

C-470: Wadsworth Boulevard to I-70 Project

Planning and Environmental Linkages (PEL) to National
Environmental Policy Act (NEPA) Transition Document

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Acronyms and Abbreviations

APE	Area of Potential Effects
CatEx	Categorical Exclusion
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
C-470	Colorado Highway 470
CLOMR	conditional letter of map approval
CO	carbon monoxide
CPW	Colorado Parks and Wildlife
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EB	eastbound
ELMP	Express Lanes Master Plan
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
HOV	high occupancy vehicle
HPTE	High Performance Transportation Enterprise
I-25	Interstate 25
I-70	Interstate 70
MS4	municipal separate storm sewer system
NB	northbound
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PEL	Planning and Environmental Linkages
PM ₁₀	particulate matter less than 10 microns
RAMP	Responsible Acceleration of Maintenance and Partnerships
RTD	Regional Transportation District
RTP	Regional Transportation Plan
SB	southbound
SH	State Highway
SHPO	State Historic Preservation Officer
SWMP	stormwater management plan

TWG Technical Working Group
US United States
US 6 United States Highway 6
USACE US Army Corps of Engineers
USEPA US Environmental Protection Agency
USFWS US Fish and Wildlife Service
WB westbound

1. Introduction and Background

1.1. What Is the Purpose of this PEL to NEPA Transition Document?

This document summarizes relevant information from the WestConnect Coalition Planning and Environmental Linkages (PEL) Study and other previous planning studies to support design decisions and maximize efficiency in the National Environmental Policy Act (NEPA) process for the Colorado Highway 470 (C-470): Wadsworth Boulevard to Interstate 70 (I-70) Project (Project). This document summarizes information from prior studies' backgrounds, purposes and needs, alternatives/proposed actions, environmental considerations, and public involvement processes, and also outlines a NEPA work plan for the Project.

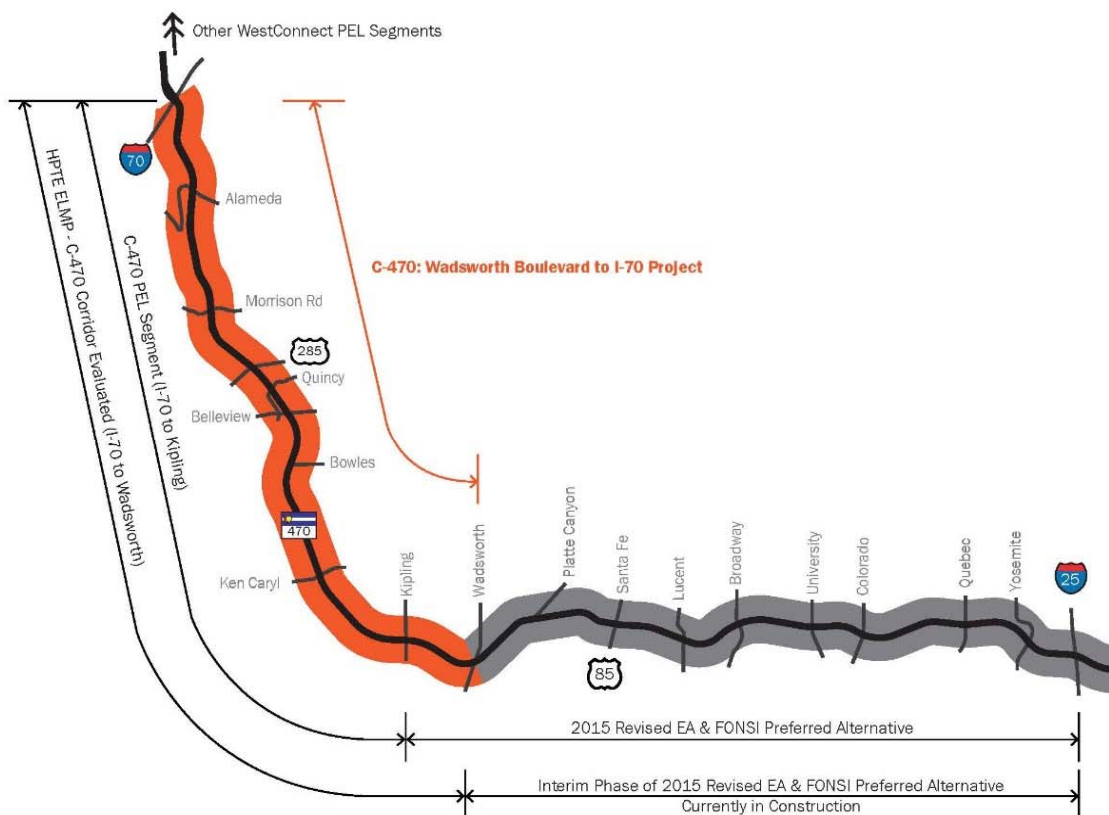
1.2. What Previous Planning Studies Are Relevant to this Project?

Three background studies are relevant to development of this Project:

- WestConnect Coalition PEL Study (2018)
- C-470 Corridor Revised Environmental Assessment (EA) and Finding of No Significant Impact (FONSI): Kipling Parkway to Interstate 25 (I-25) (2015)
- High Performance Transportation Enterprise (HPTE) Express Lanes Master Plan (ELMP) (2020)

A map of the C-470 corridor from I-25 to I-70 is provided in Figure 1 and outlines the geographic limits of each of the previous studies mentioned above.

Figure 1. C-470 Wadsworth Boulevard to I-70 Project Limits and Associated Project Locations



1.2.1. WestConnect Coalition PEL Study (2018 PEL Study)

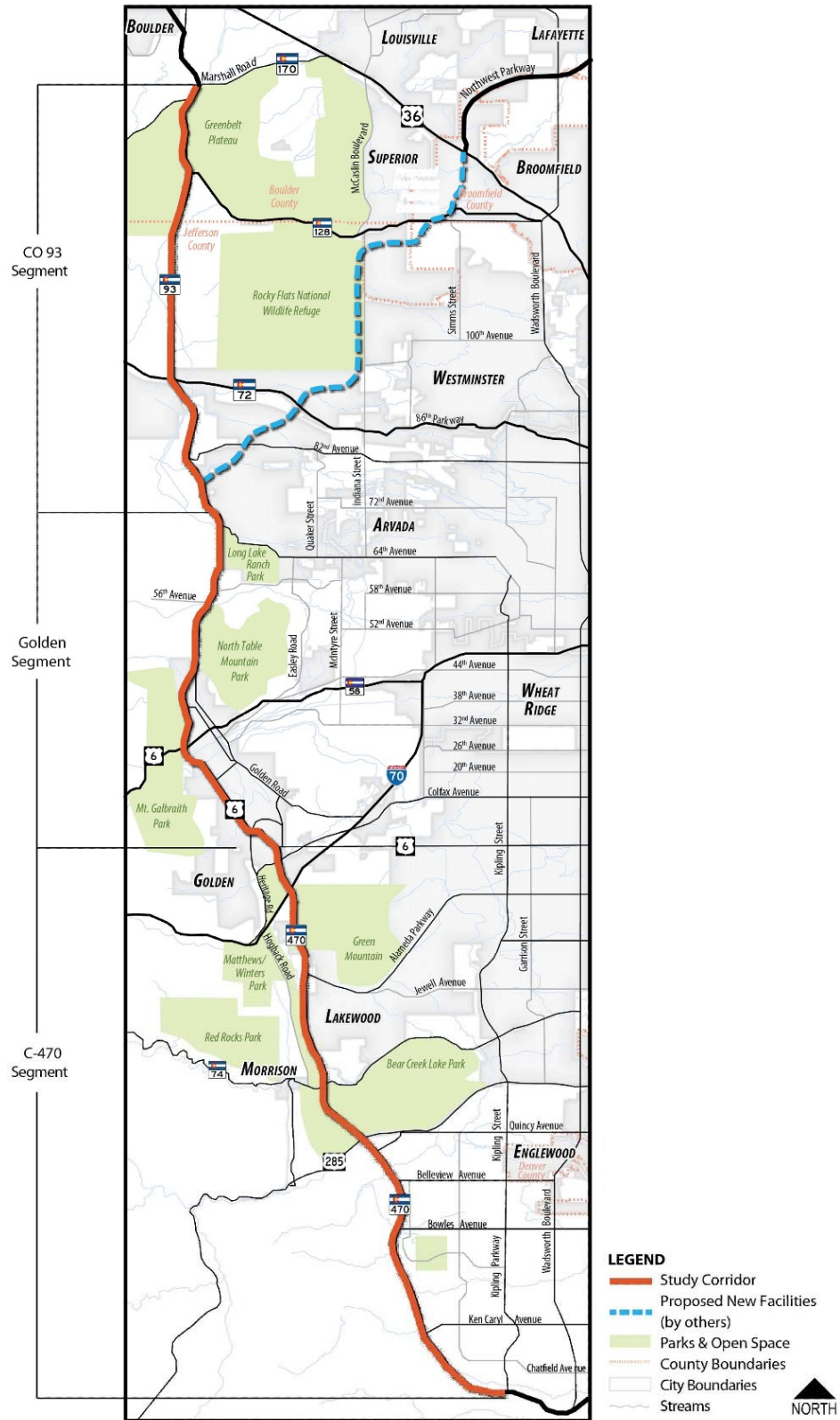
The Colorado Department of Transportation (CDOT) and the WestConnect Coalition conducted the 2018 PEL Study to identify needed transportation improvements along a 32-mile corridor between Lakewood, Golden, and Boulder along C-470, United States (US) Highway 6 (US 6), and State Highway (SH) 93 from the C-470/Kipling Parkway interchange north to the SH 93/Marshall Road (SH 170) interchange. The *Final PEL Study Report* (CDOT, 2018a) was completed in 2018 and is intended to provide a framework for short- and long-term implementation of transportation improvements, as funding is identified.

The 2018 PEL Study area was divided into three geographic segments (Figure 2). The Purpose and Need statement for the 2018 PEL Study applies to all three geographic segments and was developed in coordination with agency stakeholders with review by the general public. The Purpose and Need statement is “to improve safety for all users, reduce recurring congestion, and improve existing and future operational performance while reflecting the local community context along the WestConnect corridor from C-470 at Kipling Parkway, along US 6 through Golden, to [SH] 93 at [SH] 170” (CDOT, 2018a).

The southern segment, called the C-470 Segment, included C-470 mainline and interchanges from Kipling Parkway to I-70/US 6 and is entirely within the limits of the Project. 2018 PEL Study recommendations for this geographic segment will inform the Purpose and Need and alternatives/proposed action for the Project.

In the C-470 Segment, the 2018 PEL Study evaluated a variety of alternatives for their ability to meet the Purpose and Need. The 2018 PEL Study recommended two alternatives for C-470 mainline: Alternative 1 consists of one new general purpose lane plus auxiliary lanes in each direction, and Alternative 2 consists of one or two new managed lanes (now called Express Lanes) plus auxiliary lanes in each direction. The 2018 PEL Study also recommended interchange improvements and C-470 trail elements (which are the same for both Alternative 1 and Alternative 2), transit elements, system management strategies, and technology applications.

Figure 2. 2018 PEL Study Segments



Source: CDOT, 2018a

The 2018 PEL Study includes an implementation plan for individual projects that have independent utility (meaning the individual projects can operate on their own, without other elements of the Recommended Alternatives) and that contribute to meeting the overall Purpose and Need. The 2018 PEL Study recommended these projects be implemented with priority given to projects that most effectively leverage available funding sources, existing facilities, and other project opportunities. Projects would rely on the 2018 PEL Study Report and PEL Questionnaire to facilitate the transition from planning to NEPA. Within the Project area, the 2018 PEL Study recommended individual projects for:

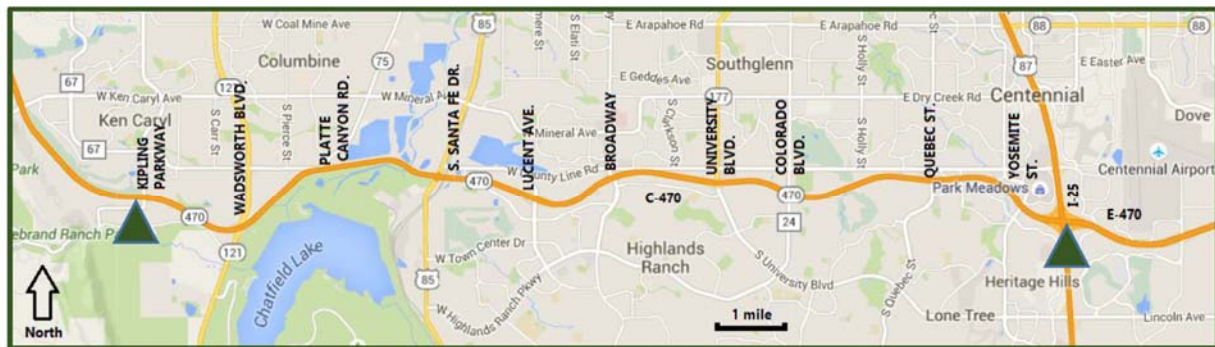
- Infrastructure improvements—general purpose lanes from Kipling Parkway to I-70 to support Alternative 1, managed lanes from Kipling Parkway to I-70 to support Alternative 2, and individual interchange projects from Kipling Parkway to I-70 to support either alternative.
- System management—increased transit frequency, improved Park-n-Ride and shared ride facilities, carpool and vanpool programs, event traffic management program, incident management plan, enhanced maintenance and operations plan, and snow fencing.
- Technology—variable speed limits, dynamic lane use at the Bowles Avenue interchange westbound on-ramp, queue warnings on westbound C-470 approaching Bowles Avenue and on eastbound C-470 approaching Alameda Parkway, ramp metering, enhanced communication infrastructure, and a road/weather information system near the Morrison Road interchange.
- Pedestrian/bicycle improvements—C-470 bike trail signage and wayfinding improvements, and pedestrian/bicycle grade separations at known conflict points, such as Kipling Parkway north of C-470 and on Bowles Avenue east of C-470.

The 2018 PEL Study recommended next steps for advancing projects, consisting of securing funding, completing NEPA analyses and design, obtaining right-of-way, obtaining utility and environmental permits, completing local agency Intergovernmental Agreements, and construction. The 2018 PEL Study noted that each step would need to be coordinated with the Federal Highway Administration (FHWA) and appropriate agency stakeholders.

The portion of the Project between Kipling Parkway and I-70/US 6 is called the “C-470 PEL Segment” for the purposes of this Project.

1.2.2. C-470 Corridor Revised EA and FONSI: Kipling Parkway to I-25 (2015 EA/FONSI)
In 2015 CDOT completed the Revised EA (CDOT, 2015a) and FONSI (CDOT, 2015b) leading to construction of new Express Lanes in the C-470 Corridor between Wadsworth Boulevard and I-25 (Figure 3). The original EA, completed in 2006, never advanced to a decision document due to lack of funding to support the Proposed Action. The Revised EA was prepared in coordination with the C-470 Corridor Coalition, a group of cities and counties in the project area that formed in 2011 to develop and evaluate cost-effective solutions for the C-470 corridor, reach consensus on the technical solutions for the corridor, and develop a strategic plan for phased implementation of corridor improvements. The 2015 EA/FONSI noted the Purpose and Need is to provide congestion relief, decrease travel delay, and improve corridor reliability. The approved new Express Lanes are “an implementable transportation solution that provide reliable and consistent travel times and commuting travel choices to accommodate an expected increase in the intensity and duration of congestion forecasted in the future” (CDOT, 2015b).

Figure 3. 2015 EA/FONSI Limits and Key North-South Roadways in the Project Area



▲ Denotes project limit

An Interim phase of the 2015 EA/FONSI Proposed Action is currently under construction on C-470 between I-25 and Wadsworth Boulevard, with completion anticipated in 2020. The Interim phase includes adding two westbound Express Lanes on C-470 between I-25 and Colorado Boulevard, one westbound Express Lane continuing from Colorado Boulevard west to Wadsworth Boulevard, and one eastbound Express Lane between I-25 and Wadsworth Boulevard. The ultimate Proposed Action includes the construction of a second westbound Express Lane between Colorado Boulevard and Lucent Boulevard, a second eastbound Express Lane between I-25 and Broadway, and the continuation of one Express Lane in each direction between Wadsworth Boulevard and Kipling Parkway, when funding is available.

Multiple reevaluations of the EA have been completed to support final design and construction of the Interim phase. However, these reevaluations are of limited relevance to this Project, since they 1) do not modify the 2015 EA/FONSI Purpose and Need and 2) evaluated transportation impacts at locations well east of the Project.

The portion of the C-470 corridor between Wadsworth Boulevard and Kipling Parkway in the 2015 EA/FONSI is located within the limits of the Project and informs the Purpose and Need and proposed action for the Project. For the purposes of this project, this portion of the study area is called the “C-470 EA Segment.”

1.2.3. HPTE Express Lanes Master Plan (2020 ELMP)

Colorado’s High-Performance Transportation Enterprise (HPTE) developed the 2020 ELMP, in coordination with stakeholders and the public, to identify and prioritize highway corridors in Colorado that have the potential to benefit from Express Lanes. The 2020 ELMP analyzes the financial feasibility of building and operating Express Lanes in congested corridors by using travel demand and traffic and revenue modeling to determine toll revenue estimates and Express Lane volumes and estimating capital and operations and maintenance costs. The 2020 ELMP evaluated the C-470 corridor between Wadsworth Boulevard and I-70 specifically and recommends that the C-470 Express Lanes under construction between I-25 and Wadsworth Boulevard be extended along C-470 to I-70. The 2020 ELMP refers to this corridor as the “C-470 Express Lane corridor, Wadsworth Boulevard to I-70.” The 2020 ELMP also evaluated Express Lanes on I-70 from the C-470/I-70 interchange to the east towards I-25, and recommended future Express Lanes on this stretch of I-70. The recommendation for Express Lanes on I-70 has the potential to influence the Project’s Proposed Action at the C-470 and I-70/US 6 interchange complex.

Recommendations from the 2020 ELMP, and the Level 2 Traffic & Revenue Study currently underway, will continue to influence development of the Project as it moves through NEPA and design phases.

1.3. What Conditions Have Changed Since Previous Planning Documents Were Approved?

The Interim C-470 Express Lanes construction project between I-25 and Wadsworth Boulevard had excess Responsible Acceleration of Maintenance and Partnerships (RAMP) revenue. The C-470 Coalition recommended that CDOT apply the excess funds to “another surface transportation infrastructure project that is integrated with the project as part of a surface transportation system,” consistent with HPTe’s authority (Colorado Revised Statutes 43-4-806).

As noted previously, the ongoing C-470 Express Lanes construction project from I-25 to Wadsworth Boulevard is an Interim phase of the larger 2015 EA/FONSI project that extends to Kipling Parkway. However, because the section of C-470 EA Segment (from Wadsworth Boulevard to Kipling Parkway) is not part of the current Interim construction project, it has been included in the project limits of this Project. This will allow for design to incorporate a seamless transition between the two project areas for all users.

Approximately \$5 million of RAMP funds have been allocated to the Project for preliminary design, NEPA process(es) and documentation, and potential early right-of-way acquisition. Consistent with the 2018 PEL Study’s recommendation to implement projects that leverage available funding sources, existing facilities, and other project opportunities most effectively, the Project is moving forward and building on the previous planning study recommendations. Additionally, the 2020 ELMP analysis indicates that the Project has substantial mobility benefits for the Express Lane network and may have revenue-generating potential that could further leverage funding sources.

Since the 2018 PEL Study was approved, CDOT has begun two projects from the Study’s Implementation Plan: 1) installation of ramp metering within the C-470 PEL Segment and 2) signal improvements on Ken Caryl Avenue at C-470. Both of these projects are within the Project’s limits.

1.4. What Are the Limits of this Project?

The preliminary limits of this Project extend along C-470 between its interchange with Wadsworth Boulevard on the east and its interchanges with I-70 and US 6 on the west (see Figure 1).

- The eastern limit at Wadsworth Boulevard reflects the end of the ongoing construction of the Interim phase of the 2015 EA/FONSI project between I-25 and Wadsworth Boulevard. This is a logical terminus for the Project because it is the transition point between the existing four-lane capacity on C-470 west of Wadsworth Boulevard and the new six-lane capacity on C-470 east of Wadsworth Boulevard.
- The western limit at I-70 and US 6 includes the C-470 PEL Segment and encompasses the system interchange between C-470 and I-70/US 6, including ramp connections east on I-70 to US 6 eastbound. This is a logical terminus for the Project because C-470 ends at I-70/US 6, and most traffic entering and exiting the north end of C-470 travels on I-70 and US 6.

The Project limits will be verified and revised if needed in the future NEPA phase(s), as more information becomes available.

The preliminary Project study area includes C-470, all interchanges within the Project limits, adjacent frontage roads, and the adjacent bicycle trail located primarily on the east side of C-470 through the Project limits, encompassing the Proposed Action project elements described in Section 3.1. As the Project develops in the future NEPA phase(s), the Project purpose and need and Proposed Action will be refined, and the study area may be revised to reflect the refined information.

2. Purpose and Need

The 2018 PEL Study and the 2015 EA/FONSI identified needs related to the Project area that form the basis of a preliminary purpose and need for this Project. The Project-specific purpose and need will be developed by evaluating the needs from these previous studies and incorporating information from the 2020 ELMP and Level 2 Traffic and Revenue Study. The NEPA work plan in Section 6 describes the process to evaluate and develop the Project-specific NEPA purpose and need.

2.1. Preliminary Project Purpose and Need

The preliminary purpose of this Project is to improve corridor travel reliability and safety, reduce recurring congestion, decrease travel delay, and improve operational performance on C-470 between Wadsworth Boulevard and I-70. This preliminary purpose is based on the results of the 2018 PEL Study, 2015 EA/FONSI, and 2020 ELMP recommendations. The preliminary needs to address recurring congestion, travel delay, and poor operational performance are based on the needs identified in the 2018 PEL Study and 2015 EA/FONSI, described in Section 2.2 of this document, and their applicability to the Project area. The purpose and need will be refined during the NEPA process(es), as described in the NEPA work plan in Section 6.

2.2. Needs Identified in Previous Studies

The 2018 PEL Study and the 2015 EA/FONSI analyzed needs in the C-470 corridor related to each project's purpose. The 2018 PEL Study focused on needs related to congestion, travel delays, poor operational performance, and safety on C-470. The 2015 EA/FONSI focused on needs related to reliability, congestion, and travel delays on C-470. These needs, described in the sections below, will be used as a starting point to help develop a project-specific Purpose & Need in future NEPA phase(s), as described in the NEPA work plan in Section 6.

2.2.1. Reliability

The 2015 EA/FONSI outlined the current and future congestion issues of the C-470 corridor, which, combined with unpredictable traffic incidents, result in motorists not being able to reliably predict how long it will take them to travel on C-470 during peak periods.

The metric for travel time reliability used in the 2015 EA/FONSI is the ratio of travel time during peak periods to free flow travel times. The Denver Regional Council of Governments (DRCOG) predicted that C-470's travel time variation ratio will worsen from 1.44 in 2006 to 2.93 by the year 2035. These ratios mean that in 2006, travel time in congested conditions averaged 44 percent longer than in free-flow conditions, and in 2035, travel time in congested conditions is predicted to average 193 percent longer – which is nearly three times as long – compared to travel in free-flow conditions. For example, in 2006, a 10-minute free-flow drive would take nearly 15 minutes in congested conditions, and in 2035, a 10-minute free-flow drive would take nearly 30 minutes in congested conditions.

The 2018 PEL Study identified a need to address recurring congestion and travel delay, described in Section 2.2.2 and Section 2.2.3, which is an indicator of travel reliability problems. The 2018 PEL Study also indicated weather-related issues for safety and incident management that contribute to unpredictable conditions and travel times independent of congestion.

The 2020 ELMP also concluded that Express Lanes are feasible through the entirety of the C-470 corridor, and Express Lanes are often recommended when travel reliability is an issue.

Reliability is also an issue for transit service in the Project area. The Regional Transportation District (RTD) does not operate fixed route bus service on C-470 and has in recent years viewed the C-470 corridor as a low priority for expanding transit use due to lack of reliability. However, through

coordination during the 2015 EA/FONSI process, RTD did indicate a willingness to consider operating bus service on C-470 if reliable travel times can be assured in the future.

Reliability is a documented need in the previous studies and, therefore, warrants consideration for further evaluation when the Project develops a project-specific Purpose & Need in future NEPA phase(s).

2.2.2. Recurring Congestion

The 2018 PEL Study found that drivers experience substantial delays and queues during commuter peak periods, particularly along C-470 between US 285 and I-70. Congestion is expected to worsen by 2040 with longer recurring peak periods of delay and slower speeds. New areas of developing congestion are expected to develop as traffic volumes increase due to forecasted local and regional population and employment growth.

Along C-470, merging and weaving conflicts between the US 285 and Morrison Road interchanges cause significant speed reduction and congestion. Queues for westbound traffic frequently extend approximately 3.5 miles from Morrison Road back to Bowles Avenue during the morning peak commuting period.

During the evening peak commuting period, the lane drop on eastbound C-470 at Morrison Road (where the number of lanes reduces from three to two) creates merging conflicts and lane changing maneuvers that cause significant speed reduction. Eastbound queues in the evening commute period typically reach approximately 2 miles, to north of Alameda Parkway.

The 2015 EA/FONSI noted that C-470 within the 2015 EA/FONSI project area was identified as a “key congested area” by DRCOG. Traffic volumes currently exceed the capacity of a four-lane freeway during peak hours east of Lucent Boulevard, and traffic volumes are projected to exceed the capacity of a four-lane freeway during peak hours in 2035 for the entirety of the 2015 EA/FONSI project area. Past and future population and employment growth has led and will continue to lead to congestion on C-470.

Congestion is a documented need in the previous studies and, therefore, warrants consideration for further evaluation when the Project develops a project-specific Purpose & Need in future NEPA phase(s).

2.2.3. Travel Delay

The 2018 PEL Study found that within the C-470 PEL Segment, existing (2016) congestion adds approximately five minutes of travel time during the weekday morning commute and almost 15 minutes of travel time during the weekday evening commute. The 2018 PEL Study noted that by 2040, congestion is expected to worsen, with longer recurring peak periods of delay and slower speeds and new areas of congestion. Traffic volumes are expected to increase by up to 60 percent by 2040 due to local and regional population and employment growth.

The 2015 EA/FONSI evaluated all 26 miles of C-470 from I-25 to I-70 and projected that travel delay along the entire corridor would increase more than five-fold from 6,650 daily hours of vehicle delay in 2006 to 41,940 daily hours of vehicle delay in 2035.

Travel delay is a documented need in the previous studies and, therefore, warrants consideration for further evaluation when the Project develops a project-specific Purpose & Need in future NEPA phase(s).

2.2.4. Poor Operational Performance

The 2018 PEL Study found that geometric characteristics within the C-470 PEL Segment create traffic disruptions, particularly weaving conflicts between interchanges along C-470 and the lane drop on

eastbound C-470 at Morrison Road. Grades on C-470 north of US 285 lead to variable speeds in both directions that cause lane changing maneuvers and other driver behaviors that frequently disrupt traffic flow.

The 2018 PEL Study also identified operational needs related to transit, pedestrian, and bicycle facilities in the study area. There are a lack of transit services along the C-470 corridor and limited service from the 2018 PEL Study area to downtown Denver, with transit operating only during the morning and evening peak periods at 30- to 60-minute intervals. The heavily-used C-470 bikeway crosses high-volume free-right turn movements at interchanges such as Kipling Street, Ken Caryl Avenue, and Bowles Avenue, creating the potential for multimodal conflict. The 2018 PEL Study Corridor Conditions Report identified that two bicycle crashes occurred at the Bowles Avenue interchange and one bicycle crash occurred at the Ken Caryl interchange during the five-year period from January 1, 2010 through December 31, 2014. The 2018 PEL Study ultimately recommended grade-separated crossings at Kipling Street and Bowles Avenue, along with other C-470 Trail improvements, including completing missing trail connections, improved trail width, on-street pavement markings, and route and wayfinding signage leading to and along the existing C-470 Trail.

Poor operational performance was not one of the specific need statements for the 2015 EA/FONSI. However, it is a documented need in the 2018 PEL Study and warrants consideration for further evaluation when the Project develops a project-specific Purpose & Need in future NEPA phase(s).

2.2.5. Safety Concerns

The 2018 PEL Study evaluated safety in the C-470 PEL Segment and documented more than 950 crashes over the five-year analysis period (January 2010 through December 2014). Significant crash types were rear-end, wildlife, and weather-related crashes. Recurring congestion from US 285 to Morrison Road contributes to rear-end crashes. In addition to congestion and operational issues, adverse road conditions (particularly icy conditions) contribute substantially to crashes along the C-470 extension from I-70 to US 6.

Safety concerns documented in the 2015 EA/FONSI were related to congestion and not to geometric deficiencies on C-470 within the 2015 EA/FONSI project area. The 2015 EA/FONSI noted the prevalence of rear-end crashes, which occur predominately in the weekday peak hours, is likely to be reduced if congestion were reduced.

Safety is a documented need in the previous studies and, therefore, warrants consideration for further evaluation when the Project develops a project-specific Purpose & Need in future NEPA phase(s).

2.3. Independent Utility

Based on the preliminary project limits (see Section 1.4) and purpose and need (described previously in this section of the document), the Project is expected to have independent utility. The Project will be usable and a reasonable expenditure of funds even if no other transportation improvements are made in the area because safety, mobility, and capacity improvements, including Express Lanes, would be implemented continuously along C-470, including on the unimproved section of C-470 between Wadsworth Boulevard and I-70/US 6. The Project is not expected to trigger other actions that may require environmental review; the Project will have its own Purpose and Need independent of other projects and will be developed to fully address the project-specific Purpose and Need without requiring other actions. The Project's independent utility will be confirmed as the Purpose and Need is developed and finalized in the NEPA phase(s).

3. Proposed Action and Background

The preliminary Proposed Action for the Project includes three categories of potential improvements:

- Adding Express Lanes on C-470 in each direction between Wadsworth Boulevard and I-70;
- Potential improvements to each of the eight interchanges in the Project area, including the system interchange of C-470 and I-70/US 6; and
- Other elements related to wildlife crossing and environmental mitigations, technology and system management upgrades, and bike and pedestrian improvements.

The preliminary Proposed Action was developed from the alternatives analyses and recommendations of the previous studies described in Section 1 of this document: the 2018 PEL Study, 2015 EA/FONSI, and the 2020 ELMP. The relevant analyses and recommendations from each of these studies and how they influence the development of the Proposed Action are described in Section 3.2.

The Proposed Action will be refined in NEPA based on several factors, such as 2020 ELMP recommendations, Level 2 Traffic and Revenue Study, funding, and further design. The NEPA work plan in Section 6 provides information about the additional work required to refine and advance the Proposed Action in the future NEPA phase(s).

3.1. Description of the Proposed Action

3.1.1. C-470 Mainline Improvements

The Project includes the addition of Express Lanes that will transition from the Express Lanes included in the Interim construction project. The number, location, and operation of the Express Lanes will be informed by a Level 2 Traffic and Revenue Study that is underway by HPTE. The Traffic and Revenue Study will also advise whether high occupancy vehicles (HOVs) (three or more per vehicle) should be allowed without tolls in the Express Lanes, as well as whether auxiliary lanes between interchanges recommended in the 2018 PEL Study should be included in the Project.

3.1.2. Interchange Operation Concepts

Eight interchanges are located within the Project limits. Operational and geometric configurations of each of these interchanges will be evaluated. The Project will identify and develop interchange operational and safety improvements as a result of this evaluation.

C-470 and I-70/US 6 System Interchange

The most complicated of the interchanges is the C-470 and I-70/US 6 system interchange, which includes numerous directional movements. Table 1 outlines the movements that will be included in the evaluation of the Proposed Action components for the Project.

Table 1. C-470 and I-70/US 6 Interchange Movements to be Evaluated as Part of the Proposed Action

Travel Direction (From)	Travel Direction (To)	Design Component/Improvement
Movements in Proposed Action		
Northbound (NB) C-470 General Purpose Lane	Eastbound (EB) I-70 General Purpose Lane	A braided ramp or collector/distributor system will be designed to separate ramp movements for NB C-470 and EB I-70 to EB I-70 and EB US 6 to eliminate the EB weave section along I-70 between C-470 and US 6.
NB C-470 Express Lane	EB I-70 General Purpose Lane	C-470 Express Lane egress prior to I-70 Interchange
NB C-470 General Purpose Lane	Westbound (WB) I-70 General Purpose Lane	Existing loop ramp*
NB C-470 Express Lane	WB I-70 General Purpose Lane	C-470 Express Lane egress prior to I-70 Interchange, utilize existing loop ramp
NB C-470 General Purpose Lane	US 6	A braided ramp or collector/distributor system will be evaluated to separate ramp movements for NB C-470 and EB I-70 to EB I-70 and EB US 6 to eliminate the EB weave section along I-70 between C-470 and US 6.
EB I-70 General Purpose Lane	Southbound (SB) C-470 General Purpose Lane	Existing ramp*
EB I-70 General Purpose Lane	SB C-470 Express Lane	SB C-470 Express Lane ingress on C-470
EB I-70 General Purpose Lane	EB US 6	A braided ramp or collector/distributor system will be evaluated to separate ramp movements for NB C-470 and EB I-70 to EB I-70 and EB US 6 to eliminate the EB weave section along I-70 between C-470 and US 6.
WB I-70 General Purpose Lane	SB C-470 General Purpose Lane	Existing ramp
WB I-70 General Purpose Lane	SB C-470 Express Lane	SB C-470 Express Lane ingress on C-470
EB I-70 General Purpose Lane	NB C-470/US 6/SH 93 General Purpose Lane	Existing loop ramp*
Movements Not to Preclude in the Project		
NB C-470 Express Lane	EB I-70 Express Lane (Future)	Future direct connection
WB I-70 EL (Future)	SB C-470 EL	Future direct connection
Movements for Future I-70 Express Lane Project to Address		
NB C-470 General Purpose Lane	EB I-70 Express Lane (Future)	Future I-70 EB Express Lane ingress on I-70 East of C-470
WB I-70 Express Lane (Future)	SB C-470 General Purpose Lane	Future WB I-70 Express Lane egress on I-70

* All movements included in this table will be evaluated to determine how they are affected by the Proposed Action.

Other Interchanges

Table 2 details the other interchanges within the Project limits and types of improvements to be considered in the Proposed Action.

Table 2. Interchange Improvements to be Evaluated as Part of the Proposed Action

Interchange	Scope of Potential Improvements
C-470 and Alameda Avenue	Minor operational improvements to ramps, ramp terminals, and lane configuration on cross street
C-470 and Morrison Road	Potential early-action bridge widening project; may also include signal upgrade on Morrison Road below C-470 bridge
C-470 and US 285/Quincy Avenue/Belleview Avenue	Operational reconfiguration of parts of the interchange complex at this location, including the south to east flyover geometry, north to west flyover geometry, interchange and ramp connections between Belleview Avenue, Quincy Avenue, and US 285, and potential relocation of access to Bear Creek Park. Direct connect Express Lanes are not planned for this interchange complex, per 2020 ELMP.
C-470 and Bowles Avenue	Minor operational changes to ramps, ramp terminals, and lane configuration on Bowles Avenue
C-470 and Ken Caryl Parkway	Early-action signal upgrade/intersection improvement project underway; no other Project improvements planned
C-470 and Kipling Parkway	Confirm validity of Proposed Action from 2015 EA/FONSI
C-470 and Wadsworth Boulevard	Confirm validity of Proposed Action from 2015 EA/FONSI

3.1.3. Other Project Elements

Other Project elements that will be considered for the Proposed Action include:

- Wildlife crossings at select locations within the corridor (identified in 2018 PEL Study and to be evaluated in NEPA)
- Water quality facilities throughout the corridor (identified in 2018 PEL Study and 2015 EA/FONSI and to be evaluated in NEPA)
- Environmental resource mitigation requirements (to be determined in NEPA)
- System management upgrades throughout the corridor (transit frequency, Park-n-Ride improvements, incident management, etc.) (identified in 2018 PEL Study and to be evaluated in NEPA)
- Technology upgrades throughout the corridor (ramp metering, variable speeds, etc.) (identified in 2018 PEL Study and to be evaluated in NEPA)
- Bike/pedestrian improvements throughout the corridor (trail grade separations at Kipling Parkway and Bowles Avenue, trail enhancements, etc.) (identified in 2018 PEL Study and to be evaluated in NEPA)

Other Project elements will be considered in the Project Proposed Action or later project(s). The background on the alternatives evaluation process and recommendations affecting C-470 in the Project limits is summarized below from the source studies.

3.2. Alternatives Development and Analysis from Previous Studies

The previous studies' alternatives analyses and recommendations that influenced the Proposed Action for this Project are described below.

3.2.1. 2018 PEL Study Alternatives

The 2018 PEL Study's alternatives evaluation process was conducted between September 2016 and January 2018. Alternatives considered and recommended in the 2018 PEL Study are relevant to this Project within the C-470 PEL Segment of the Project limits as described in Section 1 of this document.

2018 PEL Study Alternatives Evaluation Process

The 2018 PEL Study completed a NEPA-like alternatives evaluation that included three levels of screening, documented in the 2018 PEL Study *Final Alternatives Report* (CDOT, 2018b). The first level of screening began with multiple concepts that were considered applicable to each of the 2018 PEL Study's three corridor segments. The concepts were categorized into five improvement types or strategies: highway, intersections/interchanges, multimodal elements, corridor management, and technology. For the C-470 PEL Segment, 32 concepts were considered in these categories, four of which were eliminated from further consideration due to fatal flaws, while the majority were retained as elements that could be packaged into corridor alternatives. After the first screening, two subsequent levels of screening packaged corridor alternatives (by segment) with infrastructure recommendations, layouts, costs, and traffic operations. Two packaged infrastructure alternatives were recommended for the C-470 PEL Segment, and 15 operational or corridor management strategies were carried forward as elements of these alternatives for further consideration in NEPA.

2018 PEL Study Recommended Alternatives

The 2018 PEL Study recommended two alternatives for C-470, referred to as Recommended Alternatives, that could be considered for a future C-470 roadway project. The Recommended Alternatives were determined to meet the Purpose and Need to the highest degree while minimizing environmental and community impacts.

- 2018 PEL Study Alternative 1 consists of the two existing general purpose lanes plus one new general purpose lane and auxiliary lanes between interchanges in each direction. The 2018 PEL Study identified that Alternative 1 could be implemented with up to four individual projects, depending on phasing.
- 2018 PEL Study Alternative 2 consists of the two existing general purpose lanes plus one or two managed lanes (now called Express Lanes) and auxiliary lanes between interchanges in each direction. The 2018 PEL Study concluded that Alternative 2 would need to be implemented as a single project.

The 2018 PEL Study concluded that both alternatives provide reasonable safety and mobility benefits related to recurring congestion and operational conditions and enhance multimodal mobility options, while minimizing impacts to the community and environmental resources. The 2018 PEL Study did not provide a framework for how to decide between the two alternatives in NEPA, but did note important differences between them. The study concluded that Alternative 1 would be easier to implement because it could be divided into smaller phases (improvements between interchanges) but would be relatively inconsistent with the Interim phase of the 2015 EA/FONSI currently under construction from Wadsworth Boulevard to I-25. Alternative 2 would be consistent with the Express Lanes being implemented by the Interim construction project to the east and would provide better travel time reliability with higher speeds maintained in Express Lanes but with some congestion in the general purpose lanes (CDOT, 2018b).

Additional projects were identified in the 2018 PEL Study that were considered separate in the implementation plan but would be complimentary to the mainline roadway recommendations. These additional projects include interchange improvements, trail and transit enhancements, and operational improvements, such as ramp metering of all on-ramps. In addition to the interchange improvements considered and recommended, the Recommended Alternatives include two options—a collector/distributor road or a braided ramp—east of the system interchange along I-70 between C-470 and US 6.

The 2018 PEL Study Recommended Alternatives 1 and 2 were presented for public and agency comment in early 2018. Comments related to the roadway recommendations generally supported increased capacity but noted concerns with the large highway footprint and maintaining views and undeveloped landscapes. Other comments supported safety and operational improvements, particularly to address weaving conflicts and unreliable travel times. No comments were received specific to the comparison of Alternatives 1 and 2 (CDOT, 2018a).

Relationship of the PEL Recommended Alternatives to Project Proposed Action

The preliminary Proposed Action for the Project generally incorporates Alternative 2 from the 2018 PEL Study. Consistent with the 2018 PEL Study conclusions, the Express Lanes included in Alternative 2 are more compatible with C-470 operations, the 2015 EA/FONSI Proposed Action, and construction of Express Lanes to the east on C-470. Express Lanes along the entire C-470 corridor are also consistent with HPTe's 2020 ELMP network goals and provide revenue-generating potential that could leverage funding sources to advance the Project.

Interchange improvement recommendations are also advanced from the 2018 PEL Study and will be subject to additional design and operational analysis due to the conceptual nature of the 2018 PEL Study design. Interchange improvements will be included in the Proposed Action based on refined design and understanding of traffic and geometric conditions.

Other project elements support and were recommended for both alternatives. These project elements are described in Section 3.1.3 of this document and will be considered in the Project Proposed Action or later project(s).

3.2.2. 2015 EA/FONSI Proposed Action

The portion of the Project between Wadsworth Boulevard and Kipling Parkway (the C-470 EA Segment) is part of the approved Proposed Action from the 2015 EA/FONSI. An Interim phase of the 2015 EA/FONSI is under construction to the east of the Project between Wadsworth Boulevard and I-25, as described in Section 1 of this document. However, no construction or additional planning has occurred for the C-470 EA Segment of the Project area since the FONSI was signed in 2015.

2015 EA/FONSI Alternatives Evaluation Process

The 2015 EA/FONSI alternatives evaluation process was conducted initially for the 2006 EA and revisited in 2015 during the Revised EA process. The 2006 EA considered nine variations of general purpose and managed (Express Lane and HOV) lanes for the C-470 mainline and interchanges, along with transit and other non-infrastructure mobility enhancements. A General Purpose Lane Alternative and an Express Lane Alternative were carried forward for detailed analysis in the 2006 EA. The Revised EA reviewed all the alternatives from the 2006 EA and determined that the Express Lane Alternative from the 2006 EA was the only one that could meet the purpose and need *and* was feasible because it had reasonably foreseeable funding. The 2015 EA/FONSI evaluated in detail and approved the Express Lane Alternative as the Proposed Action.

2015 EA/FONSI Proposed Action between Wadsworth Boulevard and Kipling Parkway
Within the C-470 EA Segment, the 2015 EA/FONSI includes adding Express Lanes in each direction between Wadsworth Boulevard and Kipling Parkway and continuous auxiliary lanes in each direction between these two interchanges (Wadsworth Boulevard and Kipling Parkway). The 2015 EA/FONSI Proposed Action also includes preliminary locations for Express Lane ingress and egress.

Relationship of the 2015 EA/FONSI Proposed Action to Project Proposed Action

This Project's Proposed Action described in Section 3.1 incorporates the 2015 EA/FONSI Proposed Action typical section, adding Express Lanes and auxiliary lanes each direction between Wadsworth Boulevard and Kipling Parkway. The location of Express Lane ingress and egress points will be refined through preliminary engineering for the Project in coordination with the Interim phase construction project east of Wadsworth Boulevard. The 2015 EA/FONSI found that the Express Lane Alternative could not be financed without Express Lane revenue and that financing of the construction project was only feasible with Express Lanes. The financing limitations remain valid for the next phases of the 2015 EA/FONSI Proposed Action implementation.

3.2.3. Relationship of HPTE 2020 ELMP Recommendations to the Project Proposed Action

The 2020 ELMP considers how an integrated Express Lane network across Colorado, including along the entirety of C-470, could enhance mobility, safety, and accessibility for statewide travelers in support of economic vitality.

The 2020 ELMP recommends that the C-470 Express Lanes under construction between I-25 and Wadsworth Boulevard be extended along C-470 to I-70. Although the 2020 ELMP did not follow NEPA or PEL processes, the study was conducted with the understanding that implementation of future projects would follow such processes. Recommendations from the 2020 ELMP will continue to influence the Project through the transition from planning into design and NEPA, and HPTE will be conducting additional traffic and revenue studies to understand Express Lane revenue projections and Project financing.

In February 2019, CDOT issued Managed Lane Guidelines that provided additional guidance for implementing the Transportation Commission Policy Directive 1603.0, which encourages CDOT to strongly consider Express Lanes for new capacity improvements (CDOT, 2019). The Guidelines support that if a corridor is identified in the HPTE 2020 ELMP, an Express Lane alternative should be considered in NEPA. FHWA guidance on tolling reinforces that if non-tolled alternatives are not financially viable or cannot meet the purpose and need, general purpose lane alternatives do not need to be considered in the NEPA process (FHWA, 2004 and FHWA, 2019).

4. Environmental Considerations

CDOT has a sizable amount of right-of-way within the C-470 corridor. For the original construction of C-470, CDOT acquired 300 feet of right-of-way for the mainline and additional right-of-way around interchanges (CDOT, 2015a). Generally, this was considered sufficient for future mainline expansion. Some requirements, such as the need for permanent water quality facilities and operational improvements at interchanges, may require additional right-of-way.

As noted in Section 1.4, the preliminary Project study area includes C-470, all interchanges within the Project limits, adjacent frontage roads, and the adjacent bicycle trail located primarily on the east side of C-470 through the Project limits. The 2018 PEL Study and 2015 EA/FONSI provide a substantial amount of information and context for environmental resources in this study area. Important environmental resources are present adjacent to and within the right-of-way.

4.1. Environmental Resource Conditions and Context in the Project Study Area

The 2018 PEL Study reviewed environmental conditions and potential impacts of alternatives in the C-470 PEL Segment for the following topics: air quality, environmental justice, farmlands, floodplains, hazardous/ solid wastes, historic resources, land use, noise, paleontology, recreation, right-of-way, Section 4(f), Section 6(f), water and oil/gas wells, storm/water quality, threatened and endangered species, visual/ aesthetics, wetlands and other waters of the US, and wildlife/fisheries. The 2018 PEL Study Questionnaire includes a table regarding environmental issues to be considered during NEPA, by resource.

The 2015 EA/FONSI reviewed environmental conditions and impacts of the Proposed Action for the following topics: air quality, archaeology, cumulative impacts, environmental justice, farmlands, floodplains, geologic resources and soils, hazardous/solid wastes, historic resources, land use, Native American consultation, noise, paleontology, recreation, right-of-way, Section 4(f), Section 6(f), socioeconomics, storm/water quality, threatened and endangered species, transportation, utilities, vegetation, visual and aesthetics, wetlands and other waters of the US, and wildlife/fisheries.

Table 3 summarizes the 2018 PEL Study and 2015 EA/FONSI discussion of environmental conditions and context for the Project and notes recommendations for NEPA work activities associated with each resource. The resources in Table 3 are listed in the order they occur in the CDOT Environmental Scoping Form, and recommendations for the level of analysis and documentation are consistent with the levels used in the form. Generally, “some” analysis and documentation is recommended to supplement analysis and documentation included in the 2018 PEL Study and 2015 EA/FONSI, and “full” analysis and documentation is recommended for resources that would need additional characterization and assessment to comply with regulatory processes in the NEPA phase. These NEPA considerations, which will be guided by the resource-specific considerations and procedures outlined in Chapter 9 of the NEPA Manual (CDOT, 2017b), are presented in Table 3.

Table 3. Summary of Environmental Conditions, Context, and Recommendations

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
Air quality	<p>The C-470 PEL Segment of this Project is within the Denver Metro/North Front Range Ozone Non-Attainment Area and the maintenance areas associated with Carbon Monoxide and PM-10. The region experiences exceedances several days per year of the national standard for ozone, but not for other pollutants. The highest ozone concentrations measured in the area tend to be at monitoring stations at the base of the foothills, e.g., Rocky Flats National Wildlife Refuge, Golden-NREL, and Chatfield State Park.</p> <p>The 2018 PEL Study did not conduct any air quality analysis but noted future projects may require location-specific carbon monoxide (CO) or particulate matter less than 10 micrometers (PM₁₀) hot spot analyses.</p>	<p>The 2015 EA/FONSI noted the same issues with ozone noted in the 2018 PEL Study, and those issues are applicable to the C-470 EA Segment of this Project.</p> <p>Hot spot modeling of CO was conducted, and emissions were determined to be below the National Ambient Air Quality Standards and would not interfere with the regional CO Maintenance Plan or its goals. Hot spot analysis was not required or conducted for PM₁₀ because the number of diesel vehicles is not high or increasing.</p>	<p>Full analysis and documentation required.</p> <p>Conditions are likely to require a CO hot spot analysis and unlikely to require a hot spot analysis for PM₁₀ due to the low truck percentage on C-470.</p> <p>Although climate change and greenhouse gas emissions (GHG) are a growing concern locally and nationally, FHWA has determined that analysis of GHG emissions does not meaningfully distinguish project-specific transportation alternatives.</p> <p>Scoping should coordinate with relevant air regulatory agencies including the Colorado Department of Public Health and Environment (CDPHE) Air Quality/Air Pollution Control Division, the US Environmental Protection Agency (USEPA), and local agencies to define content and methods of analysis. The USEPA requested future projects in the C-470 PEL Segment complete a Project of Air Quality Concern questionnaire for USEPA review as early as possible in project development.</p> <p>The C-470 EA Segment of this Project is included in the 2040 Fiscally Constrained Regional Transportation Plan (RTP), but the broader Project, which includes both the C-470 EA Segment and the C-470 PEL Segment, is not. DRCOG is in the process of developing a new RTP for 2050. The Project will need to be included in the fiscally constrained 2050 RTP (and associated air quality conformity determination) for NEPA action to be taken.</p>
Archaeology	<p>The length of C-470 between I-25 and I-70 was inventoried for archaeological resources in 1976 during the environmental clearance</p>	<p>As noted in the column to the left, surveys for the original construction of C-470 and subsequent projects (mostly for non-</p>	<p>Full analysis and documentation required.</p> <p>A records search, including the 1976 survey, should be reviewed and compared to the APE for the</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	<p>process for the original construction of C-470 (CDOT, 1976). From the 1970s through the early 2000s, a number of additional archaeological surveys were undertaken (mostly for non-transportation-related development). These studies identified numerous archaeological sites eligible for the National Register of Historic Places (NRHP) or needing additional data to evaluate significance along the length of C-470 from I-70 to I-25.</p> <p>The 2018 PEL Study outlined general conditions but did not conduct or review surveys to identify known archaeological resources in the C-470 PEL Segment of this Project or the rest of the 2018 PEL Study area.</p>	<p>transportation-related development) identified a number of archaeological sites along the length of C-470, from I-70 to I-25, that were eligible for the NRHP or needed additional data to evaluate significance.</p> <p>The 2015 EA/FONSI conducted a file search and determined that additional field survey was not required for the 2015 EA/FONSI Proposed Action. Eight prehistoric sites identified within the 2015 EA/FONSI Area of Potential Effects (APE), which included the C-470 EA Segment of this Project, were evaluated for NRHP eligibility. None were determined eligible.</p>	<p>Project, and an additional survey should be conducted. Survey efforts should be coordinated for historic and archaeological surveys to ensure surveys are thorough but not duplicative.</p> <p>Scoping should include the State Historic Preservation Officer (SHPO) and any other identified consulting parties as part of the Section 106 consultation process.</p> <p>Recommendations for tribal consultation are included in the Native American Consultation row of this table.</p>
Cumulative Impacts	The 2018 PEL Study did not evaluate cumulative impacts.	The 2015 EA/FONSI reviewed past, present, and reasonably foreseeable future actions within the 2015 EA/FONSI study area, including the C-470 EA Segment of this Project, with particular focus on the large developments east of this Project's limits, such as the Highlands Ranch neighborhood, Park Meadows Mall, and E-470. The analysis concluded that the 2015 EA/FONSI Proposed Action would contribute to cumulative water quality effects from increased impervious areas and some increased loss of prairie dog habitat.	<p>Full analysis and documentation required.</p> <p>Coordination with resource agencies should be conducted to determine a study area for each resource, and the relationship to the 2015 EA/FONSI and Interim phase construction project should be considered. Resources that may be cumulatively impacted include noise impacts to local residents, economic impacts, floodplain impacts, and direct/ indirect loss of wetlands due to surface disturbance and increased impervious surface area. Wildlife habitat loss may also occur due to planned development. This list of resources should be reviewed, updated, and expanded as necessary.</p>
Environmental Justice	The 2018 PEL Study area, including the C-470 PEL Segment of this Project, generally has smaller proportions of minority and low-income populations than the broader Denver metropolitan area.	The 2015 EA/FONSI study area, including the C-470 EA Segment of this Project, generally has smaller proportions of minority and low-income populations than the broader Denver metropolitan area.	<p>Some analysis and documentation required.</p> <p>Coordinate with local business owners, property owners, residents, planners, and other local officials to determine if clusters of minority or low-income</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	Urban areas and multi-unit, higher density residential housing along the C-470 PEL Segment, such as in the vicinity of the C-470/Wadsworth Boulevard, C-470/Kipling Street, C-470/Bowles Avenue, and C-470/Bellevue Avenue interchanges, as well as the C-470 and I-70/US 6 interchange complex, have greater potential for minority and low-income populations.	Near the C-470 EA Segment, a cluster of households with limited English proficiency was noted in the Dakota Station neighborhood one-half-mile north of C-470 and east of Kipling Parkway.	households are present in the study area and may require specialized outreach. The Project should also consider preparing outreach materials in Spanish to communicate with the cluster of Spanish-speaking households identified in the 2015 EA/FONSI.
Farmlands	The 2018 PEL Study identified no unique farmland but did note small pockets of potential prime farmland throughout the C-470 PEL Segment of this Project.	The 2015 EA/FONSI project area, including the C-470 EA Segment of this Project, is included within the metro Denver urbanized area. No Federally-protected farmland is present, and no impacts were identified.	Some analysis and documentation required. Farmlands analysis should be conducted to determine if soils identified as "prime farmland if irrigated" are irrigated and will be impacted by the Project. Local planners and National Resources Conservation Service representatives should be consulted during scoping. Coordination with property owners, businesses, and residents potentially affected by farmland impacts should also occur.
Floodplains	Multiple floodplains cross or parallel the C-470 PEL Segment of this Project: Lena Gulch, Rooney Gulch, Bear Creek, Turkey Creek, Weaver Creek, Bergen Tributary, Coon Creek, Dutch Creek (also a floodway), and Massey Draw (also a floodway). A Conditional Letter of Map Revision (CLOMR) may be required if the Project impacts any floodplains.	The 2015 EA/FONSI identified the Massey Draw 100-year floodplain in the C-470 EA Segment of this Project. The 2015 EA/FONSI concluded that the 2015 EA/FONSI Proposed Action would not affect this floodplain. From US 85 to Wadsworth Boulevard, east of this Project's limits, C-470 crosses property owned by the US Army Corps of Engineers (USACE) under an easement granted to CDOT for the specific purpose of transportation use. In the 2015 EA/FONSI, additional coordination with the USACE was required for improvements within this easement, specifically regarding USACE's flood control/storage in	Full analysis and documentation required. Due to the number of floodplains crossing and paralleling the Project area, floodplain modeling will likely be required to assess floodplain impacts. A CLOMR will be required for floodplain impacts. Scoping activities should coordinate with Jefferson County, which is responsible for floodplain management over regulatory floodplains in the Project area and has local floodplain permitting requirements for development activities within the floodplain. Scoping should include coordination with the USACE regarding flood control/storage in the C-470

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
		Chatfield State Park. The eastern limit of this Project immediately abuts this easement at the Wadsworth Boulevard interchange.	easement area, which ends at the Wadsworth Boulevard interchange. Scoping should also confirm whether C-470 crosses any other USACE easements, such as near Soda Lake and Bear Creek Park.
Geologic Resources and Soil	The 2018 PEL Study did not assess impacts to geologic resources or soils. Geologic and soil maps were reviewed to assess conditions for paleontological resources, vegetation, and farmlands.	The 2015 EA/FONSI identified areas of expansive soils and bedrock, corrosive soils, steeply dipping bedrock, collapsible soils, and unstable slopes. CDOT did not shift the proposed location of the Proposed Action's features to avoid these conditions, but the conditions should be considered during design of the Project.	Some analysis and documentation required. Geologic conditions should be investigated using 1) existing mapping and reports, and 2) new geotechnical field investigations. Geologic conditions should be taken into account during design of the Project.
Hazardous/Solid Waste	<p>The 2018 PEL Study identified seven hazardous materials sites within the C-470 PEL Segment of this Project with medium risk to impact both Recommended Alternatives based on the location of the facilities and known releases. The sites were identified in the vicinity of three interchanges: C-470 and I-70/US 6, C-470/Morrison Road, and C-470/Bowles Avenue.</p> <p>The 2018 PEL Study noted that some or all of these sites may require remediation prior to acquisition or development.</p>	One site within the C-470 EA Segment study area was identified as with a "recognized environmental condition." This site, a location of improper oil disposal, was noted near the C-470/Kipling Parkway interchange.	<p>Full analysis and documentation required.</p> <p>A corridor-wide Modified Phase I Environmental Site Assessment or CDOT Initial Site Assessment at site-specific locations should be conducted to evaluate the hazardous materials sites identified in the C-470 PEL Segment and C-470 EA Segment that may require remediation prior to acquisition or development. Based on the results of the investigation, further subsurface investigations, including collection of subsurface soil samples and groundwater samples, may be required to delineate the specific horizontal and vertical extents of contamination. During the design process, this information can be used to identify avoidance options, when possible, and to develop specific contaminated soils/ groundwater material management or mitigation measures.</p> <p>Scoping should include the CDPHE Hazardous Materials and Waste Management Division.</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
Historic Resources	<p>The 2018 PEL Study did not conduct an evaluation of effects to historic properties under the requirements of Section 106 of the National Historic Preservation Act (NHPA).</p> <p>The 2018 PEL Study conducted a records review of previously identified sites and review of Jefferson County Assessor records of historic age (45 years old or older). The 2018 PEL Study alternatives evaluation found Alternatives 1 and 2 both would likely affect potential historic properties in the C-470 PEL Segment of this Project and that the number of properties affected was similar between the alternatives.</p>	<p>The 2015 EA/FONSI conducted a Section 106 evaluation of effects to historic properties. One NRHP-listed historic property was identified within the C-470 EA Segment of this Project: Hildebrand Ranch, which is located southwest of C-470 and Wadsworth Boulevard. The 2015 EA/FONSI Proposed Action did not affect the property, and a “no historic properties affected” determination was documented.</p>	<p>Full analysis and documentation required.</p> <p>The Project will need to comply with Section 106 of the NHPA, including setting the APE as early as design allows, identifying historic properties within the APE, assessing project effects on historic properties, and developing mitigation (resolving effects) for adverse effects to historic properties, if needed.</p> <p>A scoping meeting specific to Section 106 will be held to discuss the proposed APE, resources including the potential for historic roads, ditches, and subdivisions, and approach to cultural survey.</p> <p>The Project will need to consult with the SHPO and other interested consulting parties throughout the Section 106 process.</p>
Land Use	<p>The 2018 PEL Study summarized and mapped land use conditions in the C-470 PEL Segment of this Project. The C-470 land uses were summarized in two segments: Kipling Parkway to US 285 and US 285 to I-70. Most of the land in both segments is in unincorporated Jefferson County and includes a mix of residential, commercial, agricultural, and recreational. Impacts to land uses were not assessed.</p>	<p>Land uses and land use plans were reviewed and characterized in the 2015 EA/FONSI. Land uses in the C-470 EA Segment of this Project north of C-470 include primarily residential with small pockets of commercial and office uses. In the C-470 EA Segment south of C-470, land uses are primarily open space/parks with small areas of residential and office land uses immediately adjacent to the highway.</p> <p>The 2015 EA/FONSI concluded that no changes to land uses or accesses in the 2015 EA/FONSI project area, including the C-470 EA Segment of this Project, would result from the 2015 EA/FONSI Proposed Action.</p>	<p>Some analysis and documentation required.</p> <p>Although land use changes or conflicts are not likely, the Project should conduct a land use analysis to confirm that the Project will not conflict with surrounding land uses or land use plans.</p> <p>Local officials and planners should be contacted during the scoping period to initiate coordination and ensure the Project is compatible with local planning.</p>
Native American Consultation	<p>The 2018 PEL Study did not conduct tribal consultations.</p>	<p>Ten tribes were contacted and invited to participate in the 2015 EA/FONSI. Four tribes responded to the invitation (Northern Arapaho, Southern Ute, Pawnee Nation, and Standing</p>	<p>Some analysis and documentation required.</p> <p>Consistent with Section 106 of the NHPA, the Project should coordinate with interested Native American tribes to solicit their input on the Project</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
		Rock Sioux). Two tribes, (Northern Arapaho and Southern Ute) participated as consulting parties; neither raised specific issues of concern regarding the 2015 EA/FONSI Proposed Action.	and identify any properties of religious or cultural significance in the Project area. Tribes should be initially contacted during the scoping period.
Noise	<p>The 2018 PEL Study identified numerous potentially affected Category B (residential) receptors located in the following areas of the C-470 PEL Segment of this Project: Wadsworth Boulevard to Ken Caryl Avenue, C-470/Coal Mine Avenue vicinity, Belleview Avenue to US 285, I-70 to US 6, and other scattered residences adjacent to the C-470 PEL Segment study area. Category C receptors, including churches, golf courses, parks, recreation areas, and open spaces with public trails, were also identified in the C-470 PEL Segment.</p> <p>Receptors are shown in maps in the 2018 PEL Study <i>Final Environmental Scan Report</i> (CDOT, 2017a).</p> <p>The 2018 PEL Study conducted a representative traffic noise model depicting likely noise conditions for a generic four-lane C-470 (not adjusted for terrain, traffic volumes, speeds, vehicles types). The model showed that receptors within 200 feet of the outside edge of the outside C-470 driving lanes are within the area where noise levels likely exceed noise abatement criteria.</p>	<p>Within the study area associated with the C-470 EA Segment of this Project, the 2015 EA/FONSI identified two neighborhoods—Chatfield Bluffs and Meadowbrook—along with the Deer Creek Park and Pool and the Deer Creek Golf Course that experience noise levels that currently approach or exceed noise abatement criteria. Mitigation was evaluated but not recommended in these locations because it was not found to be reasonable based on CDOT’s cost criteria.</p> <p>The Meadowbrook neighborhood currently has existing noise berms that were previously constructed for noise mitigation, which would need to remain in place, but additional mitigation was not found to be reasonable.</p>	<p>Full analysis and documentation required.</p> <p>The NEPA process should include a full traffic noise assessment to identify receptors where noise levels approach or exceed CDOT’s noise abatement criteria that may be impacted by the Project, and whether noise mitigation is warranted in accordance with CDOT’s Noise Analysis and Abatement Guidelines (CDOT, 2015c).</p>
Noxious Weeds	The 2018 PEL Study provided an overview of noxious weeds in the state. Locations of noxious weeds were not mapped in the C-470	Noxious weeds in the 2015 EA/FONSI study area, including the C-470 EA Segment of this Project, were identified through statewide	<p>Some analysis and documentation required.</p> <p>A field visit to confirm and document locations of weed-infested areas is recommended. The field</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	<p>PEL Segment of this project nor in the rest of the 2018 PEL Study area, and no surveys were conducted.</p>	<p>mapping efforts, and field visits were conducted to document weed-infested areas during the 2015 EA/FONSI. The 2015 EA/FONSI updated mapping of noxious weed locations and concluded that noxious weeds could be spread during construction. Preparation of a noxious weed management plan was recommended during construction.</p>	<p>visit should include a visit to areas of noxious weeds that are identified in the noxious weed management plan developed for the Interim construction project.</p> <p>The Project will need to complete an integrated noxious weed management plan to limit the spread of noxious weeds during construction.</p>
Paleontology	<p>The 2018 PEL Study reviewed geologic mapping of several high sensitivity rock formations in the 2018 PEL Study area, which encompassed the C-470 PEL Segment of this Project. The 2018 PEL Study also included a literature search and records review of paleontological fossil localities, which revealed presence of numerous fossil localities throughout the 2018 PEL Study area, including some within the highway right-of-way, that have yielded fossils of the late Jurassic, early Cretaceous, late Cretaceous, Pleistocene, and Holocene ages.</p>	<p>No field surveys were conducted for the 2015 EA/FONSI due to the heavy residential and commercial development within the 2015 EA/FONSI study area and lack of fossil-bearing bedrock exposures within the 2015 EA/FONSI project area.</p> <p>A review of maps and records related to paleontological resources identified potential for fossil-bearing units to be encountered during subsurface excavations, and construction monitoring was recommended.</p>	<p>Full analysis and documentation required.</p> <p>High-sensitivity geologic formations occur in many locations in the Project area. Mapping and records review should be updated as necessary, and construction monitoring will be needed, particularly in the section of C-470 between Alameda Avenue and US 6 in the highly sensitive Denver formation.</p>
Recreation	<p>The 2018 PEL Study identified a number of recreational resources in the C-470 PEL Segment of this Project. Recreational and park resources include the Rooney Road Regional Sports Complex, North Dinosaur Park (Dinosaur Ridge), William Frederick Hayden Park (Green Mountain), Bandimere Speedway, Bear Creek Lake Park, Mount Glennon Park, and Meadows Golf Club. Trails include the C-470 Bikeway, Bear Creek Trail, Dutch Creek Trail, and Weaver Gulch Regional Trail. Many of these recreational resources are Section 4(f) resources, and Mount Glennon Park is both a Section 6(f) and Section 4(f) resource.</p>	<p>The 2015 EA/FONSI identified one recreational resource within the C-470 EA Segment of this Project: Deer Creek Park and Pool. The property, which is not a Section 4(f) resource, would not be affected by the 2015 EA/FONSI Proposed Action.</p>	<p>Full analysis and documentation required.</p> <p>Numerous recreation resources are present in the Project area, and impacts to these properties are possible. A detailed analysis of impacts to recreation resources will be required.</p> <p>Many recreational resources are also Section 4(f) properties, and one is a Section 6(f) property. These properties will require additional evaluation as noted in the Section 4(f) and Section 6(f) rows of this table.</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	The 2018 PEL Study concluded both PEL Recommended Alternatives had the potential to affect nine of these recreational resources.		
Right-of-Way	The 2018 PEL Study discussed the potential for the PEL Recommended Alternatives to impact property within and outside of CDOT's right-of-way and included mapping of wells.	<p>Within the C-470 EA Segment of this Project, the 2015 EA/FONSI identified one location on the south side of C-470 where the 2015 EA/FONSI Proposed Action would require acquisition of 0.74 acres of a vacant parcel (planned residential) for permanent water quality.</p> <p>The 2015 EA/FONSI noted that right-of-way needs for the 2015 EA/FONSI Proposed Action were largely driven by the need to provide permanent water quality treatment facilities, which is a new requirement since the original construction of the highway.</p>	<p>Full analysis and documentation required.</p> <p>Although C-470 has wide right-of-way, the Project could require right-of-way acquisition, particularly around interchanges. A detailed analysis will be required.</p>
Section 4(f)	<p>The 2018 PEL Study identified six recreational Section 4(f) properties in the C-470 PEL Segment of this Project.</p> <p>Although no known (officially eligible or listed) historic properties were identified in the C-470 PEL Segment, numerous properties of historic age were identified that will need to be assessed for NRHP eligibility. Any historic properties determined eligible for the NRHP will need to be evaluated for potential Section 4(f) use.</p>	No historic or recreational Section 4(f) properties were identified in the C-470 EA Segment of this Project.	<p>Full analysis and documentation required.</p> <p>Numerous Section 4(f) recreational and potential historic resources are present. A complete Section 4(f) analysis is needed to determine if use of any of these resources would occur. Depending on the type of use, the Project may prepare a <i>de minimis</i> impact determination, apply a programmatic Section 4(f) evaluation, and/or prepare an individual Section 4(f) evaluation.</p> <p>The Project will need to coordinate with the officials with jurisdiction over the recreation resources and with the SHPO and other Section 106 consulting parties regarding effects to historic Section 4(f) resources.</p>
Section 6(f)	The 2018 PEL Study identified one Section 6(f) property in the C-470 PEL Segment of this Project: Mount Glennon Park, which is located	No Section 6(f) resources were identified in the C-470 EA Segment of this Project.	<p>Full analysis and documentation required.</p> <p>This Project should conduct a Section 6(f) analysis and follow the requirements for the conversion of</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	along the south (west) side of C-470 between US 285 and Morrison Road. Impacts to this property were noted for both PEL Recommended Alternatives.		Section 6(f) properties. Conversion of Section 6(f) properties requires acquisition of replacement land during the right-of-way acquisition phase. Preparation and implementation of a Section 6(f) Land Replacement Plan would be required, along with coordination with Colorado Parks and Wildlife (CPW) and the National Park Service.
Socioeconomics – Community and Public Wells	<p>The 2018 PEL Study did not conduct a detailed socioeconomic analysis.</p> <p>Within the C-470 PEL Segment of this Project, community and public wells were identified in the vicinity of the C-470/Ken Caryl Avenue and C-470/US 285 interchanges. The 2018 PEL Study noted that these wells could be affected by the Recommended Alternatives.</p> <p>Modest population growth in the C-470 PEL Segment was noted in the land use assessment.</p>	The 2015 EA/FONSI noted moderate employment density along C-470 within the C-470 EA Segment of this Project. Employment growth was projected to be increasingly dense and concentrated near the C-470/Kipling Parkway interchange. For the entire 2015 EA/FONSI study area, some economic benefit from construction of the 2015 EA/FONSI Proposed Action was identified, and no direct or adverse effects were noted for socioeconomic resources.	<p>Full analysis and documentation required.</p> <p>A full socioeconomic analysis should be conducted to assess potential community and economic impacts of the Project, including environmental justice considerations (noted in the Environmental Justice row of this table) as well as potential impacts to and plans for avoiding existing wells.</p> <p>Scoping should include coordination with local planners as well as owners and operators of wells in the Project area.</p>
Storm/Water Quality	<p>The 2018 PEL Study documented three impaired water bodies in the C-470 PEL Segment of this Project: Lena Gulch (main stem and all tributaries and wetlands from its source to the inlet of Maple Grove Reservoir); main stem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch; and an unnamed tributary to the South Platte River.</p> <p>The 2018 PEL Study did not conclude whether these water bodies would be affected by the Recommended Alternatives.</p> <p>Most of the C-470 PEL Segment is located in CDOT municipal separate storm sewer system (MS4) permit areas, and both permanent and</p>	The 2015 EA/FONSI evaluated effects on water quality, including impaired water bodies. The 2015 EA/FONSI Proposed Action included permanent water quality treatment facilities to mitigate water quality effects of increased stormwater runoff. One permanent water quality treatment facility is included in the C-470 EA Segment of this Project, west of Wadsworth Boulevard on the south side of C-470 (0.74 acres). The 2015 EA/FONSI also noted the need for Project construction to complete a Stormwater Management Plan (SWMP).	<p>Full analysis and documentation required.</p> <p>A full analysis of permanent water quality will be required, and it is anticipated that permanent water quality facilities will need to be provided in compliance with CDOT's MS4 Permit. CDOT's MS4 permit will be renewed in 2020.</p> <p>Scoping should include coordination with the CDPHE Water Quality Control Division. The Project will need to comply with CDOT's MS4 permit requirements for permanent water quality treatment and for construction activities, and potentially with CDPHE Regulation Number 73 - Chatfield Reservoir Control Regulation. A Colorado Discharge Permit System Construction Stormwater</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	temporary water quality impacts are anticipated.		Permit and a SWMP will be required for construction.
Threatened and Endangered Species	<p>The 2018 PEL Study identified a number of sensitive species likely to occur in the 2018 PEL Study area, primarily near the numerous streams and drainages, including the Turkey Creek and Bear Creek drainages in the C-470 PEL Segment of this Project.</p> <p>The 2018 PEL Study did not conduct Section 7 consultations or make any preliminary determinations of effects.</p>	The 2015 EA/FONSI identified many active black-tailed prairie dog colonies throughout the 2015 EA/FONSI project area, including in the C-470 EA Segment of this Project.	<p>Full analysis and documentation required.</p> <p>The Project should conduct surveys of the Project study area, focusing on drainages as suggested by the 2018 PEL Study, to identify the presence or absence of sensitive species and coordinate with the US Fish and Wildlife Service (USFWS) and CPW regarding federally- and state-protected species. Survey of Ute ladies'-tresses orchid must be scheduled during the blooming period, per the USFWS survey guidelines.</p> <p>If prairie dog colonies are present and impacted, mitigation should follow the 2009 CDOT Impacted Black-Tailed Prairie Dog Policy. Scoping should include coordination with the USFWS and CPW.</p>
Utilities	The 2018 PEL Study <i>Final Corridor Conditions Report</i> (CDOT, 2018d) assessed major utilities in the C-470 PEL Segment of this Project and also identified major utility owners. Both public and private entities own facilities in the C-470 PEL Segment.	The 2015 EA/FONSI Proposed Action requires a number of utility relocations throughout the 2015 EA/FONSI project area, including the C-470 EA Segment of this Project. Final design would be needed to determine and coordinate relocation requirements.	<p>Some analysis and documentation required.</p> <p>The Project survey should validate the presence of known utilities within the Project limits, and also identify any major utilities that may have been installed in recent years (since the 2018 PEL Study and 2015 EA/FONSI were completed). Compliance and coordination with Subsurface Utilities Engineering requirements will be necessary.</p>
Vegetation	The 2018 PEL Study reviewed and noted locations of important vegetation types associated with protected species habitats and wetlands, generally along riparian corridors throughout the 2018 PEL Study area, including the C-470 PEL Segment of this Project. The 2018 PEL Study also provided an overview of requirements to control noxious weeds but did	The 2015 EA/FONSI noted riparian area vegetation provides the highest ecological value of vegetation types of those present in the 2015 EA/FONSI study area, including the C-470 EA Segment. The majority of these areas are under the jurisdiction of Senate Bill 40, which requires a wildlife certification from CPW and mitigation for impacts to riparian areas. The Massey Draw riparian area is	<p>Some analysis and documentation required.</p> <p>The Project should conduct a field survey to identify vegetation types, particularly within the numerous riparian areas surrounding drainages in the Project area.</p> <p>The Project will need to comply with Senate Bill 40 requirements for impacts in riparian areas.</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	not conduct any field surveys or mapping reviews.	located in the C-470 EA Segment of this Project.	
Visual/Aesthetics	<p>The 2018 PEL Study conducted a detailed and thorough assessment of visual conditions and potential effects of the PEL Recommended Alternatives.</p> <p>The C-470 PEL Segment of this Project is within visually sensitive and scenic landscape viewsheds and provides access to regionally and nationally recognized natural and cultural landmarks. The C-470 PEL Segment is within the Front Range Mountain Backdrop, an important scenic landscape for many communities in the Denver metropolitan area and elsewhere in Colorado. The Jefferson County Comprehensive Master Plan (Jefferson County, 2017) identifies the need to design transportation improvement projects to protect and preserve the Front Range Mountain Backdrop.</p> <p>Multiple parks and open space lands are highly visible from the C-470 PEL Segment, including Matthews Winters Park, Dinosaur Ridge, William Frederick Hayden Park (Green Mountain), Mount Glennon Park, and Bear Creek Lake.</p> <p>The 2018 PEL Study Recommended Alternatives would affect the viewshed of the C-470 PEL Segment with roadway widening, increased infrastructure, and signage. Both vertical and horizontal elements have the potential to affect visual resources, but vertical</p>	<p>The visual character of the C-470 EA Segment of this Project is less sensitive than the C-470 PEL Segment. The 2015 EA/FONSI concluded minimal visual changes would occur in the 2015 EA/FONSI project area, including the C-470 EA Segment of this Project, from the 2015 EA/FONSI Proposed Action. The widened roadway would be more visually imposing in the suburban landscape, affecting views of and to the roadway, but only minimally affecting drivers' views from the roadway. Within the 2015 EA/FONSI project area, CDOT developed corridor-wide standard architectural treatments to create a more consistent appearance of the corridor when looking out from the roadway and when looking toward the roadway from nearby, with input from adjacent jurisdictions.</p>	<p>Full analysis and documentation required.</p> <p>The Project should include a Standard Visual Impacts Assessment following current guidance, which was updated in 2019. The 2018 PEL Study's detailed assessment provides substantial input to the Visual Impacts Assessment; it is likely the landscape units can be consolidated and simplified. Detailed visual analyses will be important to the NEPA decision process due to the high sensitivity of publicly protected landscape within the corridor viewshed and the extent of guidelines and policies for visual resources management and protection within Jefferson County.</p> <p>The architectural standards developed for the 2015 EA/FONSI are not likely applicable to the more rural and scenic conditions of the C-470 PEL Segment, but will be instructive in the transition from the suburban area to the Front Range Mountain Backdrop.</p> <p>Compliance with visual resource policies and guidelines will necessitate context sensitive mitigation strategies.</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
	<p>elements are most disruptive and harder to mitigate.</p> <p>The 2018 PEL Study indicated visual changes have a high potential for controversy from surrounding corridor communities, given the history of other related transportation planning efforts associated with I-70 and C-470.</p>		
Wetlands and Other Waters of the US	<p>The 2018 PEL Study did not delineate wetlands and waters of the US. Thirty-seven wetlands and streams/water bodies were identified in the C-470 PEL Segment of this Project, based on data from the National Wetlands Inventory and a limited site visit conducted in June 2016.</p> <p>Both of the Recommended Alternatives would affect five identified wetlands and seven identified streams/water bodies in the C-470 PEL Segment, including Massey Draw (which has been identified as a jurisdictional water in other Section 404 permitting).</p>	<p>Wetland and waters of the US delineations were conducted and coordinated with the USACE. Four wetlands, were identified along Massey Draw in the C-470 EA Segment of this Project.</p> <p>East of this Project's limits, from US 85 to Wadsworth Boulevard, C-470 crosses property owned by the USACE under an easement granted to CDOT for the specific purpose of transportation use. Improvements within this easement required CDOT to coordinate with the USACE regarding potential requirements under Section 408. This coordination occurred after the NEPA process was complete and may impact future NEPA processes in this corridor. The eastern limit of this Project will immediately abut this easement at the Wadsworth Boulevard interchange.</p>	<p>Full analysis and documentation required.</p> <p>Wetland delineations should be completed in the areas that could be impacted by Project-related activities in accordance with the 1987 USACE Wetland Delineation Manual, and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0).</p> <p>Impacts to waters and wetlands under the jurisdiction of the USACE will need to be permitted under a Section 404 Permit. Impacts under 0.5 acres can be authorized under a Nationwide Permit. Impacts greater than 0.5 acres would likely require obtaining an Individual Permit.</p> <p>CDOT also mitigates wetland impacts not under USACE jurisdiction. A CDOT Wetland Finding report may be required if permanent wetland impacts exceed 500 square feet or if temporary impacts exceed 1,000 square feet, regardless of whether USACE has jurisdiction. This does not include impacts to open water areas.</p> <p>Scoping should include coordination with the USACE, including specific evaluation of the C-470 easement and potential requirements under Section 408. Scoping should also confirm whether C-470</p>

Resource	Environmental context and conditions from 2018 PEL Study (C-470 PEL Segment)	Environmental context and conditions from 2015 EA/FONSI Study (C-470 EA Segment)	NEPA Recommendations for the Project
			crosses any other USACE easements, such as near Soda Lake and Bear Creek Park.
Wildlife/Fisheries	<p>The 2018 PEL Study documented wildlife-vehicle collisions in the C-470 PEL Segment of this Project, and the 2018 PEL Study recommended six wildlife crossings in the C-470 PEL Segment as mitigation: Green Mountain (MP 0.7), Bear Creek (MP 4.3), and the C-470/US 285 interchange are identified as high priority locations for improved crossings for deer, elk, and other carnivores; Rooney Gulch (MP 2.5), Meadows Golf Club (MP 9.3), and Massey Draw (MP 10.4) are identified as medium to low priority locations for improved crossings for deer and other large carnivores.</p> <p>These prioritized recommendations were a result of a multi-step process including compiling and analyzing available data and reports, interviews with on-the-ground wildlife managers, and roadway site surveys. Wildlife presence and potential highway crossing zones were identified to determine areas of major crossing activity, barriers to movement, and road mortality. A stakeholder meeting was held to review a preliminary list of crossing recommendations, and the input received during that meeting resulted in the final set of prioritized recommendations.</p> <p>No nests were observed in field surveys, but the 2018 PEL Study noted that migratory bird and raptor nests are likely present in the C-470 PEL Segment study area.</p>	<p>Wildlife fencing lines the C-470 EA Segment of this Project. No wildlife vehicle collision conflicts were noted in the C-470 EA Segment of this Project. (Improved wildlife movement was desired and included along the South Platte River corridor adjacent to the Mary Carter Greenway Trail, east of this Project's limits.)</p> <p>Some 2015 EA/FONSI project-wide impacts were noted from loss of wildlife habitat. Wildlife habitat throughout the 2015 EA/FONSI project area has been affected by development.</p> <p>Migratory birds were noted in the 2015 EA/FONSI area, particularly in the Chatfield Reservoir and South Platte River areas east of the C-470 EA Segment. The 2015 EA/FONSI described impacts from land-clearing and bridge construction projects that would need to be mitigated during construction.</p>	<p>Full analysis and documentation required.</p> <p>The Project should conduct a field survey to identify wildlife habitat, including black-tailed prairie dog colonies and migratory bird habitat and nesting, which includes raptors.</p> <p>Locations recommended in the 2018 PEL Study for wildlife crossings, and associated wildlife fencing, escape ramps, and deer guards at interchanges, should be considered when developing the scope and design of the Project. In addition to large mammal crossing structures, intermittent small culverts may also be warranted in fenced segments of roadway to provide greater passage opportunities for smaller fauna. Scoping should include coordination with CPW.</p>

4.2. Resource Agency Coordination Background and Input

4.2.1. Coordination for the 2018 PEL Study

Environmental resource agencies were contacted to introduce the 2018 PEL Study and establish communications, and to present existing conditions, draft alternatives screening, and draft study recommendations for comment. Information was gathered regarding necessary next steps related to any environmental impact mitigation or next steps that would be required in NEPA.

The following agencies received the PEL Report for comment: CDPHE Air Quality/Air Pollution Control Division, CDPHE Hazardous Materials and Waste Management Division, CDPHE Water Quality Control Division, CPW, Jefferson County Health Department, Jefferson County Historical Society, SHPO, USACE, USEPA, and USFWS. Only the USEPA provided comments, requesting that the 2018 PEL Study list the 24 high or medium risk hazardous materials facilities in the main report. They also requested that future projects complete a Project of Air Quality Concern questionnaire for USEPA review as early as possible in project development. These comments were addressed in the 2018 PEL Study and included in the Table 3 NEPA recommendations.

4.2.2. Coordination for the 2015 EA/FONSI

Resource agencies were extensively involved during development of the 2006 EA and again during the 2015 Revised EA. The following agencies were consulted during the 2015 EA/FONSI process: CDPHE, Chatfield State Park, CPW, DRCOG, NPS, SHPO, South Suburban Parks and Recreation District, USACE, and USFWS. An agency scoping meeting solicited early input on key issues and was attended by the CPW, DRCOG, and USACE. USACE and South Suburban Parks and Recreation District provided input on the EA; none of the input was related to the C-470 EA Segment. However, as noted in Table 3, additional coordination with USACE will be needed east of this Project's limits, from US 85 to Wadsworth Boulevard, where C-470 crosses property owned by the USACE under an easement granted to CDOT for the specific purpose of transportation use.

4.2.3. NEPA Considerations

Table 3 summarizes relevant agency coordination requirements and recommendations in the NEPA Recommendations column. In addition to resource-specific coordination, the Project will continue to meet with the 2018 PEL Study Technical Working Group (TWG) and the Coalition Steering Committee at key milestones (see Section 5 for discussions of these groups). Regular coordination will be provided to the TWG with information on current Project status.

5. Public Involvement

5.1. 2018 PEL Study Public Input

5.1.1. 2018 PEL Study Public Involvement Activities

Stakeholder involvement was emphasized throughout the PEL process and feedback was solicited from the agency and public partners at key decision points to foster acceptance of recommendations. The 2018 PEL Study coordinated with key stakeholders through the WestConnect Coalition Steering Committee and the TWG and coordinated with the general public through public meetings and telephone town halls.

Coalition Steering Committee

The WestConnect Coalition formed a Steering Committee comprising elected officials and other high-level decision-makers to direct the Coalition's efforts. During the 2018 PEL Study, the project team presented information to the Coalition Steering Committee at eight planned meetings of the group. This kept Coalition Steering Committee members informed of the study's progress and allowed them to provide input at key milestones. Information was presented to the Coalition Steering Committee prior to presentation to the public.

Coalition Steering Committee members were expected to keep other elected officials in their agencies informed of 2018 PEL Study development and bring relevant issues to the project team for discussion. To facilitate the sharing of information, Coalition Steering Committee members were provided study briefing packets that could be easily forwarded to their fellow Council or Commission members to explain 2018 PEL Study activities. The following agencies were represented by their elected officials or senior leadership on the Coalition Steering Committee: Boulder County, CDOT Region 1, City and County of Broomfield, City of Arvada, City of Boulder, City of Golden, City of Lakewood, City of Littleton, City of Westminster, Douglas County, FHWA, Jefferson County, Town of Morrison, and Town of Superior.

TWG

The TWG served as the focal point for the stakeholder engagement process, and it was the primary means of interacting with and engaging the corridor communities and stakeholders. The 2018 PEL Study coordinated with the TWG to determine the proper level of engagement required for member agencies' elected officials and associated stakeholder groups. The 17 TWG meetings were the forum for addressing corridor-wide issues and making recommendations as a group. The following agencies were represented by their technical staff on the TWG: Boulder County, CDOT Headquarters – Environmental Programs Branch, CDOT Region 1, City and County of Broomfield, City of Arvada, City of Boulder, City of Golden, City of Lakewood, Town of Superior, City of Westminster, Douglas County, DRCOG, FHWA, Jefferson County, and Jefferson Parkway Public Highway Authority.

Public Involvement

Public involvement efforts focused on soliciting input from the general public, including potential users of the corridor and surrounding roadways. The 2018 PEL Study held public meetings at three points in the study, posted videos on the project website, gave presentations to several organized groups, and distributed information via news releases, phone calls, email, and website updates.

The first round of public meetings in November 2016 introduced the study and discussed existing conditions and the needs for transportation improvements. This round of meetings included a telephone town hall and three meetings in person in Broomfield, Golden, and Littleton. 800 people participated in the telephone town hall during peak attendance, and over 150 callers stayed engaged for the duration of the call. 130 members of the public attended the in-person meetings.

A second public meeting in May 2017 presented an update on the study status and introduced alternatives being considered and the alternatives evaluation process. This meeting was held as a telephone town hall. 270 people were engaged for at least a portion of the hour-long call.

The third round of public meetings in January 2018 presented the results of the alternatives evaluation and the draft study recommendations. This round of meetings was held in person in Arvada, Golden, and Littleton. 280 members of the public attended these meetings.

5.1.2. 2018 PEL Study Input Received

Input received during stakeholder and public involvement activities indicated general agreement with the 2018 PEL Study recommendations. The Coalition Steering Committee and TWG provided concurrence with the recommendations at their meetings, and public input provided general agreement with the recommendations at the last round of public meetings.

The 2018 PEL Study identified the following topics as unresolved issues in the C-470 PEL Segment that would need to be revisited in future NEPA phase(s):

- Local agency coordination regarding adjacent development, timing of improvements, access considerations, and pedestrian and bicycle infrastructure connections
- Considerations for improvements at the Ken Caryl Avenue/C-470 ramp intersections
- Coordination with Lakewood Parks regarding the secondary access point to Bear Creek Lake Park and adjacent private properties—further coordination with Lakewood Parks and private property owners served by the secondary access to Bear Creek Lake Park will be necessary if the Project relocates and realigns the secondary access point as recommended by the 2018 PEL Study
- C-470/US 285 and C-470/Morrison interchange early action improvements and related impacts and mitigation of traffic operations on I-70 between C-470 and US 6
- RTD infrastructure and service coordination related to recommended service enhancements, Park-n-Ride lots and bus stop improvements
- Water quality accommodations to meet MS4 requirements
- Utilities coordination, especially the electrical towers at the C-470/US 285 interchange

5.2. 2015 EA/FONSI Public Input

5.2.1. 2015 EA/FONSI Public Involvement Activities

The C-470 Corridor Coalition and CDOT conducted stakeholder involvement activities in 2012 prior to initiating the Revised EA, and the Coalition unanimously agreed in 2013 on tolling as the recommended funding option for the project.

After the Revised EA was initiated, CDOT hosted a round of public meetings in September 2014 to present and solicit input on the Proposed Action and Revised EA progress to date, including preliminary environmental findings. The round of meetings comprised three telephone town hall meetings and four in-person meetings in Littleton, Highlands Ranch, Lone Tree, and Centennial.

CDOT hosted two public open house meetings in February 2015 in Highlands Ranch and presented to community organizations and other interested groups regarding noise analysis results. CDOT held a public hearing during the 45-day EA public comment period to present the findings of the EA and solicit public comments. Approximately 171 members of the public attended. CDOT also posted updates to the project website and distributed information via news releases throughout the 2015 EA/FONSI process.

5.2.2. 2015 EA/FONSI Input Received

The primary focus of public input received on the EA was related to noise impacts and mitigation. Public input also included some opposition to tolling and requests for the toll lanes to be publicly operated and not privatized.

5.3. Public Involvement in NEPA

The Project will develop a public involvement plan for NEPA, as discussed in the NEPA work plan in Section 6. The type, frequency, and methods of engagement are informed by the level of interest in the previous study phases. In addition to general public outreach, specialized outreach may be required for special interest topics, such as Express Lane operations and traffic and revenue study results and impacts related to noise, visual resources, and parks.

6. NEPA Work Plan for C-470: Wadsworth Boulevard to I-70 Project

6.1. NEPA Class of Action Considerations

The 2018 PEL Study and 2015 EA/FONSI indicate that environmental impacts of the Project are not likely to be significant and that a documented Categorical Exclusion (CatEx) should be appropriate. However, additional information is needed to determine the NEPA class of action as the Project design progresses and more information is available to assess the potential severity of environmental impacts. Specifically, the interchange designs around the Bowles Avenue, Quincy Avenue/Bellevue Avenue complex, the US 285 interchange, and the C-470 and I-70/US 6 interchange need to be advanced to understand right-of-way needs, particularly with regard to parkland impacts, including whether potential Section 4(f) and Section 6(f) uses would be more than minor (i.e., unable to be processed as *de minimis* impacts or through a programmatic approval).

A CatEx may not be appropriate in the following instances, as defined in 23 CFR 771.117:

- Induces significant impacts to planned growth or land use for the area
- Requires relocation of significant numbers of people or businesses
- Has significant impacts on any natural, cultural, recreational, historic, or other resource
- Has significant air, noise, or water quality impacts
- Has significant impacts on travel patterns
- Has individual or cumulative significant environmental impacts
- Has a large amount of public controversy surrounding the project
- Has substantial controversy on environmental grounds
- Has significant impact on properties protected by Section 4(f)
- Shows inconsistencies with any federal, state, or local law

Although the Project Proposed Action does not seem to have any of these issues, CDOT will complete the CatEx checklist to confirm the applicability of a CatEx and discuss the class of action with FHWA after scoping is completed, the design progresses, and the severity of environmental impacts can be better anticipated, particularly with regard to overall right-of-way needs, changes in access or use of Section 4(f) properties, and potential for public controversy regarding noise or other environmental issues. If after this review, FHWA and CDOT determine a CatEx would not be appropriate, CDOT would complete an EA.

6.2. Purpose and Need Elements to be Addressed in NEPA

The preliminary purpose and need for this Project, discussed in Section 2 of this document, stems from the recommendations of previous transportation studies. The preliminary NEPA purpose of this Project is to improve corridor travel reliability and safety on C-470 between Wadsworth Boulevard and I-70. This purpose is based on the 2018 PEL Study and 2015 EA/FONSI information and the recent 2020 ELMP recommendations.

The Project needs include reducing recurring congestion, decreasing travel delays, and improving operational performance; these needs are based on the needs identified in the 2018 PEL Study and 2015 EA/FONSI and their applicability to the Project area.

The preliminary purpose and need will be evaluated and fully developed into a Project-specific purpose and need during the NEPA process(es). The Project will evaluate the previous studies' needs, described in Section 2.2 of this document, for their compatibility with the recent recommendations from the 2020 ELMP and for their continued applicability to the Project area. The needs will provide a foundation for the project moving forward and will continue to evolve as additional information becomes available

from the Level 2 traffic and revenue study, the Proposed Action is refined and advanced, and funding is identified. Refinements to the purpose and need may result in refinements to the Project limits and study area. The Project's independent utility will be confirmed as the Project-specific purpose and need is developed and finalized.

6.3. Proposed Action Considerations to Be Addressed in NEPA

This transition document describes the previous planning that has shaped the preliminary Project Proposed Action to implement Express Lanes, assess interchange improvements, and evaluate other elements described in Section 3.1. Additional alternatives analysis is not planned in the NEPA phase; however, the Proposed Action will evolve during NEPA as physical and operational elements of the Project Proposed Action are refined, Project elements are evaluated, traffic studies are completed, and funding is identified. Additional engineering will be needed to define the physical footprint of the Project, including details such as locations and number of Express Lane ingress and egress points; evaluation of interchange concepts, including validating needs for ramps, bridges, and signals; and advanced design of other project elements such as wildlife crossings, water quality facilities, and trail enhancements. Operational considerations include Express Lane operations, such as whether HOVs will be allowed, and system improvements, such as ramp metering and incident management tools. Further refinement of the Project Purpose and Need may change the scope of the Project Proposed Action and result in refinements to the Project's limits and study area.

6.4. Environmental Considerations for NEPA

The 2018 PEL Study and 2015 EA/FONSI provide useful context for evaluating the likelihood and severity of the Project's potential impacts on environmental resources. Due to the availability of right-of-way within the C-470 corridor, environmental impacts are expected to be minimal, despite the presence of important natural, visual, and recreational properties throughout the Project area. Table 3 in Section 4 of this document summarizes the resource considerations for the Project and recommendations for the level of impact analysis for the Project's NEPA process, which were developed by comparing the environmental conditions for the Project study area with the resource considerations and procedures for outlined in Chapter 9 of the NEPA Manual (CDOT, 2017b).

6.5. Agency Coordination and Public Involvement Plan Considerations

Agency coordination will include involvement of local and state agencies as well as state and federal resource agencies. Table 3 in Section 4 of this document outlines scoping and coordination actions with resource agencies related to environmental impacts. Local and state agencies are also involved in the TWG and the Coalition Steering Committee, which will continue to meet at key milestones through project development.

A NEPA public involvement plan will be developed. It is anticipated that outreach will include meetings and information distribution via electronic communication. Telephone town halls and in-person public meetings were effective means of communication with the public during the 2018 PEL Study and 2015 EA/FONSI and are recommended at key milestones during this Project's NEPA process.

Funding for the Project will likely require coordination with HPTE's public process. This Project's NEPA team will coordinate directly with the HPTE financing team regarding timing for public involvement activities in order to be efficient and consistent.

The unresolved issues from the 2018 PEL Study listed in Section 5.1.2 of this report should be considered during coordination with agencies and the public.

7. References

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