OVERVIEW

- HERS Background
- System Planning Tool Development
- HERS_IN Structure
- Results of Statewide Analysis
- Current Applications
- Future Development
- Question and Answer Period

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**HERS BACKGROUND**

- Highway Economic Requirements System (HERS) developed in 1991 by Jack Faucett Associates
  - Uses the HPMS national sample data
  - USDOT “Status of the Nation’s Surface Transportation System: Condition and Performance-Report to Congress
  - HERS provides
    - Summary of the highway system LOS and Speeds
    - Identify highway investment needs
    - Generates B/C analysis of investment levels
  - HERS provides system level information based upon expansion of sample data
  - INDOT need for project specific B/C analysis

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SYSTEM PLANNING TOOLS DEVELOPMENT

- Intermodal Management System
  - Purchase of TransCAD GIS
  - Statewide GIS Highway Network and Routing System for Dynamic Segmentation
  - Display of State Jurisdiction Road Inventory Data

- Major Corridor Study
  - Indiana Statewide Travel Model
  - Highway Economic Requirements System/Indiana
  - Develop State Jurisdiction Roadway Data for HERS_IN to create 100 percent database
HERS_IN NEEDS ANALYSIS MODEL

- FHWA Model Modified by Cambridge Systematics (Ver 3.097)
- Integration with Statewide Travel Demand Model
- Focus on Identification of Capacity Expansion Improvements
- Use of B/C analysis to Determine Improvements by Phase
- Estimation of Capacity Expansion Project Costs
- Expansion of Model Analysis (Basic and Override)
- Integration of Link Specific Output with GIS
**HERS_IN INPUT DATA FILE**

- **MODIFIED HPMS DATA FILE**
  - Linear Referencing Data (Route ID, Log Miles)

- **ROAD INVENTORY FILE - - 12,000 Segments**
  - Physical Features (FC, Lanes, Widths, Access Control)
  - Operating Characteristics (AADT, Posted Speeds)

- **HPMS BASED DEFAULT DATA**
  - Percent Sight Passing Distance
  - Percentage of Commercial Vehicles
  - Percent Green Time
  - Numbers of Intersections (Estimation Procedure)

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HERS IN ANALYSIS - GENERAL PROCESS

- **Input**
  - Future Conditions and Performance
- **Deficiency Identification**
- **Potential Improvement Identification**
- **Improvement Selection**
  - Output
    - B/C Ratio
    - Project Cost
INTEGRATION WITH STATEWIDE TRAVEL DEMAND MODEL FORECASTS

Use of Travel Demand Model’s Forecasted Growth Rates

Rural Interstate System

Growth Rates developed by each Functional Classification Category by each Indiana County

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**HERS_IN IMPROVEMENT TYPES**

- Added Travel Lanes (Major Widening at Normal Cost)
- Improve Alignment (dropped for initial applications)
  - Horizontal and Vertical Curvature
- Pavement Improvement Treatments (Removed from Model)
  - Resurface
  - Reconstruction
- Ability to code in Pavement Replacement/Reconstruction locations in future work with HERS_IN “Override Mode”
HERS_IN IMPROVEMENT COSTS

- Costs based on 1997 INDOT Cost Estimates Developed by Engineering Assessment Section of Pre-Engineering and Environment Division

- Cost per Mile Varies by Improvement Type, Functional Classification Groupings (FC), and Terrain
  - Major Widening at Normal Cost
  - Rural FC (Interstate, OPA, Min. Arterial, Major Collector)
  - Urban FC (Freeway/Expressway, Other Div, Un-Div)

- Experience has shown need to incorporate Major Widening at High Cost using widening feasibility codes
**BENEFIT CATEGORIES**

- Travel Time by Vehicle Type (2-Auto, 5-Truck)
- Operating Costs (Fuel, Oil, Tires, Maint. & Repair, Deprec.)
- Safety
  - Crashes
  - Injuries
  - Fatalities
- Residual Value of Improvement
STATEWIDE ANALYSIS 2000 TO 2025

• NO BUILD
  • Statewide Annual VMT increases 62 %
  • Percentage of VMT below MTC for Congestion increases from 4% to 25%
  • Overall System Speed decreases 10%
  • Urban Interstate Speeds decrease 25%

• FULL SYSTEM IMPROVEMENTS
  • Improvement Costs $ 3.2 Billion with 1074 miles of roadway widened
  • Percentage of VMT below MTC for Congestion decreases from 4% to 2%
  • Overall System Speed decreases 1%
  • Urban Interstate Speeds remain constant

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FULL NEEDS ANALYSIS

Future Added Travel Lane Improvements by Priority

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HERS - PROJECTS IDENTIFIED

FULL NEEDS ANALYSIS

• 66 % of Roadway Improvements in Urban Areas

• Interstate Improvements ( $1.473 Billion)
  • Rural 110 miles
  • Urban 190 miles

• Principal Arterial ($1.388 Billion)
  • Rural 91 miles
  • Urban 475 miles

• Minor Arterial ($201 Million)
  • Rural 89 miles
  • Urban 29 miles

• Collector --85 miles Rural, 0 miles Urban---($127 Million)

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HERS - PROJECTS IDENTIFIED

Proposed Improvements
Project Phase
- 2000-2005
- 2006-2010
- 2011-2015
- 2016-2020
- 2021-2025

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**HERS_IN APPLICATIONS**

- Needs Identification Tool for 2000 to 2025 Statewide Plan
- Statewide System Performance Report for Executive Staff
- District / MPO Needs Report and Project Map
  - Project Specific Discussion at MPO/District Project Development Process (PDP) Meetings for Selecting New Projects for Development
  - Review of MPO Long-Range Plan Proposals for State Jurisdictional Roadways
FUTURE HERS_IN APPLICATIONS

- Improve Integration between Road Inventory Data updates, the Statewide Travel Demand Model and HERS_IN
- Update Cost Estimation Information
- Update HERS_IN Model with HERS/ST Improvements
- Integrate Pavement Management System
Highway Economic Requirements System for Indiana

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