

## Chapter 3. Affected Environment and Environmental Consequences

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### What does Chapter 3 cover?

**Chapter 3** discusses the affected environment and environmental impacts from construction and operation of the alternatives listed in **Chapter 2, Summary and Comparison of Alternatives**.

**Chapter 3** presents background, methodologies, agency coordination, areas of interest, direct and indirect impacts, Tier 2 process information, and mitigation strategies for each resource. **Chapter 4, Cumulative Impacts Analysis**, discusses cumulative impacts of this action, along with other past, present and reasonably foreseeable future planned actions in the cumulative study area.

The natural and human environment resources inventoried and described in this chapter include the following:

- |   |   |
|---|---|
| 3.1 Climate and Air Quality Resources       | 3.9 Environmental Justice                                 |
| 3.2 Biological Resources                    | 3.10 Noise  |
| 3.3 Wetlands and Other Waters of the U.S.   | 3.11 Visual Resources                                     |
| 3.4 Water Resources                         | 3.12 Recreation Resources and Section 6(f) Evaluation     |
| 3.5 Geologic Hazards                        | 3.13 Historic Properties and Native American Consultation |
| 3.6 Regulated Materials and Historic Mining | 3.14 Section 4(f)   |
| 3.7 Land Use and Right-of-Way               | 3.15 Paleontology   |
| 3.8 Social and Economic Values              | 3.16 Energy   |

Additionally, discussions and summaries of other impacts or issues that are not resource or human environment-specific include those found in the following sections:

- 3.17 Irreversible and Irretrievable Commitment of Resources
- 3.18 Short-term Uses versus Long-term Productivity
- 3.19 Mitigation Summary

### What is the context of the resource evaluations?

The project study limits extend 144 miles from Glenwood Springs in western Colorado to C-470/Jeffco Government Center light rail station on the western edge of metropolitan Denver, Colorado. The I-70 Mountain Corridor includes the I-70 highway and its associated infrastructure and in these study limits is referred to as the Corridor throughout this document. The study area includes the projected footprint of the Action Alternatives and extends out farther depending on the resource evaluated. For example, when evaluating water resources, the Corridor includes all adjacent watersheds or when evaluating socioeconomic resources, the nine counties that represent the economic base of the Corridor are evaluated. The study area for each resource is described in the individual resource sections (**Sections 3.1 through 3.16**).

The environment of the Corridor is diverse and includes:

- Four life zones
  - Foothills
  - Montane

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- Subalpine
- Alpine
- Four watersheds
  - Colorado River sub-basin
  - Eagle River sub-basin
  - Blue River sub-basin
  - Clear Creek sub-basin
- Nine geologic domains (see **Section 3.5, Geologic Hazards**)
- Two National Forests
  - White River National Forest
  - Arapaho and Roosevelt National Forests
- Five counties
  - Garfield
  - Eagle
  - Summit
  - Clear Creek
  - Jefferson
- Twenty-seven scenery analysis units (see **Section 3.11, Visual Resources**).

These zones, watersheds, domains, or jurisdictions are used to organize the resources.

In recognition of the need for a short- and long-term sustainable transportation vision, the project analysis uses both a 2035 planning horizon and a 2050 long-term horizon. The lead agencies, the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA), performed the detailed analysis based on the available data that is representative of the conditions of Corridor resources. Available traffic, land use, and socioeconomic forecasts extend through the 2035 planning horizon. The lead agencies consider effects on resources based on trends or changes that may occur between 2035 and 2050, using 2035 as a stepping stone to look toward the 2050 planning horizon. The project purpose and need is based on a 2050 travel demand. This 2050 analysis is affected by future fluctuations in global, regional, and local trends, such as the declining availability of fossil fuels (peak oil), climate change, technological advances, and changing demographics.

### Why is this analysis focused on specific issues?

This analysis focuses on resource issues that differentiate the alternatives being described. Council on Environmental Quality regulations on implementing the National Environmental Policy Act (NEPA) provide direction to focus the assessment criteria for alternative impact discussions (40 Code of Federal Regulations 1500.1). Highlights from section 1500.1 (b) and (c) state that “Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail” and “Ultimately it is not better documents, of course, but better decisions that count.”

It is the policy of NEPA (40 Code of Federal Regulations 1500.2 (b)) “...to emphasize real environmental issues and alternatives.”

The National Environmental Policy Act emphasizes reducing paperwork (40 Code of Federal Regulations 1500.4 (f) and (g)) by “Emphasizing the portions of the environmental impact statement that are useful to decision makers and the public” and “narrowing the scope of the environmental impact statement process....” to support the decision being made.

### What is the general methodology for the natural and human environment resource evaluations?

The Project Leadership Team and Issue Task Force processes identified the main natural and human environment resource issues. **Chapter 6, Public and Agency Involvement** provides more information on the following:

- Resource agency input,
- Workshops with jurisdictions and special interest groups,
- Public comment, and
- Data sources.

Resource and built environment specialists collected data through the use of geographic information systems, public databases, published resources, and fieldwork.

The natural and human environment resource subsections describe more specific methodologies. Techniques for assessing impacts of the alternatives at the Tier 1 level of analysis include geographic information systems resource mapping overlaid with the project footprint, alternative design interpretation, and modeling. The project footprint includes the physical conceptual footprint of the alternatives, plus an additional 30 feet on each side. The 30 feet includes a 15-foot construction disturbance zone and an additional 15-foot sensitivity zone. Alternative designs at Tier 1 are conceptual and provide detail appropriate for a first tier assessment to assess the types of impacts that could occur and compare Action Alternatives and their relative impacts. While this level of detail is adequate to make the decisions of general location, mode, and capacity at the Tier 1 level, specific locations and design decisions will be refined during Tier 2 processes. At that time alignments and alternatives and their corresponding impacts will be evaluated.

### How did the lead agencies collect and update data for environmental analyses?

This project started in 2000. Some of the initial data collection to characterize the Corridor's affected environment occurred early in the study process – between 2001 and 2004 – and has not been updated. As time progressed, the lead agencies evaluated changes in the Corridor (such as development, land use, wetlands, biological resources, water quality, air quality, and visitation trends), and broader factors (such as economic conditions, gasoline prices and oil supply, and regulatory trends), to determine if these data remain representative of the Corridor conditions and provide a reasonable baseline to compare environmental impacts of the Action Alternatives. The lead agencies identified resources that might be sensitive to changes to evaluate whether data needed to be updated and, if necessary, updated those data accordingly. In most cases, the data collected in the early part of this study still accurately characterize resource conditions in the Corridor. Updating the data would not result in a discernible difference in the comparative analysis due to the relatively stable conditions in the Corridor over the last decade and because small variations in the existing conditions have little effect at the Tier 1 level when comparing impacts in 2035 or beyond. As Tier 2 processes are undertaken, new and often more detailed data will be collected and analyzed. Each resource area includes a discussion related to the validity of the data used for the comparative analysis.

### How were impacts quantified?

For purposes of presenting impact quantities in this document, the Combination alternatives include the Six-Lane Highway and Rail with Intermountain Connection, Six-Lane Highway with Advanced Guideway System, and Six-Lane Highway with Bus in Guideway. The Preferred Alternative is also a Combination alternative. These following eight Preservation Alternatives are quantified within the category of Combination alternatives:

- Combination Six-Lane Highway with Rail and Intermountain Connection, Preserve for Highway Alternative
- Combination Six-Lane Highway with Rail and Intermountain Connection, Preserve for Transit Alternative
- Combination Six-Lane Highway with Dual Mode Bus in Guideway, Preserve for Highway Alternative
- Combination Six-Lane Highway with Dual Mode Bus in Guideway, Preserve for Transit Alternative
- Combination Six-Lane Highway with Diesel Bus in Guideway, Preserve for Highway Alternative
- Combination Six-Lane Highway with Diesel Bus in Guideway, Preserve for Transit Alternative
- Combination Six-Lane Highway with Advanced Guideway System, Preserve for Highway Alternative
- Combination Six-Lane Highway with Advanced Guideway System, Preserve for Transit Alternative

The Preservation Alternatives are not presented separately in this document because they are all assumed to be built, so that the components that are “preserved” or “not precluded” are actually constructed and operating in 2050. These Preservation Alternatives become phasing options for implementing whichever Combination Alternative contains those same components.

How and in what order specific components of the Combination alternatives are built create subtle differences in impacts on various resources. These could include differences such as:

- Economic or community impacts of a longer or two phased construction period
- Increases in overall construction costs because of a need to pay for mobilization of labor and materials twice
- Greater responsiveness to funding sources

The Highway alternatives and highway components of the Combination alternatives have greater construction impacts on Clear Creek County than the Transit alternatives due to the constrained right-of-way in this area and the wider construction footprint needed. The phased approach of the Preferred Alternative provides ongoing opportunities to avoid, minimize, and mitigate impacts during implementation. The impacts discussed in this chapter reflect these differences.

All Action Alternatives are included in the resource analyses, but as described in **Chapter 2, Summary and Comparison of Alternatives** the single mode alternatives, those alternatives consisting solely of roadway improvements or transit improvements, but not both, do not meet the purpose and need of the I-70 Mountain Corridor project. In addition, the Preferred Alternative Minimum Program does not meet purpose and need either, as highway capacity will be exceeded before 2050.

### What is the difference between direct and indirect impacts?

Direct impacts are defined as impacts that are:

- Caused by the action, and
- Occur at the same time and place. (40 Code of Federal Regulations 1508.8)

Indirect impacts are defined as impacts that:

- Are caused by the action;
- Are later in time or farther removed in distance;
- Are reasonably foreseeable; and
- May include growth-inducing effects, and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 Code of Federal Regulations 1508.8)

Indirect impacts in the form of induced growth are anticipated to vary by mode. Transit alternatives are expected to concentrate induced growth in urban areas surrounding transit centers in areas of existing or planned urban development. Highway alternatives are expected to distribute growth based on existing trends for urban/rural development in each county, resulting in increased densities in rural areas. Combination alternatives are expected to distribute growth equally between the above transit and highway distribution scenarios, resulting in increased pressure in both urban and rural areas. The Minimum Program of the Preferred Alternative is expected to initially induce growth in a manner similar to that of the Transit alternatives; growth would be concentrated in urban areas surrounding transit centers. If later phases of the Maximum Program of the Preferred Alternative are implemented, it induces growth in a manner more similar to that of the Combination alternatives.

The adaptive management approach of the Preferred Alternative allows transportation improvements to be implemented over time, allowing it to be implemented based on future needs and associated triggers for further action. This approach also results in impacts being more spread out over time. For more information, see **Section 2.7.1**.

Growth predictions are based on statistical models. These predictions are intended to be conservative and do not account for possible growth restrictions that communities adopt during their land use planning processes. For more information on induced growth, see **Section 3.7, Land Use and Right-of-Way**, and the *I-70 Mountain Corridor PEIS Land Use Technical Report* (CDOT, March 2011).

### How are impacts defined at Tier 1 versus Tier 2?

All of the Action Alternatives evaluated in this document result in environmental and social impacts. This document addresses differences in impacts by evaluating a range of alternatives at a scale appropriate for first tier Corridor analysis.

Tiering the analysis addresses the impacts of a broad program (defining travel mode, capacity, and general location) and associated issues at a higher level, and outlines mitigation “strategies” at a similarly high level. Tier 2 processes follow the processes and decisions defined at Tier 1 and analyze site-specific proposals and impacts and commit to site-specific mitigation measures. The tiered process provides a means to evaluate and decide upon a course of action for the entire Corridor at the Tier 1 level. Tier 2 processes advance smaller, fundable projects consistent with the decisions made in the Tier 1 analysis. This tiered process provides consistency and an overarching vision that can meet the Corridor transportation needs over time. This document identifies existing and future needs along the Corridor and assesses the types of impacts that occur based on the conceptual alternative designs developed for Tier 1.

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The analysis presented is broad and based on conceptual designs. Impact analysis will be refined when more site specific improvements are developed and defined during Tier 2 processes.

Subsequent Tier 2 processes for these individual projects will address site-specific details and update information from Tier 1 studies (for example, new Census data), before technology, design, and location decisions are made. For example, final decisions on the precise location and configuration of lanes are made during Tier 2 processes, based on traffic projections or other factors, when detailed information is developed. While all Action Alternatives are generally located along the existing I-70 highway alignment, the actual alternative alignment could shift within the Corridor from what was evaluated in the Tier 1 process, which could provide additional benefits or impacts not stated in this document. The differences will be evaluated during Tier 2 processes.

Compliance with applicable environmental laws and regulations also must occur for projects in Tier 2. The Tier 1 decisions do not preclude future avoidance and minimization measures as part of Tier 2. Furthermore, construction of individual projects cannot occur until the completion of the subsequent Tier 2 processes.

### What is the programmatic approach to mitigation planning?

One role of this document is to provide general mitigation strategies guiding subsequent Tier 2 processes and implementation of the Preferred Alternative. These mitigation strategies may become specific mitigation commitments in Tier 2 processes. **Sections 3.1 through 3.18** of this document describe the environmental impacts and resource mitigation strategies for corresponding impacts.

Practical measures were taken throughout the Tier 1 process to identify alternatives minimizing environmental and community impacts. These efforts centered on developing alternatives through the coordination of conceptual planning, design, and environmental studies, with the intent of minimizing alternative footprints. In addition, committees were formed to address issues and mitigation potential associated with sensitive resources. See **Section 6.5 “Who Participated in the Public and Agency Information and Involvement Program?”** for more information. These measures are key considerations in design strategies for Tier 2. In Tier 2 processes, project-specific mitigation is further shaped and implemented with design efforts to further avoid and minimize impacts to the greatest extent possible.

**Sections 3.1 through 3.18** describe the environmental impacts and resource mitigation strategies for the impacts. **Table 3.19-1** provides a verbatim compilation of the mitigation strategies contained in **Sections 3.1 through 3.18**.

In addition to the mitigation strategies, the lead agencies will comply with all laws and agreements including the following:

1. Follow the I-70 Mountain Corridor Context Sensitive Solutions process, and comply with design criteria for engineering and aesthetic guidance to further minimize impacts on communities and the environment.
2. Apply the conditions set forth in the Programmatic Agreement among the consulting parties involving Section 106 of the National Historic Preservation Act.
3. Fulfill responsibilities set forth in the ALIVE (A Landscape Level Inventory of Valued Ecosystem components) Memorandum of Understanding to address issues related to improving wildlife movement and reducing habitat fragmentation in the Corridor.
4. Fulfill responsibilities set forth in the Biological Assessment/Biological Opinion developed in conjunction with the U.S. Fish and Wildlife Service.

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5. Develop mitigation measures to offset impacts on species identified in the Biological Report for the White River National Forest and the Arapaho and Roosevelt National Forests.
6. Comply with the 404(b)(1) guidelines of the Clean Water Act.
7. Fulfill responsibilities set forth in the Stream and Wetland Ecological Enhancement Program (SWEEP) Memorandum of Understanding to integrate aquatic resource needs (such as streams, wetlands, and riparian areas) with mitigation recommendations.
8. Integrate winter storm management and maintenance procedures into any of the proposed improvements. Highway Alternative improvements throughout Clear Creek County will include snow storage areas in select locations to capture snow and other roadway runoff to reduce impacts on adjacent ecosystems.
9. Address specifically identified total maximum daily load thresholds, and implement the Sediment Control Action Plans developed specifically for Straight Creek and Black Gore Creek to identify methods to control the existing transport of winter sanding materials. Develop Sediment Action Control Plans for other Corridor areas such as the upper reaches of Clear Creek.
10. Develop information systems (such as advertising campaigns to support local businesses, signage with hours of operation, and detour plans) to inform affected communities, I-70 Corridor travelers, businesses, and homeowners about construction activities and schedules.

### How do I read Chapter 3?

On the **Chapter 3** tab, the reader can find a list describing the alternatives evaluated for their effects on the various environmental resources. The reader can use this tab for easy reference while reviewing the resource affected environments and environmental consequences by the Action Alternatives on the resources.

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