Questionnaire to Support the Development of the TMIP Performance-Based Transportation Planning Toolbox

Questionnaire Introduction

Welcome and thank you for participating in the Questionnaire!

With the new emphasis on performance measurement and prediction under MAP-21, the Federal Highway Administration (FHWA) has undertaken to develop a toolbox to support performance-based transportation planning by state and local agencies through its Travel Model Improvement Program (TMIP).

The objective of the TMIP Performance-Based Transportation Planning Toolbox (the Toolbox) is to be a reference resource for the selection and application of analytical tools and methods incorporating principles of risk management to support data driven, performance-based transportation planning. The goal of the Toolbox is not to identify a single or even a set of ideal tools, but rather to provide a process, information and examples helping agencies to thoughtfully identify the appropriate tools and methods for their analytical needs with careful consideration of the data available, the issues and the risks involved.

The purpose of this questionnaire is to help identify the goals, experiences, needs and risks that your agency faces in generating performance measures to support transportation planning. In particular, through this Questionnaire, TMIP hopes to learn more about:

1. The issues of importance to your agency.
2. Your agency's experience and concerns related to performance measurement and prediction.
3. The technical and non-technical risks related to quantitative analysis to support the prediction of performance measures.
4. The analysis tools and methods used by your agency and the resources necessary to develop, use and maintain them.

TMIP will use the results of this Questionnaire to help focus the Toolbox in areas of the most need and to provide information about resources required to develop, use and maintain various types of analysis tools.

Your responses will represent the goals, experiences and needs of your agency. Thank you again for your participation.

Please email TMIP_Survey@rsginc.com with any questions or concerns.

Agency Background

1. Agency Name
2. Website URL
3. Person responsible for providing this information
   a) Name
   b) Position
   c) Email
   d) Phone Number
4. What is the status of tolling within your agency's jurisdiction?
   a) Existing toll facilities
   b) No existing, but planned toll facilities
   c) No planned toll facilities, but enabling legislation
   d) No enabling legislation
   e) No toll facilities or plans, unsure of legislation
5. What is the status of passenger rail service in your agency's jurisdiction?
   a) Existing passenger rail service (at least four trains daily)
   b) No existing, but planned passenger rail service (at least four trains daily)
   c) No existing or planned passenger rail service
6. At any time prior to this Questionnaire, was any part of your area designated non-attainment or maintenance for any of the following air quality criteria pollutants?
   a) Ozone
   b) CO (1 hr)
   c) CO (8 hr)
   d) PM_{10}
   e) $PM_{2.5}$ (daily)
   f) $PM_{2.5}$ (annual)
   g) NO_2 (1 hr)
   h) NO_2 (annual)
7. [If passenger rail service (Q5a or b)] Has your region ever submitted a New Starts/Small Starts applications?
   a) Completed one or more
   b) One or more in progress but none completed
   c) Contemplating one or more but none in progress
   d) None completed, in progress or contemplated

8. For each of the following please indicate, as best you can, the importance of the following issues to your agency as a whole:

	Extremely Important	Very Important	Important	Not very Important	Not at all Important
Transportation					
Road/Cordon Pricing					
Mobility/Congestion Reduction					
Transit					
Asset / Infrastructure Conditions					
Travel Demand / Congestion Management					
Traffic Operations/Systems Management					
Travel Time Reliability					
Economics					
Economic Impacts / Cost Effectiveness					
Freight					
Visitors/Seasonal Residents					
Economic Development					
Environmental					
Environmental Impacts					
Air Quality / Climate Change					
Environmental Justice / Equity / Transportation for Seniors					
Quality of Life					
Sustainability / Livability					
Walking / Biking/ Active Transportation					
Safety					
School Transportation					
Growth					
Smart Growth / Transit-Oriented Design/Built Environment					
Demographics/Evolution					
Long Distance Travel/ Migration					
Other					
(please specify)					

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Data Sources and Data Collection

9. Which of the following freely available federal data sources does your agency use (check all that apply)?

    a) Decennial Census
    b) Census Bureau - American Communities Survey (ACS)
    c) Census Bureau - Public Use Micro Data (PUMS) (either Decennial or ACS)
    d) Census Bureau - Longitudinal Employer-Household Dynamics (LEHD)
    e) Census Bureau - County Business Patterns
    f) Census Transportation Planning Package (CTPP)
    g) Bureau of Labor Statistics data
    h) Bureau of Economic Analysis - Regional Economic Accounts
    i) Bureau of Transportation Statistics – Transportation Statistics
    j) Bureau of Transportation Statistics – Commodity Flow Survey (CFS)
    k) Bureau of Transportation Statistics – Intermodal Freight Facilities Database
    l) Surface Transportation Board – Carload Waybill Sample
    m) Federal Highway Administration – Freight Analysis Framework (FAF)
    n) Federal Highway Administration – Vehicle Inventory and Use Survey (VIUS)
    o) Federal Highway Administration – National Household Travel Survey (NHTS)
    p) Federal Highway Administration – Highway Statistics Series (HPMS data)
    q) Federal Highway Administration – National Bridge Inventory (NBI)
    r) Federal Transit Administration – National Transit Database (NTD)
    s) National Highway Traffic Safety Administration – NASS-GES/FARS data
    t) Other (please specify)

10. Which of the following state data sources does your agency use (check all that apply)?

    a) Covered employment and wages data (ES-202)
    b) Economic input/output data (I/O)
    c) Population projections
    d) Economic forecasts
    e) School enrollment projections
    f) Vehicle registration data
    g) Traffic counts

11. Which of the following proprietary/commercial data does your agency purchase and use (check all that apply)?

    a) Employment/establishment data sets (InfoGroup/InfoUSA, Dunn & Bradstreet, etc.)
    b) Economic forecasts (Woods & Poole, etc.)
    c) Economic input/output data (IMPLAN, etc.)
    d) Composite/bundled data (Nielsen/Claritas, etc.)
    e) Trucking/warehousing databases (FleetSeek, Leonard's Guide, etc.)
    f) Freight/commodity flow (IHS Global Insight/Reebie TRANSEARCH, IMPLAN, etc.)
    g) Travel time data (INRIX, NavTeq, TomTom, AirSage, etc.)
    h) Other (please specify)

12. Does your agency have or have access to a GIS database of all land parcels within your planning jurisdiction?

13. How frequently does your agency conduct/participate in the following types of special surveys?

	1-2 years	3-5 years	6-10 years	Less than every 10 years	Never
Household travel survey					
Establishment travel survey					
Transit on-board survey					
Visitor survey					
External cordon line origin-destination survey					
Corridor or other special origin-destination survey					
Freight roadside intercept survey					
Commodity Flow Survey					
Stated preference surveys					
Parking Surveys					
Special Generator Surveys					
Panel Surveys					

14. Which of the following emerging data sources / collection technologies has your agency used (check all that apply)?
   a) Archived operational traffic data
   b) Transit operational data on actual vehicle headways
   c) Web-based surveys
   d) GPS based external cordon line or other special origin-destination surveys
   e) Cell-phone based external cordon line or other special origin-destination surveys
   f) Bluetooth based external cordon line or other special origin-destination surveys
   g) GPS-based household surveys
   h) Tablet-based on-board surveys

i) ATRI truck GPS data

j) Electronic transit fare and toll collection data

k) Data on internet and smart-phone use, purchases, etc.

Performance Measurement and Prediction

15. How important are quantitative analysis / performance measures in your agency's current decision making processes?

   a) Extremely Important
   b) Very important
   c) Somewhat Important
   d) Not very important
   e) Not at all important

16. Do you think MAP-21 will make performance measures and quantitative analysis more important in your agency's decision making process? [Y/N/do not have enough information yet]

17. What experience does your agency have generating the following general types of performance measures:

	Extensive Experience	Considerable Experience	Some Experience	A Little Experience	No Experience
Transportation					
Bridge Conditions					
Pavement Conditions					
Other Asset Conditions					
Mode Split/Alternative Modes					
Transit Ridership					
VMT / Roadway Volume					
Average Speed / Delay					
Reliability					
Accessibility					
Economic / Freight					
Freight Mobility					
User Benefits					
Economic Impacts					
Economic Development					
Visitor Travel/Seasonal Residents					
Cost					
Cost					
Cost Effectiveness					
Environmental					
Ecosystem / Biodiversity / Habitat					
Water Quality					
Wetlands					
Air Quality					
Climate Change					
Energy Consumption					

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Environmental Health					
Noise					
Community					
Health / Physical Activity / Walking / Biking					
Land Use					
Archeological / Historical Resources					
Social					
Visual Quality					
Quality of Life					
Environmental Justice / Equity					
Parks and Recreation					
Schools					
Safety (crashes, crash rates)					
Emergency Response Times					
Other					
(please specify)					

18. [For measures in Q14 with experience] For each of the following general types of performance measures, please rate on a scale of 1 to 5, your confidence in the accuracy of your agency's data on current conditions and the ability of your agency to accurately forecast future conditions. [5 = high confidence, 1 = no confidence]

	Accurate Data on Current Conditions	Accurate Forecasts of Future Conditions
Transportation		
Bridge Conditions		
Pavement Conditions		
Other Asset Conditions		
Mode Split/Alternative Modes		
Transit Ridership		
VMT / Roadway Volume		
Average Speed / Delay		
Reliability		
Accessibility		
Economic / Freight		
Freight Mobility		
User Benefits		
Economic Impacts		
Economic Development		
Visitor Travel/Seasonal Residents		
Cost		
Cost		
Cost Effectiveness		
Environmental		
Ecosystem / Biodiversity / Habitat		
Water Quality		

	Accurate Data on Current Conditions	Accurate Forecasts of Future Conditions
Wetlands		
Air Quality		
Climate Change		
Energy Consumption		
Environmental Health		
Noise		
Community		
Health / Physical Activity / Walking / Biking		
Land Use		
Archeological / Historical Resources		
Social		
Visual Quality		
Quality of Life		
Environmental Justice / Equity		
Parks and Recreation		
Schools		
Safety (crashes, crash rates)		
Emergency Response Times		
Other		
(please specify)		

General Risks for Quantitative Analysis

Note: This set of questions (MaxDiff) serves to obtain quantitative information from respondents about the general adverse risks to the successful prediction of performance measures. MaxDiff will provide a raw utility for each statement and the relative/ranked importance among all statements. MaxDiff is a statistical method pioneered by Jordan Louviere in the early 1990s. MaxDff questions force respondents to make choices between options and produce results that show the relative importance of the items being rated. This is useful because it avoids situations where respondents rate most or all statements as "important" making it more difficult to distinguish the most important statement. Instead, the raw utility of each MaxDiff statement is calculated allowing the analyst to examine the relative differences in <u>importance</u> among all statements.

[Note: Example question for illustrative purposes]

Next, you will see a series of 8 questions. For each question, you will see 4 types of analyses that could be difficult because of inaccurate or incomplete input data, invalid assumptions, or inaccurate or incomplete data for model development/calibration/validation.

For each question, please choose the analysis that is MOST LIKELY to be a risk to your agency and also choose the analysis that is LEAST LIKELY to be a risk to your agency because of data problems.

19-26. MaxDiff1

Which of the following analysis is MOST LIKELY to be a risk to your agency because of inaccurate or incomplete input data, invalid assumptions, or inaccurate or incomplete data for model development/calibration/validation? Which of the following analysis is LEAST LIKELY to be a risk to your agency because of problems with data?

MOST LIKELY		LEAST LIKELY
€		€
€		€
€		€
€		€

Note: This is the full list of statements to be asked. Each statement is shown at least twice to the respondent. An experimental design is used to determine which four statements are shown in each question.

1. Asset conditions forecast
2. Traffic forecasts
3. Operations analysis
4. Transit ridership forecast
5. Intercity/external forecast
6. Pedestrian/cyclist activity forecast
7. Economic analysis
8. Freight forecast
9. Project cost estimate
10. Environmental impact assessment
11. Land use/demographic forecast
12. Environmental Justice / equity analysis

27-34. MaxDiff2

Which of the following analysis is MOST LIKELY to be a risk to your agency because of technical problems, such as in-sensitivity or over-sensitivity of analysis tools, over-calibration or over-specification or models, use of adjustment factors, poor predictive power of existing tools, or lack of available tools or methods? Which of the following analysis is LEAST LIKELY to be a risk to your agency because of technical problems with tools or methods?

Note: The same list of 12 statements will be asked. Each statement is shown at least twice to the respondent. An experimental design is used to determine which four statements are shown in each question.

35-42. MaxDiff3

Which of the following analysis is MOST LIKELY to be a risk to your agency because of budget or schedule problems, such as cost overruns, schedule delays, insufficient staffing or insufficient staff

skills to correctly apply available tools? Which of the following analysis is LEAST LIKELY to be a risk to your agency because of budget or schedule problems with analysis tools?

Note: The same list of 12 statements will be asked. Each statement is shown at least twice to the respondent. An experimental design is used to determine which four statements are shown in each question.

43. Does your agency have a formal risk management process/program?
    a) Yes
    b) No

44. Does your agency have a formal quality control or quality assurance process/program?
    a) Yes
    b) No

Analysis Tools and Methods

45. Does your agency document its decision process to develop or acquire analysis tools / methods?
    a) Yes
    b) No

46. [if Yes] Please provide a title of and/or link to an example of such documentation.

47. Does your agency document its decision process to use an analysis tool / method for a particular project or program?
    a) Yes
    b) No

48. [if Yes] Please provide a title of and/or link to an example of such documentation.

49. Which of the following tools has your agency used (directly or through consultant assistance) within the past three years (check all that apply)?
    a) Sketch planning tools (IDAS, SPASM, SMITE, etc.)
    b) Strategic models (SmartGAP, GreenSTEP, EERPAT, etc.)
    c) Land use model / visioning tool (UrbanSim, PECAS, DRAM/EMPAL, LUSDR, LEAM, CubeLand, TRANUS, MEPLAN, METROSIM, UPLAN, CommunityViz, i-PLACE3S, EnvisionTomorrow, WhatIf?, etc.)
    d) Travel demand model (TransCAD, CUBE, EMME, VISUM, QRS II, etc.)
    e) Dynamic traffic assignment (DTA) (CUBE Avenue, TransModeler, TRANSIMS, VISTA, DynaSmart, DynusT, DynaMIT, etc.)
    f) Traffic microsimulation model (VISSIM, TransModeler, Paramics, CORSIM, etc.)
    g) Analytic/deterministic/optimization traffic tool (McTrans HCS/HCM, Synchro, TEAPAC, TRAFFIX, etc.)
    h) Economic impact / Benefit-cost tool (TREDIS, REMI, STEAM, T-PICS, HERS, Cal-B/C, NET-BC, MicroBENCOST, HDM4, etc.)
    i) Crash forecasting tool (HSM / IHSDM, SafetyAnalyst, etc.)
    j) Project (lifecycle) costing tool (RealCost, etc.)
    k) Vehicle emissions models (MOVES, EMFAC, MOBILE)

      l)   Air dispersion model (AERMOD, CAL3QHC or similar)

      m) Noise impact model (FHWA's TNM or similar)

      n)   Data visualization/visual analytics (ESRI, CADD, Adobe, etc.)

      o)   Other (please specify)

50. [If Sketch Planning Tools] What sketch planning tool(s) does your agency use?

51. [If Strategic Models] What strategic model(s) does your agency use?

52. [If Land use model / visioning tool] Which of the tool does your agency used (check all that apply)?

      a)   UrbanSim / OPUS

      b)   PECAS

      c)   DRAM/EMPAL

      d)   LEAM

      e)   CubeLand

      f)   TRANUS

      g)   MEPLAN

      h)   METROSIM

      i)   ULAM

      j)   UPLAN

      k)   CommunityViz

      l)   i-PLACE3S

      m) EnvisionTomorrow

      n)   WhatIf?

      o)   MetroQuest

      p)   RapidFire

      q)   Custom / "Home-grown" (LUSDR, CUSIM, LUCI, etc.) (please specify)

      r)   Other commercial/standard model (please specify)

53. [If Land use model / visioning tool] How long has your agency been using this tool?

      a)   Still under development

      b)   1 year or less

      c)   2 years

      d)   3-5 years

      e)   5-10 years

      f)   More than 10 years

52. [If Land use model / visioning tool] Is the tool integrated with the agency's travel model?

      a)   No, independent tool

      b)   Integration in progress

      c)   Partial integration

      d)   Full operational integration

53. [If NOT Land use model / visioning tool] Is your agency considering use of a land use model / visioning tool?

      a)   No, we rely on land use forecasts from another agency / source

      b)   No, we rely on expert panels / professional judgment

   c) No, we rely on simple manual, rule-based processes (based on comprehensive/master plan/zoning, scale up current distribution, most recent growth areas, etc.)
   d) Yes, we are considering such tools but have no definite plans
   e) Yes, we have plans to purchase / develop a land use tool / model

54. [if Travel demand model] Which of the following is the travel demand model used to develop forecasts for by your agency (check all that apply)?
   a) Long Range Plan Development
   b) TIP Development
   c) Air Quality Conformity Demonstrations
   d) NEPA Alternatives Analysis
   e) Design Forecasts
   f) Operational Planning / Travel Demand Management
   g) Transit Studies
   h) Freight Studies
   i) Operational Studies

55. [if Travel demand model] Which personal travel modes does your travel model forecast (check all that apply)?
   a) Auto (total only)
   b) Auto (SOV and HOV)
   c) Walk/bike
   d) Bus
   e) Rail
   f) Air
   g) Other (please specify)

56. [if Travel demand model] Which freight modes does your travel model forecast (explicitly) (check all that apply)?
   a) Four tire commercial vehicles
   b) Trucks
   c) Rail
   d) Rail/Truck Intermodal
   e) Other Intermodal
   f) Barge
   g) Air
   h) Other (please specify)
   i) Freight is not modeled explicitly

57. [if Travel demand model] Which framework is your current travel model?
   a) Trip-based
   b) Tour-based (trips linked into tours)
   c) Activity-based (trips and tours linked into daily patterns)

58. [if Tour or activity-based] How long has your agency been using this tool?
   a) Still under development
   b) 1 year or less

    c)   2 years

    d)   3-5 years

    e)   5-10 years

    f)   More than 10 years

59. [if Trip-based] Is your agency moving towards a tour or activity-based model?

    a)   No

    b)   Undecided

    c)   Yes, but no concrete plans / timeframe uncertain

    d)   Yes, next model update, not underway

    e)   Yes, efforts currently underway

60. [if Travel demand model] Is your travel model sensitive to the following and if so, in what elements of the decision structure is it applied?

	Number of Trips	Destinations	Modes	Time of Day	Routes
Age of Head of Household or Presence of Seniors					
Land use Diversity or Mixed Use Developments					
Measures of walk/bike suitability					
Roadway tolls					
Parking costs					
Fuel prices					
Accessibility [to jobs, to shopping, etc.]					
Traveler attitudes					
Service characteristics other than time/cost, such as reliability, real-time information, comfort, safety, etc.					
Employer policies such as flex-time, free parking for carpooling, subsidized transit passes, etc.					
ITS policies such as ramp metering, speed harmonization, incident management, etc.					

61. [if DTA] What DTA tool(s) does your agency use (check all that apply)?

    a)   TRANSIMS

    b)   CUBE Avenue

    c)   TransModeler

    d)   VISTA

    e)   DynaSmart

    f)   DynusT

    g)   DynaMIT

    h)   Other

        (please specify)

62. [if DTA] How long has your agency been using the DTA tool(s)?
   a) Still under development
   b) 1 year or less
   c) 2 years
   d) 3-5 years
   e) 5-10 years
   f) More than 10 years

63. [if NOT DTA] Is your agency moving towards a dynamic traffic assignment?
   a) No
   b) Undecided
   c) Yes, but no concrete plans / timeframe uncertain
   d) Yes, next model update or planning cycle, not underway
   e) Yes, efforts currently underway

64. [if Traffic microsimulation model] What traffic microsimulation model(s) does your agency use (check all that apply)?
   a) VISSIM
   b) TransModeler
   c) Paramics
   d) CORSIM
   e) Other (please specify)

65. [if Analytic/deterministic/optimization traffic tool] What analytic/deterministic/optimization traffic tool(s) does your agency use (check all that apply)?
   a) McTrans HCS/HCM
   b) Synchro
   c) TEAPAC
   d) TRAFFIX
   e) Other (please specify)

66. [if Economic impact / Benefit-cost tool] What economic impact / benefit-cost tool(s) does your agency use (check all that apply)?
   a) TREDIS
   b) REMI
   c) STEAM
   d) T-PICS
   e) HERS
   f) Cal-B/C
   g) NET-BC
   h) MicroBENCOST

    i)   HDM4

    j)   Other Custom / "Homegrown"

    k)   Other

        (please specify)

67. [if Economic impact / Benefit-cost tool] How long has your agency been using the economic impact/benefit-cost tool?

    a)   Do Not Use

    b)   1 Year or less

    c)   2 Years

    d)   3-5 Years

    e)   5-10 Years

    f)   10 Years

68. Which of the following software does your agency use for visualization / visual analytics?

    a)   ESRI (AcrMap)

    b)   CADD (Bentley Microstation, Geopak, Leap Suite, etc.)

    c)   Adobe (Photoshop, Premiere, Illustrator)

    d)   Microsoft (Word, Excel, Viso)

    e)   HEC-RAS

    f)   HY8

    g)   USGS Maps

    h)   Trimble

    i)   Ziess/Intergraph

    j)   Ortho photos

    k)   Google Earth

    l)   Pathway Viewer

    m)   Visidata Viewer

    n)   Lumon-3D

    o)   Silverlight

    p)   Slope\W

    q)   MSEW

    r)   SHORING

    s)   SLIDE

    t)   FoSSA

    u)   ReSSA

    v)   ALLPile

    w)   ArchVision (RPC) (Trees, Cars, People, Water)

    x)   Autoturn

69. Which of the following does your agency use these tools for (check all that apply)?

    a)   Reports

    b)   Powerpoint presentations

    c)   Process charts

    d)   Public meeting media

e) Viewing/evaluating alternate alignments

f) Viewing/evaluating alternate operational strategies

g) Accident data review

h) Roadway (pavement) conditions review

i) Asset review (signs, guardrails, etc.)

j) 3D models

k) 3D color renderings

l) Animations

m) Photomontage