

# Research Problem Statement

## Title<sup>1</sup>

Transferable Analysis Techniques and Data for Multimodal Assessment in Smaller Communities

## Background<sup>2</sup>

A wide range of analysis tools have been developed to evaluate multimodal strategies to meet transportation needs. These tools tend to offer system-level approaches to transportation planning. Multimodal analysis tools can be especially useful to planners in rural and small but growing communities. For example, multimodal systems can be effective in areas with high levels of tourism or recreation (e.g., National Park shuttle systems and bicycle, pedestrian or transit access to trailheads can help relieve roadway capacity constraints).

Multimodal analysis tools can be used to assess and evaluate the performance of transit, bicycle, and pedestrian facilities, and can range from a question-and-answer checklist to detailed multimodal performance measures. As an example, multimodal level of service standards can be used to indicate problems and ways to improve each mode. Establishing transit, bicycle, or pedestrian level of service analysis methods and requirements allows for a systematic identification of impacts or benefits to alternative modes of transportation. Level of service criteria and target performance measures can be qualitative and quantitative, including measures of accessibility, connectivity, safety, and security. However the limitation is that multimodal level of service criteria and analysis methods have primarily been documented for larger urban areas, particularly ones with existing multimodal facilities and services.

A recently completed research project sponsored by the Montana Department of Transportation<sup>3</sup> found much of current content related to multimodal analysis addresses either system-level planning or corridor/project analysis in areas with existing transit systems and nonmotorized facilities. The available analysis techniques and data for multimodal analysis are primarily geared for urban areas and the associated effectiveness measures and standards tend to be system-related.

There currently is a need for transferable analysis techniques and data for multimodal assessment for smaller communities, particularly those that face rapid growth and/or extreme seasonal peaking due to recreational travel. Content and tools are lacking to assist smaller communities identify location-specific transit and nonmotorized needs that arise from new development proposals. The resulting tools need to be usable by communities with limited background data and/or prior multimodal successes from which to draw comparisons.

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<sup>1</sup> This section corresponds to “Problem Title” in the MDT and TCRP Research Problem Statements.

<sup>2</sup> This section corresponds to “Problem Statement” in the MDT Research Topic Statement, and “Research Problem Statement” in the TCRP Research Problem Statement.

<sup>3</sup> *Local Transportation and Land Use Coordination: Tools and Gaps*, [http://www.mdt.mt.gov/research/projects/planning/smart\\_trans.shtml](http://www.mdt.mt.gov/research/projects/planning/smart_trans.shtml).

## Objective

The objective of the research is to develop specific transferable analysis techniques and data for multimodal assessment in smaller communities.

## Potential Benefits<sup>4</sup>

The national best-practice documents provide very few transferable processes or guidelines for smaller communities. This research will bring additional multimodal analysis tools tailored to smaller communities across the nation. While multimodal analysis techniques are generally well-developed, their usage in the planning profession still remains limited. As currently developed, this tool is best suited for larger urban areas since the effectiveness measures and standards tend to be system-related.

Research products, especially sample analytic procedures and best-practice applications from peer communities, are needed to assist small communities identify specific transit and nonmotorized needs and potential implementation opportunities, potentially including funding, that arise from new development proposals. These products may range from tailored checklists to detailed multimodal performance measures that can be used to identify needs and ways to improve each mode. The products need to be usable by communities with limited background data and/or prior multimodal successes from which to draw comparisons.

## Relationships to the Existing Body of Knowledge<sup>5</sup>

The Transportation Research Board (TRB) *Research in Progress* database was searched in December 2009, and no citations were found relating to development or synthesizing of multimodal analysis tools or procedures for smaller communities.<sup>6</sup> Previous research products such as NCHRP Report 616 (*Multimodal Level of Service Analysis for Urban Streets*) are not structured in a way to help small communities identify and prioritize specific facility-level or route-level multimodal opportunities. Technical products like the *Introduction to Multimodal Transportation Planning Principles and Practices* report on tools and research findings from larger communities.

A search of the Transportation Research Information Services (TRIS) database was conducted in April 2010 using the keywords of “multimodal AND (analysis OR assess\* OR tool\*) and (small or medium)”; the search string was linked to subject areas of “public transportation,” “pedestrians and bicyclists,” and “planning and forecasting.” Eight relevant records were reviewed, most of which related to presentations or papers from the last several *National Conference on Transportation Planning for Small and Medium-Sized Communities*. The most relevant citation, *Integrating Multimodal Transportation into the Development Review Process*, describes a tool and process to

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<sup>4</sup>This section corresponds to “Urgency and Expected Benefits” in the MDT Research Topic Statement, and “Urgency and Payoff Potential” in the TCRP Research Problem Statement.

<sup>5</sup>This section corresponds to “Related Research” in the TCRP Research Problem Statement. This information is included in the “Problem Statement” section of the MDT Research Topic Statement.

<sup>6</sup>RIP search terms: multimodal, analysis.

develop, measure, and analyze the LOS and accessibility of a multimodal transportation system and the integration of this process into development review. However, this tool and process were developed in Rockville, Maryland, a mid-sized city in the Washington, D.C. metropolitan area that has a fairly long history with innovative planning procedures.

Several research papers and reports describe the Georgia Department of Transportation's Multimodal Transportation Planning Tool (MTPT), including several applications of this sketch planning tool at the statewide and county levels. However, the MTPT is not intended for application in urbanized areas, and the MTPT has a decidedly major highway orientation (in spite of its name) and is not able to explicitly analyze new land development proposals. Previous research products such as NCHRP 8-36, Task 32 (*Tools, Techniques, and Methods for Rural Transportation Planning*) are not structured in a way to facilitate transfer of procedures between communities, while NCHRP Report 582 (*Best Practices to Enhance the Transportation-Land Use Connection in the Rural United States*) does not provide detail on analysis procedures. More technical products like NCHRP Report 365 (*Travel Estimation Techniques for Urban Planning*) or TCRP Report 95 (*Traveler Response to Transportation System Changes*) report on technical tools and research findings from larger communities, especially ones with access to travel demand models.

In short, no current product provides simple, transferable, actionable procedures that a smaller community can apply to assess location-specific multimodal needs and opportunities. While the proposed research may reference or adapt some of the specific tools and procedures noted in the literature, a much broader research perspective is proposed that will provide a more comprehensive transportation planning guide and, potentially, sample tools and procedures, oriented towards smaller communities.

## Tasks<sup>7</sup>

One potential research approach taken for the development of transferable analysis techniques and data for multimodal assessment in smaller communities may include outreach to local, regional and state transportation planners plus follow-up case studies of promising analytic approaches. The survey approach may consider the following to uncover the keys to successful multimodal analysis:

- Establishing appropriate multimodal level of service standards, methods and requirements to identify problems and ways to improve each mode;
- Evaluating transit, bicycle, and pedestrian facility performance in smaller communities;
- Developing a systematic identification of impacts and benefits from smaller-scale multimodal investments;
- Including measures of accessibility, connectivity, safety, and security in the level of service criteria; and

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<sup>7</sup>This section corresponds to "Research Proposed" in the MDT Research Topic Statement and the TCRP Research Problem Statement.

- Involving the community in identifying, assessing and implementing multimodal opportunities.

### **Follow-on and Implementation Activities<sup>8</sup>**

The end product of this research effort is anticipated to be tools and guidance for use in smaller communities. It is possible that this information could be integrated into existing on-line planning toolkits such as *Montana Transportation and Land Use: Resources for Growing Communities*.<sup>9</sup> The research products will also be useful additions for existing training programs, conferences and guidebooks related to general transportation planning.

### **Estimated Funding Requirements<sup>10</sup>**

The estimated funding needed for this research project is between \$225,000 and \$250,000. Estimated labor needs for a research team are about 350 hours for a principal investigator, 150 hours of senior-level research support, 400 hours of mid-level research support, and 600 hours of junior-level research support. A research period of about 15 to 18 months, including review time for draft products, is anticipated.

### **Relationship to FTA Strategic Research Goals and/or TCRP Strategic Priorities<sup>11</sup>**

The proposed research directly supports both FTA Strategic Research Areas. In terms of livability, the proposed research will provide tools for assessing the potential benefits that can accrue by virtue of increasing ridership in small communities. The proposed research will also identify tools to assist small communities in identifying transit investments that can support improved transportation system performance. Similarly, improved planning tools and data are fundamental for small communities to continuously improve public transportation (TCRP Strategic Priority 3).

### **Person(s) Developing the Problem<sup>12</sup>**

<<To be completed at time of submittal to the research program.>>

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<sup>8</sup>This section corresponds to “Implementation Plan” in the MDT Research Topic Statement. There is no corresponding section in the TCRP Research Problem Statement.

<sup>9</sup><http://www.mdt.mt.gov/research/toolkit/>.

<sup>10</sup> This section corresponds to “Estimate of the Problem Funding and Research Period” in the TCRP Research Problem Statement. There is no corresponding section in the MDT Research Topic Statement.

<sup>11</sup> This section only appears in the TCRP Research Problem Statement.

<sup>12</sup> This section only appears in the TCRP Research Problem Statement.

## **Process Used to Develop Problem Statement<sup>13</sup>**

This problem statement is the product of the *Local Transportation and Land Use Coordination: Tools and Gaps* research project sponsored by the Montana Department of Transportation. The research topic was one of six high-priority gaps in practice identified by the research team and confirmed by a research panel comprised of representatives from city, county and state government agencies as well as transportation stakeholder groups.

## **IT Component<sup>14</sup>**

The necessary software applications are already resident within planning offices. No new software is anticipated to be developed as part of this research effort. It is anticipated that the research product may be incorporated in an existing database within the *Montana Transportation and Land Use Toolkit*.

## **Date and Submitted By<sup>15</sup>**

<<To be completed at time of submittal to the research program.>>

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<sup>13</sup> This section only appears in the TCRP Research Problem Statement.

<sup>14</sup> This section only appears in the MDT Research Topic Statement.

<sup>15</sup> This section corresponds to “Submitted by” in the MDT Research Topic Statement.