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*Study of Innovative Approaches to Planning Implementation*

# Final Report

Scan of NYSMPOs' Project Tracking Needs and Issues  
*and*  
Scan of National Best Practices in Project Tracking

*Prepared for*

Greater Buffalo-Niagara Regional Transportation Council

*On behalf of*

Association of New York State Metropolitan Planning  
Organizations

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*Prepared by*





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- Metropolitan Transportation Commission (San Francisco Bay area)
- Puget Sound Regional Council (Seattle area)
- Denver Regional Council of Governments
- Miami Valley Regional Planning Commission (Dayton area)
- Delaware Valley Regional Planning Commission (Philadelphia area)
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## INTRODUCTION & RESULTS IN BRIEF

The goal of this study is to identify Transportation Improvement Program (TIP) project tracking needs for New York State Metropolitan Planning Organizations (NYSMPOs) and related agencies, and develop concepts for systems that can be used for this purpose.

### **Results in Brief**

Across the 13 Metropolitan Planning Organizations (MPOs) in New York State, there is virtually no systematic, automated method for obtaining or receiving project status information from project sponsors. Specifically, (1) basic project status information is primarily received on an ad hoc basis and on request only; and (2) most MPOs receive information that is minimal but adequate for complying with the federal law requiring annual federal obligations reporting. In addition, MPOs vary significantly with respect to their need for improved project status information.

The national scan and case studies of “best practices” revealed that most MPOs across the country struggle to get timely and accurate information on local and state DOT projects and that sponsor/implementing agency cooperation is essential to an MPO’s ability to track project status. Some state DOTs are now providing their MPOs with “read-only” access to project status information. Generally, project status data are limited and MPOs can expend considerable staff resources to obtain information for locally sponsored projects and maintain systems that shadow state DOT information.

Detailed review of two systems showed the difficulty of project tracking within the TIP process. Miami Valley Regional Planning Commission (MVRPC) covering the Dayton, OH area uses a pre-packaged program called Web-TELUS. The program provides detailed project programming capabilities in a web-based system which includes public access for certain functions and review. Support for the system from the TELUS developer (the New Jersey Institute of Technology) is good. However, the system does not integrate with the Ohio DOT system and thus manual entry / staff time is high. The Delaware Valley Regional Planning Commission (DVRPC) covering the Philadelphia, PA area uses an in-house developed system on MS Access. While this system has taken several years to develop, it provides detailed project programming and project change histories. Direct integration with both state DOTs involved (New Jersey and Pennsylvania) is not available for either project programming or implementation. Thus staff time to monitor and track project programming and TIP amendments is high. However, future plans include automated connection efforts.

Due to the wide variety of MPO needs and State DOT systems and processes, the study has shown that a single solution for TIP programming and tracking does not exist at this time. The increased SAFETEA-LU Public Involvement Requirements have led to a variety of on-line searchable TIP databases and mapping systems which often include on-line public and agency comment systems. TELUS provides a national standard in TIP programming and tracking with

most desired features, but must be set-up and populated with the correct data to be effective. Future improvements to the TELUS system may allow better TIP and TIP amendment processing, better fiscal constraint analysis, and better funds reprogramming. Agency built TIP systems (MS Access, Oracle database, etc.) often will perform many of the desired functions but do not operate on a common structure and require very good in-house staff programming knowledge.

NYSMPO should consider a joint effort to develop a standardized dataset useful to all MPOs and coordinated with NYSDOT such that the appropriate data transfers are available. NYSMPO may also consider developing a stock TIP programming and tracking application or recommend use of the TELUS system and the appropriate dataset. Also, once key information and an appropriate tracking application is available, New York MPOs may want to develop project implementation policies which flag projects for review based on performance criteria. Steps to achieve these outcomes are given at the end of this report.

## **1. EVALUATION OF EXISTING CONDITIONS AND ISSUES**

During November and December 2006, the WSA Team conducted telephone interviews or meetings with each of the 13 MPOs located in New York State. These sessions focused on available and desirable data needs and tracking. In addition, the WSA Team met with representatives of the New York State Department of Transportation (NYSDOT) central office and selected regional offices. The WSA Team also met with representatives of the Federal Highway Administration (FHWA) New York State Division.

### **Process for MPO Survey and Interviews**

Initially, each of the MPOs was contacted through publicly available information such as each MPO's website and WSA Team familiarity with New York MPO agencies. During initial contact, WSA staff described the purpose of the study, questions to be asked, and identified the appropriate contact person with whom to discuss the TIP project tracking process. Interviewees were then contacted directly to arrange for scheduled interviews. The majority of interviews were conducted by telephone. The following is the list of interviewees.

MPO Interviewees / Points of Contact

<b>New York State MPO</b>	<b>Interviewee</b>
Adirondack-Glens Falls Transportation Committee (A/GFTC)	Aaron Frankenfeld, Director
Binghamton Metropolitan Transportation Study (BMTCS)	Steve Gayle, Director
Capital District Transportation Committee (CDTC – Albany)	Glenn Posca, Senior Transportation Planner
Elmira-Chemung Transportation Council	Jay Schissell, Director
Genesee Transportation Council (GTC – Rochester)	Rich Perrin, Director
Greater Buffalo-Niagara Frontier Transportation Committee (GBNRTC)	Tim Trabold, Principal Analyst
Herkimer-Oneida Counties Transportation Study (HOCTS)	Harry Miller, Director
Ithaca-Tompkins County Transportation Council (ITCTC)	Fernando D’Aragon, Director
New York Metropolitan Transportation Council (NYMTC)	Gerald Bogacz, Deputy Director
Orange County Transportation Council (OCTC)	John Czamanske, Deputy Commissioner of Planning
Poughkeepsie-Dutchess County Transportation Council (PDCTC)	Eoin Wrafter, Senior Planner
Syracuse Metropolitan Transportation Council (SMTCS)	Mary Rowlands, Director
Ulster County Transportation Council (UCTC – Kingston)	Dennis Doyle, Director

Interview Guide

The WSA Team developed the following interview guide based on the overall study goals, the Team’s MPO experience and input from the NYSMPO study management group.

**NYSMPO Project Implementation Study  
Discussion Guide for MPO Needs Assessment of New York MPOs**

1. Please describe your MPO's current efforts to track the status of projects that have been programmed in your TIP.
2. How does your MPO and/or MPO member governments use project tracking information that you generate?
3. What information on the status of individual projects programmed in your TIP do you currently receive after the TIP is approved and transmitted to NYSDOT?
  - Implementation phase (PE, design, construction, ROW, etc.)
  - Financial information (actual cost vs. TIP figures, etc.)
  - Other
4. Who do you receive project status information from?
  - NYSDOT Regional Office (Region #\_\_\_\_)                       FHWA/FTA
  - Transit agency     Other
  - Local/county government
5. If you receive project status information from the NYSDOT Regional Office, which unit does it come from?
  - Local Projects Unit
  - Planning and Programming Unit
  - Other (specify)
6. How frequently do you receive project status information?
  - On regular basis (monthly, quarterly, etc.)
  - On request only
7. In what form is project status information received?
  - Electronic/manipulable (spreadsheet, database)
  - Non-manipulable (hard-copy, PDF, email)
8. If you receive only hard-copy or non-manipulable information, would you prefer to receive it in electronic form that allows data sorting and analysis? Why or why not? Have you requested this? Why is the information not provided to you in this form?
9. In your opinion, is the level of detail/quality of project status information you receive adequate for tracking TIP project implementation by your MPO? Why or why not?
10. Would your MPO receive project status information if you did not seek it from project sponsors/implementers?
11. For your MPO, please provide us with the following contact information:
  - a) NYSDOT Regional Office
    - Local Projects Unit
    - Planning & Programming Unit
  - b) Local Government
    - Major (central city, key county)
    - Minor (village, outer county)
  - c) Transit Agency(ies)
    - Project status contact(s)

## Results of MPO Survey and Interviews

### Project Status/Tracking Information Obtained by MPOs Today

Based on interviews with the 13 MPOs in New York State, it can be concluded that there is virtually no systematic method for obtaining or receiving project status information from project sponsors. Specifically:

- (1) Basic project status information is primarily received on an ad hoc basis and on request only
- (2) Most MPOs receive information that is adequate for complying with the federal law requiring annual federal obligations reporting, but lack detail for good project tracking, TIP financial management, and reprogramming of funds

Also, the interviews indicated MPOs vary significantly with respect to their need for improved project status information.

### Suggested Typology of New York State MPOs

For the purposes of analyzing and organizing MPO needs, issues, and options, a typology of the MPOs in New York based on size of the planning area and transportation investment program is suggested as follows:

Very Large TMA (1)	NYMTC (and three Transportation Coordinating Committees*)
Large TMA (4)	Buffalo, Rochester, Syracuse, Albany
Small TMA (4)	Binghamton, Orange County, Poughkeepsie, Utica-Rome
Non-TMA (4)	Adirondack-Glens Falls, Elmira, Ithaca, Kingston

\*Long Island, New York City, and Lower Hudson Valley

### MPO Priorities for Project Tracking Information Access and Availability

All 13 MPOs were interviewed to understand each organization's current project tracking process and needs, including sources of project status information and the quality, character, and uses of that information. Generally, priorities for project tracking ability were strongly correlated with MPO type, as shown in the table below.

✓✓✓=High priority   ✓✓=Moderate priority   ✓= Low priority

Desired Ability	NYMTC*	Large TMAs	Small TMAs	Non-TMAs
Straightforward reporting on annual obligations	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Status of available out-year funding for programming	✓	✓✓	✓✓	✓
Ability to know about and influence reprogramming of funds in advance (not after the fact)	✓✓	✓✓✓	✓✓	✓
Information for ensuring project sponsor accountability	✓	✓✓	✓✓	✓
Automated or electronic access to project status information	✓✓	✓✓	✓	✓

\***Note:** NYMTC central staff manages the overall MPO TIP process and document; however, the three individual Transportation Coordinating Committees (TCC) – Long Island, New York City, and Lower Hudson Valley – each manage the “details” of the TIP process for their geographic areas and may have varying levels of interest in the abilities listed above.

As the above table illustrates, the most important priority for all MPOs is straightforward reporting on annual obligations. This is a common need shared by all MPOs and is required by law; therefore, it is not surprising that this is the top priority. The second-highest priority is the ability to know about and influence reprogramming of funds in advance of the need to do so. Delays and cost increases affect overall TIP programming, and the ability to re-program funds earlier in the TIP cycle may lead to better financial management and delivery of projects. Generally, the larger the MPO, the more important this is perceived to be. (NYMTC reported this to be a moderate priority, less important than annual reporting of obligations.)

The remaining possible priorities were all less important. For small TMA and non-TMA MPOs, knowing the status of available out-year funding and having sufficient information to ensure project sponsor accountability are both considered equal in importance to the ability to influence reprogramming funds in advance.

None of the MPOs reported that system technology issues are a key problem; the highest rank was a “moderate.” This indicates that data availability, relationships, communications, and/or processes are issues to be addressed before improved technology could provide more efficient or accurate project tracking. Thus, the issue of technology is not relevant at this time, but could become more relevant as the “upstream” issues are resolved. Section 3 of this report provides two case studies of currently used TIP tracking technology.

Issues/Problems Currently Affecting MPO Project Tracking Abilities

The MPO interviews revealed a variety of issues and problems that currently affect the MPOs’ ability to understand and track the status of projects in their areas. These issues and problems

generally fall within one or more categories, including system technology, information management process, organizational relationship, communication, and data availability as shown below.

Current Issue/Problem	Category of Issue/Problem				
	Technology	Process	Relationship	Communication	Data
Limited up-to-date information on schedule/status of local projects	✓	✓	✓	✓	✓
Unknown impact of cost changes on out-year funding available for MPO programming		✓	✓	✓	
Project status information is received on an ad-hoc rather than standardized basis		✓	✓	✓	
Data formats are requested and/or provided inconsistently across the state	✓			✓	
No common system/approach across MPOs in the state		✓		✓	
MPO need/desire for additional/more timely and accurate data varies widely		✓		✓	
Wide variation in reporting provided by different types of agencies (DOT, locals, transit)		✓	✓	✓	✓
Lack of willingness to press for project sponsor accountability			✓		
Awkwardness, redundancy and/or inconsistency in data management approaches across DOT regions	✓	✓			✓
Ability of MPOs to comply with annual obligations reporting requirement varies		✓	✓	✓	
Responsibility for obtaining status of local projects unclear			✓	✓	
Inability of TIP planning and project implementation systems to track historical changes in milestones and budgets	✓	✓			✓

A nearly universal problem among MPOs is limited up-to-date information on the schedule and status of projects. This problem has roots in all five of the categories – Processes, Relationships, Communication, Data, and Technology. Some common components of this problem include:

- A wide variation in the types of data and reporting provided by different types of agencies (DOT, locals, transit)
- Awkwardness, redundancy and/or inconsistency in data management approaches across NYSDOT regions
- Project status information is received on an ad-hoc rather than standardized and regular basis

Other important problems include unknown impacts of cost changes on out-year funding available for MPO programming, and variable abilities of MPOs to comply with annual obligations reporting requirements.

The inability of TIP systems to track changes in project costs and schedules causes problems for project implementation policies. As an example, many systems overwrite the estimated obligation date as new dates arise which prevents identification of project schedule slippage. Thus, policies which flag projects falling behind on schedule and cost cannot be implemented.

The table above shows the complex set of issues that affect New York MPOs' tracking abilities, and contributing factors. As the table shows, communication and process issues are the most prevalent obstacles to project tracking. Organizational relationship issues are also important. System technology and data issues were not reported as key problem, indicating that the other factors need to be resolved before improved technology can improve project tracking abilities.

## **2. SCAN OF AVAILABLE TECHNOLOGIES AND NATIONAL BEST PRACTICES**

### **Process for Best Practices Review**

As with the NYSMPO interview process, the case study process included making initial contact with the selected MPOs/Agencies, explaining the study underway and information being sought, identifying key individuals to interview, setting up interviews, and conducting interviews. An initial group of candidate MPOs and state DOTs was identified through a national scan of existing project tracking processes based on agency website reviews, existing research from TRB, NCHRP, AMPO and other entities, and WSA team knowledge. The original NYSMPO RFP also identified processes employed by certain MPOs that were to be included in the study. The WSA Team then screened the candidates for potentially applicability to the NYSMPO situation and environment. This was a somewhat subjective process since the relationships between MPOs and implementing agencies are unique to each state and, in some cases, to each MPO within a state.

The WSA Team developed a data collection instrument (questionnaire) to ascertain how these agencies managed the TIP project process / implementation. Below are the general interview questions.

**NYSMPO Project Implementation Study  
Discussion Guide for MPO General Case Studies**

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1. Provide a general description of the MPO region including number of participating entities (State, transit, county, city), land area, average projects, etc.
2. Provide a general description of current TIP tracking activities and process
  - a. What funding categories does the MPO control?
  - b. What funding categories does the MPO track?
  - c. How are changes to the TIP (cost increases, scope changes, add/delete projects) handled? What is the MPO's role in approving changes?
3. What project development and construction milestones to you track?
4. How do you receive information on project status? (verbal, hard copy, electronic transmission, direct access to partner systems) From whom does the information come?
5. How often is project status data provided? How up-to-date and accurate is the information?
6. Describe how your DOT and other agencies up-date their project status information? What are their policies related to up-dating information?
7. How do you use the project status information you receive?
8. What are the strengths and weaknesses of your current project tracking approach? What improvements do you think could be made?
9. What suggestions would you make to an MPO that is trying to improve its TIP project tracking capabilities?

## **Best Practice Review Results**

### Summary / Overview

Through the process described in the previous section, the WSA Team identified five MPOs across the country to serve as best practice case-studies. These were contacted and a case-study developed for each:

- The San Francisco (CA) Metropolitan Transportation Commission (“MTC”)
- The Puget Sound Regional Council (“PSRC”, Seattle, WA)
- Denver (CO) Regional Council of Governments (“DRCOG”)
- Miami Valley Regional Planning Commission (“MVRPC”, Dayton, OH)
- Delaware Valley Regional Planning Commission (“DVRPC”, Philadelphia, PA)

Several general observations may be drawn from the case studies:

- NYSMPOs are not alone. Most MPOs struggle to get timely and accurate info on local and state DOT projects.
- State DOTs must be on board. DOT cooperation is essential to an MPO’s ability to track project status, and many state DOTs are in various stages of developing standard data files and reporting protocols for this information. Some states – including Ohio, Pennsylvania, and New Jersey – provide their MPOs with “read-only” access to project status information. However, this read-only access is often complicated and only provides a manual linkage.
- Project Managers are critical too. The quality of information delivered from all sources is variable and its utility depends on project managers keeping information databases current.
- Common Priorities. The primary focus in all case-studies is on keeping project planning information up to date at the local and state level, and tracking obligations and/or project letting dates, as well as tracking milestone progress. However, most agencies reported using a manual or semi-automated system.
- Incentives and Sanctions. In some instances, policies and processes are being used to address local agency project delivery issues, establishing incentives or sanctions for lateness (e.g. being more than one year late for the obligation date causes project funds withdrawal).
- Resource Requirements Can Be Intensive. Project status data are generally limited, and where tracking efforts are most intensive, MPOs expend considerable staff resources chasing project sponsors to obtain information, particularly for local projects.

Detailed information on each case study follows:

San Francisco Bay Area (MTC)

The Metropolitan Transportation Commission covers a large, populous region consisting of nine counties that include 101 municipalities and eight major transit agencies.

**Metropolitan Transportation Commission (San Francisco Bay Area)**

Population (2006)	7,260,600
Employment (2006)	3,919,900
Land Area (square miles)	7,000
Population Density (per sq mi)	1037
Average Projects in TIP	950
Approximate Per Year Programming (all funds)	\$3.086 Billion

Source: MTC Website – [www.mtc.ca.gov](http://www.mtc.ca.gov) and MTC staff interview January 2007

The MTC controls Discretionary Funds including federal Surface Transportation Program funds (STP), Congestion Mitigation and Air Quality funds (CMAQ), Federal Transit Administration funds 5307/5309 (FTA), regional measure #2 (from tolls), Transit Development Act funds allocation, parts of ½ cent state transit sales tax, and State TIP (STIP) funds for the region (75% regional funds / 25% state funds). Funds tracked by MTC are primarily the STP and CMAQ funds as well as anything in the region in the federal TIP, and regionally significant projects needed for air quality review.

For TIP programming purposes, the MTC uses a finance software tool that allows public and agency access via the Internet. The tool is called the Funds Management System (FMS) which contains project by project details including project description, funding types/years, contacts, and location by representative districts. Fields are included for FHWA obligations by date and fund. The on-line FMS is searchable by several categories, and includes an application process for proposing new TIP projects and applying for modifications by authorized agencies/governments. FMS includes a mapping system which is active for some projects. MTC initially used a consultant to build the FMS but eventually it was developed by MTC internally. It is Oracle database driven. The web access interface (including the mapping feature) to the databases/FMS has been programmed internally in Java language.

For project tracking (once projects are let), Caltrans (the State DOT) has its own system. Information from this system is problematic and is updated on ad hoc basis, although Caltrans local assistance personnel are usually very helpful if information is requested. Local project tracking is delegated as a local agency responsibility. The MTC encourages local sponsors to meet that responsibility through an enforcement mechanism in which the sponsor can lose funding if it misses the obligation date deadline (May 31 of the programmed TIP year), does not bill regularly (at least once every six months or, in the case of funds contracted out, awarded

within nine months of obligation), or does not close out a project on time (within six months of final invoice).

Obligation information in the FMS comes from the state in hardcopy format each month and annual obligations are provided by the state in a spreadsheet. MTC personnel manually enter the information into FMS. FMS tracks actual obligations on each program line for STP and CMAQ funds which assists sponsors to meet critical obligation timelines.

One strength of the system is that it manages project funding by individual funds resulting in information on actual spending and programming plus comparisons to available funding resources. Additionally, all data is entered electronically for easier TIP management. On-line access provides better and more direct communications to project sponsors, agencies, and the general public. For example, sponsor agencies can view or propose to edit their projects with minimal supervision from MTC. In addition, they can generate project reports to share project and funding information with their internal staff.

FMS weaknesses include the inability to tie into other systems (such as Caltrans' project tracking / spending / obligation system) and the inability to track planned project development milestones against actual milestones.

MTC has been working on adding new features to the FMS to allow more access to obligation information and Regional Transportation Plan (non-TIP) projects. Caltrans has been working on data sharing of fiscal information across agencies.

Suggestions from MTC staff for improving TIP project tracking capabilities include: make sure developers of any tracking system understand and can de-couple programming from obligations and understand program level management versus individual project development; and build the system to provide an audit trail of funding allocation throughout the entire life of the funding stream.

### Seattle / Puget Sound

The Puget Sound Regional Council covers a diverse region consisting of four counties that include 71 cities and towns, four port districts, transit agencies, state agencies, and Native American tribes.

**Puget Sound Regional Council (Seattle, WA area)**

Population (2007 estimate)	3,582,900
Employment (2005 estimate)	1,760,000
Land Area (square miles)	6,290
Population Density (per sq mi)	570
Average Projects in TIP	530
Approximate Per Year Programming	\$328,173,000

Source: PSRC Website – [www.psrc.org](http://www.psrc.org)

The PSRC website includes a map based user interface for finding specific TIP projects. Information includes standard TIP data such as description, planned schedule, and funding sources (i.e. no current status information). Also, forms for modification requests are available on the website. On-line mapping of TIP projects including searching for TIP projects by map location is available.

PSRC controls STP, CMAQ, and FTA 5307/5309 funds. Funds tracked include the STP and CMAQ programs, and at the time of inquiry PSRC was working on adding tracking for FTA funds to its system.

The Puget Sound Regional Council addresses project status and reporting via a formal policy and a technical committee – the Regional Project Evaluation Committee. This committee tracks project status and decides whether changes are warranted, or if the funds should be returned to the funding pool to be used for prioritized contingency list projects. (This information is available on-line in a publication format.) The focus of PSRC’s efforts is on getting past due projects – of which there were over 400 at the time of the agency interview – obligated. Since then, this number has been significantly reduced. Project tracking is a staff-intensive undertaking. The Washington State DOT project tracking system generates hard copy reports and spreadsheets that are sent to the MPO quarterly which includes obligated amounts and dates, expenditure information, and project closeout information. One report is for PSRC’s controlled funds and another is for state controlled federal funds awarded to the region. (The report on state controlled federal funds is a relatively new piece of information sharing, complying with a TEA-21 federal requirement to provide an annual list of all obligated federally funded projects in the MPO region.) This information is then entered into the TIP database. PSRC staff has access to transit agency funding information on-line, but this is also a manual entry process. To perform local project tracking, two MPO staff contact project sponsors. (However, the effort is not two full-time equivalent staff.) To encourage timeliness, project sponsors must formally request an extension if they are more than one-year late in obligating funds. This formalized process has resulted in most projects moving ahead.

Key strengths of the system are the on-line access and on-line project request/change forms. Also, the system tracks projects falling behind based on programmed and actual obligation dates. However, the system is very staff intensive. In addition to entering the tracking data from the state, keeping up with local projects is difficult. There are many reasons why projects are running behind and each is discussed with the staff. At the time of the interview, PSRC was

trying to catch up on project status and be able to give notice when projects were nine months overdue for obligation. Future improvements to the system include annual project reviews to make sure all funds and costs are included and to make sure projects are described correctly.

Suggestions from PSRC staff for other MPOs include:

- Develop a good relationship with state DOT (headquarters and district/regional offices)
- Get accurate data and keep the system up to date
- Get committees and boards to adopt accountability measures (such as formal reviews of delays when obligation deadlines are missed)
- Document process and policies with full agreement of the MPO and state DOT so that everyone is on the same page and speaks with one voice
- Report on progress made in keeping projects moving forward, as well as any common issues contributing to project delay

## DRCOG

The Denver Regional Council of Governments (DRCOG) covers a diverse region consisting of nine counties that include the cities of Denver and Broomfield for a total of 52 local government members.

### **Denver Regional Council of Governments**

Population (2006 estimate)	2,711,536
Employment (2006 estimate)	1,589,506
Land Area (square miles)	5,074
Population Density (per sq mi)	534
Average Projects in TIP	215
Approximate Per Year Programming	\$382,861,000

Source: DRCOG Website – [www.drcog.org](http://www.drcog.org) and [www.city-data.com](http://www.city-data.com)

The DRCOG website has full copies of the TIP, federally obligated project lists, and cross-table indexes. It does not have a searchable database system. Each project listing includes project data, funding data, and a graphic map if the project can be mapped.

The DRCOG TIP includes project funding programming for federal STP and CMAQ funds, FTA funds (5307/5308/5309/5316/5317), local transit funds, and Colorado DOT funds (including bridge, congestion, priority projects, federal earmarks, safety, and others). DRCOG members control STP (Metro and Enhancement) and CMAQ funds as well as specific FTA funds, similar to other MPOs.

The focus of DRCOG's efforts is to ensure projects are let on time, while project sponsors are responsible for cost overruns. This focus forces project sponsors to provide better cost estimates and updates as projects develop. In addition, for projects with cost overruns, the sponsor may re-apply in the competitive TIP update process with the higher costs. If the project scores

within the funded list, then additional funds are added to the project. If the project does not score within the funded list, the sponsor may use the original funds and make up any cost overruns from other non-MPO sources. Finally, if the project does not score well, the sponsor can withdraw the project and reimburse any funds already expended.

Tracking of Colorado DOT projects as well as local projects which have been let is done on an ad hoc basis. DRCOG officials meet regularly with CDOT District staff to review the status of key projects. If specific information is needed, the CDOT District office is contacted by DRCOG staff and usually results are provided quickly. DRCOG enforces timeliness through a policy in which local sponsors can lose funding if they miss the equivalent of the letting date three times. This “three strikes” policy pressures sponsors to be more forthright about project status.

CDOT is currently moving to a comprehensive ERP (Enterprise Resource Planning) system that could enable real time tracking of project status. DRCOG’s future access to information in this system and the quality of information available is still unclear.

### Miami Valley

The Miami Valley Regional Planning Commission (MVRPC) in Dayton, Ohio, covers three counties and part of a fourth with a total of 26 municipalities and three transit agencies.

**Miami Valley Regional Planning Commission (Dayton, OH area)**

Population (2000 estimate)	822,000
Employment (2000 estimate)	437,000
Land Area (square miles)	1,300
Population Density (per sq mi)	632
Average Projects in TIP	230
Approximate Per Year Programming	\$223,340,000

Source: MVRPC website – [www.mvrpc.org](http://www.mvrpc.org) and [www.city-data.com](http://www.city-data.com)

MVRPC currently controls STP, CMAQ, and Transportation Enhancement funds. MVRPC tracks these funds as well as funds spent in the MVRPC region not controlled by the MPO.

The Miami Valley RPC is the only MPO surveyed that uses the FHWA-sponsored TELUS software to manage project status data. (Specifically, MVRPC uses Web TELUS. TELUS is developed by the New Jersey Institute of Technology.) To use this system, MVRPC expends 75% of one full-time staff to track the status of over 200 projects. The TELUS system is established at MVRPC. Ohio DOT uses a different system called Ellis to track project progress. Updates and changes are sent to MVRPC from the ODOT district offices in electronic read-only format almost daily and sometimes via phone calls. This information is then entered into the TELUS system manually. MVRPC recently has been given read-only access to the full Ellis system which includes funding breakdowns for each project by year and specific fund(s). This has helped the upkeep of the TELUS information. Local project data is collected by regular

contact with project sponsors (which is sometimes project sponsor initiated) or through ODOT district offices.

The MVRPC TELUS system tracks environmental documentation completion date, receipt of plans at ODOT District office date, right of way authorization date, ODOT District right of way certification date, receipt of plans in central ODOT office date, sale date, award date, and completion date. Generally, the system only shows one date for each milestone. (However, there is functionality available in TELUS that can show planned vs. actual milestone dates and allocated vs. obligated funds.) Thus, if the date is before the current date, it is generally the actual date of the event. If the date is after the current date, the date is an estimated date. TELUS information generally lags the actual dates by a few days to a few weeks due to the manual transfer and entry process. Also, if the ODOT system is not up to date, neither will TELUS be up to date. However, the ODOT districts in the MVRPC region generally keep the project information up to date.

MVRPC uses the information received to keep the TELUS system up to date, maintain fiscal constraints, and process TIP amendments through the MVRPC board if necessary. Twice a year, ODOT and MVRPC meet to discuss project progress for all projects.

MVRPC believes that the strengths of the TELUS system include transparency through web-based browsing and GIS mapping/interface for TELUS projects. The weaknesses include reliance on Ellis / manual entry and the necessity of contacting ODOT districts and local sponsors.

MVRPC suggests any agency pursuing TELUS should be able to get it set-up and running for virtually no outside costs with NJIT's help. Also, MVRPC suggests that a good relationship with the district DOT offices is very important for project tracking and implementation.

### DVRPC

The Delaware Valley Regional Planning Commission (DVRPC) covers the greater metropolitan Philadelphia, PA area consisting of five counties in Pennsylvania and four in New Jersey. The region covers 353 municipalities and all or part of 3 major transit entities.

**Delaware Valley Regional Planning Commission (Philadelphia, PA area)**

Population (2005 estimate)	5,504,466
Employment (2005 estimate)	2,739,237
Land Area (square miles)	3,743
Population Density (per sq mi)	1,471
Average Projects in TIP	New Jersey – 230 Pennsylvania – 570
Approximate Per Year Programming	\$445 Million - New Jersey <u>\$788 Million - Pennsylvania</u> \$1.233 Billion Total

Source: DVRPC website – [www.dvrpc.org](http://www.dvrpc.org)

The DVRPC controls and tracks all transportation funding streams. Most MPOs do not participate in the programming of funds usually controlled by the state such as the National Highway System funds. However, DVRPC works in a cooperative relationship with the state departments of transportation to set the funding program. Each project record in the DVRPC TIP includes funds programmed by funding source and TIP year.

Request for changes to the TIP generally come from the DOT districts themselves which DVRPC receives via email (usually monthly). Locally sponsored project changes are usually initiated by DVRPC at the request of the counties. While DVRPC can get access to some DOT information on-line, the communications and data structures are not the same. For major updates, the DOT information is downloaded for use by DVRPC. DVRPC provides the existing database to its county and transit agencies. The agencies can then update projects and suggest new ones. All of the separate agency files are then recollected into the DVRPC system and the financial constraint planning process begins. Prior to the major update MPO approval, the information is sent back to the DOTs for rectification in their systems. This is a manual process in the case of Pennsylvania, and as a database file update in the case of New Jersey.

DVRPC’s system tracks project actions from inception to when they are turned over to be bid and constructed. All information is posted to their website. This allows members and the public to review all changes on a project up until the DOT or local sponsor receives final bids for construction. DVRPC’s system is not set up to track projects as they are built. The DVRPC system is a financial planning tool. Both states have their own transactional systems for project tracking and management through construction.

When amendment requests are sent in from the DOTs, the transit agencies, or the counties, DVRPC compares the changes against the financial constraints and re-programs funds as possible. In Pennsylvania, a state-wide financial working group of all MPOs and the state agencies establishes financial guidance to be used at major updates which must be adhered to during the amendment process.

An inherent problem leading to many TIP changes is the accuracy of DOT project status reports which depend on individual project managers keeping the information current. Both states are trying to keep this information updated quarterly.

DVRPC TIP management personnel feel their system has key strengths as a project action tracking system due to its database structure and MPO control. In particular, providing web access, including mapping, of all federal and state capital projects makes the process open to the public and the private sector. Having a searchable public access website for approved TIP / amendments has drastically lowered DVRPC staff time spent fielding inquiries. Weaknesses are related to the STIP systems with which DVRPC interfaces. On the project tracking/cost issues, weaknesses are related to poor project planning, poor cost estimates, rapid cost inflation, and having too many projects in process and not enough project managers. Consequently, proactive TIP planning is very difficult.

Suggestions for improving TIP project tracking include making sure all stakeholders understand the difference between the planning/programming stages and transactional/construction stages, keeping records of modifications/amendments to projects, and making searchable mapping and record-linked mapping available to the public on the web server versions of the TIP.

#### FHWA / E-STIP / PSS

In addition to the five MPO applications/processes discussed above, the WSA Team also examined the “E-STIP” application developed by the Federal Highway Administration (FHWA)’s New York State Division Office in Albany. For several years, FHWA has worked with the New York Metropolitan Transportation Council (NYMTC) and NYSDOT on an “E-STIP” application that provides a web based approach for submitting amendments to the approved STIP (NYSDOT) and TIP (NYMTC, Poughkeepsie-Dutchess County Transportation Council PDCTC, Orange County Transportation Council OCTC, and Ulster County Transportation Council UCTC). It should be noted that NYMTC, PDCTC, OCTC and UCTC are managing their respective current, approved TIPs via this system and NYSDOT manages its STIP via this application as well.

Upstate MPOs submit TIP amendments via hard copy to NYSDOT’s Program Management staff. The state DOT uses this information to input information into E-STIP, affording electronic transactions reflecting STIP amendment approvals.

In all cases, once NYSDOT approves the amendments through E-STIP, the information is forwarded electronically to FHWA and FTA Region II for federal agency approval. Once the FHWA or FTA approve the electronically submitted amendments, the STIP is automatically updated reflecting the changes generated through the MPO’s approval of a TIP amendment.

E-STIP does not include the capability to have a detailed project tracking / implementation system. While the New York E-STIP is currently an amendment approval system, work is underway to complete a TIP/STIP enterprise level program update leading to a more comprehensive system. In the near future, FHWA will be turning over the code for E-STIP to the New Jersey Institute of Technology so the program can be integrated with the TELUS TIP project programming and tracking system.

NYSDOT uses PSS as its internal project tracking/implementation system. This tool is designed for tracking project progress by phases including obligations. Direct access to the system is by NYSDOT only. At major TIP updates, PSS information is exported and formatted for use by other agencies. In the NYMTC case, PSS information is received and compared with E-STIP information to form the basis for the next TIP. PSS information on obligations is also provided on a yearly basis to the MPOs. According to NYSDOT, currently there are no plans to replace PSS or to allow MPO staff direct access to PSS information. Also, while some NYMTC personnel are hosted by NYSDOT and thus have access to PSS, PSS information is usually obtained by contacting the NYSDOT Regional Planning and Programming manager.

### **3. DETAILED INVESTIGATION OF PROJECT IMPLEMENTATION TRACKING APPLICATIONS**

The purpose of this task was to examine two computerized project planning and implementation tracking applications in detail and provide information on the amount and type of effort and data required to use them in a meaningful way. The two agencies were selected from the five agencies covered in Task 2. The Miami Valley Regional Planning Commission (MVRPC Dayton, Ohio area) was selected based on the agency's use of Web TELUS, a software packaged developed specifically for TIP project planning and tracking. The Delaware Valley Regional Planning Commission (DVRPC Philadelphia, Pennsylvania area) was selected based on the agency's direct access and use of DOT information from both Pennsylvania and New Jersey.

#### **Detailed Case Study Process**

A detailed data collection instrument was developed to gather information about the two case studies. This set of questions was then answered through on-line research, direct interviews with agency TIP managers, and follow-up questions via email as appropriate. The questions asked are below.

**NYSMPO Project Implementation Study  
Discussion Guide for Detailed MPO Case Studies**

- Name of Application/Program and Developer
- Inputs
  - Where did/does the initial project database come from?
    - Existing information databases
    - Previous software (such as old TELUS versions)
    - Difficulty of getting DOT and MPO databases?
    - What's included? e.g.:
      - Project number, description, location, funding source, cost, project milestone dates (Obligation, letting, advertise, awarding, major milestones, completion)
  - Where do updates come from?
    - DOT – direct reading of database / direct integration with STIP? New TIPs / Amendments, Manual entry?
    - MPO – does the MPO use the software as the real time project manager?
    - Does the DOT have direct access to the MPO project database or is the MPO application reading directly from the DOT databases? (For project progress, updates, tracking)
  - Does the MPO collect MPO and local project updates? How?
  - What other information is needed – for instance, to use the GIS capabilities of TELUS, GIS location is needed
- Outputs
  - What reports can be generated? Can they be customized? (e.g. by town, county, MPO, route, etc.)
  - Can the DOT access the MPO application directly?
  - Can the local project managers / towns / public access the system?
  - Are sample reports available for study personnel to see?
- Capabilities
  - Does your application provide enough data and functionality to support proactive TIP management? Does it: track project deadlines not being met such as obligation date, track project progress / milestones against a project schedule, track project cost increases, and/or track project scope creep that may trigger additional funding needs or other review requirements?
  - What features are available? (Such as project location mapping, project scoring module, automated project modification requests, economic impact module, land-use module)
  - What are the security levels? (e.g. public read-only, MPO full access, DOT project status access, etc.)
  - Are reports customizable?
  - How often is the data updated? Real Time? Monthly? Quarterly?
- Limitations
  - Technology based limitations and Institutional issues
- Start-up Costs, e.g.
  - Cost of application and/or accessory applications (web servers, GIS modules, etc.)
  - Initial set-up of software and initial entry of data (either automatic or manual)
  - Hours/people needed to set-up and implement application
- Recurring / Ongoing Costs
  - Hours/people needed to keep system updated and running
  - Hours/people needed to help report out information as needed (i.e. can everyone use the application or only those trained on it?)
  - Hours/people needed to keep information up to date
- Barriers
  - What would you like to do with the application that you cannot now? What are your long range plans for updates or a new application?
- Challenges
  - What were the hardest parts of getting the system up and running? Technical? Getting correct information? Resistance from users / stakeholders?
  - What are the hardest parts of keeping the system going?
    - Project information not up to date (institutional)
    - Project information difficult to enter (wrong format either by content, medium, incompatible files)

## **Detailed Case Study Results**

### **Miami Valley Regional Planning Commission Detailed Case Study**

The Miami Valley Regional Planning Commission (MVRPC) serves the greater Dayton, Ohio area. MVRPC utilizes Web-TELUS to manage its TIP planning process and perform limited project implementation tracking. TELUS (both desktop and web-based) was developed by the New Jersey Institute of Technology (NJIT) in conjunction with FHWA and continues to be developed and supported by NJIT. Currently MVRPC, Alabama DOT, and the Houston-Galveston Area Council (H-GAC) are the only users of Web TELUS. MVRPC and H-GAC both have geographic information system (GIS) maps for project mapping including searchable, point and click maps as part of their TELUS installations.

MVRPC's TIP data files were originally in either a spreadsheet or database system. These were converted into Desktop-TELUS and MVRPC used Desktop-TELUS from 1999-2005 before converting to Web-TELUS in 2005. Data fields needed to be defined and cross-matched for import from the original system to TELUS. NJIT helped through this conversion process, but staff time of about 2-3 weeks was needed. MVRPC staff stated this conversion process would likely be the most time consuming part of switching from an existing spreadsheet or database TIP system to TELUS. Once set-up and running in Desktop-TELUS, conversion to Web-TELUS was relatively straight forward for MVRPC. Again, assistance from NJIT was available. It is possible, of course, to convert directly from an existing TIP system into Web-TELUS without using Desktop-TELUS. However, the data conversion process would likely remain the most time consuming part of the process.

One of the key differences between Desktop-TELUS and Web-TELUS is in the database structure. MVRPC developed many specialized reports both for approval boards and use by other agencies in Desktop-TELUS. Since the desktop version is MS Access based, so were the reports. However, Web-TELUS uses a MYSQL language / database structure. Thus, all of the specialized reporting had to be converted. MVRPC finds having staff that is fluent in MYSQL is very useful.

TELUS is offered to state DOTs and all MPOs free of charge. However, the implementing agency is responsible for purchasing accessory applications such as GIS software to support mapping; e-reporting software to support on-line custom report production; and MYSQL interfaces for database management and query. The implementing agency is also responsible for hardware costs such as web-servers and high-speed access lines.

The duration of conversion from Desktop-TELUS to Web-TELUS was about three months from the time of the decision to move forward. The core of the change was installed in three days with the assistance of NJIT.

The MVRPC Web-TELUS system does not directly integrate with Ohio Department of Transportation (ODOT) system. ODOT uses its own project tracking system called Ellis. MVRPC has direct, read-only access to this system. Consequently, MVRPC uses Web-TELUS to shadow the information in ODOT's Ellis system as well as to manage other TIP data not carried in the Ellis system. This process requires MVRPC personnel to manually enter information from Ellis into Web-TELUS.

Project initialization generally works in two ways. For funds not controlled by MVRPC, ODOT usually makes a direct request to MVRPC to have projects considered for the TIP. MVRPC staff gets the information in manual form (paper, email, telephone) and enters the project into the TELUS system for consideration by the MPO. For funds which are controlled by MVRPC (Surface Transportation Program, Congestion Management Air Quality, and Transportation Enhancements), MVRPC sends out paper applications to local project sponsors each fall. A ranking and selection process is used to choose which projects are funded. Then, MVRPC enters the project information into TELUS and works with ODOT to have these projects entered into ODOT's Ellis system. Long Range Plan (LRP) projects are handled in a similar manner, but designated differently in TELUS. When the decision to move an LRP project to the TIP is made, changing the project status is easy in TELUS.

Updates of TIP projects including requests for amendments typically come from the ODOT district office on a daily to weekly basis via telephone or paper format. Local project amendments are requested in writing. (Alternatively, MVRPC staff sometimes notices changes in projects on the Ellis system and enters them into the TELUS system for review before a formal request has been made.) MVRPC staff review requested changes and decide if a TIP amendment is necessary. Requested changes are entered into web-TELUS and subject to the MPO approval process. While an amendment on a project is pending, the publicly viewable on-line version of the project record will open with a pop-up screen denoting the project information has been updated but has not been approved by the MVRPC. Once approved, the amendments are sent back to the state DOT from Web-TELUS in paper form for manual entry into the Ellis system. At this point the on-line pop-up page providing notification of the pending amendment is removed.

TELUS includes a wide variety of data and can be modified to include additional fields / data tracking. Example inputs for the system (taken from the MVRPC Web-TELUS system) are the project information detailed below.

- Tip Year Approved
- (State) Project ID
- MVRPC (MPO) ID
- Long Range Plan ID
- County
- Route Section
- Construction year - programmed year

- General Comments
- Phase Cap – MVRPC funding limit for MVRPC funds
- Letting Type – Local, Non-let (ODOT project), Traditional
- Transportation Mode – Bike/Ped, Bus/Transit, or Roadway
- Lead Agency – Towns, Townships, Regional Transit Authorities, ODOT Districts
- Air Quality Review – Exempt or Analyzed plus air quality scenario name
- Reservoir Year and Phase - This field is used to signal phases of projects which are ready to go in a previous year. Then, if funding becomes available, these projects are the next candidates for those funds.
- Project Milestones: Environmental document approval date, ROW authorization date, tracings complete/plans to ODOT district date, ODOT district right of way certification date, plans to central office date, sale date, award date, completion date, and project status. These dates are estimated dates unless the date has past, then the system reflects the actual date.
- Location: Route, lanes, county, ODOT district, start and end log, locale/town, length, map layer, actual map graphic on project page
- Project Finance Information: Current year (programmed year of phase), phase (design, construction, right of way), work type (plans and engineering, right of way, construction, others), funding type (federal or non-federal), funding program (state, local, bridge, etc.), allocated amount, obligated amount

The system is searchable by many of the fields described above and can generate a wide variety of reports automatically through the web-site. These reports are:

- Profile – general project information
- Financial
- Fund Tracking
- Status (although MVRPC does not currently use this feature)
- Audit (tells what changes have been made to each record and by whom)

The reports are summary reports by project, but do not include summaries of the entire selection such as total project value for all projects included in a report. Also, the reports can be segregated by town, county, route number, ODOT district, and others.

ODOT has direct read-only access to Web-TELUS information as does the area's local project sponsors (towns, transit districts, etc.) and the general public. Public information is for the currently approved TIP only. Prior TIPS and future draft TIPS are also handled on Web-TELUS directly by the MVRPC staff, but are not available publicly on-line.

While the system does not currently flag particular records of projects which fall behind, it does provide some information related to project tracking. Estimated milestone dates are in the system as well as actual dates once they occur. However, these are the same field and thus

comparisons must be manual. (No history of changes in a particular milestone date is available.) Also, the system relies heavily on quality and freshness of ODOT information and MVRPC shadowing of ODOT information. The system technically tracks project increases since TIP amendments are necessary to change funding on a project. Consequently, the TIP amendment published each month contains these changes. (Also, Web-TELUS reflects these on-line but does not show the history.) Project scope creep changes are rare and usually handled through the update of specific projects rather than by any automated system.

The Web-TELUS system has several features. MVRPC is currently using the general project system as well as the GIS mapping interface system. The project mapping system takes some work to set up initially due to entering the location information (either point or line). Each year when the list of new/requested projects comes in, a lot of geographic coding is done.

While TELUS includes several other modules (project scoring, project conflicts, economic impact, land-use), MVRPC does not use these. In fact, the research conducted for this study shows the developer of TELUS is concentrating primarily on the core functions (project information, mapping, and fiscal constraint) for future TELUS improvements.

The system's security is set up for three basic levels: Full access, modifications only, and read only. MVRPC's Web-TELUS and web-site system allows the public to review draft TIPs online during the public comment process and submit comments online. MVRPC has also been using Web-TELUS to follow long range plan projects. Projects are designated as long range plan projects or TIP projects in TELUS.

MVRPC staff feels there are few limitations to the system. However, having a staff person who uses the MYSQL language is very helpful in generating reports and maintaining the system. No institutional issues have appeared.

MVRPC sees the on-line nature of Web-TELUS as being a major asset. Public, local project sponsors, officials, and others can access the TIP on-line 24 hours a day. This allows MVRPC staff more time for other work that used to be spent answering TIP informational inquiries.

The major difficulty with the system is keeping the data up to date. MVRPC spends about 75% of a full time staff person to keep the system running and sequenced with the ODOT system. Daily maintenance of data is needed so project changes do not build up.

Long term, MVRPC is trying to figure out how to interface Web-TELUS and ODOT's Ellis for easier data update and transfer.

#### MVRPC / Web-TELUS Summary

Web-TELUS has provided MVRPC with a system for managing its TIP which allows TIP project mapping and on-line read-only access for the public. Set-up of the system was challenging in

that the database information available needed to be converted into the TELUS system. Also, conversion of specialized reports from the Desktop-TELUS system to Web-TELUS and future report synthesis required staff with MYSQL abilities.

The Web-TELUS software package is free, but MVRPC pays for a web-server, high speed connection line, and software licenses such as GIS mapping, e-reporting, and MYSQL.

The MVRPC system does not interface directly with Ohio DOT's project management system. MVRPC personnel get daily updates from the ODOT districts and enter the information into Web-TELUS. Overall personnel requirements are 75% of one full time equivalent to track about 230 projects.

MVRPC's Web-TELUS system includes a wide variety of project information including estimated and actual project milestone information. However, differences in estimated and actual dates are not available. It allows a wide variety of reporting inquiries and customization. Consequently, the current version of TELUS used by MVRPC does not allow for strong proactive TIP planning and programming, but does provide some of the fundamentals needed for TIP management.

MVRPC is also using Web-TELUS to manage long range plan projects and is attempting to construct a system for feeding information from ODOT's project system directly into Web-TELUS.

### **Delaware Valley Regional Planning Commission Detailed Case Study**

The Delaware Valley Regional Planning Commission (DVRPC) serves the greater Philadelphia, Pennsylvania area. The region includes five counties in Pennsylvania and four in New Jersey. Consequently, DVRPC manages two TIPs, one for each state.

DVRPC uses an in-house developed TIP management system which is Microsoft Access based. DVRPC maintains the TIP on this system. Staff member Charles Dougherty developed the overall system over several years. Mr. Dougherty is a medium level MS Access user/programmer. Currently, two other staff members manage the TIP system. One of these staff members has a good working knowledge of Access and can handle day to day issues. Mr. Dougherty now works at the policy level of the agency but still provides higher level advice on Access issues and the system architecture. The DVRPC IT department has also been providing additional support.

The DVRPC TIP has been managed using some form of database system since the late 1980s. To develop the same system DVRPC is using today, DVRPC staff estimates it would take an MPO staff member with medium level MS Access skills and knowledge of the MPO's TIP process

about two weeks to develop and populate a similar system. Entry of data to populate the system may take more time depending on the number of projects.

The DVRPC TIP system does not integrate directly with either states' DOT system. Pennsylvania uses a STIP database system called the Multi-modal Project Management System (MPMS), a very complex system which contains multiple records for each project detailing many aspects of the project including funding for each project phase. Upon request, DVRPC can get an export file of MPMS information for use with its own system. They usually do this every two years at major TIP updates and have been pursuing a quarterly export of certain state data. DVRPC also can get view-only online access to MPMS, but the linkage is very complicated. Data must be manually entered into DVRPC's system. Monthly TIP amendments are requested by the project sponsors (PennDOT, transit operators, local agencies), and once reviewed and approved by the DVRPC, are sent via email to the state.

New Jersey DOT's STIP development process uses an MS Access system with architecture which is roughly the same as the DVRPC system. Consequently, files can be passed back and forth during major updates with some modifications done using MS Access functions. While the current approach is somewhat low-tech, DVRPC staff believes the system will evolve to a centralized web-accessed system. For monthly updates of the approved TIP, changes are requested by NJDOT, transit operators, and local sponsors via email using agreed to MS Excel sheets and memos. After approval in the DVRPC process, the state is notified and the state manually updates its system.

For project changes/amendments in both states, the DVRPC TIP system and the state STIP systems usually have the requested changes entered in parallel. DVRPC then notifies the appropriate agencies when the changes are approved by the MPO.

The DVRPC system includes all the major information used in typical TIP management systems:

- Tracking number (MPMS# in the case of PA, DB# in the case of NJ)
- County
- Status (New project or in TIP) – allows candidate TIP projects to be in system
- Mode program (transit or highway)
- Air Quality Code (refers to air quality model scenarios and other air quality considerations with over 60 different codes)
- Category
  - Highway reconstruction/restoration
  - Transit restoration/rehabilitation
  - Highway safety, operations, and drainage
  - Transit safety and operations improvements
  - New highway capacity
  - New transit capacity
  - Bridge replacement or rehabilitation

- Pedestrian / Bicycle
- Air Quality
- Studies and other miscellaneous
- DVRPC Map – tells if the project can be mapped and if it has been mapped
- ITS – tells if the project is ITS related or not
- Link to Congestion Management System / Program
- Road name, limits
- State route and section (Until recently, this reference system was not well maintained. A new system will be downloaded from PennDOT in the near future and data fields rebuilt to provide better project location and GIS information.)
- Improvement type (a short description of project – a couple words, standardized and categorized for sorting and searching such as bridge replacement, interchange improvement, intersection and signal improvements, etc.)
- Minor Civil Division Names – links to a standardized list, but can select multiple MCDs if project is in multiple areas (a one to many relationship)
- Local sponsor (if it has one)
- Regional sponsor (county, DVRPC, transit agency, PennDOT, NJDOT, etc.)
- Manager (DOT project manager, consultant, DVRPC, etc.)
- Description (generally a paragraph with good details written in plain language – this field appears in the on-line web version of the TIP also)
- Schedule and Costs: year, phase, fund, cost, modification (which modification number of the funding for the specific project), funds needed in years beyond TIP
- Last modification (number)
- Action details

The last three pieces of information above contain very specific information regarding changes to the project. The DVRPC system is designed to track all changes to a project related to funding and a complete history of these official actions is available.

DVRPC's TIP program development process involves all capital programming for projects using federal and state funds, not just those using funds designated for MPO control.

Updates for project planning are handled on an annual basis. The DOTs, transit operators, and local project sponsors identify changes in costs and schedules to DVRPC. DVRPC then compares the changes against known financial constraints using, in part, the TIP system. The Pennsylvania STIP process also has a state-wide financial working group that meets to decide by consensus the financial guidance of funds available for TIP development and constraints.

Other information used in the DVRPC system includes project location for GIS mapping. An update of the mapping system is being developed that will allow better and faster project mapping without each DVRPC staff member mapping projects needing GIS software licenses.

DVRPC does not allow direct on-line access to its TIP system. Instead, the approved TIPs are available on-line in a “.pdf” document format and also as a web searchable format (by county, key word, project ID, fund), which draws data from a copy of the MS Access database stored on the DVRPC web server. A GIS “point and click” mapping system (based on ESRI’s ArcIMS system) is also available to access the on-line approved TIP. The on-line system displays major project information only: project number, project title, air quality code, route segment, description, civil division, funding type by year, and total cost for current TIP. While the on-line system provides only project summaries, this information is sufficient to answer the majority of public and local sponsor questions about projects. The amount of time DVRPC staff spends fielding phone project inquiries has dropped drastically since the on-line access system was developed.

The DVRPC system generates a wide variety of reports necessary for TIP maintenance. Project summary reports can vary in detail and grouping (i.e. type of project, county of project, etc.) Other reports include summaries of financial information across all projects. Action summary reports can be generated showing all actions taken on the project during a period of time.

The DVRPC system does not have an automated TIP implementation and tracking system. Both states have their own project management systems which are used for day to day project management. Updates from these systems, which include schedule slippage and cost changes, are sent to DVRPC on a periodic basis from the DOT offices either in electronic form or via online view-only access.

At the time of the study interview, many difficulties in project planning and implementation were noted including poor original cost estimates, construction inflation, schedule delays, and project scope creep. While all of these issues affect the ability of the MPO to re-program funds, none of them are directly related to technology issues. Rather, they are institutional and circumstantial, beyond the MPO’s control.

DVRPC receives a quarterly report from the state DOTs on obligations. While DVRPC has tried to link the DOTs’ information directly with the DVRPC system, differences in the way the state information is made available have made that complicated. Even the state DOTs find they have to manually manipulate data on project tracking and funding, due to information coming from different internal accounting systems

Both state DOT project tracking systems have estimated dates for major project milestones. However, the systems do not track variation between estimated and actual dates, and thus information needed for proactive TIP programming is not available.

DVRPC staff noted that the hardest part of the TIP process was not the database system development but managing the paperwork needed to support the meeting processes and approvals for TIP amendments. This includes getting information from the state, project sponsors, and others; creating change memos for projects; reviewing proposed changes for

federal compliances; facilitating the public participation process; sending changes to various committees for review; developing presentations for the DVRPC board; and generating reports for filing changes with the states and federal agencies. Many of these processes involve hardcopy and/or read-only electronic reports. For Pennsylvania, TIP updates/amendments once approved by DVRPC, are sent through an electronic approval process. DVRPC generates an electronic file with approval steps of the changes and backup documentation which is then forwarded to PennDOT for their review, and finally to the federal agencies (FHWA and FTA in particular) for their review. Finalized documentation is then sent electronically back to DVRPC. A similar set of electronic documents and process is used for NJDOT projects, but the electronic approval file is not included.

DVRPC staff noted they would like to evolve their TIP system to a web-based Oracle database application with GIS integration. Recent addition of a new field in the TIP system may allow a cross reference to projects in the Long Range Plan. Also, the Long Range Plan projects are being converted into a database system. However, it has not been decided if the Long Range Plan system should be combined with the TIP system.

### DVRPC Summary

DVRPC, serving the greater Philadelphia, PA region, maintains two different TIPs: one for Pennsylvania (over 500 projects) and one for New Jersey (over 200 projects). DVRPC has developed an in-house MS Access based TIP management system. Two fulltime staff plus part of a third are used to manage the TIP system.

The system serves to track projects as they are programmed including project details and funding. The system does not integrate directly or automatically with the state DOT systems (Pennsylvania and New Jersey). Pennsylvania uses a project programming system with a structure similar to DVRPC's system, but in a different program base. New Jersey's system is MS Access based and downloads from this system are easier to integrate into DVRPC's system. DVRPC periodically requests data exports from both systems for use in updating DVRPC records. On-line read-only access is available to the Pennsylvania system. The overall process is only semi-automated and still requires significant staff manipulation and review. Monthly TIP amendment requests are submitted by project sponsors to DVRPC manually.

The DVRPC system contains general project descriptions, identification fields, funding sources and years, and other key TIP information. The system is somewhat unique in that it tracks all funding changes made to a specific project, allowing historic review and reporting as projects develop. Also, the system encompasses all capital programming, not just programming related to funds designated for MPO control. Finally, the system has a GIS mapping capability including "point and click" mapping and a web-based search capability.

Once approved, the TIP and amendments are made available to the general public on-line. The on-line reports system includes fewer project details than the in-house system, but sufficient information to answer most inquiries.

Both state DOTs have their own project management systems. Reports are available from these systems regarding project status. Quarterly obligation reports are also made from these systems. These reports can then be used for project tracking and re-programming, but the process is not automated nor does it provide information for proactive TIP management. At the time of the study interview, DVRPC was facing numerous project implementation issues not related to the TIP programming or management but to cost escalation, scope creep, and poor cost and schedule estimates.

**Comparison of MVRPC (TELUS) and DVRPC (MS Access) Systems**

<b>Current User (MPOs)</b>	<b>Miami Valley Regional Planning Commission (MVRPC) Dayton, OH</b>	<b>Delaware Valley Regional Planning Commission (DVRPC) Philadelphia, PA</b>
Application	Web-TELUS	DVRPC staff developed in-house system in MS Access
Website	<a href="http://maps.mvrpc.org/telus/WebTelus/Login:LoginPublic">http://maps.mvrpc.org/telus/WebTelus/Login:LoginPublic</a>	<a href="http://www.dvrpc.org/transportation/capital/tip.htm">http://www.dvrpc.org/transportation/capital/tip.htm</a>
Type of Application	Web-server based tracking / database system	MS Access database system which produces approved finalized on-line searchable database.
Software Cost	Free, but need to purchase web server software and other software for additional functionality (such as ArcGIS, MYSQL, E-reports)	Base TIP system is MS Access which is commonly available and is included in many micro PC packages. Need to have web server software and other software for additional functionality such as on-line GIS searchable mapping
Hardware Cost	Web-server and high speed internet line	Web-server and high speed internet line for public on-line system
Time to Implement	NJIT can assist in installation and conversion from older system. Installation time was approximately three days. Total conversion time was three months from desktop TELUS to Web-TELUS.	A good MS Access programmer with a working knowledge of MPO and state processes should take about two weeks to develop core package. Population of database can be long depending on the number of projects being entered/ converted. Total conversion time from MS Excel based system probably would take 2-3 months.
Ongoing Maintenance	<ul style="list-style-type: none"> <li>• Cost of high speed internet line and internet service provider</li> <li>• 50%-75% of one person's time to keep projects updated and another 25% for technical support to program and track about 225 projects</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of high speed internet line and internet service provider</li> <li>• Two full-time persons to manage TIP plus partial administrator / expert time combined to program and track over 700 projects</li> </ul>
Inputs	<ul style="list-style-type: none"> <li>• General project information (TIP year, Identification number, lead agency)</li> <li>• Project milestones (dates)</li> <li>• Location (including GIS mapping function)</li> <li>• Financial information (phase, cost, funding source)</li> </ul>	<ul style="list-style-type: none"> <li>• General project information (TIP year, Identification number, lead agency)</li> <li>• Location (including GIS mapping function which is not part of the base system)</li> <li>• Financial information (phase, cost, funding source)</li> </ul>
Outputs	Wide variety of reports, searchable database, real-time access for agencies and public, customizable reports	Wide variety of reports, searchable database, real-time access for agencies and public of approved TIP only, customizable reports

<b>Current User (MPOs)</b>	<b>Miami Valley Regional Planning Commission (MVRPC) Dayton, OH</b>	<b>Delaware Valley Regional Planning Commission (DVRPC) Philadelphia, PA</b>
Communicate with State DOT System?	No. Reports are sent by DOT districts on changes almost daily. MPO has read-only access to DOT system.	Not directly. Requests are sent by DOT district for changes on monthly MPO schedule. MPO has read-only access to some DOT systems, gets downloads of other systems
Automated Pro-Active TIP Programming Assistance?	No. However, milestone dates can be queried using MYSQL to determine if delays are happening. No tracking of cost increases once construction is awarded.	No. Both DOTs (Pennsylvania and New Jersey) use different transactional project management systems which are difficult to interface with. Downloads can be provided by the DOTs upon request.
Public Access	Yes – provided WebTELUS is used. (i.e. not Desktop TELUS) Provides searchable agency, municipal, and public access through categorical and interactive map search system with full project information	Yes. Provides searchable agency, municipal, and public access through categorical and interactive map search system with limited project information designed for general public
Revisions Tracking	Yes – Limited. Provides audit of changes made to record but no processed comparison format – difficult to use	Yes – Limited. System provides reporting of historical updates to project funding in a processed format and main information screens indicate project modification levels

## **4. CONCLUSION AND LESSONS LEARNED**

The original goals of this project included finding a recommended project tracking and implementation system for the New York MPOs based on a needs review, best practices survey, and detailed application demonstrations. However, through the course of the project, it quickly became clear that the needs and systems available to fulfill those needs vary greatly among MPOs both within New York and across the country. It also became clear that a single solution does not exist.

### Issues Identified – New York MPOs

Due to the federal requirements on obligation reporting, tracking of obligations is the key priority of MPOs across New York. Other project implementation and tracking needs differ by the size of MPO.

New York's very small MPOs (which are also not Transportation Management Areas—TMAs) typically have a very small number of project on their TIP. Consequently, they usually work closely with the local project sponsors and the NYSDOT Regional Program Project Managers to program the TIP and review project progress. Also, given the relatively small size of the MPO members and low number of projects, cooperation and information sharing happens fairly regularly albeit mostly on an ad-hoc basis. All of these MPOs generally receive project obligation information from the appropriate NYSDOT region and request information from local project sponsors and transit agencies during major TIP updates. Some of these MPOs thought the use of electronic standardized tracking reports may give them less information than they get now and may create extra paperwork which is unneeded.

New York's small sized MPOs (which are TMAs) usually have a larger number of projects in their TIP. These agencies also typically use their NYSDOT regional contacts to get project update/tracking information when needed. Transit information is gathered from the transit agencies during major updates or on a quarterly basis along with information on projects with local sponsors. Most interviewed staff thought the idea of getting information in electronic form might be useful for some purposes (such as searching through the database and for posting information on the web for members and local agency staff to see.) However, many felt the NYSDOT could be more forthcoming about the status of projects, especially as they move toward being obligated / bid.

New York's large MPO/TMAs, of course, have an even larger number of projects in their TIP. Project tracking varies, but most of the MPOs at this level request information from the DOT regional offices, transit agencies, and local sponsors on a quarterly or more frequent basis. This information is often transferred electronically. Most of these large MPOs use some type of electronic / database system to manage their TIP. Information coming out of the NYSDOT PSS system is often not sufficient for re-programming funds or programming the following year

funds because needed funds for multi-year projects are not included. The TIP for these MPOs is typically available on the MPO website and is often searchable.

New York's largest MPO, NYMTC, covers the New York City, Long Island, and lower Hudson areas. NYMTC is unique in that its TIP is managed through a program jointly developed by FHWA, NYSDOT, and NYMTC known as E-STIP. E-STIP is designed to assist in TIP development and TIP amendments. Project tracking for NYMTC happens through the DOT districts and other processes similar to other New York MPOs.

In summary, the NYSMPOs have a variety of interests depending on size. Overall, the key to getting project tracking information and TIP programming information is a good relationship with specific NYSDOT Region personnel. All of the MPOs thought the communications issues could be handled better. Most saw these issues as more of an impediment to project tracking than technological issues.

#### SAFETEA-LU Public Involvement Requirements

SAFETEA-LU legislation increased the requirements for public involvement in the TIP development and amendment process. The number of stakeholders has increased and the ability of those stakeholders to comment on the TIP process has become more important. TIP applications which allow for a web-based public access component can provide this increased access through searchable database systems, interactive mapping, and common language project description. These systems can also allow for on-line comment and input to the TIP process. They represent a major leap forward from previous public systems which distributed TIP information in unsearchable paper and web-based electronic read-only document formats and allowed public comment only through written letters and by attending public hearings.

#### Application Options Available

The case studies surveyed of available options for TIP project tracking turned up a very limited number of applications available. Many of the five outside New York state MPOs interviewed had internally developed systems for handling TIP programming and project implementation. Some were database driven while others used specialized systems. All of the case study MPOs rely heavily on their respective state DOTs for project implementation / tracking information. For the most part, no automated system exists to interface between state DOT information and MPO project financial information, based on the five case studies. From the five MPOs reviewed, two were chosen for detailed review of their system: Miami Valley Regional Planning Commission (MVRPC – Dayton, OH) and Delaware Valley Regional Planning Commission (DVRPC – Philadelphia, PA). MVRPC uses the TELUS system while DVRPC has developed its own MS Access based system as noted in Section 3 of this report.

TELUS

TELUS, being free to MPOs and having technical support through the New Jersey Institute of Technology (NJIT), is a viable option for many New York MPOs to use to program TIP projects and provide project tracking. Both desktop and web-based versions are available. NJIT provides some technical assistance in setting up and installing the system. Customized fields and reports can be developed for the system. Current database and worksheet based TIP information can be converted to populate the TELUS project information. Real-time on-line access to the TIP can be provided to local agencies (with change authority options) and the general public using Web TELUS.

TELUS includes a specialized tool for customization which may cover some detailed manipulation and specialized reporting needs. However, if more detailed data manipulation or specialized reporting is desired after installation, on-staff expertise is usually needed (MS Access skills for desktop TELUS or MYSQL skills for Web TELUS). For Web TELUS, an MPO would need to have high-speed internet access and a web-server available. Additional software purchases may also be necessary such as web-server software, e-reporting software, and GIS software. The extent of these purchases relates to the functionality desired from the TELUS program.

Another issue to consider is the tracking of projects. While TELUS can be used to track project milestone progress and cost forecasts against actual costs, the NYSDOT project implementation system is not designed to interface with TELUS. Thus, most MPOs would need to inquire to NYSDOT and the individual NYSDOT regions to get project information. This information would then need to be entered manually into the TELUS system.

There are a variety of additional TELUS features in which New York MPOs may have interest. For Desktop TELUS, the system can be figured in a client/server structure so multiple users within the same office network/server can access the system. Also, Desktop TELUS includes a GIS mapping function while server based GIS software would generally be needed for WebTELUS. Summary reporting of total financial information for a selected group of projects is possible. A project revision system for major changes is available. This feature allows all the existing information for a project to remain in the TELUS database while a new record (including a different revision number) can be created and altered to reflect new information.

#### Future TELUS Systems

NJIT's primary focus for TELUS appears to be on the fundamental project planning, fiscal planning, tracking, mapping, and approval processing features. Thus, over time, the TELUS system may become more and more useful for MPO project planning and tracking. Each new version of TELUS will likely be backward compatible with existing TELUS data.

NJIT is planning to develop a Project Management and Optimal Financial Resource Allocation Model for TELUS. The model will track revenue streams from all funding sources and compare it to the amount of obligated funds. It will identify if and when the fiscal constraint is exceeded. Given the TIP-approved project schedules and available funds across all funding sources, the model will design an optimal schedule so that the use of funds is optimized. If a project (or any of its phases) is delayed, the model will re-design the schedule and re-optimize the use of funds. Development of these features is expected to begin in October of 2007. The fiscal constraint portion should be completed in December 2007 and the capital budgeting portion is estimated to be completed in February of 2008.

As explained in this report, NYMTC / NYSDOT/ and FHWA have developed a work-flow application for TIP development and TIP amendments approvals called E-STIP. Negotiations for NJIT to receive the base code for E-STIP are ongoing. Once complete, NJIT plans to combine E-STIP into the TELUS system, however no estimated timeline was available at the time of publication. Also, NYMTC has been able to use semi-automated processing on information sent to them by NYSDOT from the NYSDOT system (PSS) to use as input to the E-STIP system during major updates of the TIP. As TELUS develops and potentially involves the E-STIP system, this link might become available for the other New York MPOs.

#### MS Access / Databases

As mentioned earlier, DVRPC has developed its own relational database TIP system which operates on the MicroSoft Access software. The DVRPC system's structure is similar to the two state systems (Pennsylvania and New Jersey) which are involved with DVRPC. While some on-line access is available to the Pennsylvania system, the process is not automated. Due to the similarities between the DVRPC system and the New Jersey system however, DVRPC can accept export files from the New Jersey system. However, this data does need some processing to be used in the DVRPC system.

New York MPOs may individually decide to develop their own project planning and tracking system using MS Access or another database software tool. However, such systems may require additional extensive on-staff skill to manipulate and upgrade the software.

#### Building an Institutional Relationship Structure, Standardized Files, and Data

The research in this study has shown the relationship of an MPO to its respective DOT division(s) is clearly very important in improving project tracking and implementation. Actual software applications are somewhat secondary.

Some of the information needed for project tracking is in NYSDOT's PSS system which New York MPOs could work to obtain. However, given that the DOT regions individually often

shadow the PSS system and given that neither NYSDOT headquarters nor NYSDOT regional systems are entirely up to date, there are some institutional issues at the NYSDOT level on which New York MPOs may have little influence. Also, direct access to PSS requires high level computer data lines and training which the MPOs may not be willing to pursue due to a possibly high cost/benefit ratio; and, NYSDOT would likely be hesitant to allow outside access to this internal project system. In addition, any information downloaded from PSS represents only a snapshot in time. Since PSS information changes frequently (on a daily basis) any downloaded information needs to be treated properly.

An alternative approach would be to have each MPO in New York attempt to work out an agreement for project tracking information sharing with their respective NYSDOT region(s). However, this may prove to be difficult and complicated, resulting in inconsistencies across the state. Given the Association of New York State Metropolitan Planning Organizations (NYSMPO) organizational clout, it could institute an organized effort to work with the NYSDOT headquarters and regions in developing a standard data set that most NYSMPOs would like to have for project tracking and implementation. A standard protocol for data transfer could be initiated which gives the MPOs the information they seek on a regular basis while protecting the PSS internal data at a comfortable level for NYSDOT. A starting point for the dataset formation may be to examine the TELUS project process which has dataset standardization as one of its goals.

At the same time, NYSMPO could develop a recommended TIP management software system that is compatible with the NYSDOT dataset described above. It is very likely that not all New York MPOs will be interested in developing this software system. For instance, NYMTC is already using a more complicated system with ties to the NYSDOT system. However, the other New York MPOs would likely benefit by using a standard system and having the ability to import a standard project progress dataset from NYSDOT. The options for developing this system include either using a version of TELUS or developing a system for New York MPOs to use at their option.

### Project Implementation Policies

In addition to the institutional structures, data issues, and TIP programming and tracking software, the research for this study included policy mechanisms for moving projects through the programming and implementation process. Several policies were found which has similar effects on project programming. However, all these mechanisms require historical and accurate project tracking. These are not recommended but are presented for consideration by NYSMPO.

- Three strikes rule – if a project misses the proposed advertising/letting date three times, the funding is withdrawn and re-programmed for other purposes
- Obligation date deadline – a project sponsor can lose funding if it misses the obligation date deadline (May 31 of the programmed TIP year, for instance)

- Regular billing against funds – a project sponsor can lose funding if it does not bill against the funds regularly (at least once every six months or, in the case of projects contracted out, awarded within nine months of obligation)
- Formal project extension requests – to encourage timeliness, project sponsors must formally request an extension if they are more than one-year late in obligating funds
- Regional project evaluation committee – a technical committee which may include staff from the MPO, staff from other MPO members, and/or regional technical advisory committee members who review project process and requests for extensions on a project by project basis
- Cost overrun responsibility – making project sponsors responsible for cost overruns can force project sponsors to be more forthcoming about expected project expenses in the programming stages

Of course, all of these policy approaches rely on having accurate project data available.

Any of these policies may be effective in helping individual New York MPOs deliver projects on a more timely and orderly basis. It may be useful for NYSMPO to hold a discussion session on various implementation techniques at a regular meeting and provide for its members a list of viable techniques.

### Summary of Next Steps

#### Near Term

- Present results of this study to NYSMPO members
- Begin discussion of suggested tracking approaches
  - Should NYSMPO pursue better data acquisition through cooperation with NYSDOT headquarters and regions?
  - Should NYSMPO discuss among members and recommend a particular TIP software approach for members (TELUS, MS Access, etc.)?
  - Should NYSMPO open a dialog with representative local sponsor and transit agencies regarding input to the project management/tracking process?
- Begin discussion of implementation accountability techniques beginning with those in this report

#### Intermediate Term

- Open dialog with NYSDOT headquarters on needed dataset and structures which are available for export on a regular basis
- Develop a software solution for NYSMPO members to use or recommend use of the TELUS system

- Provide basic structure of necessary datasets and how those relate to New York MPOs
- Provide interface to NYSDOT dataset
- Provide on-going review of accountability techniques and effectiveness as reported by NYSMPO members

#### Long Term

- Provide members with forum for project planning and implementation techniques updates
- Established TIP project programming and implementation dataset
- Established, consistent system across New York MPOs and NYSDOT to allow efficient and effective project programming and implementation