

Travel Forecasting for Project-Level Planning and Design

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U.S. Department of Transportation
Federal Highway Administration



Safe Roads for a Safer Future
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<http://safety.fhwa.dot.gov>

Agenda

- Why forecast travel?
- Forecasting process
- Resource documents
- Selected case history
- NEPA considerations



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Why forecast travel?

- Design roadways based on future need
- Prioritize transportation improvement projects
- Justify the necessity of road projects
- Maximize the effectiveness of limited funds
- 23 USC 109 (b) – 20 year Interstate design requirement
- NEPA: evaluate performance of alternatives
- NEPA: estimate environmental impact such as air quality, noise, safety, indirect and cumulative effects

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Forecasting Process

- Determine time frame
- Determine geography/study area
- Identify geometric/operational changes
- Identify significant non-geometric changes, i.e. major changes in land use
- Identify resources
- Select traffic forecasting tools



Forecasting Process

- Collect data
- Perform field observations
- Run travel demand model (or use of another forecasting tool)
- Quality analysis /quality review
- Documentation (should be conducted concurrently with all of the above)

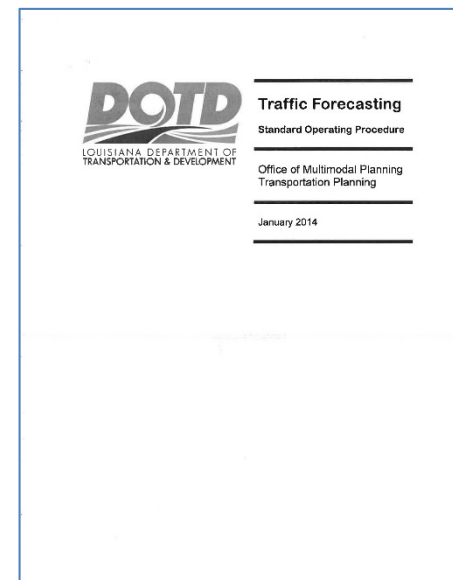
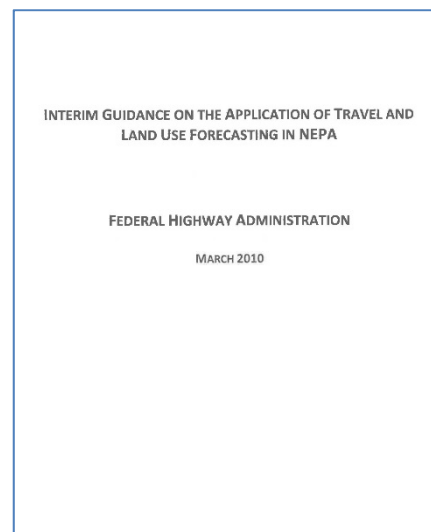
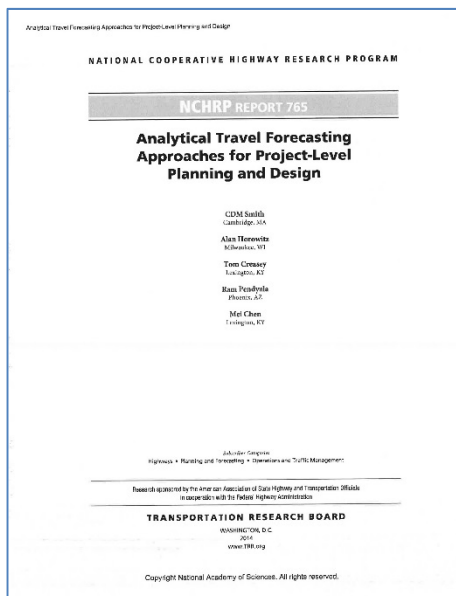
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Resource Documents

- NCHRP Report 765
- FHWA Guidance on Application of Travel and Land Use Forecasting in NEPA
- DOTD Standard Operating Procedure



Resource Documents

- NCHRP Report 765
 - “Analytical Travel Forecasting Approaches for Project-Level Planning and Design”
 - Published in 2014
 - Updated version of 1982 NCHRP Report 255
 - TRB / AASHTO / FHWA
 - Most State policies based on 765
 - Technical document but not a cook book

Resource Documents

- FHWA Guidance on Application of Travel and Land Use Forecasting in NEPA
 - March 2010 ‘Interim’ Guidance
 - “Litigation risk” prompted development
 - Focuses on procedural and process considerations in traffic forecasting
 - Companion to NCHRP 765



Resource Documents

- FHWA Guidance on Application of Travel and Land Use Forecasting in NEPA
 - Why?
 - Forecasting methods often a source of significant disagreement among agencies and interest groups
 - Conflicts often process-related in nature
 - Misunderstandings regarding what work was done
 - What assumptions were made
 - What input was used

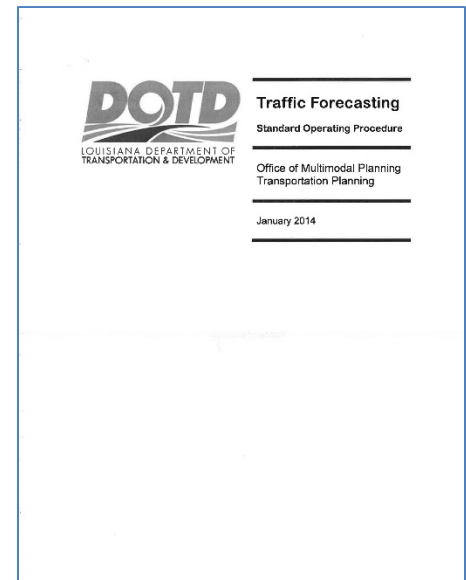
Resource Documents

- FHWA Guidance on Application of Travel and Land Use Forecasting in NEPA
 - Why?
 - How methods and approaches were chosen
 - How procedures were carried out
 - Forecasting is not a heavily legislated or regulated area of science
 - Driven by professional practice and judgement

Target rich environment for litigation!

Resource Documents

- DOTD Traffic Forecasting Standard Operating Procedure
 - Office of Multimodal Planning
 - January 2014
 - Outlines roles and responsibilities
 - Provides procedures for
 - Forecasting without a model
 - Forecasting with a model



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Selected Case History

- Why is traffic forecasting a high litigation risk?
 - Not heavily legislated or regulated area
 - Mainly driven by the standards of professional practice
 - Large variation in practice and experience
 - Source of disagreements among agencies
 - Large number of assumptions and judgments

Selected Case History

Vermont Yankee Nuclear Power Corp. v.
Natural Res. Def. Council Inc

NEPA's mandate to agencies is essentially procedural. It is to insure a fully informed and well-considered decision.

Selected Case History

Strycker's Bay Neighborhood Council v. Karlen

“The only role for a court is to insure that the agency has considered the environmental consequences; it cannot interject itself within the area of discretion of the executive as to the choice of the action to be taken”

Selected Case History

Sierra Club, Ill Chapter v US DOT

- *The EIS contained no analysis of how the project would improve travel times, enhance community linkages, or alleviate other existing transportation problems*
- *The Court found the EIS legally insufficient because of the absence of such information*

Selected Case History

Marsh v. Oregon Natural Reservation

“...Court must set aside agency actions, findings and conclusions found to arbitrary, capricious, an abuse of discretion...”

“...Court must consider whether the decision was based on a consideration of the relevant factors”

- U.S. Supreme Court

Selected Case History

Senville v. Peters

“...Court must set aside agency decision when it

- 1) failed to consider an important part of the problem*
- 2) ignored pertinent data*
- 3) offered an explanation for its decision that runs counter to the evidence*
- 4) reached a wholly implausible decision”*

Selected Case History

Senville v. Peters

“An EIS will be upheld if the agency:

- 1) Followed a ‘rule of reason’ in its preparation and compiled it in good faith*
- 2) Set forth sufficient information to enable the decision-maker to consider fully the factors involved*
- 3) Can make a reasoned decision after balancing the risks of harm against the benefits derived from action*
- 4) Can make a reasoned choice between alternatives*

Selected Case History

North Carolina Alliance for Transp. Reform v US DOT

- *Agencies misstatement of traffic modeling data was impermissible*
- *Agency violated NEPA by including higher, overstated estimates of traffic projections*
- *Accurate scientific analysis and public scrutiny are essential to implementing NEPA*
- *Thorough documentation is the only way to ensure adequate public scrutiny*

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NEPA Considerations

- Scope of study needs to fit project purposes and decision maker needs
- Modeling methods, tools and data must be suitable to adequately examine alternatives
- Early coordination during the scoping process is recommended to reach and document agreements on forecasting assumptions

NEPA Considerations

- Project management efforts should be monitored to ensure consistency in data, results and approaches
- The based assumptions used for the traffic forecast should be the same as those used in air quality and noise analyses
- All forecasting efforts must be documented and archived to describe how analytical models were chosen, what assumptions were made and who made the choices.

NEPA Considerations

- Use of tools and methods should be justified.
- Forecasting methods, assumptions and judgements must be applied objectively without bias toward a decision
- Adding “safety factors” can be interpreted as a bias toward a particular alternative

NEPA Considerations

- Track all assumptions, judgements, simplifications and estimations no matter how minor or seemingly insignificant
- If inconsistent assumptions are necessary, justify and document
- Calibration, validation and reasonableness checking

NEPA Considerations

- Peer Review
 - Ensures standard or professional practice
 - Inherently requires documentation
 - Challenges assumptions and judgement
 - Risk-based application

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