U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
RESOURCE CENTER

Fiscal Constraint 101

January 19, 2010

New Mexico

Federal Highway Administration
Resource Center Planning Team

Seminar Objectives

- Understand the regulatory background of fiscal constraint
- Know the definition of key terms
- Explore considerations in revenue forecasting
- Outline the process used in estimating costs
- Know how to account for operations and maintenance costs
- Explain the role of the MPO and DOT Planner

Choose topics for in-depth treatment in March

Presentation Outline

- Fiscal Constraint Overview
- Contents of a Financial Plan
- Revenue Forecasting
- Project Cost Estimation
- Operations & Maintenance
- Putting it All Together
- Available Resources
- Discussion and Questions

Let's Get Started!

- Meet your instructor

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Fiscal Constraint Overview

What do we mean by Fiscal Constraint?

The metropolitan transportation plan, TIP, and STIP includes sufficient financial information for demonstrating that projects … can be implemented using committed, available, or reasonably available revenue sources, with reasonable assurance that the federally supported transportation system is being adequately operated and maintained." (23 CFR 450.104)

*Balancing available funding (revenues) with uses (costs)

When does it apply?

Applies to MTP/RTP, TIP/STIP

Does not apply to long range statewide plan

MTP Requirements

- Proposed improvements in sufficient detail to develop cost estimates
- A Financial Plan that shows:
  - Revenue to adequately operate and maintain system
  - Cooperatively developed revenue estimates
  - New sources needed and strategy to obtain
  - Year of expenditure dollars
  - Illustrative projects (optional)

S/TIP Requirements

- All Federally funded capital and non-capital projects
- Regionally significant projects
- For each project (or phase):
  - Description
  - Total estimated project cost
  - Funds to be obligated by year
  - Source of non-Federal funds
- Financial Plan (technically optional for STIP)

Fiscal Constraint:
Some Overarching Issues/Common Themes

- **Predicting the Future**
  - Uncertainty in many fund sources
  - Reauthorization unknowns
  - Cost increases/escalation

- **Risk and Uncertainty**
  - Risk mitigation strategies
  - Contingencies
  - Public Private Partnerships and Innovative Finance

- **Updates and Process Management**
  - Important for both Costs and Revenues
  - Fiscal constraint “feedback loop”

Fiscal Constraint:
Some Overarching Issues/Common Themes

- **Documentation**
  - Critical, critical, critical
  - Sufficient for both revenues and costs?
  - Sources, assumptions and methodology

- **Year of Expenditure (YOE)**
  - Applies to costs (inflation) and revenues (growth)
  - Escalation rates may differ

CONTENTS OF A FINANCIAL PLAN

Key Terms

Financial Plan - A comprehensive document that reflects revenues and costs of a transportation plan or program and provides a reasonable assurance that there will be sufficient financial resources available to implement and complete all the elements in the plan or program.

Fiscal Constraint - A demonstration of sufficient funds (Federal, State, local, and private) to implement proposed transportation system improvements, as well as to operate and maintain the entire system, through the comparison of revenues and costs.

Key Terms (cont.)

Inflation – Change in the value of money over time.

Escalation – Change in the price of a individual commodity or in the wage rates for a particular craft, caused by changes in market conditions (surplus or scarcity) independent of inflation.

Year of Expenditure – The predicted cost of a project or elements of a project taking into account both inflation and escalation at the time the costs are incurred.

Key Terms (cont.)

Capital Expenses - Includes highway construction (e.g., resurfacing, restoration, and rehabilitation improvements; construction of additional lanes, interchanges, and grade separations; and construction of a new facility on a new location) and acquisition of transit vehicles and equipment.

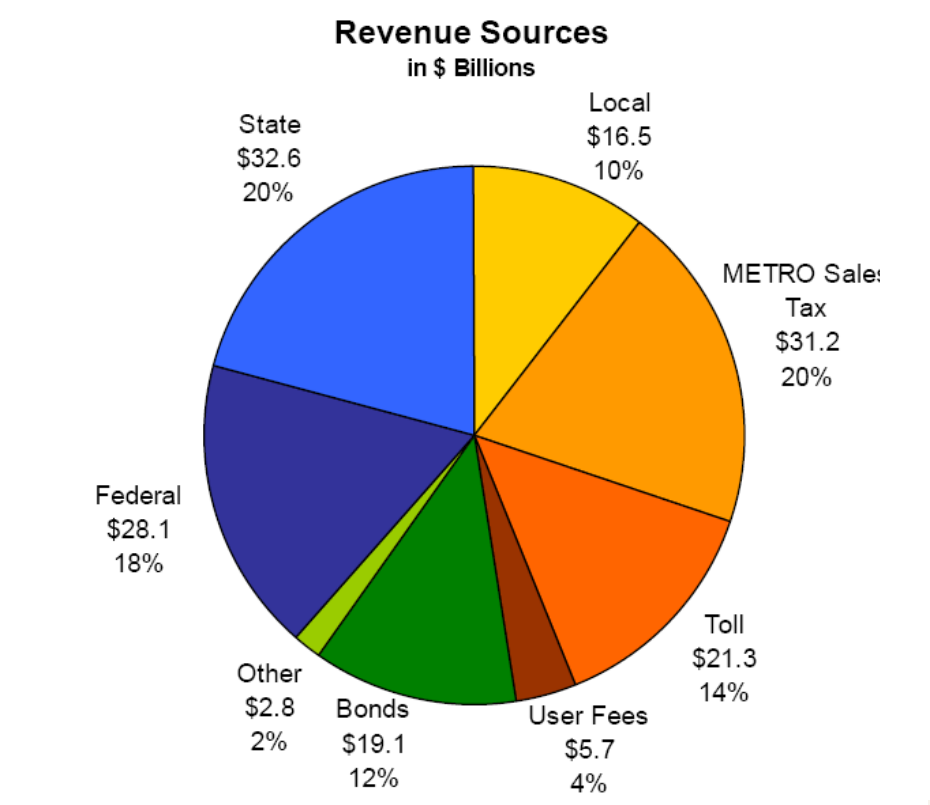
Cost Estimate - A prediction of all costs and the value of any resources needed to complete the design, right-of-way activities, environmental studies, construction, project management, etc. as well as costs and resources paid to others for work related to a project such as utility adjustments, environmental mitigations, and railroad relocations.

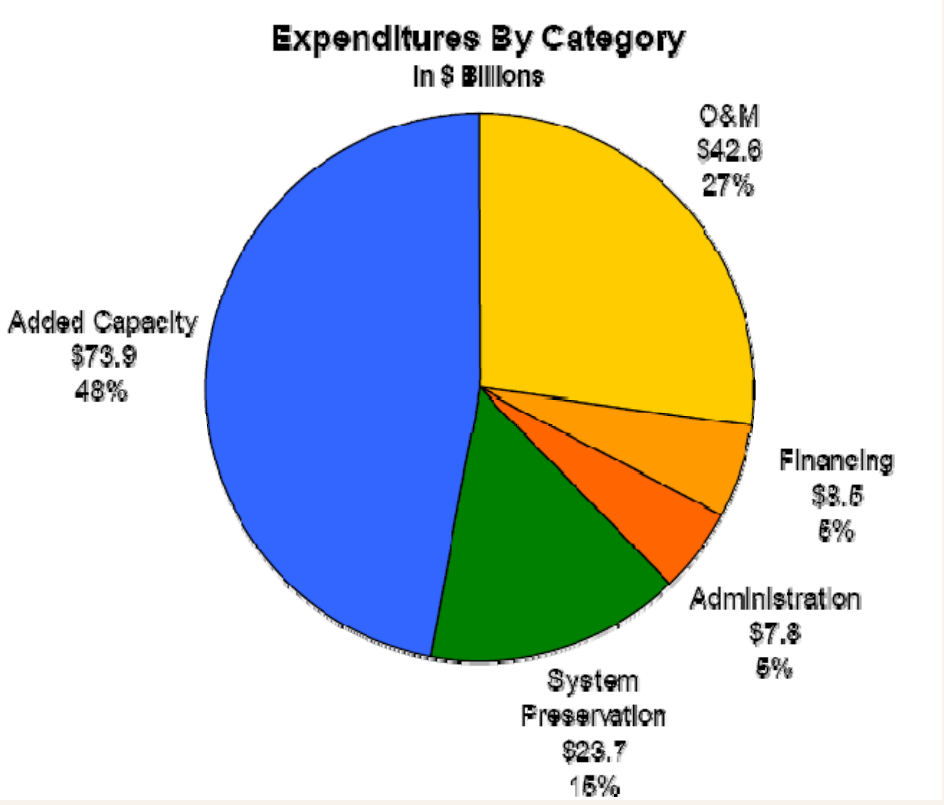
What is a Financial Plan?

A document that answers three questions:

- What will the needs for transportation in the region or State cost?
- What revenues are available that can be applied to the needs?
- Are the revenues sufficient to cover costs?

What is a Financial Plan?





Source: Houston-Galveston Area Council

REVENUES

Revenues: Key Definitions

- **COMMITTED**
  - Dedicated (trust fund) or Obligated (by legislation)
  - Governor controls (S/TIP approval)
  - Private funds in writing
  - FTA Grant Agreement

- **AVAILABLE**
  - Federal – Authorized and/or Appropriated
  - State – Dedicated and/or Historically Used

- **PUBLIC PRIVATE PARTNERSHIPS**
  - Any arrangements where the private sector takes on more risk than under the traditional program

- **INNOVATIVE FINANCING**
  - Debt mechanisms that leverage future revenue streams

Revenues: Key Definitions

- **REASONABLY EXPECTED TO BE AVAILBALE**
  - **Federal Funds**
    - Actual authorizations - extrapolation
  - **State/Local Funds**
    - Dedicated/Historically Used
    - Track record
  - **New Funds**
    - Strategy for obtaining
    - Political support
    - Amount of risk

Transportation Revenue Options: The Menu

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User-Based Fees

- Tolls
- Transit Fares
- Park and Ride Fees
- Congestion charges
- Lease revenue
- Container Fees

Development Based Fees & Taxes ("Beneficiary Pays")

- Tax increment
- Special assessments
- Development fees

Broad-Based Taxes

- Gas tax
- Sales
- Property Tax
- General Revenue
- Hotel Tax
- Rental Car Tax

Revenues: Forecasting Techniques

- Qualitative Analysis
  - Expert analysis or survey of key participants
- Trend Analysis
  - Assume the future looks like the past
- Econometric Models
  - Simple regression models
  - More sophisticated projections

Length of forecast, level of accuracy, data availability

Revenues: Issues and Challenges

- Documentation, Documentation, Documentation
- Identification of Funding Sources
- Using Innovative Financing Strategies
- Accounting for Risk and Uncertainty
  - Assumptions about current sources
  - Availability of new sources

- Available Resource: Revenue Checklist

Revenue Assessment Checklist to Help Ensure Fiscal Constraint Requirements

Documentation
(Included in Revenue Template and Technical Reports)

- Does the RTP, TIP, STIP contain a financial plan that summarizes current and future revenue sources?
- If the financial plan and supporting details are included in a separate document from the RTP, TIP, STIP, is this clearly communicated?

Revenues: Process, Documentation and Tools

- **PROCESS**
  - Example: Has revenue information and assumptions in the financial plan been coordinated with all of the affected agencies (MPOs, State DOT and transit operators)?
- **DOCUMENTATION**
  - Example: Does the MTP/RTP and/or TIP contain a financial plan summarizing current and future revenues? Is information available on sources, assumptions and methodology?
- **TOOLS**
  - Example: Is there a consistent way/format of displaying revenue sources and categories (ex. narrative or data template)?

Revenues: Issues and Challenges

A Closer Look at Documentation…

- Are the assumptions and data sources for ***each*** revenue source (federal, state, local, other) clearly documented in the financial plan?
  - Documentation provided for each source?
  - Documentation could take form of narrative or table format
  - Includes information on:
    - Funding Program/Financing Technique (description)
    - Base Year
    - Data Source
    - Growth Rate
    - Assumption Base

Revenues: Notable Practices (Process)

Florida DOT:

- Twice yearly revenue estimating conferences with MPOs and variety of FL state agencies

MTC:

- Collaborative process to review revenue sources, estimates and supporting assumptions through Partnership Technical Advisory Committee (PTAC). Includes counties, cities, transit operators, Caltrans, FHWA and FTA

Revenues: Notable Examples (Documentation)

Are the assumptions and data sources for each revenue source clearly documented in the financial plan? (Federal; FHWA; Narrative Approach)

- CMAQ: Description: Program with goals to reduce traffic congestion and improve air quality in non-attainment areas. Base Year: Average Apportionments during TEA-21 Period. Project examples include: signal coordination, park and ride lots, ridesharing, bus service expansion, and alternative transportation modes. Data Source: FHWA. Growth Rate: 3% nominal. Assumption Base: Adjusted rate based on historic growth rate over ISTEA and TEA-21 period. Revenue total: $1.312 Billion.

Sample format using MTC Data

Revenues: Notable Practices (Documentation)

Are the assumptions and data sources for each revenue source clearly documented in the financial plan? (Federal; FTA; Table Format Approach from MTC

Revenue Source	Revenue Projection Assumptions	Baseline Revenue
FTA Non-Formula Program Fixed Guideway Program	Description: Description: Program funds infrastructure improvements to existing rail and other fixed guideway systems. Can include track and right of way rehabilitation, modernization of stations, rolling stock purchase and rehabilitation and signal and power modernization Also includes modernization of ferry terminals. In general, eligible urbanized areas have populations of at least 200,000 and fixed guideway systems that are at least seven years old. Base Year: FY 2002-03 Data Source: FTA Growth Rate: 3% nominal Assumption Base: Adjusted rate based on historic growth rate over ISTEA and TEA-21 period	$2.665

Revenues: Notable Examples (Tools)

Extract from Revenue Template Prepared for CA Division (Local Sources)

REVENUE SOURCES	
LOCAL	Sales Tax
	-- City
	-- County
	-- Other (Transportation Development Act)
	Gas Tax
	-- Gas Tax (Subventions to Cities)
	-- Gas Tax (Subventions to Counties)
	Other Local Funds
	-- City General Funds
	-- Street Taxes and Developer Fees
	-- Other (registration fees (AB434) and Prop 42)
	Transit
	-- Transit Fares
	-- Other Transit (e.g., parcel/property taxes, parking revenue, etc)
	Tolls (e.g., non-state owned bridges)
	Other (e.g., RTEP)
	Local Total

Revenues: Notable Practices (Tools)

Southern California Association of Governments (SCAG)

TABLE 4.4 2008 REGIONAL TRANSPORTATION PLAN REVENUES (IN NOMINAL DOLLARS, BILLIONS)

	REVENUE SOURCES	FY2007-11	FY2012-16	FY2017-21	FY2022-26	FY2027-31	FY2032-36	TOTAL
LOCAL	Sales Tax	$14.3	$19.4	$26.0	$34.1	$44.8	$59.7	$198.3
	– County	10.7	14.4	19.3	25.1	32.8	43.3	145.6
	– Transportation Development Act	3.6	5.0	6.7	9.0	12.0	16.4	52.7
	Gas Tax (Subvention to Cities & Counties)	1.1	1.2	1.3	1.4	1.5	1.6	8.0
	Other Local Funds	2.5	4.5	3.2	4.6	3.5	1.6	20.0
	Transit Fares	3.1	4.5	5.7	7.3	9.3	11.3	41.2
	Tolls	0.3	0.4	0.4	0.5	0.6	0.8	3.0
	Mitigation Fees	1.3	1.7	2.3	2.3	3.4	5.0	15.9
	LOCAL TOTAL	$22.6	$31.7	$39.0	$50.3	$63.0	$79.8	$286.5
STATE	State Highway Operations and Protection Program (SHOPP)	5.3	5.3	5.7	5.7	5.7	5.7	33.3
	State Transportation Improvement Program (STIP)	2.9	2.2	2.4	2.5	2.7	3.1	15.9
	– Regional - RTIP	2.2	1.7	1.8	1.9	2.1	2.3	11.9
	– Interregional - ITIP	0.7	0.6	0.6	0.6	0.7	0.8	4.0
	Traffic Congestion Relief Program, Propositions 42 and 1A	2.0	1.8	2.0	2.3	2.8	3.4	14.3
	State Transit Assistance (STA)	0.8	1.0	1.3	1.6	2.0	2.4	9.1
	Proposition 1B	7.2	2.9	0.0	0.0	0.0	0.0	10.1
	Other (1)	0.1	0.1	0.1	0.1	0.1	0.2	0.7
	STATE TOTAL	$18.3	$13.3	$11.4	$12.2	$13.3	$14.7	$83.4
FEDERAL	Federal Transit	$2.9	$2.5	$2.9	$3.2	$3.3	$4.2	$19.0
	– Federal Transit Formula	1.9	2.0	2.3	2.7	3.1	3.8	15.8
	– Federal Transit Non-Formula	1.0	0.4	0.6	0.5	0.2	0.5	3.1
	Federal Highway & Other	$3.0	$3.1	$3.6	$3.5	$4.2	$5.1	$22.6
	– Congestion Mitigation and Air Quality	1.3	1.6	1.8	1.3	1.6	1.9	9.5
	– Surface Transportation Program (Regional)	1.1	1.3	1.5	1.9	2.2	2.7	10.6
	– Other (2)	0.7	0.2	0.3	0.3	0.4	0.6	2.5
	FEDERAL TOTAL	$5.9	$5.6	$6.5	$6.7	$7.5	$9.3	$41.6
NCING & OURCES	Private Equity Participation	1.1	1.5	1.8	0.0	0.0	0.0	4.4
	TIFIA Loans	0.0	0.0	0.0	0.0	0.0	0.9	0.9
	Value Capture Strategies	1.0	1.4	1.4	0.0	0.0	0.0	3.7
	Highway Tolls (including bond proceeds)	0.1	2.3	4.8	3.1	3.8	7.8	22.0
	Port Container Fee (including railroad fee and bond proceeds)	4.0	9.4	7.8	6.3	6.3	7.7	41.5

Revenues: Notable Examples (Tools)

Availability Assumptions and Risk Assessment Sample Presentation

Revenue Source	New or Existing	Availability Assumption	Potential Risk	Risk Mitigation
Federal Non-Discretionary Funds (apportioned) (FTA/FHWA)	Existing	Continued federal funding at current apportionment levels.	Lack of federal authorization bill upon immediate expiration of current legislation.	Funds continue on incremental basis, at historic levels
Federal Funds Discretionary (FTA/FHWA)	New	Cannot be considered a committed and available source until they are awarded by USDOT or authorized by Congress. Reasonably available based on recent past and current allocations to the region/state	Lack of authorization or award	Alternative funding sources substituted; RTP amended if needed
Local Option Sales Tax Continuing	Existing	Of seven local sales tax measures, 3 will extend throughout the life of the RTP in the amount of $5.4 billion.		Assume availability

Revenues: Notable Examples (Tools)

New Revenue Sources: Risk Strategies (SANDAG)

ACTIONS

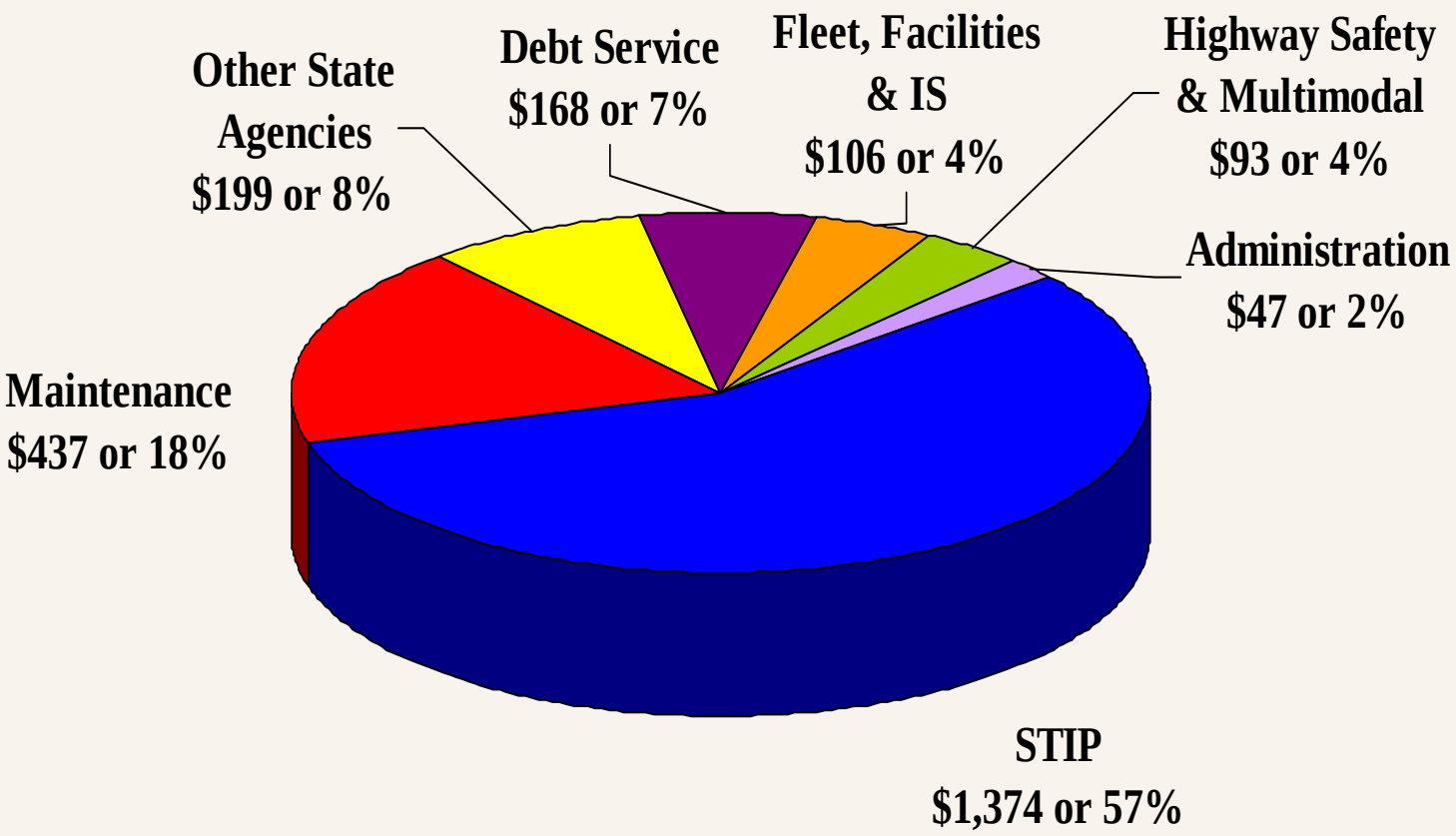
The following actions support the Plan's Financial Strategies Chapter recommendations.

FINANCIAL STRATEGIES

Proposed Actions	Responsible Parties
General Legislative and Funding Actions	
1. Maximize opportunities to leverage local transportation sales tax revenues to attract additional state and federal funds to the region for transportation and related infrastructure improvements.	SANDAG and local agencies
2. Maximize opportunities to secure unique funding sources for the region that can supplement the Smart Growth Incentives Program and related infrastructure improvements.	SANDAG and local agencies
3. Evaluate the feasibility of and pursue potential funding sources to pay for the Reasonably Expected Revenue Scenario.	SANDAG

COST ESTIMATION

Components of Cost



Source: Missouri DOT

Components of Cost

- Capital Expenditures – Projects
- Operations and Maintenance
- Indirect Costs
  - Debt Service

Key Terms (cont.)

Risk - The combination of the probability of an event and its consequences.

Contingency - A markup applied to account for substantial uncertainties in quantities and unit costs and the possibility of currently unforeseen risk events related to quantities, work elements, or other project requirements. Contingency is a risk cost.

Key Terms (cont.)

Deterministic Cost Estimate – Inputs and outputs are discrete values. The estimate is expressed as a single number.

Probabilistic Cost Estimate – Inputs and outputs account for variability and risk. The estimate is expressed as a range or with a statement of probability.

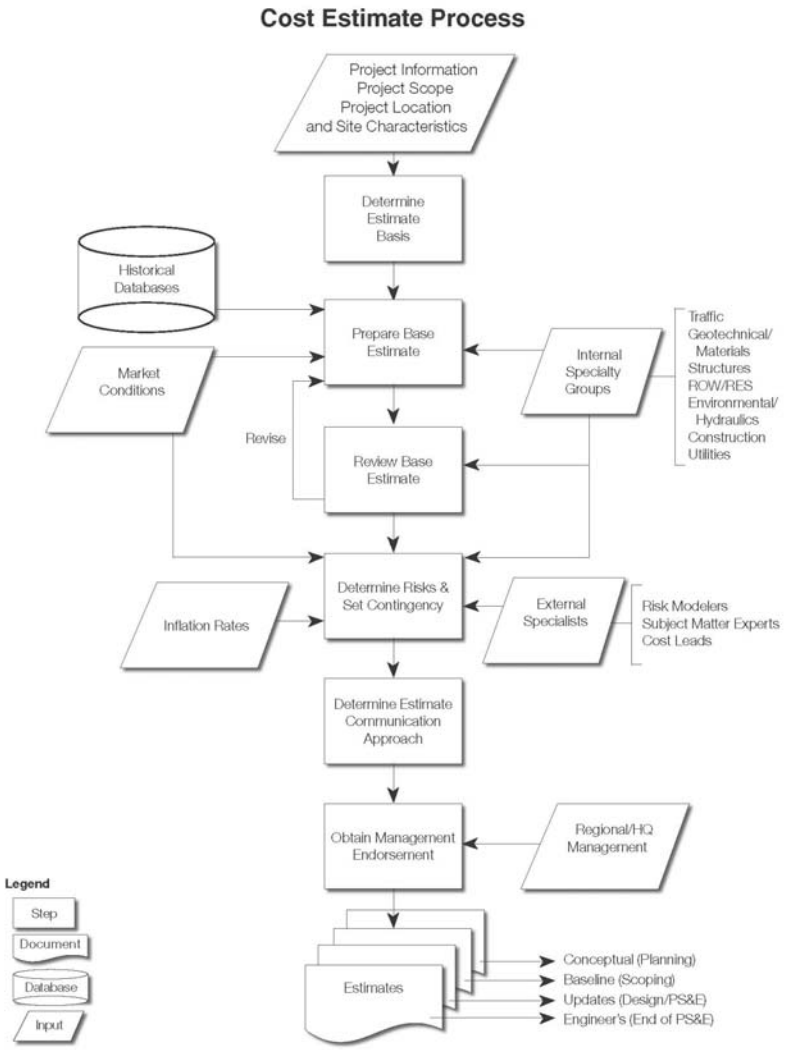
Costs: Issues and Challenges

- **Documentation**
  - Adequate?
  - Often much more information on revenues
  - Project Size
- **Role of MPO in Cost Estimation**
  - Coordination with Sponsors
  - Getting proper documentation on time
  - Quality control
- **Cost Management Process**
  - Are costs updated? When? By Whom?
  - Communication with the Public (Avoiding the “Blackout”)

Developing Project Cost Estimates

What's In The Black Box?

- Defining Project type and scope
- Determining Your Base Estimate
- Ensuring Total Costs Approach
- Recognizing Risk and Setting Contingency



Issues in Scoping

- Scoping is foundation of an estimate
- Earlier phases, more uncertainty
- Multiple alternatives even after programming design
- Scope -> Complexity -> Management approach
- External issues (environmental, community)
- Scope creep

Developing Cost Estimates: Base and Total Costs

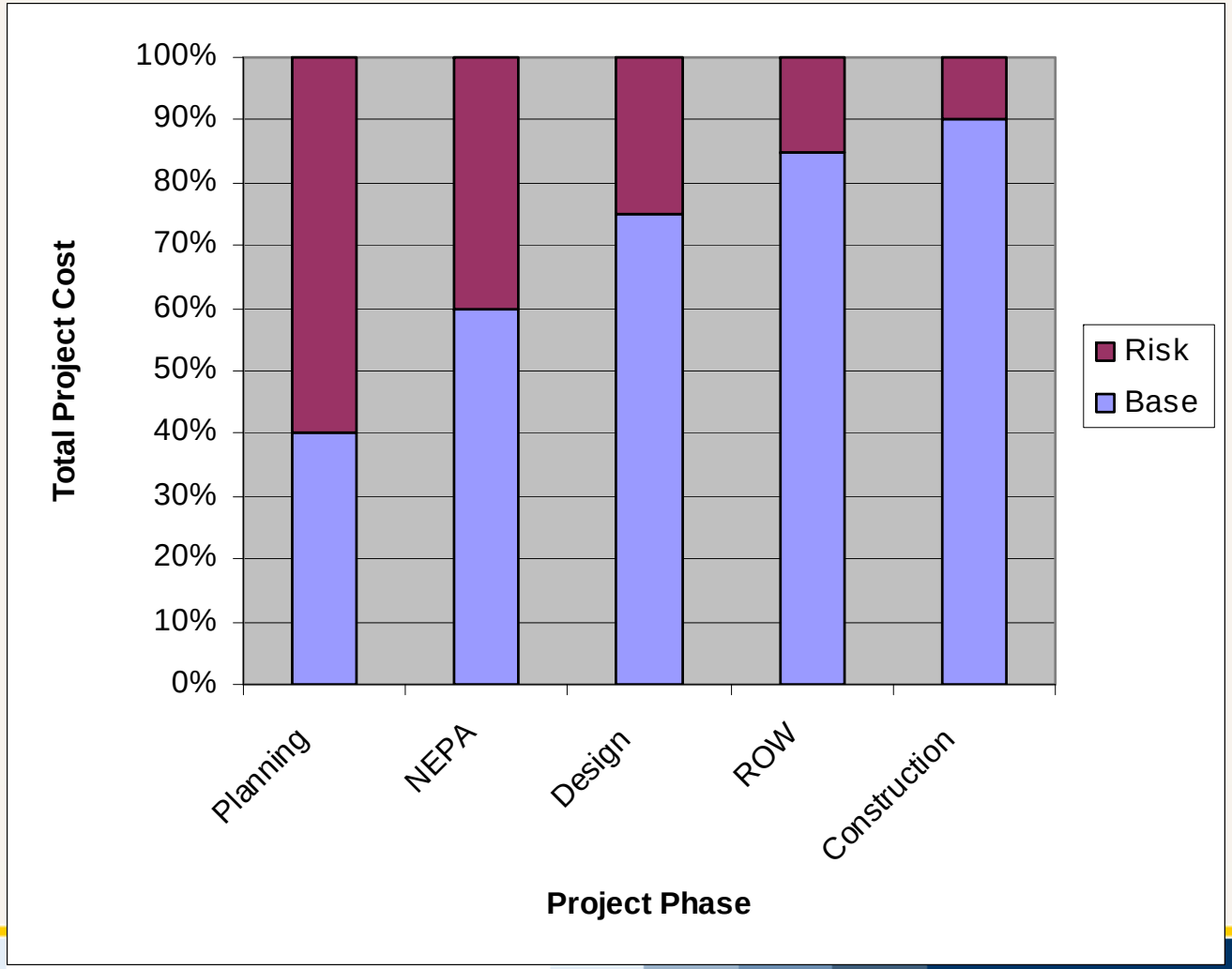
Total Project Cost = Base + Risk

What are Risks?

- Known Unknowns
  - Fair Market Value (RoW)
  - Environmental Mitigation
  - Traffic Control
  - *Foreseen, predictable, quantities uncertain*
- Unknown Unknowns
  - Labor Strike
  - Material Shortage
  - Natural Disaster
  - *Not individually foreseeable or predictable*

Developing Cost Estimates: Base and Total Costs

Total Project Cost = Base + Risk



Developing Cost Estimates: Specific Techniques

Planning → ***NEPA*** → ***Design/PS&E*** → *RoW* → *Construction*

- Analogous or similar project
- Major cost items using standard sections
- Parametric estimation (i.e., cost per lane-mile)

Planning → *NEPA* → ***Design/PS&E*** → ***RoW*** → ***Construction***

- Cost-based, bottom up
- Historical bid based
- Historical percentages

Types of Cost Estimates

Deterministic

- Produces a single number
- Inputs/Outputs are discrete values
- Implies certainty
  - *The project will cost $502M*

Probabilistic

- Produces a range
- Inputs/Outputs account for variability, risk, and uncertainty
  - *There is an 80% probability Total Project Costs will be between $480M and $522M*

Setting Contingencies

- Each risk identified and analyzed
- Probable cost assigned to each risk

Evaluating Impact of a Threat on Major Project Objectives						
Impact		Very Low	Low	Moderate	High	Very High
JECTIVE	Time	Insignificant Schedule Slippage	Delivery Plan milestone delay within quarter	Delivery Plan milestone delay of one quarter	Delivery Plan milestone delay of more than 1 quarter	Delivery Plan milestone delay outside fiscal year
	Cost	Insignificant Cost Increase	<5% Cost Increase	5-10% Cost Increase	10-20% Cost Increase	>20% Cost Increase
	Scope	Scope decrease is barely noticeable	Changes in project limits or features with	Changes in project limits or features with 5-10% Cost	Sponsor does not agree that Scope meets the purpose	Scope does not meet purpose and need

Documentation: Financial Plans

Using Cost Ranges in Planning Documents

- **Long Range Plan**
  - When might ranges and bands be used?
    Beyond the first 10 years
  - What are “aggregate” cost ranges and bands?
    Categories or grouped projects (i.e., system preservation)
  - How does that impact fiscal constraint?
    Sufficient revenues to cover top of range

- **S/TIP**
  - When might ranges and bands be used?
    Technically never
  - Can categories or grouped projects be used?
    Yes for projects that will be categorical exclusions
  - How can uncertainty be expressed – especially pre-NEPA?
    Examples from different DOTs

Costs: Process, Documentation and Tools

- **PROCESS**
  - *Example*: What types of historical data do you use as a basis for preparing conceptual estimates? How are the data adjusted for time (schedule), location and other project specific conditions?
- **DOCUMENTATION**
  - *Example*: What formal mechanisms are in place for capturing and transferring knowledge about cost estimating techniques?
- **TOOLS**
  - *Example*: Once approved, is the planning conceptual estimate communicated to executive management and/or the public as a point estimate (one number) or as a range of values with an indication of reliability?

Cost Estimation Management

Estimate Updates

- Change in:
  - Scope
  - Schedule
- *Risk event retired or realized*
- Milestones (MTP, STIP, NEPA, Financial Plan, etc.)
- Agency Policy
- Federal requirement for major projects
- Avoid the “blackout”

Planners' Role

- Understand sponsors' management policy
- Promote commonality among jurisdictions
- Participate in estimate approvals (especially board approvals)
- Serve as "gatekeeper"

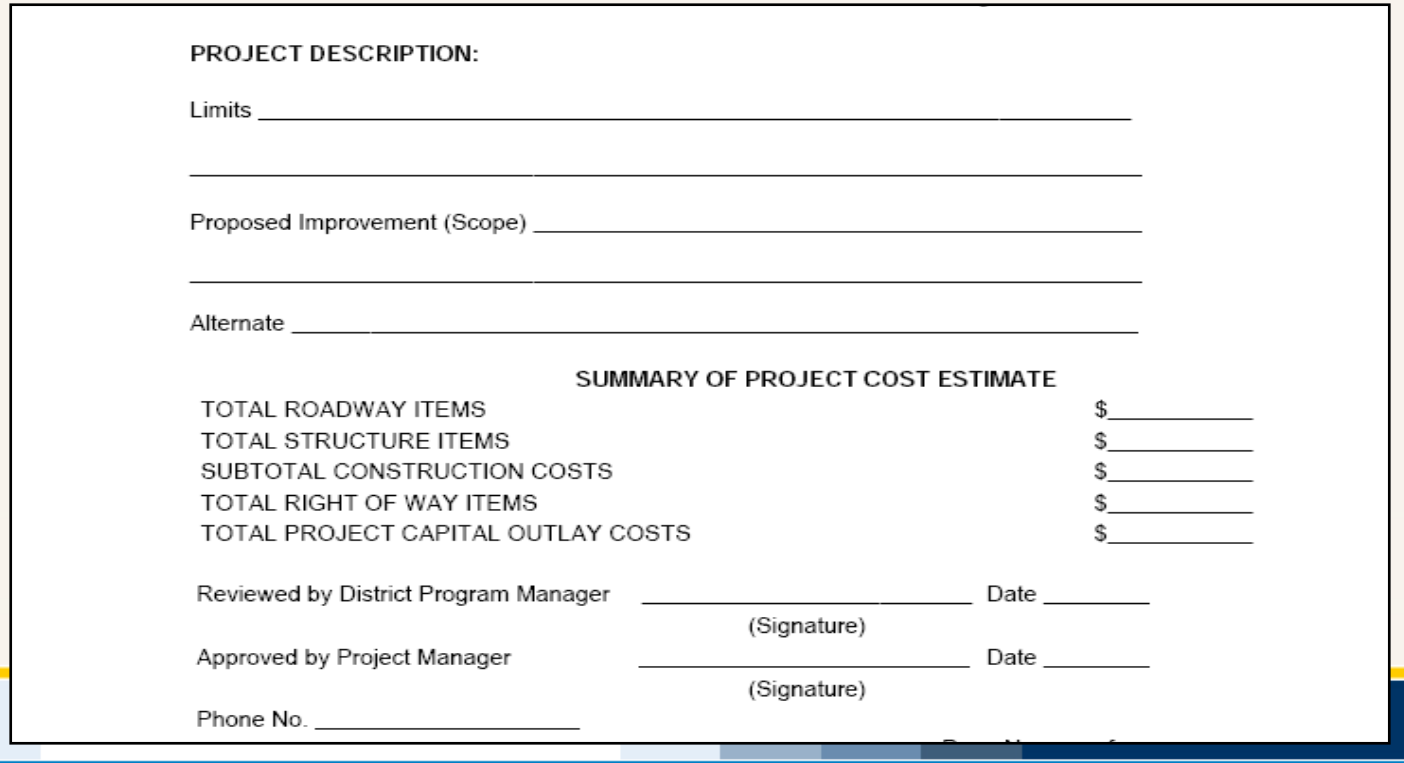
Importance of Effective Documentation

- To establish a benchmark
- To document the management process
  - Project estimate file
- To provide updated information
- **To support the MTP/STIP financial plan**

Documentation Example: California

Caltrans District 4:

- Form required for every project
- Assumptions, price sources, escalation rate
- Risk management plan
- Documents management approval



PROJECT DESCRIPTION:

Limits _____

_____

Proposed Improvement (Scope) _____

_____

Alternate _____

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$_____
TOTAL STRUCTURE ITEMS	$_____
SUBTOTAL CONSTRUCTION COSTS	$_____
TOTAL RIGHT OF WAY ITEMS	$_____
TOTAL PROJECT CAPITAL OUTLAY COSTS	$_____

Reviewed by District Program Manager _____ Date _____
(Signature)

Approved by Project Manager _____ Date _____
(Signature)

Phone No. _____

Documentation Examples

Contra Costa County Transportation Authority

- Cost Estimating Guide
- Consistency among project sponsors

CONTRA COSTA TRANSPORTATION AUTHORITY **APPENDIX C**

FORMS

The forms found in this appendix were created in Microsoft Word. Forms are as follows:

Quantity Sheet	Form C-1
Unit Price Estimate	Form C-2
Estimate Review and Sign-Off Sheet	Form C-3

Documentation Examples

Cost Estimation Documentation for Financial Plans

- Responsible agency
- Date prepared
- Methodology
- Assumptions
- Data Sources
- Dollar Value (YOE)
- Reviews
- Management approvals

Communication and Documentation

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Key **Communication** Issues

- Defining Your Audience
  - Internal
  - External
- Appropriate communication approaches at different stages
- Communicating risk and uncertainty
- Reporting

Costs: Notable Practices (Documentation)

DOCUMENTATION – WSDOT Estimate Summary

SR 99 Alaskan Way Viaduct and Seawall Replacement

Revised June 2004

Scenario

Rebuild Plan

Project Description:

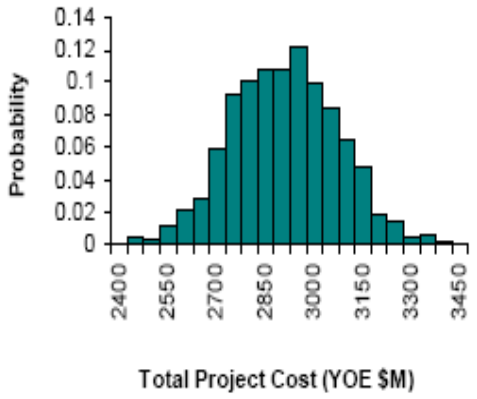
- Rebuilds viaduct in the same location with slightly wider lanes and some shoulders.
- Rebuilds seawall from Washington Street to Myrtle Edwards Park.
- Replaces the south end of the viaduct with a surface SR 99 roadway. Connections to Royal Brougham and Atlantic provided by overpasses crossing over SR 99.
- Restores Alaskan Way surface street with 4 lanes.
- Provides improved pedestrian and bicycle access along Alaskan Way.

Schedule:

Begin Construction: 2008

End Construction Range: 2014 - 2015

CEVP Result:



Project Benefits:

- Reduces seismic risk for viaduct and seawall.
- Rebuilds double deck portion of viaduct with 75 year design life.
- Maintains current highway capacity.
- Improves access and circulation to stadium

Project Cost Range:

10% chance the cost < $2.7 Billion

50% chance the cost < $2.9 Billion

90% chance the cost < $3.1 Billion

Costs: Notable Practices (Tools)

Cost Template

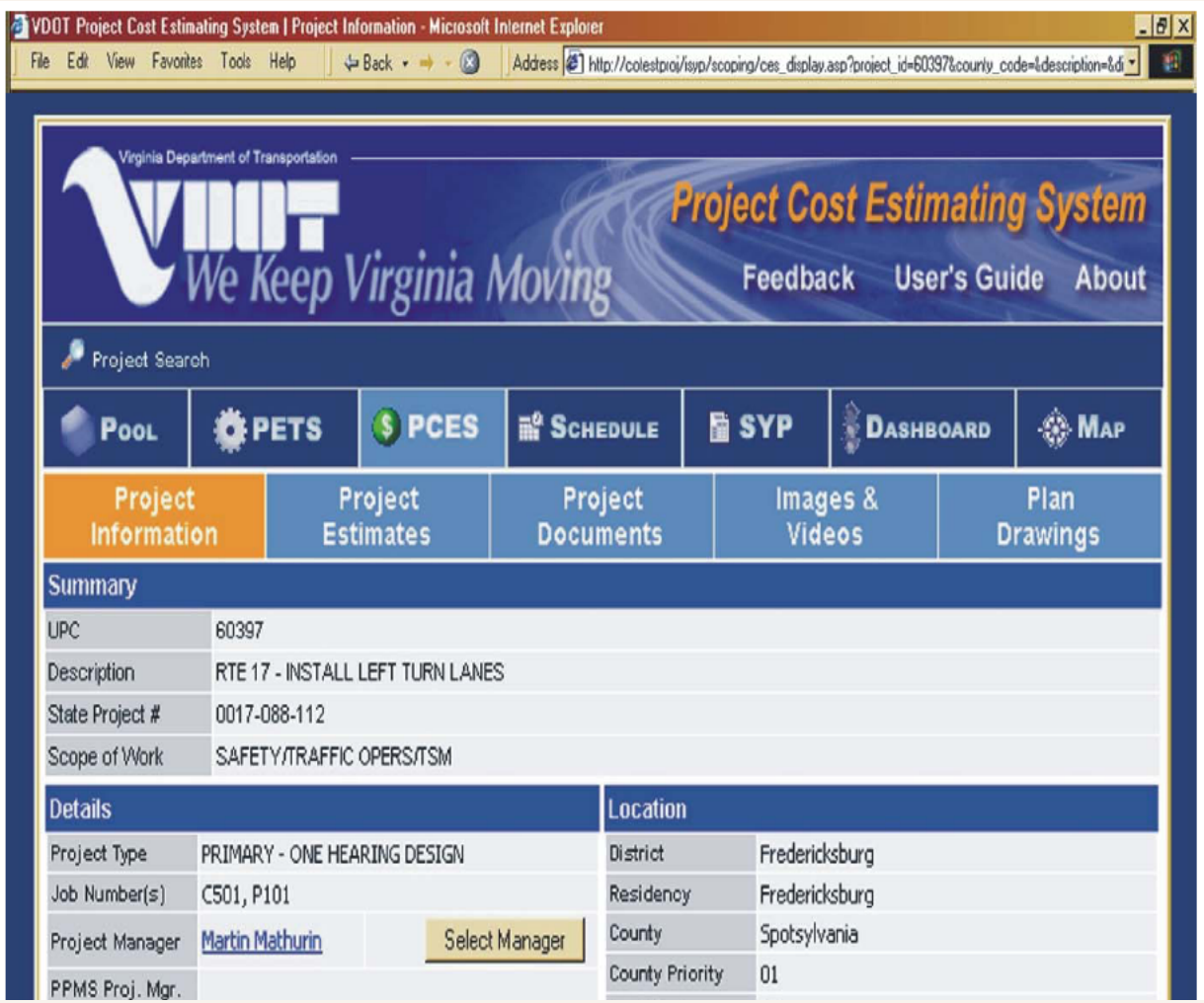
Systems Level Long-Range Plan Cost Template Table

2007 Year of Expenditure Dollars, Millions

	COSTS/REVENUE USES	FIRST 5 YEARS (See FSTIP Cycle)						NEXT 5 YEARS	NEXT 5 YEARS	NEXT 5 YEARS	NEXT 10 YEARS	30 YEAR TOTAL
		Year 1	Year 2	Year 3	Year 4	Year 5	Five Year Sum					
OPERATIONS, MAINTENANCE & PRESERVATION	*Highway*											
	Highway, State (SHOPP)											
	Highway, Local Streets and Roads											
	Transit											
	Transit Systems Facilities and Fleet Maintenance											
	Base Rail/Bus Service											
	Other (Specify)											
	Other (e.g. Off Street Bicyle/Ped Facility Maintenance and Preservation)											
	Operations, Maintenance and Preservation Total											
PROJECT DEVELOPMENT	*Highway*											
	Highway Project Development Total, Non-Major Projects											
	State (STIP)											
	Local											
	Highway Project Development Total, Major Projects											
	Right of Way Acquistion and Support Costs--Major Projects											
	Preliminary Engineering--Major Projects											
	Final Design (Plans, Specifications and Estimates PS&E)--Major Projects											
	Other (e.g. third party costs)--Major Projects											
	Transit											
	Transit Project Development Total, Non-Major Projects											
	Transit Project Development Total, Major Projects											
	Right of Way Acquistion and Support Costs--Major Projects											
	Preliminary Engineering--Major Projects											
	Final Design (Plans, Specifications and Estimates PS&E)--Major Projects											
	Other (Specify)--Major Projects											
	Other modes (specify)											
	Project Development Total											

Costs: Notable Practices (Tools)

TOOLS – Virginia DOT Project Cost Estimating System



Costs: Notable Practices (Tools)

Standardized Software

- AASHTO Trns*port
  - Cost Estimation System (CES) module
- WS Planning Level Cost Estimate Tool
- VA Project Cost Estimation Tool
- Atlanta Regional Commission Costing Tool
- AZ Enhancement Project Cost Estimate

Cross-Cutting Issues with Cost Estimates

Management

- Managing and updating costs estimates for the MTP and TIP/STIP

Documentation

- Ensuring adequate and sufficient documentation on cost estimates for the MTP and TIP/STIP

Communication

- Determining appropriate communication about cost estimates within your agency and to key stakeholders
- Communicating risk and uncertainty to decision-makers and the public

Understanding

- Understanding what the cost estimates include and how they are developed (what's inside the "black box")

NON-CAPITAL COSTS

Fiscal Constraint and O&M

"For purposes of transportation operations and maintenance, the STIP shall include financial information containing system-level estimates of costs and revenue sources that are reasonably expected to be available to adequately operate and maintain Federal-aid highways (as defined by 23 U.S.C. 101(a)(5)) and public transportation (as defined by title 49 U.S.C. Chapter 53)."

23 CFR 450.216(m) and 23 CFR 450.324(h)

Federal Statute

23 USC 116 - Maintenance

- Duty of the State DOT
- Agreements with localities
- Funds withheld if not properly maintained

O&M: Key Definitions

- **Operations Activities**
  - **The range of activities/services provided to ensure ongoing system performance** (e.g., transit drivers, dispatchers, snow and ice control, traffic management centers, emergency response)
- **Maintenance Activities**
  - **The upkeep and preservation of the existing system** (e.g., sweeping, mowing, crack sealing, bridge washing, building, signal, and rolling stock maintenance)
- **Federally Supported Facilities**
  - Federal-aid eligible highways [23 USC 101(a)(5)] and public transportation [49 USC 5302(a)(10)]

O&M: Issues and Challenges

- Systems level view
- What is “adequate”?
- Significant and growing O&M
- More Diverse Revenue Sources
- Federal funding included
- Need to ensure both highway and transit focus
- Non-motorized facilities?

O&M Revenues

- **Local**
  - Dedicated, budgetary, fare-box, tolls
- **State**
  - Fuel tax, bond proceeds, general revenue, tolls
- **Federal**
  - Transit Operating Assistance (5307, 5311), Interstate Maintenance, NHS, STP, CMAQ, Preventive Maintenance - 23 USC 116(d)

O&M: Key Definitions

Preventive Maintenance:

Highways: “the planned strategy of cost effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system without increasing structural capacity." - *AASHTO*

O&M: Key Definitions

Preventive Maintenance:

Transit: "All maintenance costs related to vehicles and non-vehicles. Specifically, it is defined as all the activities, supplies, materials, labor, services, and associated costs required to preserve or extend the functionality and serviceability of the asset in a cost effective manner, up to and including the current state of the art for maintaining such an asset."

-FTA Circular 9300.1B

O&M: Key Definitions

Preventive Maintenance:

Which are preventive maintenance?

- Snow removal
- Pothole patching
- Motor oil (for buses)
- Grass cutting
- Custodial services
- Crack sealing
- Cleaning storm drains
- Bridge washing

O&M: Estimating Costs

Historical Trends

- X Year Average
  - Per Lane-Mile, ft² of Bridge Deck
  - By Functional Class
  - Lump Sum

Performance Based *(Asset Management)*

- Management Systems
- Current Condition and Performance
- Desired Future Condition and Performance
- Measures
- Scenarios

O&M: Key Definitions

Asset Management: “a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives.” - *AASHTO*

O&M: Notable Practices (Process)

- **MTC - Local Streets and Roads Committee**
  - Consistency among Jurisdictions
  - Scenarios for different levels of investment

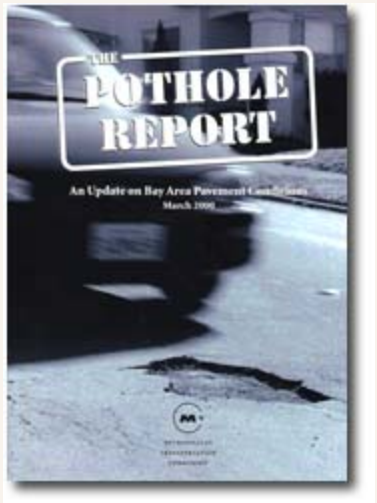
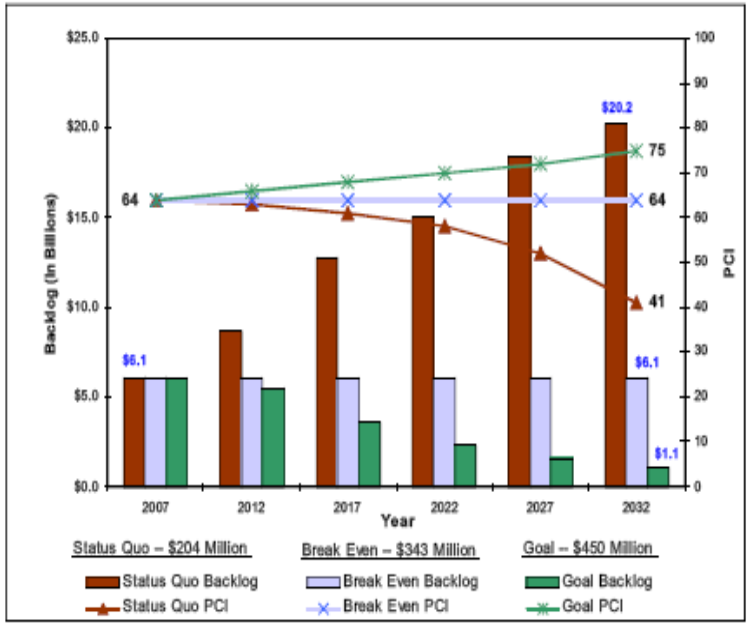


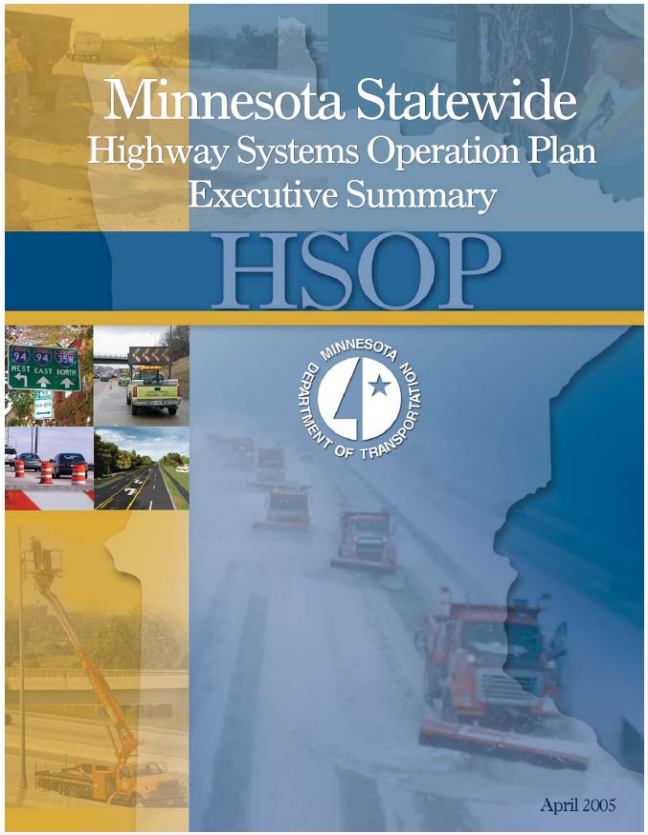
Figure 1: Regional Pavement Maintenance Backlog and PCI over Time Under Different Annual Funding Scenarios (In 2006 Dollars)



[1] Refer to Figure 3 on page 6 for more information on the pavement deterioration curve.
[2] Based on analyses performed with the MTC pavement management software – Street Saver 8.0 ®

O&M: Notable Practices (Process)

- **MN Maintenance Plan**
  - Complement Mn/DOT's Statewide Transportation Plan
  - Identify performance measures and data
  - Identify funding gaps
  - Scenarios for different levels of investment



O&M: Notable Practices (Process)

- **Topeka - Forecast of Local Revenues and Costs for O&M**
  - Developed in consultation with State and locals
  - based on historical and existing funding levels

Transit
Operations & Maintenance Funding Forecast – 2034

Revenue Source	Annual Funding Levels Total	Total (2007-2034)
Federal Formula Operating Assistance (FTA-5307)	$1,600,000	$ 44,800,000
KDOT Operating Assistance	$ 480,000	$ 13,440,000
Local Property Tax Levy	$2,200,000	$ 61,600,000
Farebox Revenue	$ 800,000	$ 22,400,000
Advertising and Other Revenues	$ 110,000	$ 3,080,000
Total	**$5,190,000**	**$145,320,000**

O&M: Notable Practices (Tools)

- **Pikes Peak Area – Maintenance Needs Forecast**
  - Highway Economic Resource System for States (HERS-ST)
  - Costs per mile for routine maintenance
  - Life-cycle treatments per lane mile
  - Scenario capable

System Quality				
Surface Treatment	$ 6,917,435	$ 7,268,372	$ 6,448,089	$ 4,638,649
Bridge Program	$ 1,288,192	$ 1,330,325	$ 1,295,485	$ 1,146,062
Maintenance (MLOS)	$ 1,961,484	$ 2,015,811	$ 2,072,997	$ 2,077,635
ITS Maintenance	$ 822,096	$ 844,866	$ 729,854	$ 490,780
Mobility				
Congestion Relief	$ 704,906	$ 740,668	$ 653,565	$ 457,920
Snow and Ice Maintenance	$ 1,341,915	$ 1,379,082	$ 1,418,205	$ 1,421,378
STP-Enhancement	$ 778,163	$ 787,486	$ 825,421	$ 825,747
STP- Metro	*$ 7,264,584*	*$ 7,337,033*	*$ 5,179,982*	*$ 5,555,268*
CMAQ	$ 4,833,099	$ 4,880,813	$ 3,172,713	$ 3,370,207
Safety				
Safety Surface Treatment	$ 231,942	$ 238,366	$ 207,024	$ 142,932
Traffic Operations Maintenance	$ 2,729,707	$ 2,805,311	$ 2,884,894	$ 2,891,349
Hazard Elimination	$ 1,835,755	$ 1,863,881	$ 1,532,493	$ 1,630,010
Safe Routes To Schools	$ 184,643	$ 231,344	$ 207,088	$ 219,119
Program Delivery				
Maintenance	$ 408,290	$ 419,599	$ 431,502	$ 432,468
Maintenance Incentive Program	$ 948,000	$ 974,257	$ 1,001,895	$ 1,004,137

O&M: Notable Practices (Tools)

- **O&M Template**
  - Developed by FHWA RC
  - Systems level view of O&M costs
  - Three major categories
  - Definitions, documentation and technical guide

O&M COSTS/REVENUE USES	
OPERATIONS, MAINTENANCE & PRESERVATION	*Highway* *Highway, State* *Maintenance/Preservation Activities* Roadway Preservation Bridge Preservation Roadside Improvement Facility Improvement *Operational Performance Activities* Emergency Response Collision Reduction Mobility Improvement Legal and Regulatory Mandates *Highway, Local Streets and Roads* *Highway, Other (specify)* *Transit* *Maintenance/Preservation Activities* Transit Facilities Maintenance Transit Fleet Maintenance/Replacement Other (specify) *Operational Performance Activities* Transit System Operations Bus Light Rail Heavy Rail Other (specify) *Other (e.g. Off Street Bicyle/Ped Facility Maintenance and Preservation)*
	Operations, Maintenance and Preservation Total
O&M COSTS/REVENUE USES TOTAL	

O&M Notable Practices (Tools)

National Transit Database

Table 13:Transit Operating Expenses by Mode, Type of Service a

State	Name	ID	Org Type	Mode	TOS	VOMS	Operators Wages	Other Salaries & Wages	Fringe Benefits	Services	Mat Fuel ar Lube
NM	ABQ Ride	6019	A	DR	DO	50	1,830.9	1,746.6	1,428.0	0.0	
NM	ABQ Ride	6019	A	MB	DO	123	7,438.1	7,564.2	5,690.2	0.0	4,
				Total		173	9,269.1	9,310.8	7,118.2	0.0	4,
NM	Las Cruces Area Transit(RoadRUNNER)	6049	A	DR	DO	12	384.7	204.0	251.0	22.4	
NM	Las Cruces Area Transit(RoadRUNNER)	6049	A	MB	DO	11	852.4	373.5	509.2	84.5	
				Total		23	1,237.1	577.5	760.2	106.9	
NM	Santa Fe Trails - City of Santa Fe(SFT)	6077	A	DR	DO	14	347.0	300.2	107.7	91.0	
NM	Santa Fe Trails - City of Santa Fe(SFT)	6077	A	MB	DO	23	1,521.2	800.3	483.7	813.8	
				Total		37	1,868.2	1,100.5	591.4	904.8	

http://www.ntdprogram.gov/ntdprogram/

O&M: Notable Practices (Tools)

- **O&M Checklist**
  - Developed by FHWA RC
  - Questions on process, documentation, and methodology
  - Used in preparation or review

Operations and Maintenance Assessment Checklist

Operations and Maintenance Assessment Checklist to Help Ensure Fiscal Constraint Requirements

O&M Estimate Preparation

–Are clear and documented policies, procedures, techniques and/or standards used in preparing long range planning O&M estimates in place?

–How is the extent of the system(s) to which the O&M estimate applies determined?

What about your agency?

Do you know how O&M costs are developed in your region/State?

- Is there consistency across agencies?

Does your agency (or partners) have an asset management system?

Does your agency have a definition of adequate?

- Who decides and how?

Are you spending Federal funds on preventive maintenance?

- Highways?
- Transit?

Does your Plan and/or TIP inform the public about O&M revenues and costs?

Indirect Costs

Debt Service

State (or local) Debt:

- General Obligation Bonds
- Motor Fuel Bonds
- Toll Bonds
- Certificates of Participation
- Contingency Payments
- Private Activity Bonds

Is it required to be in the STIP?

- No, as long as Federal-aid is not used, but it is helpful in explaining major projects or public private partnerships

Debt Service

State Debt eligible for Federal-aid reimbursement:

- Grant Anticipation Notes (23 USC 122)
- GARVEE Bonds
- TIFIA Loans (principle and interest)

Is it required to be in the STIP?

- Yes, can be shown as line item or project cost.

Debt Service

Rhode Island STIP

- GARVEE Bonds
- First obligation of the fiscal year

Major Projects with Multi Year Funding

GARVEE Debt Service		Debt Service			$44.60	$47.80	$47.80	$47.80		
Rt 403 Relocation	N. Kingstown	Construction Above GARVEE		C	$3.20	$1.60				
	N. Kingstown	Design Costs		D	$.50					
	North Kingstown	Landscape Phase 1 - West Davisville Road to Route 4	0014V	C	$1.72					
I-195 Relocation - Non-GARVEE	Providence	Design-ROW-Utility Work		C	$2.00	$1.00	$1.00	$1.00		
	Providence	Construction Above GARVEE		C		$1.00	$1.00	$1.00	$8.00	
I-195 Relocation - Remaining Construction	Providence	Contract 12	0010U	C	$6.88					GRV-LS
	Providence	Contract 13	0010V	C	$27.50					GRV-LS
	Providence	Contract 14	0010W	C	$12.50					GRV-LS
	Providence	Contract 15	0010X	C	$15.00					GRV-LS
	Providence	Landscape Contracts	0012A	C	$1.61	$1.51	$16.20	$1.93	$.61	GRV-LS

August 14, 2008 EM: Earmarked Funds GRV: GARVEE Funds LS: Land Sales Revenue State: State Funded TBA: Turnpike and Bridge Authority Page 10 of 24

Overhead Costs

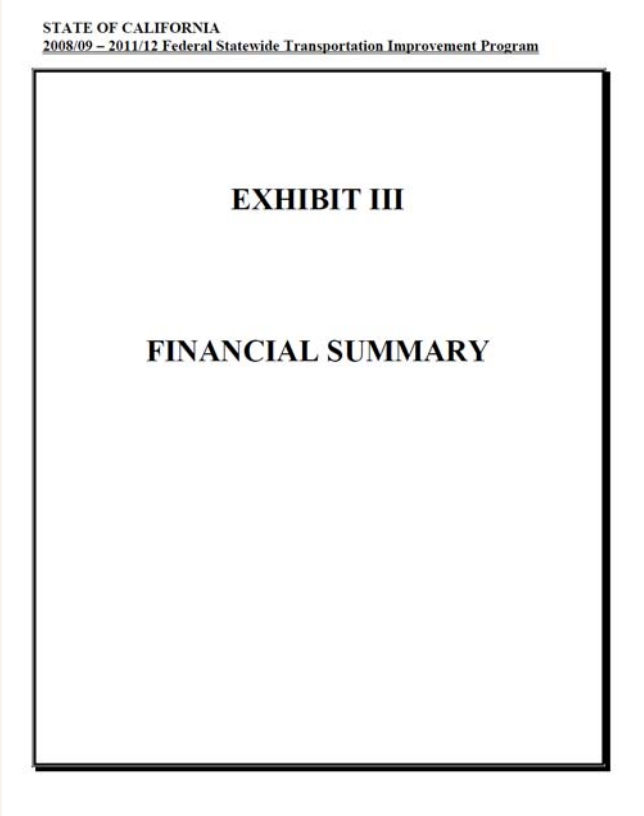
Which are indirect, fixed costs or overhead?

- Construction engineering
- The Chief Engineer's salary
- Pavement (ARAN) van
- Contract Audits
- Building rental (or leasing or mortgage)
- Contract claims settlements
- Traffic counters
- Software licenses and maintenance
- Motor fuel tax evasion enforcement

Summary

- Indirect costs are expenditures that cannot be tied to a particular project (overhead, administration, etc.)
- Indirect costs are not programmed, but should be accounted for in the financial plan
- Debt service may or may not need to programmed

PULLING IT ALL TOGETHER

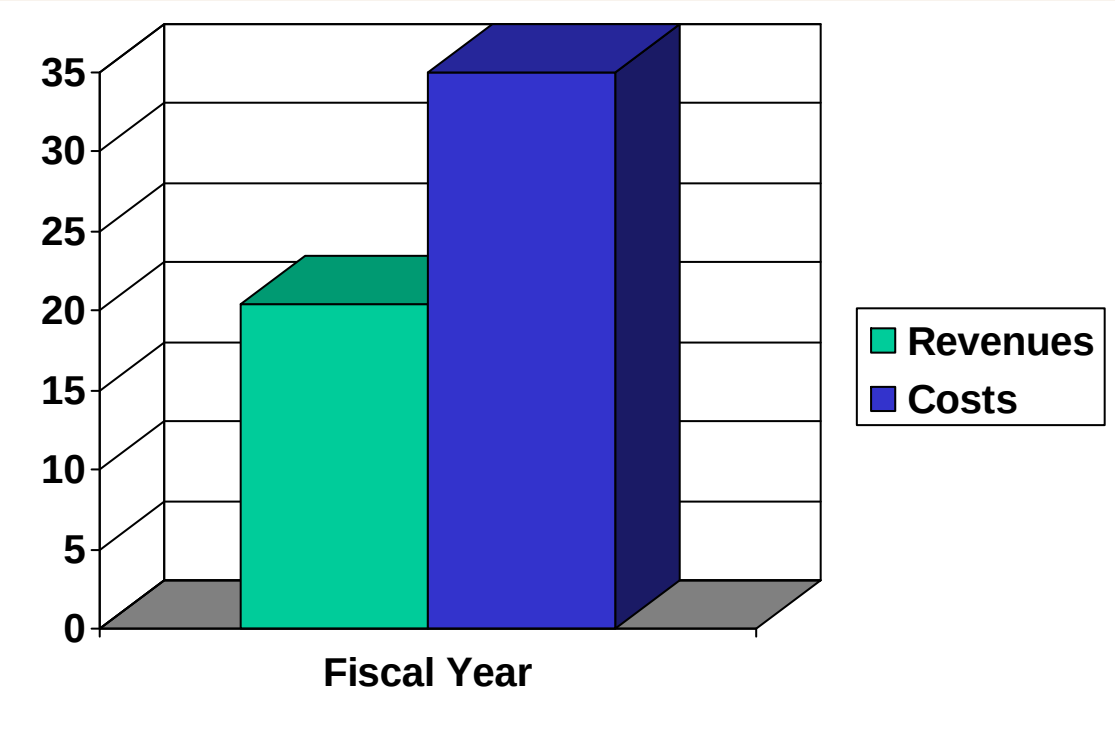


STATE OF CALIFORNIA
2008/09 – 2011/12 Federal Statewide Transportation Improvement Program

EXHIBIT III

FINANCIAL SUMMARY

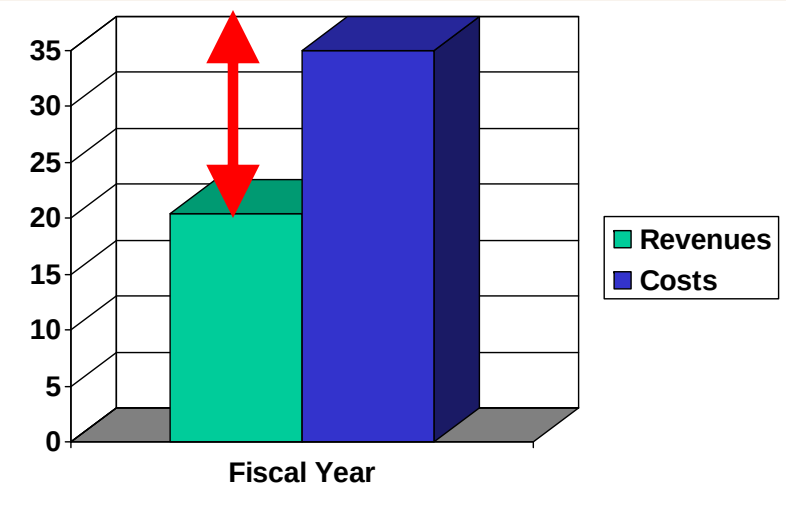
Demonstrating Fiscal Constraint



OOPS!

Filling the Gap

- Drop Projects
- Find Additional Revenues
- Leverage Funds by Financing
- Get the Private Sector Involved



Transportation Finance Options: The Menu

Bonds

- General Obligation Bonds
- Grant Anticipation Revenue Bonds
- Revenue Bonds (toll and non-toll)

Loans

- TIFIA Credit Assistance
- State Infrastructure Bank
- Commercial Bank Loans

Financing Linked to Private Procurement Options

- Private Activity Bonds
- Commercial Bank Loans

Public Private Partnerships (P3s)

- A P3 is any arrangement where the private sector takes on more risk than under the traditional process
- Availability payments and toll concessions are two types of P3s
- Project usually has revenue generating potential
- Involve the private sector taking on design, construction, finance, and long-term operation of projects
- Fiscal constraint still applies

Financial Plans: Notable Examples

Los Angeles, CA – Southern California Ass'n of Gov'ts

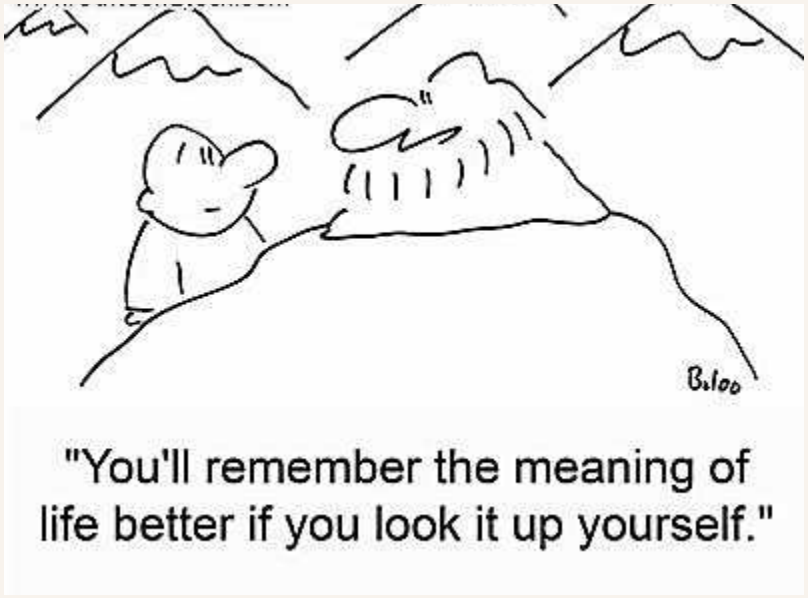
- Addresses Year of Expenditure
- Discusses New Revenue Strategies
- Forecasts O&M

Financial Plans: Notable Examples

Boulder, CO MTP – Pike's Peak MPO

- Addresses Year of Expenditure
- Discusses New Revenue Strategies
- Forecasts O&M

RESOURCES


"You'll remember the meaning of life better if you look it up yourself."

Available Fiscal Constraint Resources

FHWA/FTA Planning Regulations:

23 CFR 450 - ecfr.gpoaccess.gov

FHWA Guidance

www.fhwa.dot.gov/planning

FTA Financial Planning for Transit

www.fta.dot.gov/planning/newstarts/planning_environment_2421.html

Training

- NTI Course: Financial Planning (to be revised)
- NHI Course: Addressing Uncertainty in Cost Estimation
- NHI Course: Risk Management
- RC Webinar/Seminars

Available Fiscal Constraint Resources

Technical Assistance

- RC Planning TST
  - Definitions
  - Checklists
  - Optional Templates
  - Documentation Examples
  - Notable Practices
- RC Financial Services TST
  - Help with YOE methodology, cash flow, FMIS, A-87
- Office of Innovative Program Delivery
  - Partnering with AASHTO
  - New program office/tech assistance available

Available Fiscal Constraint Resources

Other Resources

- **FHWA Major Projects Website:**

  www.fhwa.dot.gov/programadmin/mega/index.cfm

- **FTA New Starts Website:**

  www.fta.dot.gov/planning/newstarts/planning_environment_2608.html

- **The Transportation Planning Capacity Building Program**

  www.planning.dot.gov

- **NCHRP Report 574 (Project 8-49), *Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming and Preconstruction***

Advance Construction Resources

Federal Statute and Regulation

- 23 U.S.C. Section 115 - Advance Construction
- 23 CFR Section 630.701-709, Subpart G - Advance Construction of Federal-Aid Projects
- Advance Construction Final Rule - August 26, 2008 Federal Register
- 23 U.S.C. Section 135(g) - Statewide Transportation Improvement Program

A Guide To Federal-Aid Programs And Projects

- http://www.fhwa.dot.gov/federalaid/projects.cfm

O&M: Resources

Training

- *NHI Transportation Asset Management #131106*
- *NHI Principles and Practices for Enhanced Maintenance Management Systems #131107*

Publications

- *AASHTO Transportation Asset Management Guide, NCHRP Project 20-24(11)*
- *FTA Financial Planning for Transit*
- *NCHRP Report 574 (Project 8-49), Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming and Preconstruction*
- *FHWA Transportation Asset Management Case Studies*

Software

- *HERS-ST Highway Economic Requirements System - State Version*

Discussion and Questions

- How would you assess your state and MPO?
- What are the major challenges/issues you are seeing?
- Are the process and documentation examples helpful?
- Is the template a useful tool?
- What additional resources may be needed?
- What would you like to cover in depth in March?

Seminar Evaluation

Don’t Leave Yet!

Thanks for your feedback and participation!