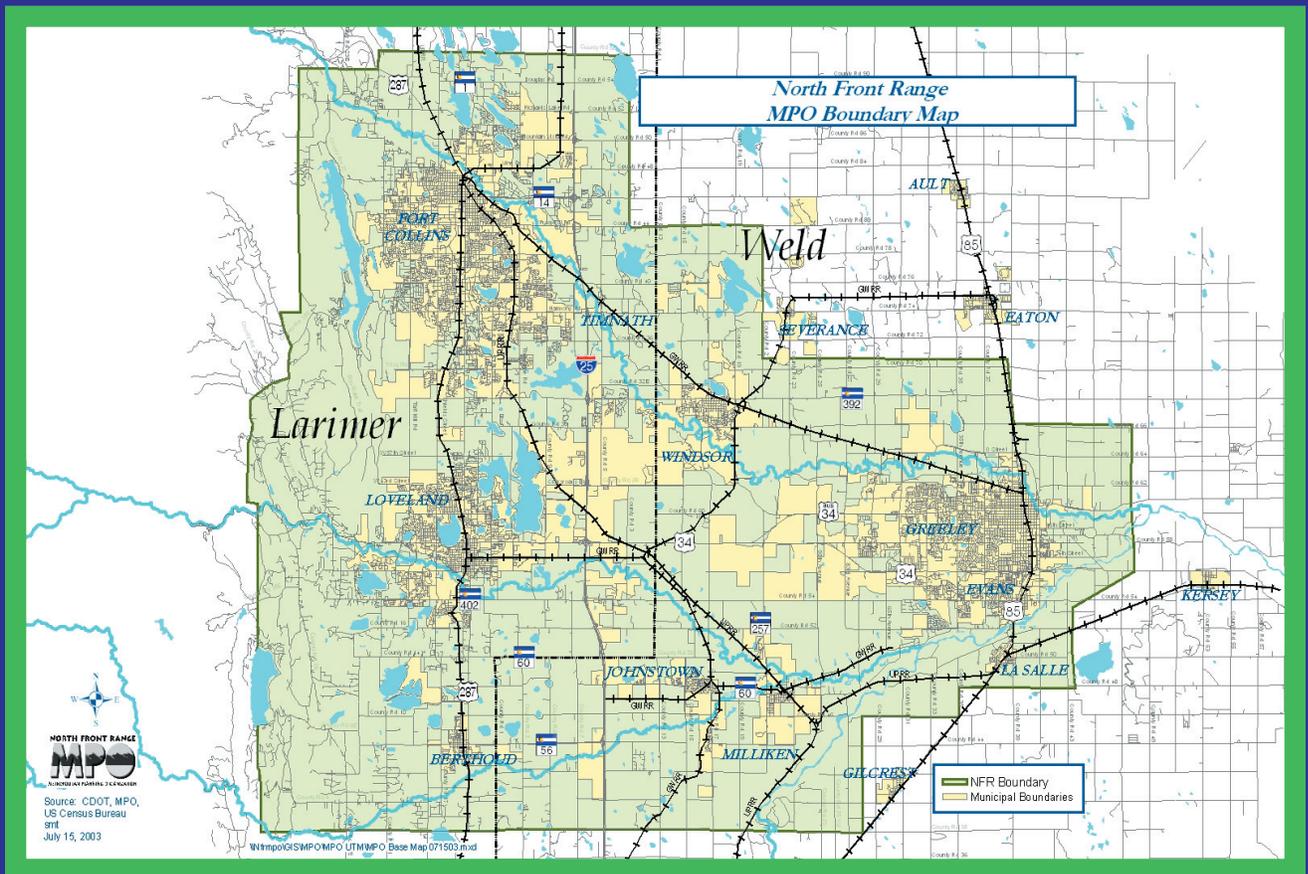


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Final Phase I Report

STEP UP PHASE I REPORT

May 2005

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Carter & Burgess, Inc.



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16. Abstract This report was prepared at the completion of Phase I of the Strategic Transportation, Environmental and Planning Process for Urbanizing Places (STEP UP) environmental streamlining pilot project. This project was initiated by the Federal Highway Administration (FHWA), the US Environmental Protection Agency (EPA), the Colorado Department of Transportation (CDOT) and the North Front Range Metropolitan Planning Organization (NFRMPO) to evaluate procedures and tools that would result in improved transportation, land use and environmental planning. The report documents the efforts conducted under Phase I and provides recommendations for Phase II. As part of the project, a new model planning process was developed to incorporate environmental data and agency review at the earliest stages in transportation planning. An application was designed to provide a user-friendly interface to accomplish each step in the modified process and produce a reusable database of projects and environmental data. All environmental data should be based in GIS for display on maps within the application. A web-based collaborative application and statewide environmental database will be required in order to support the model planning process. Implementation of the STEP UP process will require short-term steps to test the model planning process and long-term steps to successfully implement the overall program at a statewide level. The outcomes from this process can be used by local, regional, state and federal agencies in their respective planning activities.			
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STEP UP PHASE I REPORT

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EXECUTIVE SUMMARY

This report was prepared at the completion of Phase I of the STEP UP project. STEP UP, the Strategic Transportation, Environmental and Planning Process for Urbanizing Places, is an environmental streamlining project for Colorado to develop an improved process for addressing environmental impacts related to transportation projects at the earliest stage and the tools to implement the process. The effort focused on the transportation planning process used by the North Front Range Metropolitan Planning Organization (NFRMPO) to develop their Regional Transportation Plan (RTP). The STEP UP model planning process is in accordance with recent guidance, “Linking the Transportation Planning and National Environmental Policy Act (NEPA) Processes” issued jointly by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

In a review of the environmental streamlining efforts by other states and MPOs, elements from each were used to best meet the objectives desired by participants in the STEP UP program. Each effort looked to an early screening of proposed transportation projects utilizing an interactive database centered on a Geographic Information System (GIS). Incorporating an environmental review of projects at the earliest possible point is a key objective of the STEP UP project.

To achieve this objective a new model planning process has been developed. This process begins with identification and review of regional environmental concerns prior to the submission of projects by local governments for a Regional Transportation Plan. Local governments will be able to use this information to develop transportation projects and in land use planning. The STEP UP model planning process also incorporates current CDOT guidance on developing Corridor Visions within a region and statewide. NFRMPO has already begun its implementation of this concept and screens out projects that are not part of an identified regionally significant corridor.

STEP UP will further strengthen the process by which projects are screened and prioritized for inclusion in regionally significant corridors by allowing both project planners and MPO staff to review the potential environmental conflicts for corridors and individual projects. The MPO will be able to use this information in its prioritization and screening process so that the new RTP will prioritize those projects that will avoid constrained resources and not require mitigation.

STEP UP also includes the beginnings of a Regional Cumulative Effects Assessment (RCEA) process. All of the environmental data provided or reviewed by participating agencies will be available to CDOT along with the database of potential transportation improvements. These data can be used along with land use data sets to generate maps of potential growth areas. These maps along with the project locations can be reviewed regionally for impacts to critical environmental resources.

A web-based collaborative application and a statewide environmental database will be required in order to support the model planning process and RCEA process. An application was designed to provide a user-friendly interface to accomplish each step in the modified process and produce a reusable database of projects and environmental data. All environmental data should be based in GIS for graphical display on maps within the application.

Initial design work for the application has been completed at the concept level with technical parameters defined by current CDOT application development standards. Data layers that should be included in a statewide environmental repository are listed in Chapter 6 along with potential sources and general areas for which data will be hard to gather. The collection and sharing of environmental data is one of the key challenges facing the implementation of the STEP UP model planning process. Data access, repository design and data management are additional issues to be resolved for STEP UP.

Short and long-term recommendations are identified in Chapter 7. These include immediate steps that can be taken to conduct the pilot program of applying the STEP UP process to the upcoming RTP update for the NFRMPO and steps for the long-term successful implementation of STEP UP. The recommended short-term implementation steps for the pilot program include:

- ▶ Initiate development of the proposed application to support the STEP UP model planning process.
- ▶ Create a temporary regional database with as many layers as possible.
- ▶ Create and formalize initial partnerships with resource agencies that can participate in the pilot program.
- ▶ Test existing Cumulative Effects Assessment models developed by the University of Colorado at Denver.

The three primary long-term recommendations are:

- ▶ Develop formal partnership agreements between the Steering Committee and resource agencies needing to participate in the environmental review process for the program.
- ▶ Strengthen support for a statewide environmental database with all environmental issues properly represented.
- ▶ Further develop more sophisticated Cumulative Effects Assessment models that function at a regional scale so that the impacts and implications of transportation development in a region can be more fully understood.

Implementation of the STEP UP process will mostly likely require additional staff and training of staff at the NFRMPO and CDOT. As stated above, it also will require the development and deployment of the multi-user application, the development and review of a GIS repository of statewide environmental data, and the review and modeling of RTP projects for the RCEA process and document. These activities must fit into the business process reengineering efforts underway at CDOT.

FHWA and EPA will continue to play a vital role in sponsoring this effort and assisting CDOT and NFRMPO as needed. Their involvement will be key in facilitating resource agency participating and providing overall guidance on federal requirements pertaining to transportation planning and the NEPA process.

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List of Acronyms

The following list contains definitions of acronyms used throughout this report.

CDOT	Colorado Department of Transportation	NDIS	Natural Diversity Information System
CDOW	Colorado Division of Wildlife	NEPA	National Environmental Policy Act
CDPHE	Colorado Department of Public Health and Environment	NFRMPO	North Front Range Metropolitan Planning Organization
CE	Categorical Exclusion	NRCS	Natural Resources Conservation Service
DNR	Department of Natural Resources	NREL	Natural Resources Ecology Lab
EA	Environmental Assessment	PPSP	Project Prioritization and Screening Process
EIS	Environmental Impact Statement	RCEA	Regional Cumulative Effects Assessment
EPA	Environmental Protection Agency	RTP	Regional Transportation Plan
ETAT	Environmental Technical Advisory Team	SHPO	State Historic Preservation Officer
ETDM	Efficient Transportation Decision Making	SIP	State Implementation Plan
FDOT	Florida Department of Transportation	STEP UP	Strategic Transportation, Environmental Planning Process for Urbanizing Places
FHWA	Federal Highway Administration	STIP	State Transportation Improvement Program
FTA	Federal Transportation Administration	SWP	Statewide Transportation Plan
GIS	Geographic Information System	TIP	Transportation Improvement Program
HSI	Habitat Suitability Index	TPR	Transportation Planning Region
IDA	Index of Development Attractiveness	USFWS	United States Fish and Wildlife Service
MOU	Memorandum of Understanding	USGS	United States Geological Survey
MPO	Metropolitan Planning Organization		

Chapter 1.0: Introduction

Strategic Transportation, Environmental and Planning Process for Urbanizing Places, or STEP UP, is an environmental streamlining pilot project involving the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the Environmental Protection Agency (EPA) and the North Front Range Metropolitan Planning Organization (NFRMPO). In July 2003, the FHWA Colorado Division office received funding to carry out the STEP UP project to evaluate environmental impacts of transportation projects early in the planning process, specifically during the development of the long range Regional Transportation Plan (RTP). CDOT administers the funds for the pilot project to the NFRMPO. The NFRMPO was selected as the region for the pilot study due to its moderate size (approximately 350,000 people over 1600 square miles) and it contains two urbanized areas that are rapidly growing.

In 2004 the Denver office of Carter & Burgess, Inc. (Carter & Burgess) was selected as the consultant for the pilot study and began work in April. The primary project objectives of the work begun at this time included:

1. Development of an improved process and methodology for addressing environmental impacts related to transportation projects at the earliest possible stage.
2. Development of GIS-based tools for identifying the impacts of transportation projects and plans early on.
3. Development of a Regional Cumulative Effects Assessment (RCEA) process for the NFRMPO's Regional Transportation Plan to help understand the effects of transportation development on land use and the environment.

This effort focused on the process by which projects are planned and implemented from the creation of a Regional Transportation Plan (RTP) through the inclusion of projects in the Statewide Transportation Plan (SWP), the State and MPO Transportation Improvement Programs (STIP/TIP), onto the development of individual projects and clearance through the National Environmental Policy Act (NEPA) process.

The project effort, as documented in this report, began with a review of other state streamlining initiatives. This effort is described in Chapter 2.0. Chapter 3.0 describes the existing transportation planning process and the proposed STEP UP model planning process. The STEP UP model planning process consists of methods to involve resource agencies early on, to consider environmental impacts during the RTP development process and to provide opportunities for the environmental screening of projects prior to NEPA.

Chapter 4.0 describes a potential RCEA process. This chapter also looks at the models available, assessment needs and recommendations for implementation.

Chapters 5.0 and 6.0 describe the conceptual design of the proposed application and the data requirements that could be used for STEP UP. This application is proposed as a web-based application using GIS data to provide access to environmental, land use and RTP project information. The application provides results of GIS analyses and affords resource agencies, CDOT, local and regional agencies the ability to review and comment on the effects of regional

transportation projects on sensitive resources. The environmental review and environmental screening tools enable agencies to provide feedback on potential impacts and assists local agencies in developing projects that avoid, minimize or mitigate adverse effects.

Chapter 7.0 provides recommendations, and requirements for implementation. It concludes with recommendations for the Phase II effort.

Appendix A contains information on the individuals and agencies that participated in developing STEP UP. Appendix B contains the screen shots for the proposed application designed to support the processes proposed for STEP UP as described in Chapter 3. Appendix C includes the recent FHWA and FTA Guidance Memorandum on the Integration of Planning and NEPA Processes.

1.1 PURPOSE

STEP UP was initiated in response to Section 1309 of the Transportation Equity Act for the 21st Century (TEA-21) as a pilot project for NFRMPO. Section 1309 mandates Environmental Streamlining in order to help achieve the timely delivery of transportation projects while protecting and enhancing the environment. The purposes of this pilot project are to increase consideration of environmental impacts early within the transportation planning process and to help ensure that projects selected for funding are able to proceed more quickly through the environmental review process during the Project Development Phase. The pilot project will result in a model planning process for identifying environmental issues early in the development of the long-range Regional Transportation Plan, early and continued involvement by resource agencies, creating a better link between transportation, environmental and land use planning, and implementing transportation improvements that protect the environment, enhance the quality of life and promote community values. This process is a more streamlined process resulting in projects moving into the Project Development Phase with fewer environmental impacts.

1.2 PHASE I WORK PROGRAM

Phase I, Process Development and Tool Design consisted of seven tasks. These tasks focused on understanding and evaluating the current transportation planning process at the State level and MPO level, proposing new initiatives to modify the process, and envisioning the tools required to support the new process.

1.2.1 Conduct Research

As the initial step in developing a new process, methods, and tools, Carter & Burgess conducted research and reviewed environmental, cumulative effects and streamlining processes for transportation programs on a nationwide level. The information gathered from other state Departments of Transportation, MPOs, state and federal agencies was used to evaluate the existing process currently being used by CDOT and NFRMPO and its suitability in achieving the goals of the project. This effort focused on the initiatives in Florida, California, North Carolina, and South Carolina.

1.2.2 Document Existing Process

Through several meetings, Carter & Burgess identified and documented the existing transportation planning process used by CDOT and NFRMPO as understood by those involved at each agency. The primary purpose of this task was to achieve a common understanding of the transportation planning process by all participants from which to begin the subsequent task of evaluation. This task included discussions on the steps in the existing process, current relationship between land use, transportation and environmental planning; timing and level of resource agency involvement; current GIS tools and other data sources; and current methodology used to assess cumulative impacts.

1.2.3 Evaluate Existing Process

Carter & Burgess evaluated the existing process to identify where modifications could be made to meet the overall project objectives. The existing process was represented in a flow chart and team members were asked to provide input on where they think the problems are in the existing process.

1.2.4 Modify Existing Process

Carter & Burgess worked with the Steering Committee to determine the most appropriate way to modify the existing transportation planning process in use by the NFRMPO to prepare their RTP. Key objectives were to determine the environmental screening process at the earliest possible time and to develop methods for ensuring early stakeholder involvement; methods and tools to integrate land use, transportation and environmental planning; methods to incorporate cumulative effects assessment into the process; and additional transportation screening methods. Four work groups were convened to discuss specific issues related to the planning process, cumulative effects, tools, and a data repository.

1.2.5 Cumulative Effects in the Planning Process

In conjunction with the above tasks, Carter & Burgess worked with the Resource Agency Workgroup, Steering Committee and a cumulative effects work group to develop an effective process to analyze the cumulative effects of a specific region using the projects identified in the RTP. Two cumulative effects work group meetings were held to identify the significant cumulative effects issues and to define the assessment goals and process. The data and input for this assessment is developed as part of the modified process.

1.2.6 Identify Needed Tools

Based on the analysis in the previous tasks, Carter & Burgess worked with the tools and data repository work groups to identify the tools needed to accomplish the project goals. A mock-up of the potential application was created, presented to the work groups and feedback was obtained. A technical memorandum was prepared documenting the framework of tools and data needed for the new process.

1.2.7 Process Report

Carter & Burgess prepared a final report (this document) describing the entire Process Development and Tool Design Phase (Phase I). The report was submitted to the Steering Committee for two cycles of review and comment.

1.3 RESOURCE AGENCY OUTREACH

The STEP UP Steering Committee has identified that the participation of state and federal resource agencies, many of which have a regulatory role in the permitting or approval of transportation projects, along with the involvement of local agencies as a key and underlying element of STEP UP. Outreach to agencies that were not part of the Steering Committee occurred through two stakeholder meetings in 2003 and 2004 and through a set of outreach presentations to a group of specific agencies. Resource agencies to be involved in STEP UP include federal and state agencies that have a regulatory responsibility under NEPA as well as a role in managing particular resources in the state of Colorado. While not formally part of the Steering Committee, the US Fish and Wildlife Service has been a key participant and partner in the efforts undertaken.

Early and continued resource agency involvement is a key component to the success of STEP UP. Resource agency involvement at the planning level provides for early identification of environmentally sensitive areas within a region. This information can then be used by local and regional planners in identifying and screening projects for inclusion in the Regional Transportation Plan. Resource agencies also will be able to comment on and review projects much sooner in the process. Through this process and early agency involvement better projects will move into the Project Development Phase that already avoid, minimize or mitigate environmental impacts.

Outreach to the resource agencies should continue to bring about full and early participation of all relevant agencies that must review a transportation improvement or issue a permit, license, and opinion relating to a project. In recognition of staffing limitations at the various resource agencies, the STEP UP process was developed with this in mind. The steps in the modified process requiring resource agency involvement were designed to make that involvement as simple as possible and not impose any hardship on the staff participating in STEP UP.

1.3.1 Stakeholder Meetings

The STEP UP Steering Committee sponsored two meetings to which stakeholder agencies were invited. The first meeting was held on September 22, 2003 in order to present the upcoming pilot project to interested staff from these agencies. Discussions were held on integrating the environmental and planning process, on GIS analytical tools, and on the importance of stakeholder participation. The second meeting was held on May 24, 2004 and included updates on the STEP UP project as well as a presentation on Florida's Efficient Transportation Decision Making (ETDM) process.

1.3.2 Outreach Presentations

Further efforts have been made to include and update stakeholders on the STEP UP project. Members of the project team met with staff from the US Army Corps of Engineers, Colorado

Division of Wildlife, US Environmental Protection Agency, and United States Geological Survey in three separate meetings on November 29, 2004. The focus of this outreach effort was to encourage more upfront participation from resource agencies involved in projects at the NEPA level. At each meeting an overview of the STEP UP project was presented along with the potential benefits of the modified process to these agencies. Project team members also provided information to the agencies about how they could participate and discussed the potential use of a Partnering/Cooperative Agreement. These meetings also provided the resource agency staff the opportunity to ask questions about the process and how they can participate.

1.4 RELATIONSHIP TO FHWA/FTA GUIDANCE ON LINKING THE TRANSPORTATION PLANNING AND NEPA PROCESSES

At roughly the same time as the conclusion of Phase I, FHWA and FTA issued joint guidance regarding the integration of transportation planning and the NEPA processes. A copy of the guidance is included in Appendix C. While these guidelines are voluntary, they strongly encourage the consideration of the results of the data and decision-making undertaken as part of the development of long-range transportation plans in preparing NEPA documents for projects included in the long-range plans. According to the memorandum, the planning process and the environmental assessment required during project development under NEPA should work together, with the output of the transportation planning process feeding into the NEPA process. However, in order for these results to be used in the NEPA process, they must meet certain requirements established by NEPA. For example, the purpose and need, alternatives development and screening, existing conditions, and environmental consequences are all elements included in the NEPA documentation that can all originate during the transportation planning process. The guidelines describe how efforts as part of the transportation planning process might be incorporated into a NEPA analysis and the standards they would need to meet.

The emphasis and analysis presented in the guidance coincides well and supports what has been recommended under STEP UP. The STEP UP process encourages early agency involvement and consideration of environmental factors in developing projects for inclusion in the long-range transportation plan. Furthermore, the process, through the environmental screening, results in a project that has been developed to avoid or minimize impacts. As final steps in the STEP UP model planning process, class of action determinations, development of a clear purpose and need statement, and preliminary cost estimates for NEPA studies can be made. CDOT guidance on preparing long-range plans and the Environmental Stewardship Guide set the stage for transportation planning regions and metropolitan planning organizations to develop plans that would be useful in preparing NEPA documents. In particular, the planning process and development of Corridor Visions should consider the natural and built environment as early as possible.

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Chapter 2.0: Other Initiatives

As part of Phase I, Carter & Burgess researched the efforts of other states in streamlining the environmental and transportation planning process. Several states around the country have developed and implemented additional steps in the transportation planning process that incorporate an environmental screening of projects at the earliest stages of development, usually the development of the Regional Transportation Plan. This allows for early detection of impacts before the project enters the NEPA process.

Many of the efforts around the country have been in response to Section 1309 of the Transportation Equity Act for the 21st Century (TEA-21). The objectives of Section 1309 include integration of review and permitting processes, participation by resource agencies early on in the process, and implementation of procedures for addressing unresolved project issues. These efforts are intended to result in better NEPA decision-making and improved project delivery without compromising environmental protection.

Information gathered focused on four states: Florida, California, North Carolina, and South Carolina. These state processes vary in the level of detail and extent of scope. However, there are several steps in the processes that are similar within each state. Each state process incorporates a project screening for potential environmental and social impacts early in the transportation planning process, establishes early and continuous agency involvement, utilizes a GIS database to identify impacts, and develops a purpose and need statement for each project at the RTP stage.

Based on this research and on discussions with project staff, there are elements that are compatible with the goals for the STEP UP pilot project. The information gathered under this task was considered for relevancy to the NFRMPO and Colorado state transportation planning processes to identify which elements can be incorporated to improve the existing process and how. Each state process is summarized below.

2.1 FLORIDA'S ETDM PROCESS

Florida's Efficient Transportation Decision Making (ETDM) process is a partnership between Florida Department of Transportation (FDOT), FHWA, and other federal, state, and local agencies to redefine how Florida will accomplish transportation planning and project development within its current statutes and regulations. Florida was considered an ideal pilot state due to its strong environmental laws that mesh with federal laws and processes. A primary goal was to develop a refined and improved methodology for effecting improved transportation decisions.

Several key problems with the existing process were identified:

- ▶ Minimal consideration given to the potential direct, indirect, and cumulative impacts of transportation or land use decisions during the comprehensive planning process.
- ▶ Timing of agency input – occurs too late and substantial environmental impacts that could influence the priority of a project are not considered.

- ▶ Project enters development phase and then a decision not to build a project is not an option and mitigation measures are identified.

The ETDM process provides a link between land use, transportation, and environmental resource planning through early and continuous agency involvement. The early identification of environmental issues provides opportunity to change the project's priority, alignment, or future features. As part of the effort an Environmental Technical Advisory Team (ETAT) consisting of planning, consultation, and regulatory and resource agencies was formed to review projects in the early stages of the planning process. ETAT members also assist in the permitting process for a project simultaneously with the NEPA process. Each FDOT district has an ETAT.

To ensure stakeholder involvement a Memorandum of Understanding (MOU) was signed by member agencies of the ETAT. The MOU outlines how the group will work together to implement the ETDM process.

The ETDM process includes two screenings built into the current transportation planning process:

- ▶ Planning Screen: The first screening is during the development of the Long Range Transportation Plan (LRTP). A System Summary Report summarizes key recommendations and conclusions for the direct, indirect and cumulative impacts identified by the ETAT in the LRTP screen. The report will be provided to the planners responsible for developing local plans.
- ▶ Programming Screen: The second screening occurs when a project is entered into the Transportation Improvement Program (TIP). The primary purpose of the TIP screen is for the ETAT to conduct "project scoping." At the TIP level, the screening satisfies NEPA agency scoping requirements. The ETAT will provide comments on the purpose and need statement, update environmental reviews since the LRTP screen, identify required studies to satisfy NEPA and permitting requirements. A Project Summary Report will be prepared as a transition document to the project development phase of a project.

An interactive GIS database was developed to assist the ETAT in environmental screenings and to allow input of agency comments. GIS data components include project information, resources, feedback and decisions, and public access. Also developed was a process to address cumulative impacts early on and at a system-wide level. The ETAT will evaluate and provide comments on potential secondary and cumulative impacts of a project for the resource that their agency is responsible for protecting.

A working group of 50 representatives from over 28 agencies participated in eight workshops to examine the current planning process and develop a more efficient process that protects the environment. As a group, they identified problems with the current processes and several characteristics necessary for a streamlined environmental review process: earlier agency involvement in the planning phase, complete and accurate information, improved access to information, better and continuous communication among agencies and the public, more efficient and concurrent project reviews, and complete and timely permit applications.

Two working groups expanded into focus groups to further develop and refine the planning and permitting phases of the new process. In addition, nine task work groups were created to develop specific details about how the ETDM process works. In the new process, resource avoidance and minimization options and strategies are identified earlier, and cost impacts for these strategies can be considered in establishing transportation plan priorities.

Additional information about Florida's ETDM program can be found at the following website: <http://fdotenvironmentalstreamlining.urs-tally.com/>.

2.2 NORTH CAROLINA

Senior leadership at the North Carolina Department of Environment and Natural Resources (DENR) and the North Carolina Department of Transportation (NCDOT) is committed to providing for North Carolina's transportation needs while protecting and enhancing the environment. In 2001, this partnership was formalized with the signing of a Memorandum of Understanding outlining a set of common goals that support environmental stewardship and responsible and timely transportation decision-making. Evidence of this successful partnership can be seen in the numerous stewardship and streamlining initiatives that have been undertaken cooperatively by DENR and NCDOT. NCDOT's homepage for environmental streamlining can be found at <http://www.ncdot.org/secretary/envsteward/>.

Most notable among these initiatives are the process improvements in the areas of environmental permitting and wetland, stream, and buffer mitigation. Senior management at these agencies recognizes that the key to success hinges on establishing and maintaining trust at all levels within and between agencies, communicating effectively, building partnerships, and providing the resources to undertake initiatives that support specific goals.

2.3 SOUTH CAROLINA

The SCDOT Office of Planning has established a resource and regulatory agency early review process for transportation projects listed in Long Range Transportation Plans. Nine federal and state agencies are participating in the pilot program including the SC Departments of Health & Environmental Control (DHEC), Natural Resources (DNR), and Archives and History (SHPO), and the US Fish & Wildlife Service (USFWS) where liaison positions have been established to facilitate transportation issues. A GIS system is used to evaluate each project, and a location map, project description, and summary of potential impacts are provided for each project. Agency officials will be able to evaluate the potential impacts of transportation plans on environmental resources earlier and, if appropriate, provide for early consideration of mitigation measures and project alternatives.

The primary objective will be to streamline the project development process. The resource agencies' input earlier in the process should:

- ▶ Help to identify any major impediments and provide supporting information,
- ▶ Provide a description of potential impacts that should be considered during early project development, and

- ▶ Describe mitigation measures that might be necessary to accomplish the project.

Results of early project screening will be used to support future NEPA documentation. Comments will be used to complete project rankings. Based on the agencies' comments, corridor studies and/or alternatives will be studied to avoid and minimize the impacts of a proposed project. Overall, comments provided by the resource agencies will support the transportation planning process.

The project began in 2000 with implementation of a pilot project in December 2001. Initiation of the project was a response to federal streamlining requirements and the DOT's desire to improve the system to identify problems early in the process before a project enters the NEPA phase. The process involves one level of screening to identify potential impacts of a project on cultural and environmental resources. A GIS database is used with data supplied by federal and state agencies. A project is then overlaid with different data files to develop a list of issues. The following are the steps used to develop the process:

1. Collect Data Sources: the DOT collected GIS data from state and federal sources. Some data came from state departments, but based on federal GIS information (e.g., historic properties and wetlands). A GIS database was developed as a completely new tool at the DOT. Prior to this no GIS data or staff existed. Initially GIS information was obtained from the University of South Carolina GIS data server. Data was downloaded to the DOT and augmented with data from federal and state resource agencies. SCDOT maintains this GIS data and contacts resource agencies once a year to update the information via an MOU. The database is not interactive or web-based.
2. Assess Projects: this is performed by SCDOT staff.
 - a. Overlay each project with the different GIS data layers. Based on the results develop a list of issues. A report is prepared that identifies the issues and presents a purpose and need statement (1 paragraph). This can include a discussion of traffic volumes and related LOS, future benefits of the project, mobility, safety, etc...
 - b. Agency review: DOT departments review the report prepared for each project and provide comments. Prior to going to the resource agencies, the various Council of Governments (COG) and MPOs in the state also review the report. The agencies are provided with a hard copy package containing a project map with the various environmental issues mapped, the report and list of issues. The agencies have 45 days to review and provide comments.
 - c. Screening: the screening takes place prior to the STIP. The MPOs and Councils of Government initiate the purpose and need statement and send to DOT for review. Agencies also identify the projects for the DOT to overlay with the database layers.
 - d. Resource agency comments: SCDOT summarizes into a table the comments received and distributes the table to all agencies along with the actual comments. This information goes to the MPOs and Councils of Government as well. The comments are used in ranking the projects in the STIP.

Ideally the process will help form the projects that are in the MPO and COG developed long range transportation plans. The MPOs and COGs will use the comments from the agencies to change projects as necessary. The project would then be part of the LRP and move into the STIP.

SCDOT developed the process and presented it to the resource agencies. There was no formal approval process or Memorandum of Understanding. Some agencies may have sent in letters agreeing with the process. A project statement on what the DOT hoped to achieve with the project was presented to the agencies.

2.4 CALIFORNIA, MERCED COUNTY – PIP

The Partnership for Integrated Planning (PIP) is a pilot project with Merced County Association of Governments (MPO) and is sponsored by FHWA, EPA, and Caltrans. It is a two-year program to identify, develop and evaluate procedures and tools, such as GIS with traffic and environmental models, that would result in improved regional transportation, land use, and environmental planning as well as delivery methods for transportation projects. MCAG was selected for the pilot project since it was in the process of updating its RTP and had strong GIS capabilities. The three agencies agreed that the best way to improve their interagency relationship was through their partnership in this effort. PIP's homepage can be found at <http://www.mcag.cog.ca.us/pip/>.

The goals established for PIP include:

- ▶ Streamline the transportation project delivery process by developing a method to integrate land use planning with environmental and transportation planning.
- ▶ Lessen the environmental impact by providing a forum for regulatory agencies to arrive at a consensus regarding priorities.
- ▶ Ensure that all community groups have been represented. Implement an aggressive public outreach campaign to solicit more widespread citizen involvement in the transportation planning process from the beginning through plan level recommendations. The public and agencies were asked to identify values that they wanted in Merced. A brainstorming session was used to identify all community values and then rank them. Based on the outcome, different scenarios for the RTP were reviewed. Outreach to the public included communities that typically do not participate.

The process should improve communication, quality, timeliness, and introduce environmental issues early in the transportation planning process. The project is directed by a Steering Committee comprised of FHWA, EPA, Caltrans, and MCAG representatives. A technical group also was established consisting of Federal, State and local agencies, and other interested parties.

Objectives of the PIP initiative include:

- ▶ Develop a model process with a list of needs and constraints to encourage agencies to consider environmental issues early in the transportation planning process.

- ▶ Identify, develop, and test planning tools to achieve environmental goals during transportation planning by coordinating land use, transportation, and environmental planning on a regional level.
- ▶ Environmental regulatory review, agreement, and conceptual approval at the regional transportation planning stage instead of as part of specific projects.
- ▶ Application of this process to the MPO's RTP.

The centerpiece of PIP is the development of the RTP using an innovative process to assess cumulative impacts of transportation and land use decisions within the 26-year horizon of the plan. The scope is regional, at the plan level, rather than focusing on individual projects. The RTP process is sufficiently flexible to allow modifying transportation projects in the planning stage if significant cumulative impacts are identified.

PIP is using the GIS-based UPLAN model for transportation and urban growth scenario analysis, mapping, and graphic presentations to the public. UPLAN was developed at UC Davis and tailored for the PIP project. It is interactive and uses input layers that are widely available. The user is able to set various environmental and social constraints to growth.

PIP also incorporated early involvement of the resource and permitting agencies. The PIP Steering Committee meets regularly (monthly) and includes Caltrans, FHWA, EPA, UC Davis, and MCAG. Other key agencies attend stakeholder meetings, as do non-governmental groups such as The Nature Conservancy. Resource agencies were not willing to commit to a formal agreement such as an MOU. However, the majority of agencies participate informally by attending meetings and providing data as needed. Persistent communication and proactive outreach has been very effective in gaining resource agency support. Limited agency staffing and resources were a key reason for lack of interest in formalizing the process.

MCAG staff met with each federal resource agency individually at the highest management level to obtain support and ensure participation. Subsequent agency outreach was done to encourage attendance at stakeholder meetings and provide data. Agencies were also asked to rank the resources within their jurisdiction for the GIS database.

An in-depth environmental study (Environmental Impact Report pursuant to California state law) will be prepared for the RTP. Federal, state and local agencies are working together to develop GIS environmental data layers for the EIR. Performing the environmental review at this early planning stage, provides an opportunity for resource agencies to suggest habitat avoidance and mitigation strategies at the regional, corridor and landscape scale. The goal of the early input is to identify concerns in the planning stage when they can be addressed and to avoid later conflicts in the project development and construction phases.

A cumulative impacts team made up of MCAG, Caltrans, UC Davis and several resource agencies will produce a methodology for analyzing cumulative impacts in the RTP.

One early lesson learned is that commitment of the partners to put in time and resources is critical. The partners must embrace the goal of a better-integrated planning process and be willing to modify the way they do business to meet the objectives of the initiative.

Chapter 3.0: Process Development

This chapter describes the development of the STEP UP model planning process, which was largely designed for the process used by the NFRMPO to prepare a Regional Transportation Plan (RTP). It begins with a summary of the existing transportation planning process used by CDOT and by the NFRMPO. Based on an understanding of the current process, an evaluation was conducted to determine the most appropriate way to make modifications to effectively meet the objectives of the pilot project. Key objectives of STEP UP were to incorporate an environmental review process at the earliest possible time, to develop methods for ensuring early stakeholder involvement and input, to develop the methods and tools to integrate land use, transportation and environmental planning, to identify ways to incorporate cumulative effects assessment into the process, and to conduct additional environmental review of projects to be included in the RTP prior to NEPA analysis.

The modified process presented allows for early resource agency involvement during the initial stages of preparing the RTP. Regional environmental data and project information is available for review and comment by stakeholders as the RTP is being developed. Two additional points in the process address environmental impacts: as projects are screened and prioritized for inclusion in the RTP and prior to a projects inclusion in the Transportation Improvement Program (TIP).

The STEP UP model planning process is designed to help decision makers consider environmental impacts early on and involve resource agencies from project inception to completion, thereby developing environmentally responsible and sustainable projects. By making this information available to local planning, regional, state and federal agencies, a more cooperative link between transportation, land use and environmental planning can be made.

3.1 EXISTING TRANSPORTATION PLANNING PROCESS

The following sections review the existing transportation planning process in place for Colorado and the NFRMPO. These processes were used as a starting point for the new model planning process.

3.1.1 Colorado

In 1991 Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA). This federal legislation required states to prepare Statewide Transportation Plans and a Statewide Transportation Improvement Program. In 1998 ISTEA was followed by enactment of the Transportation Efficiency Act for the 21st Century (TEA-21).

In addition to the 1991 federal legislation, state legislation designated CDOT as the agency to address all modes of transportation in Colorado at the state, regional and local levels. The legislation called for the development of local transportation plans by Transportation Planning Regions (TPRs) to be integrated into the Statewide Transportation Plan (SWP). Transportation plans were to be multimodal in nature and include greater public participation during the development of the plans.

Within the state of Colorado, there are 15 TPRs, five of which are Metropolitan Planning Organizations (MPOs). Each TPR/MPO is responsible for preparing a Regional Transportation Plan in accordance with CDOT guidelines. The RTPs identify and prioritize the transportation needs for the region over at least a 20-year planning period. RTPs are to be updated every five years in air quality conformity areas and every three years in air quality non-attainment or maintenance areas. In addition to the region's 20 year vision, the plans must include a fiscally constrained element, address all modes of transportation, be environmentally sensitive and be based on an adequate public involvement process.

CDOT and the Statewide Transportation Advisory Committee (STAC) review the RTPs for consistency and compliance with state guidelines. To assist the TPRs and MPOs, CDOT developed guidelines identifying several key elements to be included in the Regional Transportation Plans. These elements, listed below, are from the *Regional Transportation Planning Guidebook*, prepared by CDOT in January 2003:

- ▶ Implementation of a Public Participation Process.
- ▶ Establishment of Regional Values, Vision, Goals, and Strategies.
- ▶ Inventory of Existing Transportation System.
- ▶ Development of Socioeconomic and Environmental Regional Profile.
- ▶ Mobility Demand Analysis.
- ▶ Preferred or Vision Plan.
- ▶ Project Prioritization Process.
- ▶ Financially Constrained Plan.

In addition to the above elements, CDOT has introduced the concept of Corridor Visions to be included in the 2030 Regional and Statewide Plans. Each region must identify significant transportation corridors and determine the visions, goals and strategies for each corridor. Community values also are integrated with multi-modal transportation needs. A corridor is defined as, "A transportation system that includes all modes and facilities within a described geographic area, having length and width." The corridors are to be integrated statewide to create a system vision of transportation in Colorado.

Following approval at the regional level, the Regional Transportation Plans are then submitted to CDOT and integrated into the Statewide Transportation Plan. Projects must be contained in or consistent with the Regional Transportation Plans to be eligible for inclusion in the SWP. The SWP is updated every six years and examines the transportation needs for the state as a whole.

In addition to state law, federal law requires MPOs to prepare a Transportation Improvement Program (TIP) and the state to prepare a Statewide Transportation Improvement Program (STIP) in order to be eligible for federal funding of transportation improvement projects. A TIP is a staged, multi-year (3 to 6 years), multi-modal, financially constrained program of transportation projects that is consistent with the Regional Transportation Plan. The TIP is updated every two years. The MPOs in air quality non-attainment and maintenance areas must develop a TIP in

conformity with air quality requirements. Projects prioritized in the MPOs' TIP are automatically included, as is, in the STIP.

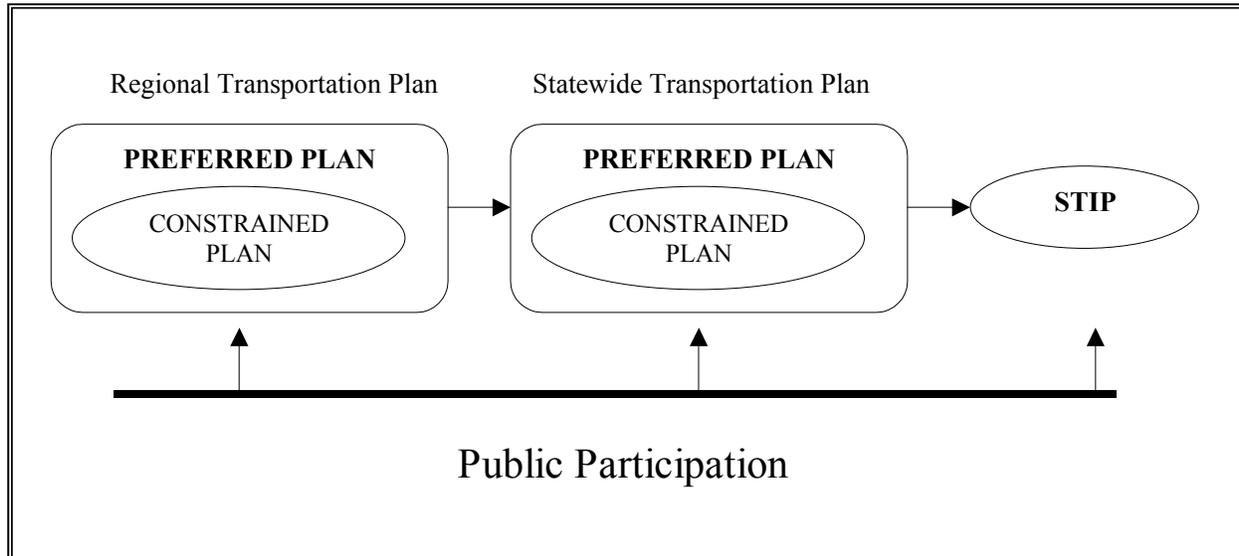


Figure 3.1 Colorado's Transportation Planning Process

3.1.2 North Front Range Metropolitan Planning Organization (NFRMPO)

The North Front Range was designated as a Metropolitan Planning Organization in 1988 with 9 members. Between 1993 and 2001 four more members joined for a total of 13. As an MPO, their objective is "to provide the information, tools and public input needed for improving the regional transportation system's performance in the North Front Range."

The NFRMPO is the agency responsible for preparing the Regional Transportation Plan and the Transportation Improvement Program in cooperation with CDOT. The current process, abbreviated for the purposes of STEP UP, consists of the following steps:

1. Call for Projects: Local governments and CDOT submit projects for consideration in the RTP.
2. Project Prioritization Process: Projects submitted are reviewed for eligibility including regional significance and are then categorized, evaluated and ranked. Currently, no environmental criteria is included as part of this process.
3. RTP Development: if a project is eligible the Planning Council approves it for inclusion in the RTP. The RTP consists of a Vision Plan and a Fiscally Constrained Plan. Ultimately the NFRMPO's RTP is incorporated into the Statewide Transportation Plan. Every three years the RTP is updated and is based on the following 12 steps:
 - Develop the Vision and Goals
 - Public Involvement
 - Inventory of Existing Transportation System

- Socio-Economic and Demographic Profile
 - Travel Demand Model
 - Mobility Demand Analysis
 - Corridor Visioning
 - Project Identification (through the Project Prioritization Process)
 - Preferred or Vision Plan
 - Draft Plan
 - Public Involvement (2nd round)
 - Final Adopted Plan
4. Prepare Transportation Improvement Program (TIP): The TIP presents a six-year schedule of multi-modal projects from the fiscally constrained portion of the RTP. The TIP is updated at least every 2 years and must show conformity with the Colorado State Implementation Plan (SIP) for air quality. The TIP is incorporated into the STIP. A project included in the STIP is eligible for state and federal funds and based on its priority moves into project development and implementation.

3.2 MODIFIED RTP DEVELOPMENT PROCESS

Based on the evaluation of the current NFRMPO RTP process described above, several issues were identified that would need to be addressed to meet the goals and objectives for STEP UP. Specific issues include:

- ▶ The lack of environmental considerations in the current transportation planning process
- ▶ The lack of resource agency involvement during the planning stage
- ▶ The lack of integration between land use, transportation and environmental planning
- ▶ No consideration of environmental feasibility of projects in the TIP

The following recommendations were made to address these issues:

- ▶ Creation of an environmental database with access by all for use in planning
- ▶ Early and continuous Resource Agency involvement
- ▶ More definitive guidelines for environmental review and prioritization of projects in the RTP process
- ▶ Environmental screening of corridors and projects by resource agencies before they enter the NEPA process
- ▶ Development of a Regional Cumulative Effects Assessment (RCEA) process for NFRMPO's Regional Transportation Plan

The process was modified to incorporate the above recommendations and redefines how the NFRMPO accomplishes transportation planning. By incorporating environmental considerations and resource agency input early in the process, efficiencies can be achieved during the project development phase (NEPA). In this new process, avoidance and minimization of impacts to critical environmental resources are identified early. This early identification may lead to changes in a project's alignment or features as well as changes in project timelines or phasing.

The following text describes each key step in the process shown in Figure 3.2. The conceptual interface developed for the proposed application (see Chapter 5.0) representing each step is found in Appendix B. Please note this process does not show all efforts related to developing the NFRMPO's RTP and TIP. Also, some steps in the process may occur concurrently.

(0) Environmental Database

Purpose:

Provide data on the natural, built and social environment for use in the Regional Transportation Plan development process and regional cumulative effects assessment process. This includes gathering and storing system-wide baseline data in a single repository that is accessible to all users.

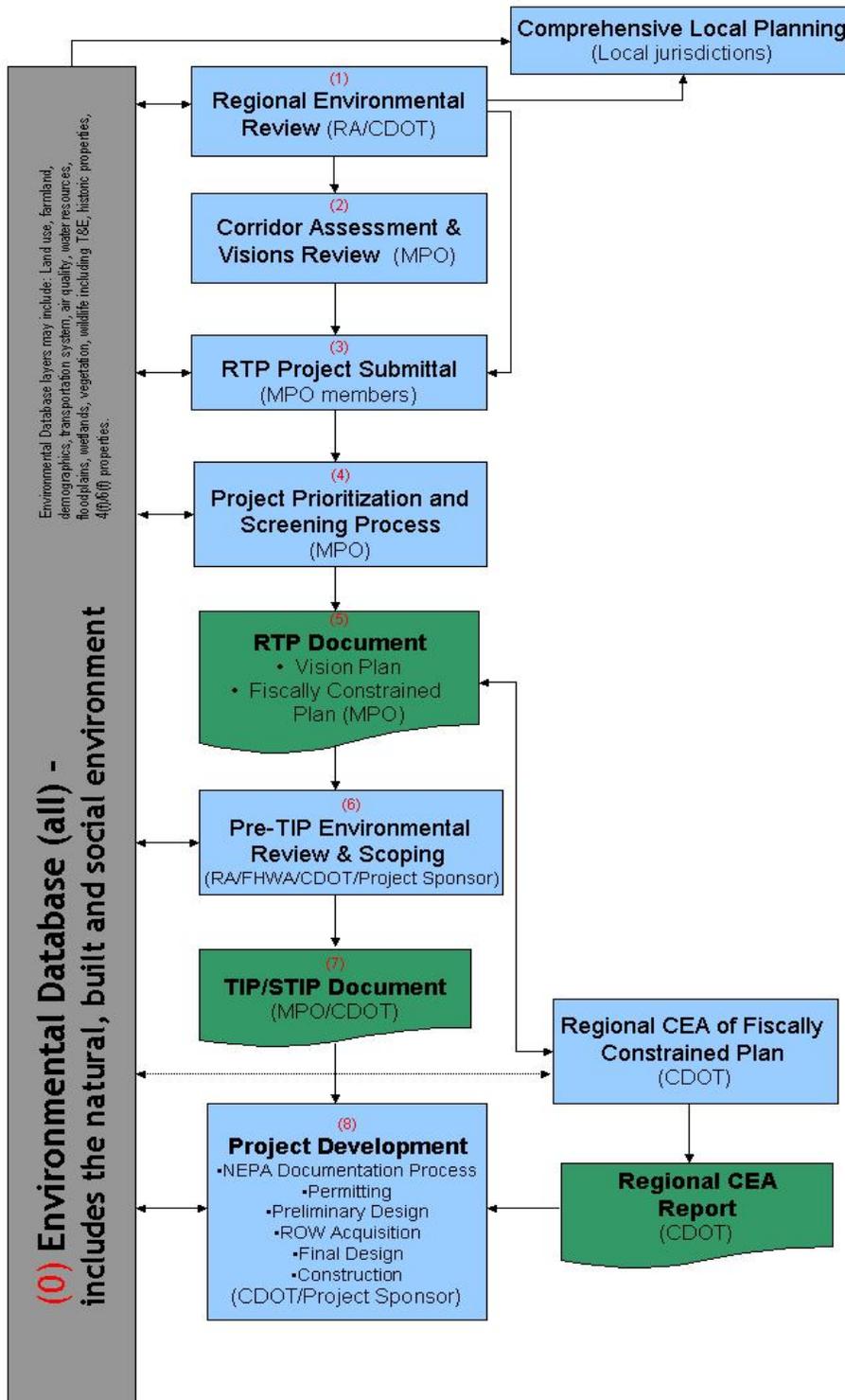
Goals/Objectives:

- ▶ Develop an interactive, GIS-based environmental database for use in land use, transportation and environmental planning.
- ▶ Build a partnership with federal and state resource agencies, and local sources to populate and maintain the database.
- ▶ Provide public and user interface to access environmental data.

Methodology:

As a means for efficient decision making and meeting regulatory requirements, environmental data is provided upfront to stakeholders via a web-based GIS application. The data provide stakeholders with a comprehensive look at the region for a number of environmental factors through a consistent format. The MPO/TPR will use this data in developing a Regional Transportation Plan as specified by State and Federal legislation. Resource agencies can benefit from the data as part of their regulatory responsibilities. Local jurisdictions are encouraged to use the data for planning such as developing comprehensive plans/growth policy plans and transportation plans.

This information also can be made available to the public through a public domain website as part of the RTP public involvement process or through another vehicle. With the public aware of the sensitive environmental areas within the region, the local planning jurisdictions should take this into account in planning decisions and the compatibility of land use decisions with the established community visions and goals for an area.



Note: Some of the actions in the process may occur concurrently. Steps indicate a logical flow, but not chronological.

Figure 3.2. STEP UP Model Planning Process

The database will be comprised of several GIS data layers from a variety of sources. The data layers, as discussed in Chapter 6, may include, but are not limited to, land use, farmland, demographics, transportation system, air quality, water resources, floodplains, wetlands, vegetation, wildlife including threatened and endangered species, historic properties, and 4(f)/6(f) properties. Resource agencies, CDOT and the MPO/TPR are involved in the database development, data sharing agreements and building the data layers. CDOT or its designee will store and maintain the database, and environmental data sets will be normalized to a standard, simplified coding scheme for representing areas of constraint. This would likely result in the need to hire 1 to 2 staff and find the physical equipment and connections to support a web-based data repository. The information will be available for use by local governments, planning agencies, CDOT, FHWA, FTA, and resource agencies.

(1) Regional Environmental Review

Purpose:

To provide for early identification and consideration of regional environmental issues for specific geographies to use in the development/update of the RTP and local agency comprehensive plans. To identify potential environmental mitigation sites within the region early on in advance of project development.

Goals/Objectives:

- ▶ Encourage early resource agency involvement to:
 - Identify critical environmental issues (fatal flaws) within a region that may affect the transportation system or conflict with land uses.
 - Review and comment on regionally significant corridors (RSC), including identification of critical environmental issues within each corridor.
 - Identify resources for a Cumulative Effects Assessment within the region and by corridor.
- ▶ Better integration of transportation, land use, and environmental planning.
- ▶ Identify data deficiencies.
- ▶ Maintain regular coordination with resource agencies.

Methodology:

This step in the process provides for early coordination and scoping with agencies having regulatory responsibilities for environmental resources. It involves prioritization by CDOT and resource agencies of sensitive social and natural resource protection areas consistent with the requirements of NEPA. Using the web-based application, resource agencies and CDOT review environmental data layers, identify critical environmental issues within the region, and comment

on a corridor and its relationship to environmental resources. A checklist of potential cumulative effects in the region and by corridor can also be generated from this review for use in a RCEA.

A GIS-based map of critical issues is created based on the resource agencies and CDOT comments and review of the environmental data and corridors. This map is available for use by local and regional planning agencies in developing transportation and land use plans. CDOT, the MPO/TPR and resource agencies also can utilize this information in their respective planning activities.

As a result of adding this step to the process, resource agencies and CDOT are involved much earlier in the planning process. Critical environmental issues for either avoidance or mitigation are taken into account early on by all jurisdictions involved in planning activities. The early system-wide review of regionally significant corridors by various agencies allows for opportunities to address environmental impacts by avoiding certain areas and identifying potential mitigation sites prior to project development and NEPA documentation. Baseline environmental data is available for environmental resource and cumulative effects assessments by local, regional, state, and federal agencies.

(2) Corridor Assessment & Visions Review

Purpose:

Review the regionally significant corridors, including the visions, goals, and strategies, as part of the development/update of the RTP. The review may include consideration of critical environmental concerns as identified by resource agencies and CDOT during the Regional Environmental Review (1). Prepare a RTP consistent with CDOT environmental policies.

Goals/Objectives:

- ▶ To access and evaluate the regionally significant corridors based on identified environmental concerns.
- ▶ To review/refine the visions, goals and strategies of regionally significant corridors, incorporating environmental constraints.
- ▶ To identify regional values associated with corridors and established policy.

Methodology:

MPO staff facilitates the review of the regionally significant corridors and works with MPO members to develop and refine the visions, goals, and strategies for each corridor as defined by the CDOT process, environmental policy, and corridor values. MPO staff and members are able to identify the environmental issues up front for each corridor and to address them in the vision statements. Because there is member participation this also allows for early involvement in the environmental issues by the MPO members as the project sponsors.

(3) RTP Project Submittal

Purpose:

MPO members submit projects to be considered for inclusion in the RTP.

Goals/Objectives:

- ▶ Provide MPO members access to the Environmental Database and the Regional Environmental Review comments for use in advancing the best projects for consideration in the RTP.

Methodology:

Local jurisdictions are given the projects included in the previous RTP and the Project Prioritization and Screening Process (PPSP)¹ guidelines to develop projects for the RTP. The projects are submitted to the NFRMPO for evaluation. MPO members are responsible for using the information provided on environmental issues and the regionally significant corridors in developing projects for submittal. The MPO uses the same information to evaluate the projects. The projects submitted by the local agencies are pre-screened during the “Initial Screening” based on the eligibility criteria identified in the PPSP.

If the project meets the eligibility requirements it goes through the prioritization and screening process conducted by the MPO (see Step 4). Projects submitted by MPO members for inclusion in the RTP must meet the eligibility requirements as well as the project prioritization and screening evaluation criteria. The use of current environmental data will assist project submitters with such things as best alignment, cost considerations, and a preview of environmental clearances that may be required.

(4) Project Prioritization and Screening Process

Purpose:

Evaluate and prioritize projects for inclusion in the Regional Transportation Plan based on criteria including environmental impacts.

Goals/Objectives:

- ▶ To apply actual environmental data to the evaluation process used to screen and prioritize projects.

¹ The PPSP is a modified version of the existing Project Prioritization Process (PPP) for STEP UP.

- ▶ To evaluate environmental impacts, including potential for cumulative effects, of candidate projects.
- ▶ To improve the quality of information needed to make sound planning decisions and develop the most environmentally responsible and sustainable projects.

Methodology:

MPO staff in conjunction with its members review and update the PPSP every three years prior to the RTP process starting. An environmental impacts criterion is added to the Project Prioritization and Screening Process. The data provided, as part of the Environmental Database (0) and Regional Environmental Review (1), is used for this criterion during the assessment of candidate projects submitted by local jurisdictions. It may also be used as an eligibility requirement based on comments in an effort to protect highly sensitive environmental resources.

MPO member agencies are strongly encouraged to use the Project Prioritization and Screening Process in developing candidate projects for inclusion in the RTP. The MPO uses the process to assess the projects submitted by local agencies for consideration for placement into the RTP. The resource agency and CDOT review comments also will be used in the evaluation and would include any flagging on the potential for a cumulative effects assessment.

This additional criterion also provides an opportunity for the MPO (or its representative) to review and comment on the RTP candidate projects with specific data. Project costs and project timing are better understood at this stage.

(5) Regional Transportation Plan Document

The NFRMPO's RTP is updated every three years to identify regional transportation needs. The RTP includes a Vision Plan and a Fiscally Constrained Plan. The Vision Plan is a comprehensive list of multi-modal transportation needs within the region for at least a 20-year period and is corridor based. All projects initially identified and submitted for consideration in the RTP are categorized and prioritized to establish a list of projects ranked in order of importance to the region. The Fiscally Constrained Plan includes the high priority projects from the Vision Plan that are likely to be funded with available resources over the period of the plan.

Key elements of the RTP are:

- ▶ Values, vision, goals and strategies
- ▶ Inventory of Existing Transportation System – region-wide and used to identify areas in need of improvement over the planning period. Information from the Environmental Database is used by the NFRMPO and CDOT to assess the current transportation system during the “Inventory of Existing Transportation System, Services and Infrastructure” step of the RTP development process by the NFRMPO.
- ▶ Regionally Significant Corridors:

- Transportation Corridors that connect communities by facilitating the timely and safe movement of people, goods, information, and services.
- Types of corridors are:
 - roadway
 - bicycle/pedestrian
 - freight rail
 - passenger rail
- Play a key role in shaping project eligibility (initial screening) and project scoring. A project must be consistent with the vision for the corridor in which it is located to be eligible for the RTP.
- Visions, goals, and strategies in corridor visions may include:
 - maintain or improve infrastructure to optimal condition
 - reduce fatalities, injuries and property damage crash rates
 - coordinate transportation and land use decisions
 - promote transportation improvements that are environmentally responsible

(6) Pre-TIP Environmental Review & Scoping

Purpose:

To conduct a more detailed environmental review of the top few construction projects from the RTP prior to inclusion in the TIP, as well as for those projects moving into the TIP from a suballocation process. To identify cumulative and environmental issues that may affect the project's priority, alignment, or features. To implement transportation improvements that protect the environment, enhance quality of life and promote community values. This also marks the initial Project Development phase beginning with the NEPA process.

Goals/Objectives:

- ▶ Class of Action determination (Categorical Exclusion, Environmental Assessment, Environmental Impact Statement) prior to project development.
- ▶ Identify agencies requiring no further involvement.
- ▶ Early assessment of project's potential environmental and cumulative effects to focus on in the NEPA documentation (agency scoping).
- ▶ Development of clear project description and/or purpose and need.
- ▶ Coordinated involvement of resource agencies, FHWA, CDOT, and local agencies.
- ▶ Preliminary cost estimates for NEPA studies

- ▶ Programmatic Agreements

Methodology:

The environmental consequences, including cumulative effects, of the top few projects to move into the TIP are evaluated in more detail. For projects to move into the TIP, the environmental and cost implications should be understood. This sets the stage for the environmental documentation process required under NEPA. This includes early identification of issues (scoping), continued resource agency involvement prior to the NEPA process (streamlining), development of clear project description and/or purpose and need statement, preliminary cost estimates for NEPA studies, and class of action determination (CE, EA, EIS).

This step includes the involvement of FHWA, CDOT, resource agencies, and project sponsors. The information entered into the management application discussed in Chapter 5.0 will help determine the class of action. This decision is made by FHWA based on the issues and comments associated with each project. This screening prepares projects that are included in the TIP for the NEPA process. Projects should then move more smoothly through NEPA documentation, resulting in schedule and budget efficiencies.

(7) Transportation Improvement Program (TIP)/Statewide Transportation Improvement Program (STIP)

A TIP is a six-year program based on the fiscally constrained portion of the RTP and is updated every two years. It lists the projects to be funded over the next six years. Each TPR/MPO's TIP is integrated into the STIP. A project must be included in the STIP to be eligible for federal and/or state funding. FHWA's project category designation occurs after a proposed project is identified in the STIP by the Colorado Transportation Commission.

(8) Project Development

This step of the process is the responsibility of CDOT and the project sponsor. At this point the projects identified in the TIP/STIP go through the following steps:

- ▶ NEPA Documentation
- ▶ Permitting
- ▶ Preliminary design
- ▶ ROW acquisition
- ▶ Final design
- ▶ Construction

3.3 RELATIONSHIP TO COMPREHENSIVE LOCAL PLANNING

Environmental data is available for use by local jurisdictions for a variety of planning and applications. This data can come directly from the Environmental Database (0) or the result of the Regional Environmental Review (1). The intent of making this information available to local planners is to provide them with environmental data to help make sound planning decisions. By providing this data, a link is created between the environment and land use planning.

3.4 REGIONAL CUMULATIVE EFFECTS ASSESSMENT PROCESS

To address the issue of regional cumulative effects, a work group was established to define a process for evaluating cumulative effects as part of the RTP development process using GIS software. As projects are being developed for inclusion in the RTP, resources agencies will identify and provide comments on resources that are of concern from a cumulative effects standpoint. By providing this information early in the transportation planning process, costly impacts can be avoided or minimized. This component of the STEP UP model planning process is fully discussed in Chapter 4.0.

3.5 SUMMARY

The STEP UP model planning process described in this chapter modifies how the RTP is developed in the NFRMPO. A comprehensive environmental database is developed for use by local, regional, state and federal agencies in their respective planning activities. The process brings agency involvement into the early stages of transportation planning to identify critical environmental issues well before a project enters the NEPA process. Along with this is the early identification of avoidance and mitigation strategies. The environmental data provided can be used to develop criteria for use in prioritizing and screening projects in the RTP process.

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Chapter 4.0: Regional Cumulative Effects Assessment Process

This chapter examines the role of a Regional Cumulative Effects Assessment (RCEA) process as part of the programs that could be advanced through the STEP UP initiative. Steering Committee members identified early in the project that the goals of STEP UP included the development of a methodology for assessing cumulative effects. Furthermore, this goal would be reached through achieving the objectives of having a process and the tools to assist with the environmental impacts of a Regional Transportation Plan.

In the development of an RCEA process for STEP UP, this chapter first reviews other initiatives toward the development of cumulative effects assessment models and methodologies in Colorado. An outline for a new RCEA process is then described. Short and long-term implementation strategies for this process are identified along with initial recommendations on how to begin this implementation strategy.

The model planning process developed for STEP UP specifically applies to the RTP development process used by the NFRMPO. The process does not include a RCEA to be performed by the MPO. Initially, the RCEA would be the responsibility of CDOT or its designee in coordination with other efforts the agency is pursuing. What STEP UP does do, is set the stage and provide some of the data necessary to perform a RCEA.

4.1 EXISTING EFFORTS IN COLORADO

4.1.1 Regional Cumulative Effects Assessment for El Paso County

CDOT Region 2 recently completed a Regional Cumulative Effects Assessment for El Paso County². The purpose of this RCEA is to inform decision-makers about the potential consequences of implementing proposed long-range transportation and land use plans on resources and to provide a context for subsequent NEPA documents in the Region. The document, *Sustaining Nature and Community in the Pikes Peak Region: A Sourcebook for Analyzing Regional Cumulative Effects*, is intended to provide insight on impacts at a landscape level so that each project level NEPA effort will have a context for examination of their project impact zone. A general discussion of cumulative effects and sustainability are provided, as are issues specific to the Pikes Peak Region. The Sourcebook focuses on overall trends in the region and how growth relates to sustainability, biodiversity, and quality of life.

4.1.2 GIS-Based Cumulative Effects Assessment

This study, conducted by the University of Colorado at Denver, investigated resources, tools and methods for conducting cumulative effects assessments resulting from growth associated with transportation infrastructure using GIS, aerial photography, and remotely sensed images. The study also generated models to predict growth, evaluate effects of impervious surfaces on storm water runoff, and assess the sensitivity of ecosystems and habitats to environmental impacts.

² Colorado Department of Transportation, 2003. *Sustaining Nature and Community in the Pikes Peak Region: A Sourcebook for Analyzing Regional Cumulative Effects*.

A report was prepared demonstrating four different environmental assessments using GIS. These include a habitat suitability study, a land use change analysis, a spatial database to measure hydrologic impacts due to land changes, and development growth modeling. As part of this effort, an environmental geo-database is being built that will contain GIS-based data layers for numerous environmental resources across Colorado. The models developed as part of this study have been integrated into the implementation strategies discussed later in this chapter.

4.1.3 Area-wide Coordinated Cumulative Effects Analysis Research Study

CDOT recently retained the University of Colorado at Denver to take the available tools and identified resources and combine with sustainability to develop models to assess regional cumulative effects. The initial phase of the research study involves selecting resources of concern, developing an analysis methodology and developing appropriate measurements or impact budgets, and identifying thresholds of concern that can be applied in an evaluation of regional cumulative effects to each of the resources selected for this study. The resulting methods or techniques will be applied to the analysis of cumulative effects to one of the selected resources.

4.2 POTENTIAL RCEA PROCESS

As part of the STEP UP project, a Cumulative Effects work group was established to help create a methodology/process for conducting cumulative effects analysis early on as part of the STEP UP model planning process. The primary purpose was to develop a cumulative effects analysis of the regional transportation system that allows resource agencies (federal and state), as well as other local and regional jurisdictions, to provide input and comment on the system of transportation projects and the relationship to environmental resources and land use.

The potential process outlined here will require specific implementation strategies (see Section 4.4) and is outside of the RTP development process.

1. *Identify Regional Resources of Concern for Cumulative Effects:* As part of the resource agencies involvement in the Regional Environmental Review (see Figure 3.2), staff from these agencies will identify critical environmental and cumulative effects issues within the specific region. This is similar to the scoping process under NEPA. The intent is to narrow down the issues of concern for analysis. Input on the regional cumulative effects issues of concern could be obtained by use of a simple checklist within the proposed management application discussed in the next chapter. The checklist would consist of all resources typically addressed in the NEPA process with a “yes, no, unknown” check box for whether or not the resource is of concern from a cumulative effects perspective. This information would be available to local, regional and state planners.
2. *Identify Data Needs:* Based on the resources of concern, staff from any agencies involved with conducting the RCEA process will need to determine if the data available in the STEP UP repository will be adequate for a general regional analysis. If the data is not available, it will need to be gathered and added to the database. The data gathered should be used in the establishing the thresholds discussed below.

3. *Establish Thresholds for Resources*: This step is similar to what is currently done as part of air quality conformity. For each resource identified for consideration in the RCEA, a threshold or budget for sustainability would be established from which to evaluate the impacts of proposed transportation improvements. The thresholds should define the upper limit of impacts based on what is known about the resource (e.g., habitat needs, population size, range). These thresholds might be determined through activities such as the development of resource conservation plans. This type of plan details the historical presence of a particular resource, impacts to that resource over a certain time period, what is left of that resource, and how much more impact that resource can sustain. This analysis should indicate the criticality of the resource: whether the particular resource is sustainable if impacted more, or whether it is threatened and cannot sustain further impacts.
4. *Identify Impacts of RTP Fiscally Constrained Projects on Identified Resources*: In general, staff members conducting the RCEA will determine the impacts or loss of a resource associated with both proposed transportation projects and future growth scenarios. The impacts associated with each proposed improvement from the projects included in either the RTP's vision or financially constrained plan would not easily be quantifiable based on the project description, but all of the interactions between projects in the plan and a resource could be located and documented. Expert analysis, together with GIS data layers, could be used to identify impact areas.
5. *Identify Impacts of Land Use Changes on Identified Resources*: A land use prediction model will be required to identify the regional land use changes that might take place in part as a result of changes to the transportation network. The interactive database would allow staff members conducting the RCEA to overlay layers describing future land use with mapping of the potentially effected resources. In this manner, the process will allow for examination of the impacts of transportation induced growth on the effected resources.

4.3 IMPLEMENTATION

Short and long-term implementation strategies are available for the RCEA process documented above. In each case an initial database describing the resource layers to be studied and proposed improvements to the regional transportation system would be required. Both of these products will be available through the development of the management application proposed in Chapter 5 for the STEP UP model planning process. This application will assist resource agency staff members in identifying the data layers they want to see included in the RCEA and will assist local governments, MPOs, and CDOT in identifying the projects that are likely to be built. CDOT will be responsible for preparing the RCEA report.

The fourth step identified above also will be achievable through implementation of these systems. Once projects have been identified and mapped against the GIS-based transportation network, the projects that have been screened for inclusion in the fiscally constrained plan in the RTP can be overlaid with the resources identified in step 1 above. Reporting on the number of impacts can be provided, and magnitudes of these impacts (e.g. number of acres effected) could also be estimated using expert opinions about the likely extent of the impacts of different projects based on the project type and magnitude.

Fully implementing this process will require two tools not fully developed at this time. First, a robust model for predicting land use changes as a product of existing land use plans, environmental and socio-economic constraints, and proposed changes to the transportation network will be required. Currently available is a model developed by University of Colorado at Denver used to generate a GIS layer of future land use. This model provides an Index of Development Attractiveness (IDA) that scores each location in a geographic region for the likelihood that it will see further development.³ When applied retroactively, this model has shown a strong correlation with development that actually occurred in a study region, but the authors of the model believe that it requires further validation and that other modeling approaches may be more effective.

Also required will be precise methodologies for establishing the thresholds or budgets available for a constrained resource within a region along with a methodology for calculating the impacts on these budgets from potential projects. Overlays that can be currently performed can be used to indicate the approximate area of impact between a resource and one or more projects. These measurements, however, do not assist in determining the ability of that resource to withstand the impacts. For example, while the number of acres of wetlands affected by a set of projects may be determined in GIS, there is currently no way of assessing whether these impacts will reduce the number of wetlands in the region to the point where they fail to meet their ecological functions of providing habitat and maintaining water quality.

4.4 RECOMMENDATIONS

Despite the limitations of the tools and staff available for short-term implementation, a successful RCEA process could be initiated using the proposed management application along with some of the models recently developed by the University of Colorado at Denver for CDOT. The group of models developed includes:

- ▶ Habitat Suitability Index (HSI): this model calculates the potential suitability of the study area for different species based on factors such as land use and vegetation. Each species under study requires its own HSI model.
- ▶ Index of Development Attractiveness (IDA): As mentioned above, this model identifies areas where human development is most likely to occur. Transportation networks are a key input to this model along with maps of existing development and other factors.
- ▶ A simple overlay model designed to compare the results of the HSI with the IDA to identify potential conflict zones.
- ▶ Hydrologic Effects of Land Use Change: a model based on the TR-55 hydrologic computer model to identify changes to watersheds from development

All of these models can be developed and saved using the ArcToolbox component of ArcGIS as part of a geodatabase. In this manner the models and their data sets can be transferred to CDOT

³ Lynn Johnson, John Wyckoff, et. al., 2004. *GIS-Based Cumulative Effects Assessment*. Colorado Department of Transportation, Research Branch.

or another agency with a single prerequisite that ArcGIS (version 9) is installed on the target computer. These models will allow for an initial RCEA of the total impact of the projects included in the fiscally constrained plan for the RTP's horizon year. The relationship of these models and their deployment for the development of an initial RCEA process to the STEP UP model planning process documented in Chapter 3 is shown in Figure 4.1.

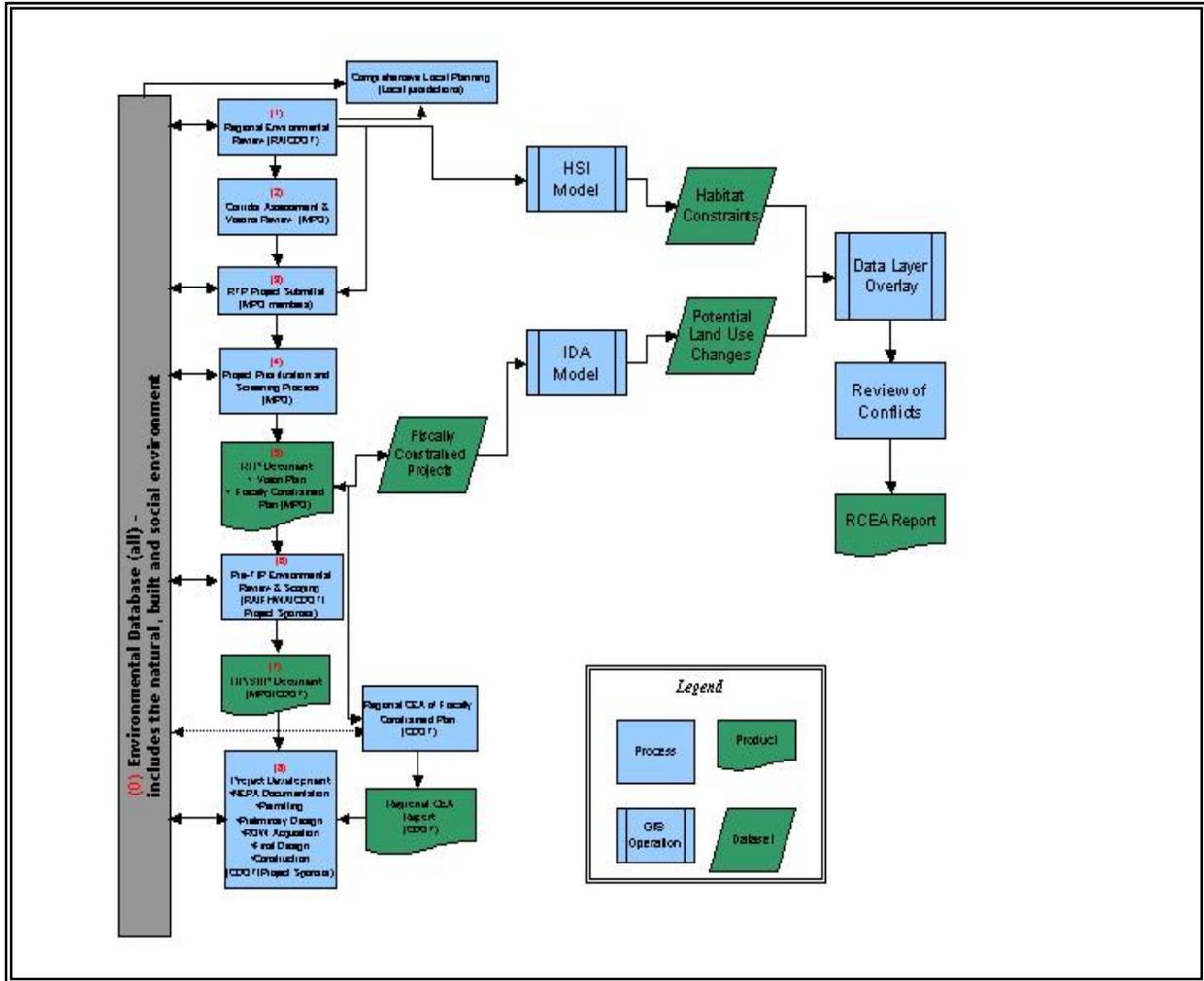


Figure 4.1. Potential Short-Term Implementation of RCEA Process

In addition, the agencies involved with STEP UP should remain in contact with faculty from the University of Colorado at Denver during their work on the development of a new methodology for conducting cumulative effects assessments. As mentioned in Section 4.1.3 the new work effort sponsored by CDOT will look further into methods for performing this type of analysis so that it includes the establishment of thresholds or budgets. The target study area for this effort is the Denver Metropolitan area, but any recommendations could also be applied to the STEP UP pilot area in the North Front Range. The initial study should be completed early in 2006 with implementation of tools to follow.

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Chapter 5.0: Management Application for STEP UP

This chapter describes an application to manage the collection of data, agency comments, and screening steps that form the STEP UP model planning process identified in Chapter 3. A conceptual design for this application was formulated through a series of meetings involving STEP UP Steering Committee members as well as representatives from a number of resource agencies. This design is presented in the following sections, describing the objectives of this application, the development approach, requirements used in formulating this design, and the core functionality that this application will provide. A complete set of the conceptual interfaces developed for this design can be found in Appendix B.

5.1 DESIGN PROCESS

The conceptual design presented in this chapter was assembled through a collaborative process based around a series of five meetings held between October and December of 2004. Participants in these meetings included staff from Carter & Burgess, representatives of the agencies on the Steering Committee, and volunteers from other agencies that might be involved with STEP UP's future initiatives. The participants attending the meetings varied, so that not all participants were at each meeting.

In each of these meetings, Carter & Burgess provided initial sketches of the potential application interface designed to represent a portion of the model planning process for STEP UP documented in Chapter 3. Participants then commented on these designs and provided critical feedback as to how well they felt the proposed design reflected the stated objective. At each subsequent meeting, Carter & Burgess provided updated designs for the steps of the process previously discussed along with initial designs for the next elements.

This process allowed for interplay between the design of the interfaces and the further refinement of the steps that will be involved with each major process component of STEP UP. By developing these interfaces, the group reached a more detailed understanding of the interactions that will be necessary to achieve each step of this process. The interactive process to develop the design, therefore, has also had a positive effect on better defining the overall process that the application will manage.

5.2 DESIGN OBJECTIVES

In working through the application design with participants, Carter & Burgess attempted to meet three primary objectives, as follows:

1. Represent each process step from Figure 3.2. Each activity or step shown in this diagram should be represented by one or more user-friendly application interfaces. These interfaces must be accessible by members and staff of MPOs, CDOT, FHWA and resource agencies.
2. Provide dynamic mapping of environmental issues, proposed projects, and transportation planning corridors. Configurable GIS mapping should be provided to display all of the key elements of the STEP UP planning process.

3. Produce a reusable database of projects and environmental data. All of the key data input through the application should be used to extend or enhance the underlying GIS and relational databases that will be used to control the application. This will ensure that the data produced through this application will be available across planning efforts or planning cycles.

These objectives were considered during the design process along with the technical requirements documented in Section 5.3.

5.3 TECHNICAL APPROACH

During design of the application, Carter & Burgess considered a number of technical requirements that might affect the development of the application. These requirements included the primary delivery platform, specific development standards enforced by CDOT, and data management considerations. CDOT development standards were used, as that organization is the most likely location for the development and deployment of the application, at this time. However, if moved outside of CDOT, CDOT will coordinate with the development standards of the outside agency.

5.3.1 Delivery Platform

In order to meet the first objective of making the application widely accessible and easy to use, the model of a web-based application was used. This approach provides the minimum number of requirements on potential users: only a standard web browser (such as Microsoft Explorer) and connectivity to the Internet. In addition, changes to the application do not require end-users to update any software components on their own computers, and there are no software licensing expenses for end users of the application.

5.3.2 Development Standards

The following CDOT standards were used in formulating the application design.

1. Web-based applications should be written using current CDOT standards for web application implementation.
2. GIS mapping for web-based applications should be based around ESRI's ArcIMS. ArcIMS (Arc Internet Mapping Server) provides extensions to the web server so that maps may be included in the web pages provided to end users. The extent and layers for each map are configured to CDOT's application standard.
3. Management of data used in the application should be built around the Oracle database. Oracle is CDOT's enterprise standard for a relational database management system (RDBMS). CDOT has recently extended its use of Oracle into the management of GIS data using ESRI's ArcSDE (Spatial Database Engine).

The interfaces developed as part of this conceptual design are only conceptual 'mock-ups' and, therefore, do not currently require any of the technical components listed above. During their design, however, these requirements were considered so that the functionality shown on these interfaces could all be achieved using these technical specifications.

5.3.3 Data Management

Two additional considerations were made with respect to the underlying data sources for the application.

1. All environmental data should be based in GIS so that it can be displayed graphically on maps within the application. Transportation networks should also be based in GIS so that these networks, along with related elements such as proposed improvements and planning corridors can also be displayed in the application's maps.
2. All data for the application that is not inherently geographic should be stored and managed in a relational database (Oracle for CDOT applications) so that the objective of creating a reusable data set of information about plans, corridors, and projects is met.

5.4 MAIN FUNCTIONALITY

The key functions provided by the proposed application are described in the following sections. The first set of functions relate to the Regional Environmental Review (Step 1). The second set of functionality provides the capabilities to conduct Steps 2 through 6 of the model planning process. Also included is an overview of the site and its administration.

5.4.1 Home Page and Site Administration

The project home page provides a common starting point that all users of the application can log into. The home page design is shown in Figure 5.1. In this design, all potential activities in which a user might need to participate are shown as links. This design, however, can be made context sensitive to the way in which an individual user needs to participate in using the application. For example, a staff member from a Federal resource agency logging into the application would need to help review environmental data but would not need access to the project or corridor entry pages. This user would only see the links to 'Resources' and 'Interactive Map.' An MPO staff member, however, would have access to those links to allow for updating information on corridors and plans while a local government staff member would be able to input new projects.

Maintenance of these roles would be one of the site administration functions also accessible from the home page. Administration functions would most likely be handled by the agency, potentially CDOT, which hosts the application and oversees the implementation of STEP UP through the required databases and applications.

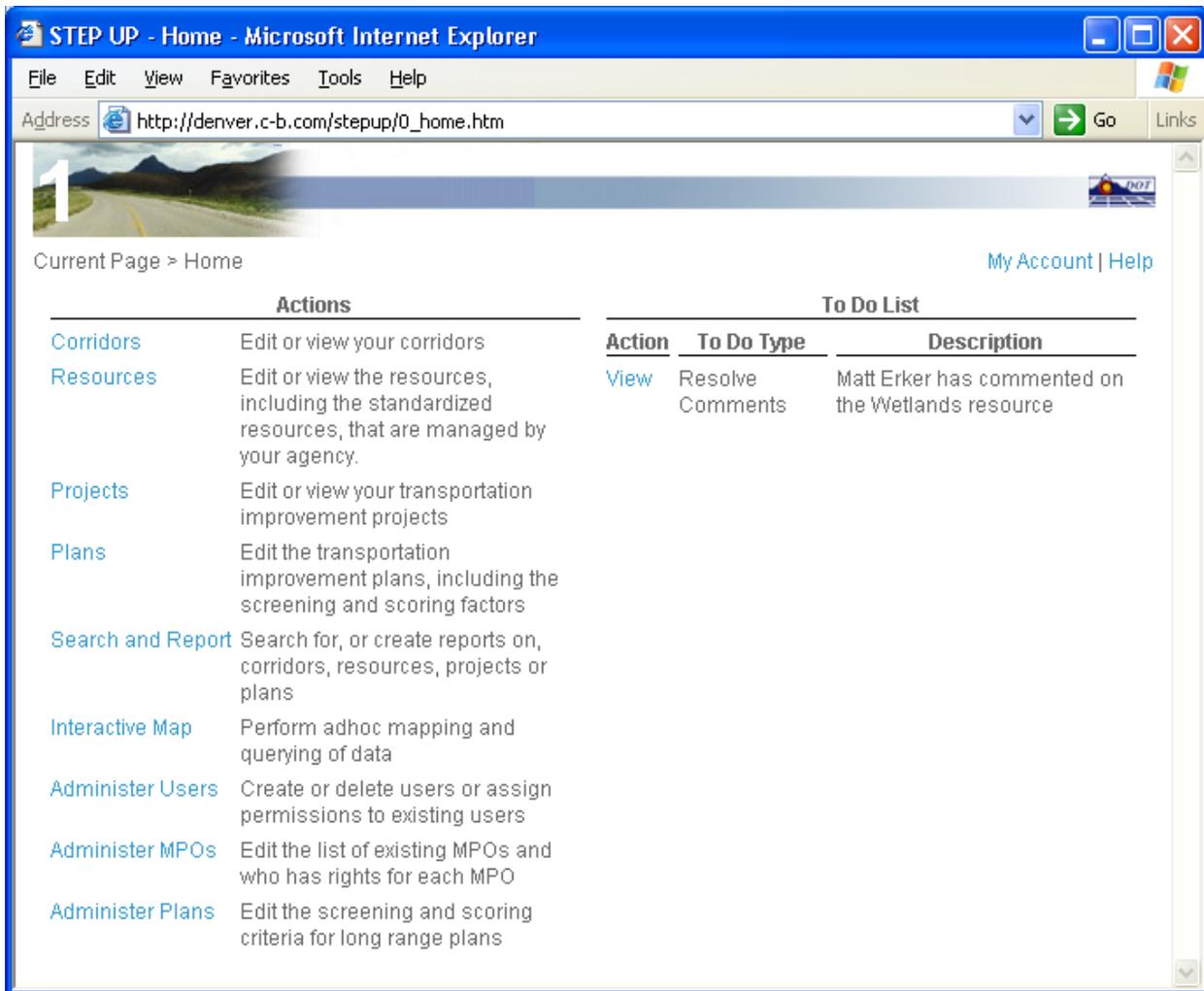


Figure 5.1. Home Page and Site Administration

5.4.2 Environmental Data Management

One of the key challenges for realizing the model planning process identified by STEP UP will be the collection and sharing of environmental data from Federal and state regulatory and resource management agencies participating in the program. Much of the functionality of the proposed application will revolve around this need. The application provides two key functions related to environmental data: tools to identify and assist in the normalization of environmental resources and the ability to view the resource data.

5.4.2.1 Normalization of Environmental Constraints

Participants in the development of the application identified the need to have layers of environmental resource data made available to transportation planners and local government officials in a way that would allow these users to quickly assess potential interactions between proposed projects and environmental constraints. To this end, the application includes functionality to allow staff from resource agencies to identify ways of classifying the data layer

associated with an environmental issue into areas of low to high constraint. This functionality is shown in Figure 5.2.

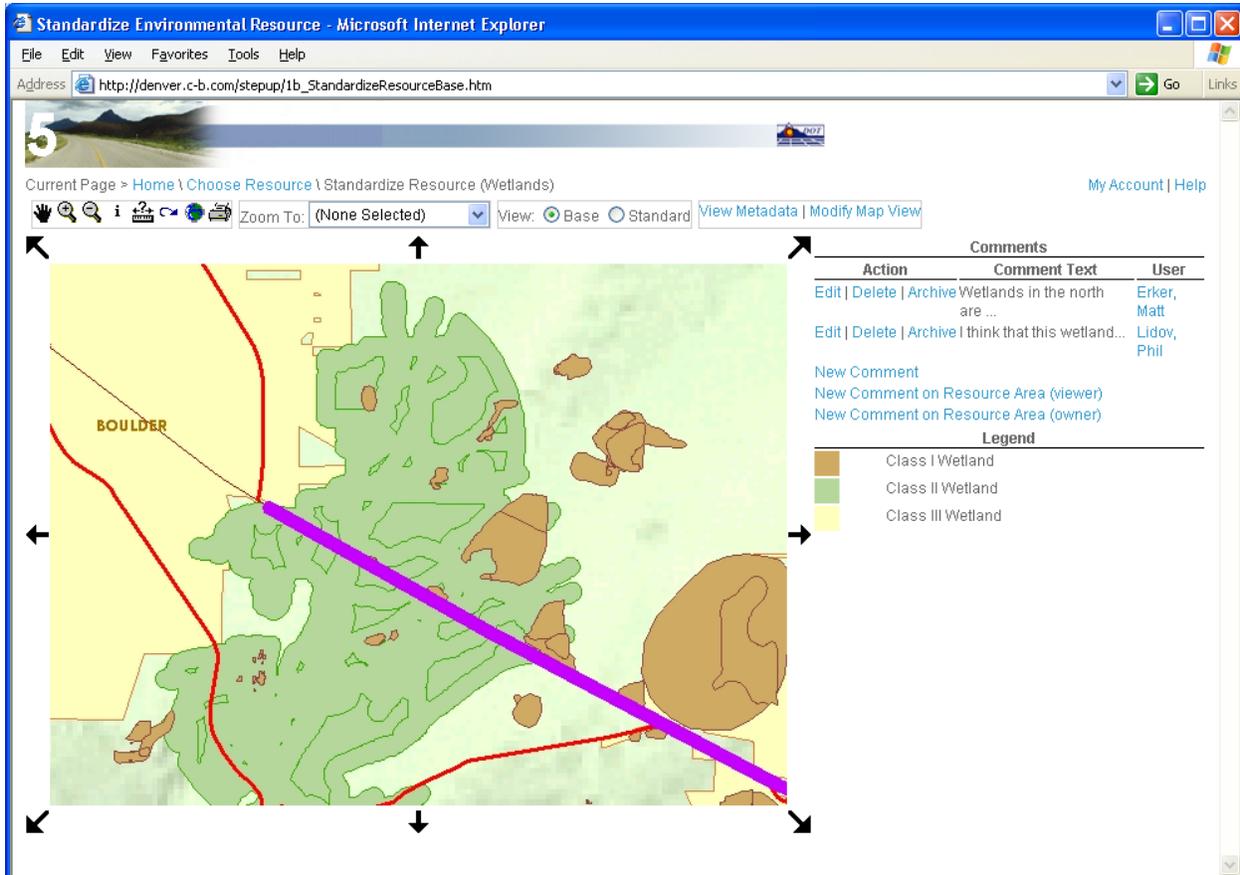


Figure 5.2. Normalization of Environmental Resource

In the interface shown above, there is functionality for a user from a resource agency to create one or more comments about the data layer. These comments will be received by a database manager (this role is discussed further in Chapter 6) for use in revising the data layer and developing a simplified version of the data layer using a simplified classification scheme. For example, the user could create a comment that indicates that all wetlands of a certain type should be classified at a certain level of constraint.

An exception to this rule could be created through an additional comment that selects one or more features from the wetland layer and that indicates that the level of constraint should be at a higher level than indicated by the first comment. The resource agency user will be able to track the progress of the data administrator in resolving these comments through the same interface. Each user would only be able to provide this type of comment and direction on layers assigned to their agency.

5.4.2.2 Review of Resource Data

As data is classified into standard levels of constraint, users of the environmental mapping for project and corridor planning will need to view this data. All users also will have access to general mapping functionality that will allow viewing of any of the data sets. The proposed interface to assist with this functionality is shown in Figure 5.3.

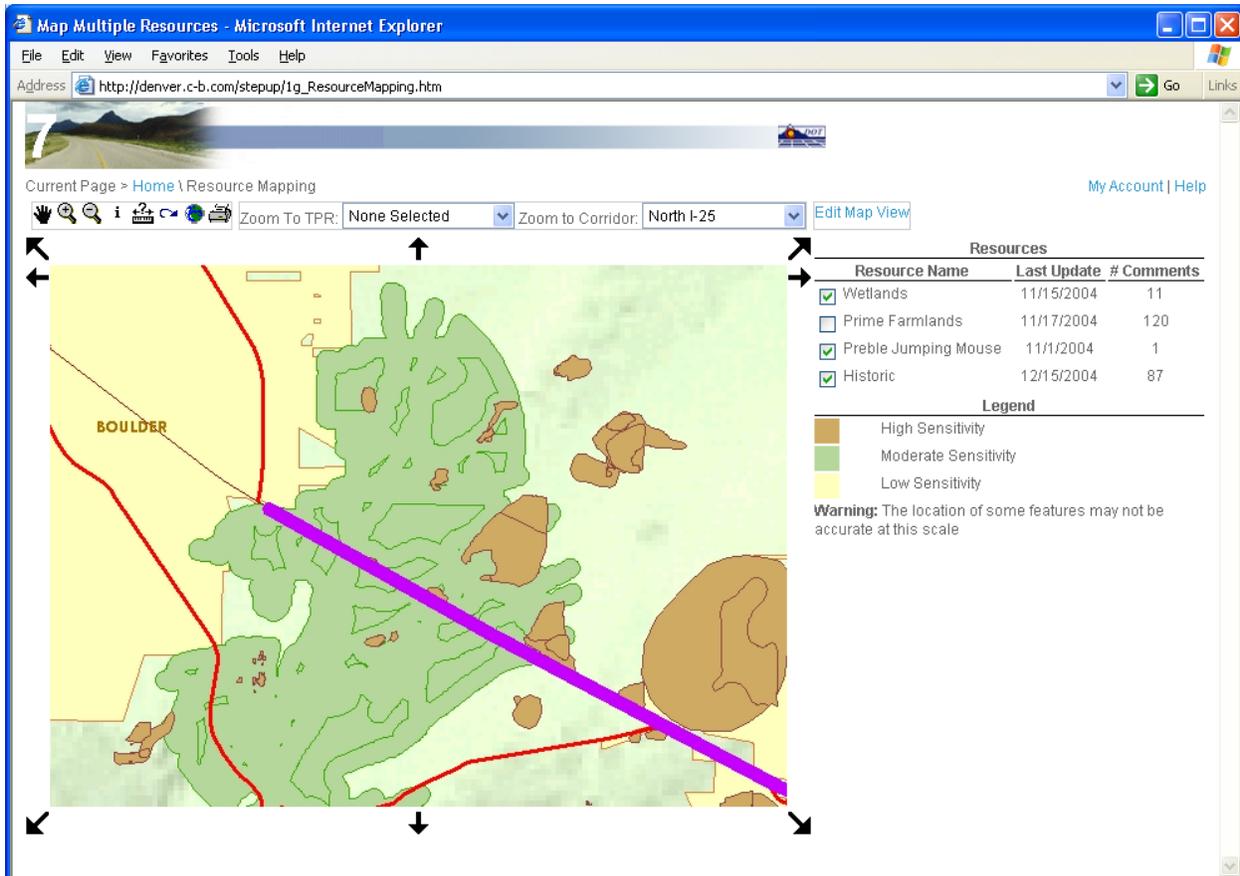


Figure 5.3. Viewing of Environmental Resource

This interface allows the user to select one or more environmental layers for viewing. As with all mapping screens in the application, basic map navigation and identification functionality is included, such as the ability to pan the map, to zoom in or out, to identify individual map features, and to print maps.

5.4.3 Transportation Plan Management

Steps 2 through 6 of the STEP UP model planning process include activities for MPOs to identify planning corridors, for local agencies and MPO staff members to input projects for a Regional Transportation Plan (RTP), and for MPO staff to screen these projects. These functions and their corresponding interfaces are discussed in the following sections.

5.4.3.1 Corridors

CDOT has standardized its development of the Statewide Transportation Plan around the concept of regionally significant corridors. In its most recent RTP, the NFRMPO has begun using corridors to organize its plan. In NFRMPO's new planning guidelines, locally sponsored improvement projects are only eligible to be considered in the RTP if they are located along one of these corridors. In addition, each corridor submitted by the MPO has a specific vision, goals, and implementation strategies. The interface for MPO staff members to locate each corridor and to define its key attributes is shown in Figure 5.4.

Figure 5.4. Corridor Definition Interface

By locating these corridors on a GIS-based transportation network, MPOs also will allow staff from resource agencies to provide specific comments as to the environmental resources present in and around that corridor. Through the interface described in the previous section, resource agency staff will be able to change the level of constraint for a resource in proximity to a particular corridor. For example, agencies with oversight of wetlands could indicate that wetlands that normally could be impacted and mitigated offsite, could not be treated in this

manner due to the impact on the ability of these wetlands to provide the proper environmental and ecological functions on a specific corridor.

5.4.3.2 Plans and Screening Criteria

In order for an MPO to evaluate the projects submitted for its RTP, screening criteria need to be defined for that plan. These criteria, developed by the MPO, can then be used to screen and prioritize each potential project in a consistent manner. The interface shown in Figure 5.5 is designed to assist the MPO staff in defining the criteria for evaluating projects to be included in the RTP. Multiple versions of the screening criteria, resulting in different project prioritization scenarios, can also be created by creating alternative versions of each plan.

The interface shown in Figure 5.5 provides the MPO with the ability to define the types of projects that can be submitted to the plan along with the evaluation criteria that will be used to screen and prioritize each project. Once these criteria have been established they are available to MPO members in the project entry forms shown in the next section.

Current Page > Home \ List Plans \ Edit Plan

Owning MPO: North Front Range MPO

Plan Name: 2025

Description: Official plan for 2025

Plan Cost Year: 2020

Plan Status: Draft

Project Category:

Action	Project Category
Edit Delete	Transportation Systems Management Projects
Edit Delete	Travel Demand Management
Edit Delete	Transit Projects
Edit Delete	Passenger and Freight Rail Projects
Edit Delete	Bicycle/Pedestrian Projects
Create New Project Type	

Evaluation Criteria:

Action	Criteria	Weight	Description	Scoring Instructions
Edit Delete	System Continuity	21	Project will provide a new service...	3 = Project will significantly...
Edit Delete	Congestion Mitigation	24	Project will significantly reduce...	3 = Project will significantly...
Edit Delete	Safety Enhancement	9	Project will significantly improv...	3 = Project will significantly...
Edit Delete	Environmental	9	Project will significantly improv...	3 = Cleans air and water, increases livestock...
Edit Delete	Multimodal	4	Plains Trains and Automobiles	3 = Forces ridership...
Edit Delete	Timely Implementation	4	How soon can it be built	3 = Within 5 years...
Edit Delete	Land Use	2	How green will it be when completed?	3 = Dark green...
Create New Narrative Question				

Reviewers:

Action	Reviewer Name	Organization
Delete	Thierman, Suzette	North Front Range MPO
Delete	Eiker, Matt	Carter & Burgess
Delete	Lidov, Phil	CDOT
Add Reviewer		

Cancel Save

Figure 5.5. Plan Entry with Evaluation Criteria

5.4.3.3 Projects

In Step 4 on Figure 3.2, the STEP UP model planning process screens and prioritizes the projects submitted in Step 3. These functions are combined into the interface shown in Figure 5.6. This interface provides multiple input screens for local agencies and MPO staff members to enter all of the information required about a project in order to have it screened and prioritized for the RTP. The input screens are shown as individual ‘tabs’ across the top of the form. The first four tabs, General, Cost, Element, and Criteria, will be filled in by the local government or other agency sponsoring the project.

The screenshot shows a web browser window titled "Edit Project - Microsoft Internet Explorer". The browser's address bar shows the current page is "Home \ List Projects \ Edit Project". The page has a navigation menu with tabs: "General", "Cost", "Element", "Evaluation Criteria", "Environmental Review", "Location", "Score", "Comments", and "Status". The "General" tab is selected. The form contains the following fields and options:

- Project Name: [Text Input]
- Submitting Agency: North Front Range MPO
- Contact: Thieman, Suzette
- Primary Investment Category: System Quality (Dropdown)
- Project Category: Transit (Dropdown)
- Plan Year: [Text Input]
- Description: [Text Area]
- Local Project Code: [Text Input]
- Was project included in previous RTP?: Yes (Dropdown)
- Is Project in other local and/or Regional Plan?: Yes (Dropdown)
- if Yes, which plan: [Text Input]
- How does the project fit with the Corridor Vision?: [Text Area]
- Is the project area covered by an adequate public facilities ordinance?: Yes (Dropdown)
- if so, basic or enhanced?: Basic (Dropdown)
- Is there another project or phase that needs to be completed before this project can be implemented?: Yes (Dropdown)
- if Yes, which project: [Text Input]

At the bottom left of the form, there are "Save" and "Cancel" buttons.

Figure 5.6. Project Data Entry

The location tab, shown in Figure 5.7, provides a number of ways in which MPO staff can accurately locate the project as part of the regional transportation network. The scoring and screening tabs provide MPO staff an opportunity to set values that will be used in project prioritization and to ensure that the project meets RTP criteria, which includes specific environmental criteria derived in consultation with resource agencies and CDOT.

Current Page > Home \ List Projects \ Edit Project
Long Range Plan Number: New Project
Project Location:

General | Coast | Element | Evaluation Criteria | Environmental Review | Location | Score | Comments | Status

County: None Selected | New | Edit
City: None Selected | New | Edit
CDDT Region: None Selected | New | Edit
Transportation Planning Region: None Selected | New | Edit
Transportation Commission District: None Selected | New | Edit
Regionally Significant Corridor: None Selected

Project Location Mapping
Location Type: Route on Existing Highway
Highway Route: 009B
From Milepost: 18.168
To Milepost: 76.396
Select from Map | Type in Location

Click here to view Location Information | Get Map

Save | Cancel

Figure 5.7. Project Location Input Tab

The score tab, shown in Figure 5.8, represents the MPO’s project prioritization process. Each evaluation criteria is listed and used by the MPO staff to evaluate each project submitted for inclusion in the RTP.

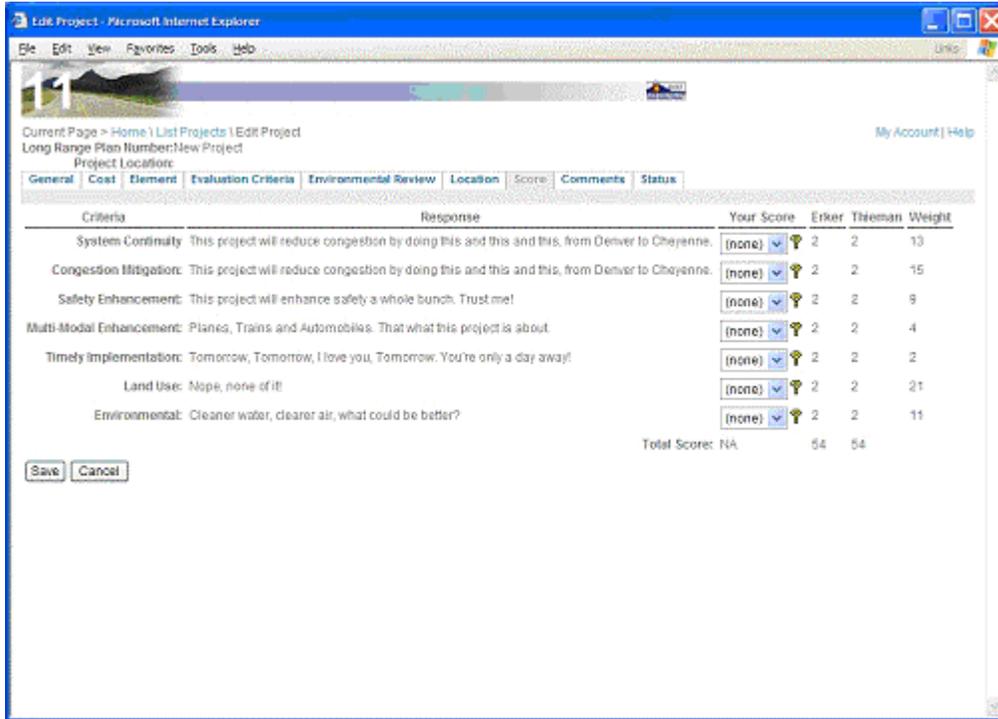


Figure 5.8. Project Prioritization

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Chapter 6.0: Environmental and Land Use Database

This chapter reviews the data requirements that will be created by the development of the application described in Chapter 5 and by the integration of cumulative effects assessment tools into the STEP UP model planning process. In considering the database requirements, a review of the GIS data layers that would together constitute an ideal database is provided. These data will need to be managed and administered in a manner that makes them accessible to the STEP UP program, and a scheme for this management is provided. Existing initiatives to collect and manage environmental data that might be useful to STEP UP are also reviewed.

6.1 DATA CONTENTS

The STEP UP model planning process and RCEA process that might be used by the program require high quality data about environmental resources, regional land uses, and the transportation system. All of this data is best utilized when it is provided as a layer in a geographic information system (GIS). The following sections provide a detailed review of all of the layers that would have utility to STEP UP in assessing the potential impacts of new transportation projects individually as well as cumulatively. Much of the work in identifying these data needs was the result of a work group meeting held by STEP UP during December 2004. A number of state and federal agencies were represented at this meeting along with members of the Steering Committee. This section also lists out general data gaps: issues of data availability that will make it difficult to compile existing data resources into a continuous and complete data set for all areas of the state.

6.1.1 Existing Data Resources

The data layers are grouped into three general categories and described in the subsequent sections. The first discusses layers most directly associated with natural and biological resources. The second category includes layers reflecting the built and social environment usually considered during the National Environmental Policy Act (NEPA) assessment process. The final category includes additional land use data that will be required for STEP UP. The transportation system can be an overlay to all of these data layers.

6.1.1.1 Layers for the Natural Environment

In developing a list of environmental layers that would be most useful to STEP UP, consideration was given to guidelines for reviewing transportation projects through NEPA. Further information on the assessment of project impacts on different environmental resources is available from the Federal Highway Administration (FHWA) at their website⁴.

⁴ FHWA *Environmental Guidebook* (<http://environment.fhwa.dot.gov/guidebook/index.htm>) and *Re:NEPA* (<http://nepa.fhwa.dot.gov/ReNepa/ReNepa.nsf/home>).

Water Resources

Layers for water resources help form both a geographic and ecological base for many of the other resources that need to be reviewed. Specific legislation also exists to assist in the preservation of wetlands, and environmental and engineering concerns exist around floodplains. A complete list of potential database layers for water resources for STEP UP are listed in Table 6.1

Table 6.1. Water Resource Layers

Layer	Source	Availability
Wetlands	National Wetlands Inventory – US Fish & Wildlife Service (USFWS)	Limited availability at 1:24,000 scale paper maps for most of Colorado. Note: many are outdated.
Waters of the US	National Hydrography Dataset – US Geological Survey (USGS)	Small scale data available nationwide
Floodplains	Federal Emergency Management Agency (FEMA)	Limited availability of digital products
Watersheds/Hydrologic Units, including impaired waters	Colorado Department of Public Health and the Environment (CDPHE)/US Environmental Protection Agency (EPA)	Small scale data available nationwide – 303(d) list and TMDL list
Canals/Ditches	Various	No standard products available
Dams/Impoundments	DNR/State Engineer	Text database available
Riparian Vegetation	Various	No standard products available

The wetlands data available from the National Wetlands Inventory (NWI) are often not of sufficient detail to meet permitting requirements. A more detailed repository of these data will be required.

The vegetation communities along riparian areas also are included in this list due to the sensitive nature of these environments and because of the key ecological role that many of these communities play. While there are no standard products available for riparian vegetation, the Colorado Vegetation Classification Project (CVSP) has mapped and classified riparian vegetation in Colorado watersheds. NREL also features classified and mapped riparian areas on its website.

Species of Interest

This section includes species of both flora and fauna that receive protection at the state or federal level due to a specific concern that the species is in decline or because of particular recreational interest in that species. The complete list of the data layers recommended for STEP UP is shown in Table 6.2.

Table 6.2. Layers for Species of Interest

Layer	Source	Availability
Threatened & Endangered Species	USFWS, USGS Biological Research Division (formerly the US National Biological Survey), CDOW	Some Internet mapping
Critical Habitat/ Migration Corridors	Colorado Division of Wildlife (CDOW)/Natural Diversity Information System (NDIS) at the Natural Resources Ecology Lab (NREL), Colorado State University ⁵	Complete statewide digital datasets for species studied by CDOW.
Game Species Habitat	CDOW/NDIS	Same

Geology

Geologic layers help define potential environmental hazards that might be encountered while developing projects. Much of the data shown in Table 6.3 is available through different branches of the Colorado Department of Natural Resources (DNR). While hazardous materials are not strictly a geologic resource, this layer has been grouped here for convenience.

Table 6.3. Geological Layers

Layer	Source	Availability
Hazards	Colorado Geological Survey (Colorado DNR)	Some shape files available
Abandoned Mines	Colorado Geological Survey	Downloadable maps
Oil & Gas Wells	Oil and Gas Conservation Commission (Colorado DNR)	On-line mapping
Hazardous Materials/ Waste	CDPHE	On-line mapping

The Oil and Gas Commission currently maintains a repository of oil and gas well location that includes on-line mapping capabilities. The Geologic Survey has many of their layers available for download.⁶

⁵ The website for NDIS includes web-based GIS mapping (<http://ndis.nrel.colostate.edu/>).

⁶ The Geological Survey's website can be found at <http://geosurvey.state.co.us/>. The Oil and Gas Commission is at <http://oil-gas.state.co.us/>.

6.1.1.2 *Layers for the Built and Social Environment*

The NEPA process also considers impacts to the built and social environments. Any screening conducting by the STEP UP program or any cumulative effects analysis should consider these layers as well.

Section 4(f)/6(f)

Section 4(f) refers to the USDOT Act of 1966 which dictated that FHWA would not approve any program or project which requires the use of any publicly owned land of a public park, recreation area, wildlife or waterfowl refuge, or any land from an historic site of national, state, or local significance unless:

1. there is no feasible and prudent alternative to the use of that land, and
2. all possible planning to minimize harm resulting from such use was included.

Section 6(f) of this Act prohibits the conversion of property acquired or developed with grants from the Land and Water Conservation Fund to a non-recreational purpose without the approval of the Department of the Interior's (DOI) National Park Service. Layers required to perform all of these assessments are shown in Table 6.4.

Table 6.4. Section 4(f)/6(f) Data Layers

Layer	Source	Availability
Parks and Recreation Areas	Colorado Department of Natural Resources (DNR)/Local governments	No standard data products
Historic Sites	State Historic Preservation Officer (SHPO)	See notes following Table 6.5
Wildlife Refuges	Various	No standard data products
Water Rowl	Various	No standard data products
Land & Water Conservation Fund Lands	Various	No standard data products

Typically, much of the research and data gathering to perform these assessments must be done on a project-by-project basis. Research usually involves coordination with local governments in order to identify any locally operated parks and recreational sites. Recent initiatives at NREL are discussed in Section 6.3.5 to create an archive of these data for Colorado.

Cultural Resources

Impacts to the cultural resources shown in Table 6.5 are closely regulated, and these resources must be considered in screening activities for STEP UP as well as in cumulative effects analysis.

Table 6.5. Cultural Resource Layers

Layer	Source	Availability
Historic Properties	Colorado Historical Society – Office of Archaeology and Historic Preservation	See discussion below
Archaeological Resources		
Paleontological Resources		

GIS programs for the State Historic Preservation Office (SHPO) at the Colorado Historical Society were initiated in 1999, but information about these data holdings is not available on-line. Access to these data may be limited based on the type of use due to concern about the security of some of the sites.

Land Use

Additional data required by STEP UP relating to regional planning and land uses is shown in Table 6.6. Some of these layers are not required for the screening of individual projects but will be needed in order to utilize the cumulative assessment models.

Table 6.6. Regional Land Use Data

Layer	Source	Availability
Existing Land Use	Regional Councils of Governments (COGS) and Metropolitan Planning Organizations (MPOs)	Good case-by-case availability where a region is supported by an MPO. For most of the non- urbanized portions of the state (eight out of 15 planning regions where there is no MPO), data would have to be assembled from various county and local governments
Existing Zoning		
Future Land Use		
Urban Growth Boundaries		
Regional Roadway Network		
Air Quality Non- Attainment/Maintenance Areas	MPOs/CDPHE	
Socio-Economic	Census, State Demographer	Census data is widely available from several archive repositories
Public/Protected Lands	US Forest Service, US Bureau of Land Management, USFWS, National Park Service, Counties	See Section 6.3.5
Farmland	NRCS	On-line availability

The NFRMPO currently has an initiative underway to develop a regional data repository with many of these layers. If NFRMPO continues as a pilot participant for STEP UP, the program should be able to take advantage of the availability of these data.

6.1.2 Data Gaps

The most readily available environmental data for Colorado can be found as a product of federal and state agencies with an agenda that includes the compilation of these data layers. For federal agencies and their data sets, however, much of the available data comes at a scale that is too small: minimum mapping units are set to large and the resolution of the data limits its uses. In some cases, the agenda set for a resource regulated at the federal level is carried out by state agencies that have limited funding.

Most of the water resources listed in Table 6.1 fall into these categories. Wetlands regulations are the domain of EPA and the US Army Corps of Engineers, but neither agency maintains a data set. The available NWI data set is generally too coarse to serve the analysis requirements of individual projects.

Better data is available statewide for species of interest, especially game species for which there is strong interest shown by CDOW due to its responsibilities to regulate hunting and fishing in the state. Funding may not always have been provided consistently to other threatened species that CDOW assists the USFWS in studying.

A number of state agencies, however, have begun to make on-line mapping services available related to data sets of interest to STEP UP. These sites make it easy to perform a single inquiry about the location of potential resources or constraints at a single location. In order to be utilized in a dedicated repository, the data sets behind these sites will need to be transferred to a new environmental database. These activities will require negotiation on a project-by-project basis with the agency currently sponsoring the site.

The biggest gap in data availability for a statewide implementation of STEP UP will be the lack of available land use data for non-urban areas. These data include everything from parcel level ownership describing the location of potential 4(f) sites to regional land use plans. Currently, some regional entities such as the NFRMPO are making efforts to build data sets like these, and larger counties are able to fund and manage their own detailed parcel data GIS systems. Outside of Front Range urban communities, few counties or TPRs have the resources to provide detailed land use data with regional coverage.

6.2 DATA MANAGEMENT AND REPOSITORY DESIGN

Along with the definition of the types of data that would be required in a repository for the STEP UP program, the following sections review some of the additional issues that must be considered in the design of a repository. These issues include access to the data, the technical approach to implementing the repository, and data management strategies for the repository.

6.2.1 Data Access

There are potentially many different agencies that could participate in any programs advanced by STEP UP. With these data being accessed by many different users, the level of access provided to each would need to be regulated through a consistent strategy in order to protect sensitive data as identified by participating agencies. For instance, some layers might be available for viewing but not downloading while others might only be made viewable in new, derived layers rather

than in their original source format. This concern exists especially for data layers that might come from the Colorado Historical Society as well as data that might be collected from local governments with a financial stake in their data holdings.

6.2.2 Repository Design

Potentially, a data repository for the STEP UP program could exist as either a single database residing at one location or as a distributed collection of data sets administered by multiple agencies. The repository needs to function as a ‘one-stop’ site for data, but there is a technical possibility that web-based data services from multiple agencies could be combined to form a ‘virtual’ database. In the long run, this approach has several positive attributes; primarily, it allows for individual organizations providing data layers to maintain those layers at their own office and update them as required by their regular course of work. There would be no need to transfer duplicate data sets to the repository, removing some of the impediments to keeping the repository current.

This implementation strategy, however, suffers from the varying levels of technology available from the different organizations that might participate in a statewide environmental database. Most of the organizations currently with these capabilities are larger federal and state agencies, so this approach would be difficult to implement. For the near-term a repository managed as a single database hosted by a single agency is more feasible.

6.2.3 Data Management

The maintenance of a repository for STEP UP will require many agencies to work cooperatively in different capacities to achieve the objective of providing access to statewide layers of environmental and land use data. Three potential roles have been identified in this effort and are diagrammed in Figure 6.1.

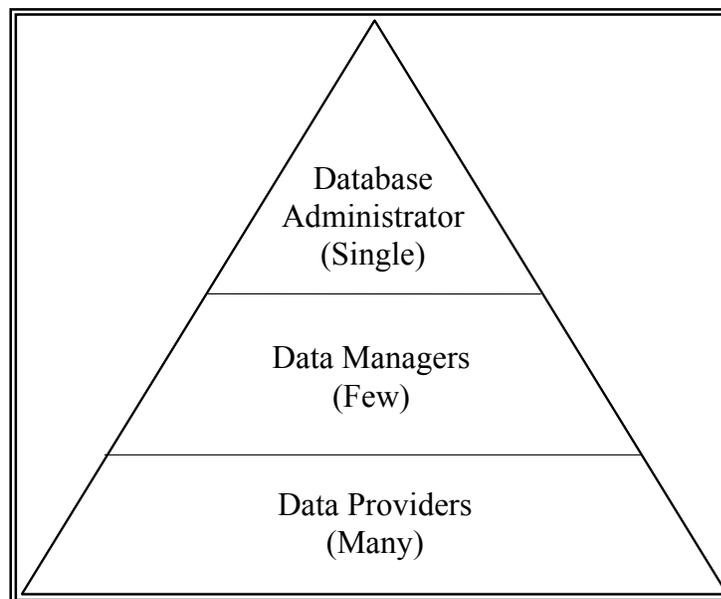


Figure 6.1. Data Management Hierarchy

At the bottom tier of this diagram are agencies and their staff providing data to the repository. As listed in the tables in the preceding sections, there are a large number of organizations that could potentially participate in this role. With a centralized, rather than distributed, repository, each of these agencies would provide data to the repository as they were able. The most likely arrangement would be for those agencies participating in the model planning process for STEP UP defined in Chapter 3 to provide the data layers that would represent the issues for which they have jurisdiction or interest.

These layers would be managed by staff from the STEP UP sponsoring agencies. These staff members would be responsible for making updates to the data layers in the repository and for addressing any comments about these data made by resource agencies using the data review tools outlined in Chapter 5. The number of participants required at this level should be considerably fewer than those participating as data providers.

Finally, a single management agency or management consortium could be responsible for overall site maintenance and administration, including physical hardware for the repository. This would not necessarily be the same as one of the agencies working as data managers. Database administration would include the creation and execution of backup plans, account management, disaster recovery for the database, and any other task required to keep the physical database available to users of the STEP UP applications.

6.3 EXISTING INITIATIVES

A number of initiatives already underway in Colorado are discussed in the following sections. These initiatives may be able to help provide data or other resources to a Colorado statewide repository for STEP UP or can serve as models for any new STEP UP initiative.

6.3.1 GIS Colorado

GIS Colorado (GISCO) is a professional organization with the stated purpose of assisting its members “to communicate and advance, as a unified group, the status and level of effectiveness of GIS use in the State of Colorado.” Members of this group have the potential to provide resources for a cooperatively managed repository or for supporting other initiatives. The group’s website can be found at <http://www.giscolorado.org/>.

6.3.2 Statewide Environmental Geodatabase

Faculty associated with the FAST lab at the University of Colorado at Denver is currently contracted to CDOT for the development of a state environmental geodatabase. This database will be compatible with the ArcGIS software from ESRI and will be delivered to CDOT, where it may be maintained with the Transportation Geodatabase currently underdevelopment by CDOT’s GIS Section. No formal definition exists yet of the data sets that will comprise this database, but efforts are underway to collect all available GIS data for the state that can be easily moved from sponsor organizations into this database. The current effort does not include a plan for maintaining the data after they are delivered.

6.3.3 CDOT Corridor Initiative

Staff from the GIS Support Unit of the GIS Section in the Division of Transportation Development are spearheading efforts to compile and distribute data sets generated by CDOT and its consultants during corridor studies such as NEPA programs. There is a web-based application available for viewing these data for participating corridors. The GIS Support Unit also has produced a data standards document for participating projects. This initiative may lead to the development of high quality environmental data sets not currently available for transportation planning and project development. For example, a full compilation of all of the wetland delineations performed along transportation corridors would far exceed the quality of the data currently available from the National Wetlands Inventory.

6.3.4 Natural Diversity Information Source

The Natural Diversity Information Source (NDIS) is a project of the Natural Resource Ecology Lab (NREL) at Colorado State University with sponsorship from Colorado Division of Wildlife. The web site for this program (<http://ndis.nrel.colostate.edu/>) provides on-line mapping and downloads of GIS data for habitat mapping. This site is already a highly relied on source for information about the habitats of species of concern to CDOW.

6.3.5 Colorado Ownership, Management, and Protection

The Colorado Ownership, Management, and Protection (COMaP) project is a new initiative at NREL to build a state repository of protected lands in Colorado at multiple jurisdictional levels including national, state, local and private. These data are viewable through the mapping application at NDIS, and the project managers are maintaining a semi-annual update schedule. COMaP is built from data provided by participants from a wide variety of federal, state, and local agencies whose data is combined into a standard structure for viewing. The website for COMaP (<http://www.nrel.colostate.edu/projects/giam/comap.html>) provides additional information about the program.

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Chapter 7.0: Conclusions and Recommendations

This chapter concludes with two sets of recommendations and a review of the potential impacts of these recommendations. The first set identifies short-term implementation steps for a work program that will achieve the objectives of conducting a pilot program that will assist the NFRMPO with their next RTP update. Also outlined are the long-term requirements that should be met in order for the model planning process and other programs associated with STEP UP to be a success at the statewide level.

7.1 SHORT-TERM IMPLEMENTATION RECOMMENDATIONS (PHASE II)

Based on the accomplishments under Phase I of STEP UP, Phase II should consist of conducting the pilot project for the NFRMPO. The NFRMPO will begin the process of updating their RTP next spring. There are several tasks that could be included in Phase II. The objectives will be to:

1. Conduct a pilot program that further develops and proves the concepts behind the STEP UP and RCEA processes for eventual statewide implementation.
2. Support the North Front Range in providing additional environmental review capabilities during its next RTP update.
3. Formalize the process and tools.

The following tasks are recommended:

1. Create a regional environmental database with as many layers as possible. Much of this data can probably come from the statewide environmental geodatabases under development by the University of Colorado at Denver and in progress at the NFRMPO. Additional detail may be possible for some datasets by looking at data developed by consultants for a number of corridor studies, especially the North I-25 EIS.
2. Create initial and formalize partnerships with agencies that have expressed interest in the program to date and seek their participation in a Regional Environmental Review for the North Front Range. Likely agencies based on existing outreach, participation in work group meetings, or membership in the STEP UP Steering Committee include the Environmental Protection Agency (EPA), the Colorado Division of Wildlife (CDOW), the United States Fish and Wildlife Service (USFWS), the US Army Corps of Engineers, and possibly the State Historical Society.
3. Initiate development of the application proposed in Chapter 5 to support the model planning process. This application should be developed at CDOT for use by the NFRMPO so that this agency can conduct additional review of projects proposed for the next RTP. This application can be built in less than one year for deployment in the next planning cycle.
4. Test existing CEA models. The models already developed by the University of Colorado at Denver could be tested during the development of a RCEA process for the North Front

Range similar to the effort already conducted for El Paso County. These models do not represent a complete RCEA, but their effectiveness, along with the utility of the project database created through STEP UP could be tested and demonstrated in an initial assessment of the regional environment.

Through these tasks, the STEP UP model process can be tested in the NFRMPO. The results will assist with the long-term implementation recommendations in Section 7.1 and statewide implementation. For the process to work at the statewide level, several issues will need to be addressed. These include ensuring resource agency participation in the process, filling in any data gaps and keeping the data current, staffing and training concerns at participating agencies, and the logistics regarding the location and maintenance of the statewide database and web-based application.

7.2 LONG-TERM PROGRAM RECOMMENDATIONS

The following recommendations concern the long-term successful statewide implementation of the STEP UP model planning process contained in this report. The three primary recommendations are:

- ▶ Develop formal partnerships for the program
- ▶ Strengthen support for a statewide environmental database
- ▶ Further develop Regional Cumulative Effects Assessment models

STEP UP is currently sponsored through a loose partnership between the staff of several agencies. In order for this initiative to move forward, these relationships should be formalized and extended to include resource management and planning agencies at the federal, state, and regional level. The development of the full set of partnerships may take several years; the ETDM process in Florida only succeeded in executing a series of formal partnering agreements in 2004. The program can move ahead by creating initial relationships with agencies that could participate in a pilot program for the North Front Range. This step is discussed in Section 7.2.

One element that these partnerships will need to include will be data sharing and reviewing relationships. Agencies that develop and maintain environmental or planning data that is needed by STEP UP will need to see the benefit in sharing that data with the program. The potential benefit offered by the STEP UP model planning process in these cases is the ability to be able to participate meaningfully in a review of regional issues of concern while projects are still in the earliest stages of development. Other agencies may be very willing to participate but lack the dataset to cover the issues that they would like reviewed. In these cases it will be helpful if STEP UP is able to provide resources to assist in the development or compilation of these data.

In all cases, a statewide repository for the datasets will be needed. The cost of such an effort is probably greater than any funding that could be provided through STEP UP. This initiative, however, is not the only one that would benefit from the development of a statewide environmental repository. Partners in this program, therefore, should look to performing outreach with other state agencies, university, and other organizations that could assist in advocating for a state government backed repository.

The models currently available for assessing cumulative effects at a regional scale do not meet the full intention of the STEP UP program in identifying the stress placed on different resources by transportation development and the land use changes associated with this development. Further work, some of which is currently funded, is needed in both the development of RCEA models that include the ability to assess a resources ability to withstand a set of impacts and in the development of land use models that can accurately predict land use changes in both rural and urban settings. Significant research in these topics has been conducted at universities in the state, but a complete agenda for supporting this research should be developed and reviewed by the STEP UP program.

7.3 IMPLEMENTATION PROCESS AND IMPACTS

The STEP UP model planning process and RCEA process implementation recommendations have been developed through the participation of a multi-agency committee with the intention of identifying potential new changes to transportation planning in Colorado. Specific commitments will be required by multiple agencies to realize these recommendations. Along with these commitments, the potential impacts of these recommendations on the organizations that they most directly affect are discussed below.

As the STEP UP program moves into a pilot implementation, the primary user of the updated process and tools will be NFRMPO. In developing this application, extensive consideration was given towards an interface that would easily accommodate the existing RTP guidelines used by NFRMPO as well as towards allowing the system to be user configurable to fit any new screening or prioritization criteria. Pilot implementation, however, will still require further consultation not only with the staff of NFRMPO but also with its board members and CDOT to ensure that the process underlying the application is acceptable to all. This coordination, along with any training requirements for the MPO and its member agencies, will require time from NFRMPO's staff.

NFRMPO also will be responsible for making any planning data required by the application, such as zoning and land use information, available to the application and for the RCEA process following the development of the next RTP. This may require additional staff time. A staff commitment also will be necessary for NFRMPO to participate in the RCEA process; however, this commitment can be tailored to be more or less extensive.

The STEP UP model planning process and RCEA process also place a potential staffing requirement for the responsible agency. Staff from CDOT's Environmental and Information Management branches, and regional offices could potentially have roles in supporting:

- ▶ The development and deployment of the multi-user application to support the model planning process,
- ▶ The development and review of a GIS repository of statewide environmental data,
- ▶ The review and modeling of projects from the RTP in support of the creation of a RCEA document.

Any of these activities taken on by CDOT must fit into changes occurring through business process reengineering (BPR) efforts. The current BPR effort is occurring around the deployment of a new Enterprise Resource Planning (ERP) software system. The deployment of the ERP is also changing software development standards so that any STEP UP applications may need to comply with these changes.

Finally, FHWA will continue to play a lead role as a sponsor of any new processes related to the STEP UP effort. In this role, staff from FHWA as well as Steering Committee members will need to continue to reach out to other stakeholders that are either currently involved with transportation planning or might want to participate in the environmental processes that will be included in STEP UP. These stakeholders include MPOs other than NFRMPO, local governments, and state and federal agencies involved with the management of natural resources.

Appendix A. STEP UP Phase I Participation

A.1. STEP UP Steering Committee

The STEP UP Steering Committee is a voluntary group working together to study the strategic relationships between transportation planning and the built and natural environments for the urbanizing areas of Colorado. Work performed for the STEP UP initiative has been funded by the Federal Highway Administration through and Environmental Streamlining grant awarded to the NFRMPO and administered by CDOT.

Table A.1. STEP UP Steering Committee Members

Name	Agency	Role
Aaron Willis	Colorado Department of Transportation	Phase I Project Manager
George Gerstle	Colorado Department of Transportation	
Roland Westl	Colorado Department of Transportation	Phase I Project Manager
Myron Hora	Colorado Department of Transportation – Region IV	
Sheble McConnellogue	Colorado Department of Transportation – Region IV	
Stan Elmquist	Colorado Department of Transportation – Region IV	
Deb Lebow	Environmental Protection Agency	
Bill Haas	Federal Highway Administration	Chair
Cliff Davidson	NFRMPO	
Suzette Thieman	NFRMPO	

A.2. Work Group Participants

The development of the STEP UP model planning process was largely driven through a series of work group meetings sponsored by the Steering Committee. Participation in these work groups included members of the Steering Committee as well as staff from other stakeholder agencies. Work groups were established in four general areas and are shown in Table A.2. Participants in the work groups are shown in Table A.3.

Table A.2. STEP UP Work Groups

Work Group	Dates	Purpose
Planning Process	<ul style="list-style-type: none"> • July 2, 2004 • July 15, 2004 • September, 13, 2004 	Identify and review existing transportation planning process at the state level and MPO level. Critique the existing process and identify areas for modification.
Cumulative Effects Assessment	<ul style="list-style-type: none"> • July 7, 2004 • July 28, 2004 • September, 13, 2004 	Identify the beginnings of a methodology for the cumulative effects analysis component of the STEP UP Project.

Work Group	Dates	Purpose
Tools	<ul style="list-style-type: none"> • October 12, 2004 • November 10, 2004 • November 23, 2004 • December 3, 2004 • December 22, 2004 	Develop a conceptual design for a multi-user application that would support the STEP UP model planning process.
Data Repository	<ul style="list-style-type: none"> • December 3, 2004 	Define the data content and data management needs for the tools required by the STEP UP model planning process.

Table A.3. Participants in STEP UP Work Groups

Name	Agency	Work Groups
Roland Westl	CDOT – Environmental Branch	Cumulative Effects, Planning, Data Repository, Tools
Shannon Philippus	CDOT – Environmental Branch	Data Repository, Tools
Sharleen Bakeman	CDOT – Environmental Branch	Cumulative Effects, Planning
Jeff Gockley	CDOT – Information Management Branch	Data Repository, Tools
Lou Henefeld	CDOT – Information Management Branch	Data Repository, Tools
Aaron Willis	CDOT – Planning Branch	Cumulative Effects, Planning, Data Repository, Tools
George Gerstle	CDOT – Planning Branch	Cumulative Effects, Planning
Lizzie Kemp	CDOT – Planning Branch	Cumulative Effects, Planning
Larry Myers	CDOT – Region IV	Data Repository
Myron Hora	CDOT – Region IV	Cumulative Effects, Planning
Sheble McConnellogue	CDOT – Region IV	Cumulative Effects, Planning
Stan Elmquist	CDOT – Region IV	Cumulative Effects, Planning
Fred Nuszdorfer	CU Denver	Data Repository
Lynn Johnson	CU Denver	Data Repository
Deb Lebow	EPA	Cumulative Effects, Planning
Bill Haas	FHWA	Cumulative Effects, Planning, Data Repository
Mike Vanderhoof	FHWA	Cumulative Effects, Data Repository, Tools
Cliff Davidson	NFRMPO	Cumulative Effects, Planning, Data Repository
Suzette Thieman	NFRMPO	Cumulative Effects, Planning, Tools

Name	Agency	Work Groups
Rena Brand	US Army Corps of Engineers	Data Repository
Alison Michael	USFWS	Cumulative Effects, Planning, Tools
Connie Young-Dubovsky	USFWS	Cumulative Effects, Planning

A.3. Stakeholders

The following agencies were represented at the presentations organized by the STEP UP Steering Committee.

September 22, 2003

- Colorado Department of Public Health and the Environment
- Colorado Department of Transportation – Data Management Branch
- Colorado Department of Transportation – Environmental Branch
- Colorado Department of Transportation – Region IV
- Colorado Historical Society
- Colorado Natural Heritage Program
- Environmental Protection Agency – Region 8
- Federal Highway Administration
- Middle South Platt Wetland Bank
- North Front Range Metropolitan Planning Organization
- US Army Corps of Engineers
- US Fish and Wildlife Service
- US Forest Service
- US Geological Survey

May 24, 2004

- North Front Range Metropolitan Planning Organization
- Colorado Department of Transportation – Data Management Branch
- Colorado Department of Transportation – Environmental Branch
- Colorado Department of Transportation – Planning Branch
- Colorado Department of Transportation – Region IV
- Colorado Historical Society
- Denver Regional Council of Governments
- Environmental Protection Agency – Region 8

- Federal Highway Administration
- Rocky Mountain Bird Observatory
- Spensley and Associates
- US Fish and Wildlife Service
- US Geological Survey

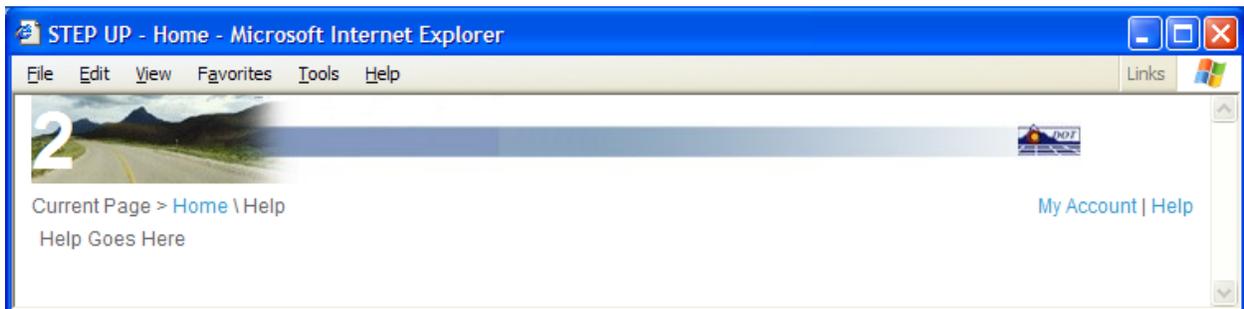
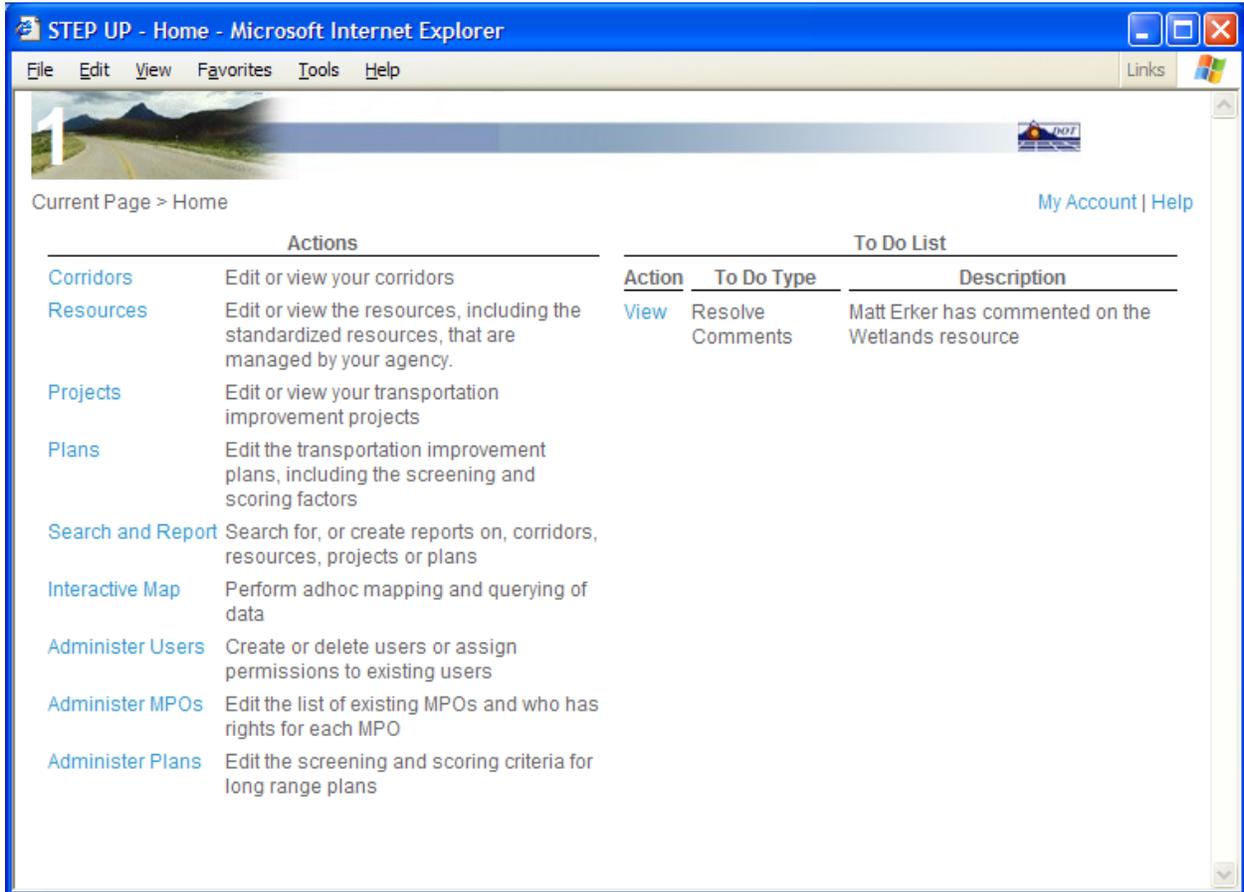
A.4. Consultant Involvement

The Denver office of Carter & Burgess, Inc. (707 17th Street, Denver, CO 80202), under contract to the Colorado Department of Transportation, has functioned as the principal consultant to the Steering Committee charged with researching and developing the model planning process and Regional Cumulative Effects Assessment process. The following staff members have participated in the project.

Table A.4. Consultant Staffing

Name	Role
Gina McAfee, AICP	<i>Project Director</i>
Phil Lidov	<i>Project Manager</i>
Tracey MacDonald	<i>Phase I Task Manager, Principal Researcher</i>
Matt Erker	<i>Application Development</i>

Appendix B. Application Screens



STEP UP - Home - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

3

Current Page > Home \ My Account [My Account](#) | [Help](#)

Login Name: erkermw

First Name:

Last Name:

New Password: (leave blank to not change password)

Confirm New Password:

E-Mail Address:

Phone Number:

Organization: Carter & Burgess

Rights: Viewer

List Corridors - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

4

Current Page > Home \ Choose Resource [My Account](#) | [Help](#)

My Resources

Action	Resource Name	Last Updated
Edit	Wetlands	11/20/2004
Edit	Prairie Dog Habitat	11/22/2004
Edit	Rabbit Burrows	8/20/2004

Standardize Environmental Resource - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Current Page > Home \ Choose Resource \ Standardize Resource (Wetlands) My Account | Help

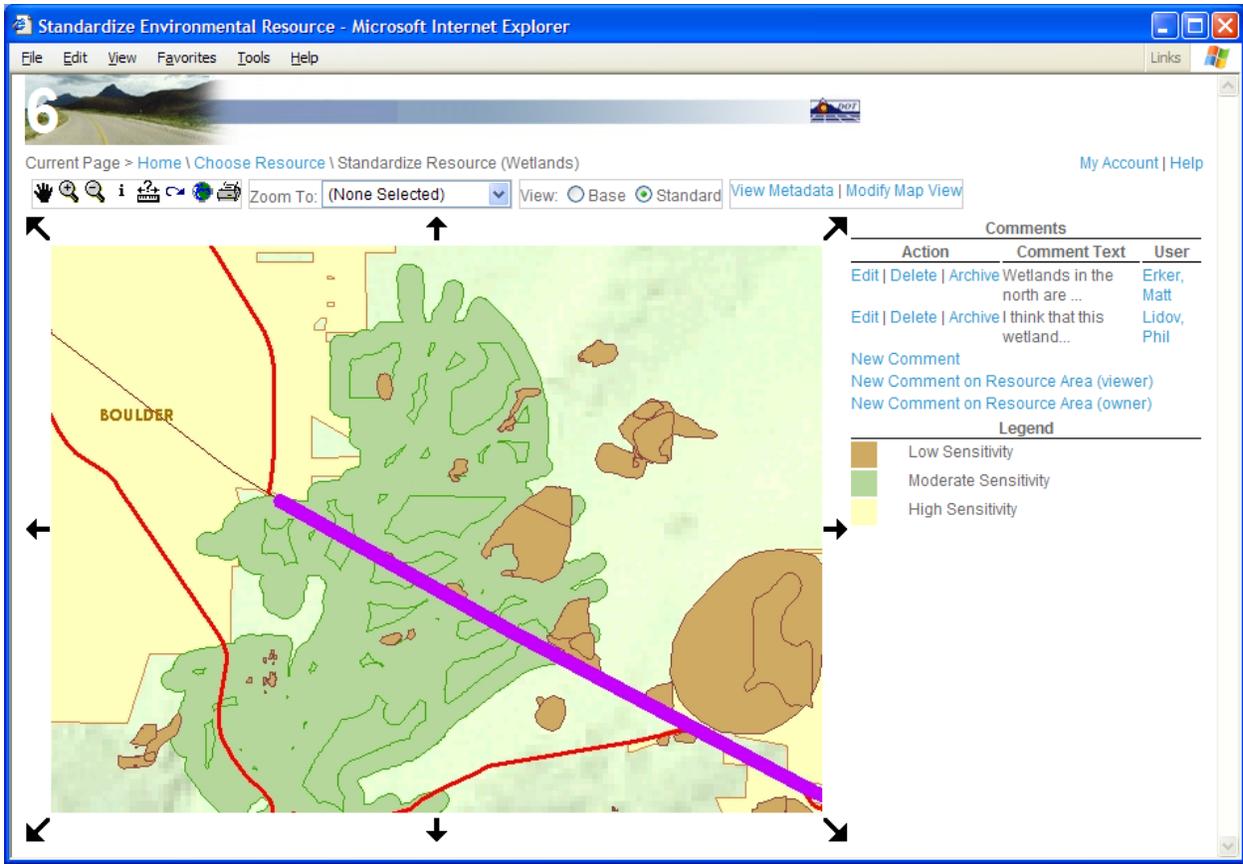
Zoom To: (None Selected) View: Base Standard [View Metadata](#) | [Modify Map View](#)

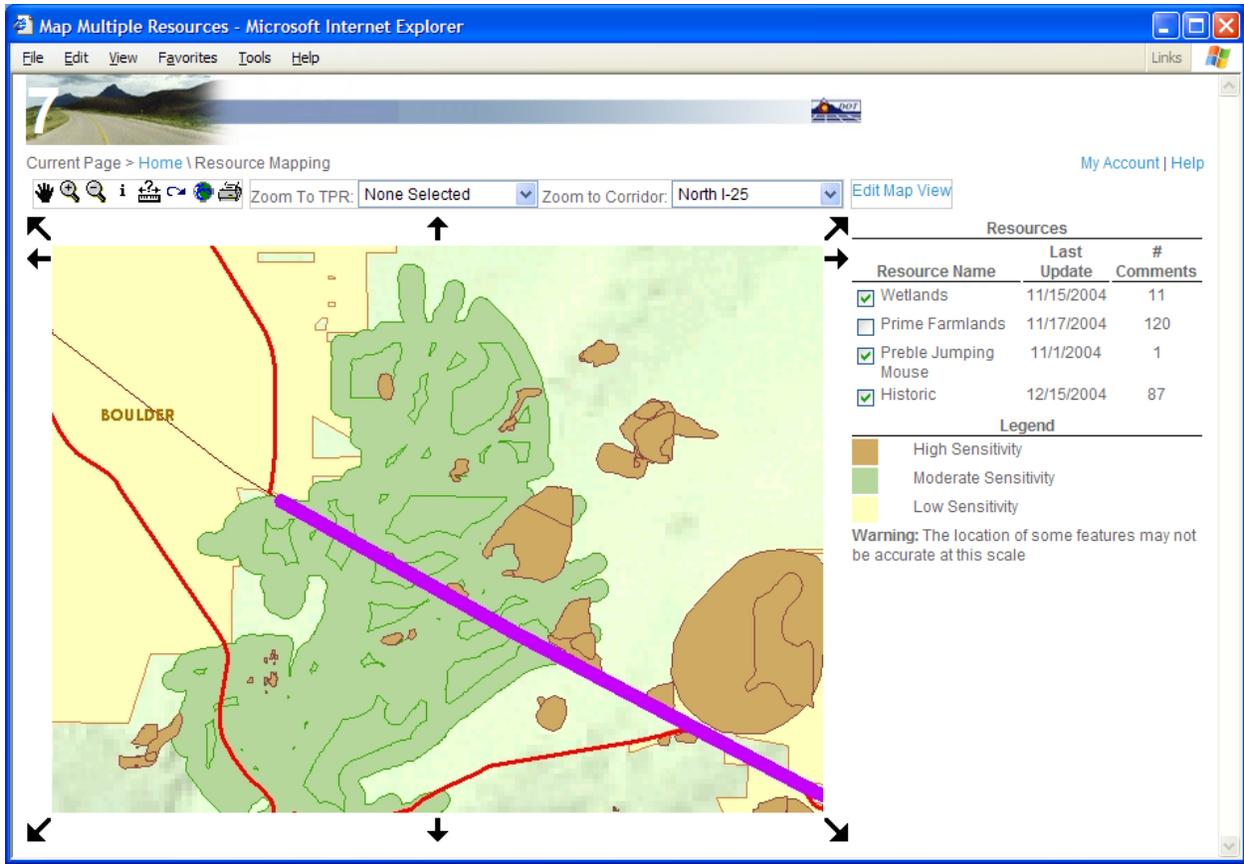
Comments

Action	Comment Text	User
Edit Delete Archive	Wetlands in the north are ...	Erker, Matt
Edit Delete Archive	I think that this wetland...	Lidov, Phil
New Comment		
New Comment on Resource Area (viewer)		
New Comment on Resource Area (owner)		

Legend

- Class I Wetland
- Class II Wetland
- Class III Wetland





8

List Corridors - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Current Page > Home \ List Corridors

My Account | Help

My Corridors

Action	Corridor Name	Last Updated	Primary Investment Category
Edit Delete	North I-25	11/20/2004	System Quality
Edit Delete	Horseshoe Reservoir Road	11/22/2004	Mobility
Edit Delete	Erker Lane	8/20/2004	Strategic Projects

[Create New Corridor](#)

Location Map

9

Enter/Edit Corridor - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Current Page > Home \ List Corridors \ Edit Corridor

My Account | Help

TPR: North Front Range MPO

Name:

Primary Investment Category:

Attributes:

- System Quality:
- Safety:
- Mobility:
- Strategic Projects:

Vision:

Goals:

Strategies:

Location Description:

Location Map

List Projects - Microsoft Internet Explorer

File Edit View Favorites Tools Help

10

Current Page > Home \ List Projects My Account | Help

Actions	Project	Project Location	Status
Edit Delete	CF-5061	PCR 77 - Tarryall Creek Road FLH	Funding Submitted
Edit Delete	CF-5126	SH 9 B - US 24 (Hartsel) N to Breckenridge (R1)	Project Updated, Ranked by Region
Edit Delete	CF-5127	US 24 A - Park/Teller CL east to SH 67	Funding Submitted

My Projects

Edit Project - Microsoft Internet Explorer

File Edit View Favorites Tools Help

11

Current Page > Home \ List Projects \ Edit Project My Account | Help

Long Range Plan Number: New Project

Project Location:

General **Cost** Element Narrative Location Score Detailed Screening Comments Status

Project Name:

Submitting Agency: North Front Range MPO
Contact: [Thieman, Suzette](#)

Primary Investment Category: System Quality

Description:

Project Code:

Was project included in RTP?:

Is Project in other local and/or Regional Plan?:

if Yes, which plan:

How does the project fit with the Corridor Vision?:

Is the project area covered by an adequate public facilities ordinance?:

If so, basic or enhanced?:

Is there another project or phase that needs to be completed before this project can be implemented?:

if Yes, which project:

11

Current Page > Home \ List Projects \ Edit Project

Long Range Plan Number: New Project

Project Location:

General Cost Element Narrative Location Score Detailed Screening Comments Status

Total Capital Cost: \$

Annual Operating Cost: \$

Current Available Federal/State Funding \$:

Current Available Local Match: \$

Current Available Local Overmatch: \$

Save Cancel

11

Current Page > [Home](#) \ [List Projects](#) \ Edit Project [My Account](#) | [Help](#)

Long Range Plan Number: New Project
Project Location:

General | **Cost** | **Element** | **Narrative** | **Location** | **Score** | **Detailed Screening** | **Comments** | **Status**

Narrative	Response	Your Score	Erker	Thieman	Weight
System Congestion	This project will reduce congestion by doing this and this and this, from Denver to Cheyenne.	(none) ?	2	2	13
Congestion Mitigation:	This project will reduce congestion by doing this and this and this, from Denver to Cheyenne.	(none) ?	2	2	15
Safety Enhancement:	This project will enhance safety a whole bunch. Trust me!	(none) ?	2	2	9
Multi-Modal Enhancement:	Planes, Trains and Automobiles. That what this project is about.	(none) ?	2	2	4
Timely Implementation:	Tomorrow, Tomorrow, I love you, Tomorrow. You're only a day away!	(none) ?	2	2	2
Land Use:	Nope, none of it!	(none) ?	2	2	21
Environmental:	Cleaner water, clearer air, what could be better?	(none) ?	2	2	11
Total Score: NA			54	54	

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Current Page > [Home](#) \ [List Projects](#) \ Edit Project
 Long Range Plan Number: New Project [My Account](#) | [Help](#)

Project Location:

[General](#) | [Cost](#) | [Element](#) | [Narrative](#) | [Location](#) | [Score](#) | [Detailed Screening](#) | [Comments](#) | [Status](#)

Resource Name	Not Scored	Low Impact	Moderate Impact	High Impact	Comments
Wetlands	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Prairie Dog Habitat	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Rabbit Burrows	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

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Project Location:

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Action	Commentor	Organization	Comments
View	Joe Smith	NFR MPO	If you build this, they will come. Is this a good thing?
View	Phil Lidov	CDOT	I don't want you to build this!

[Create New Comment](#)

Edit Project - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Long Range Plan Number: New Project

Project Location:

General Cost Element Narrative Location Score Detailed Screening Comments Status

Current Project Status: **Draft** [v]

Date	Person	Status	Comments
11-02-2004	Smith, Granny	New Comment	
12-04-2004	Thieman, Suzette	Project Reviewed	Looks great! Good job Granny!
12-22-2004	Lidov, Phil	Project Location Entered	I made some assumptions about where this is located

List Plans - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Action	Owning MPO	Plan Name	Description	Last Updated	# Project Types
Edit Copy Delete	North Front Range	MPO 2025	Official plan for 2025	10/09/2003	5
Edit Copy Delete	North Front Range	MPO 2030	2030 Plan with FasTracks	11/09/2004	5
Edit Copy Delete	North Front Range	MPO 2030	Official plan for 2030	11/09/2004	5

[Create New Plan](#)

List Plans - Microsoft Internet Explorer

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Owning MPO: North Front Range MPO

Plan Name:

Description:

Plan Cost Year:

Project Types:

Action	Project Type
Edit Delete	Transportation Systems Management Projects
Edit Delete	Travel Demand Management
Edit Delete	Transit Projects
Edit Delete	Passenger and Freight Rail Projects
Edit Delete	Bicycle/Pedestrian Projects
Create New Project Type	

Narrative Questions:

Action	Narrative Name	Weight	Description	Scoring Instructions
Edit Delete	System Continuity	21	Project will provide a new service...	3 = Project will significantly...
Edit Delete	Congestion Mitigation	24	Project will significantly reduce...	3 = Project will significantly...
Edit Delete	Safety Enhancement	9	Project will significantly improv...	3 = Project will significantly...
Edit Delete	Environmental	9	Project will significantly improv...	3 = Cleans air and water, increases livestock...
Create New Narrative Question				

Reviewers:

Action	Reviewer Name	Organization
Delete	Thieman, Suzette	North Front Range MPO
Delete	Erker, Matt	Carter & Burgess
Delete	Lidov, Phil	CDOT
Add Reviewer		

Enter/Edit Comment - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Resource: Wetlands

Comment Date: 2/14/2005
 User: Erker, Matt (Carter & Burgess)

Comment: This area is wet and mushy. Should it be a Class I wetland or a Class II?

Current Sensitivity: High Sensitivity
 New Sensitivity Value: (No Change to Current Value) ?
 Explain:

Current Accuracy: Low Accuracy
 New Accuracy: (No Change to Current Value) ?
 Explain:

Spatial Extent: Statewide
 Transportation Planning Region: Central Front Range
 Corridor: North I-25
 Resource Area: Select Resource Area
 Specific Location: Modify Location

Data Manager Response: Resolved
 Need Input

Data Manager Comments:

Cancel Save

Location



View/Edit Environmental Resource - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Selected Resource: Wetlands
Last Updated: 11/25/2004

Resource Area Name:

Current Sensitivity: High Sensitivity
New Sensitivity Value: ?

Explain:

Current Accuracy: Low Accuracy
New Accuracy: ?

Explain:

Comments:

Contact: Name: Lidov, Phil
Phone: 303-820-5201
E-Mail: lidovpa@c-b.com

Data Manager Response: Resolved
 Need Input

Data Manager Comments:

Location



View/Edit Metadata - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Resource: Wetlands

Themes:	Action	Title
	View	Rivers
	View	Wet Mushy Areas

Identification Information:

Citation:
Citation information:
Originators: Colorado Department of Transportation

Title:
Cities

Publication date: 20031231
Geospatial data presentation form: vector digital data

Online linkage: <http://www.dot.state.co.us>

Description:
Abstract: Features in this dataset represent the legal incorporation boundaries of all incorporated cities in the State of Colorado. Features are represented by polygon geographic shapes.
Purpose: Used for general reference, geoprocessing, and cartography.

Time period of content:
Time period information:
Single date/time:
Calendar date: 20021231

Cancel

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Resource Mapping: Maximum - Maximum of any resource
 Additive - Sum of all resources
 Average - Average of all resources

Base Layers

Show w/o labels	Show w/ labels	Do Not Show	Layer Name
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Existing Roads
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	County Boundaries
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	City Boundaries
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Water Bodies

Cancel Save

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Corridor: North I-25

Routes:	Action	Road Name	Start MP	End MP	Width (feet)
	Edit Delete	25A	156	169	1500
	Edit Delete	25B	158	179	1000

[Create New Route](#)

Edit Route:

Roadway:

[Pick from Map](#)

Search by Name

Keyword:

Results:

Search by Class

Class:

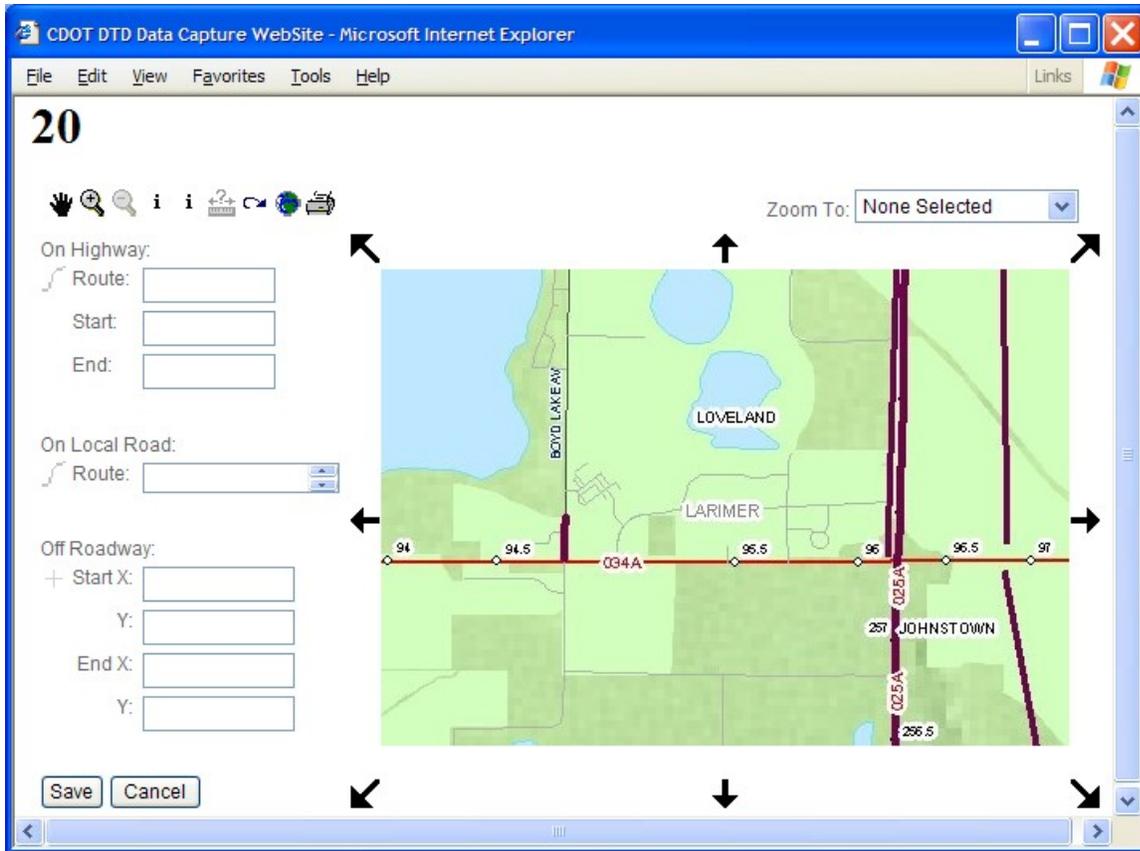
Results:

Start MP:

End MP:

Width: (feet)

Location Map



CDOT DTD Data Capture WebSite - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Select Location Close Window

Point On Existing Highway:
 Highway Route:
 Milepost:

Route On Existing Highway:
 Highway Route:
 From Milepost:
 To Milepost:

Point Off Existing Highway:
 Easting: Note: Enter values in UTM Zone 13
 Northing:

Enter Address:
 Address:
 Zip:

Intersection:
 Primary Street:
 Secondary Street:
 Zip:

Edit Project Type - Microsoft Internet Explorer

File Edit View Favorites Tools Help Links

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Project Category:

Elements:	Action	Order	Element Name	Description
	Edit Delete	1	Geographic Coverage	Describe where your project is using lat/long
	Edit Delete	2	Anticipated Improvement	Number of affected travelers, reduced travel time, improved safety...
	Edit Delete	3	Total Accidents	Please identify time period and separate by PDO, injury and fatal...
	Edit Delete	4	Accident Rate	If non-state highway, compare to other roadways/intersections...

[Create New Element](#)

Appendix C. FHWA/FTA NEPA Guidance Memorandum

