

FY 2008 Network Development Program for TPB Travel Forecasting

Presentation
to the
Travel Forecasting Subcommittee
September 19, 2008

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Overview: Network Development Program

Supports:

- Transportation Modeling Activities
- Air Quality Conformity Determination



Time-Line for Network Development and Air Quality Conformity Activities

		FY-2008											
		Calendar 2007						Calendar 2008					
		July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Transportation Network Maintenance:													
1	Network Review by state and local transportation agencies.												
2	Network review by Model, GIS, and Systems applications groups.												
3	Update GIS-based highway network database.												
4	Solicit transit information from regional transit providers.												
5	Update catalogues and transit files with current data.												
Air Quality Conformity Process:													
		2007 CLRP/ FY2008-13 TIP						2008 CLRP / FY2009-14 TIP					
6	Request CLRP and TIP project submissions.						X						
7	Deadline for project submissions.							X					
8	Public comment on project submissions begins.							X					
9	Public comment on project submissions ends.								X				
10	Develop transportation networks based on project submissions.												
11	Execute travel demand and emissions models.												
12	Summarize and analyze results.												
13	Prepare CLRP and TIP draft documents.												
14	Begin public comment on conformity results.						X						X
15	End public comment on conformity results.							X					
16	Adoption of CLRP and TIP by TPB.							X					
Legend:													
Transportation Network Maintenance													
Air Quality Conformity Assessment Activity													
Transportation Planning Board Activity		X											



Network Development Activities

- Update Base Year Highway and Transit Networks
- Develop Forecast Year Networks
- Highway network files are managed and pre-processed in COG/TPB's GIS



Report Overview

This report presents the following:

1. Overview of Network Development.
2. Overview of Facilities Coded in the Networks Representing the 2007 CLRP and FY2008-2013 TIP
3. Version 2.2 Model Network Development
4. Looking Ahead
5. Appendices: Highway and Transit Projects Modeled for 2007 CLRP and FY2008-2013 TIP



New Network Developments

Network Development Changes in the Version 2.2 Travel Model

- Transit line files developed for the Version 2.2 model now reflect the newer TP+ TRNBUILD format
- Fares Inputs Simplified
- Max. number of stations/PNR lots in the station file (STA_TPP.BSE) expanded to 1000



Looking Ahead

- Transfer of Bus Schedule Data between Transit Providers and TPB Staff
- Improving GIS Applications in TPB's Network Development



Improving GIS Applications in TPB's Network Development

Presentation to the
Travel Forecasting Subcommittee
19 September 2008

Charlene Howard, COG/TPB



Presentation overview

- Background & purpose
- Project objectives
- Project history
- Project challenges & considerations
- Wrap-up & future plans



Background & purpose

- To improve & extend our existing TPB Master Network by better leveraging GIS technology
 - Edit and maintain both highway & transit networks
 - Support multiple concurrent users
 - Improve & streamline existing network development procedures
 - Implement new ESRI geodatabase model
- New zone system (TAZ) being developed; more detailed networks



Background & purpose, continued

- TPB has contracted with Daniel Consultants Inc. (DCI) for this endeavor
 - Provide a new a foundation upon which to perform master network editing & maintenance tasks
 - Implement advanced functionality through customization
- Two phases- divided between fiscal years FY 2008 and FY2009
- \$150,000 total budget, with half (\$75,000) allocated for each phase



Project objectives

- Report current network development procedures
 - Identify needs and priorities: current & future
 - Identify opportunities to improve workflows
- Develop an ArcGIS data model, geodatabase & custom application tools that
 - Replicate all functionality of TPB's legacy editing application for the master highway network
 - Allow multiple concurrent users to interact with the database
 - Integrate transit network features into master network
 - Improve highway network feature editing
 - Facilitate TIP project tracking



Project history:

Phase 1 (FY-2008)

- Focused primarily on highway functionality
- Evaluated existing procedures
- Conducted focus group interviews with GIS, networks, and models teams
- Identified functional needs for new application
 - Prioritized 'wish list,' ranking feasibility & importance
 - Most 'Phase 1' items addressed in deliverables
- Organized all relevant datasets
 - Product: data model for our Master Network
 - Product: Geodatabase with all relevant datasets
- "COG Tools": custom ArcGIS toolbar
 - Editing highway networks
 - Building any-year networks
- Final Report: "GIS Database Applications and Protocols to Develop and Manage Transportation Network"



COG Tools toolbar & interface

- ArcMap environment
- COG Tools toolbar
- COG Network Editor
- Information window
- Export options

The screenshot displays the ArcMap environment with several COG Tools components. The main map area shows a network diagram with a highlighted link labeled '13418'. The COG Network Editor window is open, showing a tree view of network elements and a table of attributes for the selected link.

Attributes of Link 13418 -> 13234 (2000)	
BaseYear	2000
NetworkYear	
ANode	13418
BNode	13234
Distance	0.140541748245448
TOLL	0
TollGroup	0
FType	6
AMLane	2
PMLane	2
OPLane	2
AMLimit	0

The COG Tools toolbar is visible, and its context menu is open, showing options like 'Edit Master Network', 'Export Network', and 'Add BaseLayer'. The COGTools Info window displays system information, and the Export Network dialog is open, showing options for 'Export Format' and 'Network Year'.



Project history:

Phase 2 - (FY-2009)

- Review and test existing prototype
 - Include additional datasets
 - Address any bugs or other functionality limitations
- Implement additional features
 - Working from our prioritized 'wish list'
 - Additional newly discovered user requirements
- Include transit network editing
 - Extend data model to include all relevant transit data
 - Modify application tools to facilitate transit network editing



- Target completion date: January 2009

Project challenges

- We are on the forefront of this type of development
 - Many MPO's are interested in leveraging GIS technology to facilitate network development...
 - But there's no 'silver bullet' solution
 - Network development needs do not always easily translate into 'GIS speak'
- A limited budget has partially dictated our implementation
 - The need to prioritize our wants and needs
 - Complex, customized applications require time
- Project requires management & input from multiple teams in the department
- Finding a balance between GIS and transportation planning/modeling expertise



Wrap-up & future plans

- We are in the second phase of a 2-phase project that upgrades and improves our current master network editing and maintenance procedures
- The end-product will be a multi-year geodatabase and ArcGIS application that supports
 - Multiple concurrent user
 - editing/integration of both highway and transit features
- Regular progress reports will be given to TFS, as warranted

