TRANSPORTATION. ECONOMIC, & LAND USE SYSTEM

# The TELUS STORY

# Infomation Tool for Transportation Planning Makes Its Debut

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During the first week of June, the Institute for Transportation at the New Jersey Institute of Technology (NJIT-IT) shipped the first version of TELUS-the Transportation, Economic, and Land Use System-to approximately 340 metropolitan planning organizations (MPOs) and 50 state departments of transportation (DOTS) nationwide. The culmination of almost four years of work, TELUS is a data-management and decision-support system that enables transportation agencies, particularly MPOs, to meet the requirements of federal law efficiently and effectively.

## Need for TELUS

The need for TELUS arose with the enactment of the Intermodal Surface Transportation and Efficiency Act (ISTEA) in 1991. ISTEA created a new federal, state, and local partnership for transportation planning and programming, and it shifted several duties and responsibilities to transportation agencies at the substate or regional and local levels. Some of the new requirements, although sound and necessary public policy, strained the capacities of many MPOs. For instance, the transportation planning and programming process must

* Be open to citizens and stakeholder groups, not only in selecting projects for funding but in keeping track of project schedules, funding commitments, and related issues;
* Consider the impacts of projects on local economies, land use, environment, and historical and cultural resources;
* Result in a "financially constrained" transportation improvement program (TIP);
* Weigh alternatives to highway solutions; and
* Result in projects that meet the standards of the Clean Air Act.

This new regulatory direction in transportation planning was confirmed in 1998 with the reauthorizing legislation known as the Transportation Equity Act for the 2lst Century (TEA-21). Under TEA-21, Congress identified seven criteria to guide decisions on funding projects with federal dollars. The projects should

* Support the economic vitality of the metropolitan area by enabling global competitiveness, productivity, and efficiency;
* Increase the safety and security of the transportation system for users of motorized and nonmotorized vehicles;
* Increase the accessibility and mobility options for people and for freight;
* Protect and enhance the environment, promote energy conservation, and improve quality of life;
* Enhance the integration and connectivity of the transportation system across and between modes for people and for freight;
* Promote efficient system management and operation; and
* Preserve the transportation system.

## Development of TELUS

Because of the expanded planning and programming responsibilities that ISTEA and TEA-21 had placed on MPOs, the North Jersey Transportation Planning Authority (NJTPA)-the fourth largest MPO in the nation-sought to develop a system that would enhance its capacity to meet the legislative mandates. NJTPA joined with NJIT-IT, which served as the lead research institution for the project, and the Center for Urban Policy Research (CUPR) at Rutgers University, Between 1996 and 1998, this partnership-guided by the NJTPA staff and a project steering committee of NJTPA board members-designed and implemented the TELUS data-management and decision-support system.

FIGURE I Opening screen.

The design criteria required the computerized system to incorporate the following features:

* Graphical interface,
* Ease of use,
* Strong querying and sorting capabilities,
* lntegrated geographic information system (GIS) , and
* Computer models to identify specific economic and land use impacts of each-project.

TEA-21 allocated $1 million per year for six years for the development and deployment of TELUS. Almost as soon as the act went into effect,

## TELUS WHATs AND HOWS

* Windows-based program that runs on Windows 95, 98, or NT operating systems.
* Recommended for use with Pentium PC with 166 MHz, 64-MB RAM, and 100 MB of hard disk space.
* CD-ROM drive is required for installation.
* Uses features of Microsoft Visual Basic for Applications@ and MS Access 2000.
* MS Access 2000 Runtime must be downloaded during installation, if MS Access 2000 not on user's hard drive.

TELUS is license-free to all public transportation agencies. MPOs or state DOTs that did not receive TELUS in the June mailing can request a copy via the Internet (wwwtelus-national.org).

in October 1998, NJlT-IT hosted a focus group in Newark for representatives of 13 large, medium, and small MPOs from every region of the country, plus the director of the Association of Metropolitan Planning Organizations, and two representatives of regional councils that work with county-designated MPOs in Florida.

These representatives engaged in extensive discussions with the TELUS team about MPO needs in several areas, including

* Automation of the TIP,
* Improved project scoring techniques,
* Analyses of project interrelationships,
* Improved project tracking,
* Economic and land-use impact analyses, and
* Handling freight issues.

Between October 1998 and June 1999, the TELUS team made substantial changes to the system based on the focus group discussions. A beta-test group of 12 MPO staff and two state DOT staff received the first beta version of TELUS National in June 1999. Three subcontractors joined the TELUS team: Stephen H. Putman of S. H. Putnam Associates, Townsend, Delaware, to develop the land-use model; Henry Robison of Economic Modeling Specialists, Inc. (EMSI), Moscow, Idaho, to develop the input-output model; and Anne Strauss-Wieder of A. Strauss-Wieder, Inc., Westfield, New Jersey, to increase the strength of the scoring and project-interrelationships modules.

After three months of testing, in September 1999, the TELUS team met with the beta testers to present the latest adjustments to the system as well as the conceptual designs for the land-use and input-output models. The beta testers made additional suggestions for improvements, and the TELUS team modified the system in preparation for the June 2000 shipping date.

## TELUS National Version I .O

The version of TELUS that was shipped in June 2000 contains two of the complete system's four components: the automated TIP component and the utilities component (Figure 1). Still to come are' the economic component and the land-use component. The team also is rcscarching the addition of a freight component.

### Automated TIP Component

The automated TIP component contains a total of five modules:

* The project information module contains basic data about every project in the TIP or state transportation improvement program (STIP); it is

**FIGURE 2 Data input** screen.

the central database for the other TELUS components and modules. It includes such project data as identification number, name, lead agency and contact, revision number, narrative description, location, costs, funding sources, mode, category, phases of work, and schedule (Figure 2).

* The project tracking module maintains the status of single and multiyear projects quarterly. The module yields both numerical data and graphs comparing actual with planned schedules and committed with uncommitted funds.

* The project interrelationships module, through sorts and queries, identifies potential conflicts in scheduling, funding, location, and other requirements.

* The project scoring module offers the option of a TELUS-assisted or an external scoring system.

* The planning analysis module calculates the degree to which the TIP meets the seven TEA-21 planning objectives.

### Utilities Component

The utilities component includes four modules:

* The user-customization module allows the changing of screen labels, default values, and other features.

* The system security module allows the MPO or state DOT system administrator to establish user IDs, passwords, and levels of system access for individual users.

* With the GIS module, users can select projects for analysis and print maps of projects.

* The reports module offers preformatted forms (Figure 3) to generate project reports for the MPO board, citizens, federal and state agencies, and other interested parties.

## TELUS of the Future

Future versions of TELUS will include the economic and land-use components, as well as modifications based on user feedback. The two components are in development, but their use is optional and they do not affect the primary functions of TELUS.

### *Economic Component*

The economic component of TELUS will include a regional input-output model for measuring the spending impacts of both construction and total transportation system'operation and maintenance. The model will use a three-dimensional transportation investment multiplier, a matrix comprising

FIGURE 3 Example of preformatted report.

* Project type (e.g., bridge rehabilitation, road widening, new transit facility) and funding level (e.g., less than $15 million or more than $15 million);
* Jurisdiction (e.g., the entire MPO, each county, the state; and
* Industrial categories (e.g., manufacturing, trade, services).

The model will use these data to calculate the direct and total economic effects of transportation improvements on the county, the neighboring counties, the MPO region, and the state. The calculations will cover both the construction and operational phases of a project, based on type and funding level. When the land-use model output is available, the input-output model also will calculate the ripple effects of growth on real properties, both residential and nonresidential. If the network-model output-that is, the travel demand forecasting model-is available, the model will calculate the economic effects of the reduced travel times resulting from transportation improvements.

Other specific outputs include changes in construction jobs, community income, gross regional product, and local, state, and federal tax revenues as a result of transportation investments. Both the construction- and operation-phase impacts are identified and broken down by Standard lndustrial Classification codes, share of the economic base, and millions of dollars invested.

### *Land-Use Component*

The land-use component will feature a simulation model created by the developer of the DRAM/EMPAL model used by some MPOs. The TELUS land-use model, however, will resemble Putnam's more recent METROPILUS and will be provided license-free to MPOs and interested state DOTs. The land-use model will have a self-calibration feature and will grow "smarter" as the user inputs more detailed information.

The land-use model in TELUS will help MPOs satisfy the TEA-21 requirement to evaluate the land use impacts of alternative TIPS. The model also will allow MPOs to augment or replace their present means of supplying land use information for travel demand forecasting. Most MPOs do not employ a formal land use model but rely instead on a variety of techniques to arrive at a consensus on land use distributions (i.e., population and employment) within their local areas.

## Addressing the Issues

The TELUS team has presented the system at national and state meetings of local elected officials, professional transportation planners, and others. A major concern at these sessions has been the increasing pressure that citizens, special-interest groups, and other stakeholders are exerting on transportation agencies at all levels to

* Make project information more available and more timely, and
* Conduct comprehensive and rigorous impact assessments of the TlP and individual projects.

### Timely and Available Information

Many MPOs and state DOTs are overwhelmed with requests for information about specific projects or about their entire TIP or STIP The project profil-

ing, querying, and report formatting capabilities of TELUS will help answer these. Some potential users have suggested that a network workstation could be set up in the agency's library or reception area so that interested citizens and interest-group representatives could interact with TELUS and view or print the information they want.

1mpact Assessments

Most potential users note that the TELUS input-output model would provide more economic information than is now possible. The land-use model, however, would have to undergo local scrutiny before its usefulness can be determined. Nonetheless, many stakeholders request other information, such as

* How the TIP affects the overall economic vitality of the community;
* How the TIP and individual projects affect minority communities in terms of traffic, commuting patterns, public transportation costs, and job opportunities; and
* How the TIP, or individual projects, contribute to clean air and water. protect habitats and wetlands, preserve historic and cultural resources. and contribute in general to the community's quality of life.

TELUS, as an information-management system, can produce a variety of project reports quickly, It includes decision-support tools for project scoring, analyzing project interrelationships, and tracking project schedules and costs. These and other TELUS support features, combined with the air- and water-quality models and other impact modeling techniques used by MPOs and state DOTs, can help state and local officials deal with issues related to transportation plans.

TELUS is not envisioned as an all-in-one system for assessing the considerable array of impacts of TIP and transportation projects. Definitive answers to some of the questions posed by stakeholders require substantial advances in the state-of-the art of impact-assessment modeling. The objective of TELUS is to advance the state of the practice in transportation planning by providing the basic tools to arrive at informed decisions on the issues raised by stakeholders. The TELUS system will evolve as its users deal with these issues.

## Work in Progress

TELUS is a work in progress. With the release of TELUS National Version 1.0 to 340 MPOs and 50 state DOTs, the basic system will undergo a level of scrutiny that will lead to a system that serves the practical needs of transportation planning organizations.

The TELUS team has invited feedback from all users so that improvements can be made during the next three or four years of the TEA-21 funding for the project. The NJIT-IT website for TELUS (www.telus-national.org) enables users to exchange information, find answers to frequently asked questions about the system and how to use it, and, soon, to download system updates.

## Acknowledgment

The authors gratefully acknowledge the substantial contributions of two members of the TELUS team: Robert W. BurchelI, distinguished professor, Center for Urban Policy Research, Rutgers University, and Naveed Shad, senior information systems analyst, Institute for Transportation, New Institute of Technology,