Maintaining Project Consistency throughout the Project Development Process

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ABSTRACT

Federal and state transportation planning statutory and regulatory laws require transportation projects to be consistent with transportation plans and improvement programs before a federal action can be taken on a project requiring one. Significant delays in project delivery can occur if the federal funding is withheld when projects are found to be inconsistent with transportation plans and improvement programs. This issue is especially critical for projects in nonattainment and maintenance areas because an inconsistent project might trigger a conformity failure or delayed determination for the entire plan and/or program.

This paper describes the main challenges leading to project inconsistencies are insufficient communication over the changes to projects’ design concept and scope, cost, and estimated letting date. The research team developed a comprehensive background informational, Project Consistency Guidebook, and a project consistency checklist for practitioners to check for consistency during the project development process. The guidebook explains how project planning and development interact with the regional and project level air quality conformity process, and details procedures and tools that Department of Transportations and Metropolitan Planning Organizations can use to understand and maintain project consistency.
INTRODUCTION

Streamlined project delivery is consistently a goal for state department of transportation (DOT). Any unnecessary delay in the project delivery process may exacerbate the cost of the project. Federal and state transportation planning statutory and regulatory laws require transportation projects to be consistent with metropolitan transportation plans (MTP) and transportation improvement programs (TIP) before the Federal Highway Administration or the Federal Transit Authority (FTA) take federal action on a project requiring one.¹

The main purpose of this paper is to describe the work completed by the researchers to assist transportation practitioners maintain project consistency through the project development process and identify what causes and leads to project inconsistencies. Project consistency is especially critical for projects in nonattainment and maintenance areas. This is because an individual project’s conformity is directly linked to the consistency of the projects with appropriate transportation plans (MTP) and improvement programs (TIP and Statewide Transportation Improvement Program [STIP]); a non-conforming project might trigger a conformity failure for the entire TIP. For example, a project is no longer conforming to the State Implementation Plan (SIP) if it becomes inconsistent with the Metropolitan Transportation Plan and the Transportation Improvement Program.

This project was conducted for the Texas Department of Transportation’s Environmental Affairs Division to understand the causes leading to project inconsistency and how to best address them. Federal and state requirements state that transportation projects must be described consistently in all applicable plans, programs, conformity documentation and environmental documents with regards to the following elements:

- Design concept, including project limits, location, type of facility, and scheduled letting date.
- Design scope, including specific information such as number of lanes, length, signalization, etc.
- Project cost.

In general, if a project does not meet the federal project consistency requirements, the FHWA will not take action on the project. When federal action cannot be taken due to project inconsistency, delays occur, and those delays put TxDOT at financial risk. More importantly, without these federal actions, TxDOT cannot be reimbursed with federal funds for eligible project costs.

The project investigated the various aspects of the project development process that TxDOT conducted and focused on how to maintain project consistency through the letting stage. The research team gained an understanding of the regulations of transportation planning, the project development life cycle, and how they relate to the general and project-level transportation conformity process. The researchers developed a guidebook for practitioners outlining the causes

¹ Including signing a Record of Decision (ROD), Finding of No Significant Impact (FONSI), or approval of a Categorical Exclusion (CE) for a project.
of project consistency and how to prevent inconsistencies from occurring. For the purposes of this project, maintaining project consistency is relevant to projects listed in the MTP, TIP, STIP, and conformity documentation. TxDOT uses the Unified Transportation Program (UTP) as TxDOT’s 10 year plan to guide transportation project development. According to state regulations, projects listed in the UTP also must be consistent with project listed in the MTP, TIP and STIP. This paper will describe the project, the study approach, methods used and the results of the project.

8 STUDY APPROACH

The overall approach for achieving the objectives of this study consisted of the following four basic steps:

1. Identify information sources and obtain and review appropriate information through literature review and interviews;
2. Process the information and obtain details on key issues (i.e. processes and practices);
3. Identify needs and problem spots based on detail information of previous steps; and
4. Develop solutions to address the needs based on findings of steps 2 and 3.

Researchers conducted a literature review on the transportation planning process, project development process and also conducted interviews with key stakeholders in the planning and project development process in the state of Texas. The following section describes study’s approach.

20 Literature Review

The researchers conducted an extensive literature search and synthesis to provide context/understanding of project consistency regulations and practices, with a focus on the PD process’s relationship with the planning and programming documents.

The literature synthesis was assembled based on preliminary interviews with TxDOT staff, a review of current practices, findings from published and internet sources, and other information sources. The primary information sources include materials from FHWA, TxDOT, MPOs, TxDOT partner agencies, state DOTs, or other agencies from outside Texas. The research team compiled a list of target information sources see Table 1.
Table 1. Literature Review Information Sources.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Year</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHWA/FTA</td>
<td>2007</td>
<td>The Transportation Planning Process Key Issues, A Briefing Book for Transportation Decision Makers, Officials, and Staff</td>
</tr>
<tr>
<td>FHWA</td>
<td>2010</td>
<td>Transportation Conformity, A Basic Guide for State &amp; Local Officials</td>
</tr>
<tr>
<td>TxDOT</td>
<td>2001</td>
<td>Transportation Planning Manual</td>
</tr>
<tr>
<td>TxDOT</td>
<td>2012</td>
<td>Project Development Process Manual</td>
</tr>
<tr>
<td>TxDOT</td>
<td>2004</td>
<td>Environmental Manual</td>
</tr>
<tr>
<td>TxDOT</td>
<td>2011</td>
<td>Standards of Uniformity for Projects without Federal Highway Administration Involvement, Transportation Planning Consistency, and Fiscal Constraint</td>
</tr>
<tr>
<td>TxDOT</td>
<td>2012</td>
<td>Project Scope and Environmental Issues Checklist for CEs, BCEs, and PCEs</td>
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<td>TxDOT</td>
<td>2012</td>
<td>Project Scope for Environmental Review Documents</td>
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<tr>
<td>TxDOT</td>
<td>2012</td>
<td>Project Scope Amendment</td>
</tr>
<tr>
<td>City of Port Angeles</td>
<td>2011</td>
<td>Project Development Checklist</td>
</tr>
<tr>
<td>Colorado DOT</td>
<td>2003</td>
<td>Non-Programmatic Categorical Exclusion Environmental Review Summary</td>
</tr>
<tr>
<td>University of Princeton</td>
<td>2012</td>
<td>Project Audit &amp; Review Checklist</td>
</tr>
<tr>
<td>Arizona DOT</td>
<td>2009</td>
<td>Development Process Checklist</td>
</tr>
<tr>
<td>Georgia DOT</td>
<td>2011</td>
<td>Plan Development Process</td>
</tr>
<tr>
<td>Kentucky Transportation Cabinet</td>
<td>2011</td>
<td>Local Public Agency Project Development Checklist</td>
</tr>
</tbody>
</table>
Federal and state transportation planning statutes and regulations require transportation projects to be consistent with transportation plans and programs. This way, the FHWA (under NEPA regulations) can sign a Record of Decision, Finding of No Significant Impact, or approve a Categorical Exclusion for a project delegated to TxDOT/ENV under MAP-21 effective February 12, 2014. Figure 1 summarizes the requirements of federal regulations with regard to the plans and programs that are subject to maintaining project consistency. Each project or project phase included in the TIP, in metropolitan planning areas, must be consistent with an approved MPO transportation plan.

- Projects described in ROD, FONSI, or CE shall be consistent with the MTP.
- All project phases planned within the life of the transportation plan have to be included in the fiscally constrained MTP for FHWA approval.

- Must be fiscally constrained and must include a financial summary that is fiscally constrained to funding forecasts of TxDOT’s Finance Division.
- Inclusion of projects only if consistent with state and local long-range plans.
- The timing of subsequent phases should be consistent with the MTP and the environmental document.

Source: Adapted from 23 CFR 450 (i) and Texas Administrative Code 43 TAC 16 (ii)

Figure 1. Federal and State Project Consistency Requirements.

Stakeholder Interviews

In addition to the literature synthesis, researchers conducted a series of interviews to document current practices and efforts in maintaining project consistency. The interviews helped the research team to gain an understanding of the stakeholders’ roles and responsibilities during the project life cycle. The interviews were conducted in person, through conference calls, and email. The research team contacted state DOTs that have similar characteristics as TxDOT such as large population, many transportation projects, and nonattainment metropolitan areas. The interviews with state DOTs occurred through conference calls. A majority of DOTs have developed their own process for project development. The research team reviewed three other DOTs project development process—California, Florida, and Ohio. All state DOTs have developed their own project development process and manual identifying their specific problems and concerns during project development process; however, the tools and resources shared with the research team did not directly correlate to this specific project of maintaining project consistency throughout the project development process. Table 2 shows the final list of the interviews.
Table 2. Final List of Interviews.

<table>
<thead>
<tr>
<th>District</th>
<th>Austin, Beaumont, Dallas, El Paso, Fort Worth, Houston, Pharr, Paris, San Antonio, and Waco</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPOs</td>
<td>Beaumont, Brownwood, Capital Area MPO (CAMPO), El Paso, Harlingen, Houston-Galveston Area Governments, San Antonio, Sherman, and Waco</td>
</tr>
<tr>
<td>TxDOT Divisions</td>
<td>Right-of-Way (ROW), Toll Authority, Transportation Planning and Programming (TPP), Environmental Affairs (ENV), Finance (FIN), Project Management Office (PMO)</td>
</tr>
<tr>
<td>Federal Agencies</td>
<td>Federal Highway Administration (FHWA)</td>
</tr>
<tr>
<td>State DOTs</td>
<td>California, Ohio, Florida</td>
</tr>
</tbody>
</table>

The research team gained an understanding of the transportation planning process through the literature review and interviews. The MPOs and the state DOT are the major partners in the transportation planning process. Transportation planning is a cooperative process because no single agency is responsible for the entire transportation system. In metropolitan areas, the MPO is responsible for actively seeking the participation of all relevant agencies including transit agencies and stakeholders in the planning process, whereas the state DOT is responsible for activities outside metropolitan areas.

The research team identified three TxDOT manuals and a SOU guide that directly relates to the project development process to maintain project consistency obtained from interview with TxDOT staff. These manuals provide streamlined guidance to ensure that the project development process complies with both federal and state transportation planning requirements and regulations. A list of the manuals and the SOU reviewed are listed below:

**Environmental Manual**

This manual provides technical information for the ENV Division of TxDOT. The manual outlines the policies and practices relating to environmental analysis and the transportation project development process. The manual also provide information on guiding projects through the environmental clearance process of NEPA.

**Transportation Planning Manual**

This manual provides guidance on the Texas planning process for rural and metropolitan areas and the statewide transportation plan. The manual outlines the federal and state requirements and regulations.

**Project Development Process Manual**

The manual provides technical guidance for the project development process and how stakeholders can properly move a project through the process to meet all state and federal
regulations. The intended audience is TxDOT personnel and describes each development process from the project initiation to letting.

**Standards of Uniformity for Projects without Federal Highway Administration Involvement**

TxDOT’s ENV Division has developed the guide to projects without FHWA involvement in proposed projects (NFPPs), called *Standards of Uniformity (SOU) for Projects without Federal Highway Administration Involvement*. The SOU is designed to ensure that all NFPPs using it during the development process will comply with air quality-related requirements.

**RESULTS/FINDINGS**

The research team found after conducting interviews with TxDOT districts and MPOs that a diverse audience and various staff was involved and responsible for maintaining project consistency. Therefore, the research team needed to provide background on transportation planning, project development process, conformity and environmental documents. Staff would be involved in one phase of the project development process but needed the background all the elements to understand why and how to maintain consistency. Staff needed to understand how their role relates to the entire process and how any inconsistency in their area can impact the project planning documents. The research team then developed a training package for practitioners which included background information on key elements of the process, a guidebook covering project consistency elements and a tool in the form of a checklist to check for consistency in planning documents. The following sections will describe the background, project consistency guidebook and checklist.

**Background Overview**

The background material provided practitioners with a general understanding of the transportation planning process, federal environmental regulations specifically the National Environment Policy Act of 1969 (NEPA) and conformity regulations and its relevance to maintaining project consistency.

Transportation planning is used by state and local governments to decide which transportation projects to fund. Because transportation has broad impacts, transportation planning involves not only transportation goals such as mobility, accessibility, and connectivity, but it also involves social aspects, such as economic vitality, the environment, livability, social equity, safety, security, and financial constraints. An effective transportation planning process is one that is continuing, cooperative, and comprehensive. Transportation planning is conducted at the statewide and metropolitan levels.

The two most important agencies/institutions involved in planning for publicly funded transportation infrastructure projects in Texas are TxDOT and MPOs. TxDOT is responsible for the state maintained road network, which is commonly referred to as “on-system” facilities. MPOs are responsible for planning for transportation infrastructure in the current and expected urbanized areas over a 20-year forecast period. Texas has four planning documents that must remain consistent which includes the MTP, UTP, TIP and STIP. The figure below shows the planning documents has they relate to the project development process.
Figure 2. Key Transportation Planning Documents.

Project Development Process

Generally, a project life cycle shows the distinct phases a project passes through as it progresses. Organizations can divide projects into phases to provide better management control. Collectively, these phases are known as the project life cycle. TxDOT identifies four general stages in the project life cycle: project initiation, planning, development, and construction. TxDOT districts, in conjunction with MPOs, manage the project through these four stages. Figure 3 shows a simplified overview of the TxDOT project development process and where key TxDOT divisions are involved.
Figure 3. Overview of TxDOT Project Development Process.
Source: Adapted from TxDOT Project Development Process Flowchart.

Planning and Conformity
The background section described the relationship between the environment and transportation planning. The National Environmental Policy Act of 1969 (NEPA) established a national policy to promote the protection of the environment through the actions and programs of federal agencies. A direct link between NEPA and transportation planning is the requirement that a project in a nonattainment or maintenance area be included in a conforming plan and TIP before it can be advanced; a major change in the project scope and design as it evolves during the NEPA process triggers a conformity and plan reassessment. Figure 4 shows an overview of the major elements of the transportation conformity process.
Researchers developed a guidebook for TxDOT to provide an understanding of causes of project inconsistency and how to address project consistency. The guidebook assists practitioners identify causes of project inconsistency and how to address inconsistencies and prevent them from occurring in the future and has three basic goals:

- Define project consistency and identify the causes of project inconsistencies.
- Identify resources and best practices that minimize project delays and financial risk, including the Project Consistency Checklist.

Figure 4. Overview of Transportation Conformity Process.
Kenney, Farzaneh and Prozzi

- Provide contact information for external entities as well as communication guidelines for resolving project inconsistencies.

To meet these goals, this guidebook was organized into chapters as follows:
- Chapter 2 defines project consistency and provides an overview of its elements.
- Chapter 3 identifies the causes of inconsistencies and outlines where project consistency should be reviewed.
- Chapter 4 discusses project consistency management throughout the project development process to minimize delay and financial risk. In addition, this chapter identifies the tools helpful in this process.

The following sections highlight important sections from the guidebook.

Causes of Inconsistencies

Through the literature review and interviews with various stakeholders, the research team identified four of the most common causes that lead to project inconsistencies. The causes of project inconsistency can be numerous, but the following is a summary of the most common causes:

- **Projects evolve** – The long periods of time that elapse between stages in the planning, project development, and environmental processes increase the chances that a project’s design, scope, estimated cost, or estimated letting date will change. When changes are not communicated, it is difficult to maintain project consistently in every document in which the project has been listed.

- **Inconsistency in regulatory processes** – Though inadvertent, some of the regulatory requirements for planning, transportation conformity, and NEPA evaluations are inconsistent in terms of the timing and criteria under which the federal actions related to each process can occur.

- **Communication** – More to the point, there can be a lack of communication between the numerous local, state, and federal entities responsible for the completion of the plans, programs, and processes to advance a project from inception to construction. For example, if the project description is changed during the preliminary design phase, TxDOT would need to notify the MPO to update the project description in the MTP before that project is carried into the TIP with an inconsistent (or rather, incorrect) project description.

- **Complexity of Funding Scenarios** – Programming transportation projects is a dynamic process. Changes in funding levels, fund sources, agency operations, economic
conditions, current law, timing of project schedules, and other factors\textsuperscript{2} such as changes in the estimated cost of a project over the time it takes to develop a project, will result in changes to one or more aspects of a project’s scope, design, or description. The changes would have to be revised in the appropriate planning and environmental documents.

Examples of possible inconsistencies are listed below:

- The project design concept and scope are not consistent with that provided in the MTP, TIP, and/or STIP, and/or the scopes do not match the funding amounts that are projected.
- The project is not fiscally constrained because:
  - It is not included in the fiscally constrained portion of the MTP.
  - The project funding type is not consistent with that in the MTP, TIP, and/or STIP.
  - The total project cost significantly exceeds that provided in the MTP, TIP, and/or STIP (by more than 50 percent).
- A project is not included in the STIP or TIP but is found earlier in the planning documents such as the MTP.
- In areas subject to transportation conformity (i.e., nonattainment and maintenance areas), the project completion year is not consistent with the MTP and/or TIP regional emissions analysis years for conformity determination.

In general, if a project does not meet the federal project consistency requirements, the FHWA will not take action on the project. When federal action cannot be taken due to project inconsistency, delays occur, and those delays put TxDOT at financial risk. More importantly, without these federal actions, TxDOT cannot be reimbursed with federal funds for eligible project costs. Figure 5 summarizes the potential consequences of a project inconsistency.

\textsuperscript{2} 2014–2023 Cash Forecast. TxDOT. August 2013.
Figure 5. Consequences of Project Inconsistency.

Project Consistency Responsibility

DOTs and MPOs are the major partners responsible for keeping projects consistent with planning documents. Project managers play a central role in maintaining project consistency. It is important for Districts and MPOs to identify the staff responsible for key consistency-related steps/activities during the project development process, both inside their own agency and their partner agency. Figure 6 lists the most common steps/activities that can be used for this purpose along with the most appropriate staff member. Responsibilities should be clearly explained and assigned to staff, and an effort should be made to ensure that they know the responsible party for the other activities.

- **Internal Communication and Coordination**
  - Tracking and internal coordination of changes made to projects
  - As project moves through the PD process, checks environmental documents for any inconsistencies

- **Oversee and Coordinate Environmental Process**
  - Compiles environmental documents for projects, and checks for any inconsistencies with the planning documents (MTP, TIP, STIP, UTP)

- **External Communication and Coordination**
  - Communicating changes to/from MPOs and headquarter staff
  - Ultimately responsible for maintaining project consistency and coordinating with the MPO and TxDOT Divisions

- **Review of Submitted Environmental Documents and Project Scope**
Maintaining Project Consistency

Maintaining project consistency, or Project Consistency Management, is an ongoing process and covers all phases of project development. It becomes critical during the last four years of the project development process (i.e., when projects are listed in the TIP and STIP).

The scoping document is a collection of the first set of information on a project. A robust scoping coupled with early coordination ensures that the project is set up by various stakeholders in a consistent and timely manner. This early consistency has been indicated to greatly help the stakeholders to maintain the consistency of information in the later stages of the project development.

The project should be consistent with all applicable planning documents throughout the project development process and into the preparation of the environmental review document. The main mechanism through which TxDOT and FHWA/FTA check for project consistency is the environmental review document and applicable planning documents (i.e., MTP, TIP, STIP). If the project design concept or scope changes significantly after the project is environmentally cleared, a reevaluation will be required and planning documents will likely need to be updated.

The basic principle of project consistency management is a seemingly simple task that becomes a challenge in practice because at any given time, there are multiple teams working on different aspects of a project and each use different tools and data resources. That is why project inconsistencies are strongly associated with a breakdown of communication and poor coordination. Establishing a systematic process for this task can greatly help practitioners to simplify the coordination of efforts between different parties.

The following proposed steps can help in establishing such a process. The goal of these steps is to establish project inconsistency prevention as a routine part of project development process at the local and regional level.

- **Step 1: Training** – Make sure that all project managers have a general understanding of the:
  - Project delivery process.
  - Planning and programming documents.
  - Environmental process.
  - Transportation conformity.
  - Importance of maintaining project consistency.

- **Step 2: Assign Responsibility** – Clear roles assignment is an important factor in establishing an effective PCM process. Ensure that all staff and parties involved in the project inconsistency prevention, specifically project managers, have a clear understanding of their responsibility in the process.
- **Step 3: Authority and Tools** – To establish an effective PCM process, project managers should be assigned the authority to meet their responsibilities and be equipped with the right tools to accomplish them.

- **Step 4: Establish a PCM Work Flow** – Establishing a workflow helps to clarify the steps necessary for maintaining project consistency. A workflow is a depiction of a sequence of operations and connected steps, which demonstrate the elements and flow of work in a simple form.

- **Step 5: Systematic Coordination and Communication** – Having a set of effective communication and coordination procedures, specifically with MPO staffers, is fundamental to achieve a successful project consistency management process. Many times communication and coordination occur on a personal level. While personal level communication and coordination is necessary and works in many instances, it has a few major flaws that can cause a breakdown of communication:
  
  o Risk of discontinuity: Staff turnovers can cause a major breakdown of communication until the new person establishes the working/personal relationship.
  
  o No guarantee of a minimum level of communication: It requires a strong personal level relationship of the staff and can become unreliable if a strong working/personal relationship does not exist between the parties.

**Best Practices**

The following are examples of best practices based on the research team’s interview with TxDOT and MPO staff with regard to establishing a system of communication and coordination that TxDOT districts have done:

- **Regular Meetings with MPO**—The TP&D director and/or environmental coordinators in some districts have monthly or quarterly meetings with MPO staffers. The main purpose of these meetings is to keep MPOs aware of any changes to projects as well as amendments or updates needed in the planning documents. Items such as project scope, costs, and limits are discussed in the meetings.

- **Regular Internal Project Meetings**—Some districts have regular internal meetings between the various district departments working on projects, including design, environmental, and planning. These internal meetings help maintain communication as a
project is developed at the district level. The involved parties are usually the district planners, environmental coordinators, and design engineers. These meeting are held on a regular basis or at critical junctures such as 30 percent, 60 percent, and 90 percent design or environmental analysis completed.

**Project Consistency Checklist**

The research team developed a project consistency checklist as a tool for practitioners to use to check for project consistency throughout the project development process. The checklist includes various elements related to conformity, design concept, design scope and project cost. The checklist also includes the planning documents that have to be checked such as NEPA documentation, MTP, TIP/STIP and UTP. The project checklist was developed based on forms that TxDOT currently uses for easy implementation for practitioners. The research team could not provide the checklist because TxDOT has not released the checklist for publication.

**CONCLUSIONS**

The research team investigated the various aspects of the project development process with a focus on how to maintain project consistency through the letting stage. Through an extensive literature review and interviews with TxDOT and MPO staff, the researchers gained an understanding of the regulations of transportation planning, project development life cycle, and how they relate to the general and project-level transportation conformity process. This project provides an insight to stakeholders’ involvement in maintaining project consistency and key challenges that hinder project consistency during the project development process. This project also outlines tools and resources that will assist with meeting FHWA’s criteria of maintaining project consistency.

The researchers found that the main challenges leading to project inconsistencies are insufficient communication over the changes to the projects’ design concept and scope, cost, and estimated letting date. This research provides a set of tools and recommended practices to assist state DOTs and MPO staff in maintaining project consistency throughout the project development process. The research team developed a project consistency guidebook. The guidebook explains how project planning and development interact with the regional and project level air quality conformity process.

**ACKNOWLEDGEMENTS**

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