management
TMA	Transportation Management Association
TNC	Transportation Network Company
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

STUDY OVERVIEW

The purpose of the Peña Boulevard Transportation and Mobility Master Plan is to determine the existing transportation and mobility conditions within the Peña Boulevard corridor and develop and evaluate alternatives to address deficiencies. Viable alternatives from this plan will advance to an alternatives analysis, conceptual design and an environmental review under the National Environmental Policy Act (NEPA).

Introduction

Peña Boulevard is an 11.1-mile-long freeway that provides the only roadway access to Denver International Airport (DEN) while also offering connectivity to numerous off-airport communities and businesses. In 2023, DEN served 77.8 million annual passengers and is preparing to serve 100 million passengers in the next couple of years (see Vision 100 call-out on page 2). Air travel projections indicate that DEN could serve as many as 120 million passengers by 2045.

Northeast Denver has some of the largest, remaining undeveloped land in the Denver Metro area and continues to experience unprecedented growth—including noteworthy projects such as the 2018 opening of the Gaylord Rockies Resort and Convention Center to the millions of square feet of industrial projects and plans for 20,000 more residential units. The RTD A Line, shown in the Study area map on page 3, is a commuter rail line that runs from Denver's Union Station in Downtown Denver to DEN and opened in April 2016. Within the Study area, there are two A Line rail stations located at 40th Avenue and Airport Boulevard and 61st Avenue and Peña, both of which are also park-n-ride facilities. Bicycle and pedestrian facilities remain unconnected, with barriers to access transit and limited multimodal transportation options within the Peña Boulevard corridor. For the purposes of the Study, it was assumed that the Peña Boulevard corridor includes the DEN property boundary which extends approximately 1,000 feet either side of the Peña Boulevard mainline and includes the RTD A Line, see Study area figure on page 3.

By several measures of success, the international airport, surrounding communities, and the state of Colorado have prospered and will continue to do so in the foreseeable future due to DEN, Denver, Adams and Arapahoe County's plans for passenger and urban growth. To ensure the airport is prepared to capture forthcoming opportunities, DEN initiated the Peña Boulevard Transportation and Mobility Master Plan Study (the Study) in late Spring 2022 to better understand existing and future transportation demands for the Peña Boulevard corridor and identify ways to improve mobility to the airport. The Study resulted in the Peña Master Plan which documents existing transportation, mobility, and environmental conditions within the Peña Boulevard corridor. This work will be the foundation for future environmental review, as required under the National Environmental Policy Act (NEPA).

Although this plan was not prepared as Planning and Environmental Linkages (PEL) as defined by the Federal Highway Administration (FHWA), the planning process followed PEL principles to accelerate project delivery. Specifically, *a collaborative and integrated planning approach*:

1. *considered environmental, community, and economic goals early in the transportation planning process and;*
2. *will use the information, analyses, and products developed during planning to inform about the environmental review process.*
   Source: FHWA Environmental Review Toolkit.

What is Vision 100 and Operation 2045?

Mission: To provide excellence in service and support

Vision: 100 million Annual Passengers and Beyond

Vision 100 and Operation 2045 are two phases of DEN's strategic plan. Vision 100 is phase one and is focused on preparing the airport to serve 100 million annual passengers as soon as 2027. Operation 2045 is phase two which will prepare the airport for its 50th Anniversary in 2045 when an expected 120 million-plus annual passengers will pass through the airport. Both phases combined serve as a blueprint to align decision-making and accountability. Learn more about Vision 100 and Operation 2045 by visiting:

www.FlyDenver.com/about-den/vision-100-operation-2045/

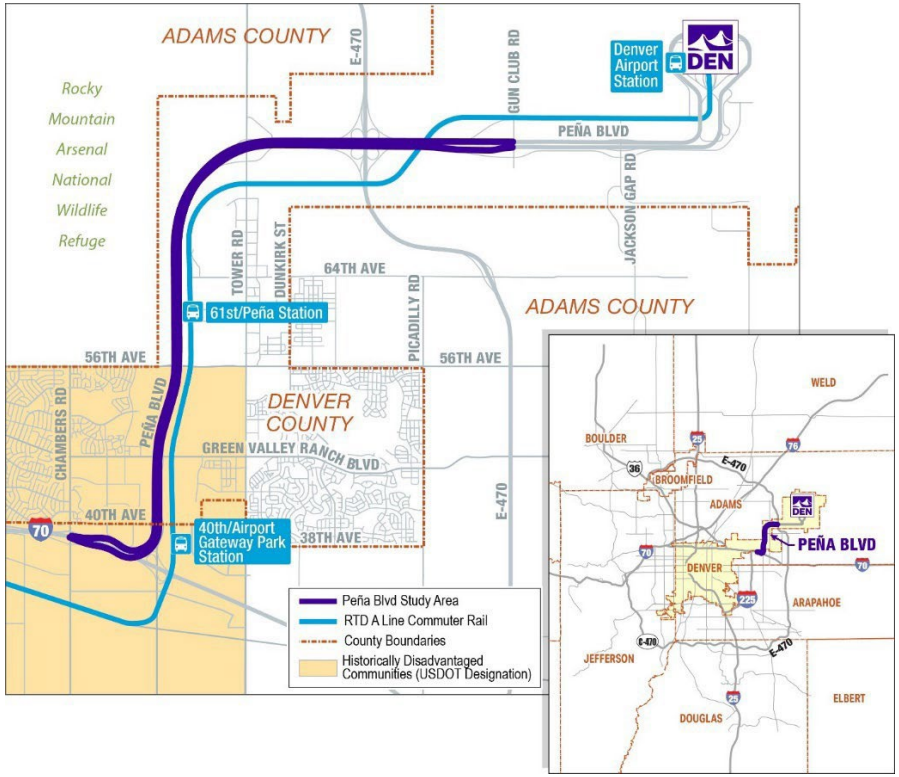
What is NEPA? The National Environmental Protection Act (NEPA) was enacted in 1970 to promote a national policy for protection of the environment and to raise awareness about the importance of natural resources to the nation. NEPA requires federal agencies, in cooperation with state and local governments, to assess environmental effects of a proposed federal action or an action that receives federal funds, prior to making decisions.

Using the NEPA process, DEN will evaluate environmental and related social and economic effects of the proposed action. DEN will outline anticipated effects associated with the project and provide public review and comment opportunities on these evaluations.

Study Area

Peña Boulevard is an 11.1-mile-long roadway that extends from Interstate 70 (I-70) to the Jeppesen terminal at DEN. Peña Boulevard is the only roadway access to DEN while providing access to adjacent communities including Montbello, Green Valley Ranch, and Gateway. DEN is in the process of reconstructing Peña Boulevard between Jackson Gap Street and Jeppesen Terminal. These upgrades are an independent need, essential to ensure reliability of shuttle bus and ground transportation operations and to address safety and address failing pavement conditions. The Peña Master Plan is the first step in identifying potential alternatives for Peña Boulevard from I-70 to Gun Club Road.

The City of Denver's equity index indicates that communities surrounding Peña Boulevard experience more socioeconomic, built environment, health care, and health barriers than most other communities within the city. The airport is a major employer for these communities, and DEN aims to increase transportation choices and continue to provide access to jobs. Denver's Department of Transportation and Infrastructure (DOTI) is conducting the Gateway Area Travel Study to understand how potential improvements to the Peña Boulevard corridor will influence travel patterns in the Montbello, Green Valley Ranch, and Gateway communities.



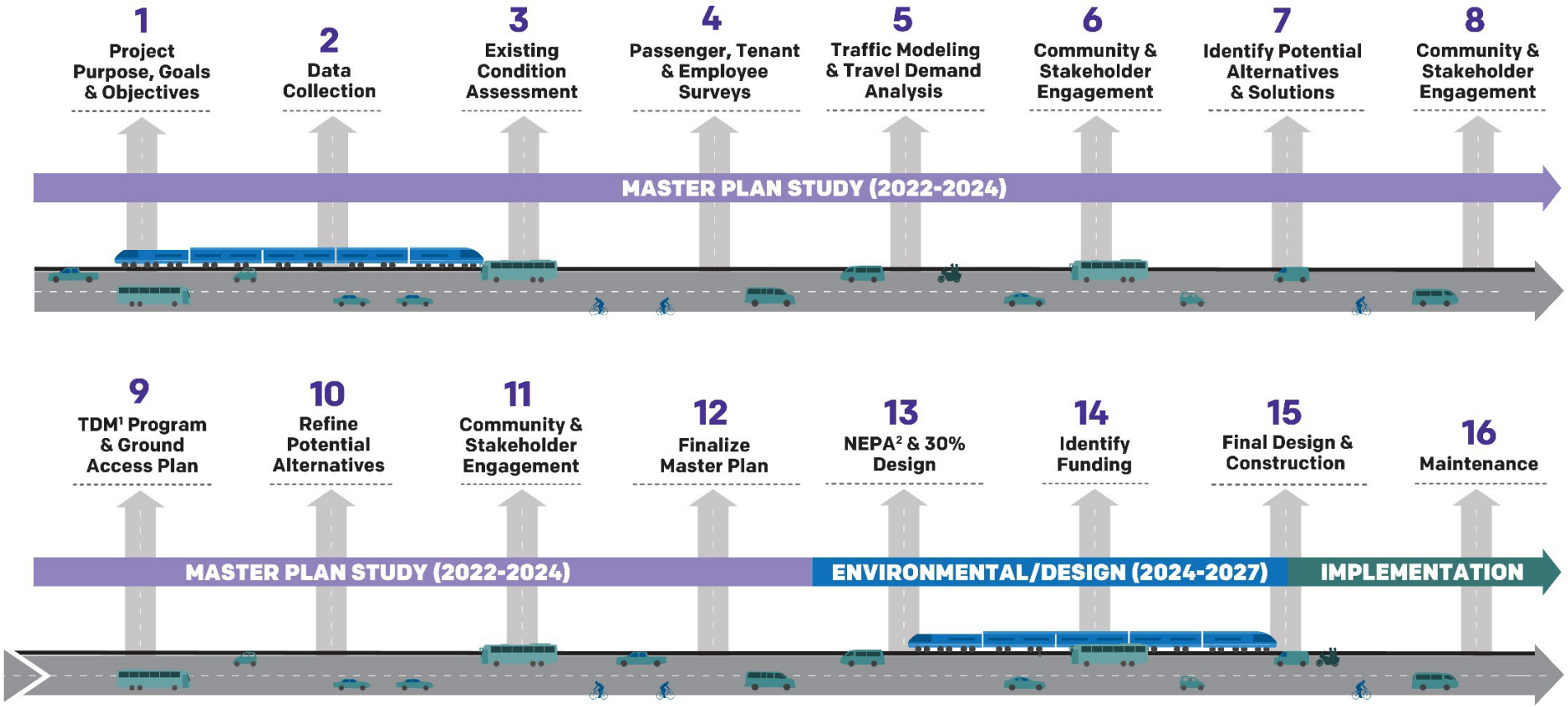
Study Process/Master Plan Development

The Peña Master Plan is a blueprint for infrastructure improvements along the Peña Boulevard corridor and was developed by Study team made up DEN staff and consultants. The Study team received guidance from a Technical Advisory Committee (TAC), Steering Committee, and from surrounding communities and other stakeholders. The Peña Master Plan aims to increase mobility options, enhance safety, establish specific goals for mode-shift, and manage travel demand for the airport and the surrounding communities while addressing congestion. The Peña Master Plan development process is outlined below.

1. **Existing Conditions Assessment:**
   The first step in developing the Peña Master Plan was to document an assessment of existing conditions within the Study area and along Peña Boulevard. An understanding of existing conditions guided the Study team in creating the purpose, need, goals, and objectives of the Peña Master Plan.
2. **Purpose, Need, Goals and Objectives:**
   The purpose, need, goals and objectives of the Study helped to create a vision for the Peña Boulevard corridor and ensure that the Peña Master Plan balanced the interests of the airport, surrounding communities, and the public.
3. **Public and Stakeholder Engagement:**
   DEN values input provided by the public and stakeholders and creates opportunities for meaningful involvement and throughout this process. Outreach events were conducted at three key milestones throughout the planning process to keep the community informed and solicit their input. Feedback received throughout the Study influenced the solutions considered in the Peña Master Plan. Further, DEN developed a Peña Master Plan webpage on the www.FlyDenver.com website which included Study updates, frequently asked questions, and a sign-up form for individuals to be notified of future engagement events. A Study email address, PeñaPlan@flydenver.com, was created to ensure the public and stakeholders could contact the Study team.
4. **Transportation Demand Management (TDM):**
   DEN developed a Transportation Demand Management (TDM) Plan in parallel to the Peña Master Plan. The TDM Plan outlines solutions to complement potential improvements to the Peña Boulevard corridor by improving access to DEN through more sustainable modes of transportation and reducing drive-alone trips along Peña Boulevard. An overview of the TDM Plan is provided within this document.
5. **Potential Alternative Concepts for Peña Boulevard, Traffic Modeling and Further Refinement:**
   A range of alternative concepts for Peña Boulevard were identified through brainstorming discussions with the TAC, through public and stakeholder input, and from recommendations of previous studies. Once identified, these alternatives concepts underwent two levels of screening: firstly, using the purpose and need and secondly, using goals and objectives.
6. **Traffic Modeling and Further Refinement:**
   The potential alternatives for Peña Boulevard were evaluated within Denver Regional Council of Governments (DRCOG's) regional travel demand model to understand how various configurations for Peña Boulevard would influence travel patterns within the Study area and identify which alternatives best align with the goals of the Study.
7. **Conclusions and Next Steps:**
   The Peña Master Plan will be a foundation for future environmental studies, as required under the National Environmental Policy Act (NEPA). The results of the alternatives analysis and the traffic modeling will guide the airport to a preferred alternative during environmental review under NEPA. Mobility solutions are documented in the TDM plan, and DEN plans to start implementing options by early Summer 2024.

Study Timeline

The Study was initiated in Spring 2022, and the Peña Master Plan was completed in March of 2024. As shown in the timeline below, DEN provided opportunities for public and stakeholder participation throughout the Study and held engagement events at three key milestones to ensure their feedback was considered and incorporated into the Peña Master Plan. The Peña Master Plan marks the end of the Study and seamlessly begins the environmental review process including selection of a preferred alternative. Upon completion and approval of the environmental review document, final design for the preferred alternative would commence, sometime after 2027. As of spring 2024, DEN is finalizing the scope of services to begin the conceptual design and environmental review by late 2024.



[1] TDM - Transportation Demand Management [2] NEPA – National Environmental Policy Act

Denver Moves Gateway Area Travel Study

The City and County of Denver's (CCD) Department of Transportation and Infrastructure (DOTI) assessed the Denver Moves Gateway Area Travel Study (Gateway Study) to address the need for comprehensive transportation planning and to accommodate the growth projected in the Montbello and Green Valley Ranch neighborhoods surrounding the Peña Boulevard corridor. In general, the Gateway Area surrounds Chambers Road on the west, Himalaya Street on the east, Green Valley Ranch Boulevard on the south, and Peña Boulevard on the north. DEN and DOTI recognized there was significant overlap between the Gateway Study and the Peña Master Plan and agreed to combine them into one study, co-managed by these two agencies.

The purpose of the Denver Moves Gateway Area Travel Study is to understand how various alternatives for Peña Boulevard will impact traffic flow on the local street network, in addition to assessing how growth and evolving land use are influencing travel patterns in the Gateway Area.
A variety of scenarios for Peña Boulevard and local streets were evaluated using DRCOG's regional travel demand model to allow DOTI and DEN to understand the interdependent nature of travel patterns in northeast Denver. The Gateway Study built upon recommendations from previous planning efforts, such as the Far Northeast Area Plan, to identify improvements for the local street network that encourage a reduction in drive alone trips and compliment the proposed improvements to the Peña Boulevard corridor.

Refer to *Attachment A. Existing Conditions Assessment Report* and the *Denver Moves Gateway Area Travel Study* for additional information.

Objectives of the Denver Moves Gateway Area Travel Study include:

- Understand the impact of non-airport-related traffic in the Gateway Area.
- Understand how proposed alternatives and scenarios for Peña Boulevard affect the Gateway Area.
- Manage increasing travel demand while avoiding the construction of large, multi-lane roadways (where feasible).
- Understand what transportation alternatives are feasible to offset single-occupancy vehicle (SOV) trips in Gateway Area.
- Understand traffic demand origins and destinations.
- Understand implications to the Gateway roadway network (if determined) that the interchange at 64th/Peña Boulevard will not be constructed

EXISTING CONDITIONS ASSESSMENT

Existing and Expected Future Conditions Along Peña Boulevard

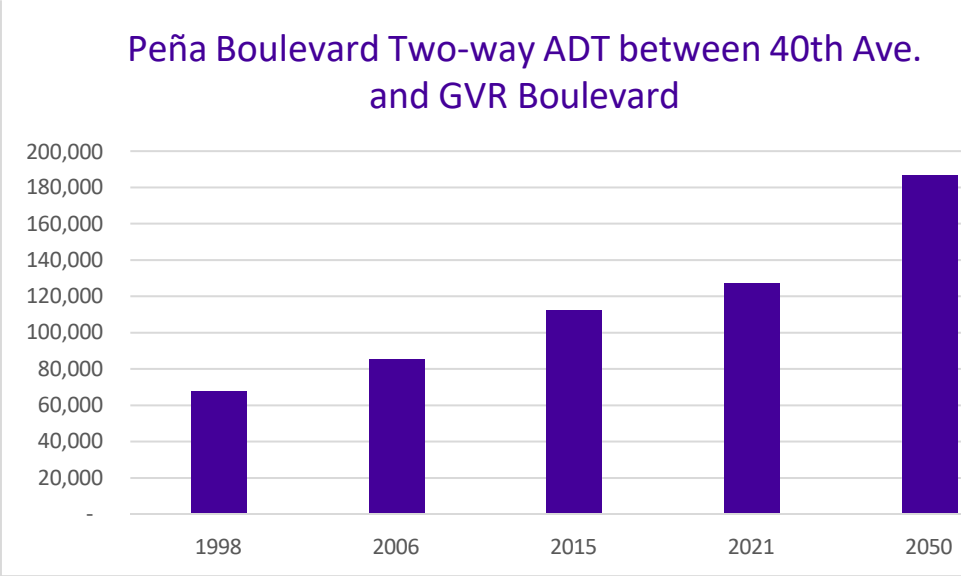
Peña Boulevard accommodates a variety of users who all rely on Peña Boulevard to move them to and from DEN, their residences, local businesses, and the larger Denver Metro area. Increased travel demands in recent years have resulted in higher crash rates, more and longer periods of congestion, lack of travel time reliability, and environmental sustainability concerns as a result of traffic operations. As the number of Peña Boulevard users continue to increase, these conditions are likely to worsen. Planning for the future requires a strong understanding of who and how people are using Peña Boulevard today and in the future. The Peña Master Plan aims to assess how these demands would be accommodated with and without improvements to the Peña Boulevard cross-section.

The Peña Boulevard Master Plan Existing Conditions Assessment Report was prepared early in the Study to document the existing and anticipated future conditions for Peña Boulevard and the Gateway Study. This assessment helped to guide the development of potential alternatives and solutions for the combined area. An overview of some key existing conditions is included in this section. For a full description of the existing conditions, refer to *Attachment A. Existing Conditions Assessment Report*.

Increasing Demand and Congestion

The number of vehicles traveling on Peña Boulevard has increased since its original construction. In 1998, three years after the airport opened, the average daily traffic (ADT) on Peña Boulevard between 40th Avenue and Green Valley Ranch (GVR) Boulevard was approximately 67,500 vehicles. By 2021, that volume doubled to an ADT of 127,300 vehicles and it expected to triple to 186,600 vehicles per day by 2050. Despite this growth, most of the corridor has not been rebuilt since its original construction.

This growing demand has resulted in increased travel times along Peña Boulevard, particularly during peak travel periods. During free-flow traffic conditions (no congestion), it takes approximately 8 minutes to drive approximately 8 miles between I-70 and Gun Club Road. In 2021, peak period congestion made this same trip take up to 24 minutes. This congestion is expected to worsen by 2050 and extend to cover more hours of the day.



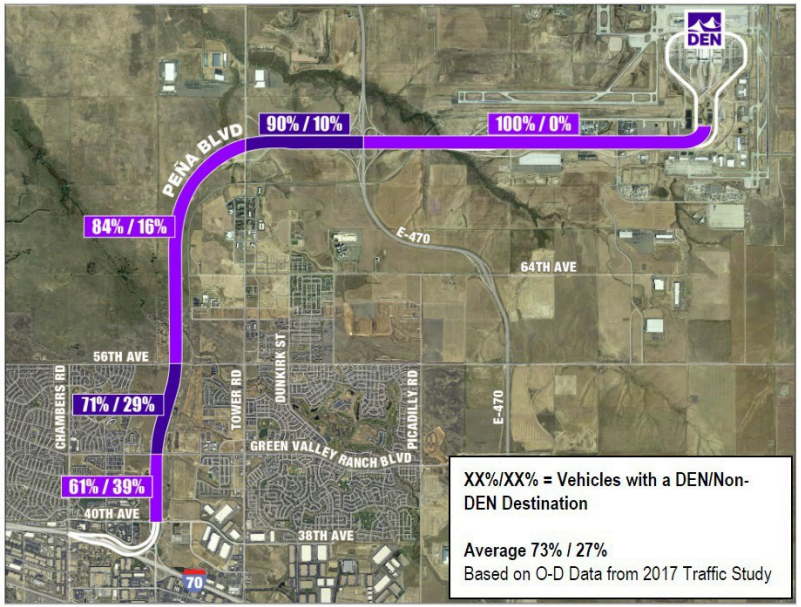
Source: 1998, 2006, and 2015 volumes were obtained from the 2017 *Peña Boulevard Corridor Transportation Study*.
2021 data was obtained from the continuous count stations located on Peña Boulevard provided by DEN.
Projected 2050 volumes were obtained from DRCOG's regional travel demand model.

The Denver Regional Council of Governments' (DRCOG) 2022 annual report on roadway traffic congestion in the Denver region notes: Peña Boulevard returned to pre-pandemic traffic conditions early in 2022. During busy holiday travel times, traffic volumes surpassed even 2019 levels by roughly 17 percent in December 2022. Traffic on Peña Boulevard is unique because the corridor does not have typical peak rush hours. Given that a large percentage of the travel along Peña Boulevard is associated with airport, it becomes congested even at off-peak times. A 2022 return to pre-pandemic levels of traffic and congestion on the corridor is caused by record high levels of passengers and employees at Denver International Airport, significant population and housing growth in the area between Peña Boulevard and E-470, and the completion of the Peña Boulevard/Tower Road interchange Southbound (SB) to Westbound (WB) ramp. DRCOG's staff estimate that between 2019 and 2022, the area experienced a 20 percent increase in jobs (4,750 new jobs) and a 6 percent increase in housing units (1,050 new housing units), funneling additional traffic into bottleneck points through the corridor.

Changing Travel Patterns

When Peña Boulevard opened, the land around DEN and northeast Denver was primarily undeveloped, and most users of Peña Boulevard were heading to or from DEN. Users were able to travel smoothly along Peña Boulevard and did not have to merge or weave with much traffic heading to interim interchanges, such as 40th Avenue, Green Valley Ranch Boulevard, 56th Avenue, Tower Road, or E-470. However, growth in northeast Denver, and the larger Denver Metro, now means more people are utilizing Peña Boulevard for reasons other than traveling to/from DEN.

Notably, the Federal Aviation Administration (FAA) prohibits the use of airport revenue for non-aeronautical use. Based on a 2017 traffic study along Peña Boulevard, it was determined that 73% of traffic is airport-based, while 27% is non-airport traffic, see figure below. Due to the split of airport/non-airport traffic, the FAA has determined that, for the segment of Peña Boulevard west of E-470 to I-70, DEN may only fund maintenance, capital improvement costs, and future debt service on a pro rata basis.



Moving People

How people travel to/from DEN, and the surrounding communities, continues to evolve. Expanded transit options, such as RTD's A Line, a more connected walking and bicycling network, new micromobility options, evolving rideshare options, and emerging technologies continue to change how people move along and across Peña Boulevard. Accommodating these various mobility options and private vehicles will be critical to providing sustainable and efficient travel options.

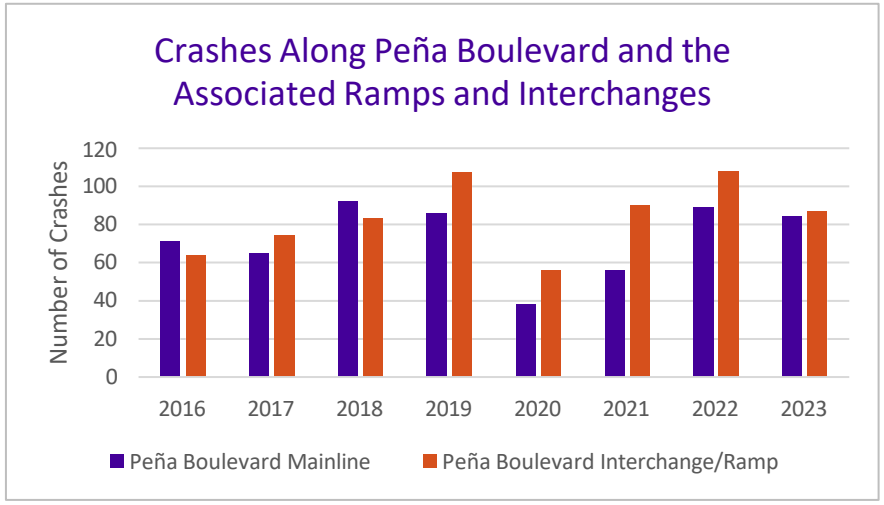
In 2021, approximately 9 percent of passengers and 17 percent of employees took transit (RTD A Line or bus services) to/from DEN; 86 percent of passengers and 74 percent of employees traveled to/from DEN via automobile. Vehicle occupancy counts on Peña Boulevard conducted in 2022, show that on average, 57 percent of vehicles have one occupant, 37 percent have two occupants, and 6 percent have three or more occupants, see table below. It is a goal of the Peña Master Plan to reduce drive-alone trips on Peña Boulevard and encourage more sustainable modes of travel to DEN.

Peña Boulevard Average Vehicle Occupancy Counts

Location	Direction	1 Occupant	2 Occupants	3+ Occupants
Peña Boulevard Between 40th Ave. and Green Valley Ranch	Inbound	57.3%	38.0%	4.7%
	Outbound	58.2%	36.1%	5.7%
Peña Boulevard Between E-470 and Gun Club Rd	Inbound	57.4%	36.6%	6.0%
	Outbound	54.8%	37.9%	7.3%
Average		**57%**	**37%**	**6%**

Safety Concerns

Crashes along Peña Boulevard result in property damage, injuries, and fatalities, and contribute to congestion along the corridor. Between 2016 and 2023, there were more than 1,250 total crashes along Peña Boulevard and associated ramps and interchanges, see figure below. Six of these crashes resulted in a fatality. Data between 2016 and 2023 shows an increasing number of crashes each year with 2020 and 2021 only showing a decrease due to decreased traffic volumes by the COVID-19 pandemic. Without intervention, it is expected that the number of crashes on Peña Boulevard, and their associated impacts, will continue to worsen into the future.



Note: Lower air passengers and traffic volumes due to the COVID-19 pandemic has resulted in lower collision rates from 2020 through 2021.

Of the 1,250 vehicles crashes on Peña Boulevard from 2016 through 2023, 45 percent were rear-end collisions, which are predominately due to congestion.

Crash hot spots are at the interchange ramp locations, attributable to adjacent land users accessing the Peña Boulevard corridor. These locations are predominately due to the numerous closely spaced interchanges with short weave distances, creating weave and conflict locations.

Peña Boulevard was originally constructed more than 30 years ago. As such, much of Peña Boulevard is no longer up to current design standards, including substandard shoulder widths, acceleration/deceleration lengths, and merge/diverge locations. Current shoulder widths vary between 6 feet and 8 feet. Increasing shoulder widths to 12 feet would reduce accidents and ensure infrastructure resiliency. Shoulders provide space to escape potential collisions or reduce their severity and allow faster, more efficient incident responses, thus reducing delays caused by crashes and weather incidents. Bringing shoulder widths, acceleration/deceleration lengths, and merge/diverge locations up to current design standards would improve safety and operations on Peña Boulevard.

With increases to freight movement using Peña Boulevard, improvements to geometrics and reliability are critical for maintaining the supply chain. DEN completed improvements to Peña Boulevard in November 2021, which included the reconstruction of eastbound lanes between Jackson Gap Street and the Jeppesen Terminal. Collision rates for this section of corridor were between 38 crashes and 43 crashes annually from 2016 to 2019. After completing improvements and reducing conflict points, this number dropped to 20 collisions in 2021.

Environmental Overview

DEN is committed to strategically considering the long-term economic, social, and environmental impacts of all airport activities to maximize long-term benefits and ensure that our success strengthens our community and stakeholders.

The Peña Master Plan aligns with DEN's Sustainability Policy to consider long-term economic, social, and environmental impacts from improvements to Peña Boulevard. As part of the Peña Master Plan, DEN developed a TDM Plan aimed to reduce single-occupancy vehicles (SOVs) on Peña Boulevard and shift existing travel to more sustainable modes of transportation. These TDM solutions include implementing strategies and policies that encourage shifts to more sustainable travel modes, such as to public transit and active transportation modes. With an aim to reduce carbon emissions, DEN is expanding electric vehicle charging infrastructure throughout the airport and facilitating more electrical vehicle use on Peña Boulevard. Recommendations from the TDM Plan are discussed in the *Transportation Demand Management* section of this document.

Attachment A, Existing Conditions Assessment Report documented the desktop environmental review of environmental resources along Peña Boulevard. Resources reviewed include:

- Greenhouse Gas Emissions
- Hazardous Materials
- Water Quality
- Socioeconomic Resources
- Environmental Justice
- Agricultural Soils and Operations
- Natural resources
- Cultural Resources
- Recreational Areas and Section 4(f)
- Noise
- Air Quality

It is important to understand the environmental context to inform development and evaluation of alternative solutions for Peña Boulevard. As the Peña Master Plan moves into design, a detailed environmental review under NEPA will be conducted to evaluate the effects of alternatives. Results of the environmental review will be documented, reviewed by the public and assist in the decision of the proposed action. As discussed in *Attachment A. Existing Conditions Assessment Report,* all federal, state, and local laws and regulations will be followed during the NEPA process.

Envision is a framework developed by Institute for Sustainable Infrastructure (ISI) that encourages systemic changes in the planning, design, and delivery of sustainable, resilient, and equitable civil infrastructure through education, training, and third-party project verification. In alignment with the airport's overarching sustainability commitments and policies, DEN is committed to incorporating environmental sustainability into the Peña Master Plan and utilized the **Envision® framework to incorporate sustainable infrastructure strategies, with the ultimate goal of achieving Envision verification**. As the Peña Master Plan moves in design and environmental review, DEN will continue to follow the Envision Framework and will minimize the impact of its operations on the environment by exploring continuous improvements and opportunities for innovation.

PURPOSE, NEED, GOALS, AND OBJECTIVES

Purpose: ***The purpose of the Peña Boulevard Transportation and Mobility Master Plan is to determine the existing transportation and mobility conditions within the Peña Boulevard corridor and develop and evaluate alternatives to address deficiencies. Viable alternatives from this plan will advance to an alternatives analysis, conceptual design, and an environmental review under the National Environmental Policy Act (NEPA).***

Needs

 **Safety**	There were 1,250 crashes on Peña Boulevard between 2016 through 2022. With 181 crashes in 2016 and 224 crashes in 2019, this 4-year period experienced a 24% increase (or a 7% average annual increase) in crashes on Peña Boulevard. Of the 1,250 crashes, 45% were front to rear (rear-end collision), and six incidents involved fatalities. Rear-end collisions are typically the result of traffic congestion along a facility.
 **Multimodal Connectivity**	Bicycle and pedestrian facilities in and around the Peña Boulevard corridor are not connected to transit stations and regional trails. There are currently no bicycle facilities connecting the 40th Avenue and Airport Boulevard to Gateway Park or 61st Avenue and Peña rail transit stations with surrounding neighborhoods or the First Creek Trail.
 **Regional Growth**	Passenger growth at DEN, developments along the corridor, and increased freight trips have accumulated significant demands to the corridor, and these factors are expected to increase due to anticipated regional growth projections. Peña Boulevard was originally constructed over 30 years ago, serving 31 million DEN air passengers in 1995 when the airport opened. By 2023, DEN served 77.8 million passengers—a 150% increase since it opened in 1995. DEN is preparing to serve 100 million annual passengers in the next few years. Using DRCOG 2050 projections for household and employment numbers within 5 miles of Peña Boulevard, households are likely to increase from approximately 127,000 to 250,000, and the number of jobs inside and outside of DEN are projected to increase from 238,000 jobs to 400,000 jobs in the 30-year period.
 **Congestion**	Average daily traffic (ADT) volume along Peña Boulevard has increased from 75,000 vehicles in 1995 to more than 136,000 vehicles in 2023—which is an increase of 80%. If this congestion and demand are not managed, vehicles will continue to redirect along local streets. Despite this growth, most of the corridor has not been rebuilt since its original construction.
 **Travel Time Reliability**	Travel time is increasingly unreliable on Peña Boulevard, which is critical for airline passengers traveling to the airport. When Peña Boulevard is free flowing, it takes eight minutes to travel westbound from Gun Club Road to I-70 (an 8-mile segment); meanwhile, during congested periods, it can take about 24 minutes, assuming there are no road incidents.
 **Aging Infrastructure**	DEN is committed to maintaining transportation facilities under its jurisdiction in a state of good repair. Because Peña Boulevard is more than 30 years old, required annual maintenance work is necessary, and the cost to maintain its aging facility is substantial. Since 2017, DEN has invested over $17 million in pavement maintenance and improvements for Peña Boulevard. An update of the facility at current design standards would provide new pavement with a 30-year or greater design life, reducing the cost of annual maintenance work.

Refer to *Attachment D. Alternatives Evaluation Report* for additional information.

Goals and Objectives

Goals and objectives were established at the beginning of the Study identify and evaluate solutions for the corridor that incorporate sustainability, quality of life, mobility and connectivity, economic competitiveness, and reduce barriers to opportunity while incorporating equity considerations for DEN's economically disadvantaged workers. Goals and objectives were presented to the public and stakeholders during the first round of engagement in February 2023 and approved by the TAC and Steering Committee.

Goals

Mobility Improve *mobility for everyone accessing the airport: vehicles; freight; transit; and first mile - last mile bicycle and pedestrian connections to transit.*

Safety Eliminate *traffic related fatalities and serious injuries on Peña Boulevard and enhance safety of all users along the corridor*

Manage Demand and Congestion *Ensure Peña Boulevard continues to facilitate the growth of DEN while reasonably accommodating surrounding non-airport developments.*

Economic Growth *Support DEN's strategic plan, Vision 100, to prepare for 100 million annual passengers within 10 years.*

Equity and Access to *Jobs* *Increase transportation choices along the corridor to reduce barriers to economic opportunity and ensure all residents have equitable access to good-paying jobs.*

Resilience Increase *the durability and reduce the total lifecycle cost of existing transportation facilities and systems on Peña Boulevard.*

Sustainability *Reduce single occupancy vehicles (SOVs) on Peña Boulevard and shift existing travel to more sustainable modes of transportation.*

Environment *Improve air quality and enhance quality of life in the communities surrounding Peña Boulevard.*

Partnership *Keep surrounding communities and agencies informed of the proposed solutions for the Peña Boulevard Corridor and the associated benefits to the region.*

Innovative Technologies *Use technology to improve operations and accommodate the projected growth on Peña Boulevard.*

Inclusivity and Accessibility *Promote inclusive, accessible and safe modes of transportation removing unnecessary barriers for people with disabilities and access needs.*

PUBLIC & STAKEHOLDER ENGAGEMENT

Public & Stakeholder Engagement

DEN values input of the public and its stakeholders and provided opportunities for meaningful involvement and input throughout the Study. Outreach events were conducted at three key milestones throughout the Study to keep the public and stakeholders informed and solicit their input. Feedback received during outreach events and throughout the Study influenced the goals, objectives and solutions considered for the Peña Master Plan. Feedback is documented in *Attachment B. Public & Stakeholder Engagement Summary*.

Round #1

Winter 2023

- Initiated communication with the public and presented purpose, need, goals, and objectives.
- Presented work accomplished to date, existing conditions, mobility surveys, and peer benchmarking.
- Provided opportunities for community members to give input on potential alternatives.

Round #2

Summer 2023

- Presented work accomplished to date and overview of round #1 engagement.
- Described alternative analysis and potential alternatives being assessed.
- Outlined transportation/mobility challenges and opportunities within Peña Master Plan Study area.
- Solicited community input on potential alternatives and presented next steps.

Round #3

Winter 2024

- Present key findings from the Peña Master Plan and TDM Plan.
- Solicit public and stakeholder feedback.
- Outline next steps, including future environmental studies, as required under the National Environmental Policy Act (NEPA).

Public engagement occurred, both in-person and virtually, and advertised on more than a dozen media platforms to encourage participation and feedback from a wide audience.
In-person engagement occurred in Montbello and Green Valley Ranch, communities adjacent to airport property, in addition to engagement events at the airport. Virtual open houses were hosted on the project webpage to ensure those who could not attend in-person events had an opportunity to engage with the Study. Feedback was collected through various tools, including paper and virtual comment forms, roll plot maps, and oral comments. All materials from the engagement are available at www.FlyDenver.com/Pena_Plan.

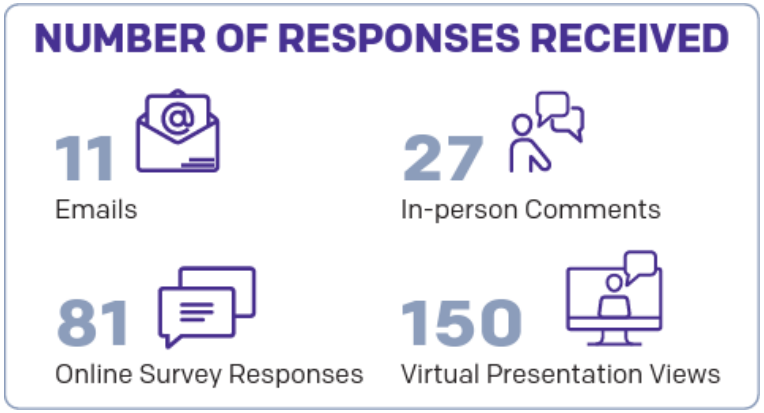
Public Engagement Round #1 – Winter 2023

The first round of public engagement occurred in February and March 2023. DEN held two in-person open houses on Thursday, February 23, 2023 in Montbello and Tuesday, February 28, 2023 in Green Valley Ranch. In addition, DEN hosted a self-guided virtual open house on www.FlyDenver.com, which was available from February 23, 2023 to March 9, 2023.

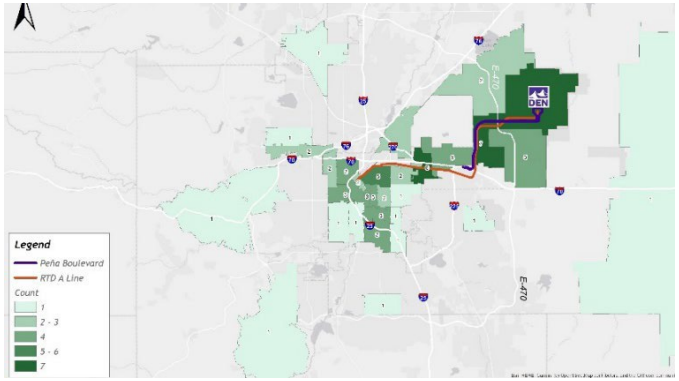
Both in-person and virtual open house attendees were provided with a comment form with the following questions:

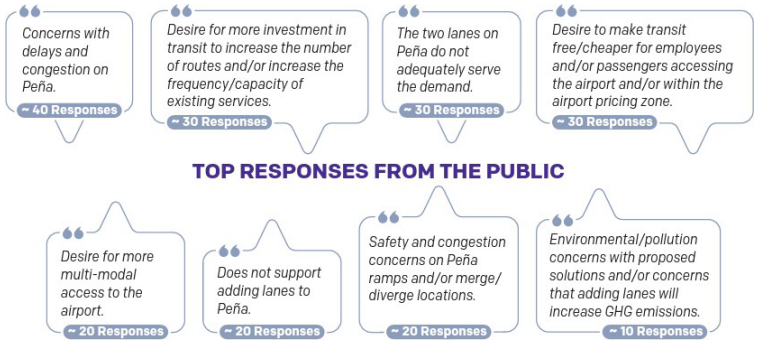
- Describe the transportation barriers/challenges that Peña Boulevard presents for you?
- Do you have any location-specific concerns with the study area transportation network?
- Do you have any other questions or comments regarding the Peña Boulevard Transportation and Mobility Master Plan?

Refer to *Attachment B. Public & Stakeholder Engagement Summary,* for additional information.



Zip Code of Responders Round #1





Public Engagement Round #2 – Summer 2023

The second round of public outreach and engagement occurred in Summer 2023. DEN attended six local and community organized events in Montbello, Green Valley Ranch, and at the airport to provide information about the Peña Master Plan, solicit feedback, and encourage the community to participate in virtual open house. DEN received feedback or comments from more than 600 people within the Study area and throughout the Denver Metro area, including:

- 41 emails
- 601 Virtual Comments
- 29 In-person Comments
- 280 Open House Views (YouTube)

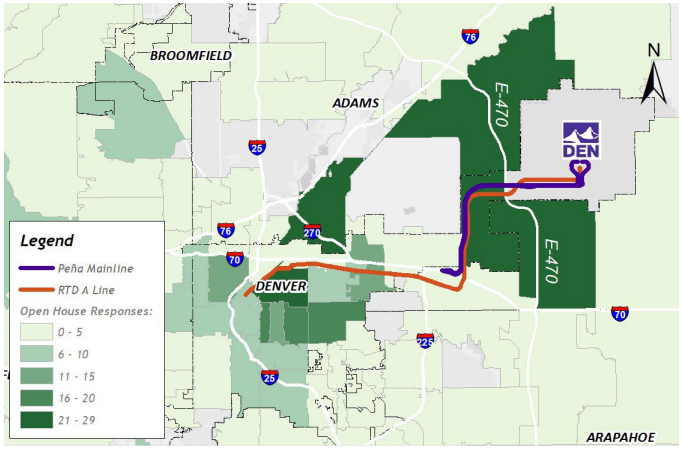
When asked ***"Do you have any comments or concerns regarding the alternatives being considered for Peña Boulevard?"***, the public responded:

Alternative	# of Responses
Do something (see breakdown on next table)	484
Enhanced transit and TDM strategies	137
Do nothing	115
Opposed to tolling	40
Opposed to adding lanes for cars or SOVs	29

Top Do Something Responses:

Alternative	# of Responses
Separating local and airport traffic	89
General purpose lanes or "add lanes"	77
Separating local and airport traffic (frontage road)	65
Managed lanes	53
Bus only lanes	30
Express lanes to DEN	26

Zip Codes of Responders (Round #2)



Other Comment Sentiments

Safety and congestion concerns on Peña ramps and/or merge/diverge locations

Desire for enhanced transit and TDM strategies

Concerned with delays and congestion on Peña

Concerns with the I-70 Interchange

Desire for more direct transit service to DEN

Bike Infrastructure: Better bike facilities and/or bike connections to transit

Home location / family commitments / schedule not conducive to more sustainable modes of transportation

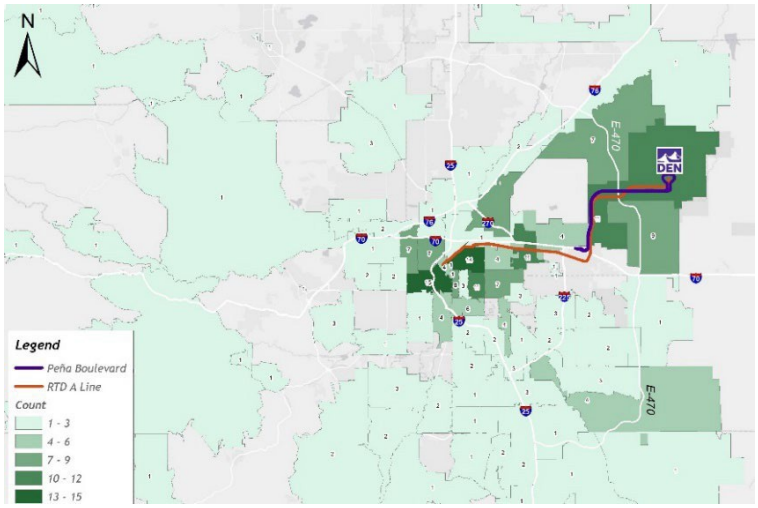
Desire for more reliable, higher frequency, faster or an express A-Line service to DEN

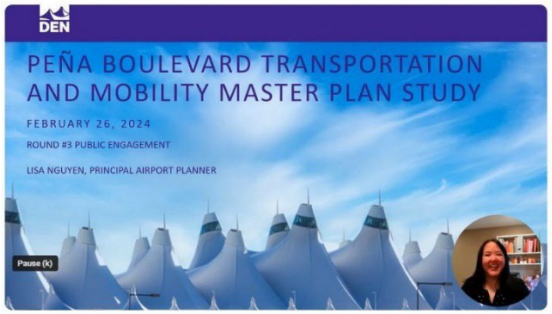
Response Categories: Purple = Congestion, Green = Transit, Orange = Infrastructure, Gray = Mobility Barrier

Public Engagement Round #3

The third and final round of public outreach and engagement occurred from late February through early March 2024. DEN hosted a virtual open house on FlyDenver.com from and on February 22nd, 2024, members of the TAC attended the City and County of Denver District 11 Town Hall hosted by Councilwoman Stacie Gilmore. These events provided DEN the opportunity to connect with more than 200 in-person attendees and almost 300 virtual viewers to inform them of the Peña Master Plan and hear their feedback and concerns. Nearly 300 individuals provided comments on the virtual open house and over 300 viewed the presentation recording.

Zip Codes of Responders (Round #3)

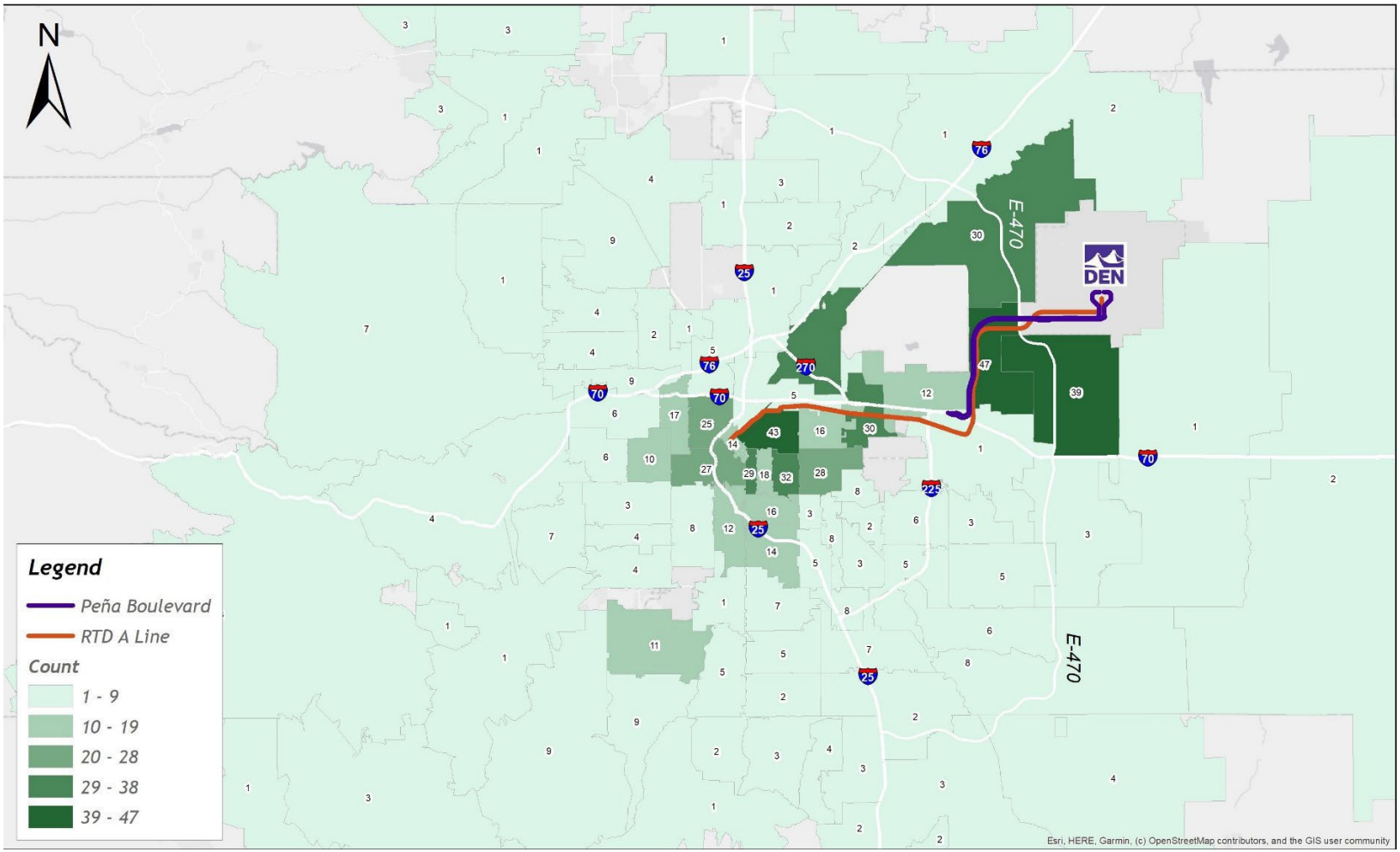




Peña Blvd. Master Plan - Virtual Engagement Round #3

Public Engagement Reach

Through the three rounds of public outreach and engagement feedback was received from over 1,000 individuals on the Peña Master Plan from across the state of Colorado.



Stakeholder Engagement

Peña Boulevard is a regionally significant corridor, providing access to DEN and northeast metro Denver. As such, DEN identified the Stakeholder Working Group (SWG) which consisted of surrounding transportation and local agencies and advocacy groups to guide the development of the Peña Master Plan.

A total of three meetings were conducted at key milestones throughout the Study to allow the SWG to review and comment on Study elements, including project goals, existing conditions, proposed alternatives, and recommendations. This forum ensured that the Study team provided consistent information to all stakeholders and allowed stakeholders to hear ideas and concerns of other agencies and groups. Their valuable feedback was considered throughout the development of the Peña Master Plan, and DEN will continue to engage with the SWG during future phases. Refer to *Attachment B. Public & Stakeholder Engagement Summary* for additional information.

Thank You to the Organizations & Advocacy Groups Participating in the SWG

- Mayors Bicycle Advisory Board
- Win-Win Coalition

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management

What is Transportation Demand Management (TDM)?

TDM is a set of strategies to provide travelers with choices to improve trip reliability and reduce the number of vehicles that travel on roadways. TDM strategies can include promoting alternatives to driving alone, such as transit, biking, walking, and ridesharing.

By implementing TDM strategies, organizations can work towards enhancing the efficiency of transportation systems and promote healthier and more sustainable communities.

The Peña Master Plan includes a TDM Plan to identify solutions to improve access to the airport by using mobility strategies. Recommendations from the TDM Plan complement potential improvements to the Peña Boulevard corridor by improving access to DEN through more sustainable modes of transportation and reducing drive-alone trips along Peña Boulevard. By improving access to the airport, recommendations that improve access to jobs for low-income employees and others who cannot afford to drive or are unable to drive were taken into consideration. Improved job access can benefit workers economically and enhance airport operations by increasing the number of people who can work at the airport and by improving job retention.

DEN conducted surveys of more than 5,000 passengers, 2,700 employees, and 50 tenants to understand their transportation needs and challenges when accessing the airport. An analysis of these passenger, employee, and tenant surveys influenced the development of TDM strategies. A collection of 70-plus TDM and mobility access recommendations was evaluated. Considering the unique needs of these airport users helped narrow the list to 19 priority strategies. TDM strategies include educational programs, incentives and pricing, policies, investment in low-cost infrastructure, and transportation services to inform and encourage travelers to make choices that efficiently meet their travel needs.

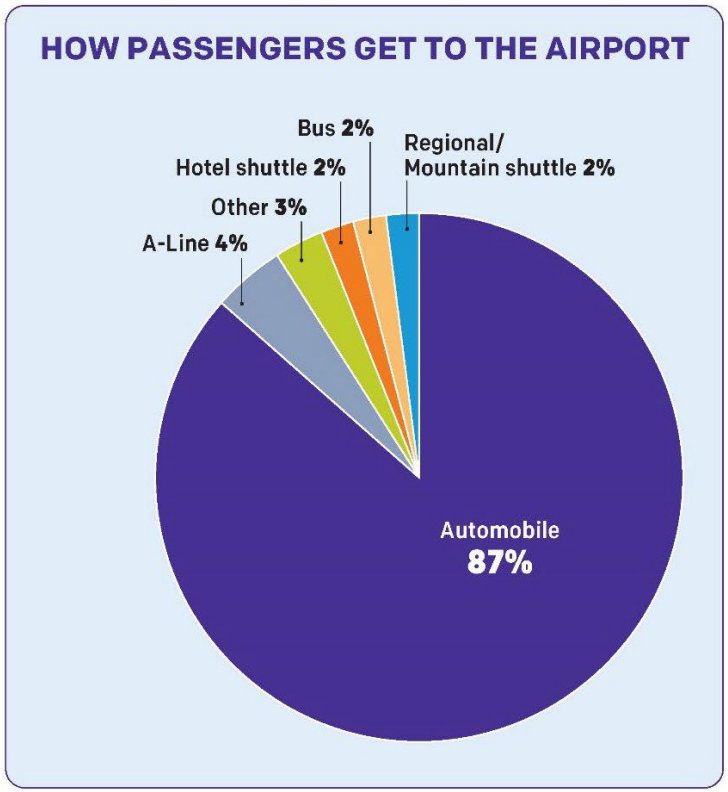
An overview of the mobility strategies and solutions is in the following pages. Refer to the *TDM Plan* for additional information.

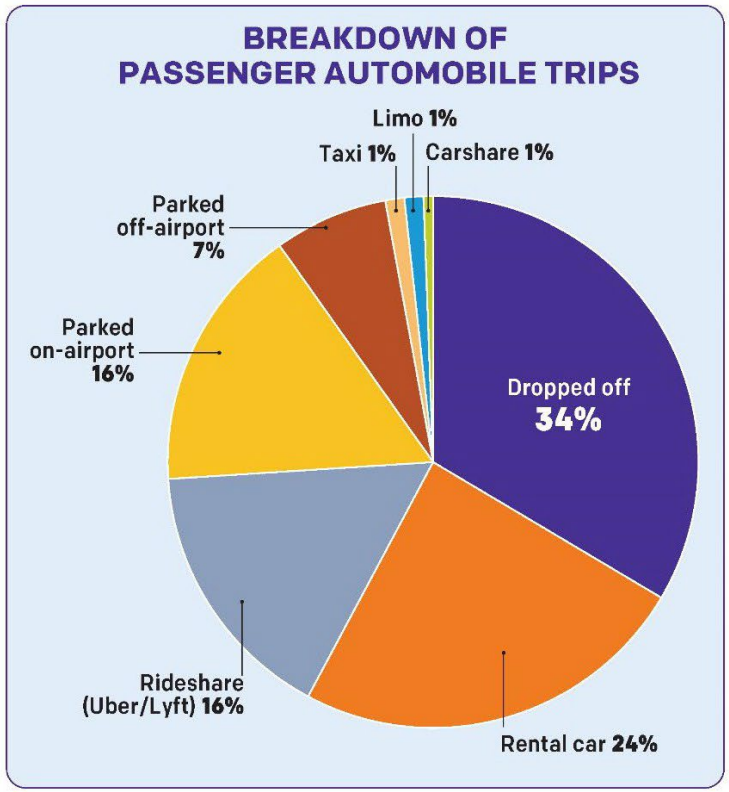
Passenger and Employee Surveys

Passenger and employee surveys provided an initial baseline for the trend analysis that was used for development of strategies and programs in the TDM Plan.

Passenger Survey

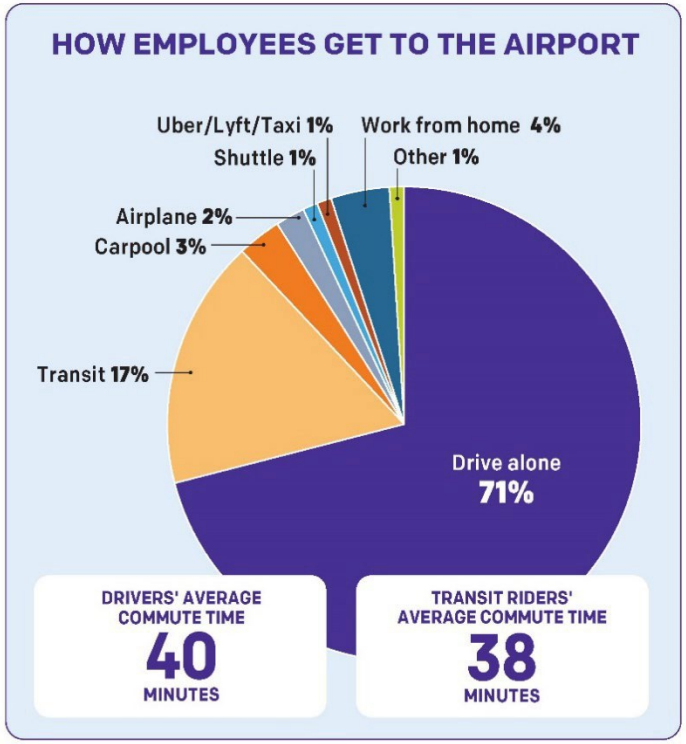
Passenger surveys were conducted between July 14, 2022, and August 16, 2022, which concluded with 4,968 useable surveys. The purpose of the survey was to calculate current passenger ground access mode shares, identify market segments of departing passengers through trip purpose (Business/Non-Business) and residency (Resident/Non-Resident), to understand and evaluate ground access characteristics of the DEN air passenger.





Employee Survey

Employee surveys were conducted from October 11, 2022, to January 20, 2023, and concluded with 2,702 usable responses (approximately 8 percent of all DEN employees). The purpose of the survey was to understand the impacts of groundside access to DEN employees, note the effects that impact mode choice, and learn about employees' commute challenges.



Employee Feedback

"I enjoy the train even though it's expensive."

"I like contributing to fewer cars on the road. I also don't like the drive from Arvada to DIA."

"I drive because the A Line is not cheap enough and not frequent enough."

Findings of these surveys indicate that transit can be an efficient travel option for employees and travelers because it is sometimes faster than driving and can be less expensive than parking for passengers and employees. However, many employees and passengers said they do not have access to transit service that can get them from their homes to the airport, or transit does not operate when they need it. A key concern for all travelers is the time it takes to travel to the airport. Any programs that can improve transit access, or the awareness of transit, and reduce travel time would likely be well received.

Refer to the *TDM Plan* for additional information.

Tenant Interviews and Surveys

Tenant interviews and surveys leveraged employer insights by informing them about the employee survey data collection effort and potential mobility strategies while providing an opportunity for the project team to educate tenants on the goals of the Peña Master Plan effort. Results from this quantitative and qualitative data collection effort provided an overview of the impacts of current mobility challenges on tenant operations and recruitment efforts. It was also an effective way to obtain feedback related to potential programmatic outcomes.

Tenant Interviews

Tenant Interviews were conducted in October 2022 with 10 large DEN tenants, including representatives from airlines, airport operations/maintenance, cargo, concessions, labor unions representing airline support and concessions, and rental car agencies. The purpose of the survey was to gather their feedback on ways in which mobility access impacts operations, including employee retention and recruitment and transportation employment benefits available to employees.

Tenant Interview Feedback

"The hardest part about working at the airport is getting to the airport."
-Concessionaire

"Sometimes people can wait about 40 minutes for a bus and then also must go through security. ***That could be an hour and a half in the morning of unpaid time."***
-Concessionaire

"People will reconsider jobs behind security because their journey is so long."
-Labor Union

Tenant Surveys

Between August 2022 and November 2022, 54 tenant representatives completed the survey from various companies and industries, including airlines, rental car agencies, cargo, concessions, security, government agencies, and airport operations representing more than 11,000 DEN employees. The purpose of the survey was to understand the effects of groundside access at DEN, which impacts employers and their employees.

Tenant Survey Key Findings

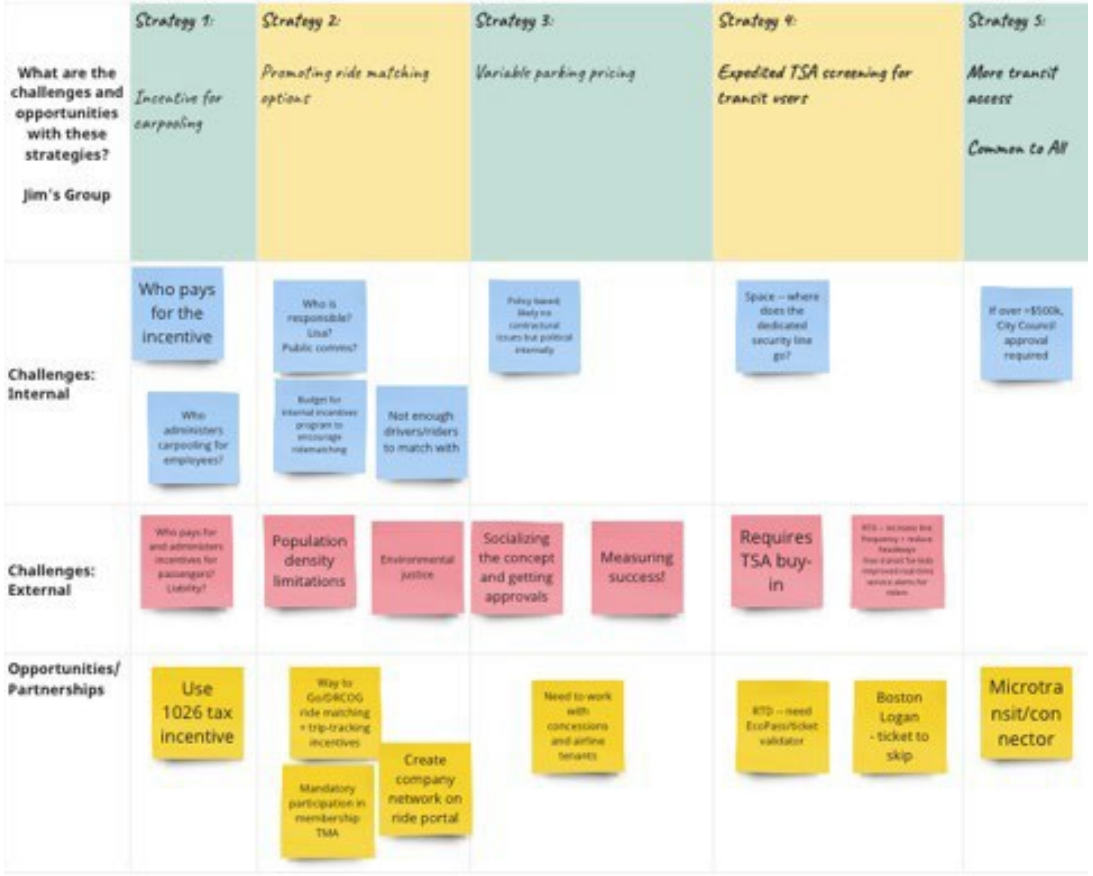
- **88% of tenants provide employees with free parking**
- **33% of tenants provide free EcoPass**
- **Smaller employers are twice as likely to offer EcoPass**

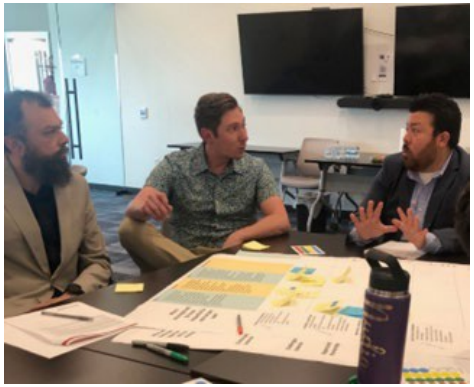
Tenants cite the following that affect their ability to recruit/retain employees:

- Cost of driving to the airport 🕓 66%
- Time it takes to get to the airport 🕓 60%
- RTD does not operate around employees' schedules 🕓 43%
- Employees lack access to a reliable car 🕓 23%

TDM Stakeholder Workshop

DEN held a stakeholder workshop in summer of 2023 to brainstorm potential TDM strategies with representatives from DOTI, DRCOG, CDOT, local Transportation Management Associations (TMAs), and various DEN internal departments. Each strategy was analyzed for potential challenges, required approvals, supporting partnerships, and alignment with specific goals in the Peña Master Plan.





Strategy Evaluation

The TDM Plan used the Peña Master Plan goals (see page 15) to guide the development of TDM recommendations for DEN. The goals applicable to the Mobility Study are listed below.

Goals

Mobility Improve mobility for everyone accessing the airport: vehicles; freight; transit; and first mile - last mile bicycle and pedestrian connections to transit.

Equity and Access to Jobs Increase transportation choices along the corridor to reduce barriers to economic opportunity and ensure all residents have equitable access to good-paying jobs.

Environment Improve air quality and enhance quality of life in the communities surrounding Peña Boulevard.

Manage Demand and Congestion Ensure Peña Boulevard continues to facilitate the growth of DEN while reasonably accommodating surrounding non-airport developments.

Sustainability Reduce single occupancy vehicles (SOVs) on Peña Boulevard and shift existing travel to more sustainable modes of transportation.

Innovative Technologies Use technology to improve operations and accommodate the projected growth on Peña Boulevard.

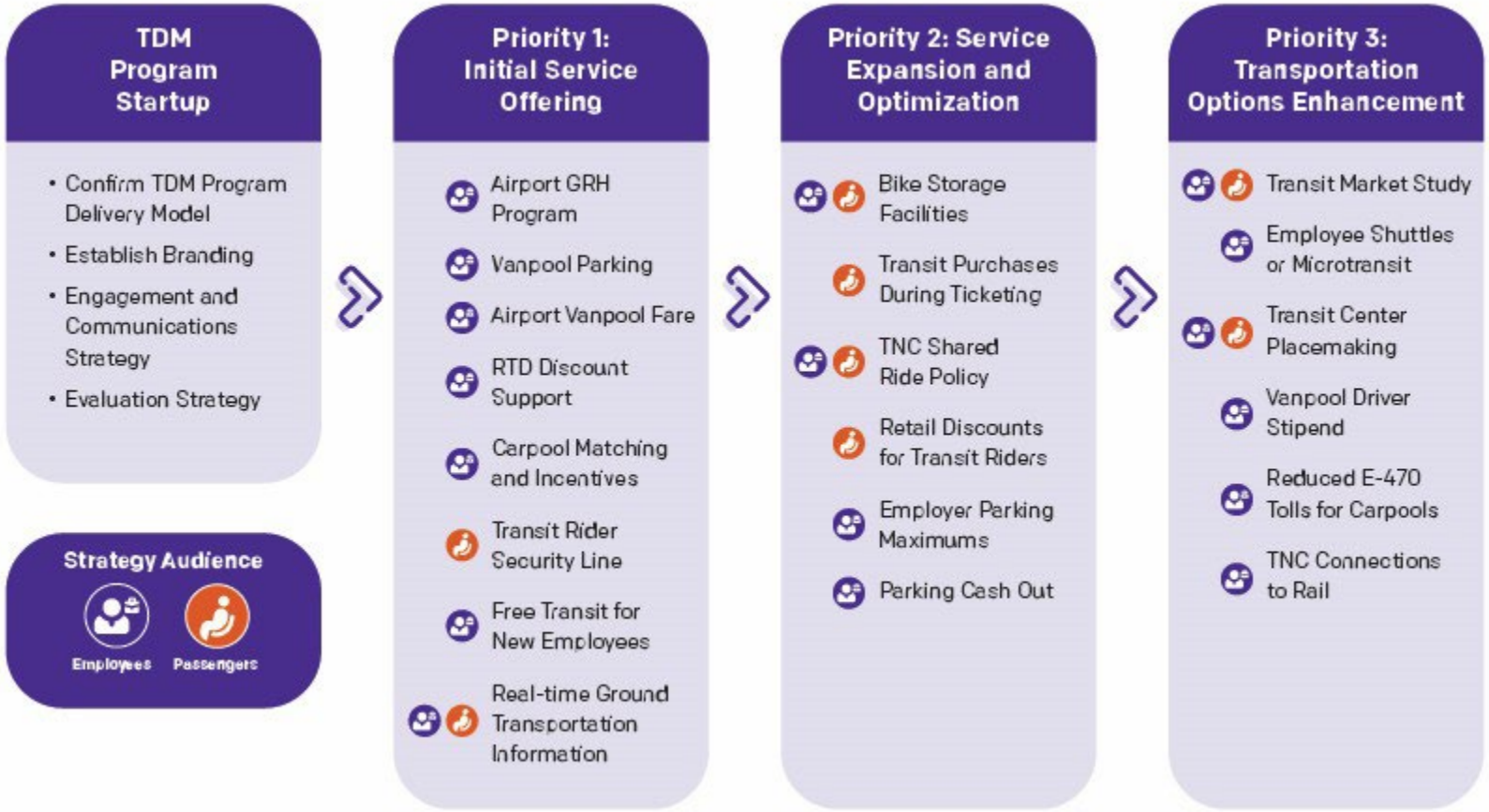
Target Modal Split

As part of the TDM Plan, DEN established long-term goals for how employees and passengers access the airport. By 2035 DEN seeks to:

- ***Decrease DEN employee drive-alone trips by 10 percent*** *(from 71 percent to 61 percent).*
- ***Increase DEN passenger transit trips (RTD A Line, buses, & shuttles) by 10 percent*** *(from 9 percent to 19 percent).*

Final TDM Recommendations

The research was analyzed, and strategies resulted in final TDM strategies that address transportation needs from the surveys, tenant and public engagement, and review of the transportation system were identified as final recommendations. Recommendations and the associated implementation plan are in the TDM Plan. As a result of the selection process, all strategies are recommended for implementation within the next ten years. TDM strategies are divided into four categories to help DEN prioritize implementation and funding. The ranking process was done to prioritize strategies, not remove strategies from consideration.



These recommended TDM strategies will be most successful when managed and delivered through dedicated TDM Program staff. Aligned branding efforts executed through a marketing and communications plan is recommended. Refer to the *TDM Plan* for additional information.

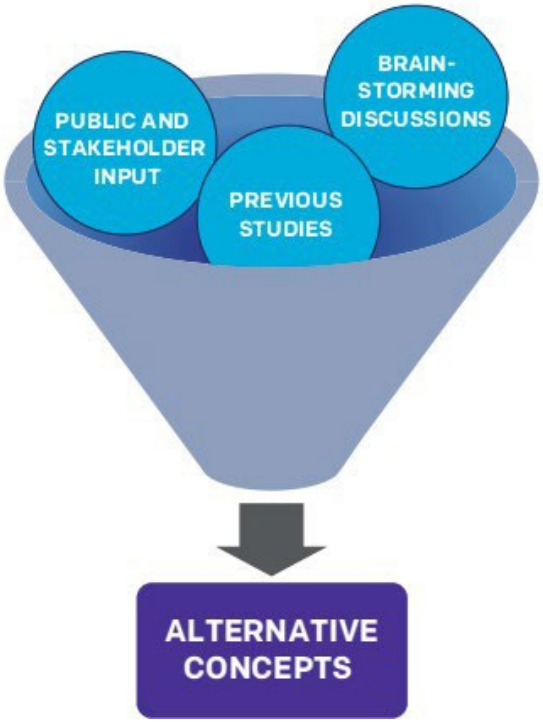
POTENTIAL ALTERNATIVE CONCEPTS FOR PEÑA BOULEVARD

Potential Alternative Concepts for Peña Boulevard

A range of alternative concepts were identified for Peña Boulevard through brainstorming discussions with the TAC, through public and stakeholder input, and from recommendations of previous studies. Once identified, these alternative concepts underwent two levels of screening (shown in the evaluation process below): firstly, against the purpose and need and secondly, against evaluation criteria and goals and objectives before arriving at a consolidated list of potential alternatives that were carried forward for further refinement and traffic modeling.

Refer to *Attachment D. Alternatives Evaluation Report* for additional information.

Identifying Alternative Concepts

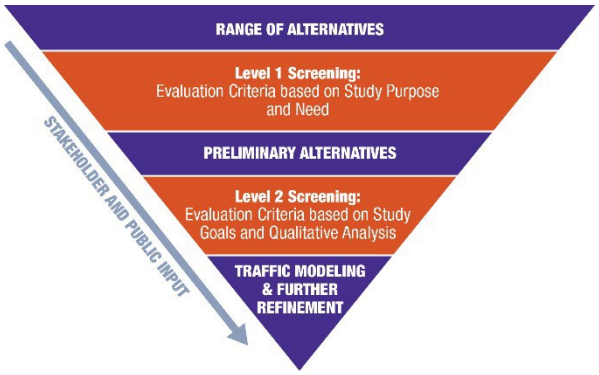


Alternative Concepts Workshop

An alternatives development and brainstorming workshop was held in Spring 2023, to review and brainstorm potential cross-sectional upgrades to Peña Boulevard between I-70 and Gun Club Road. All members of the TAC were invited to attend the 3-hour in-person workshop.

Evaluation Process

The alternatives development and evaluation process included developing a full range of alternative concepts that were screened against the project Purpose, Need, Goals and Objectives. The elimination of unreasonable alternatives was documented and is intended to limit the need for consideration during the future NEPA process.



Improvements Incorporated into all Peña Boulevard Alternatives

For all the Peña Boulevard alternatives, DEN will implement TDM Plan solutions, build operational and safety improvements, implement technology solutions, and construct multi-modal trail connections. The map below shows safety and operational improvements, and planned pedestrian/bike trails that could be implemented along the Peña Boulevard corridor.

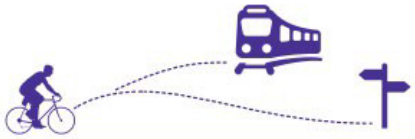
TRANSPORTATION DEMAND MANAGEMENT (TDM) AND GROUND ACCESS PLAN

SAFETY IMPROVEMENTS ON PEÑA BOULEVARD

Increased shoulder width.
Improved acceleration/deceleration lanes.

ADJACENT MULTI-USE TRAIL FACILITIES

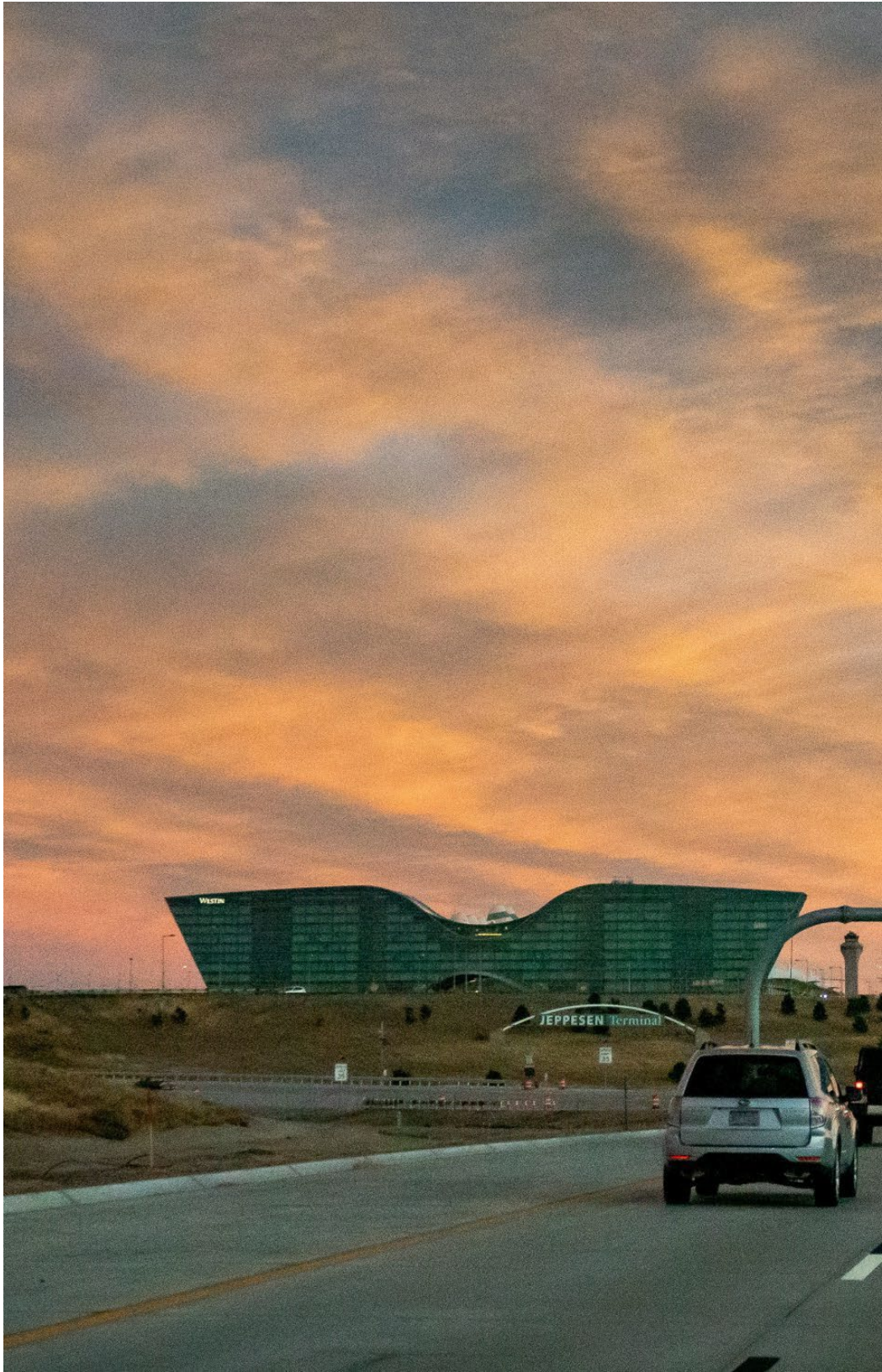
New trail connections to transit stations and regional trails.



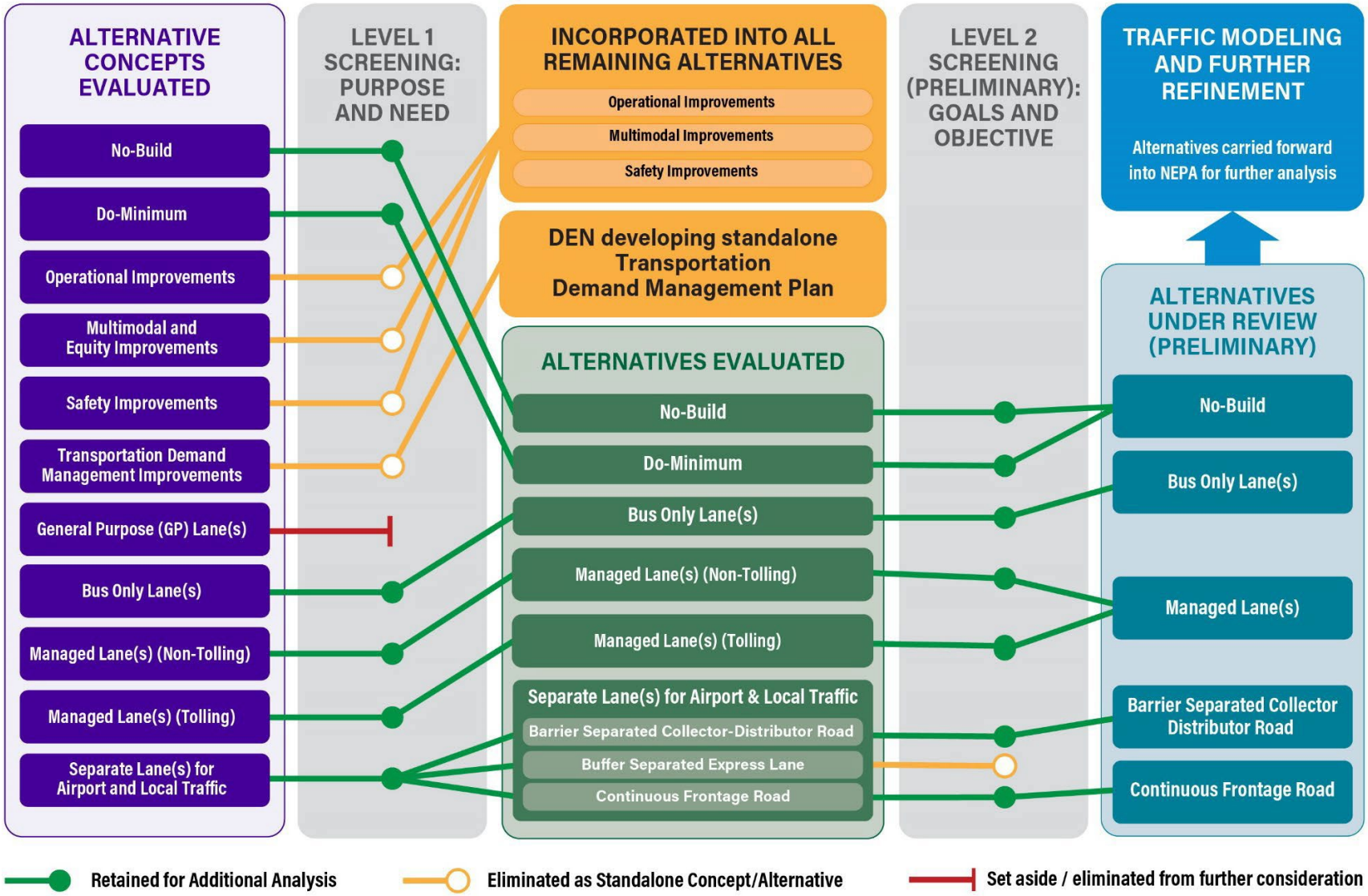
Alternative Concepts Evaluation

The alternative concepts evaluation process included two levels of screenings (outlined on page 34). Alternative concepts were first evaluated against Level 1 screening criteria to determine whether the concept meets the purpose and need of the project. Conceptual alternatives remaining after Level 1 were further refined and proceeded into Level 2 screening, where they were evaluated against goals and objectives. At the end of the screening process, five potential alternatives remained, and these alternatives underwent traffic modeling and further refinement.

Although this is not a traditional PEL study process, the alternatives development, evaluation, and screening were conducted using a robust alternatives evaluation. The alternatives evaluation will be valuable for the next step of the project development process when alternatives are further defined and optimized with conceptual engineering design and a formal environmental review under NEPA is conducted.



Alternatives Development and Evaluation Process

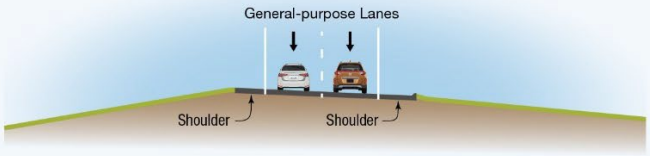


Alternative Screening

Five alternatives, displayed below, remained after Level 1 and Level 2 screening, and were carried forward for traffic modeling and further refinement. However, these alternatives represent high-level concepts. For example, within the managed lanes alternative, managed lanes could be high-occupancy toll lanes or simply high-occupancy vehicle lanes. Each of these alternatives are described in the following pages.

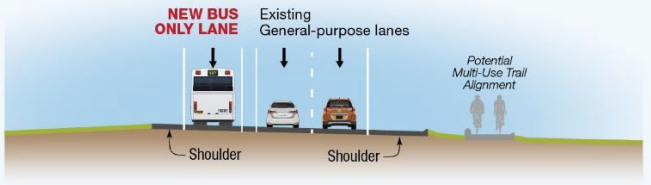
NO-BUILD

No-Build would not make changes to current cross- section but could include pavement upgrades and safety improvements.



ADD BUS-ONLY LANE (TRANSIT IMPROVEMENTS)

A bus-only lane would be an exclusive lane for RTD, mountain shuttles, and other transit vehicles



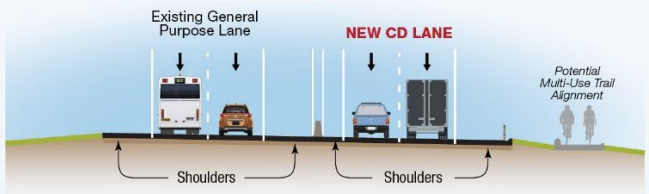
ADD MANAGED LANE (TOLLING OR NON-TOLLING)

Managed lanes are a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions. Managed lanes could include:

- High occupancy lanes (carpool, vanpool, etc.)
- Peak period shoulder running
- Tolled lanes (dynamic or fixed pricing)

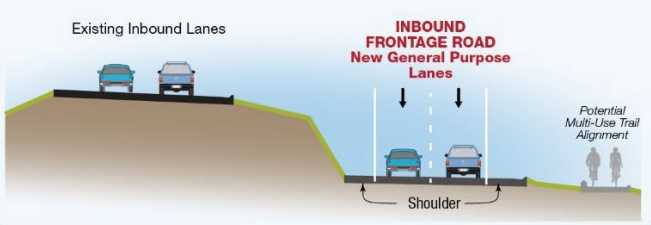
ADD COLLECTOR/DISTRIBUTOR ROAD

A collector/distributor would separate freeway through traffic from other vehicles that are exiting or entering the freeway.



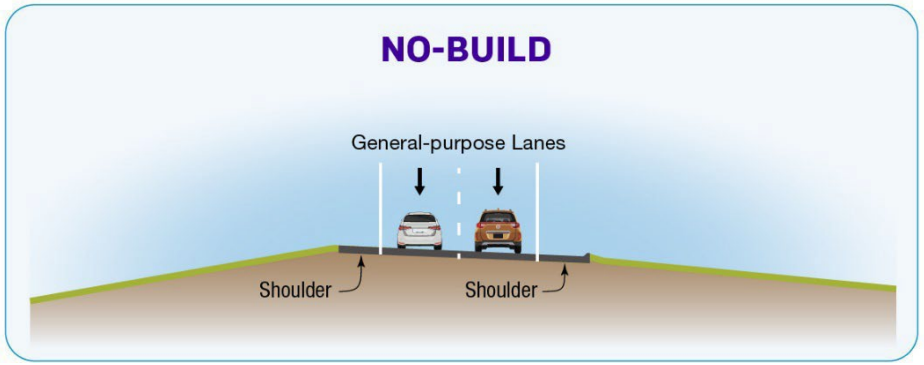
ADD FRONTAGE ROAD

A frontage road is a subsidiary road running parallel to a highway and giving access to neighborhoods and businesses.



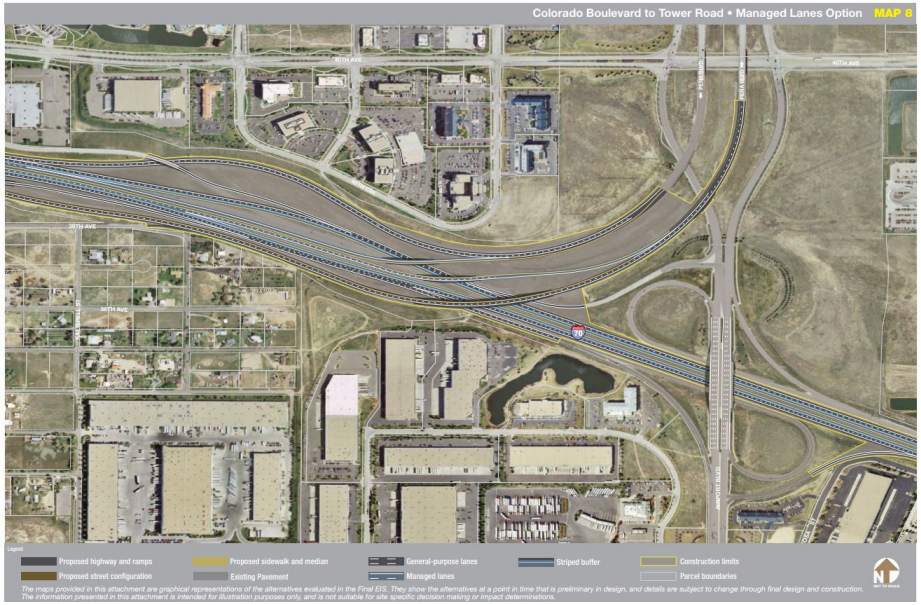
No-Build Alternative

The No-Build Alternative would not make any changes to the current cross-section of Peña Boulevard. However, it is not the same as existing conditions, as improvements to other adjacent facilities still would occur as part of other planned projects, resulting in changes to operations or conditions along Peña Boulevard. Changes assumed to occur regardless of actions taken along Peña Boulevard are outlined in DRCOG's *2050 Metro Vision Regional Transportation Plan (2050 MVRTP)*.



I-70 managed lane direct connect ramps to Peña Boulevard

The construction of managed lane direct connect ramps between existing managed lanes along I-70 and Peña Boulevard is a planned future project included within the *2050 MVRTP* and therefore included in the 2050 No-Build Alternative for Peña Boulevard. It is envisioned that such ramp connections to Peña Boulevard would start/end between 40th Avenue and Green Valley Ranch Boulevard. In the No-Build scenario, Peña Boulevard would continue to have two general purpose lanes in each direction north of Green Valley Ranch Boulevard (the same as existing conditions). The following map is a schematic layout of direct connect ramps from I-70 to Peña Boulevard that was included in Attachment A of the Central 70 Envionmental Impact Statement (EIS).

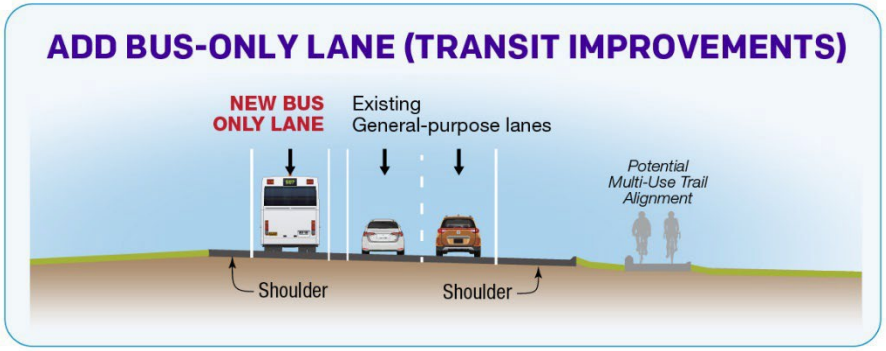


What are managed lane direct connect ramps?

Managed lane direct connect ramps are freeway ramps that connect from a managed lane facility to another facility, such as a managed lane on a crossing freeway or to a local roadway. The purpose of such ramps is to allow vehicles to enter or exit a managed lane facility, which are typically located on the inside-most lane of a freeway, without needing to merge across multiple lanes of traffic. Eliminating these lane changes improves traffic flow and reduces crashes.

Add Bus-Only Lane Alternative

The Add Bus-Only Lane Alternative proposes to construct an additional lane along Peña Boulevard that would be reserved for use by transit buses, including RTD buses, airport shuttles, etc. It is envisioned that on the southern end of Peña Boulevard (near I-70), the bus only lanes would connect directly to the managed lane direct connect ramps to/from I-70 providing buses a seamless connection to the regional express lanes network.

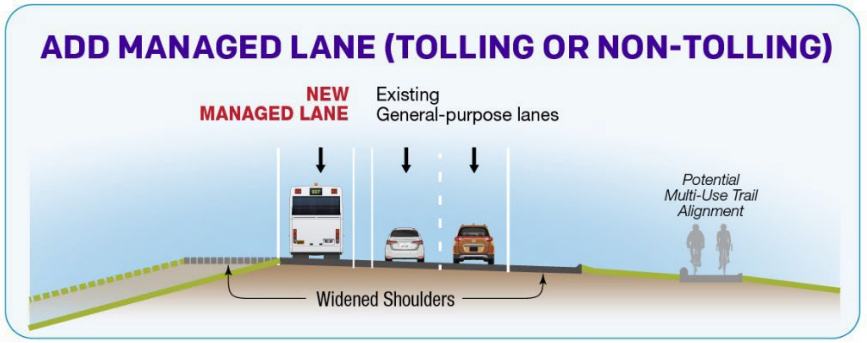


Add Managed Lanes Alternative

This alternative proposes constructing new lanes along Peña Boulevard that would be specifically managed to achieve specific mobility objectives. The existing two travel lanes would remain as general-purpose lanes. The Peña Master Plan considered two strategies for managed lanes; bus with high-occupancy vehicles (HOV) and bus with high-occupancy tolled (HOT) lanes.

What is the difference between HOV and HOT lanes?

HOV lanes are free and may only be used by vehicles that meet the specific vehicle occupancy threshold (HOV2+). At least two people per vehicle for HOV2+. HOT lanes are open to all cars but charge a toll for vehicle with less than the required number of people in the vehicle. HOT lanes (also called tolled express lanes) are currently present on numerous freeway facilities around the Denver Metro/Front Range, including on I-25, C-470, and I-70. HOT lanes along Peña Boulevard are envisioned to operate similarly to these existing facilities.



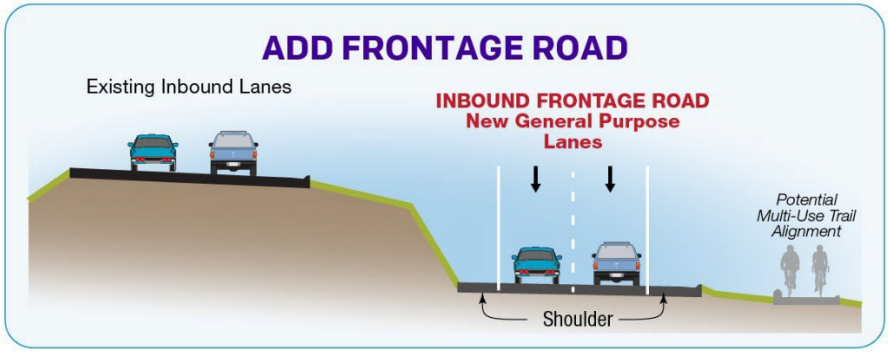
Add a Facility to Accommodate Local Traffic Alternative

Growth both at DEN and within the northeast Denver Metro area will continue to exert dual pressures on Peña Boulevard and to serve both airport and non-airport traffic. This alternative proposes constructing new facilities to best manage the needs of both user groups. Within the study, two types of facilities were considered to manage local traffic, including collector-distributor (C-D) roads and a frontage road. Although each facility type is slightly different, the intention of both is to separate local traffic from DEN traffic and create appropriate infrastructure tailored to the needs of these two different user groups.

The primary difference between C-D roads and a frontage road is that C-D roads are similar to freeway facilities, in that they are grade-separated and connect to the local roadway system through on-ramps and off-ramps; whereas, a frontage road is similar to an arterial street with at-grade, generally signalized intersections between the frontage road and crossing roadways.

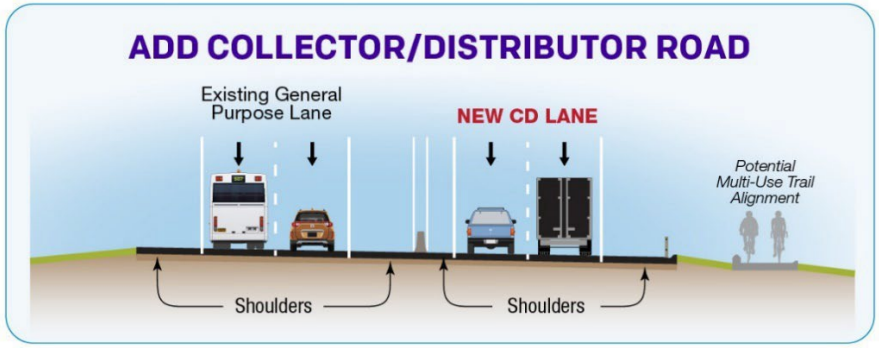
Add Frontage Road

Frontage roads are adjacent local roadways that would run parallel to Peña Boulevard. Frontage roads would include at-grade intersections with intersecting local streets. The purpose of a frontage road is to provide better access and local connectivity to the local street network than can be provided by a freeway facility. Frontage roads also provide an alternative route for local traffic trips that do not require them to utilize the freeway facility.



Add Collector Distributor Roads

C-D roads are freeway-type facilities which run parallel to the mainline freeway and connect to fully grade-separated on-ramps and off-ramps. The purpose of C-D roads is to separate traffic getting onto or off the freeway from traffic that is continuing through. This alternative provides an “airport express-lane” for through traffic to proceed without interruption from on-ramp and off-ramp local traffic usage. The lane changing associated with on-ramps and off-ramps happen on a dedicated facility, which may have a lower speed limit than the mainline freeway making it safer and easier to change lanes, especially when on-ramps and off-ramps are closely spaced.



TRAFFIC MODELING AND FURTHER REFINEMENT

Traffic Modeling and Further Refinement

The potential alternatives for Peña Boulevard were evaluated using DRCOG's regional travel demand model. Alternatives were refined within the model to understand how various configurations for Peña Boulevard would influence travel patterns within the Study area and identify which alternatives best align with the goals of the Study. Several measures of effectiveness (MOEs) were considered to evaluate the alternatives, including:

- Travel Times – For the purpose of summarization, PM peak travel times have been reported here because they represent the longest travel times as compared to the AM peak period. A shorter travel time reflects a quicker trip for people heading to or from DEN.
- Daily Vehicle Miles Traveled (VMT) – VMT is a measure of how many vehicles are traveling multiplied by the distance they travel. A higher VMT represents more vehicles traveling a further distance.
- Daily Vehicle Hours Traveled (VHT) – VHT is a measure of how many vehicles are traveling multiplied by the time it takes them to travel. A higher VHT reflects greater congestion in an area.
- Percent Single Occupancy Vehicles (SOVs) – The percentage of SOVs reflects how many people are choosing to drive alone in their vehicles. Increasing vehicle occupancy (i.e., reducing the percentage of SOVs) is a way of moving more people without needing to accommodate more vehicles on the road.
- Daily Vehicle Demand – The total number of vehicles wanting to use Peña Boulevard each day.

A summary of these MOEs for each alternative considered is provided in the table on page 40 and additional details about each MOE can be found in *Attachment D – Alternatives Evaluation Report*.

2050 Measure of Effectiveness

Alternative	PM Peak Period Travel Time for GP Lanes[1] (% difference from No Build)	PM Peak Period Travel Time for ML / Bus Lanes[1] (% difference from No Build)	Daily Study Area Vehicle Miles Traveled (VMT) (% difference from No Build)	Daily Study Area Vehicle Hours Traveled (VHT) (% difference from No Build)	Percent Single Occupancy Vehicles[2] (% difference from No Build)
No-Build	56.4 minutes	n/a	2,520,600 miles	65,000 hours	77% SOV
Bus-Only	0% increase	n/a	0% increase	0% increase	0% increase
Managed Lanes (Bus + HOV2+)	6% decrease	37% decrease	2% increase	3% decrease	5% decrease
Managed Lanes (Bus + HOT)	8% decrease	30% decrease	1% increase	2% decrease	1% decrease
Frontage Road	9% to 20% decrease	36% decrease	0% to 2% increase	2% decrease to 1% increase	1% to 2% decrease
Collector-Distributor	13% to 20% decrease	33% decrease	2% to 4% increase	3% to 5% decrease	1% to 0% decrease

[1] Travel times are based on round trip from I-70 to Jackson Gap St and back to I-70
[2] SOV percentages are for Peña Boulevard between 40th Avenue and GVR Boulevard.

Note: all increase and decreases are calculated relative to the No-Build Alternative

Volumes along Peña Boulevard

The graph shows the projected 2050 daily volumes on Peña Boulevard between GVR Boulevard and 56th Avenue for the various alternatives.

- Adding C-D roads to Peña Boulevard is expected to result in an increase in volumes as compared to the No Build Alternative because C-D roads create additional capacity and allow for people to travel to local interchanges more easily.
- Adding a frontage road to Peña Boulevard is expected to reduce vehicle volumes on Peña Boulevard as compared to the No Build Alternative because trips going to local interchanges, such as GVR Boulevard and 56th Avenue, will instead use the new frontage road.
- Adding HOV2+ lanes to Peña Boulevard is expected to increase vehicle volumes as compared to the No Build Alternative due to the additional capacity provided. This additional volume is similar to what is expected with HOT lanes.
- Adding HOT lanes to Peña Boulevard is expected to increase vehicle volumes as compared to the No Build Alternative due to the additional capacity provided. This additional volume is similar to what is expected with HOV2+ lanes.

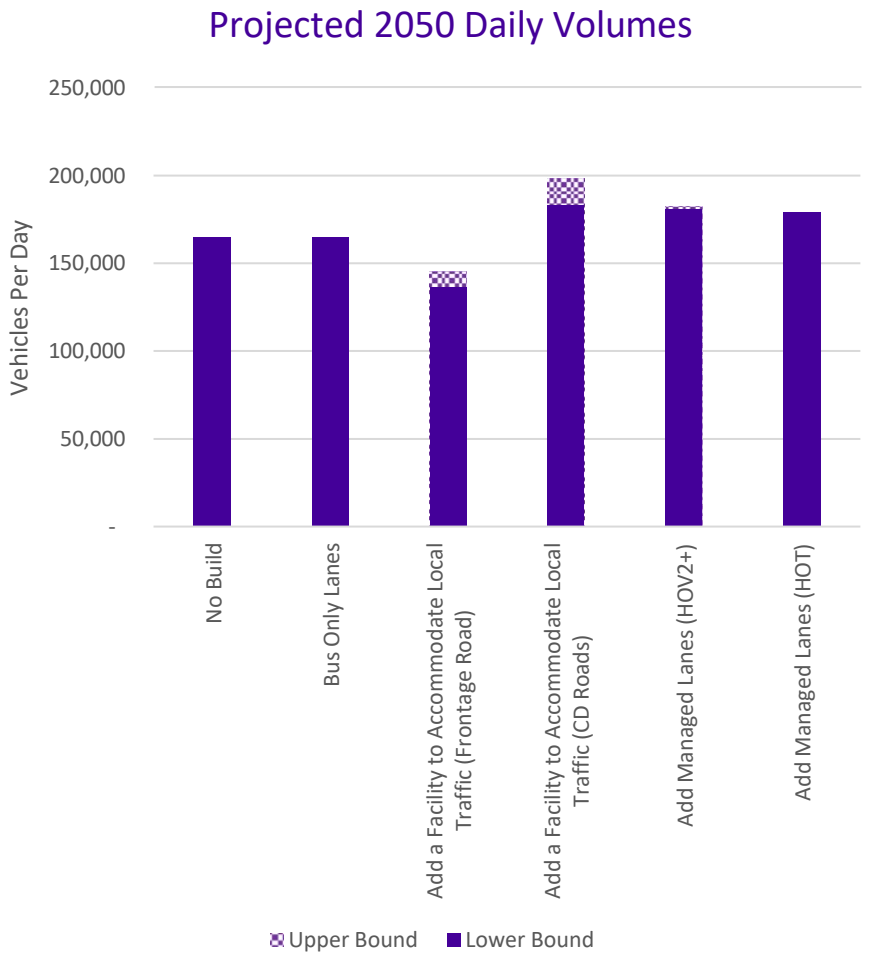


Figure shows the projected 2050 demand volumes on Peña Boulevard between GVR Boulevard and 56th Avenue for the various alternatives. The minimum and maximum values shown for each alternative reflect the different projected demand volumes given different implementation configurations. Volumes shown are inclusive of all GP, ML and C-D road volumes. However, they exclude volumes in the frontage roads if present.

Traffic Modeling Results for Each Alternative

The various alternatives evaluated each provide different benefits and have their own considerations. This section summaries the key benefits and considerations for each alternative. Additional details about the alternatives and how they may impact traffic are provided in *Attachment D – Alternatives Evaluation Report*.

No-Build Alternative

The construction of managed lane direct connect ramps between existing managed lanes along I-70 and Peña Boulevard is a planned future project included within the 2050 MVRTP and therefore included in the 2050 No-Build Alternative for Peña Boulevard. Construction of managed lane direct connect ramps from eastbound I-70 to Peña Boulevard and from Peña Boulevard to westbound I-70 could provide multiple benefits which include:

- Increasing the connectivity of the managed lanes network within the Denver Metro by allowing managed lane users, including buses to traverse the region easily and seamlessly.
- Reducing travel times on Peña Boulevard by approximately 5 percent during peak periods by alleviating congestion around the I-70 and Peña Boulevard interchange.
- Preliminary modeling shows the direct connect ramps increase VMT in the Study area by approximately 6 percent as compared to a condition in which no direct connect ramps are constructed.

Add Bus-Only Lane Alternative

From a roadway operations perspective, this alternative would operate similar to the No-Build Alternative having the same lane configuration for vehicle traffic. However, providing dedicated bus lanes along Peña Boulevard would facilitate improved transit operations along the corridor including:

- Making bus travel between DEN and I-70 on Peña Boulevard 40 percent faster than general purpose lanes during peak evening hours in 2050;
- Providing bus trip reliability; and
- Creating opportunities for new regional bus service (see TDM Plan) and increase transit ridership to/from DEN by prioritizing transit operations.

This alternative has completed the initial step in considering how bus only lanes along Peña Boulevard could be implemented. Future transit studies are required to understand how to develop and implement expanded transit serve routes and patterns to maximize utilization of this proposed infrastructure.

Add Managed Lanes Alternative (HOV2+)

The addition of HOV2+ lanes in each direction would increase capacity along Peña Boulevard while also encouraging carpooling and helping to achieve the goal of reducing SOVs. The Study considered several configurations of HOV2+ lanes along Peña Boulevard, including:

- New HOV2+ lanes in each direction along Peña Boulevard between I-70 and E-470
- New HOV2+ lanes in each direction along Peña Boulevard between I-70 and E-470 and the conversion of an existing general-purpose lane to an HOV2+ lane from E-470 to Jackson Gap Street.

Initial modeling of these different configurations shows that HOV2+ lanes could:

- Reduce end-to-end travel times (from I-70 to DEN) in the general-purpose lanes by up to approximately 6 percent and in the HOV2+ lanes by up to 37 percent during the PM peak travel period as compared to the No-Build Alternative.
- Increase Study area VMT by approximately 2 percent, as compared to the No-Build Alternative.
- Decrease Study area VHT by approximately 3 percent as compared to the No-Build Alternative.
- Decrease SOVs by up to 5 percent on Peña Boulevard as compared to the No-Build Alternative.

Add Managed Lanes Alternative (HOT)

Adding HOT lanes to Peña Boulevard in each direction would increase capacity of the roadway while also providing a guarantee of a specific travel time regardless of conditions in the general-purpose lanes. Additionally, it is assumed that any HOT facility would follow a similar management approach to other existing HOT facilities in the Denver Metro by which vehicles with three or more people in them (HOV3+) can use the HOT lanes for free. Additionally, the HOT lanes would also be available for use by transit buses (RTD buses, airport shuttle buses, etc.). Initial modeling of HOT lanes shows they could:

- Reduce end-to-end travel times (from I-70 to DEN) in the general-purpose lanes by up to approximately 8 percent and in the HOT lanes by up to 30 percent during the PM peak travel period as compared to the No-Build Alternative.
- Increase Study area VMT by approximately 1 percent, as compared to the No-Build Alternative.
- Decrease Study area VHT by approximately 2 percent as compared to the No-Build Alternative.

Add Collector-Distributor Roads

The Peña Master Plan considered several different configurations of C-D roads along Peña Boulevard, including:

- One-lane C-D roads in each direction between, and including, the 40th Avenue interchange and the 56th Avenue interchange with Peña Boulevard access to/from 40th Avenue, Green Valley Ranch Boulevard, and 56th Avenue.
- One-lane C-D roads in each direction between, and including, the 40th Avenue interchange and the Tower Road interchange with Peña Boulevard access to/from 40th Avenue, Green Valley Ranch Boulevard, 56th Avenue and Tower Road.
- Two-lane C-D road in each direction between, and including, the 40th Avenue interchange and the Tower Road interchange with Peña Boulevard access to/from 40th Avenue, Green Valley Ranch Boulevard, 56th Avenue, and Tower Road.

Initial modeling of these different configurations shows that C-D roads could:

- Reduce end-to-end travel times (from I-70 to DEN) by up to approximately 20 percent during the PM peak travel period as compared to the No-Build Alternative.
- Increase Study area VMT by between approximately 1 percent and 4 percent, as compared to the No-Build Alternative.
- Decrease Study area VHT by between approximately 3 percent and 5 percent as compared to the No-Build Alternative.

Add a Frontage Road

The primary intention of a frontage road would be to accommodate local traffic and use the capacity of Peña Boulevard as an "express-lane" for longer-distanced trips, generally heading to/from DEN. To encourage appropriate use of the frontage road, installation of a frontage road is envisioned along with reduced access to/from Peña Boulevard and local roadways. The Study considered several different configurations of frontage roads along Peña Boulevard, including:

- A two-lane frontage road (one lane in each direction) between 40th Avenue and Tower Road with limited access to/from Peña Boulevard at 40th Avenue, Green Valley Ranch Boulevard, 56th Avenue, and Tower Road.
- A two-lane frontage road (one lane in each direction) between 40th Avenue and Tower Road with access to/from Peña Boulevard only at 40th Avenue and Tower Road.
- A four-lane frontage road (two-lanes in each direction) between 40th Avenue and Tower Road with access to/from Peña Boulevard only at 40th Avenue and Tower Road.

Initial modeling of these different configurations shows that a frontage road could:

- decrease end-to-end travel times along Peña Boulevard (between I-70 and DEN) by approximately 10 percent during peak travel periods as compared to the No-Build Alternative.
- increase Study area VMT by between approximately 0 percent and 2 percent as compared to the No-Build Alternative
- Change Study area VHT by between a 2 percent decrease to a 1 percent increase as compared to the No Build Alternative. This is a result of shifting traffic away from Peña Boulevard and onto the local roadway network, including the new frontage road.

A detailed analysis, including the lane configuration and operational strategies assumed for each of these alternatives, is in *Attachment D. Alternatives Evaluation Report*.

CONCLUSIONS AND NEXT STEPS

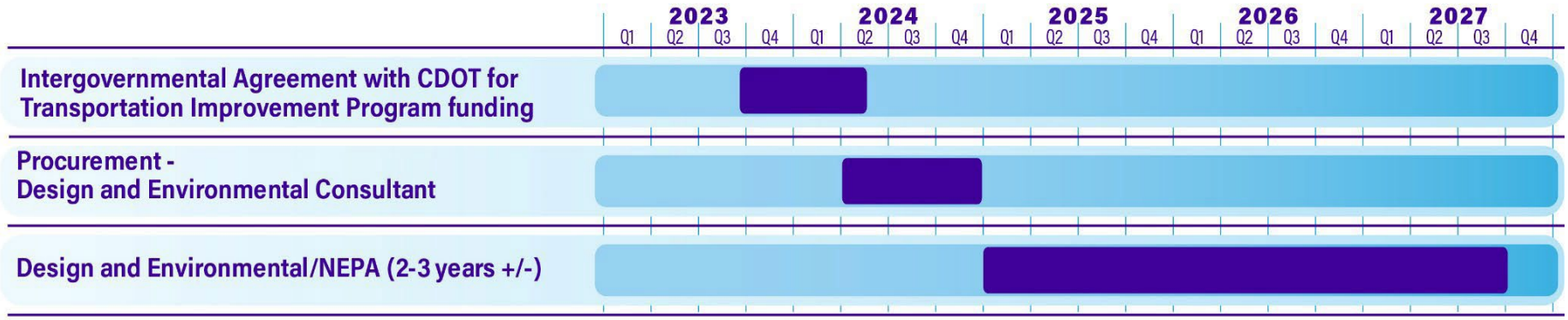
Conclusion and Next Steps

The Peña Master Plan followed PEL principles and is intended to be a foundation for the future environmental review process for Peña Boulevard. DEN will use the results gathered through the Peña Master Plan to inform the NEPA review, specifically:

- The existing conditions assessment included a desktop environmental review of environmental resources along Peña Boulevard and will form the basis for more detailed environmental assessment through the NEPA process.
- The purpose, needs, goals and objectives developed for the Peña Master Plan will inform the development of the purpose and need statement for the environmental review process.
- The community and stakeholders were engaged throughout the Study and their feedback influenced the development of the Peña Master Plan. DEN will build upon these established relationships through the NEPA process to ensure community and stakeholder input is considered as part of the decision-making process.
- Preliminary alternative analysis conducted as part of the Peña Master Plan allowed DEN to identify a range of reasonable alternatives to be carried forward into the environmental review process. Alternatives that did not meet the purpose, needs, goals and objectives of the Peña Master Plan will not be carried forward for further consideration. The results of the Peña Master Plan will be the foundation for identifying a range of reasonable alternatives to be assessed through NEPA and will be dependent on the determined class of action (see NEPA Class of Action call-out).
- All 19 strategies identified in the TDM Plan are recommended for implementation within the next ten years. At the time of writing, DEN is identifying funding to implement TDM strategy that improve access to DEN through more sustainable modes of transportation and reduce drive-alone trips along Peña Boulevard.
- The Gateway Area Travel Study analyzed the affect that various alternatives for Peña Boulevard would have on the local roadway network and provides recommendations for the local street network.

The Peña Master Plan provides DEN with the background information needed to initiate preliminary design and environmental review for Peña Boulevard as part of a NEPA Review and Decision Document. At the time of writing, DEN is finalizing an Intergovernmental Agreement (IGA) with CDOT for Transportation Improvement Program (TIP) funding and procuring a consultant to lead the preliminary design and environmental review process. Implementation of mobility solutions from the TDM Plan will be implemented concurrently.

Preliminary design and environmental review are anticipated to occur from late 2024 through 2027. Implementation of a preferred alternative would occur sometime after 2027, following a NEPA decision document, and will depend on the fund availability and project delivery method (design-bid-build vs. alternative delivery).



NEPA Class of Action

Transportation projects vary in type, size and complexity, and potential to affect the environment. Transportation project effects can vary from very minor to significant impacts on the human environment. To account for the variability of project impacts, three basic "classes of action" are allowed and determine how compliance with NEPA is carried out and documented:

An **Environmental Impact Statement (EIS)** is prepared for projects where it is known that the action will have a significant effect on the environment. An EIS requires the consideration of a range of reasonable alternatives and analyzes the potential impacts resulting from the alternatives.

An **Environmental Assessment (EA)** is prepared for actions in which the significance of the environmental impact is not clearly established. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a **Finding of No Significant Impact (FONSI)** is issued. An EA one build alternative in addition to a No Build Alternative, be assessed.

Categorical Exclusions (CatEx) are issued for actions that do not individually or cumulatively have a significant effect on the environment.

Source: FHWA Environmental Review Toolkit.