

Pre-Screening of Transit Investments in the Metropolitan Planning Process – a  
Prospectus for TELUS for Transit

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**Abstract**

This paper documents a program for enhancements to an existing system for forecasting the anticipated economic and land use impacts of transportation projects, the Transportation Economic land Use System (TELUS.)<sup>1</sup> The paper describes the metropolitan planning and programming process and discusses the needs, issues and opportunities for specific forecasting model improvements to evaluate and prioritize transit projects, early in the metropolitan planning process, based on the interactions with future land use and economic development. A set of objectives and a list of proposed model enhancements are offered for discussion. The paper seeks to stimulate a dialog among TELUS stakeholders including users, Federal sponsors and the research community.

## **Background**

A confluence of factors, including concerns about global warming, skyrocketing prices for motor fuel, intolerable traffic congestion and unaffordable costs for highway expansion, has focused attention on the need for new transit facilities and the expansion of existing transit systems and services. The high costs of constructing and operating new transit systems, however, and the limited public funding available for them, require that new transit projects be prioritized on the basis of need and cost-effectiveness if they are to qualify for Federal funding.

Travel demand forecasting models play an integral role in the planning and prioritization of transit projects. Research on the application of forecasting models to the metropolitan planning process, and the usability of output from these models by local decision-makers, appears to be overshadowed by investigations into more theoretical areas. This paper discusses the need for models that can be applied early in the planning process, are more cost-effective and user friendly, are more sensitive to subtle changes produced by transit investments, and which can display the interactions between land use and transit. The paper is intended to stimulate a dialog on prospective enhancements for TELUS being considered by the Federal Transit Administration (FTA) and the New Jersey Institute of Technology (NJIT), authorized by Congress in recent legislation.

## **Problem Statement**

In the United States, local decisions on the allocation of Federal transportation funds for new transit investments are made in regional forums under the auspices of metropolitan planning organizations (MPO'S), with the involvement of transit operators, state and local governments. The FTA, which administers Federal funding for new transit projects, offers guidance on a three-phase planning process leading to project implementation that includes: 1) transportation systems planning, 2) transit project planning and 3) transit environmental planning and review.<sup>2</sup> For major projects, the FTA has developed a "New Starts" process that grant applicants must complete, which includes a comprehensive evaluation of a broad range of costs and benefits.

Within a metropolitan region, as transit project planning advances, the focus on alternatives narrows, increasingly detailed planning and engineering information is developed, and the need grows for more planning funds. Although the process is rational, there is considerable risk that good alternatives may be dismissed too early, and that advocates become so committed to favored alternatives that they are reluctant to re-examine others. By the time a "New Starts" application is completed, several million dollars likely have been expended. There is a need to pre-screen transit investment alternatives by local officials before projects enter the New Starts pipeline.

## **Land Use and Economic Development Impacts**

In many instances, support for transit projects at the local level is based more on the expectation that the projects will stimulate economic growth and development than on a

need to improve mobility or reduce congestion. In addition, there is a relationship among urban development patterns, land use densities and the effectiveness of transit projects, which is well-known to many transit planners.<sup>3</sup> Unfortunately, these relationships are not well-understood by many developers and local officials.

There is a need to inform decision-making on transit projects earlier in the process and to make the project evaluation process simpler and more transparent to local officials participating in the MPO regional forums. The potential land use and economic development impacts of new transit investments need to be clearly articulated for alternatives. The relationship between local land use decisions and the likely success of a prospective transit investment must be clearly demonstrated.

### **Transportation Economic Land Use System (TELUS)**

The allocation of Federal funding to individual transportation projects in each metropolitan region is documented in the region's Transportation Improvement Program (TIP.) TIP's govern the expenditure of Federal funds on specific transportation projects in each MPO and must be adopted annually and submitted to the Federal Highway Administration (FHWA) and FTA for approval. As projects in the TIP progress through planning, design and construction, their costs, budgets and schedules may change, leading to revisions in the timing and amount of needed funding. Thus, TIP's are dynamic documents that often need modifications and require continual monitoring.

TELUS was developed by NJIT with Congressionally-directed Federal funding and oversight from the FHWA. TELUS was designed for use by MPO's as a means to manage data, analyze and track transportation projects for inclusion in the regional TIP. TELUS has been tested and is in use by a number of MPO's as a management tool for the TIP. It incorporates data management features, project evaluation measures and GIS capabilities.

### **TELUS for Transit**

In most regions, transit funding is eclipsed by the much larger amount of Federal funding allocated to highways. Consequently, the tracking and evaluation capabilities of TELUS are primarily applied to highway projects rather than transit projects. Also, because of differences in authorizing legislation, project planning for transit projects differs from that for highways. As stated earlier, there is a growing need for transit investments and a concurrent need for tools that MPO's can use to evaluate transit projects for inclusion not only into the TIP, but also into other Federally-required metropolitan planning documents such as the Metropolitan Transportation Plan (MTP) and Congestion Management Process (CMP).

In 2005, Congress passed the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) that allocated funding under Section 3046 to expand the capabilities of TELUS to address transit issues. Pursuant to this legislation, FTA and NJIT are developing an initiative to assist MPO's, state and regional

transit agencies and other regional planning bodies in long range planning, project prioritization and compliance with Federal planning requirements under 23 CFR 450 and 500 and 49 CFR 613, by developing cost-effective and user-friendly analytical transit planning tools under the TELUS system.

## **Objectives**

A preliminary prospectus for enhancing TELUS has been developed and is offered for discussion. The prospectus includes a statement of objectives to guide the project:

- Enhance the capabilities of the Transportation Economic Land Use System (TELUS), specifically the Transportation Economic Land Use Model (TELUM) in the areas of user-responsiveness, land use planning, transit project evaluation and prioritization, environmental justice, and congestion management.
- Develop and test enhanced TELUM capabilities through case studies and user feedback – particular consideration should be paid to improving the technical rigor and explanatory power of the underlying algorithms.
- Strengthen the partnership and dialogue among TELUS stakeholders including users, Federal sponsors and the research community. Avoid duplication and contradiction, and strive to complement, FHWA's sponsorship of TELUS activities.
- Solicit and secure stakeholder endorsement of priority areas of focus for TELUS enhancements

## **Prospective Enhancements for TELUS**

Enhancing the capabilities of TELUS, to expand its usefulness for analysis of transit projects, opens a host of possibilities; more than might be accommodated within funding and time constraints. So the development of planning tools to prioritize investments must itself be subjected to a prioritization process. Nevertheless, the preliminary prospectus incorporates a list of enhancements to “seed” the process and stimulate discussion among stakeholders. The preliminary list follows:

- Expand capability for systems and project-level analysis of Transit Oriented Developments (TOD's) by MPOs, including Density, Diversity and Design (“3-D's.”)
- Increase user-responsiveness for analysis and evaluation of alternative land use policies and growth scenarios, as well as transportation/land use plan packages.
- Incorporate, validate, and document a simplified method for evaluating transit investments and land use policies, and economic generation, the “Transit Score.”<sup>4</sup>

- Enhance capability for evaluating transit investments, demand management strategies, flexible transit operating modes, and innovative technologies, as input to the regional Congestion Management Process (CMP.)
- Incorporate elements for evaluating the effectiveness of coordinating human services transportation.
- Incorporate methods for evaluating the impacts of transit investments on Environmental Justice populations.
- Develop transit-specific visualization techniques.

## Conclusion

This paper seeks to stimulate dialog on ways to improve the analysis and prioritization of transit projects in the metropolitan planning process. It focuses on the application of forecasting models, with special attention paid to the way model results can be better incorporated into decision-making and prioritization by local officials. Specifically, the paper seeks input on the needs, issues and opportunities for enhancements to an existing system, TELUS, to achieve the stated objectives.

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<sup>1</sup> Louis J. Pignataro, J. Wen, R. Burchell, and M. L. Lahr, *Transportation Economic and Land Use System (TELUS)*, New Jersey Institute of Technology, Newark, NJ, accessed January 3, 2008, <http://transportation.njit.edu/nctip/publications/telus.pdf>

<sup>2</sup> *Planning & Environment*, Federal Transit Administration, U.S. Department of Transportation, Washington, D.C., [http://www.fta.dot.gov/planning\\_environment.html](http://www.fta.dot.gov/planning_environment.html), accessed January 3, 2008.

<sup>3</sup> Boris S. Pushkarev and J. M. Zupan, *Public Transportation and Land Use Policy, A Regional Plan Association Book*, Indiana University Press, Bloomington, IN, 1977.

<sup>4</sup> J. M. Lutin, G. R. Krykewycz, J. F. Hacker, and T. W. Marchwinski, *Transit Score – A Screening Model for Evaluating Community Suitability for Transit Investments*, accepted for presentation at the 87<sup>th</sup> Annual Meeting of the Transportation Research Board, January 14, 2008, Washington, D.C.