IOWA STANDARDIZED MODEL STRUCTURE

Mid-Continent Transportation Research Symposium

August 17th, 2017

IOWA DOT SMARTER | SIMPLER | CUSTOMER DRIVEN

HNTB

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HRGreen

Presentation Overview

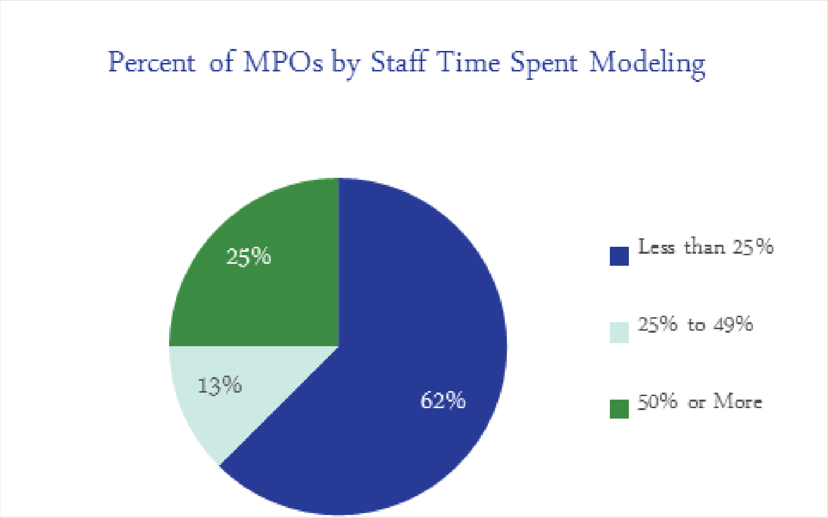
- Problem Statement
- History/Background
- What is ISMS? An overview…
- Model File Coordination & Management
- Current Status & Next Steps
- Questions

Problem Statement

- Travel Demand Models (TDMs) are a key tool for Iowa MPOs in analyzing travel demand

- Turnover and limited resources results in limited MPO expertise with these tools

- 9 unique models results in inefficiencies and inconsistencies



History/Background

- Pre-1990's DOT Responsible for models
  - Mainframe and Large Staff
- Early 1990's RIF pushed models to MPOs
  - Desktop software and PC's
  - DOT purchased licenses
- Late 1990's Chaos
- 2001 Travel Model Improvement Program (TMIP) Peer Review
  - DOT Support Modeling

History/Background

- DOT assembled team to assist
- Midwest Travel Model User Group (MTMUG) chose TransCAD platform
  - DOT covered 80% cost of TransCAD
- DOT provides continual training and assistance
- DOT largely responsible for 6 of 9 MPO models
- Need for more formal standardization
  - Follow trend of several other states

What is ISMS?

- Project Started: July 2015
- Surveys
  - Stakeholder Input
    - Iowa MPOs (nine agencies), Iowa DOT modeling team, and Consultants
  - Web-Based Review of TDM architecture frameworks for large and small MPO agencies

What is ISMS?

Goals of ISMS

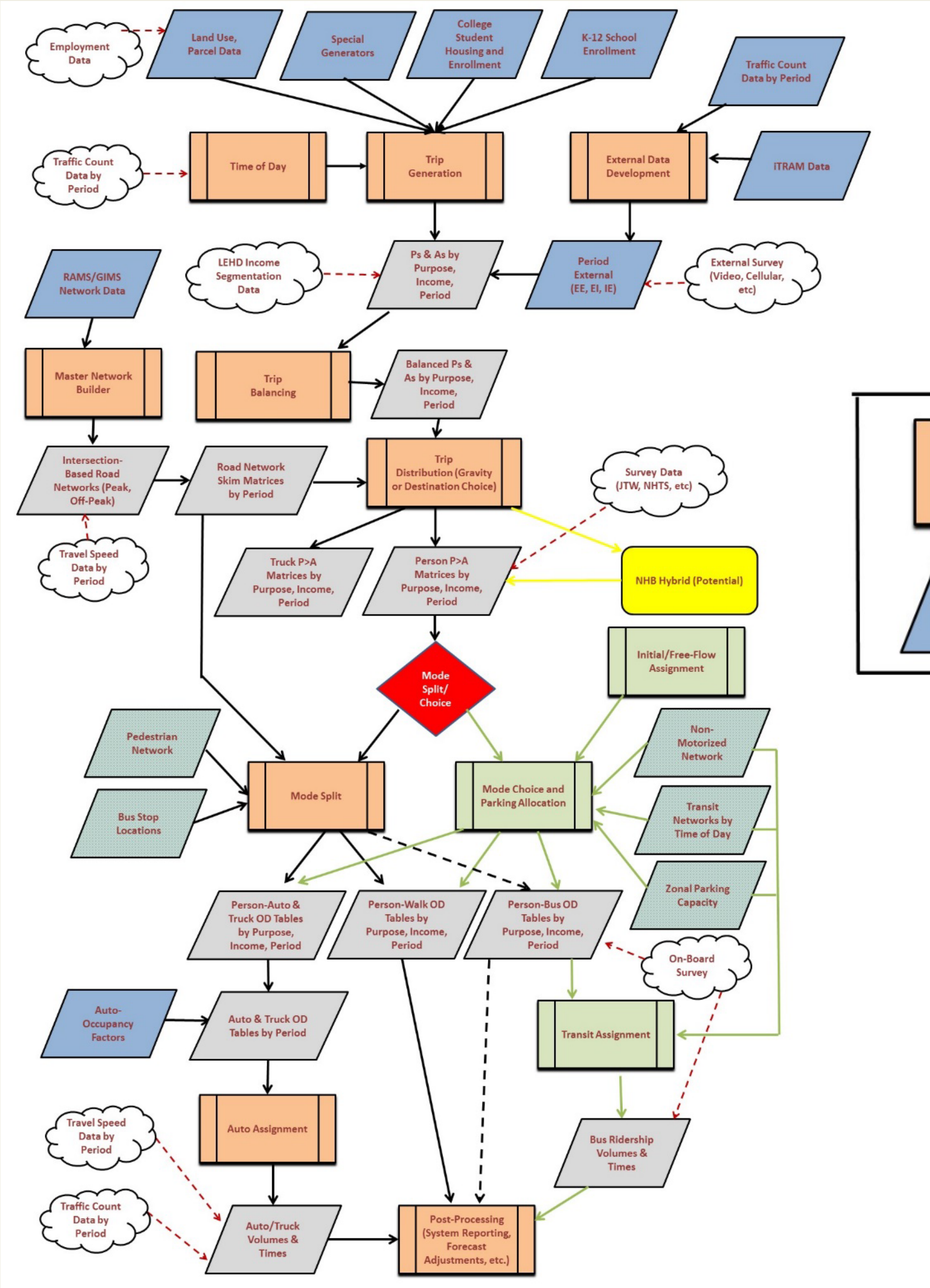
Based on current and best practices and Iowa TDM user Survey:

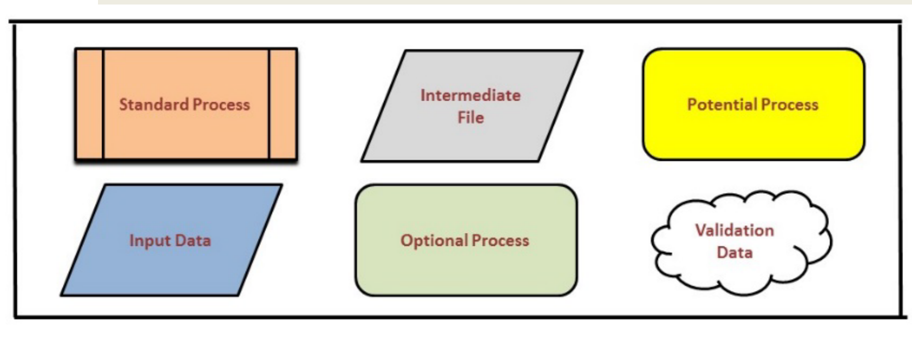
1. Institutionalize the use of TDMs in the MPO planning and prioritization processes;
2. Increase technical capabilities and understanding of MPO staff with respect to TDM development and application;
3. Develop clear guidance and expectations with respect to the roles and responsibilities of travel demand modelers;
4. Achieve a consistent approach to travel demand modeling across the State of Iowa’s 9 MPOs; and
5. Implement ongoing development and maintenance practices to ensure continual readiness and currency of MPO TDMs.

What is ISMS?

- Recommended TDM Architecture
  - 4 Step Modeling Approach
    1. Trip Generation
    2. Trip Distribution
    3. Mode Split/Mode Choice
    4. Trip Assignment
- Automated run-time procedure that is flexible
- Base and Forecast model inputs (networks, land use etc.) allow for scenario planning analysis

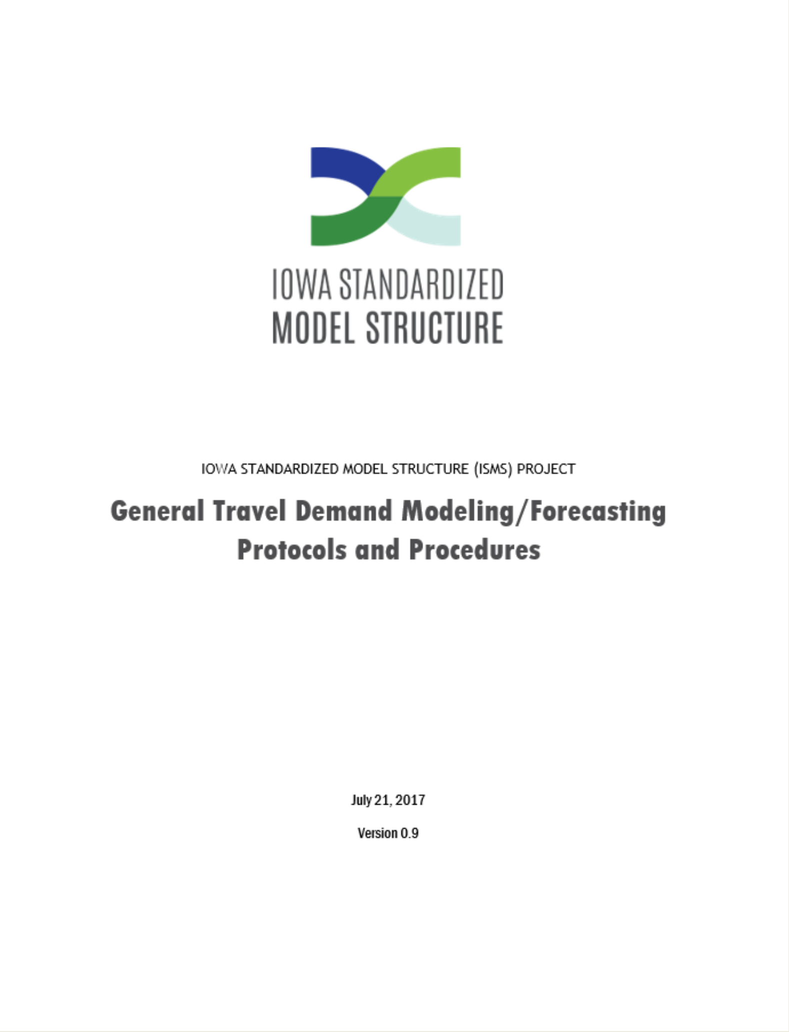
Architecture





What is ISMS?

- Manual
  - Overview
    - WHY?
  - Technical resource
    - WHAT? and HOW?
  - Workplan
    - WHO? and WHEN?



IOWA STANDARDIZED MODEL STRUCTURE

IOWA STANDARDIZED MODEL STRUCTURE (ISMS) PROJECT

General Travel Demand Modeling/Forecasting Protocols and Procedures

July 21, 2017

Version 0.9

ISMS Manual

1. Executive Summary
2. Introduction and Purpose
3. Overview of Standard Model Architecture
4. ISMS Model Architecture Details
5. General Modeling Protocols/Procedures
6. Guidance on Model Application
7. Appendices

ISMS Manual

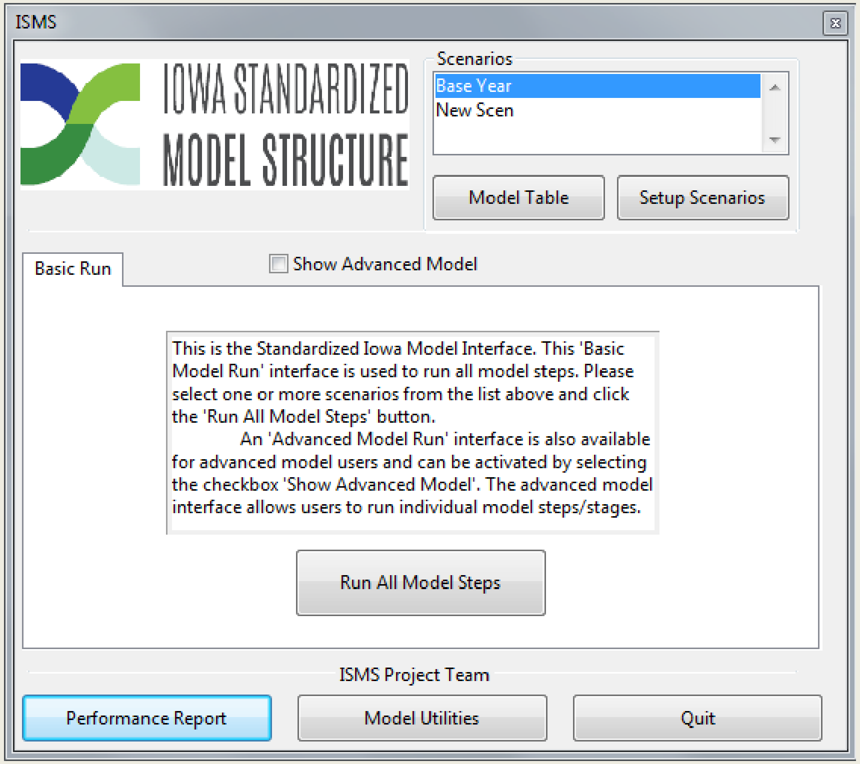
Manual Defines for each ISMS Model Step:

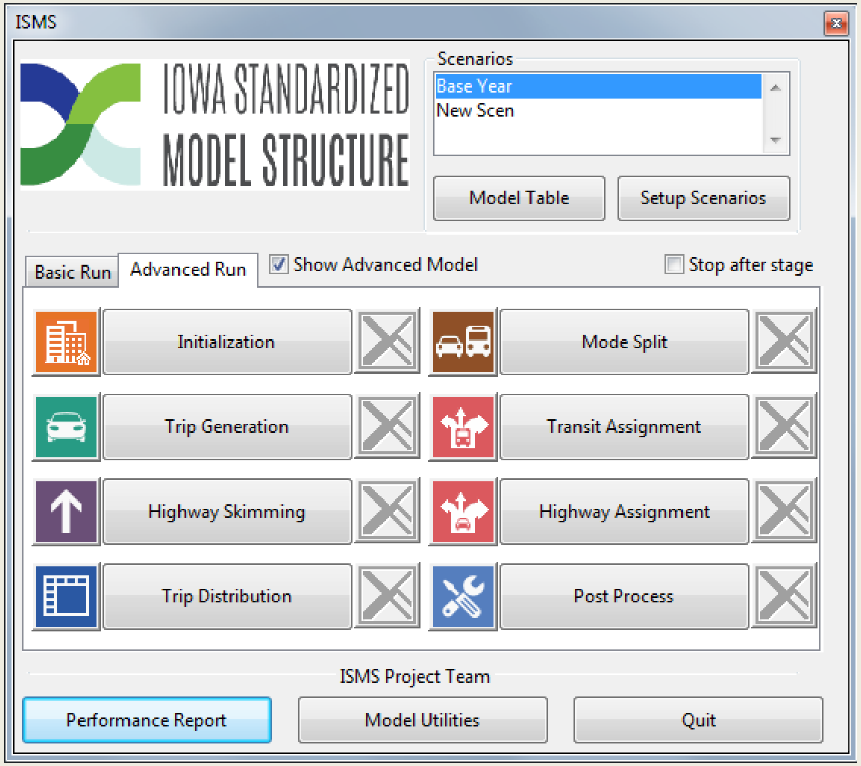
- Step Overview
- Recommended Architecture
- Data Sets (classified in one of four ways)
  - Input – data used in the model to generate outputs
  - Estimate – data used to develop the architecture or estimate parameters
  - Validation – data used to measure the model output reasonableness
  - Output – data developed as final output or intermediate files
- ISMS Application
- Calibration/Validation Standards
- Future Year Considerations
- Documentation Standards
- Quality Assurance and Control (QA/QC)

What is ISMS?

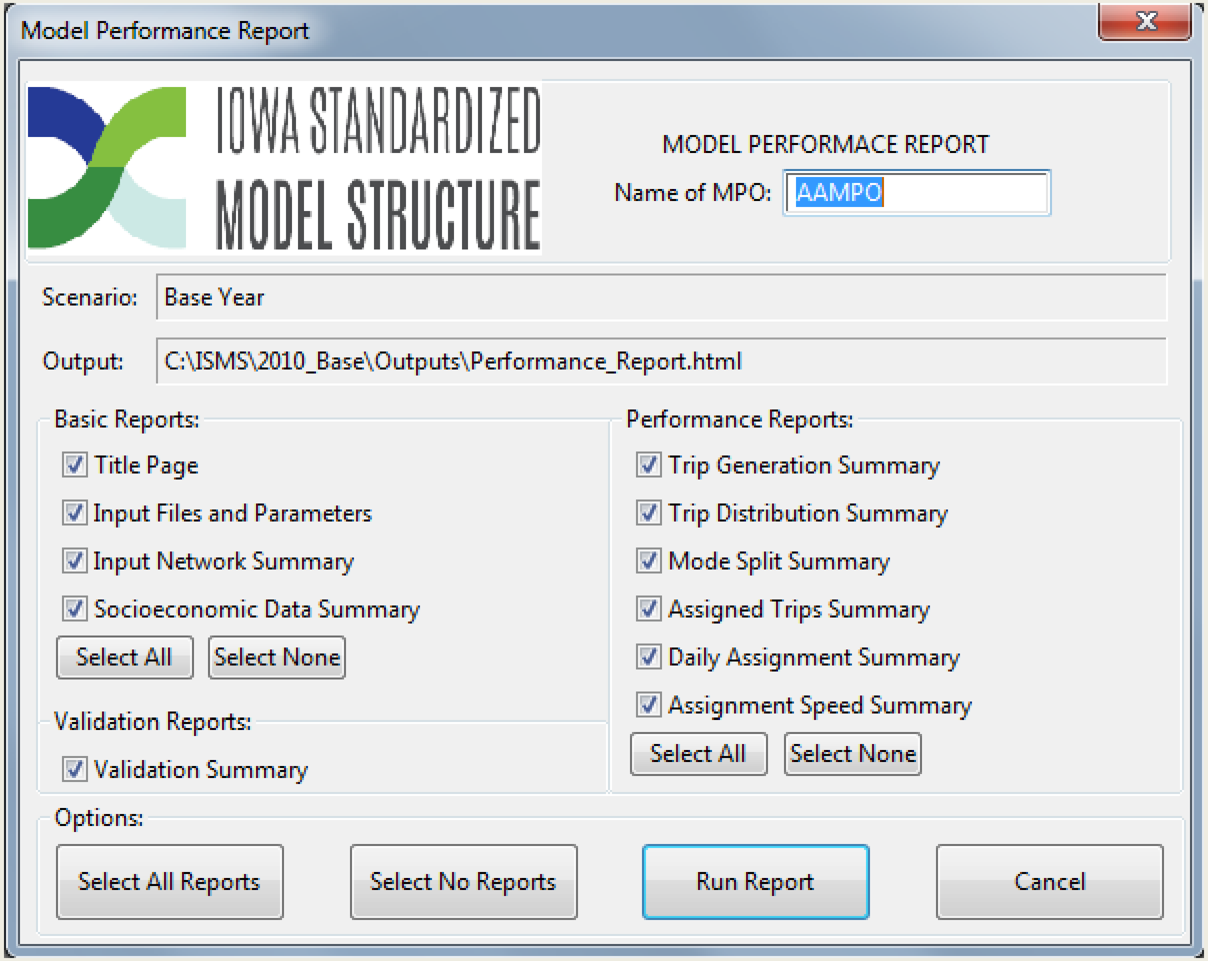
- ISMS TDM Prototype
  - Based on Caliper's GISDK programming language (C++)
  - Automated TDM process with default parameters for implementation (standardized and flexible)
  - Standardized reporting to aid in model calibration and validation

What is ISMS?


ISMS
IOWA STANDARDIZED MODEL STRUCTURE
Scenarios
Base Year
New Scen
Model Table
Setup Scenarios
Basic Run
Show Advanced Model
This is the Standardized Iowa Model Interface. This 'Basic Model Run' interface is used to run all model steps. Please select one or more scenarios from the list above and click the 'Run All Model Steps' button.
An 'Advanced Model Run' interface is also available for advanced model users and can be activated by selecting the checkbox 'Show Advanced Model'. The advanced model interface allows users to run individual model steps/stages.
Run All Model Steps
ISMS Project Team
Performance Report
Model Utilities
Quit


ISMS
IOWA STANDARDIZED MODEL STRUCTURE
Scenarios
Base Year
New Scen
Model Table
Setup Scenarios
Basic Run
Advanced Run
Show Advanced Model
Stop after stage
Initialization
Mode Split
Trip Generation
Transit Assignment
Highway Skimming
Highway Assignment
Trip Distribution
Post Process
ISMS Project Team
Performance Report
Model Utilities
Quit

What is ISMS?


Model Performance Report
IOWA STANDARDIZED MODEL STRUCTURE
MODEL PERFORMACE REPORT
Name of MPO: AAMPO
Scenario: Base Year
Output: C:\ISMS\2010_Base\Outputs\Performance_Report.html
Basic Reports:
Title Page
Input Files and Parameters
Input Network Summary
Socioeconomic Data Summary
Select All
Select None
Validation Reports:
Validation Summary
Performance Reports:
Trip Generation Summary
Trip Distribution Summary
Mode Split Summary
Assigned Trips Summary
Daily Assignment Summary
Assignment Speed Summary
Select All
Select None
Options:
Select All Reports
Select No Reports
Run Report
Cancel

Model File Coordination & Management

- ProjectWise (PW) – project collaboration software
- Bentley product (developers of MicroStation)
- Allows for better model file coordination and management as compared to email and FTP
- One location for the ‘official’ MPO model – additional users/agencies can be added if they need access to an MPO model

Current Status & Next Steps

- Final Draft nearly complete
- August 2017 MTMUG Meeting
  - Interface Prototype Demonstration
  - Manual overview
  - Input from MPO partners
- Expected Completion: October 2017
- Website Forthcoming

Questions?