

**Report and Specification**  
**for**  
**Transportation Program Management System**

**Prepared by : Iowa County Engineer's Computer Committee**  
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**A report on the functional needs and processes involved in Programming transportation projects and Developing them for construction. Contains a specification for a statewide software system to automate the procedures and defines submittals required of prospective developers.**



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# 1. Introduction

## a. Goals

TPMS is proposed as a distributed, PC-based system for automating two key processes required for road improvements in Iowa:

- a) the annual preparation, submission, and approval of road improvement programs.
- b) the ongoing process of developing plans and obtaining approval for projects to be let for bids.

## b. Structure and purpose of this specification

This specification outlines ICEA's preferences regarding TPMS's structure, screens, commands, and operation. It is intended to provide prospective developers with a clear definition of what is needed -- and to fix the vision tightly so that neither ICEA nor the developer drift into adding extra features after software writing commences.

It starts with background information on the processes and procedures that must be implemented via the new software. It then presents the data structures, screens, methods, and commands required for each major module. It profiles expected system users to improve developer understanding of end user needs and perspectives. The concluding sections outlines how the package should be built, tested, and deployed.

## 1c. TPMS Overview

This section provides a general synopsis of TPMS and reviews how the concept for it arose.

- **1c-1 TPMS project synopsis**

The TPMS project will consist of writing a custom software application for use by County Engineers, Iowa DOT local government liaison staff, and regional planning agency personnel. The proposed package will automate transportation project programming, project development tracking, and provide a project linked e-mail service. When finished, the new software will get distributed to about 150 end users around Iowa.

- **1c-2 Background**

ICEA's Computer Committee obtained Iowa Highway Research Board funding to create a County Engineer Computer Bulletin Board system, (or BBS), in 1991. Iowa State University's Center for Transportation Research and Education, (CTRE), set up and has operated the system on ICEA's behalf to the present. The BBS has served reasonably well but it's become obvious that it can't replace existing hand/voice methods of doing business unless developed to a higher level. So the computer committee has been investigating how to create a more usable and effective system.

Even as the work on the BBS took place, new factors emerged which argued still more for the creation of a customized system. A new Federal law, (the Intermodal Surface Transportation Efficiency Act of 1991, or "ISTEA"), caused a significant increase in the complexity of project programming. Simultaneously, internal reorganization of the Iowa DOT led to a decrease in the assistance they provide to local governments and increased the number of different DOT staff that must be contacted in the course of developing a project.

Prior to ISTEA, Local governments had to fill out only one, annual, road program -- and it was reviewed and approved by a single office within the DOT. After the new law went into effect, local jurisdictions found themselves juggling three to five different road programs and dealing with multiple review agencies.

In response to these emerging challenges, the ICEA Computer Committee proposed a two part solution:

- a) create a County Engineers' Service Bureau to house and operate an expanded BBS, plus provide a data interchange service between local governments and the DOT.
- b) create a custom software package that would simplify project programming and development work -- and which would serve as a platform for future "all electronic" project development in the future.

It submitted these ideas to ICEA's general membership and won support for TPMS in June 1996, followed by approval for the Service Bureau in October that same year.

After ICEA approved the TPMS concept, the Computer Committee requested funding for it from the Iowa Highway Research Board, which approved a two phase approach:

**1c-2.1 Phase 1:**

The initial work, to be executed by the ICEA Computer Committee itself, would consist of cataloging existing procedures, identifying all parties who interact to perform the tasks involved, and defining a software specification for automating the processes. (That work has been done and the findings are presented in this report.)

**1c-2.2 Phase 2:**

The second phase will consist of selecting a developer to write the actual software package, based on the requirements identified in Phase 1. After selection and contract negotiations, the Computer Committee will seek final authorization from the Research Board to complete the project.

### **1c-3 Detailed Objectives**

The objectives of TPMS development are as follows:

- a) To replace the current project programming system, which involves coordinating multiple, paper lists of projects with a system where a single, electronic master list is accessed, viewed, and processed by all involved parties, each according to their roles.
- b) To improve communications between the DOT and Local governments regarding the status of project development efforts -- and keep projects on track for bidding and avoid delays caused by incomplete or late communications.
- c) To link all agencies involved in programming and development with a convenient, automatically recorded e-mail system.
- d) to serve as the foundation for eventually developing and submitting all project plans and documents electronically.

### **d. Supplemental materials**

The appendices provide materials that supplement and amplify the text of this document. Specification sections 4 and 5 can't be understood without constant reference to their related appendices.

#### **Appendix A**

Background information and samples of how things are now handled by paper forms.

#### **Appendix B**

Detailed tabulations of the proposed directory, file, record, and field structures needed to implement TPMS, plus sample screens for key modules.

#### **Appendix C**

Additional detail on key TPMS processes.

## 2. Overview of Processes to be Automated

This section describes the processes that TPMS is intended to automate and outlines how ICEA envisions this being done. It also profiles probable end users to help developers understand of the "customers" to be served by the new system.

### 2a. Overview of current methods

The following sub-section reviews the existing processes that are proposed to be converted from paper & pencil methods to electronic, PC based, operation under TPMS.

- **2a-1 Project programming**

Project programming is an annual, multi-step, multi-participant process where local governments compile lists of the improvements they propose to make to their road systems, then submit those lists to oversight agencies for review. The latter check the proposed projects against State & Federal requirements, compare the costs with available funds, and then approve, (or disapprove), the programs. Thereafter, the approved programs govern what projects can be developed and placed under contract within particular fiscal years.

Iowa has two project programming and review processes: a State 5-Year Improvement Program and the Federal Aid Transportation Improvement Programs. While the State and Federal programs are interrelated, they are administered in different ways and serve different purposes.

#### **2a-1.1 State Five Year Program details**

The State 5-Year Program, (**5-Yr Program**), is required by the Code of Iowa. Each local jurisdiction must prepare a list of projects planned for construction during the next five fiscal years. This program list must be approved by the agency's elected officials and sent to the Iowa DOT for review. The programs are first examined by the DOT's 9 field Planners, who work out of six Transportation Center offices spread around the State. After review, those planners forward the programs to the DOT's Office of Planning Services, located in Ames, Iowa, which then rechecks and certifies them. Copies of the certified programs go back to the local jurisdictions from whence they originated, (but not, unfortunately, to the DOT Office of Local Systems.)

The 5-Year Programs become effective on July 1 of the fiscal year to which they pertain. During that year, the DOT monitors the local government project development work and will approve projects for bid letting only if they are listed within the certified programs for that year.

#### **2a-1.2 Federal Aid project programming**

Prior to the mid-90's, the 5-Yr Program process sufficed for all projects whether locally, State, or Federally funded. This changed when the Federal Transportation Act of 1991 was signed by President Bush. ISTEA replaced many old Federal policies with new ones. For local governments in Iowa, the biggest change came in the way Federal funds were programmed for disbursement.

Whereas Federal projects had previously just been included in the 5-Year Program, the new law caused Iowa to implement a more complex approval system. The DOT began requiring that every agency eligible for Federal funds join a Metropolitan Planning Organization, (MPO), or a Regional Planning Affiliation, (RPA). *(The MPO's and RPA's are quasi-governmental agencies mandated by Federal law to promote coordination between individual units of government within an economically unified areas, such as a core city and its suburbs.)*

Federal Aid projects are now reviewed and approved via a process separate from, yet parallel to, the State 5-Year Program. Local jurisdictions list projects for which they seek Federal funding over the next three federal fiscal years. These are sent to the MPO's and RPA's, which combine them into Regional Transportation Improvement Plans, (or RTIP's). The RTIP's are then reviewed and approved by special committees within the Planning agencies. (A Policy Committee composed of elected officials and a Technical Committee comprised of key engineering and technical staff of the local governments). After the regional approvals, the RTIP's go to the Iowa DOT, which incorporates them into a master document called the State Transportation Improvement Program, (or STIP). After a public comment process, the DOT seeks final approval from the FHWA and FTA. Upon receipt of Federal concurrence, the RTIP's and STIP become official.

The Federal Aid programming requirements are intended to assure that local governments work together, to promote increased public participation in project selection, to mandate realistic fiscal planning, and to impose a planning process on all levels of government.

### **2a-1.3 When RTIP's & STIP Effective**

The RTIP's and STIP become effective on October 1st each year, or as soon thereafter as Federal concurrence is received. (Sometimes this is delayed by the FHWA or by Congress.) As Federal aid projects are developed, they are screened against the current 5-Year Program, the relevant RTIP, and the STIP. To be let for bids, a project must be listed correctly in all three programs.

### **2a-1.4 Bridge Eligibility List**

Projects proposed to receive Federal Bridge replacement funds must meet a set of special criteria. The DOT Office of Local Systems maintains a list of such structures to assist project sponsors in selecting projects.

### **2a-1.5 Logistical challenges**

The initial years of the new Federal Aid programming procedure were very trying for local governments. Since then, the new procedures have become more routine and less time consuming. (At first, local governments found that they had to spend 90% of their programming time on the Federal process - even though it provided only 5 percent of their revenues.)

Even with the benefit of experience, it has proven logistically impossible to get all programs, (5yr, RTIP, STIP), to precisely match each other for any appreciable length of time. So situations evolve where two or more of the programs fail to agree with each other when a project is ready to go to bids. Such conflicts require a significant flurry of corrective letter writing to straighten things out -- or projects get delayed.

Some jurisdictions, especially Counties in metro areas, incur the additional complication of having some projects fall under MPO review while the rest require separate RPA review.

### **2a-1.6 TPMS concept for automating Project Programming**

In light of the circumstances described above, ICEA and other local jurisdictions seek to re-simplify the project programming process. The replacement must eliminate the need for people to maintain multiple, separate lists of projects and permit them to all view the project information simultaneously. It needs to eliminate transcription errors and decrease delays occasioned by multiple agencies mailing paper lists back and forth between themselves.

The TPMS project proposes the following:

- a) Replace all the separate road-programs with a single, centralized list and arrange for each agency or individual to access it via PC based telecommunications.
- b) Enable State 5yr Program, RTIP, and STIP approvals to be submitted, reviewed, and approved electronically.
- c) Create a system which automatically links each participant, (Local Jurisdiction, Planning agency, DOT-Transportation Center, and DOT-Ames Offices), to the data, screens, and commands relevant to their roles and authority.

### **• 2a-2 Project development**

After the Road Programs have been submitted and approved, the individual jobs within them must be designed and let for bids. Numerous State and Federal regulations govern how this is done. The Iowa DOT coordinates with and oversees local jurisdiction development work to assure that all requirements are met and that they are fulfilled in the proper sequence. Additionally, the DOT's bid letting process, which is used for many local projects as well as for State jobs, imposes unforgiving lead times on project development activities.

Projects must follow a sequence of reviews and approvals, as listed below:

#### **2a-2.1 Project survey, design, and research**

The local jurisdiction must survey the project site, retain an engineer to design the improvements, seek permits from regulatory agencies, and arrange for field checks of cultural features that might be impacted.

**2a-2.2 Concept and location review**

A concept statement must be prepared and submitted to the DOT for review and approval. This document lists and compares design and location options and summarizes the design guidelines that the project sponsor intends to utilize.

**2a-2.3 Preliminary plans**

Next, the local agency submits preliminary plans to the DOT for review. This usually involves examination and comment by district Local Systems Engineers and, when needed, by the Office of Local Systems. It also requires Structural and Hydraulic reviews for bridge and culvert jobs. Local Systems staff also track whether or not environmental, historical, and regulatory requirements have been started and/or met, per communications received from the Office of Project Planning

**2a-2.4 Check plans**

Upon receipt of the DOT's comments regarding the Preliminary plans, local jurisdictions proceed to develop Check Plans. These are resubmitted to the DOT to be checked for consistency with DOT bid items, specifications, standard plans, and bid procedure.

**2a-2.5 Final Plans, specifications, and estimate of cost**

Check Plan review comments guide project engineers in the preparation of Final Plans. When ready, the final plans are certified by the engineer, approved by elected officials, and submitted to the DOT for insertion into the bid letting stream -- or authorized for local letting. A detailed estimate of cost goes with this submittal.

**2a-2.6 Right-of-way certification**

Before a project is given final release for bid, the Local agency must submit a ROW statement and, for Federal Aid jobs, have signed a project agreement.

**• 2a-3 Communication and coordination**

Completing the sequence of steps outlined above requires a great deal of communication between the DOT and project sponsors. The local governments and the DOT staff need to know what each other has accomplished at any point in time. Currently, they communicate about project development via telephone and mail. While this works acceptably, voice contacts have the disadvantage of being imprecise and difficult to document, while mail has the disadvantage of being slow.

## 9. Functional requirements

This section describes the functions and capabilities needed in TPMS to automate project programming and development. It will need to be a database, communications system, official record, and process management tool.

### • 2b-1 Database functions

At its core, TPMS will contain a project database. Each record will detail a separate project. The data fields within each record will hold all information needed to define the project and record its status.

#### 2b-1.1 Key data files

The system must track the following items:

- a) Project programming - one record per project
- b) project development - one record per active project
- c) Bridge eligibility - one record per eligible bridge
- d) Critical path dates - project development target dates and programming process dates.
- e) User ID & authorities - one record for each end user
- f) Official log - database of key events
- g) E-mail - database of e-mail messages
- h) Work session log - record of session events

Most of the information entered into the system will come from the project sponsors, but the DOT and regional planning agencies will need exclusive access to certain records and fields reserved for their roles.

#### 2b-1.2 Sorting, screening, and searching

End users will need the ability to perform basic database manipulation functions on project data. This will include multiple key sorts, logical filtering, and searching for specific projects.

#### 2b-1.3 Reports

TPMS shall print pre-formatted reports. Each TPMS screen will have a specific, pre-defined report form associated with it. Users will not design their own reports. (Should someone desire an alternate format, the proposed export feature should permit them to send the data to an outside application for that purpose.)

## • 2b-2 Communications system

TPMS will also be a communications systems. It will move data back and forth across the state so that each user's actions get broadcast to all others who need to know. It will transmit e-mail one-to-one or one-to-many and link the e-mail records to specific projects for future reference. It will enable the Sysop to perform administrative functions remotely, and provide transaction security.

### 2b-2.1 Data exchange and update services

The key problem with existing methods is that multiple, geographically dispersed parties must try to keep several different lists consistent and synchronized with each other. With a lot of effort, the number of discrepancies is kept relatively low -- but errors inevitably creep in.

Under TPMS, users will access a single, combined master-list of projects. The list shall contain a superset of the data used in all three types of programs. Each TPMS user will access and edit information pertinent to their role. Internal controls will prevent them from changing things outside their domain.

A central TPMS server will act as a data collection and distribution hub. Via a process provisionally named the "INTERLINK" protocol, remote clients will dial into the server and upload any records they've changed since last contact. The server will incorporate the changes into the master files, then broadcast it to related clients when they subsequently dial in. In like manner, it will consolidate changes made by others and ship them back to the original client.

Each data record will have fields reserved for each type of system participant: local jurisdiction, regional association, DOT field offices, and DOT central offices. When a client calls in to make an upload, the server will copy only the data fields editable by that type of client. Then it will download a copy of the master record back to the client, automatically sending along updates received from others.

**2b-2.2 E-mail operations**

TPMS shall provide its users with a specialized e-mail system. It must handle regular, free-form e-mail, plus make it possible to transmit project linked e-mail. In the latter case, TPMS shall keep a permanent record of all e-mail sent or received regarding a particular project -- so that all clients can look up past correspondence when needed. It shall also incorporate a two-way hot link between an e-mail piece and the project it relates to. The user will be able to 'click' on the e-mail and have TPMS bring up the project for viewing, or 'click' on the project and bring up all past e-mail related to it.

**2b-2.3 News and instructions**

In addition to the basic e-mail functions outlined above, TPMS shall permit the server sysop to broadcast news and instructions to all clients.

**2b-2.4 Administrative project data**

Certain information, such as the list of Federal Aid eligible bridges, the critical path to letting date list, etc. must be entered periodically by the DOT and broadcast out to all other clients. TPMS must support this via the INTERLINK protocol.

## • **2b-3 Relationship tracking**

Because TPMS will link a diverse group of clients, it will need to "know" the rights and privileges of each and how they relate to each other.

### **2b-3.1 Jurisdictional Link table**

ICEA proposes that user rights and relationships be tracked via a special tabulation provisionally called the "Jurisdictional Links" table. Jurisdictional data will be stored in a special array of rows and columns to permit any TPMS module to look up its own privileges and to know what relationships it has with other related clients. To be known as the "JURSLINK" table, it will control all links and privileges, even those of the main server. For security, the central server's sysop will have sole and exclusive authority to edit this table.

### **2b-3.2 Identification of relationships between agencies**

JURSLINK shall contain both a row and a column corresponding to each and every TPMS user, including the server. The leftmost column and the top row will list all users in matching order. Each TPMS system will scan down the left hand row to find itself, then scan across the row to find out which other clients are linked to it. Users will be able to look up the linkages of any other client the same way. The JURSLINK table will enable e-mail options such as broadcasting to one's peers or sending out a query to all clients of a particular type.

### **2b-3.3 Establish and authorities and privileges**

Each cell in the JURSLINK table will contain a coded string that specifies what privileges that the agency associated with the column has with records of the user associated with the row. This will permit TPMS to operate very flexibly and enable a single version of the software to serve all clients: with embedded "IF...THEN" and/or "CASE" statements in the code that use the JURSLINK privilege data to control program execution. This way the software will not need to be rewritten if it's later decided that a certain user class' links or privileges need changed. Instead, the Sysop can implement the desired revisions simply by editing the JURSLINK cell contents.

## • **2b-4 Time sequence controls**

The TPMS project envisions a software package that will deal with and supervise events that must be performed in a specific sequence with pre-set time constraints.

### **2b-4.1 Project programming schedule**

For project programming, TPMS will need to enforce a sequential process where local jurisdictions formulate programs, submit them for review, then receive approvals of the State 5yr program first, the Regional TIP second, and the State TIP, third. TPMS must provide interlocking controls to make sure that each player performs their role in proper sequence and within a limited timeframe. After the programs receive approval, the system will need to "know" when to make them effective.

### **2b-4.2 Project development progress tracking**

The primary purpose of the Project Development module will be to record and display the progress made towards the goal of readying a job for bid letting. Secondly, it will monitor and visually indicate whether or not the project is "on schedule". This feature will key off the project's target bid-date and must dynamically update itself whenever a project sponsor changes a bid date.

## c. End user profiles

This section describes the roles and perspectives of the people who will use the TPMS software. This information is included to help the developer better comprehend who the software will serve and what it needs to do for them.

### • 2c-1 Local jurisdictions

Local Jurisdictions will use TPMS to develop Road Programs and obtain State, Regional, and Federal Aid approval thereof. They will have exclusive rights to originate projects and initiate project development. But they will often need responses from DOT reviewers before they can proceed from one step to the next.

#### 2c-1.1 County Road Departments

The 99 County Engineer Offices generate the majority of the projects to be tracked and handled via TPMS. Most have a staff of five or six, led by a licensed professional engineer. The engineer or his assistant generally handles Project Programming. In most Counties, the assistant will handle most of the project development tracking. There will be 2-3 active users of TPMS in these agencies.

An average County will have about 40 projects programmed and about 10 under active development at any one time. Some have many more while others may go several years between projects.

#### 2c-1.2 Cities

State law requires Cities to file Road Programs with the DOT but doesn't require the communities to abide by them. However, Cities receiving Federal Aid have to comply with Regional and State TIP requirements. Cities will use TPMS's Project Development module nearly exclusively for Federal Aid projects.

Unlike the Counties, which have a uniform technical competency statewide, Cities vary greatly in size and ability. The 50 largest communities probably have staff capable of running a TPMS client module, but will often delegate project development to a consulting engineer. The remaining 900 +/- cities are unlikely to be able to operate TPMS in house; when they have TPMS worthy projects, their consultant will need to handle the work for them.

**2c-1.3 Enhancement sponsors**

Other local agencies, such as County Conservation Boards, Historical Preservation Commissions, or non-profit recreational trail operators will occasionally sponsor Federal Aid projects. They generally lack familiarity with project programming and development procedure. Either their related County or City Engineer will have to assist them in TPMS operations, or such work will need to be assigned to their design consultant.

**• 2c-2 Metro and Regional planners**

Planning agencies are non-profit organizations collectively owned by client Cities and Counties. They originated in the 1970's when the Federal Government, frustrated with lack of coordination between individual local governments within metropolitan areas, mandated creation of "Councils of Governments". These agencies now handle grant writing, grant administration, community planning, etc. They draft and secure approval of regional long-range transportation plans and the shorter range RTIP's, (Regional Transportation Improvement Plans).

**2c-2.1 MPO's**

Metropolitan Planning Agencies, (or MPO's) were the first planning agencies created. They've served multi-county areas since the 70's but they focus primarily on urban projects. Staff size will vary from 5 to 10, with at least one person competent to operate TPMS. Generally, they will end up being responsible to program all city Federal Aid projects and will likely make the project development entries for a majority of their city clients.

**2c-2.2 RPA's**

Regional Planning Affiliations, (or RPA's), were set up by mandate of the DOT as a precursor to implementing new Federal Aid allocation procedures required by the ISTEA law of 1991. They handle regional planning and project programming functions for Federal Aid transportation projects. Each RPA is "owned" by the Counties and Cities within it. Some were formed independently of the pre-existing "Council of Government" agencies. Most contract with a COG for the performance of the RPA duties.

Thus RPA's contain staff competent to operate a TPMS module. The staff's role will be to review and approve the annual RTIP's. Most projects under development within a region originate from the Counties.

- **2c-3 Iowa DOT district offices**

Officially renamed "Transportation Centers" as a part of the DOT's ongoing efforts to improve itself, the district offices serve as the State's primary liaison with local governments. Two employees in each one will need to use TPMS: the Transportation Planner and the Local Systems Engineer.

- 2c-3.1 Planners**

The Planners' involvement will occur only a few times per year, in the spring. They make preliminary reviews of local jurisdiction 5-Yr Programs and forward their approval / disapproval recommendations to the Office of Planning Services in Ames, Iowa.

They do not have a direct role in the review and approval of Federal Aid road Programs, (the RTIP's). But they stay in touch with what local governments are doing by virtue of being non-voting members of each RPA and MPO. Due to the limited amount of contact they will have with TPMS, software commands and options for them should be kept self explanatory.

- 2c-3.2 Local Systems Engineers**

The LSE's do not play a role in the review and approval of programs but are actively involved in project development. They review and comment on concept statements, preliminary plans, and monitor local bid lettings when they occur. They will also be the people to enter the end-of-job data about each project as it gets completed and final payment is issued. Local Systems Engineers will use TPMS weekly if not daily.

## **2c-4 Iowa DOT Ames offices**

The Iowa Department of Transportation headquarters, located in Ames, Iowa, contains a number of offices who will be asked to adopt and use TPMS.

### **2c-4.1 Office of Planning Services**

The Office of Planning Services performs final reviews and approvals of local jurisdiction State 5-Yr Road Programs. It performs this action annually, in March and April. One person in this office will handle these tasks.

### **2c-4.2 Office of Program Management**

The Office of Program Management is in charge of compiling and securing approval of the annual State Transportation Improvement Program. They will use TPMS to indicate when Federal Aid projects have been approved at the STIP level. Only one or two persons in this office will use TPMS and they will need to operate it only for a limited time each year. They will need to be able to export TPMS' data into a spreadsheet or database so it can be merged into their STIP file.

### **2c-4.3 Office of Local Systems**

The Office of Local Systems houses two people who will become the most active users of the TPMS system: the State Secondary Roads Engineer and the Plan Review Technician. These individuals share top level responsibility to review and act on local jurisdiction project development matters. They handle duties regarding project concepts, preliminary plans, structural reviews, monitoring of permit acquisition, check plans, final plans, and right-of-way certifications. They also hand off projects to the Office of Contracts for bid letting or authorize local lettings to proceed.

They will have to access and operate TPMS daily, as it will become their primary tool for keeping track of projects and staying in communication with the local jurisdictions. As noted previously, Counties tend to have about 10 projects under development at any one time. This means that the Secondary Roads Engineer and Plan Review Tech need to track as many as 1000 different projects. They customarily receive 10 to 15 contacts a day from people inquiring about various projects.

The TPMS interface must make it easy for the people in these two positions to access, view, and update project records. ICEA's objective is to make their work easier so they can provide the best possible service to their local jurisdiction "customers".

#### **2c-4.4 Office of Project Planning**

The Office of Project Planning handles a special part of project development: they oversee the acquisition of State and Federal cultural and environmental clearances for projects. They may be able to use TPMS to keep local jurisdictions updated regarding their projects' status in this domain. Currently the office consists of three people. If TPMS is deployed there, all will have to be trained to operate it.

#### **2c-5 Future additional TPMS participants**

This section lists other parties who may be granted access to TPMS in the future. The extent to which this occurs will depend on how receptive they are and whether or not such connections generate tangible benefits for local project sponsors. These items appear here only to inform prospective developers of potential extensions of TPMS.

##### **2c-5.1 Regulatory agencies**

TPMS may someday be expanded to enable the preparation and submission of all project development documents electronically. If/when this happens, one possibility would be for ICEA to provide regulators with the ability to receive, process, and approve permit applications via TPMS. It would involve defining some new user classes, setting privileges, and installing a TPMS module on a computer in their offices.

##### **2c-5.2 Consultants**

Many local jurisdictions hire consulting engineers to oversee development of their projects. Because of this, it may become necessary to allow consultants to access the TPMS system. They'd have to be restricted to viewing and updating only those projects they've been hired to work on. TPMS will need a way to link them to their projects and to the local sponsors for whom they work. Perhaps TPMS will need a consultant list and a cross-reference table that links consultant to project to local government sponsor.

**2c-5.3 Contractor organizations**

Contractor associations, such as the Asphalt Paving Association of Iowa, often poll local agencies about future projects for the type of work performed by their membership. Perhaps TPMS can someday permit them to look this data up directly from the master files on the server.

### 3. Overview of TPMS Concept

Part 3 outlines ICEA's overall concept for the proposed TPMS software. While not providing minute details, it describes the features and functions that TPMS will need. Sections 4 through 10 provide full details on each major module.

#### 3a. Basic operating characteristics

TPMS must link and serve a diverse group of people. ICEA desires the creation of a package that is sufficiently easy to use that end-users can think primarily about the business they are transacting, without much need to have a high skill level in databases or telecommunications.

- **3a- 1 User access and control**

The various end-users will have differing needs for data access and editing, per their roles within the programming or development processes. TPMS must "know" what data they need to view and what they are permitted to do with it.

##### 3a-1.1 Domains

Each TPMS user will be considered to have a "domain" that defines what projects it can access. Domains will have two dimensions: jurisdictional and project type. These items will be specified within the JURSLINK table.

The jurisdictional dimension will specify what local jurisdictions' projects may be viewed by a specific user. Each local government will see only its own projects. Regional planning affiliations will view only the Federal aid projects proposed by sponsors within their territory. DOT Transportation Center offices will need to access both Federal and non-federal projects, but only for the Counties and Cities in their districts. The DOT Office of Local Systems will need to inspect all types of projects for all local jurisdictions, etc.

Some agencies will need to handle all types of projects. Others will only require access to Federal projects.

### 3a-1.2 Project programming view/edit privileges

Within TPMS, Local road agencies shall have exclusive power to initiate projects, enter/edit project data, and establish a proposed target bid date. But they will not receive access to the data fields reserved for other agencies. When a Local agency "submits" a new road program for approval, key data about each job will be copied from the local jurisdiction data fields into "official record" fields that may not thereafter be changed, except by re-submittal or amendment procedures.

DOT field planners and Office of Planning Services staff shall have viewing access of all projects but will be limited to approval or disapproval of a proposed program. They shall not have the ability to edit or revise project records.

RPA's and MPO's shall have access only to review and approve Federal Aid projects. They will change only those fields that pertain to Regional T.I.P. approval. (Planning agencies may be authorized to enter/edit project data by client jurisdictions, such as small cities.)

The DOT's Office of Project Programming will view only Federal Aid projects and will approve or disapprove them at the State T.I.P. level.

The DOT Office of Local Systems must be able to view all local projects but will not edit records nor approve/disapprove programs. They will, however, be in charge of entering and maintaining the list of bridges eligible for Federal, (and State), aid.

The TPMS Server Sysop shall have exclusive rights to set key Project Programming schedule dates, edit user privileges, and maintain security related files.

### 3a-1.3 Project Development Edit rights and restrictions

Local jurisdictions shall have sole power to activate a project for development. They will accomplish this by selecting a project from those contained in their TPMS Project Programming record and directing TPMS to create a development record. Once that is done, they will fill in the fields pertinent to Local Jurisdiction duties and accept or revise the project bid date.

DOT Transportation Center Local Systems Engineers shall be able to view all projects under development but will edit only the fields reserved for their role.

The DOT's Ames Office of Local Systems shall have the right to view all projects but shall have edit access only to those fields reserved for their role in step of the process. This Office shall also have the responsibility to set the critical-path-to letting dates required for projects proposed to be let by the DOT's Office of Contracts. See Section **8c**.

In project development, the local road agencies will generally initiate each step of the process and the DOT will respond with approval or disapproval. The INTERLINK process will keep each party up to date as to the actions taken by the other.

### • **3a-2 Administrative features**

A distributed, multi-user system as herein proposed, will require features to prevent deliberate or inadvertent intrusion, privilege overlap, and user mix-ups from occurring. These controls shall be provided by security measures, user privilege specifications, and system activity tracking.

#### **3a-2.1 Security Measures**

TPMS shall feature a) logistic security, b) password access control, c) built-in & encrypted data items, and d) date/time comparisons to provide system and data security.

##### Logistic security concept

Logistic security shall be achieved by a deliberate limitation on telecommunication privileges. TPMS clients will be designed so the only telcomm operation they can perform is to dial into the TPMS Server. The Server will be restricted to operating in host mode for accepting connections from clients. No client will ever accept a call, nor shall any client ever call another client, nor shall the Server ever initiate a contact. These restrictions will assure that all data is exchanged via the Server and that the Server can screen out any attempts to "hack" into the system.

Password security

TPMS will require each client to establish a local password, which the Server will record and use to verify the identity of a client when they next attempt to log on. In addition, the Server shall generate and transmit a special, non-viewable password back to a client just before concluding an INTERLINK connection. The client shall save the secret password in an unidentified location and must be able to transmit it back to the Server at next connection. The Server will ask for the special password and compare it to the internal Server password records to determine if the client's identity is valid.

Built-in & encrypted data

Security via built-in and encrypted data items shall consist of a) storing the server phone number / Internet URL in a non-viewable file, b) storing a client serial number somewhere in the data files, and c) encryption of local agency ID data.

Date and time flags

Date and time comparison security shall be used as a final check on user identity. It shall operate as follows: at the end of each INTERLINK session, the Server shall transmit a Date and time of logoff to the connected client, plus record those items in its own client profile data. Upon next connection request, after all other items have been checked, the Client shall send the logoff date and time to the server. Connection will get final approval only if the Client data matches the Server's records.

**3a-2.2 User privilege controls**

All TPMS users shall have their privileges and limits encoded in a special, "JURISDICTIONAL LINK", table as described in Section 2b-3. This table shall control who they can contact, what data fields they may view or edit, and what command options they may access.

### 3a-2.3 Usage logs / System statistics

TPMS shall record system events in three levels of log files. These records will help keep track of major actions, help in the debugging of software / data corruption problems, and provide feed back on how much use each module gets.

#### Official Record

The first level of log file shall be the "Official TPMS Log". This will be made up of entries that record the start and completion of major system events, such as Interlink sessions, addition of new projects, purging of old data, approval of road programs, etc. Entries into this record will constitute an official record that may not be edited or changed after being generated. During INTERLINK sessions, both the Server and Client shall simultaneously record matching data as proof of event execution.

#### Work Session Log

The second log file will consist of a temporary text file to record work session actions. Whenever TPMS is started, it shall open a session-log file and record each user action taken during the course of operation -- until they finally exit out of TPMS back to the computer's operating system. This file shall log each program module selection choice, each menu selection, each command activation, and the start and completion of important data processing operations. Upon successful completion of a work session, the user shall be offered the option to print out the session log, and then it shall be erased.

If, however, something causes the session to terminate prematurely, the log file will not get erased. In that case, TPMS shall immediately alert the user and print the log out when the system is next started. The session log leaves a step by step record that will enable support technicians to track down the cause of system crashes and malfunctions when they occur. It will also alert users when something failed to execute properly within a work-session.

To further enhance the utility of the session log file, TPMS must contain a utility option that, when set, will cause each software function and sub-routine to note its own startup and completion in the log.

System Usage Statistics

All TPMS systems shall track how often each major module and system function is used by the local user. TPMS shall automatically compile this data in a special file. At each INTERLINK, the clients shall upload this information to the Server, which will record it in a client database and report overall statistics. This data shall be used to determine which parts of TPMS get the most use, how many project files are stored in all systems, and how much time per week each system gets operated. Such information will have a variety of uses, including help in identifying areas where TPMS needs to be improved, finding out which users are having trouble with their systems, and determining what features to add to the software in the future.

### 3b. Single module for all users

To simplify writing the TPMS software, provide for efficient debugging, and enable easy deployment of updates, there shall be one and only one version of TPMS. This means that all clients and the Server will operate using the same software. The software shall be written to interact with the JURISDICTIONAL LINK table. Using "IF" and "SWITCH/CASE" statements to determine how it should behave at any particular location. It will read the JURISDICTIONAL LINK table specifications for its local user, then extend or limit operational privileges accordingly.

- **3b-1 Shared records / exclusive fields**

Data access privileges need to be defined for each class of end user. This control shall be implemented both by having the software controlled by the JURISDICTIONAL LINK table and by prohibiting users from editing any fields save those that specifically pertain to their TPMS roles. Each project record will contain fields for all users, but no user will be able to edit the fields of any other user.

#### **3b-1.1 Project programming**

In Project Programming, four different classes of user will edit fields within a project data record:

- a) Local jurisdictions shall enter/edit project ID & description
- b) RPA's & MPO's shall edit only the RTIP approval fields
- c) DOT Planning Services shall edit only 5Yr Program approval fields
- d) DOT Program Planning shall edit only the State TIP fields

#### **3b-1.2 Project development**

There will be three users involved in project development:

- a) Local Agencies will enter and edit local data & action fields.
- b) Transportation Center staff will edit approval fields for development actions they review.
- c) The Office of Local Systems will edit approval fields for items they are responsible to review.

TPMS must record each one's actions and communicate them to the others via the INTERLINK process.

### **3b-2 Available functions defined by user link & privilege table**

Each TPMS user shall be granted data access, viewing, and editing privileges according to their role in Project Programming or Development. In addition, TPMS must track who is related to whom, and record what degree of access one user can have with another user's data. As outlined in Section **2b-3**, TPMS shall utilize a special tabulation for this purpose. To be known as the JURISDICTIONAL LINKS, or "JURSLINK", table, this array will record the relationships and privileges of all users.

This section describes what each class of user shall be permitted to do:

#### **3b-2.1 Local jurisdictions**

Local jurisdictions, (Counties, Cities, Commissions, etc.), are the users who will initiate and sponsor projects. All other TPMS users are parties who review, approve, or assist the development of the projects. Local Jurisdiction shall have the following privileges and constraints:

#### **PROJECT PROGRAMMING**

1. Creation of new projects.
2. Entering, editing, and updating project data.
3. Viewing, sorting, and selecting their own projects.
4. Submission of road programs for review and approval.
5. Submission of amendments to road programs.
6. The right to purge completed or inactive projects.
7. They will not be able to self approve their programs.
8. They may not examine or edit other jurisdictions' projects.

#### **PROJECT DEVELOPMENT**

1. Activation of a development record for any project in program.
2. Entering, editing, and updating development data.
3. Setting or changing target bid dates.
4. Initiation of review and approval for each development step.
5. Viewing, sorting and selecting their own projects.
6. The right to purge old or inactive projects.

**3b-2.2 Program reviewers**

Program reviewers will be authorized to view some or all projects from local sponsors within their domain and to issue program approvals according to their role.

**IaDOT Field Planners**

May review and recommend State 5Yr Program approval of Local/State/Federal funded projects for all Cities and Counties in their area.

**IaDOT Office of Planning Services**

May review and issue formal 5Yr Program approval of Local Jurisdiction road programs statewide.

**Regional Planning Affiliations and/or Metropolitan Planning Agencies**

May review and approve Regional Transportation Improvement Plans from the Local sponsors within their territories. (Limited to Federal Aid projects.)

**IaDOT Office of Project Programming**

May review and approve Federal Aid projects for inclusion in the State T.I.P., (or STIP).

**3b-2.3 Project development partners**

This sub-section outlines authorized actions for DOT staff involved in reviewing and approving Local Jurisdiction progress towards letting a project for bids.

**District Local Systems Engineers. (at 6 Transportation Centers)**

The Local Systems Engineers may note approval or disapproval of a) the project concept statement, b) the preliminary plans, c) project completion data, d) review and comment on Check Plans.

**IaDOT Office of Local Systems, Ames, Iowa (OLS)**

The OLS Secondary Roads Engineer may a) note receipt of environmental concurrence from FHWA on Federal Aid projects, b) approve design exceptions, c) enter when Structural Reviews are finished and approved, d) review and approve Check Plans, e) review and approve Final Plans, f) Approve ROW/Project Development Certificates, g) Note when projects are submitted to Contracts for bid letting, and h) enter/edit Federal aid authorizations.

### 3c. Distributed operation

When TPMS gets deployed, approximately 150 end users will install it on their computers and use it to share information between themselves. The users will reside in every County in Iowa. Because of this geographic dispersion, TPMS's central server will need to function as a state-wide electronic mail room. It will pick up data from one party and see that it gets distributed to all others who need to look at it. Conversely, it will consolidate reviewer comments and report the results back to a project's sponsor.

#### • 3c-1 Central server with distributed clients

The Server will function as TPMS's hub. All client modules will be required to interface with the server in order to send or receive data. Clients will not contact each other directly, nor shall the Server ever call out to a client. This "one-way" limitation will assure that TPMS has only one potential point of outside entry -- not 150 points. It will also guarantee that the Server's files can stand as an official record of the project programming and development processes.

#### • 3c-2 INTERLINK protocol

TPMS shall feature a secure, pre-determined protocol to be followed when clients contact the central server for an update. As previously described, in Section 2b-2, this process shall be known as the "INTERLINK" protocol. It shall incorporate the follow features in its operation:

##### Security

It shall use public and private passwords, user ID, user serial number, and date of last contact to verify the identity of a client attempting to log on.

##### Enforcement of privileges

It shall use the "JURISDICTIONAL LINKS" table to decide what data fields a client can upload into the central files. It will also control what projects can be seen by a particular user.

##### Audit trails

The INTERLINK process shall dually record key actions, both in the client's log file and in the server's log file.

### Pre-defined sequence

Under the INTERLINK protocol, data shall first be uploaded from a client, then integrated into the server's files, then exact copies of the central records will be sent back to the client. Data shall be processed in the following order: a) Project programming records, b) project development records, c) e-mail and news, and d) administrative files.

### **3c-2.1 Concept**

Appendix C-2 provides a detailed outline of how an INTERLINK session shall be staged, from start to finish.

### **3c-2.2 Implementation**

Per section 3-b, all TPMS installations, including the server, shall run the same exact copy of the software. The JURSLINK privilege table shall control actual operation by telling the server to operate in host or "wait-to-receive" mode -- while telling the clients that they must operate in remote or "initiate contact" mode. For security, one other restriction must be imposed: the actual subroutines that implement the server's Host mode must never be installed on a client machine. That way, even if a hacker succeeded in modifying a client's privileges so as to permit it to run the server's host mode routines, the attempt would fail due to the code being absent.

## **3d. User interface**

TPMS shall be written to present a consistent user interface to the people who sit down to operate it. The interface shall be constructed on the assumption that an average user won't use the system everyday and may forget features or commands in between work sessions. Therefore, all but the most basic modules shall explain themselves upon activation and guide the user, step by step, through each particular task.

The TPMS user interface shall present potential actions in a structured hierarchy:

### **3d-a Choose work activity**

Upon startup, they shall be directed to select what general are they want to work in: programming, development, administration, utilities, etc.

**3d-b Select data**

Then they will select the data or project records they need to look at or work on.

**3d-c Process the data**

Upon confirming a selection of data, they will become authorized to execute commands from the menu to process it.

**3d-d Enter/Edit**

At the innermost level, the Enter/Edit commands will permit them to directly enter or set the data within individual fields of a project record.

- **3d-1 User Interface organization**

This section specifies how the user interface shall work.

**3d-1.1 Main Menu**

Upon startup, TPMS shall present a MAIN MENU that identifies the program, shows system status information, and presents a series of buttons, (on the left side), corresponding to all the major modules. This screen shall not have a menu bar at the top. Users shall select which module to enter by clicking on the appropriate left side button.

**3d-1.2 Home screen for each module**

Each module shall start with a introductory text screen that explains what the module will allow a user to do. These texts shall be keyed to the JURISDICTIONAL LINK table so as to tell a particular user only about the actions associated with their role in the process. At the bottom of the screen, the system shall list how many records are on file for the module selected.

**3d-1.3 "Drill down" approach to finding more detail**

After moving past the Home Screens, TPMS shall present the file contents to the user in the most general form possible. For both project programming and development, this will consist of a screen that shows data on all projects -- in a one-line-per-project tabulation. The user may then select a particular project or record and click on it to go down to the next level of detail. After perusing that level, they may click on a sub-category and view detailed information. Each project related module shall also feature a screen that permits the user to view, (and edit -- if authorized), all the data on a single project in one place.

In addition to the "drill down" concept noted above, TPMS shall also feature random access to different project views via the user of file tabs. Users should be able to jump from view to view simply by clicking on one tab or another.

### **3d-1.4 Menus and commands**

TPMS menus shall be displayed in standard windows form, in a bar across the top of the screen -- except for the Startup/Main menu screen. Menu choices will be grouped as follows: a) Project processing commands, b) Search - sort - filter commands, c) e-mail commands, and d) print - export commands. The standard Windows "File" and "Edit" commands shall be omitted.

## **3d-2 Screen formats**

TPMS shall feature highly standardized screen formats so users can become accustomed to looking for information in particular locations on their displays.

### **3d-2.1 Visual organization**

Each module shall feature an ID and Header bar at the top of the screen, with a system status bar at the bottom. Within each screen, the labels, graphics, and data fields shall be laid out so as to produce easy to scan visual patterns. Form style screens shall be designed so that labels and fields line up vertically along the left edge of two or maybe three columns. To the extent possible, topic headers shall line up horizontally. It's also desirable to use sufficient spacer rows to make data visually organized and easy to spot. (The sample screen formats presented in Appendices **B-5b** illustrate the "look" requested.

### **3d-2.2 Use of TAB metaphor for multi-screen data**

As noted in Section **3d-1.3**, TPMS shall permit end users to jump from one view of a project to another by use of the "file tab" metaphor. This will be important both in project programming and development. In both modules, users will need to be able to examine multiple views of a project in a random order.

**3d-2.3 Project programming**

Project programming shall feature seven different data screens:

- a) Project list : one line per project tabulation.
- b) Program Cross Reference: shows past, current, and next-year status for all three programs - State, RTIP, STIP.
- c) Standard form view : Ia DOT Five year program format.
- d) Standard form view : Regional Trans. Impr. Pgm. format.
- e) Standard form view : State Trans. Impr. Pgm. format
- f) Tabulation of bridges eligible for State & Federal Aid
- g) Single project : with sub-tabs to permit viewing all data about a project, category by category.

**3d-2.4 Project development**

Project Development shall feature nine data screens.

- a) Project list : tabulation showing one project per line.
- b) Development status : recap of the status of the 10 steps towards bid letting
- c) Project ID and Design information screen.
- d) Environmental and Cultural resource checks and reviews.
- e) Project Concept statement and Preliminary Plan reviews.
- f) Bridge and structure data and reviews.
- g) Check plan and Final plan reviews.
- h) Project development certifications and Release for bids.
- i) Project construction data and misc. information.

**• 3d-3 Pre-defined directories and files**

TPMS files shall be pre-named and stored in pre-determined directories. End users shall not be able to view, edit, or set file names, (except when exporting data). This restriction is intended to simplify the user interface and keep users from inadvertently damaging their files.

### 3d-3.1 TPMS directories

The root directory for TPMS on all machines shall be C:\TPMS. This directory shall have ten sub-directories, each with a three character name that corresponds to the types of files it will contain.

The sub-directories for the current project are:

- a) XEQ : to hold all executable and system configuration files.
- b) USR : to hold data about TPMS end users.
- c) DAT : to hold the project data files and e-mail records.
- d) LOG : to hold the official log, the work session log, & stats.
- e) ARC : for archiving data about old projects once they're done.
- f) TMP : for holding temporary files during an INTERLINK session.
- g) ADM : for holding administrative data for the server.

Several additional directories may be added in future upgrades:

- a) MAP : to hold on-screen maps for showing project locations.
- b) NFO : for holding news bulletins and reference information.
- c) PIC : for holding digitized images of forms and photos.

### 3d-3.2 TPMS files and file names

Refer to Appendix B-2 for details on TPMS file names. Preliminary ID's have been assigned for each anticipated file. Software coders may propose name changes or name additions during the development of the TPMS system, but such names must be fixed and documented.

### 3d-3.3 Records and fields

There shall be two separate databases in TPMS: one for project programming and one for project development tracking. The latter will contain a subset of the former's projects since not all programmed projects will be under development simultaneously.

Both databases shall be limited to one and only one record for each project. The records will contain all the data fields necessary to fully define the job and to permit tracking the processes. Specific fields shall be set aside for each class of user. That way, each group can enter or edit the fields required for their role in the process. But no user shall be able to touch or change data fields reserved for another.

- **3d-4 Pick & Date fields**

Many TPMS user entries will consist of "picking" a pre-set value from a "picklist", and then recording both the selected value and the date on which it was chosen.

- 3d-4.1 Reason for the concept**

In tracking what progress a project has made towards being let for bids, it's often necessary to record both what has been accomplished and the date when it was achieved. There will also be a need to restrict user inputs to pre-set values -- so that the system can automatically make "on-time?" determinations.

- 3d-4.2 Details of Pick & Date**

Each Pick & Date input will be recorded in two fields: the first will hold the "pick" value and the second shall hold the date. TPMS will need to have pre-established pick values for all such inputs. Many will fall into the category of "No action yet taken" / "Submitted for review" / "In review", and "Approved". (Rather than add a "Disapproved" setting, items that fail to receive clearance will just remain at the "In Review" setting until problems are resolved.)

- **3d-5 Reports**

Most TPMS reports shall be printed as paper facsimiles of the screen being viewed when the print command gets activated.

When TPMS generates a report, it shall automatically print the date, time, page number, and user ID on every sheet. When printing from a file where the user has specified sort and filter criteria, TPMS shall list those criteria across the top of the first page of the report so that persons viewing the report will be able to determine how it was derived. Last, when printing a report from a filtered file, TPMS shall list the following note on the first page: "This report covers xxx records from a database that contained yyy records at time of printing."

**3d-5.1 Project programming reports**

Project programming reports shall be as follows:

- a) Project list : one line per project tabulation.
- b) Program Cross Reference: shows past, current, and next-year status for all three programs - State, RTIP, STIP. Print for just one job at a time.
- c) Standard form view : Ia DOT Five year program format.
- d) Standard form view : Regional Trans. Impr. Pgm. format.
- e) Standard form view : State Trans. Impr. Pgm. format
- f) Tabulation of bridges eligible for State & Federal Aid. Print all structures for jurisdictions within domain of user.
- g) Single project : to feature a series of sub-tabs that permit viewing all data about a project from one screen. Print all the sub-screens in sequence to form one full report. Give the user the option of just printing the currently selected project or print a sheet for all jobs viewable within the current filter.

**3d-5.2 Project development reports**

Under Project Development, the first screen, (showing one project per line), will be the only one to automatically generate a matching format report. When PRINT is activated from any of the others, TPMS shall offer them the option of doing a simple hardcopy of that single screen, or printing screens 'b' through 'i' in sequence to form a full report on the currently selected project.

**3d-5.3 E-mail printing**

TPMS shall permit the following e-mail print options:

- a) Print out the e-mail currently on-screen.
- b) Permit the user to specify parameters for filtering the e-mail and then print all e-mail that meet the user's specifications.
- c) Print out all e-mail pertaining to a specific project.
- d) Print out all new, unread e-mail.

**3d-5.4 Other reports**

TPMS will need to generate administrative and utility reports from time to time. This will include printing copies of the main and work session logs, plus copies of the user statistics files. The server shall have exclusive right to print out a hardcopy of the JURSLINK table.

### 3e Service Bureau -- TPMS server operations

In order for TPMS to function, a special office with assigned staff will need to operate and maintain the central Server PC. The Iowa County Engineers Association is working with the Iowa State Association of Counties to setup a "County Engineers Service Bureau" to handle the TPMS support. A 1998 startup is anticipated.

Service Bureau staff will assist the software developer with system deployment and testing. After TPMS is successfully up and running, the bureau will eventually take over training and technical support of the entire package.

## 4. Project programming specification

This section presents detailed requirements for the TPMS Project Programming module. It should be read as an explanation of the sample screens and data structures of Appendices B-4a and B-4b.

### 4a. Program approval process

Project Programming starts with a local project sponsor listing projects it plans to build over the next three to five years. Those that need to submit five year programs to the Ia DOT for review and approval. Three year Federal Aid programs are approved separately, in a two step process.

Appendix C-1 lists the sequence of actions that TPMS must support to permit on-line submissions, approvals, and activations. The remaining sub-items of this section recap the same material in more general terms.

- **4a-1 Time sequence for review and approval**

The project programming process repeats annually, commencing in February. Local transportation agencies revise and update their project development targets, then prepare their proposed State 5-Yr Program and/or Federal Aid program lists. The respective lists are submitted to the DOT and the Regional government associations for review and approval. After a Region approves the RTIP for their area, they send it in to the DOT's Office of Project Programming for inclusion in the State TIP.

- **4a-2 Time sequence for program implementation**

New programs cannot go into effect immediately after receipt of approval. Instead, the current fiscal year's programs must continue to govern until predetermined changeover dates elapse. The change over from an old State 5-Yr program to a new one takes place on July 1st of each year. The RTIP's and STIP change over around October 1st, (the start of a new Federal Fiscal Year.)

- **4a-3 Dealing with past, current, and future programs**

In order to handle the time sequence demands associated with providing on-line programming, TPMS shall store three program sub-records within each project record:

- a) for the Fiscal year that preceded the one currently in effect
- b) for the current Fiscal year
- c) for the next, following Fiscal year.

At July 1 of each year, TPMS will update the project program records as follows:

- a) It will discard the "Previous Fiscal year" data,
- b) Copy the "Current Fiscal Year" into the "Prev. FY." fields.
- c) Erase the "Current FY" fields.
- d) Copy the "Next Fiscal Year" data over into the Current FY.
- e) Clear the "Next FY" fields for reuse at the start of the next program submission and approval cycle.
- f) Mark the State 5-Yr program in the "new" current year as being in effect.
- g) Mark the RTIP and STIP fields in the "new" Past FY as still in effect.
- h) Mark the RTIP and STIP fields in the "new" current year as "Approved - Not Yet In Effect".

Around October 1st, it will complete the cycle by:

- a) Changing the Past FY's RTIP & STIP fields to "Out-of-date".
- b) Changing the Current FY's RTIP & STIP fields to "In Effect"

## **4b. Data for project programming : content, purpose**

Each Project Programming record contain a superset of all data now logged in the State 5-Yr Programs, the RTIP's, and the STIP. A number of additional data fields will be required to facilitate computer based operations. Refer to Appendix **B-4a** for full detail on the items described in Sections **4b-1** through **4b-3**.

- **4b-1 Main record**

The main Project Programming fields will be reserved to the local project sponsors. These fields will ID the project, give its basic features, and list proposed costs and financing.

- 1) TPMS System ID codes: 6 items to uniquely identify a project.
- 2) Project Sponsor info: 6 items to identify the project sponsor.
- 3) Project Identity: 8 items to name and describe the project.
- 4) Program Information: 9 items that define programming status.
- 5) Paving Points: 6 items for determining paving points, (5Yr pgm).
- 6) Special Information: 6 items - Lat., Long., notes, ties, etc.
- 7) Cost/Pgm Year/Fund: 4 items regarding cost, fund, approvals.
- 8) Revenue sources: 20 items to note proposed project funding.

- **4b-2 State program section**

The State 5-Year Program section of a project record will consist of three sub-records, of 10 fields each, corresponding to: Previous Fiscal Year, Current Fiscal Year, and Next Fiscal Year. When a local project sponsor "submits" a program for review, TPMS will copy the values of key items from the sponsor's data fields into special fields in the DOT's section of the record. Once the copy has been made, the local jurisdiction will be free to change to change fields outside the official submission sub-record -- but can only revise the official section by resubmission.

The key items include: a1) date that Board or Council approved the local program, a6) program year for the project, a7) local funding, a8) Farm-to-market funding, a9) Special funding amount, and a10) Identity of special fund source.

The other 5-Yr program items will be Pick & Date fields that the DOT may use to electronically record approval of the project.

- **4b-3 Federal aid program**

As for the State 5-Yr program described in Section 4b-2, the RTIP/STIP data area will consist of three identical sets of fields, corresponding to Previous, Current, and Next Fiscal years. Similar to the process described for the 5-Yr program, sponsor "submission" of their program for review will cause data for all Federal Aid projects to be "snapshot" into fields which cannot thereafter be changed by the sponsor.

- **4b-4 Bridge eligibility list**

The Bridge eligibility list shall be contained in a special file that may be edited only by the Ia DOT Office of Local Systems.

- **4b-5 Control dates**

The Project Programming process is controlled by a number of key dates. There must be a special file to contain them. This file may only be edited by the Central Server's sysop. (See 'Step Two' in Appendix C-1 for details.)

## **4c. Screens for project programming**

This section details the user interface screens for Project Programming. Refer to Appendix B-4b to see the proposed screen formats outlined in this section.

Each user will "see" a different number of projects, according to their role in compiling, reviewing, and approving programs. The local sponsor will see only their own jobs. Planning agencies will see only the Federal Aid projects for the local agencies within their service area. The Sysop and the Office of Local Systems will see all projects from all sponsors.

- **4c-1 Project list screen**

The Project List screen will display programmed projects in a one-row-per-project tabulation. The purpose of this screen is to let the user see all the projects contained in their local TPMS files, to sort and filter the list, and to jump to other views of the data.

It will permit the user to view the program status of the projects for a) the current fiscal year, b) the previous fiscal year, or c) the next one. This selection may be made via "Previous / Current / Next" buttons located above the main tabulation. A label identifying the currently selected fiscal year shall be displayed in bold characters, immediately under the sheet tab.

Display project identity, (Local ID, Official number, Project name), on the left side.

Show the projects' programming on the right:

- a) The year they are proposed to be let for bids.
- b) State 5-Yr Program approval status & whether effective or not.
- c) RTIP approval status & whether effective or not.
- d) STIP approval status & whether effective or not.
- e) The STIP ID number assigned to the project by the Ia DOT Office of Program Management.

Program status values shall be displayed with color coding to assist the user in interpreting the data. Use the following scheme to associate colors with status:

- |                              |                                  |
|------------------------------|----------------------------------|
| a) RED = No Action yet taken | b) ORANGE = Submitted for review |
| c) YELLOW = In review        | d) GREEN = Approved              |
| e) BLUE = In effect          | f) Dk. GRAY = Out of date.       |

This screen shall start with the top project in the list highlighted and "selected". The user may then use the mouse or the arrow keys to "select" other jobs. Once made, a selection shall apply to all other Project Programming screens. (The user may also reset the selection when viewing the 5-Yr Program, RTIP, and STIP screens.)

This screen should permit users to go to any other Project Programming screen by click its tab. It should also allow them to jump down to the Program Cross Reference screen by double clicking in the row of the selected project.

- **4c-2 Program cross-reference screen**

The Program Cross Reference screen will display a single project's status for all three fiscal years simultaneously. It will enable the user to see the state of approval for all three programs for all three time periods. The format will help users sort out the sometimes complex combinations of review, approval, and in-effect status that will arise as the annual cycle unfolds.

The screen will also display Bridge funding eligibility at the bottom and "when effective" dates on the right side.

The top portion of the screen shall display project ID information, list the Sponsor, Region, and Trans. Centers related to it, show TPMS & STIP ID #'s, and note Type of Work, Road system, and fund from which disbursements will be made.

The screen's middle band shall present the cross-reference tabulation. Rows shall correspond to program types while columns will represent fiscal years. Use the same color coding to display status settings as described for the Project List screen, Section **4c-1**.

At the bottom of the cross-reference screen, TPMS shall display three more items:

- a) The ID of another project that is being co-programmed with the one that is currently selected.
- b) The ID of another project sponsor, if they are helping develop the job or will assist in financing its construction.
- c) The date when the currently selected project was first entered into the TPMS system.

- **4c-3 Report format screens**

TPMS will have three report format screens. These displays shall present project data in row and column layouts that exactly match the paper forms from which they derive. Like spreadsheets, these screens will need to permit vertical and horizontal scrolling to show all data. Each will represent an 8.5 x 14, legal size report.

The report format screens in TPMS Project Programming are:

- a) State 5-Yr Program: this form shall present project data in a three-rows-per-record pattern. It will replicate the standard 5-Yr program submission form; see Appendix A-1 for a copy of paper document.
- b) RTIP form: this screen shall replicate the standard Regional Transportation Improvement Program format used to list Federal Aid projects. It will use a one-line-per-project layout; see Appendix A-2 for a copy of the paper document.

Some project sponsors may deal with two or more Planning Organizations. Because of this, the RTIP screen shall feature top row buttons that permit the user to turn the view of projects assigned to a particular review agency "on" or "off". TPMS shall provide three buttons, for a) 1st review agency, b) 2nd, and c) 3rd. The user must be able to set them individually; they can be set all "on" but only two may be "off" at any one time. Each project shall be linked to only one agency.

- c) STIP screen: this display closely matches the RTIP format, with the following exceptions:
  - i - There won't be a need for 1st, 2nd, 3rd agency buttons as the Ia DOT will be the only one involved.
  - ii - Planning agency ID's shall be shown in separate column of the form.
  - iii- The DOT STIP ID number must be shown for each project.

When the user issues a Print command from within any of the report format screens, TPMS shall print out exact duplicates of the existing paper forms. This will require that TPMS print the headers, lines, as well as the data. The print routine will need to remind the user to insert 8.5 x 14 paper in the printer. Pagination must also be handled automatically.

- **4c-4 Single project view screen**

This screen must present every data field in the TPMS project programming record to the user for review, data entry, and editing. It shall accomplish this by organizing the information into seven, tabbed sub-screens:

- a) Project ID : to display all data identifying job and sponsor.
- b) 5-Yr Program: all data fields relevant to the State program.
- c) Special Information: Paving points, Special Info, & Cost est.
- d) Proposed project funding - sponsor's work area.
- e) 5-Yr program fields: lists the data in the three field sets.
- f) TIP program fields: lists the data in the three Federal Aid field sets.
- g) Misc.: Anything not covered by screens 'a' through 'f'.

Each user may view every sub-screen and data field presented by the Single Project View screen but may edit only those fields that the JURSLINK table authorizes them to. Entry and editing of fields shall be exclusive: there shall be no combination of permissions that allow two users to edit the same field within a particular project.

When a project sponsor adds a new project into their program, TPMS shall automatically step them through each sub-panel of the Single Project View screen and sequentially require them to enter every data item required. Once the record has been entered, the sponsor may edit or update fields randomly, as need dictates.

- **4c-5 Eligible bridge list**

The Eligible bridge list shall display all local structures that are a) eligible for Federal Aid funding or b) have been approved for State Bridge Program funding. This screen will have a row and column format. It will need to scroll vertically but not horizontally.

The data shall be entered and edited exclusively by the DOT Office of Local Systems. They shall be provided with buttons for a) inserting a new bridge into the list, and b) for deleting it. The list shall contain only those bridges that ARE eligible for funding; if a structure is NOT IN the list, it must be presumed not eligible. Other users may view but not edit this screen. TPMS shall scan this list automatically to determine specific project eligibility on the program cross reference screen.

## 4d. Menu commands for Project Programming

TPMS shall provide a limited set of menu options to its users. Main menu items will include: Project Actions, Program actions, Find-Filter-Sort, E-mail, Print, and Export. It shall not present the standard Windows FILE and EDIT items. Printer selection shall be made available through TPMS's Utilities module. For security, no COPY-CUT-PASTE features will be allowed.

Refer to Appendix B-4b, Sub-screen d: "STIP listing", for a concise recap of the menu items and their sub-options.

- **4d-1 Project actions**

The main menu keyword for this set of command functions will be **PROJECT**. This item shall be accessible only to project sponsors; it shall be inoperative for all others. It shall feature four sub-menu commands:

1. ADD: directs TPMS to generate an empty project record and prompt the user to input all needed data for a new job.
2. EDIT: directs TPMS to permit the sponsor to update fields within an existing project record.
3. REMOVE: starts process to erase the project record -- but only if no matching record exists under Project Development. Keeps no record of the job. For deleting projects that aren't going to get developed. Sets a flag that causes the Server to tell all clients to eliminate the project from their files, (if they have it.)
4. CLOSE: starts process to close out the Programming record of a project that has successfully been developed and let for bids. Places a copy of the record in local archives. Sets a flag that causes the server to tell all clients to archive the record.

## • 4d-2 Program actions

The **PROGRAM ACTION** menu item activates sub-options that permit each participant in the programming process to exercise their roles.

1. SUBMIT: causes client TPMS to "snapshot" current sponsor entered data on project into the 5-Yr and Federal Aid "Next fiscal year" fields. Also marks the program review status codes to "Submitted" and sets project record INTERLINK status to "Changed since last INTERLINK".

INTERLINK Note - When the project sponsor next makes an INTERLINK connection, TPMS will detect the "Changed since . . ." flags and automatically upload all project records to the Server's files. Thereafter, when a review agency INTERLINKs, the TPMS will download the "Submitted" records, (from their local agencies), into the reviewer's client computer. At the end of the session, TPMS will change the program review status codes to "In Review". The "In Review" settings will get sent back to the original sponsor the next time they contact the server -- providing notice that the reviewer has received the submission.

2. APPROVE PROGRAM: The effect of this command will depend on which type of user activated it. Program APPROVALs may only be issued by:

- a) the Ia DOT Office of Planning Services -- to mark projects as "Approved" for the "Next" fiscal year's 5-Yr Program.
- b) a Regional Planning association -- to mark projects as "Approved" for the "Next" fiscal year's RTIP.
- c) the Ia DOT's Office of Program Management -- to mark projects as "Approved" for the "Next" fiscal year's STIP.

The TPMS software shall decide how to respond to this command by consulting the user's JURSLINK table privileges. The command shall be inoperative unless the user is an eligible review agency and the action taken shall be determined by the user's exact classification.

INTERLINK Note -- After a reviewer marks a set of projects as "Approved", TPMS will set the INTERLINK status flag to "Changed since last connection". When the reviewer next makes an INTERLINK contact, TPMS will detect the flag and copy the approvals into the Server's project records. Whenever the original project sponsor(s) subsequently dial in, TPMS will download the approvals to their local files. That final step will complete the submission and review cycle.

After a sponsor's Program has been approved, it will reside inactively in the files until it becomes "effective". See Section **4a-3**

Sponsors sometimes need to amend their programs. The need may arise either prior to the "in effect" date for the program or afterwards. It may be needed in the "Current" or "Next" fiscal years or both. TPMS will need a "SUBMIT AMENDMENT" command for project sponsor and an "APPROVE AMENDMENT" command for reviewers. When an amendment is made, only the project record so marked will get sent to the reviewers. After they grant approval, the record will return to the sponsor.

To avoid potentially complex problems, amendments shall be restricted as follows:

- a) A "Next" fiscal year approved program may not be amended.
- b) The amending sponsor must wait until after October 1st to submit amendments for a "Current" program.
- c) Amendments to a current year must clear all reviews and be returned to the originating sponsor prior to July 1st or they will become void.

#### • **4d-3 Database functions**

TPMS shall permit users to apply standard database manipulation commands to their project database. All users shall be free to use these commands on all projects they deal with. The database operations shall be presented to the user via three menu keywords: FIND, FILTER, and SORT.

The FIND command will be used to locate records with specific characteristics -- such as "find the next record in the file that involves PCC Paving with STP-33E funds within the domain of RPA-18".

The FILTER command will permit the user to temporarily limit TPMS to display only those projects that meet a set of user specified criteria -- such as "all bridge projects to be built with Farm-to-Market funds in FY 1999".

The SORT command shall enable the user to have TPMS list projects in special orders -- usually things like "in order by type of

work" or "in order first by DOT district office and secondarily by project sponsor."

All three database functions, (Find, Filter, & Sort), shall permit the user to select from the following types of data fields to build their project selection criteria:

Date project added to TPMS	Project Sponsor ID
County where located	City where located
Planning Agency	DOT Transportation Center
Official Project Number	Local Project ID
Ia DOT STIP ID no. if any	FHWA Bridge No.
System (of road)	Type of work - DOT acctg code
Type of Work - TIP	Special Fund source
Primary fund (for payments)	Target FY
Estimated Cost	State 5-Yr Pgm status
RTIP Pgm status	STIP Program status

#### 4d-3.1 FIND

In the FIND command, the user shall be presented with a dialog box that allows them to choose up to three of the selection basis fields listed above for use in executing the FIND operation. Once they've indicated which fields to use, TPMS shall request that they set target values for each one. Then match test criteria shall be set.

For example, a user might elect to use the "Target FY" field as their find selector. They'd enter "1999" and specify an exact match. Or they'd enter "2000" indicate "find all greater than or equal to the target value". Or they'd enter "1999..2000" and specify "find any with the range of values shown"

After the criteria are set, the user will hit **ENTER** or click 'OK' to start the find. TPMS will locate the first record below the currently highlighted job and make it the new "selected" project. The FIND command shall retain the criteria to permit sequential "find, then go to next" operation. If no project matches the criteria, a warning dialog shall notify the user.

#### 4d-3.2 FILTER

The Filter command will enable users to temporarily instruct TPMS to display only those projects that possess special characteristics. Users will activate it by clicking the FILTER menu item. In response, TPMS will present a FILTER dialog box that will guide users through the steps of setting and applying Filtering criteria.

Establishing a set of Filtering specifications will involve the following steps:

- a) Selecting up to three data fields from the list of items enumerated just above Section 4d-3.1.
- b) Setting the evaluation basis for each field: i - exact match, ii - greater than or equal to, iii - less than, iv - between two values, v - begins with, and vi, contains.
- c) Entering the comparison or test values required by the evaluation bases selected.
- d) Combining two or three filtering criteria into logical combinations with 'AND' and 'OR' operators.

After the specifications are set, the user will click an 'OK' button and TPMS will apply the filter. It will mark all records that meet the criteria. When the screen regenerates, it will display only the records that passed the filtering test. All other projects will remain in memory but will not be visible again until the Filter is cleared. There will need to be a warning dialog to alert users when they have criteria that are so restrictive that NO projects can be displayed.

When Filtering is active, TPMS shall provide a status indication at the bottom of the screen. It shall state whether the Filter is "OFF" or "ON". If it is "ON", the status line shall also report the filter status as follows: "Displaying xxx of yyy Rcds". In that phrase, 'xxx' shall be the number of records that meet the filter criteria, while 'yyy' shall be the total number of records in the user's Project Programming database.

TPMS shall also permit the user to store up to five custom sets of filter criteria and name them for reuse in later work sessions.

**4d-3.3 SORT**

The Sort command will permit users to reset their project display viewing order. They will activate it by clicking on the SORT menu item. Upon startup, it will present a dialog box to guide the user through the steps of specifying and applying Sort criteria.

- a) The process will commence with the user selecting up to three data fields to use as their 1st, 2nd, and 3rd sort keys. TPMS shall allow them to select any data field from those enumerated above Section 4d-3.1 -- as long as they are shown on the display screen currently in view. (This means that the Ia DOT accounting code item contained in the State 5-Yr Program screen can be a sort key for that display but will be inactive when any other screen is up.)
- b) After selecting the keys, the user may instruct whether to sort each in Least-to-Greatest order or Greatest-to-Least.

When the criteria have been set, the user will click 'OK' and TPMS will re-write the display in the specified order. The default order shall be as follows: Project sponsor + FY when job is to be let for bids + Ia DOT 3-digit type of work codes.

TPMS shall permit the user to revert back to default order at any time by clicking a single button or icon. The sort dialog shall also permit a user to store up to five different sort criteria in a special file and recall them for use in later work sessions.

- **4d-4 E-mail**

The E-mail command shall bring up a dialog box for addressing, composing, and sending e-mail within the TPMS system. For security purposes, TPMS shall not accept outside e-mail.

There shall be three types of e-mail:

- a) General e-mail, sent to any or all other TPMS installations.
- b) Project linked e-mail sent between users who share responsibility for a particular project -- such as between a local sponsor and the Planning agency that reviews their RTIP submittals.
- d) Project linked e-memos, locally recorded e-mail that are addressed "to-the-file".

Items 'a' and 'b' shall be circulated via the INTERLINK process; item 'c' shall be for local installation, private use only.

Type 'a' e-mail may be sent to just specified individuals, to all users of a certain classification, to all of a user's peers statewide, to all peers linked by Planning agency or DOT district office, to all TPMS users, or to just the Server's sysop.

Type 'b' e-mail shall be tagged with the ID of a specific project, (whichever one was highlighted when the e-mail command was activated.) It shall also record the screen that was active when the e-mail was composed. These may be sent between any or all parties that share responsibility in the submission, review, and approval of a specific project. TPMS will internally refer to its JURSLINK table to determine who is connected to the project.

Type 'c' e-mail shall be tagged with a project ID but will be saved locally and not mailed -- providing a way for users to keep private notes about their projects.

As e-mail are written, they shall be compressed and saved in a special file. TPMS shall permit users to browse the file at any time and to locate individual pieces by date written or by project ID. The system shall also provide a two-way "hot-link" between projects and their e-mail. This feature shall work as follows:

- a) If working on a particular project, the user must be able to click a button or icon and have TPMS bring up all the e-mail related to that project. The user shall be able to specify some date restrictions, (such as "all e-mail written since mm/dd/yyyy"). Last, the user must be able to specify that TPMS show all e-mail or just those pieces that pertain the screen they are viewing when they activate the recall.
- b) If reviewing e-mail, the user must be able to click a button or icon and have TPMS bring up the screen that was active when the piece was written and to highlight the project to which the mail pertains.

INTERLINK Note - After e-mail have been written and saved, they will be distributed to the addressees via the INTERLINK process. The next time the e-mail author contacts the Server, their new mail will get uploaded to the central files. The Server will hold the mail until the addressee makes a link, at which time it will send the mail down to their files. Newly arrived e-mail shall be specially marked so a user can call up "New e-mail" separate from the rest of the main e-mail files.

E-mail shall also feature REPLY, CARBON COPY, and BLIND CARBON COPY capabilities.

- **4d-5 Output items**

TPMS output options shall include printing reports on paper and exporting data into spreadsheet or standard database format. Data importation will be prohibited. No information may enter TPMS except through end user key-strokes.

#### **4d-5.1 PRINT**

TPMS printing shall operate on a simple basis: it will print a paper report matching the format of the screen that is active when the menu's Print command gets activated. Thus clicking on Print while viewing the State 5-Yr program screen will cause TPMS to print a paper copy of the 5-Yr program.

Although project displays on-screen will feature vertical scrolling without showing page breaks, the print routine will need to paginate, print headers, print the report body information, and append page numbers. As noted in Section 3d-5, print routines also need to show user ID, date, time, and filter+sort criteria.

TPMS shall display a dialog box before printing. It shall declare which printer driver is going to be used and request that the user confirm that that print is the one that will be used. It shall also remind the user to load the printer with either letter or legal size paper, depending on the type of report. Last it shall tell how many records are going to get printed and how many pages will result.

#### **4d-5.2 EXPORT**

While TPMS will provide adequate database functions for most purposes, it's anticipated that many users will want to analyze or view their data in other ways. To that end, it shall provide an Export function that will write the current list of projects, (as filtered by the user), out to either a spreadsheet or database format. The user may then import the data into the package of their choice for creating different report formats, for financial analysis, for generation of charts/graphs, for importation into presentation slide software, etc.

TPMS shall export to both the LOTUS 123 or Microsoft EXCEL spreadsheets. It shall export to the dbase4 and Microsoft ACCESS database file formats.

### **4e. Special issues and functions**

This section covers special topics related to Project Programming.

- **4e-1 Managing the time sequence requirements**

Software analysts and coders are reminded that TPMS must emulate and support a rather complex sequence of events that have to elapse according to a strict schedule. A major challenge of writing this software will be to successfully implement these constraints and make the mechanism by which they are enforced invisible to the end users.

The submission, review, and approval process starts after January 1st of each year and runs through early October. The State 5-Yr program must be approved and all users so notified no later than June 30th because TPMS will have to make it "effective" on July 1st. The Federal Aid project approval process extends three months beyond July 1st, creating a 1/4 year period for the "Current" year's State program is effective but Federal Aid projects are still to be government by the RTIP & STIP from the "Previous" fiscal year. This overlap of schedules is unfortunate, but it must be handled.

TPMS must also permit users to amend their programs. Due to the overlap problem noted in the previous paragraph, users shall be restricted in this activity: they may submit amendments only between October 1st and May 30th - a time when a) both State and Federal programs are in sync, and b) enough time remains to obtain review and approval before the next fiscal year changeover starts.

- **4e-2 Use of color coding to present status information**

As noted in Sections 4c-1 and 4c-2, TPMS shall use color coding to provide users with easy to detect visual indicators regard a project's development status. Care must be taken to select combinations of foreground and background colors that are easy to see on-screen -- and which can print out legibly on a black and white printer.

- **4e-3 Handling records for 3 program years**

As noted in Section 4c-1, TPMS will need to allow end users to select whether to view the "Current", "Previous", or "Next" fiscal year settings for each project. This is to be accomplished by providing three associated buttons or icons at the top of each screen in the Project programming lineup. Software coders should note that the following restrictions must apply:

- a) Project Sponsors can "submit" projects for review ONLY when viewing "Next" fiscal year settings.
- b) Project Sponsors can initiate "amendments" only when viewing the "Current" fiscal year settings.

## 5. Project development specification

This part details the TPMS Project Development tracking module. It is supplemented by the sample screens and data structures included as Sections B-5a and B-5b of the Appendices, which should be viewed as this is read.

### 5a. Project development process

Project Development takes a project from approved program status to the state of being ready to be let for bids. It commences with the sponsoring local jurisdiction performing survey and design work, then progresses through a sequence of steps. In each one, the sponsor fulfills regulatory requirements, then submits documentation to Ia DOT reviewers for concurrence and authorization to proceed to the next step.

Project Development takes off from the point where Project Programming leaves off. The latter focuses on assuring that each jurisdiction has a well planned, economically attainable sequence of projects. The other is geared towards assuring that all applicable State and Federal laws are observed as the project's plans and specifications are prepared.

- **5a-1 Basic sequence**

The Development process consists of four basic activities:

- a) Local sponsor survey, design, and site investigation work.
- b) Preliminary design, concept approvals, and permit acquisition.
- c) Detailed plan preparation, review and approval.
- d) Final clearances for proceeding to bid.

As will be detailed in Sections 5b and 5c, the four general groups include eleven actual steps:

- a) Local sponsor preparations: 1 - Survey and Design  
2 - Environmental clearances

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- b) Preliminary plans: 3 - Project concept statement  
4 - Preliminary plan review  
5- Regulatory permit acquisition  
6- Bridge struct./hydr. reviews
- c) Detailed plan preparation: 7 - Check plan/bid item review  
8 - Final plan & spec review
- d) Pre-bid clearances 9 - Project Dev./ROW certification  
10 - Concurrence for bid letting  
11- Approval of contract

Not all projects will use all steps

Each project must follow the same pattern of required steps, completing those pertinent to its status and skipping over the others. For instance: paving projects do not need structural and hydraulic reviews -- as these are only relevant to bridges and culverts. Or: the Iowa DOT requires that Federally funded, State funded, and Farm-to-Market projects be let through the DOT bidding system -- but locally funded jobs may be let locally.

TPMS must know which steps are required

TPMS must be designed so that it will take each project through all steps required by its type of work and source of funding. Conversely, it must also "know" when to bypass functions not relevant to a particular project.

- **5a-2 Submission - review - approval actions**

Project Development involves cyclical interactions between a project sponsor and the DOT's review staff. In general, this starts when the sponsor takes an action or completes a task. They then send information about it to the DOT and request review and approval. The DOT personnel check the submission for compliance with statutory and administrative regulations and, if everything meets requirements, returns an approval. Receipt of that approval frees the sponsor to proceed with the next step. The process repeats until all necessary steps have been completed.

TPMS will serve a dispersed set of people

The parties involved in the submission-review-approval process are geographically dispersed. The project sponsors come from all 99 Counties. DOT reviewers include the district Local Systems Engineers, (located in 6 Transportation Center offices statewide), Office of Local Systems staff, (in Ames), and the Office of Project Planning, (also in Ames.)

- **5a-3 Time schedule & progress monitoring**

A project's progress towards bid letting is measured in two ways:

- a) By how many of the development milestones have been completed.
- b) By whether or not the job is "on schedule" to be let on a particular target date.

It's intended that TPMS assist end users in tracking both measures. The tracking of development step completion will be handled by recording whether it's a) Not started, b) In process, c) In review, d) Approved, or e) Not applicable. Tracking the "Is it on schedule?" status will require extra work -- and the required analysis will depend on whether the project is to be let by the DOT or locally. In either case, the determination must be based on a target bid date, as set by the project sponsor.

DOT Bid letting "Critical Dates"

In the case of projects set for DOT letting, the process of determining schedule status will be relatively easy. The DOT conducts only 10 bid lettings per year. Once they've decided on what dates the lettings will occur, they establish "**Critical dates**" by which each development step must be finished in order to allow adequate time for the remaining ones to also get done. In TPMS, the list of allowable bid dates and associated critical dates shall be stored in a special file. Each project sponsor will select one of the bid dates and assign it to their project. Once that date is set, TPMS will note the current calendar date, then look to see if each step with a critical date prior to the current date has been completed. If so, the project can be declared "on schedule"; otherwise it will be "behind".

Local Bid Letting Critical dates

Local bidding schedule analysis will work similar to the DOT process described above but local agencies may set bid lettings on any calendar date of their choice. Thus, a pre-set list of critical dates will not work in assessing progress towards local lettings. Instead, TPMS will need a special file that lists the number of days by which completion of key processes must precede the bid date. Once a user sets a bid date, TPMS shall perform date arithmetic to work backwards and determine appropriate "Critical dates". After those have been established, the system can evaluate whether or not the project is on time.

Users may reschedule projects

If a user finds that a project is indeed behind schedule, they shall be able to reset the letting to a later date. When this is done, TPMS will need to immediately recheck and then re-display the job's "on schedule?" status -- based on the new date.

## **5b. Data structure for project development : content & purpose**

The data structure for Project Development shall record three classes of information:

- a) general project identity, type-of-work and funding information.
- b) status of project sponsor "checklist" items.
- c) data on the status of the submission-review-approval processes.

Because many of the data items in project development require tracking both the current status and the date it got set, the "Pick & Date" combination field described in Section 3d-4, will have frequent application.

As in Project Programming, each project record will contain reserved fields for each type of end user. Each user will have exclusive rights to edit the fields that pertain to their roles. But they will be barred from editing any other user classes' fields. Refer to **Appendix B-5a** for a detailed listing of proposed Project Development fields.

The eleven data fields corresponding to the key items listed in Section 5a-1, "11 Key Steps", will play an important role in the operation of the Project Development module. Some or all of them will be displayed on every screen. Each one's setting will be shown on three different screens: the Intro. screen, the Project Summary screen, and a Checklist-Process detail screen.

### **5b-1 Local jurisdiction fields**

This section covers fields under the exclusive control of local project sponsors.

#### **5b-1.1 Project Identity**

Each Project Development record shall contain data fields that duplicate the project ID information held in the Project Programming records. This data shall be copied over from the program record when the development record is first started. These fields will be non-editable within Project Development but changes made in Programming will automatically get copied over. These items shall include: a) TPMS System ID code, b) Project sponsor information, c) Project identity and description, d) Program status, and e) general project information.

**5b-1.2 Target letting date**

Every project shall have a specified bid letting date.

**5b-1.3 Checklist items**

Checklist items, such as "Wetlands check" or "Flood Zone", shall be recorded within TPMS as "Pick and date" fields. In the first versions of TPMS, these fields will serve as tickler indications. Project sponsors will set them when an item of work is finished, but they will be for informational purposes only. They will not affect or impact the submission-review-approval process.

The checklist items will become more important in future versions of the system. They will become access buttons to the preparation and submission of electronic forms.

**5b-1.4 Submission and approval fields**

TPMS will record project sponsor actions for each of the 11 milestones tracked in the development process. Typical "pick" settings will be: a) Not applicable, b) Not started, c) In process, d) Submitted.

- **5b-2 Iowa DOT fields**

Three groups within the DOT will handle the project review and response duties.

**5b-2.1 Transportation Center fields**

The district Local Systems Engineers will issue review approvals on several items early in the process and will fill in the close out fields when a project has been completed.

**5b-2.2 Office of Local Systems fields**

This Office will handle several reviews over and above those performed by the district Local Systems Engineers.

**5b-2.3 Office of Project Planning**

This Office may become a review responder as they track the process of obtaining environmental/archaeological/historic clearances from the FHWA. If they do not, ICEA will ask the Office of Local Systems to handle TPMS updates for those items.

## 5c. Screens for project development

This section provides a detailed description of the contents, form, and function of each Project Development screen. Refer to **Appendix B5-b** for proposed layouts. Each screen must have good visual organization and follow a standardized format. To the extent possible Review status settings shall appear at the bottom -- so that users can automatically know right where to scan the image to see them. All data fields shall be visible to all users.

As described in Section **3d-1.3**, this TPMS module will utilize a "drill down" type interface. It shall commence with a screen that provides a global view of all projects in their domain. From there, users shall be able to seek whatever level of detail they need. It will also use the TAB metaphor outlined in Section **3d-2.2**.

### • 5c-1 Development overview screens

This sub-section describes the top two screens in the Project Development sequence.

#### 5c-1.1 Intro. screen

The Intro. Screen shall appear first when a user enters the Project Development module. This panel shall feature a row & column format, similar to a spreadsheet. It will have headings near the top to identify the contents of each column. Each row shall represent a single project, with the columns serving to organize the data about the projects. Vertical scrolling shall be permitted but the screen shall not scroll horizontally.

The screen shall be organized as follows:

- a) The leftmost column shall display the "On schedule?" status for each project. Display 'OK' in Green when a project is on time, 'Due' in Yellow when there is a unfinished review item to be completed within the next two weeks, and 'Late' in Red, if any milestone remains unfulfilled after its critical date elapses.
- b) List project and sponsor ID information in the next three columns.

- c) There will be eleven right-hand columns, each one corresponding to a key milestone record. Display an indicator color in each column to show the status of each item. No text will be needed, although there should be an explanatory key at the top of the screen. Show 'Not Started' as Red, 'In Process' as Yellow, and 'Done' or 'Not Applicable' as Green.

Users will visit this screen to select a project. This will be done by scrolling up or down until the desired job is highlighted. At that point, the user may click on the row to have TPMS jump down to the Project status screen -- or may click on the tabs at top to go directly to a specific detail screen.

#### **5c-1.2 Project status screen**

The Project Status screen will provide a detailed overview of the project's status in the left side and show all parties involved in the development process on the right.

##### a) SCREEN HEADER ITEMS

All Project Development screens, (except the Intro. Screen), shall have project ID and funding information displayed in the top two rows. This shall include: Project number, Project name, FHWA number - for bridges, STIP no. - Federal Aid jobs only, Funding - "Local", "Farm-to-Market", etc., and Functional Classification.

##### b) TARGET BID DATE

Each project's target bid date shall be set by the project sponsor at bottom left. TPMS shall require that the date be taken from the list of available DOT bid date unless the project will have a local letting -- in which case the user may select any workable date. TPMS shall use the specified target date to determine whether or not the project is on schedule.

c) DEVELOPMENT STEP STATUS

This block, to be placed left center, shall show all eleven development steps for the currently selected project. Each step shall be shown as a row in the block. Five columns of information will appear:

- i--- Development Step number
- ii-- Step title - Black characters on color coded background matching that of 'iii' below.
- iii- Step status - Show 'Not Started', 'In Process', and 'Done' in Red/Yellow/Green color coding.
- iv-- Action date - Show the date that each step's setting was last updated.
- v--- Show the critical dates for completing each step -- based on the user's target bid date and type of letting.
- vi-- Beneath the date columns, show TPMS's progress status determination. This item will correspond to those shown in the leftmost column of the Intro. screen. Show it in Green/Yellow/Red coding.

d) PROJECT PARTICIPANTS

The right side of this screen shall show what people and offices are linked to the development and review of the currently selected project. It shall also show whether or not the job is tied to another one and if there are co-sponsors.

- **5c-2 Checklist and milestone screens**

Checklist/Milestone screens will outline the eleven steps of project development. Sponsors will use these screens for three things:

- a) to enter information about their job that reviewers may need to know.
- b) to record when various development activities have been started or completed.
- c) to officially request review actions by appropriate DOT staff.

The DOT Staff shall interact with the sponsors by indicating their response to the review requests in the field areas set aside for their use.

Each Checklist/Milestone screen will use the following format:

- a) Project ID and funding information at top.
- b) Two 'panes': one left-hand and one right-hand.
- c) Headers, fields, and spacer rows in the two panes shall align with each other.
- d) Within each pane, data field descriptions, edit boxes, and dates shall line up vertically.
- e) Sponsor / Trans. Center / Office of Local Systems field descriptors shall be visually differentiated. Use fonts, boldface, color or other device to make them easily distinguished, one from another.

**5c-2.1 Project information screen**

The left side of this screen shall display three groups of fields: a) Route ID, b) Structure ID, and c) project type/funding status. Most of this data will have been copied over from the Project Programming record. The Structure data fields shall be inactive if the project does not involve a bridge or culvert. The STIP-# and STIP status items shall be active only for Federal Aid projects.

Right-hand field groups commence with "Project responsibilities". This section contains five fields into which the user may enter the name of the parties performing each type of work: Survey, Design, Archaeological assessment, Soil borings, and Right-of-way appraisal/acquisition. The second group, "Work Status", features Pick & Date fields for recording progress in completing the work.

The first development milestone, "Survey & Design status" shall appear at extreme bottom right. This Pick & Date field shall be manually set by the project sponsor. Picklist choices shall include: 'Not started' (default value), 'In process', and 'Complete'. This item shall display in the RED / YELLOW / GREEN color coding described in Section 5c-1.1. (Note: All milestone items appear in the Intro. and Project Status screens as well as in their own detail area.)

**5c-2.2 Clearances screen**

The Clearances screen provides a checklist of regulatory compliance items that pertain to project development and tracks the environmental/cultural resource approval process.

The left side will display the checklist items. Each item shall be a Pick & Date field to record status and the date that the status was achieved. The list will serve as a 'tickler' to remind sponsors to check on all required items.

The right side shall present the fields for tracking the approval process. The top three lines will record the status of Archaeological/Cultural resource investigations. Below that, there will be six date fields to track the job from submission to approval. The project sponsor shall enter the date in the "Submitted to DOT" line after they've mailed the Arch/Cultural reports to be reviewed.

The DOT Office of Local Systems shall thereafter fill out each successive line as they follow the submission through the various steps. The INTERLINK process will keep sponsors and reviewers updated on each other's actions as this takes place.

The No. 2 development milestone, "Environmental Concurrence", shall be set by the Office of Local Systems. Pick choices shall include: 'Not Started', 'In Process', and 'Complete', -- with Red/Yellow/Green color coding.

### **5c-2.3 Concept and Preliminary Plans screen**

The third detail screen covers two milestone items: Concept status and Preliminary Plan review.

Project Concept Statement preparation, review, and approval will be handled by the fields on the left side of the screen. (For software coders: a Project. Concept statement summarizes what work is planned, contrasts existing and proposed design features, and highlights what regulatory compliance items will be involved. The sponsor prepares it and the DOT reviews it.)

#### LEVEL OF SERVICE SELECTION

Under the "Level of Service" section, the Design Guide items shall be selected from a pick list of available design guide items extracted from the County Engineer Instructional Memorandum ringbinder. Paving points and AADT shall come from the Project Programming records.

#### CONCEPT STATEMENT

This section shall provide Pick & Date fields for use by the Sponsor, the Transportation Center Local Systems Engineer, and the Office of Local Systems Secondary Roads Engineer.

- a) The Sponsor will set their field to: 'Not Started', 'In Process', 'Done', and 'Submitted'. The last setting will be set when the Concept Statement has been sent for review.
- b) The Transportation Center field may only be set by the TC's Local Systems Engineer. That party will use the field to indicate the status of the Concept Statement review. The 'LSE' may pick from the following: 'Waiting', 'Received', 'Approved', and 'Exception'.

If the project is routine and can be designed in complete compliance with stated design guides, the TC marks the project approved. But if the job features segments or spot locations where final design will fall short of guideline targets, the TC must forward the job to the OLS Secondary Roads Engineer for additional review. If the project sponsor provides adequate justification, (in the form of accident analysis and benefit-cost ratio studies), for deviating from the selected guidelines, the 'SRE' may approve the deviation as a "Design Exception".

TPMS shall permit the Trans. Center to "refer" jobs to the Office of Local Systems by setting the TC field to 'Exception'.

- c) The Office of Local Systems field shall automatically get set to 'Not Needed'. But if the TC sets its field to 'Exception', TPMS shall update the OLS field status to 'Waiting'. After the Concept Statement info arrives, the Sec. Rds. Engineer shall reset the Status to 'Xcptn Received'. After review, the SRE may update it to the final setting of: 'Xcptn Approved'.

### 3. CONCEPT STATUS

Milestone No. 3, "Concept Status" shall appear at the bottom of the Concept Review sequence. This item will look like a Pick & Date field but shall have its status settings automatically determined by TPMS. It shall be updated according to the Sponsor/TC/OLS field settings:

- a) It shall remain in 'Not Started'/RED status until the Sponsor sets their field to 'Submitted'. At that point, the "Concept Status" indicator shall change to 'In Process'/YELLOW.
- b) If the Trans. Center sets their field to 'Approved', the "Concept Status" indicator shall change to 'Complete'/GREEN.
- c) If the Trans. Center sets their field to 'Exception', the "Concept Status" indicator shall remain 'In Process'/YELLOW until the Office of Local Systems finally sets their field to 'Xcptn Approved'.

Preliminary Plan preparation and review items shall appear on the right-hand part of the Concept and Preliminary plans screen, opposite the Concept items outlined in preceding paragraphs.

#### PRELIMINARY DESIGN CHECKLIST

This grouping consists of four fields that record when the project sponsor has completed required pre-design checks. Generally, this work must be done prior to a sponsor turning in Preliminary Plans for review. (Although they appear on the right side of the screen, they may need to be done before the Concept Statement can be submitted.) These fields shall all be Pick & Date style.

- a) UAC Bridge analysis: used on all projects. Pick choices - 'Not Started', 'In Process', or 'Complete', or 'Not Needed'.
- b) Bridge railing analysis: used only on bridge projects. Pick choices: 'Not Started', 'In Process', 'Complete', or 'Not Applicable'
- c) Design exception analysis: used only to justify deviations from full compliance with stated design guides. Pick choices: 'Not Started', 'In Process', 'Complete', or 'Not Applicable'
- d) Section 404 Permit: this item will let project sponsors indicate if their job i - doesn't need a 404 permit, ii - falls into a nationwide permit category, or iii - will require specific US. Army Corps. of Engineers review. Pick choices: 'Not Needed', 'Nationwide', 'Individual Permit'.

#### PLAN SUBMISSION and REVIEW STATUS

This section contains fields for logging development actions of three parties: the project sponsor, the DOT's Trans. Center Local Systems Engineers, and the DOT's Office of Local Systems. Each one has unique Pick & Date choices:

- a) For sponsors: 'Not Started', 'In Process', and 'Complete'.
- b) For TC-LSE's: 'Waiting', 'Received', 'Approved', 'Exception'. When the TC field is set to 'Exception' TPMS shall automatically require Office of Local Systems action before the Preliminary Plan status milestone can be set to 'Complete'.
- c) For OLS : 'Waiting', 'Xcptn Received', 'Xcptn Approved', 'Not Applicable'

#### 4. PRELIMINARY PLAN STATUS

This Milestone item shall appear as a Pick & Date field but its setting shall be automatically determined by TPMS from the entries made by project sponsor, DOT-TC, and DOT-LS, in the Plan Submission and Review status section.

- a) It shall start as 'Not Started'/RED and go to 'In Process'/YELLOW when the sponsor submits the plans for review.
- b) The setting may go to 'Complete'/GREEN if there are no design exceptions and the TC can simply approve the plans.
- c) When the TC indicates 'Exception' in their field, the Milestone status shall not change to 'Complete'/Green until the Office of Local Systems has set their field to 'Xcptn Approved'.

#### FEDERAL AID AGREEMENT

For projects where part of the funding will come from a Federal Highway program, the DOT drafts a 'Federal Aid Agreement' and requests the project sponsor to approve it as a pre-requisite to receiving funding. The single field provided under Milestone 4. will permit the Office of Local Systems to enter and track the status of such agreements. When Federal Aid is not involved, this item shall be set 'Not Needed'. But on Federal funded projects, the pick choices shall be 'Not Started', 'In preparation', 'Sent to sponsor', and 'Executed'.

### 5c-2.4 Bridges and Permits

The Bridges and Permits milestone screen will track information on bridge and culvert design reviews. It will also record the status of permit applications and approvals

#### Bridge rating information

Five direct entry fields shall be placed in the upper left portion of the screen. They shall be reserve for local agency use to record the following items about a structure:

- a) Sufficiency rating: an integer number, (0 - 100), representing the relative adequacy of the structure.
- b) Priority Points: an integer number, (0 - 100), for prioritizing projects to receive funds.
- c) Load Posting: records the current load posting, if any.
- d) SI&A status: records whether structure is considered "Structurally deficient", "Functionally obsolete", or both.
- e) Flood Study ID: If a specific flood study exists for the project site, an agency may record it's name, title, or ID.

These items shall be entered and edited exclusively by the project sponsors. If the Sufficiency Ratings & Priority Points entered by a local agency do not agree with the DOT's Bridge Eligibility data of the Project Programming module, (see Section 4c-5), TPMS shall display them in flashing characters. The system shall also display the word, "Recheck!" to the right of the fields) until local and DOT values match.

#### Permits

The lower left portion of the screen shall record the status of regulatory permit acquisition. The top part will consist of five Pick & Date fields covering the various permits typically required. For each one, the project sponsor shall choose from the following options: "Not ready"/RED, "Submitted"/YELLOW, "Approved"/GREEN, or "Not Needed"/BLUE.

At the bottom, a single, automatic Pick & Date field shall record overall permit status as Milestone No. 5. This field shall be set by TPMS according to the settings in the previous five:

- a) It will remain "Not Ready"/RED until the other fields have all been set to either "Submitted" or "Not Needed" -- at which point it will change to "Submitted"/YELLOW.

b) It shall update to "Finished"/GREEN when all the other fields have either been set to "Approved" or "Not Needed".

The status of the Milestone 5 field shall also display on the Project Intro. and Project status screens.

#### Bridge/Culvert form preparation checklist

Six checklist fields for tracking the preparation of bridge/culvert submittal packages shall appear in the upper right. These items, (Need for 404 permit, Section 404 checklist, DOT Form 1-E, Risk assessment form, Site photos, and hydraulic calculations), shall be presented as Pick & Date fields.

Picklist choices shall include: "Not Started"/RED, "In preparation"/YELLOW, "Finished"/GREEN, or "Not Applicable"/BLUE.

They will be edited by project sponsors. For now, they serve only as a checklist of work items that need to be done before submitting a project package to the DOT for review. In future version of TPMS, they would become gateways to electronic versions of each form.

#### Structural Review Record

The bottom right portion of the screen will record a bridge/culvert project's review status. If all of the checklist items above are set to "Not applicable", (which will be the case for non-structure projects), the fields of this section shall automatically get set to "Not Needed".

There will be two fields to record Ia DOT reviews of preliminary bridge plans: Hydraulic Review and Structural Review. Both shall be edited by the DOT Office of Local Systems. Pick & Date choices shall include: "No Action"/RED, "Sent for review"/YELLOW, "Approved"/GREEN, and "Not Needed"/BLUE.

Upon receipt of approval, the Office of Local Systems shall also enter the "Design Number" into the field provided. (Each bridge/culvert project is assigned a special ID number to use in indexing plans in the DOT's archives.)

The bottom line of the screen shall display the Milestone No. 6 item: Structural Review Status. It will consist of an automatic Pick & Date field set by TPMS according to the settings of the Hydraulic and Structural review items:

- a) It shall be set to "No action"/RED until at least one of the two source items is updated to "Sent for Review" -- at which point it shall go to "In process"/YELLOW.
- b) It shall remain "In Process" until both source fields have reached "Approved" or "Not Needed" status. Then it shall be upgraded to "Done"/GREEN.

### **5c-2.5 Check Plans / Final Plans screen**

After a local road agency has developed plans, obtained permits, and undergone the reviews of the first six milestones, they proceed to refine and add detail to the plans. They start by selecting bid items and determining bid quantities. When this has been done, a set of "Check plans" get sent to the DOT for review and comment. The DOT advises the sponsor of what revisions or changes may be needed to make the project ready to be placed into the DOT's bidding procedure. The local jurisdiction then incorporates appropriate revisions into the plans, finalizes them, develops a final cost estimate, then submits a final plan package. At this point, last minute checks are made to assure that the plan references the most current DOT specifications, standards, and drawings. When conflicts are found, DOT staff work with the project sponsors to resolve them.

#### Screen Layout

The Check Plan / Final Plan screen provides both checklist sections and action status sections to record the process described in the previous paragraph. Check Plan items show on the left, while Final Plan items show on the right. Each side has three sections: a) Local agency checklist, b) Review status record fields, and c) Development milestone status line.

#### CHECK PLANS

The Check Plan section has five Pick & Date checklist items. Picklist options shall include: "Not Started"/RED, "In Process"/YELLOW, "Done"/GREEN, or "Not Needed"/BLUE.

There shall be three Pick & Date fields in the review status area:

- a) Project Sponsor action: "No action"/RED, "In Process"/YELLOW, and "Submitted"/GREEN.
- b) DOT TC Review: "No Action"/RED, "Rc'd-In Review"/YELLOW, and "Review complete"/GREEN.
- c) Office of Local Systems review: same as for TC Review, with the addition of "Not Needed"/BLUE. This latter setting applies to projects that will be bid locally.

Milestone 7, Check Plan Status, shall consist of an automatic Pick & Date field whose status is determined by the Check Plan review items. It shall start out as "No Action"/RED and go to "In Process"/YELLOW as soon as the sponsor field gets set to "Submitted". It will upgrade to "Approved"/GREEN as soon as both the TC and OLS fields reach "Review complete" or "Not needed".

#### FINAL PLANS

The Final Plans section has six Pick & Date checklist items. Picklist options shall include: "Not Started"/RED, "In Process"/YELLOW, "Done"/GREEN, or "Not Needed"/BLUE.

There shall be two Pick & Date fields in the review status area:

- a) Project Sponsor action: "No action"/RED, "In Process"/YELLOW, and "Submitted"/GREEN.
- b) DOT OLS Review: "No Action"/RED, "Rc'd-In Review"/YELLOW, "Review complete"/GREEN, and "Not Needed"/BLUE. The latter setting applies for projects that will be bid locally.

Milestone 8, Final Plan Status, shall consist of an automatic Pick & Date field whose status is determined by the Final Plan review items. It shall start out as "No Action"/RED and go to "In Process"/YELLOW as soon as the sponsor field gets set to "Submitted". It will upgrade to "Approved"/GREEN as soon as both the OLS field reaches "Review complete" or higher status.

**5c-2.6 Right-of-way, Project Development and Bids screen**

This screen tracks progress towards completion of the final three Milestones of Project Development.

PROJECT DEVELOPMENT Checklist

The left side records information about the process of obtaining right-of-way and utility relocations.

The upper portion lists fields needed to characterize the extent and status of the effort. They will be reserved for Local sponsor use.

- a) Number of Parcels: Integer field
- b) Plats and Legals : Pick & Date field. Options include "No Action"/RED, "In Process"/YELLOW, "Finished"/GREEN, "Not Needed"/BLUE.
- c) Appraisals : same as b)
- d) Notifications : Same as b)
- e) Negotiations : same as b)

If condemnation is required, two fields may be used to record the status:

- f) # Parcels by Em. Domain : Integer field
- g) Condemnation date: mm/dd/yyyy field

Two checklist/information item fields complete the section:

- h) No. relocations Required: Integer field to record the number of families that must be relocated to new dwellings.
- i) Utility Relocation agreements: Pick & Date field. Options include "No Action" / RED, "In Process" / YELLOW, "Finished"/GREEN, "Not Needed"/BLUE.

**ROW & UTILITY CERTIFICATION**

At bottom left, the sponsor may indicate the overall status of their ROW & Project Development efforts. In a Pick & Date field, they can denote "Not Started"/RED, "In Process"/YELLOW, and "Cert. submitted"/GREEN. The final setting indicates that they've completed and sent a "Right-of-way" Certificate to the Office of Local systems. The OLS responds by reviewing and approving the certificate. In TPMS, they will record their action in the status field provided: "Waiting"/RED, "Received"/YELLOW, and "Accepted"/GREEN.

Milestone 9, "ROW/Proj. Dev. Status shall be displayed at bottom left. This shall be an automatic Pick & Date field. It will start as "No action"/RED and go to "In Process" once the sponsor sets their field to "Cert. submitted". It will upgrade to "Finished"/GREEN after the DOT Office of Local Systems sets its field to "Accepted".

**BID LETTING INFORMATION**

The final steps of Project Development, taking bids and award of contract, shall be tracked in the right half of the screen.

At top, the DOT Office of Local Systems shall enter several data items to indicate that a job may finally be let for bid:

- a) Target bid date: as a mm/dd/yyyy field. Records the date that the DOT will let the project -- or the date planned for a local letting.
- b) Type of Project: alphanumeric field to record the type of work classification under which the project will get advertised.
- c) To be let by : Picklist field. Options will include "Ia DOT" or "Local".

These items will be followed by Milestone 10, a field wherein the DOT Office of Local Systems officially records "Letting Authorization" status. The start or default value will be "No action"/RED. This may be upgraded to "Ready"/YELLOW when the project has been cleared for letting by the OLS but not yet officially placed into a letting process. When it becomes certain that a job may be let on a specific date, the field will upgrade to it's final status, "Confirmed"/GREEN.

BID parameters

Underneath Milestone 10, five more fields shall record data about the proposed contact: Start date, work days, Liquidated damages, DBE percentage, (DBE = "Disadvantaged Business Enterprise"), and Davis-Bacon wage status. These fields shall be filled in by the DOT TC Office linked to the project.

LETING RESULTS

Three more fields will record the bid letting outcome. These items shall all be entered or set by the DOT TC Office linked to the project. The first two items will hold low bidder information: Identity and bid amount.

The final item will be Milestone No. 11, "Contract Status". This Pick & Date field will start out set to "No Action"/RED". After a low bidder has been determined and award of contract made, it shall go to "Awarded"/YELLOW. Upon receipt of a fully executed contract, it shall be upgraded to "Approved"/GREEN.

**5c-2.7 Contract progress and project participants**

The final Project Development screen will record informational items about the project:

- a) The left side shall be reserved for the use of the Office of Local Systems. Therein they will record Federal Aid fund amounts authorized for use in the project.
- b) The right side will record data about project completion and serve as a mechanism to notify all parties what its status is. The top line will be a Pick and Date field for use by the sponsor to indicate progress to date. This P&D field need not be color coded. It will feature the following choices: "0%", "25%", "50%", "75%", "100%".

Five general purpose lines shall follow to record post completion finalization. These items shall be set by the TC Office linked to the project. The Form 435/436 fields shall record the date that those forms, or their electronic field book equivalent, were OK'd. Final Amount will record the final contract cost. Reimbursement Amount will hold the amount of Federal or State aid actually paid out for the project. Retainage will show hold much State/Federal Aid remains due to the sponsor.

The TC Audit and Final Payment status items shall be Pick & Date fields. Pick Choices will be "No Action", "In Process", "Finished".

## 5d. Menu commands

TPMS shall provide a limited, narrowly focused set of menu commands to end users. Main menu items shall include: Project Actions, Find-Filter-Sort (for the Intro. screen only), E-mail, Print, and Export. The Windows 'File' and 'Edit' items shall not appear. Printer selection shall be made in the TPMS utilities module. For security, no CUT-COPY-PASTE features will not be allowed.

### • 5d-1 Project options

The menu keyword for this set of command functions will be PROJECT. It shall be accessible only by project sponsors and will feature three sub-commands:

1. OPEN Dev. Rcd.: directs TPMS to open a pick list of all projects in the Project Programming module that do not already have Project Development records associated with them. The user will then select a project and 'Click' on it to start the Open Development Record process. TPMS will initiate a blank record, then copy over all relevant data from the Project Programming record. Then it will prompt the user to input necessary data not obtained from the Program files. (Once a record has been created, it will get distributed out to all other related users by the INTERLINK process.)

2. DEACTIVATE: If a sponsor decides to discontinue the development of a project, they will select 'DEACTIVATE' to notify TPMS. Upon activation, the command will cause a dialog box to come up, asking the user if they want to end development on the current project. If they answer yes, the record will be flagged inactive. The flag will get passed on to the Server by

INTERLINK. The server will then instruct all client systems that contain a copy of that project's development record to delete it. At each workstation so affected, TPMS shall offer the operator a chance to print out all data from the record before clearing it.

3. CLOSE OUT: This command shall function only after a project has been built and the Final Payment Status item of the last screen has been set to "FINISHED". If that has been done, TPMS will ask the user if they are ready to close out the project. If the reply is 'Yes', the record will be flagged for close out. The flag will get transmitted to the TPMS Server by INTERLINK. Thereafter, the Server will command all related clients to make a copy of the project record in the archive directory and then erase the record from the main file.

### • 5d-2 Database functions

The database functions for Project Development shall be the same as for Project programming, with the following exceptions:

- a) In Project Development, the data base functions shall be available only from within the Intro. screen.
- b) The fields to use for constructing database searches, sorts, and filters shall include:

County where located	Project Sponsor ID
City where located	Planning Agency
DOT Trans.. Center	Project Number
Local project ID	Ia DOT STIP #, if any
FHWA Bridge #	System
Type of work, (DOT code)	Type of work - TIP
On Schedule? status	Number of Milestones complete
Individual Milestone status	Target bid date
Type of letting planned	Funding type

#### 5d-2.1 Find

Refer to Section 4d-3.1 for details of FIND function

#### 5d-2.2 Filter

Refer to Section 4d-3.2 for details on FILTER operation.

#### 5d-2.3 Sort

Refer to Section 4d-3.3 for details on SORTing.

- **5d-3 E-mail**

Refer to Section 4d-4 for details on E-mail operation.

- **5d-4 Output**

TPMS output options shall include printing reports on paper and exporting data into spreadsheet or standard database format. Data importation will be prohibited. No information may enter TPMS except through end user key-strokes.

#### **5d-4.1 Printing**

Within the Project Development module, PRINT command behavior shall be controlled by the screen from which it gets called:

If activated from the Intro. screen, it will automatically format a tabular report in the Intro. screen format. 8.5 x 11, Portrait style. For this screen only, TPMS shall print information about current settings: User ID, date, time, and filter+sort criteria.

If the Project Status screen is on active when PRINT is called, TPMS shall print a one-page-per-project report format. It shall give the user the option of printing just the currently selected project or all projects viewable under whatever FILTER restrictions have been applied to the file.

When PRINT is activated from within any of the Checklist & Milestone screens, the system shall offer two options: a) to print just the currently viewed screen, or b) to print all Milestone screens in one combined report.

Two additional reports shall be available under the PRINT command. See Section 5f for more detail.

**5d-4.2 Data Export**

Under this option, TPMS shall create an external spreadsheet or database file containing Project Development data. It will output only those projects that meet current FILTERing criteria and write them in whatever SORT order is in effect. The user may then exit TPMS and pull the data into general use software, such as Lotus 123, Microsoft Excel, or Paradox, for special analysis.

When a user chooses EXPORT, TPMS shall respond as follows:

- a) It shall bring up a dialog box that permits the user to select the data fields to be exported. The dialog must also allow the user to enter sequence numbers to specify the order in which the fields will get exported.
- b) Next, the system shall request that the user select the output file type. File format choices shall include: Lotus 123 v.4, Microsoft Excel, a generic database format, and Microsoft Access.
- c) Last, TPMS shall ask for export file name and what directory or folder to place it in.

As noted at the start of this section, EXPORT shall be a one-way process. Users may output data to other software as needed -- but TPMS will never import any data back.

## 5e. Special issues and functions

This section discusses special issues pertaining to the operation of the Project Development module.

- **5e-1 Automatic target dates derived from bid date**

Each project contained in the Project Development database shall have a target bid letting date. This date, to be set by the project's sponsor, will cause TPMS to establish critical dates for completion of the development milestones. Actual accomplishment dates will get compared to the critical dates in order to determine whether or not the job is on schedule.

The handling of this matter is complicated by the fact that there are two different types of bid lettings, with different critical date situations. Federal Aid, rural Farm-to-market, and selected local projects will fall under the Ia. DOT bid letting procedure. This features 10 pre-set bid dates each year, with rigidly specified critical dates. All projects not let the DOT are let locally by the project sponsors. For these the letting dates can be set to any workable business day, and the critical date lead-times are shorter.

In both cases, bid and critical date information will need to be stored in special TPMS files before a user sets their bid target date. This shall be entered by the TPMS Server's sysop from time to time, in consultation with the Office of Local Systems. DOT critical dates shall be entered in dd/mm/yyyy form. Local critical dates shall not be entered directly: they will be specified to precede the bid date by a minimum number of calendar days. Both types of letting date information shall be placed in an administrative file.

When a user is ready to specify a letting date, TPMS shall use the following procedure, as described in "IF THEN ELSE" form:

```
IF <Project will be let by DOT> THEN
  BEGIN
    1. Let user select from available DOT bid dates
    2. Set project critical dates to match those of
       the specified letting date.
  END
ELSE <for Local letting jobs>
  BEGIN
    1. Permit user to enter any valid workday as bid date
    2. Working backwards from the bid date, use date
       arithmetic to establish critical days that:
       a: fall on workdays
       b: precede the bid date by at least the minimum
          number of days specified by the administrative
          file data.
  END
```

In real world situations, projects inevitably fall behind schedule and sometimes a job starts out planned for a DOT letting and changes to Local later on, (or vice versa). Therefore, sponsors must be permitted to change both target date and letting type at any time. When they do, TPMS must immediately re-compute the Milestone critical dates for that project.

### • **5e-2 Progress monitoring and status determination**

The user's selection of bid date and letting type cause the critical dates to be established. TPMS will then compare the actual status of each project milestone to determine: a) if that particular milestone is on schedule, and b) whether or not the project, as a whole, is on schedule.

Individual milestone status settings will be:

- a) OK : item hasn't been completed but critical date is more than four weeks away from current date -- or item is done.
- b) DUE : The item hasn't been completed and critical date is less than four weeks away.
- c) LATE : Item hasn't been completed and critical date is past.

The project as a whole will be assigned the following status settings:

- a) OK : if no milestones are "LATE"
- b) CRITICAL : if any milestones are "DUE" but none are more than two weeks "LATE".
- c) BEHIND : if any milestone is more than two weeks "LATE"

These evaluations will need to be rerun whenever the user updates the project records, changes letting date, or changes type of letting.

## 5f. Additional Reports

As noted in Section 5d-4.1, TPMS shall print selected reports from each screen within in the Project Development module. This section outlines three additional, administrative reports that shall be provided.

### • 5f-1. Bid letting preview

In this report, TPMS shall allow the user to specify either a particular letting date or a range of time. The system shall then print out the projects that have lettings targeted on the date, (or within the range), showing:

- a) Project Sponsor
- b) Project ID
- c) Type of work
- d) Est. cost
- e) Target bid date
- f) Type of letting planned
- g) Project's "On schedule?" status.

This report shall use 8.5 x 11 pages, portrait format.

### • 5f-2 Administrative report

This report shall provide a statistical abstract of the project development situation. It shall count jobs and report, for each letting date, how many projects are proposed to be let, what the total dollar amount is for each letting, how many are "OK", "CRITICAL", or "BEHIND", Fund type, and type of State/Federal aid. List DOT lettings first, then start local lettings on a separate page. Use 8.5 x 11 inch pages, portrait format.

• **5f-3 Work agenda report**

This report will serve as a scheduling and work planning aid. It shall print out what work items need to be completed in the next 0-30, 31-60, and 61-90 days. Each thirty day period shall be printed with the same layout:

Date / Time

User ID

WORK AGENDA REPORT

Next 0-30 days

Dates: From mm/dd/yyy to mm/dd/yyyy

Milestone	Project	Dev. Status	Critical Date
xxxxxx	xxxxxxxxxxxxxxxxxxxx	xxxxxxx	mm/dd/yyyy

List the first nine milestones on each thirty day sheet. Then, under each milestone, list each project whose critical date for that development step falls due within the time period. List the jobs in order by critical dates.

This report will assist project sponsors in anticipating work needs and remind them which projects need first attention.

## **6. INTERLINK telecommunication protocol**

As envisioned by ICEA, the INTERLINK protocol will link all system users together via a process of data exchange and synchronization. It is the core feature of the TPMS concept. The following sub-sections outline the protocol, explain how it will support project programming and development, and present an example of how it will operate.

### **6a. Synopsis of INTERLINK protocol**

The INTERLINK plan is a concept for using telecommunications to permit a widely dispersed group of end users stay synchronized as they enter, edit, and update project data.

All communication and data transfers shall be mediated by a single, central Server. Each of TPMS client will dial into the Server from time to time to upload changes made by that client and to download changes received from other clients. The process will require that clients dial in fairly often, approximately once per week, to keep things acceptably current.

This concept will work using standard asynchronous data transmission methods over phone lines and should permit connection via Internet to be developed later. It will avoid requiring full time linkage between all users, as might occur in a Wide Area Network, to maintain a high degree of security.

### **6b. Applications of INTERLINK**

The goal of the INTERLINK protocol will be to assure that all users are updated about changes made by others -- as soon as possible. It's also intended to consolidate all project programming records into one central database, (located on the central Server), to help simplify and coordinate the Project Programming process used in Iowa.

## 6c. Concept details

The INTERLINK process shall be set up and operated as a separate module. When users want to dial into the Server, they will have to exit out of whatever other module they're in, go back to the TPMS main menu, and call INTERLINK from there.

Once activated, INTERLINK shall proceed automatically. As it proceeds through it's sequence of actions, it shall display status and progress information on-screen to keep the user informed.

Refer to Appendix C-2 for a detailed outline of an INTERLINK worksession.

## 7. System logs and records

As TPMS operates, whether on a client or on the server itself, the need to document events and actions will arise. This section outlines the record keeping functions that must be written into TPMS to permit tracking key actions and to enable technicians to figure out what went wrong if and when a system crashes.

### 7a. Critical event log - official record

Each TPMS installation shall maintain a critical event log file. This record shall be used to note when key actions are initiated by the user or occur during an INTERLINK connection. These records may be created by any user, so TPMS will need to ship the log entries back & forth among users linked by territory or project.

The log itself shall be structured as a database file. The fields for it shall be:

- |                                |                          |         |                |
|--------------------------------|--------------------------|---------|----------------|
| a) User ID                     | b) Date                  | c) Time | d) TPMS Module |
| e) ID/Description of the event | f) No. of rcds processed |         |                |
| g) General purpose note.       |                          |         |                |

The system shall record the following events:

1. PROJECT PROGRAMMING:
  - a) When a project is added, changed, deleted
  - b) When a program is marked for submittal
  - c) When each program gets approved
2. PROJECT DEVELOPMENT
  - a) When a project is activated
  - b) When a project's bid date is set or reset
  - c) When a project is approved for bids
3. INTERLINK
  - a) See Appendix C-2 for details of INTERLINK session log entries
4. ADMINISTRATIVE
  - a) When new administrative data, such as bid letting milestone critical dates get entered or updated.
  - b) When the JURSLINK table gets changed
  - c) When new versions TPMS get installed

Log entries shall remain in the main log file for one year. Thereafter, TPMS shall automatically move them into separate calendar year archive files. When a log archive file exceeds three years old, (for example: a calendar year 1997 file after 12-31-2001), TPMS shall print out a hard copy and then delete the file.

Under TPMS Administrative functions, (see Section 8f), users may view and/or print all or part of the critical event log. This will be on a read-only basis. The system shall permit them to perform FIND-FILTER-SORT operations on a temporary copy of the file -- but the primary file may not be updated or edited by the users. Search & Sort keys shall include: User ID, Date, Time, TPMS module, and type of event.

## 7b. Work session log

The TPMS work session log shall consist of an ASCII text file opened at the start of each TPMS worksession. It shall record a running list of every action taken during the work session. It's purpose will be diagnostic: if at any time something goes wrong, this file will help support technicians figure out what happened, how to prevent it in the future, and what data may need to be recovered.

Each entry in the log shall record date, time, and a description. All entries shall be limited to 80 characters or less.

The log shall operate at three levels of detail:

- a) At the lowest level, it shall simply record when the system was started, when each major module was entered & exited, all critical event log entries, and the final program exit.
- b) At the second level, the system shall record everything in item a) plus all program and development data base reads and writes.
- c) At the top level, the system shall record all the items from items a) & b) plus note the entry and exit from all significant procedures and functions within the software.

There shall be a log viewer routine in the TPMS administrative module. The level of detail will default to a). Levels b) and c) shall occur only if the user has set special level of detail flags. The system shall retain all worksession log data for a week, purging old entries after they are more than seven days old.

## 7c. User statistics record

The final log shall be a simple counting routine. It shall count the number of times that each system module gets used. This data will accumulate over each calendar year. At January 1st or the first workday thereafter, TPMS shall save the old year's data as an archive file and initiate a new, clear one.

The user statistics won't have any practical application for the users themselves. It's intended as a tool to profile how TPMS gets used and as a guide for making any future enhancements.

## 8. Administrative features

Administration consists of specifying user ID's, setting privileges, adjusting preference options, and implementing security measures. This section lists the requirements for TPMS relating to those issues.

### 8a. Overview of administrative functions

All TPMS administrative functions shall reside in a single software module. Users will 'click' on the Administrative Functions button on the Main Menu screen to access them. This will require that all other TPMS modules be exited and closed prior to commencement of administrative activities. TPMS shall provide a separate screen, with appropriate dialog boxes, for implementing all administrative functions described below.

- **8a-1 General administration**

General administration shall consist of those functions which may be performed by any end user at any time: update address or other user ID information, set/clear local passwords, print administrative reports, set display colors, specify file paths, and check files. Present these options to the user in a multiple tab format.

- **8a-2 Server controls**

The central Server PC shall set, edit, and clear administrative items that affect all other users. This will include user access, inter-jurisdictional linkages, data privileges, time and sequence controls, etc.

- **8a-3 Office of Local Systems**

The Ia DOT's Office of Local Systems shall have exclusive rights to enter, edit, and maintain an official list of bridges that are eligible for Federal or State aid.

### 8b. Role of JURSLINK table in controlling operations

Per Sections 2b-3 and 3a-1, the TPMS system will track user linkages and privileges via a special row and column tabulation. Provisionally named the 'JURSLINK' table, this file will control a) what each user can do, b) who they can interact with, and c) guide the distribution of between clients.

TPMS' administrative module shall feature a screen dedicated to viewing, printing, and editing the JURSLINK table. The system will replicate the full table in all end user PC's via the INTERLINK protocol. Each client installation shall be permitted to view and print the linkage and privilege data pertinent to their situation. The central Server's Sysop shall be the only TPMS operator allowed to edit the JURSLINK file.

### **8c. Project programming administration**

The TPMS server shall enter and update program submission and approval target dates. Once set, they shall govern all users. Clients may view or print this data for reference.

The DOT's Office of Local Systems shall enter and update the eligible bridge list. This file can then be viewed and printed from within the Project Programming module, (see Section 4c-5).

### **8d. Project development administration**

Project development administration shall consist of: a) setting the DOT letting and critical path dates, and b) setting the minimum lead-time requirements for local letting projects. This shall be done exclusively by the TPMS Server sysop, subject to approval by the Office of Local Systems. Clients may view and print this data for reference.

### **8e. Security administration**

TPMS clients shall have two levels of passwords. First, they shall be permitted to enter key operation passwords: for data entry/editing, for INTERLINK control, and for module access. Second, when operated on local networks, each individual user shall have their own access ID and password. Local passwords shall not be shared -- not even with the central Server -- except as required for the INTERLINK protocol.

The server shall maintain a copy of all user ID's and INTERLINK passwords in a special file.

(The TPMS concept contains a number of pre-planned security features that will interact with the passwords to provide a reliable system. While these items won't be subject to editing or change under the Administration module, it's appropriate to highlight them under this heading. These items include:

- a) JURSLINK table: assures that each user executes only those functions appropriate to their role and defines who they share data with.
- b) Exclusive fields: Keeps one class of user from inadvertently changing data set by another.
- c) INTERLINK protocol: restricts access to the system so that outside parties cannot access or damage files. First, the server will be the only installation that is permitted to receive and respond to dial up attempts. This limits the number of points of entry to just one. Second, clients will be required to dial up the server and will be barred from initiating any other connections. Thus no user may change anyone else's files or fields. All data exchange will be brokered through the server to guarantee that all client installation files mirror the master list.
- d) No data import: the only way for project data to enter the system shall be via the keyboards of project sponsors. This will prevent unauthorized or mistaken entries.
- e) Internal e-mail: TPMS' internal e-mail will be controlled by JURSLINK and INTERLINK. The system shall be set up to permit users to merge externally received e-mail into the TPMS files -- but only with appropriate controls to guard against viruses or data corruption.

## 8f. Official Log

Per Section 7, each TPMS installation shall maintain an Official Log file. This record will track key events executed on the host PC. During INTERLINK sessions both the client and server will make identical, simultaneous entries in their respective logs to document their transactions. The Administrative module shall provide a screen for viewing the log. It shall permit use of FIND and FILTER commands, based on the fields specified in Section 7a, but the field shall always be kept in chronological order. Users shall be able to print any or all log entries on their computer.

## 8g. Statistical reports

TPMS shall provide a screen for the user to view statistical data. First, the system shall provide a user status recap: ID, privileges, linkages, number records in each file and directory, TPMS version number, etc. The system shall also display and print the usage statistics collected per Section 7c.

## 9. E-mail features

Part 9 enumerates the e-mail functions that must be built into TPMS. There will be two types: e-mail related to specific projects and general e-mail.

### 9a. Project tagged E-mail concept

Normal e-mail contains four items of information: a) who sent it, b) who it's addressed to, c) who it's copied to, (if applicable), and d) what it's in reference to. TPMS e-mail shall record several additional items:

- a) ID code of the project to which the mail refers
- b) ID code of the mail's sender
- c) User classification
- d) TPMS module active at time e-mail was composed
- e) Screen being viewed when e-mail was composed.

These items shall be incorporated into the e-mail record. They shall be automatically recorded by TPMS and users shall not be allowed to edit them. But users shall be permitted to enter a project ID code of "Unspecified" when writing pieces that cover general matters.

The extra information will 'tag' the e-mail so that TPMS can perform special e-mail lookup functions, as described in the following sections.

### 9b. External mail / news

TPMS shall also permit sending receiving external e-mail. When a user wants to send a TPMS mail piece to an addressee outside the TPMS user domain, the system shall submit a copy of the outgoing document to Microsoft Exchange. The user will then have to activate MS Exchange and send the piece. The original copy shall remain stored in TPMS.

When a user receives an e-mail from a source outside the TPMS network, they should be able to 'forward' it to TPMS for incorporation into the e-mail records. The software developer will need to devise a mechanism to enable this from Microsoft Exchange. When TPMS subsequently detects the forwarded message, it shall immediately prompt the recipient to enter a project ID code, the sender's ID, and mark the sender class as 'EXTERNAL'.

To enable the easy broadcasting of general purpose information, there shall be an option to address e-mail to 'NEWS'. When this is done, the e-mail shall not be recorded in the regular files. Instead, it shall be dumped into a special holding file maintained exclusively in the TPMS server. The sysop will periodically examine, edit, and organize the news items, then store the results in a special file reserved for NEWS BULLETINS. After this is done, the holding file will be purged to ready it for receiving more NEWS.

The Server will transmit the most recent bulletin to all users as they dial in for INTERLINK connections. A button on the TPMS main menu screen shall advise user's if they've received any NEWS BULLETINS. They can bring up the news for viewing by 'clicking' on the button. The bulletin contents shall then be displayed in a scrolling text window. Users shall be able to print bulletins if they so choose.

### 9c. E-mail screens and activation

There shall be an e-mail button or menu item present on every TPMS screen. When either is 'clicked', TPMS shall present an e-mail window. The window shall provide the following options:

- a) COMPOSE & SEND : for writing, addressing, and sending e-mail.
- b) READ NEW : for reading e-mail received in last INTERLINK.
- c) BROWSE : for sequentially viewing previous e-mail.
- d) SEARCH & FILTER : for finding a specific e-mail or for setting and applying filtering criteria.
- e) PRINT : for printing out hard copies of e-mail.

Per Item 9a., TPMS shall record the module and screen that are active when e-mail gets activated.

### 9d. Single and multiple addressees

TPMS e-mail shall support several different addressing options:

- a) SINGLE : for sending a piece to one specific party
- b) ALL of a CLASS : for broadcasting a mail item to all users that fall into a category, such as: all RPA's, or all Counties, or all DOT Trans. Centers.
- c) ALL in an AREA : for communications within a geographically defined region, such as to all users linked to a particular DOT Transportation Center or all

- users within a Planning agency territory.
- d) All of a STATUS : for sending notices to users who meet prescribed criteria: such as "all Counties that have Federal Aid bridge projects scheduled for May, 1998 bid lettings" or "all RPA's/MPO's that have not approved their RTIP's". (The criteria shall be set in the same manner as for Project Programming FILTERS -- see Section 4d-3.2.)

The four addressing options may be combined. The JURSLINK table shall serve as the TPMS on-line address book.

### 9e. Hyperlink to referenced projects

TPMS shall provide users with a two way hyperlink feature between project records and project tagged e-mail:

- a) If a user is reading an e-mail that contains a project ID code per Section 9a., the system shall display a "View Project" button within the e-mail window. If the button gets 'clicked', TPMS shall bring up the module and screen that were active when the e-mail was authored and mark the specified project as the currently selected job. The e-mail window shall remain in view and retain control while this is done.
- b) Project viewing/editing screens shall feature a reciprocal process. They shall contain an e-mail hyperlink button that, when 'clicked', opens an e-mail window and brings up all e-mail pieces that pertain to that project and screen view combination. If multiple pieces are available, they shall be listed in a pick list, with most recent first.

These hyperlinks will facilitate easy user comparison between e-mail and project records. After a hyperlinked item has been viewed, TPMS shall exit back to the screen from which the hyperlink was call.

This feature will be particularly useful for users reading new e-mail: they can activate the hyperlink to bring up the screen that the author was looking at when the mail was written. This will give them improved insight as to the reason for the author's comments and speed the process of cross-referencing between projects and e-mail.

## f. E-mail reports

TPMS shall permit users to print any single e-mail just by clicking a "Print Now" button. In addition, users shall be provided with the means to conduct batch printing.

In batch printing, the user shall first be prompted to enter e-mail FILTERING criteria. The system will then find all mail pieces that meet the criteria and a) print them out or b) print a summary listing of each one's header information plus first line of text.

Batch printing criteria shall include: a) Author, b) Date range, c) Project ID code, d) Module + screen active when written, and e) Addressee. These criteria items shall be usable alone or in combination with each other. Criteria not needed in a particular search may be set to "All".

## g. E-mail maintenance

Once TPMS e-mail gets into the system, it may not be deleted or purged until at least five years after the projects to which it pertains have been completed. So e-mail files will grow quite large. Plus, while records may not ever be erased, a mechanism will be needed to move old project e-mail out to archive files as jobs get completed or canceled. To handle these facts, TPMS shall maintain e-mail files as follows:

- a) all e-mail shall be compressed for storage and decompressed for viewing.
- b) e-mail shall remain in the main files until its project is either completed or canceled. In either case, the mail shall then be copied into archive files and purged from the main files.
- c) once stored in the archives, e-mail shall remain in place indefinitely. However, the user may, after five years, cause the mail to be first printed and then finally erased.

## 10. TPMS system utilities

All software systems need utility functions to enable the end user to examine his system at file, record, and record content levels. Plus other housekeeping tasks need to be done. This section lists such items that must be incorporated into TPMS. But the following sub-sections are not exclusive. Other utility needs will likely be identified before development and testing are complete.

### 10a. Diagnostics & internal resource analysis

The first TPMS utility option shall be to print "Internal Resource" reports. When a user accesses this item, TPMS shall require them to select one of the following reports:

a) FILE SELF SCAN

In this routine, TPMS shall go through its directories, organize the files by type, and then print them out. The file name, extension, date created, data last accessed, and size in bytes shall be shown for each.

In addition, each TPMS installation shall contain a special file containing the same data on all executable and key system files. This file shall be updated each time TPMS is updated or revised. When the FILE SELF SCAN is run, TPMS shall compare each file's actual data to the information contained in the special record file. If there are any differences, a special mark shall appear by each file that has a mismatch.

b) HOST PC RESOURCES:

This routine shall examine the host computer's internal resources, such as memory, hard drive space, com ports, etc., and report the results in printed form.

c) DATA FILE SNAPSHOT:

This utility shall print a summary report on the size and record count of each major TPMS data file. Reportable items include: Directory, file name, date created, date last accessed, date last backed up, size in bytes, and total number of records.

All the reports enumerated in this section shall produce printed output only.

## 10b. Damaged file repair / recovery

Because TPMS will operate on a distributed basis, it's likely that one or more client's data will someday become corrupted and need to be reset. When that happens, the user will need to conduct a special INTERLINK connection with the server to download new copies of the damaged records.

If a user suspects that a data file has become corrupted, they may activate this section's routine, to be called "Test and Rebuild Files". It will scan the selected data file and look for records containing invalid data. If it finds any, they will be marked. Then the routine will cause a special INTERLINK session to commence. It will download non-corrupt data from the server and repair all bad records in the client system files.

(Note: if the server's data ever gets corrupted, the INTERLINK process could quickly contaminate many client system files. Therefore, the server shall run a valid range check on every field in every record it either sends or receives. In addition, it shall maintain a secondary, reference copy of each data file and run comparisons between them and the primary files twice a day.)

## 10c. Error debugging levels

This utility option shall set the level of detail to be recorded in a TPMS system's work session log. There shall be three levels. The default at startup shall be Level 1.

### a) LEVEL 1

Under this setting, TPMS shall record the following events in its work session log:

1. All items recorded in the official log
2. Entry into and exit from all major TPMS modules
3. Each data file write operation.

### b) LEVEL 2

This setting shall cause TPMS to record everything listed for LEVEL 1 plus:

1. Entry into and exit from each TPMS screen module
2. All data file reads and writes

## c) LEVEL 3

This setting shall cause TPMS to record everything listed for LEVEL 2 plus:

1. Entry into and exit from primary and secondary subroutines for each screen.
2. Keyboard data inputs.

This feature will enable users, with guidance from technical support personnel, to 'tell' TPMS to generate an appropriate level of log detail for post execution debugging and analysis.

**10d. Work session log viewer**

The Work Session log viewer shall permit the user to view and/or print the current session log or to print the log generated during a previous work session that halted due to system error. It shall permit the user to select which log to view and show the log entries in a scrolling text window.

**10e. Printer selection**

This utility option shall bring up a dialog box to permit the user to specify their printer.

## 11. Future features preview

This specification calls for developing and deploying two main TPMS modules: Project Programming and Project Development tracking. Along with this, the system will incorporate the INTERLINK protocol and an e-mail system. The development contract will cover only the items requested within this document. All future modules are excluded.

### 11a. Covers long range items not part of current project

This part of the specification is informational. Nothing described herein is to be developed at this time. The future extensions are outlined for two reasons:

- a) First, knowledge of the potential for future TPMS modules may influence how the initial software is written.
- b) Second, we hope it will entice developers to compete for TPMS development by showing that there is long term potential for more software work after the current project is completed.

### 11b. Electronic preparation and submittal of project documents

The Project Development module includes a number of 'Checklist' items. Each one corresponds to an action wherein information is recorded on a paper form, which is then kept for documentation or sent out for review. The current TPMS project calls for setting up the checklist items to simply record if and when a task was done.

A future enhancement would be to make each checklist item serve as a gateway to a routine for filling out and transmitting an electronic version of the paper forms. If a method for attaching digital versions of plans and/or other external documents is added, the system could enable the project development process to become totally paperless.

## 11c. Financial analysis module

Although the proposed Project Programming module will offer some support for figuring project finances, there will be room for improvement. A future finance module could contain the following additional capabilities:

- a) It would enable the DOT to communicate fund availability direct to project sponsors and their planning agencies.
- b) It would assist project sponsors, planning agencies, and the DOT in analyzing proposed programs for fiscal constraint.
- c) Project sponsors and the DOT's Office of Local systems could perform 'live' cashflow analyses by fund or by program. This would reduce uncertainty as to how many projects could be let at any point in time.

This module would consist of tabular screens that would allow comparison of cash balances, estimated income, and planned project cash flows. It would permit analysis of an overall program's viability or enable the user to explore the status of a single item, like Federal Bridge funds for one County or City.

## 11d. Map links

Eventually, TPMS needs a map module. It would contain a digital copy of the DOT's Highway and Transportation map for each project sponsor jurisdiction. The sponsors could mark project locations on the maps and tie them to the Programming and Development records. Then any other user could 'click' on a project records and have TPMS show them the location on the map.

The maps could be also be combined with a FILTER capability so that they could be used to display specific groups of projects, such as "all the bridge jobs in Trans. Center x's territory in FY 2001" or "all PC or AC paving jobs planned in the next two years".

Or a user could use the maps as a visual index for selecting which project they need to edit or write an e-mail about.

## 11e. Image, voice, video data

TPMS could eventually provide for users to record and embed images, voice, faxes, scanned documents, and video data in project files. This will improve communications between the various classes of TPMS operator and permit remote reviewers to answer many questions for themselves -- without the delays inherent in asking the sponsor to obtain and send more information.

## 11f. Hypertext on-line information reference

TPMS can be expanded to include a hypertext on-line help facility. This addition would expand TPMS in several ways:

- a) It would embed context sensitive help screens in the system. The user could activate them whenever a question as to the proper operation of the software arose.
- b) The Iowa County Engineer's Instructional Memorandums, currently edited and published by the Iowa DOT's Office of Local Systems, could be placed on-line. Then users would be able to call up the appropriate section from whatever screen they are working in -- or may go to the reference module and just browse the I.M.'s in sequence.
- c) DOT announcements and policy statements could be placed on file and linked to other references by hypertext.
- d) Project sponsors could post additional information to advise each other of practical methods for performing work, operating TPMS, or complying with regulatory initiatives.

**Closing Note: All items mentioned within Section 11 ARE NOT part of the project proposed within this specification. By being listed herein, they are EXCLUDED from the current project.**

## 12. Technical software coding requirements

Section 12 identifies software coding requirements that ICEA will demand of the developer.

### 12a. Overview

This part of the TPMS specification outline 'how' ICEA wants the software written. But the requirements outlined in Sections 12b. through 12i. are not absolute. Instead, they should be interpreted as describing the style and mindset with which a developer should approach the project. ICEA will consider modifications or alternate methods if the developer presents good cause.

### 12b. Platforms, OS, compatibility requirements

As of mid-1997, most Iowa County Engineer Offices use computers and, as a result of the Iowa DOT's push to develop electronic field book software, all will have at least one PC by 1999. While current installations consist of a mix of DOS, Windows 3.1x, and Windows 95 based systems, it's clear that all of them will migrate to Windows 95 or Windows NT operating systems in the next couple of years. It's also obvious that Microsoft will dominate the world of servers and general purpose application software. Therefore, TPMS development shall be guided by the following stipulations:

- **12b-1 Operating system**

TPMS shall be designed to run under either the Windows 95 or the Windows NT operating systems.

- **12b-2 Database platform**

Microsoft's ACCESS database shall be used as the base platform TPMS's project data files.

- **12b-3 Application development software**

Developers may propose to use any commercial software development package. But they must provide ICEA with information on its quality, features, number of installations, and long term prospects. Preferred products are: a) Visual Basic, b) C++, and c) Delphi.

- **12b-4 Telcom platform**

The INTERLINK protocol will require that TPMS be able to dial up the server and connect with it via asynchronous serial communications. Developers shall select a commercially available package of such routines for use with their choice of application development system. ICEA will need to know: product name, manufacturer, number of copies in use, and other relevant information about the telcom software.

## **12c. Ownership of final code**

ICEA will require that the developer contractually agree that all source code, data files, executable files, and other objects created for TPMS shall become the property of the Iowa County Engineers Association. This specification calls for the delivery of a service, (that of writing software), rather than production of a proprietary product.

Developers should not anticipate a broad market for TPMS or derivatives thereof. While all states have local road systems, the methods by which projects are programmed and developed varies considerably. The differences arise in procedure, in the way local jurisdictions are structured, and in the degree of authority awarded to each unit of government by their legislatures.

We expect that 150 to 200 copies of TPMS will ultimately be installed in IOWA. Once they've been deployed, it's unlikely that the number will increase further.

## **12d. Code documentation**

All software modules, functions, procedures and sub-routines written for TPMS shall be thoroughly documented. Follow these guidelines in planning and writing code:

- a) Each routine shall contain an explanatory header that explains what it does, who wrote it, the date first created, the date last modified, and list any special features.
- b) All internal and external variables used in the code module shall be identified and explained. Note where and how they are used, plus indicate the range of allowable values.

- c) Insert BLANK spacer lines in the source code to make it easily readable. Use these visual delineators to separate the overall stream of code into functional sub-groupings. Place a short explanation at the top of each functional sub-section.
- d) All source code shall use indentation to clearly show blocks, sub-blocks, and sub-sub-blocks.
- e) All reserved words shall be shown in an easily discernible color, style, or capitalization. All variables shall be similarly differentiated from the rest of the source code text.
- f) Developers shall provide diagrams or charts to show how the various parts and modules of TPMS link together.

### **12e. All data files to be pre-defined**

All TPMS files and directories shall be predetermined. When TPMS is running, it shall hide all details of file names and access from the end user. This will prevent files from inadvertent renaming, deletion, or overwriting. Users will not need to be aware of file names except when naming an export file.

### **12f. Code redundancy and error recovery**

As TPMS's code is written, the developer shall embed small routines to check for invalid data values. When incorrect or out-of-range values are found, the software shall set an "error corrected" flag and either replace the data with a default value or modify the value so that it falls into an acceptable range.

Before value critical operations like division get performed, the software shall pre-check the variables to be used in the calculation. If the system detects a value that would cause an error condition to result, it shall either adjust the variable to a non-error generating value or shall cause a pre-defined final result to be generated.

This section calls for error condition avoidance. Error and exceptional handling should be built into the software, too. But ICEA wants the code written with a mindset of trying to prevent error conditions from occurring at all.

## 12g. Prevention of user errors

All TPMS data entry and edit routines shall be set up to limit keyboard input to pre-determined characters and values:

- a) When the user is asked to enter a number, the input routine should block out all characters except for '+-0123456789.'
- b) When requesting the user to input a text value that might later be used for FILTERing or SORTing records, it's preferable to have them select from a picklist so that no misspellings occur.
- c) All dates shall be entered and stored in a standardized format.

In addition, software coding shall anticipate the frequency with which each part of the system will get used. Items that will enjoy daily or weekly operation may be written with the assumption that end users will get used to them. Such routines can be written with little on screen instruction or help system information. But items that may only be executed once or twice per year shall be written to present detailed, escapable, step-by-step instructions. In this latter case, the software shall display instructions one item at a time and require a user response before going on to the next-in-sequence action.

## 12h. Embedded log messages

As noted in Section 10c., TPMS shall permit users to set the level of detail recorded in their worksession logs. All TPMS routines shall contain IF clauses print to the work session record file if they detect that a particular level has been set.

- a) IF statements for LEVEL 1 details shall be placed at the entry and exit points of all major modules and sub-sections thereof.
- b) IF statements for LEVEL 2 details shall be place at the entry and exit points of the routines that present or execute command of individual display screen routines.
- c) IF statements for LEVEL 3 details shall be inserted at all appropriate locations within all lower level routines.

The code shall typically be written as follows: IF (Detail Level) >= (User defined value) THEN Print (Short text message). The message might read: "Exiting PROCEDURE Show\_Project\_status"

## 12i. Auto upgrade feature

TPMS shall be written so that future updates and revisions may be distributed to end users via the INTERLINK process. The system shall be set up so that the Server's sysop can place new code modules in a special directory. Whenever an INTERLINK connection takes place, the Server will download the new file to the client and instruct it to overwrite the old code just before shutting down at the end of a work session.

## 12j. Process status annunciation

Whenever a major batch process, such as INTERLINKING, exporting files, updating software, or FILTERING records, TPMS shall provide the end user with frequent process status updates. The updates shall inform the user what the system is doing, how many records or files are involved, how far along the process is, and -- when possible -- how much time is needed to complete the task. It's important that the user not have to sit before a static screen, wondering what the computer is doing to their data. As a general guide, process status indicators should be updated at least once every second during any batch operation.

## 12k. Support for Local Area networks

TPMS shall be written so that it can be run on local area networks. Local users shall each have their own ID, in addition to that of their organization. Each shall be able to access TPMS independently.

There shall be three levels of local privilege:

- a) View Only: this status will be assign to all employees who might need to look up data in the system but are not authorized to make changes.
- b) Project Development: this status will permit a user to enter and edit data about Project Development but limit access to Project Programming to "view only".
- c) TPMS Administrator: a status that shall be granted to only one individual in each office. It will convey all project entry, program submittal/approval, and system administration rights to the designated party.

All local privilege levels shall be password protected. TPMS shall provide record locking to prevent simultaneous editing of the same project. The TPMS Administrator shall be able to force all other users off-line when working in Project, Program, or INTERLINK menus.

In some cases, two Counties share the same engineer. TPMS should be planned and written so that those engineers can access and view both Counties' data remotely.

## 13. Deployment, testing, activation, and maintenance

TPMS will be a complex, geographically dispersed system of computers linked by telecommunication software. Setting it up and testing it will take time. The INTERLINKing of various users performing tasks in a controlled time sequence will require a lot of test and redo work. In view of the complexity of the task, we'll need a rigorous, well planned implementation procedure. This section presents ICEA's advance thoughts on how to accomplish phase-in and testing. The developer must devise a final plan and secure approval therefor before commencing software coding.

### 13a. Software production

The TPMS software shall be first written for form, then for function

- **13a-1 Create non-functional prototype**

The developer's first task shall be to create a prototype that demonstrates the "look and feel" of the proposed end product. This module need not be functional: it can display demonstration data values. When ready, it shall be presented to the ICEA Computer committee and other anticipated TPMS participants. Self installing copies shall be made available so potential end users can take the demo home and evaluate it.

The developer should plan on receiving feedback and instructions to revise and perfect the proposed user interface. The prototype shall then be reworked and sent out again, for a second round of evaluation.

- **13a-2 Secure ICEA concurrence of prototype**

After two rounds of evaluation, the ICEA Computer committee will poll the end users and, if at least 60% approve, will issue a notice of concurrence -- authorizing the developer to proceed with functional code production. The vendor should be prepared for two rounds of review and comment before concurrence is granted.

- **13a-3 Write main program software**

Code writing may be sequenced according to the developer's best judgment. The best probable schedule is as follows:

- |                        |                          |
|------------------------|--------------------------|
| a) Main menu           | b) Administrative module |
| c) Project Programming | d) INTERLINK module      |
| e) Project Development | e) E-mail routines       |
| f) Utilities           | g) Software installation |

- **13a-4 Write diagnostics**

If any special utility programs are needed to set up TPMS files, to perform technician level diagnostics, or to enable special error condition recovery, write them as separate programs that can only be run from diskettes.

## **13b. Initial deployment and testing**

The TPMS modules need to be tested in real world conditions as soon as possible after being written. In addition, TPMS represents significant change to many anticipated users -- so initial testing must also serve as the product's introduction.

- **13b-1 Demonstrate test module**

As soon as the Main Menu, Administrative module, and Project Programming parts have been made operative, the developer shall present a live demonstration to the ICEA Computer committee and invited guests. If the Committee approves the test module, it may then be sent out for beta testing. Each subsequent module shall be introduced in the same manner.

- **13b-2 Install client modules at beta-test sites**

After a new module has been approved by the ICEA Computer Committee, it shall be install at 8 to 12 County test sites. Each site shall volunteer to operate and test the beta version(s). This local agency testing shall be limited to breaking in and looking for flaws in the basic data file handling and display operation of the code.

- **13b-3 Install server unit**

After each module has been tested, revised, and finalized at a local level, it shall be installed on the central TPMS server. The sysop shall be permitted to exercise and test the JURSLINK table editing features as soon as practicable.

The developer shall also provide a 'dummy' routine that will simulate an INTERLINK contact by a TPMS client. This special, stand-alone program should contain real data, be capable of being reset after each INTERLINK test, and allow testers to simulate a variety of different conditions.

The Serve sysop shall use the INTERLINK test routine to dial into the Server and test its host mode functions. The developer shall provide at least one person to work with the sysop in performing these tests.

- **13b-4 Test all local features**

While the Server setup and testing takes place, the developer shall finish and beta test Project Development, E-mail, and the Internal utilities. External, stand alone utilities shall be written as needed. At this point, at least one representative installation shall be place in each end user classification.

- **13b-5 Test INTERLINK**

When the Server INTERLINK host mode testing is complete and enough local users have accumulated real data to make full scale testing possible, field testing of the INTERLINK protocol shall begin. Initially it shall just be with one designated client calling in at a specific time. Then the process can be expanded to multiple sponsors. Last, test the data transfer functionality by running a mock program approval process and project development sequence.

- **13b-6 Conference demonstrations**

From time to time, ICEA will request that the developer demonstrate the software and report progress at County Engineer conferences. There are four such events per year.

- **13b-7 Debugging and documentation**

All debugging work identified by the developer shall be performed as soon as possible without need for approval by ICEA. However, debugging suggestions and feature changes determined by the ICEA Computer Committee will be submitted in written form. When such work requests are filed, the developer must report back what action was taken on each matter.

### **13c. Activation sequence**

After the software has been written and field tested, the Server shall be cleared of test data and readied for official operation. Distribution of client modules shall proceed simultaneously. Client modules shall be installed in all County Engineer offices first, so that they can commence entering official data. As soon thereafter as possible, downstream end users shall receive their TPMS installations so they can begin receiving and processing project data.

- **13c-1 Certify server readiness**

Prior to the outset of TPMS deployment, the developer shall certify in writing that the Server software has reached a state of reliability where:

- a) The Server crashes less than once very two weeks.
- b) The Server can be brought back up from a crashed state in less than one hour without loss or contamination of data.
- c) There have been at least 50 successive INTERLINK sessions without fault or error.
- d) No new bugs have surfaced in the four weeks prior to the writing of the certification.

In addition, the developer shall report on all bugs and problems that were encountered during the beta test stage and describe how they were resolved.

Distribution of client modules to end users may not commence until the certification has been reviewed and approved by both the ICEA Computer Committee and the Ia. DOT Office of Local Systems.

- **13c-2 Distribute client modules to Counties**

Once the Server is running and certified, the developer shall train the County Engineer Service Bureau staff how to install, test, and certify client installations.

Next, the developer and Service Bureau shall collaborate in presenting TPMS to all County Engineers. This shall be done by demonstrating the software live at meetings of Iowa's six County Engineer districts. At those meetings, they shall seek two volunteers from each district who are willing to accept up to two days intensive training so that they may become peer advisors.

Finally, the developer shall employ four people to travel around the state, install the TPMS software on each County client, and get it operational before leaving. If the client's hardware, operating system, or lack of workable phone connection prevents a successful installation, the County shall be advised what upgrades are required. Service Bureau staff will go back and finish the installations in such cases, so that the developer need plan for only one trip.

Each field installer will have to handle 24-25 Counties. They should be able to average 2 per day, so the complete process should be completed in a month or less.

- **13c-3 Distribute client modules to RPA's / MPO's**

Deployment to RPA's and MPO's shall not commence until at least 25 Counties have placed their Project Programming data on-line and used INTERLINK to upload it into the Server. At that point, selected volunteers shall be asked to run a mock program submittal. When this has been successfully completed, the developer shall install client modules at each RPA and MPO and train them how to access the data, perform their Program approval operations, and debug any problems that arise.

Thereafter, the ICEA Service Bureau staff shall become responsible for support and technical assistance.

- **13c-4 Distribute client modules to DOT program reviewers**

The software shall next get distributed to the Ia. DOT Offices involved in Program Approval: Transportation Center Planners, Office of Local Systems (for the bridge eligibility data), Office of Planning Services, and Office of Program Management.

The personnel from these various offices shall be trained as a group. The presenter shall demonstrate how TPMS moves the project data from sponsor to reviewer to reviewer -- in support of their various roles and authorities.

- **13c-5 Distribute client modules to DOT project development staff**

After all County projects have been entered into the system and have received official TPMS program approval by the appropriate reviewers, the system shall be installed in all DOT offices that will participate in the Project Development process. This will include the Office of Local Systems, the district Local Systems Engineers, and possibly the Office of Project Planning.

The developer shall provide a joint training session to demonstrate the software to all users and to show how it conveys information back and forth. Developer staff shall work with DOT Information Services staff to arrange installation of TPMS on each designated employee's system. The ICEA Service Bureau staff shall handle future technical support.

- **13c-6 Make available to Cities and other Local agencies**

Cities and other local project sponsors shall be invited to use TPMS after it has operated successfully at the Counties-only level for one full year. ICEA Service bureau staff will handle training and installation for these clients.

### **13d. Transition from paper processes to use of TPMS**

Not all end users will be willing or able to commence using TPMS on an exact pre-set date. Therefore, the system will have to temporarily operate in an environment where numerous project sponsors and some reviewers continue to use paper form methods. If not dealt with, this would complicate the reviewer's lives and make the Programming and Development process more, not less, difficult. To work around this growing pain, the ICEA Service Bureau will accept paper forms from off-line clients and enter them directly on the central Server. This will permit reviewers to have nearly immediate access to all project and program data.

- **13d-1 Local jurisdictions services**

The Service Bureau will transcribe paper programs and project development data for all off-line project sponsors. It will be done at no charge for the first year. Thereafter the sponsor will be billed or the cost will be added to their eventual startup charge.

- **13d-2 RPA/MPO services**

If any RPA or MPO finds themselves unable to use TPMS for Program review and approvals, the ICEA Service Bureau will print out Program data for the project sponsors and send the paper forms to the planning agency. After that entity has approved the programs of the jurisdictions it serves, the Service Bureau staff will manually update the Server's records accordingly.

- **13d-3 DOT client services**

The ICEA Service Bureau will coordinate with DOT Program and Development review staff to iron out whatever problems arise.

## 13e. Maintenance

This section outlines the developer's responsibilities for maintaining and updating TPMS code after production has ceased. Ideally, they will execute a long term maintenance agreement with the ICEA Service Bureau.

- **13e-1 General Code maintenance**

The developer shall deliver a full set of printed source code to the Service Bureau no later than one year after the Server is certified ready for operation. (See Section 13c-1). The hard copy listings shall be formatted and organized as described in Section 12d. They shall be bound in three ring binders. Updates shall be printed and mailed to the Service Bureau as software changes and bug fixes take place.

- **13e-2 Bug and error corrections**

The developer shall commit fix bugs promptly. During the two year period following Server certification, bugs shall be fixed within 60 days after the ICEA Service Bureau reports them to the developer. The developer shall also budget time for staff to make cosmetic improvements and increase operating efficiency: at least 500 labor hours per year for those two years.

After the initial period described herein, the developer shall execute an appropriate long term maintenance agreement with the Service Bureau.

- **13e-3 Product modification**

This specification has been written in highly detailed form to assure that both ICEA and the developer adhere to a firm vision of what TPMS is to do, how it shall appear on screen, and what work will be required to create it. If either party decides to propose a change before the project is complete, it may only proceed if a written change order is executed between them.

Changes requested by ICEA after the end of the project shall be handled via a new contract.

- **13e-4 Emergency service**

For the first two years after the Server is certified, the developer must commit to provide emergency assistance to the ICEA Service Bureau in case the Server fails and cannot be restored within one day. The developer shall send a competent technical representative to the Service Bureau within 12 hours after receipt of an emergency service request.

## **13f. User training**

The TPMS developer must plan to provide multiple levels of training as the system is written, tested, and deployed. Training will range from large scale group lectures to one-on-one instruction in individual users' work sites.

- **13f-1 Required training materials and equipment**

The developer shall prepare a small booklet to provide users with a synopsis of TPMS options, screens, and commands. When making group presentations, the developer shall use a projection style color monitor to display screen images. For early small group training, the developer shall load the software and test data onto five laptop PC's that can be used as training machines.

- **13f-2 General needs**

Initially, training will consist of making people aware of what is in the software and showing them how it works. When the package gets deployed for beta testing, the volunteer testers will need small group training. Last, the final distribution of software to all end users will require that a well planned group and individual training program be executed.

- **13f-3 Demonstrations**

The developer should expect to provide demonstrations and updates at four major conferences per year: Iowa State Association of Counties, (ISAC), spring and fall schools, County Engineers mid-year conference, and the ICEA annual December conference.

- **13f-4 Hands on training**

The developer shall establish the capability to provide hands on training to groups of 10, with pairs of attendees alternating use of the laptops specified in Section **13f-1**.

- **13f-5 Client on-site training**

The developer shall provide on-site training to at least two Counties in each of the six ICEA districts. Such instruction will help train 'trainers' and cause developer staff to gain better insight into end user needs, skills, and perspectives.

- **13f-6 Training future trainers**

The developer shall provide extensive training to the ICEA Service Bureau staff so that the latter can take over training and support duties after the development project is complete. The developer shall provide similar training for up to 2 volunteer, peer trainers from each ICEA district, three from the DOT, three from the planning agencies, and three from Cities.

## **13g. Technical support**

As with any major software product, end users will experience problems, find bugs, request improvements, and damage their data. The developer must plan to provide support staff who can respond to these events and help users find solutions. Along the way, the developer shall train the ICEA Service Bureau staff to handle these issues in future years.

The developer shall make their support personnel directly accessible for the first year following completion of the software. Thereafter, the Service Bureau will take over as primary support agency. Its staff will take user help requests and either resolve them independently or contact the developer for assistance. The developer shall provide the Service Bureau staff with zero wait assistance for two years following the Bureau taking over primary support responsibility.

- **13g-1 Q & A document**

As questions and problems arise and get answered, recurrent themes will become apparent. The developer shall track these and publish a Question and Answer document covering them. This publication shall be updated every six months, minimum.

- **13g-2 Printed instructions & documentation**

Printed instruction materials may be kept to a minimum: a bare bones outline of how to use the software and basic descriptions of each module's functions. Detailed instruction may be stored in text files. Make them accessible either via the WordPad program or as on-line help screens.

- **13g-3 Telephone support**

Whether serving all end users or responding only to the Service Bureau, the developer shall provide a support line phone number and assure that it's staffed at least eight hours per day, five days per week.

- **13g-4 E-mail support**

The Developer shall also publish an Internet e-mail address to which users may address help requests. All such correspondence shall be answered within two working days.

- **13g-5 Sysop technical training**

The ICEA Service Bureau Manager and TPMS sysop shall receive detailed technical training regarding the design, operation, testing, and coding of the TPMS software. This training shall be provided as a series of one-week sessions where one or both Service Bureau employees work with developer staff at the developer's offices. Each Service Bureau staff member shall receive at least three of these training weeks over a two year period.

## 14. Information requested for proposal evaluation

This section identifies what items of information the Developer Selection Committee will require from all firms making a proposal. Section 14a outlines the selection process; Sections 14b through 14g tell prospective developers what to submit.

### 14a. Developer evaluation and selection process

ICEA and its TPMS partners will select a firm to serve as TPMS developer based on qualifications, past projects, work plan, estimated billings, and clarity of understanding of project scope.

- **14a-1 IHRB project**

Because of the way governmental business is conducted, the project will be executed as an Iowa Highway Research Board research and development investigation. The Iowa County Engineer's Association will serve as project sponsor and secure authorization for the work. Once the job has been approved, the developer will execute a contract with the Iowa Dept. of Transportation to perform it. As work progresses, pay requests shall be submitted to the ICEA Service Bureau manager, who shall present it to the ICEA Computer Committee for approval. Once OK'd by the committee, the bill will be sent to the DOT for processing. Typically, they pay 90% of the amount earned and retain the rest for release at the end of the project.

- **14a-2 Selection committee**

The TPMS selection committee will consist of the following:

a) 5 Voting members:

- i - 3 individuals from the ICEA computer committee
- ii - Representative from DOT Office of Local Systems
- iii - Representative of DOT planning division

b) 5 ex-officio members

- i - Representative from a planning agency
- ii - Representative from a DOT Transportation Center
- iii - City engineer delegate
- iv - Representative from DOT Office of Planning Services
- v - Representative from DOT Office of Program Management

- **14a-3 Proposal submission**

The selection committee intends to conduct the search for a developer in two phases. First, they will seek an expression of interest and statement of qualifications from firms who want to be considered. Second, three to five firms will be selected as finalists and invited to submit full detailed proposals. Depending on the quality and quantity of proposals received, two to three firms will be interviewed. The selection committee will then choose a finalist and commence negotiations on final scope of work, price, timetable, and terms of contract. If the negotiations conclude successfully, the firm will be recommended to the Iowa Highway Research Board for approval. If not, the Selection committee may elect to terminate the process and move on to negotiations with their second ranked firm.

**14a-3.1 Proposal solicitations**

The selection committee will solicit proposals by contacting known firms and advertising in trade magazines.

**14a-3.2 Invitation to pre-proposal orientation session**

All firms interested in being considered for the TPMS development contract will be invited to a pre-proposal orientation. At this meeting, the ICEA Computer Committee will outline the functional requirements of the software, provide an overview of files contents, screen appearances and operations, and answer questions.

**14a-3.3 Declaration of interest requested**

After conducting the orientation session, the Selection Committee will ask interested firms to submit a declaration of interest and statement of qualifications.

- **14a-4 Selection process**

The selection process will commence when the Selection Committee has received any and all declarations of interest, per Section 14a-3.3 above.

**14a-4.1 Evaluation**

Copies of these specifications will be sent to top rated prospect firms. They shall review the project requirements, then prepare and file a formal proposal, per Section 15's stipulations. The Selection Committee will evaluate each proposal, then select finalists for interviews.

**14a-4.2 Interviews**

Firms invited to interview will be notified by mail. Details and agenda for the interviews will be determined and published by the Selection committee at that time. Each finalist will be granted one hour to present their proposal, answer questions, and introduce their personnel.

- **14a-5 Post selection reviews and approvals**

After the Selection committee has picked a final firm and concluded negotiations, there will be a four to six week delay before the agreement can be presented to the IHRB for funding approval. After Research Board give its OK, additional time will elapse before the DOT approves and executes the development contract.

- **14a-6 Contract preparation and execution**

Both the Selection Committee and chosen developer will need to work closely with the Office of Research, in the DOT, when working out the terms of the TPMS agreement. State law and administrative code may dictate how some contract terms must be written.

**14b. Proposal requirements**

This section outlines the technical detail that must be submitted as part of a proposal package.

- **14b-1 Restate project concept**

Each prospect must write a short paper that describes their understanding of the TPMS project: what processes it will support, key features of the software, who it will serve, and how it will operate. The paper should not exceed eight pages. The selection committee will use these submittals to ascertain how well the prospect understands the mission.

- **14b-2 List technical issues to be resolved**

Prospects should identify the key technical challenges they foresee having to solve in developing TPMS. Identify the issues, explain what difficulties they present, explain how they will affect final functionality, then describe the probable solution.

- **14b-3 Work plan, prototype, projected schedule, and estimated cost**

This section outlines project schedule and cost issues that must be addressed in TPMS proposals.

**14b-3.1 Work Plan**

Each developer firm must submit a detailed work plan showing how many staff will work on each part of the project. This should include estimated labor hours, sequence of work, milestones, and a description of how the development team will be managed.

**14b-3.2 Pre-Prototype**

If desired, developer prospects may prepare and include pre-prototype demo's of their concepts for TPMS with their proposals. No payment will be made for this, so don't overdo it.

**14b-3.3 Schedule**

Prospects must prepare and submit trial schedules that illustrate how fast they expect to proceed with the work, and which contains clear-cut deadlines for each phase. They must also explain how management will work to keep them on schedule and how the firm will react if it falls behind.

**14b-3.4 Cost Estimate**

Each proposal must contain an estimate of the total cost of the project, indicate the probable cost of each major sub-unit of the work, and provide an estimate of cashflow needs.

**14b-3.5 Contingencies**

Developers must identify key issues that could arise during the software development process and explain how they've prepared for them.

- **14b-4 Business and legal terms desired**

Each proposal should list any special or company specific business or legal terms that they would request be included in a software development agreement.

## **14c. Submit resumes for the key personnel**

Proposals shall identify and provide data regarding each person who will be involved in the developer's TPMS team. Provide a resume on each individual showing education, experience, special skills, and current assignments. Provide additional information if requested in Sections 14c-1 or 14c-2.

- **14c-1 Company management**

List the owners of the firm and all top managers. Describe their roles and note how much involvement each would have with TPMS development.

- **14c-2 Project Team**

List data about each person who will synthesize or write parts of the TPMS code.

### **14c-2.1 Team leader**

Identify who is proposed to act as team leader. Explain why the assignment will go to that person. Describe who would replace them if they left the firm or became unable to continue as leader. Include a note from the propose team leader telling how they plan to tackle the project.

### **14c-2.2 Programmer / Analysts**

Provide information on projects they've handled, what types of software development tools they prefer, and samples of source code that they've written.

- **14c-3 Company profile**

Provide a brochure or simple summary of the firm.

## **14d. Provide information on past and current work**

List information about work for other clients.

- **14d-1 Past accomplishments**

Describe and provide samplings of past software development projects. Tell how the firm got hired to perform the work, include a brief narrative on each one, identify the most successful job, and outline the least successful undertaking.

- **14d-2 Current projects**

List current software development obligations, advising who they are for, how close they are to completion, whether or not they are on schedule, and what features they contain that may prove useful in the TPMS undertaking.

- **14d-3 Upcoming work**

List other prospective work that the firm may become involve with.

## **14e. Provide data on age, stability, and financial status of the firm**

Provide balance sheets, income statements, or other documentation of the economic viability. List any changes in top management over the last five years. Include data on the company's startup, history, and future prospects.

## **14f. Provide references from previous and current clients**

Each prospect should submit a list of references composed of current and future clients. The list should identify a contact person and phone number for each.

## **14g. Proposal submission guidelines**

All proposals shall be submitted in three ring binders not more than 1.5 inches wide. Clearly mark them as TPMS proposals and list the company ID both on the cover and on the spine. Submit 12 copies.

## Appendices

The Appendices provide materials and information to supplement the main body of this software development specification.

### A: Sample documents

Appendix A contains copies of documents currently used. They are provided as report format models and to permit developers to acquaint themselves with the "paper and pencil" methods now used for Project Programming and Development.

- A-1 - Standard 5 Year Road program and instructions
- A-2 - RTIP / Regional Transportation Improvement Plan
- A-3 - STIP / State Transportation Improvement Plan
- A-4 - Project Development checklists now in use

### B: TPMS specification support materials

Appendix B presents details on TPMS's proposed data and file structures, sample screen formats, and includes a worksheet that visually represents the JURSLINK table concept.

- B-1 - Proposed directory structure
- B-2 - Proposed TPMS files: names, functions, content, directories
- B-3 - User privilege control : JURSLINK table concept sheet
- B-4a - Detailed field specification: Project Programming records
- B-4b - Sample screen formats proposed for Project Programming
- B-5a - Detailed field specification: Project Development records
- B-5b - Sample screen formats proposed for Project Development

### C. Supplementary Information on software processes

This section contains detailed operational and work session descriptions of key TPMS processes. These Appendices are referred to elsewhere in the specification.

- C-1 - Project Programming: Submission, Review, and Approval
- C-2 - Outline for INTERLINK work session.



Iowa Department of Transportation

FY97

# SECONDARY ROAD CONSTRUCTION PROGRAM

County \_\_\_\_\_ Mills \_\_\_\_\_

Fiscal Year \_\_\_\_\_ 97 \_\_\_\_\_

Original

Supplemental  No. \_\_\_\_\_

### COUNTY CERTIFICATION

The detailed construction program for the secondary road system was adopted by the Board of Supervisors on April 4th, 19 96.

### ATTESTED

<u>Cheryl Ross</u> County Auditor	<u>4-4-96</u> Date
<u>Stephen W. DeVries</u> County Engineer	<u>4-3-96</u> Date
<u>Walter F. Brundel</u> Chairperson, Board of Supervisors	<u>4-4-96</u> Date

### IOWA DOT PROGRAM APPROVALS

Recommend Approval: \_\_\_\_\_  
Transportation Center \_\_\_\_\_ Date \_\_\_\_\_

Approved: \_\_\_\_\_  
Director of Planning Services \_\_\_\_\_ Date \_\_\_\_\_

### PAVING POINT COMPUTATIONS

Mills County

Program Year:

97

Local or FM Route	Project Number	Description/Location	Grade For Pave or Pave	Proposed Program Year	County/District Computations	Funct. Class	Current AADT	Closest Paved Parallel Route	Percent Trucks	Bonus Points	Total Points
	NO NEW PAVING ANTICIPATED				County Computation						
District Office Review											
					County Computation						
District Office Review											
					County Computation						
District Office Review											
					County Computation						
District Office Review											
					County Computation						
District Office Review											
					County Computation						
District Office Review											
					County Computation						
District Office Review											

- Notes: 1. Bonus points must be accompanied by letter of documentation.  
2. Do not list bridge, culvert and 3R projects.

FIVE YEAR SECONDARY ROADS CONSTRUCTION PROGRAM  
FOR  
MILLS COUNTY

( Projected costs is \$1000's )

Project Number Local ID	Project Name Description of work Section-Town-Range/Location	AADT Length FHWA No.	System Status	\$ Day Labor Type of Work Special Fund	Fund	Accomp. Year FY: 1997	Priority Years				Program Year 1997 \$ Total Notes
							1st FY: 1998	2nd FY: 1999	3rd FY: 2000	4th FY: 2001	
BRS-65(27)--60-65 360591	Hastings Bridge replace bridge 19 72 40	770 0.5 036040	FM Previous	320 BRS	LCL						250
					FMO	50					
					SPC	200					
BRS-65(30)/POTT BR 258500	Heitman/L-45 Bridge Replace the L-45 bridge north of Mineola 5 73 42	60 0.5 246960	FM Previous	320 BRS POTT	LCL						300 #1
					FMO	60					
					SPC	240					
FM-65(32)--55-65	ACC -Bluffs View, L-31, L-63, Sharp St. ACC Resurfacing Various Locations	350 0.29 n/a	FM Previous	366	LCL						361
					FMO	361					
					SPC						
FM-65(42)--55-65	Seal Coat 96 Seal Coat Resurfacing of FM routes Various Farm to Market Roads	Varies 12.5 n/a	FM New	362	LCL						250
					FMO	250					
					SPC						
FM-65(43)--55-65	Edge Drain H-12, M-16, H-12 E of 59, L-63 Edge Drain Various Locations	220 2.798 n/a	FM Previous	389	LCL						80
					FMO	80					
					SPC						
FM-65(GS97)--55-65	FM Granular Surfacing FM Granular Surfacing Various Farm to Market Roads	Varies 17 n/a	FM Previous	361	LCL						65
					FMO	65					
					SPC						
ROW 97	Accomplishment Year ROW R-O-W Expenses		New	310	LCL	66					66
					FMO						
					SPC						
SCS-M3 249638	Lena Garret Bridge Full Flow Let Down 7 71 42	15 0.25 245231	Local Previous	320 NRCS	LCL	75	80				280 #2
					FMO						
					SPC	125					
STP-S-65(33)--5E-65	Edge Drain H-12 Edge Drains H-12 W of Mineola & L-55	620 4.528 n/a	FM Previous	389 STP	LCL						150
					FMO	30					
					SPC	120					

Notes: #1. \$240,000 BR funds will come from Pott. County balance per 281: Agreement executed between the two counties.  
#2. Golden Hills RC&D, Oakland, Ia will provide \$125,000 funds for this structure.

Project Number Local ID	Project Name Description of work Section-Town-Range/Location	AADT Length FHWA No.	System Status	\$ Day Labor Type of Work Special Fund	Fund	Accomp.	* * * * Priority Years * * * *				Program
						Year	1st	2nd	3rd	4th	Year
						FY: 1997	FY: 1998	FY: 1999	FY: 2000	FY: 2001	\$ Total Notes
BROS-65(25)--5F-65 197618	L-31 South Bridge Replace Bridge over Keg Creek 32 72 43	230 0.5 246410	FM Previous	320 BROS	LCL						300
					FMO		60				
					SPC		240				
FM-65(36)--55-65 319610	Malvern Bridge Deck Overlay 29 72 41	300 0.03	FM Previous	320	LCL						100
					FMO		100				
					SPC						
FM-65(GS98)--55-65	FM Granular Surfacing FM Granular Surfacing Various Farm to Market Roads	Varies 17 n/a	FM Previous	361	LCL						65
					FMO		65				
					SPC						
FM-65(SC98)--55-65	FM Seal Coat FM Seal Coat Various Farm to Market Roads	Varies 12 n/a	FM New	362	LCL						250
					FMO		250				
					SPC						
G-30-23 190602	PJ RR Xing Grading to improve sight distant 30 72 43	100 0.25 n/a	Local Previous	352 RRP	LCL		5				40
					FMO						
					SPC		35				
Rise	River Bend Road Construction 1 73 44 (Est. 1500,000)	n/a	FM New	367	LCL						0 #3
					FMO						
					SPC						
ROW 98	Accomplishment Year ROW R-O-W Expenses		New	310	LCL		50				50
					FMO						
					SPC						
STP-S-65(39)--5E-65	H-12 west and east of Mineola Cold in Place Recycling ACC H-12 W & E of Mineola	620 8 n/a	FM Previous	366 STP	LCL						863
					FMO		173				
					SPC		690				
BROS-65(31)--8J-65 363570	Washburn Bridge Replace Bridge 6 72 40	60 0.5 245550	FM Previous	320 BROS	LCL						400
					FMO			80			
					SPC			320			
FM-65(34)--55-65	H-12 ACC Rubblizing H-12 ACC overlay with crack and seat (Rubblizing) 12 73 40	260 0.977 n/a	FM Previous	366	LCL						250
					FMO			250			
					SPC						

Notes: #3. This entry is for a potential immediate opportunity RISE project that could develop if Pott. Co. industrial development site is sold. We will Amend program at that time to add estimated project cost.

Project Number Local ID	Project Name Description of work Section-Town-Range/Location	AADT Length FHWA No.	System Status	\$ Day Labor Type of Work Special Fund	Fund	* * * * Priority Years * * * *					Program Year 1997
						Accomp. Year	1st	2nd	3rd	4th	
						FY: 1997	FY: 1998	FY: 1999	FY: 2000	FY: 2001	
FM-65(35)--55-65	M-16 ACC Resurfacing	380	FM	366	LCL						100
	M-16 north ACC Resurfacing	1	New		FMO			100			
	12 73 40	n/a			SPC						
FM-65(38)--55-65 220600	Treatment Plant Bridge	140	FM	320	LCL						125
	Deck Overlay	0.03	Previous		FMO			125			
	26 72 43	246380			SPC						
FM-65(GS99)--55-65	FM Granular Surfacing	Varies	FM	361	LCL						65
	FM Granular Surfacing	17	Previous		FMO			65			
	Various Farm to Market Roads	n/a			SPC						
FM-65(SC99)--55-65	FM Seal Coat	Varies	FM	362	LCL						250
	FM Seal Coat	12	New		FMO			250			
	Various Farm to Market Roads	n/a			SPC						
P-23-20	M16 & King St.	770	Local	366	LCL			40			40
	ACC Resurfacing	0.33	New		FMO						
	M-16 & King St.	n/a			SPC						
ROW 99	Accomplishment Year ROW		New	310	LCL			50			50
	R-O-W Expenses				FMO						
					SPC						
FM-65(37)--55-65 373650	Williams Bridge	80	FM	320	LCL						105
	Deck overlay over Deer Creek	0.03	New		FMO			105			
	17 71 40	244730			SPC						
FM-65(GS00)--55-65	FM Granular Surfacing	Varies	FM	361	LCL						65
	FM Granular Surfacing	17	Previous		FMO			65			
	Various Farm to Market Roads	n/a			SPC						
FM-65(SC00)--55-65	FM Seal Coat	Varies	FM	362	LCL						250
	FM Seal Coat	12	New		FMO			250			
	Various Farm to Market Roads	n/a			SPC						
ROW 00	Accomplishment Year ROW		New	310	LCL			50			50
	R-O-W Expenses				FMO						
					SPC						

Project Number Local ID	Project Name Description of work Section-Town-Range/Location	AADT Length FHWA No.	System Status	\$ Day Labor Type of Work Special Fund	Fund	* * * * Priority Years * * * *					Program Year 1997 \$ Total Notes
						Accomp. Year FY: 1997	1st FY: 1998	2nd FY: 1999	3rd FY: 2000	4th FY: 2001	
STP-S-65(40)--5E-65	L-55 ACC Overlay Repair Joints and ACC overlay L-55	560 3.1 n/a	FM Previous	366 STP	LCL						360
					FMO			72			
					SPC			288			
FM-65(GS01)--55-65	FM Granular Surfacing FM Granular Surfacing Various Farm to Market Roads	Varies 17 n/a	FM New	361	LCL						65
					FMO				65		
					SPC						
FM-65(PCP)--55-65	PCC Patch Program PCC Patching Various Locations	Varies 1 n/a	FM New	367	LCL						100
					FMO				100		
					SPC						
FM-65(SC)--55-65	FM SC Indian Hollow Seal Coat of Indian Hollow (Eastman Rd) 20 73 43	350 4.25 n/a	FM New	362	LCL						160
					FMO				160		
					SPC						
FM-65(SC01)--55-65	FM Seal Coat FM Seal Coat Various Farm to Market Roads	Varies 12 n/a	FM New	362	LCL						250
					FMO				250		
					SPC						
ROW 01	Accomplishment Year ROW R-O-W Expenses		New	310	LCL					50	50
					FMO						
					SPC						
STP-S-65(ED)--5E-65	STP Subdrains Edge Drains Various Locations	Varies 7 n/a	FM New	389 STP	LCL						200
					FMO				40		
					SPC				160		
Total =					LCL	141	135	90	50	50	466
					FMO	896	648	870	492	615	3521
					SPC	685	965	320	288	160	2418

## COUNTY SECONDARY ROAD CONSTRUCTION PROGRAM

### FORMS

The secondary road construction program sheets have been designated form #740491 with sheet references 1 through 3.

The five-year program will be composed of a title sheet (Sheet 1), a paving point determination sheet (Sheet 2) and as many construction project sheets (Sheet 3) as necessary to identify your construction work plus the appropriate maps. A separate 1/4" map, showing the project locations, is to be submitted for the accomplishment year construction projects and the paving point calculation projects only. Priority year projects do not need maps. Maps shall show the seven-symbol format and may be photocopied.

~~Farm-to-market projects listed in the program will be considered to have met the requirement of Section 310.11 of the Code of Iowa for the current fiscal year.~~

Projects to be funded with federal/state aid (ie. BR, TSF, RISE) must also be listed.

### WHEN TO PREPARE AND SUBMIT

On or before April 15 of each year, the Board of Supervisors shall adopt and submit to the department for approval a secondary road construction program for the next five fiscal years. This program should be based upon the construction funds (local secondary, farm-to-market and federal/state aid) estimated to be available for such years as stated in Section 309.22 of the Code of Iowa. The Office of Planning Services encourages early submittals in order to eliminate delays in revisions and approvals.

### NUMBER OF COPIES TO BE SUBMITTED

Submit three (3) complete copies of the program and required 1/4" maps to the appropriate Transportation Center Planner for processing. The Transportation Center Planner, after review and recommendation, will send to the Office of Planning Services two (2) complete copies. When approved, copies will be distributed as follows:

- A. One copy will be sent to the county auditor.
- B. One copy will be retained by the Office of Planning Services.

If the county engineer wishes to have a copy of the approved title sheet (Sheet 1), it can be obtained from the county auditor.

The Transportation Center Planner can attach a copy of the department's approval letter to the Transportation Center copy.

### GENERAL INFORMATION

Program sheet 3 for the construction projects is a three (3) line per project entry concept. It provides a five-year program with an 'at a glance' format. Some lines are optional but most will be mandatory. Optional lines are noted by such [brackets]. All projects must be listed on these sheets--including carryover projects from the previous year. You will not need to have separate

sheets for Local, FM and FM Transfers, etc. as you did in the past. The sheet is designed to accommodate all projects.

Subject to departmental approval, any locally funded project in an approved priority year may be advanced by resolution, to the accomplishment year. The program may be revised, due to unforeseen conditions, by preparing and adopting a supplemental construction program during the current fiscal year. See Page 19 for specific details.

As with the budget, items reflected in the program may require that a letter of explanation accompany the submittal. These attachments have proven to be advantageous to both the county and the department. A sample secondary road construction program is shown in Table II.

### PROGRAM SHEET 1 -- THE TITLE SHEET

This sheet needs to be signed by the county auditor, county engineer and chairperson of the Board of Supervisors. ~~It provides for recommended approval by the Transportation Center, and final approval by the department.~~ Mark the original box on this sheet for the original submittal.

### PROGRAM SHEET 2 -- PAVING POINT COMPUTATION SHEET

This sheet needs to be completed for all pave and grade-for-pave projects listed in the five-year program. Include Sheet 2 with the program whether or not you have pave or grade-for-pave projects. Just write "none" or "N/A" on Sheet 2 if it does not apply. Do not list bridge, culvert, 3R, or grade only projects. A 1/4" map showing the pave and grade-for-pave projects is required.

List whether the project is on a local, FM, or FM/FA road, the project number, description/location, a "GP" for grade-for-pave project or a "P" for pave project, the program year, and county calculated point values.

The points assigned for the various categories are for present state functional current class, AADT, parallel route, percent trucks, and bonus points. DO NOT use future data unless the project will save a future development. Any bonus points must be accompanied by a letter of documentation listing percent of cost sharing and entity being assessed; (ie., private, government, business, etc.) Documentation should also be included for truck percentages in excess of nine percent, AADT different from the current IDOT traffic maps, and recent state functional class changes.

In lieu of a letter, you may wish to sub-note under the project or at the bottom if it involves a short explanation and you have space. Paving points will be determined by the following system:

## PAVING POINT DETERMINATION SYSTEM

Fifty (50) paving points are required for all paving projects. Paving points are not required for bridge, culvert, 3R, and grade only projects. Although grade-for-pave projects are not required to meet the 50 point criteria for approval, they will be evaluated by the paving point system.

- |    |                                                                                                                                                                                                                                          |               |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1. | <u>STATE FUNCTIONAL CLASSIFICATION OF ROUTE</u>                                                                                                                                                                                          | <u>POINTS</u> |
|    | A. Trunk                                                                                                                                                                                                                                 | 25            |
|    | B. Trunk Collector (FM) w/both termini at a city, a trunk or higher system                                                                                                                                                               | 20            |
|    | C. Trunk Collector (FM)                                                                                                                                                                                                                  | 15            |
|    | D. Area Service (Local) w/ major business or a development                                                                                                                                                                               | 10            |
|    | E. Area Service (Local) continuous, no development                                                                                                                                                                                       | 5             |
|    | F. Area Service (Local) not continuous                                                                                                                                                                                                   | 0             |
|    | ----- Terminis is project termini unless it connects to a paved route & type of major business/development is specified. -----                                                                                                           |               |
| 2. | <u>CURRENT YEAR AADT</u>                                                                                                                                                                                                                 | <u>POINTS</u> |
|    | A. One point per ten AADT of current traffic (per IDOT traffic flow map), up to a maximum of 40 points. 210 AADT would be 21 points. Average AADT over length of project.                                                                | 40            |
|    | B. Seasonal Routes--average peak volume may be used.                                                                                                                                                                                     |               |
|    | C. Development Areas--5 yr forecast AADT may be used.                                                                                                                                                                                    |               |
|    | Note if current AADT is not being used and/or development is being considered.                                                                                                                                                           |               |
| 3. | <u>CLOSEST PAVED PARALLEL ROUTE</u>                                                                                                                                                                                                      | <u>POINTS</u> |
|    | A. One mile                                                                                                                                                                                                                              | 0             |
|    | B. Two miles                                                                                                                                                                                                                             | 5             |
|    | C. Three miles                                                                                                                                                                                                                           | 10            |
|    | D. Four miles                                                                                                                                                                                                                            | 15            |
|    | E. Five or more miles                                                                                                                                                                                                                    | 20            |
|    | NOTE: Average the distance on diagonal routes.                                                                                                                                                                                           |               |
| 4. | <u>PERCENT TRUCKS</u>                                                                                                                                                                                                                    | <u>POINTS</u> |
|    | Use one point for each percent of trucks up to a maximum of fifteen (15) percent = fifteen points. Specify reason & method used to determine any percentages in excess of nine (9) percent.                                              | 15            |
| 5. | <u>BONUS POINTS</u>                                                                                                                                                                                                                      | <u>POINTS</u> |
|    | Use one point for each two (2) percent of total project costs paid by assessment; ie, Twenty (20) percent paid by assessment would equal ten (10) points. Specify percent & group being assessed. Bonus Points are for assessments only. | No maximum    |

A hearing must be held prior to submitting the program for approval for any 'accomplishment year' paving project with less than 50 points. A statement, attached to the program, from the county engineer that a hearing was held is sufficient notice.

## PROGRAM SHEET 3--CONSTRUCTION PROJECT SHEETS

Using the three (3) line per project entry concept, LCL, FM only (FMO) and SPC expenditures can be programmed simultaneously for any project. The project's funding costs can be split into one or more successive fiscal years.

While the 5 year 'at a glance' format is easier and less cumbersome, it is more inclusive and some items are mandatory such as 'Systems Status' and \$ 'Day Labor'. Do not leave these items blank. These items are further explained below.

*ALL PROJECTS NEED TO BE LISTED ON SHEET 3, INCLUDING CARRY OVER PROJECTS FROM THE PREVIOUS YEAR.* (ie., programmed projects let and/or started but not completed).

The following is the preferred method of listing projects in the 5 year program:

1. An entry called 'Accomplishment Year ROW' or 'FY ROW' if applicable.
2. An entry to accommodate Accomplishment Year Balance Held in Reserve such as 'FY\_\_ Bal. in Reserve' or 'Acc Bal in Reserve', if applicable.
3. The accomplishment year projects. (1st of the 5 years)
4. The 1st priority year projects. (2nd of the 5 years)
5. The priority year projects for years 3, 4, and 5 in that order.
6. A 1/4" map showing project locations of the accomplishment year projects.
7. A 1/4" map show project locations of paving point projects listed on sheet 2, if applicable.

Accomplishment year ROW costs should be listed as a project line entry. Priority year ROW costs should be included in the project costs.

Accomplishment Year Balance Held in Reserve is a project line entry that can be used if desired to allow for overruns. While most counties do not use this category, several do feel a need for it. It is intended to allow for project overruns and therefore should be limited to a maximum of 10% of the total accomplishment year project costs.

FM transfer projects must be designated as such on the second line of the 12th (last) column under NOTES. Use a numbered reference and footnote the reference at the bottom of Sheet 3. If you have no other notes or comments, you may just type in the term 'FM Transfer' on the second line of the 12th (last) column under NOTES.

## SHEET 3 LINE ITEM DESCRIPTIONS:

1. \_\_\_\_\_ - County name in top center of page--your county name.
2. 

PROGRAM YEAR
--------------

 - The next fiscal year in the top right corner of page.
3. COLUMN (1)-LINE (1) - Project Number--Enter the project number its likely to be constructed under. If FM or FA and in the accomplishment year, call the Iowa DOT Office of Local Systems for number assignment.  
 LINE (2) - Local ID--enter your local project number if different from Line 1 above.  
~~LINE (3) - [ --- ]--Optional line entry for your use.~~
4. COLUMN (2)-LINE (1) - Project Name--Project name such as bridge replacement on D55. Also see sample program.  
 LINE (2) - Description of work--Describe work to be done such as replace bridge, grading, PCC Pave etc. You may enter length of bridge after the words 'Bridge Replacement' or 'Bridge Repair' etc.  
 LINE (3) - Section-Town-Range/Location--Enter starting sec-twp-rge followed by N,S,E,W direction to ending sec-twp-rge. Also see sample copy.
5. COLUMN (3)-LINE (1) - AADT--Enter the current average annual daily traffic. Do not enter design year ADT.  
 LINE (2) - Length--Enter the length of the project to the nearest tenths of miles such as 2.1 miles. Leave blank for bridges. Bridge lengths should be entered under 'Description' in Columns (2).  
 LINE (3) - FHWA (#)--If applicable, enter the structure's FHWA Bridge 6 digit ID number such as '194830'.
6. COLUMN (4)-LINE (1) - System--Enter--Local, FMO or FM/FA depending which system the project is on. FA are roads classified as major collectors under the federal functional classification. Also, see page 7 of instructions for handling of BROS projects.  
 LINE (2) - Status--Enter 'NEW' or 'PREV'. New denotes projects which were not in the previous year program while PREV denotes projects that were in the previous program. This entry cannot be left blank.  
 LINE (3) - [            ] Optional line entry for your use.

7. COLUMN (5)-LINE (1) - \$Day Labor--Enter "None" or the estimated amount programmed as day labor for projects in the accomplishment year only. Do Not leave this item blank. (Use only for accomplishment year projects).

LINE (2) - Type Work--Enter the "major" 300 series account code number that best describes the work. Examples: PCC Paving-367, Grading-350, Erosion Control-382, etc.

LINE (3) - Special Fund--Enter abbreviation of any special (federal or state) fund source here if you anticipate the project will receive special funding other than farm-to-market or your local secondary funding. Two common examples would be 'RISE' and 'BRS'.

8. COLUMN (6)

- Fund--Includes the pre-printed words 'LCL' on the first line, 'FMO' on the second line and 'SPC' on the 3rd line. These pre-printed words are there as guides for figures for the next 5 columns (the 5 FY columns). They refer to local, farm-to-market or special funds.

9. COLUMNS 7-11

- These 5 columns are for entering the project costs for the 5 respective years. Note that Column 7 would be for the accomplishment year while Columns 8-11 would be for the four priority years.

LINE (1) - of each column--Enter project costs to the nearest \$1,000 to be paid from your local secondary fund.

LINE (2) - of each column--Enter projects costs to the nearest \$1,000 to be paid from your farm-to-market account.

LINE (3) - of each column--Enter project costs to the nearest \$1,000 to be paid from BR, RISE or other special funds.

NOTE: For all three lines above, if the project is estimated to cost less than \$1,000, a zero is permissible.

The TOTALS for each fiscal year (Columns 7-11) will occur at the bottom of the last Sheet 3. Also, on the last Sheet 3, enter the totals for each funding source. (i.e., a total for LCL, a total for FMO and a total for SPC) for each of the fiscal years. Also see sample program.

10. COLUMN 12

- Project totals, notes or note numbers are to be entered here.

LINE (1) - Enter the total project cost on this line. This total includes LCL, FMO and SPC for all the FY years for the project.

LINE (2) - Enter the number of a footnote that you wish to reference (1,2,3, etc.) Then, at the bottom of the page, sub-note, by reference number, any special note you deem appropriate or needed for the project. Please designate FM Transfer projects by footnotes or type in 'FM Transfer' if room is available.

LINE (3) - Unused

## PREPARATION OF SUPPLEMENTAL SECONDARY ROAD CONSTRUCTION PROGRAMS

Section 309.22 of the Code of Iowa provides for the Board of Supervisors to adopt and submit for department consideration, a revised project accomplishment list during the year. If unforeseen circumstances dictate modification of the original program, a supplemental shall be submitted to the Transportation Center Planner prior to June 1 of each year.

Counties sometimes find it necessary to revise their construction program during the fiscal year to add, delete, or change certain projects. These additions, deletions, or changes shall be incorporated into a supplemental program and be approved by the Iowa DOT prior to the start of the work. In extreme emergencies, verbal approval can be obtained from the Transportation Center Planner and the paper work submitted after the emergency situation has been alleviated.

A LETTER SHALL ACCOMPANY EACH SUPPLEMENTAL PROGRAM OUTLINING THE REASONS (UNFORESEEN CONDITIONS) FOR THE REVISIONS. THE DEADLINE IS JUNE 1 OF EACH YEAR. A SUPPLEMENTAL CANNOT COVER ACTIVITY AFTER THE FACT.

### PROGRAM SHEET 1

Check the supplemental box and list the number of the supplemental. Obtain proper signatures.

### PROGRAM SHEET 2

Only needs to be included if the project is a pave or grade-for-pave project.

### PROGRAM SHEET 3

1. List the accomplishment year program totals for LCL, FMO and SPC from the original program.
2. Enter the following comments as needed:
  - A. Deleted Project(s) - List project(s) and amount(s) under this heading.
  - B. Adjusted Project(s) - List project(s) and amount(s) of underruns and overruns. Be sure to use (+) or (-) signs by the amounts.
  - C. Added Project(s) - List project(s) and amount(s) under this heading.
3. Re-total the program for LCL, FMO and SPC as you did the original program.

Also see example of a supplemental program in this instruction package--Table IV.

Sheet 1

# DRAFT FY 1998-2003 Regional Transportation Improvement Program

March, 1997

Prepared by:

Metropolitan Area Planning Agency

in cooperation with

The Iowa Department of Transportation  
and  
Local Supporting Agencies

## INTRODUCTION

### **SUMMARY OF TRANSPORTATION PLANNING AND PROGRAMMING IN THE MAPA REGIONAL TRANSPORTATION AREA**

This report describes improvements programmed over the next six years as a result of the continuing transportation planning process in the MAPA Regional Transportation Planning area. Planning for transportation facilities and services has been in response to the development of Regional Planning Affiliations (RPA) by the Iowa Department of Transportation. Such agencies shall offer a continuing, cooperative, and comprehensive transportation planning process resulting in multi modal plans and programs consistent with the comprehensive plan and the Intermodal Surface Transportation Efficiency Act of 1991.

### **METROPOLITAN AREA PLANNING AGENCY**

The Metropolitan Area Planning Agency (MAPA) is a voluntary association of local governments in the Omaha - Council Bluffs metropolitan area chartered in 1967. MAPA serves as a forum for decision-making on regional problems and issues in the area. Such problems and issues are those that cross jurisdictional boundaries such as the Regional Transportation Improvement Program (RTIP).

### **REGIONAL PLANNING AFFILIATIONS**

The Iowa DOT has divided the state into 18 Regional Planning Affiliations. Harrison, Mills, Pottawattamie, and Shelby counties have been joined together to form the Regional Planning Affiliation - Region 18 (RPA-18). MAPA has been contracted by the governing boards of Harrison, Mills, Pottawattamie, and Shelby counties in Iowa to provide transportation and transit planning services and technical support for the RPA 18.

### **MAPA REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM STUDY AREA**

The MAPA Regional Transportation Study Area covers an area of approximately 2,541 square miles with a population base of approximately 63,900 (1990 Census). This area includes the Iowa counties of Harrison, Mills, Pottawattamie, and Shelby and the local jurisdiction therein. An outline of the MAPA Regional Transportation Study Area is identified in Figure 1.

### **MAJOR TRANSPORTATION SUBJECTS**

The RTIP provides an organizational structure to address the major transportation issues facing the RPA 18 area. The RTIP is produced annually as a staged capital improvement document. It is comprised of four

elements representing a program of projects and services for fiscal years 1998, 1999, 2000 and an out-year element spanning fiscal years 2001, 2002 and 2003.

A priority ranking of projects has been established by RPA-18 jurisdictions and state transportation agencies through their placement of projects into the three elements of the RTIP. Projects receiving the greatest priority are scheduled in fiscal year 1998 element. Projects scheduled in the second, third, and out-year elements are similarly prioritized with those projects of lesser priority scheduled in the out-year element.

### **INFORMATION**

The RTIP, based on information submitted by local and state governments, accomplish the following objectives:

- a) Identifies the transportation improvements for advancement from the long range element during the program period;
- b) Indicates the region's priorities;
- c) Groups improvements of similar urgency and anticipated staging to the same time period;
- d) Includes realistic estimates of total costs for the program period;
- e) Provides a status report of projects programmed in the previous year's annual element;
- f) Serves as chief coordination mechanism for implementing projects recommended in the Regional Planning Affiliation - Region 18 Long Range Transportation Plan;
- g) Complies with provisions under the 1990 Americans with Disabilities Act (ADA).

In addition, each project in the annual element of the RTIP includes the following information:

- a) Location of the project;
- b) Type of improvement the project entails;
- c) Length of the project to the nearest tenth of a mile;
- d) Functional Classification, if any, for the facility involved;
- e) Proposed sources and availability of federal, state, and local funds;
- f) Estimated total expenditures for each jurisdiction involved;

Projects programmed in this document represent only those projects receiving federal funding. This RTIP is not to be construed as a complete list of improvement projects within RPA-18. For further details on the programming of any individual project, consult the jurisdictional representatives cited on page v.

## LIST OF ABBREVIATIONS

### MAP LOC. & PROJ. NO. - MAP LOCATION AND PROJECT NUMBER

+ Indicates no physical location could be ascertained therefore a map location and project number are not assigned.

\* Project is outside of Regional Planning Study Area and project is provided as an Information item.

### TYPE OF IMPROVEMENT -

ACC - Asphaltic Cement Concrete  
 Culv. - Culverts, Bridges, New or Reconstructed  
 E & H - Elderly & Handicapped  
 Eng. - Engineering  
 Gr. - Grading  
 Misc. - Miscellaneous  
 FCC - Portland Cement Concrete  
 Prelim. Eng. - Preliminary Engineering  
 Resurf. - Resurfacing  
 ROW - Right-of-Way Acquisition  
 RR - Railroad  
 SPPC - Structured Plate Pipe Culvert  
 S. Shld. - Surfaced Shoulders  
 Struct. - Structures  
 Surf. - Surfacing

### JURISDICTION -

Iowa DOT - Iowa Department of Transportation  
 COE - U.S. Army Corps of Engineers  
 DNR - Department of Natural Resources  
 MAT - Metro Area Transit  
 NRCS - Natural Resource Conservation Service

### FUNDING SOURCE

AIP - Airport and Airway Improvement Program  
 Bridge - Bridge Replacement and Rehabilitation  
 CDBG - Community Development Block Grant  
 DPI - Demonstration Project Innovative  
 DPU - Demonstration Project - Urban Access  
 FM - Iowa Farm to Market  
 HUF - Highway User Fund (state gas tax)  
 IM - Interstate Maintenance  
 NHS - National Highway System  
 REAP - Iowa DNR Resource Enhancement And Protection  
 SBF - Iowa State Bridge Fund  
 NRCS - Natural Resource Conservation Service  
 Sec. 3 - Federal Transit Administration Section 3 Funds  
 Sec. 18 - Federal Transit Administration Section 18 Funds  
 SRF - Iowa Secondary Road Funds  
 STP-33A - Surface Transportation Program Safety Funds  
 STP-33B - Surface Transportation Program Transportation Enhancement  
 STP-33C - Surface Transportation Program Omaha-Council Bluffs Urbanized Area  
 STP-33D - Surface Transportation Program Iowa State (any area)  
 STP-33E - Surface Transportation Program Non-Urban Areas/Counties  
 STP-33M - Surface Transportation Program Rail Highway Protection  
 STP-33N - Surface Transportation Program Rail Highway Hazard Elimination  
 STP-33P - Surface Transportation Program Hazard Elimination on Any Public Road  
 STP-3AA - Surface Transportation Program Urban Areas 5,000 to 200,000 in population

## JURISDICTIONAL INFORMATION

### COUNTY

#### Harrison County, Iowa

J.T. (Tom) Stoner, P.E.  
Harrison County Engineer  
Courthouse  
Logan, Iowa 51546  
712-644-3140

#### Mills County, Iowa

Steve DeVries, P.E.  
Mills County Engineer  
23 N Vine Street  
Glenwood, Iowa 51534  
712-527-4873

#### Pottawattamie County, Iowa

Jerry Hare, P.E.  
Pottawattamie County Engineer  
23 S 6th Street  
Council Bluffs, Iowa 51501  
712-328-5608

#### Shelby County, Iowa

Daniel A. Hart, P.E.  
Shelby County Engineer  
PO Box 66  
Hartan, Iowa 51537  
712-755-5954

### STATE

#### Iowa

Mike Slyby  
Regional Transportation Planner  
Iowa DOT, PO Box 406  
Atlantic, Iowa 50022  
712-243-3355

John A. Munson, P.E. & L.S.  
Assistant County Engineer  
23 S 6th Street  
Council Bluffs, Iowa 51501  
712-328-5608

Charles Trainor  
Assistant Shelby County Engineer  
PO Box 66  
Hartan, Iowa 51537  
712-755-5954

Angelo Stefani  
Office of Advance Planning  
800 Lincoln Way  
Ames, Iowa 50010  
515-239-1651

### CITY

#### Glenwood, Iowa

Kenneth Cloyd  
Glenwood Public Works Director  
107 S Locust Street  
Glenwood, Iowa 51534  
712-527-4598

#### Harlan, Iowa

Terry Cox  
Harlan Public Works Director  
711 Durant Street  
Harlan, Iowa 51537  
712-755-5137

### REGIONAL

#### Metropolitan Area Planning Agency

William A. Christian  
Transportation Planner  
2222 Cuming Street  
Omaha, Nebraska 68102  
402-444-6866  
1-800-827-6866 in the MAPA Region

#### Southwest Iowa Transit Agency (SWITA)

Pat Hall  
Executive Director  
1501 Southwest 7th Street  
P.O. Box 348  
Atlantic, Iowa 50022  
712-243-4196

### FEDERAL

#### Federal Highway Administration

Larry Forney  
Planning Engineer  
Federal Highway Administration  
105 6th Street - Box 627  
Ames, Iowa 50010  
515-233-1644

**MAPA DRAFT REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM**

Fiscal Year 1998 Annual Element

Fiscal Year	Project / Project Number	Location	Type of Improvement	Length Miles/ KM	Federal Functional Classification	Jurisdiction	Federal Funding Source	Estimated Project Cost (x 1,000)				Total
								Federal	State	Farm to Market	Local	
1	County Road K-45 STP-S43(16)-55-43	From US-30 north 5 miles to Modale, Iowa.	Grade for future paving.	5.00 8.05	Rural Major Collector	Harrison	STP-33E	375.00	0.00	375.00	0.00	750.00
1	Loess Hills Scenic Byway Interpretive Panels and Route Signage (Harrison Co.)	Install interpretive panels at major points of interest and place additional route identification signs along byway.	Along the Loess Hills Scenic Byway in Harrison, Mills, Pottawattamie, Monona, Woodbury, Plymouth and Fremont counties in Iowa.	0.00 0.00	N/A	Harrison	STP-33B	69.30	0.00	0.00	17.50	86.80
1	H-12	US-275 to L-55	Rebuild facility.	0.00 0.00	Rural Major Collector	Mills	STP-33E	690.00	0.00	172.50	0.00	862.50
1	M-16 BROS-65(27)-5F-65 Mills Co.	Section 19-72-40, bridge over Indian Creek near Hastings, Iowa.	Replace bridge.	0.00 0.00	Rural Major Collector	Mills	Bridge	360.00	0.00	90.00	0.00	450.00
1	Mile Hill Lake Scenic Overlook	Mile Hill Lake Wildlife Area adjacent to US-34 in Mills County, Iowa.	Construct a scenic overlook that would connect hiking/biking trails along the Loess Hills Scenic Byway.	0.00 0.00	Local	Mills	STP-33B	57.55	0.00	0.00	15.18	72.73
1	BO-1 BROS-78(87)	Section 01-77-43, near NE corner over Potato Creek.	Replace existing bridge with concrete bridge.	0.00 0.00	Local	Pottawattamie	Bridge	224.00	0.00	0.00	56.00	280.00
1	HD-7 BROS-78(88)	Section 09-76-43, near NE corner NW1/4 SE1/4.	Replace existing bridge and construct SPPC.	0.00 0.00	Local	Pottawattamie	Bridge	48.00	0.00	0.00	12.00	60.00
1	JA-37 BROS-78(94)	Section 33-76-40 near NE corner.	Replace existing bridge with concrete bridge.	0.00 0.00	Local	Pottawattamie	Bridge	104.00	0.00	0.00	26.00	130.00
1	*KC-2 BROS-78(84)-8J-78	Section 03-74-42 near NW corner.	Replace existing bridge with concrete bridge.	0.00 0.00	Local	Pottawattamie	Bridge	180.00	0.00	0.00	45.00	225.00

200

REVIEW DET FROM

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MAPA DRAFT REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM

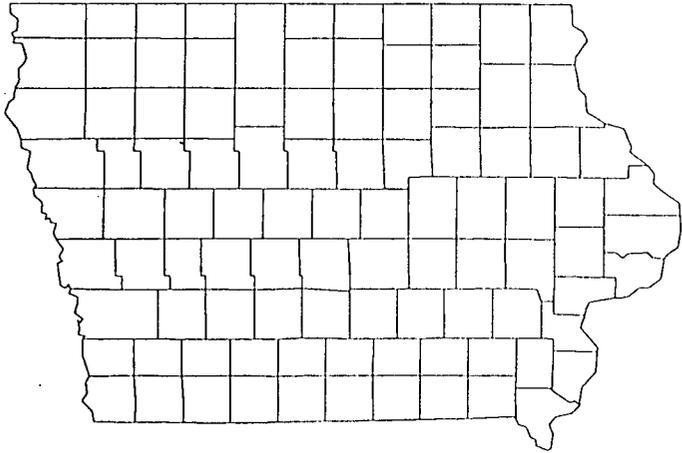
Fiscal Year 1998 Annual Element

Fiscal Year	Project / Project Number	Location	Type of Improvement	Length Miles/ KM	Federal Functional Classification	Jurisdiction	Federal Funding Source	Estimated Project Cost (x 1,000)				Total
								Federal	State	Farm to Market	Local	
1	KN-16 BROS-78(89)	Section 30-77-39, near NE corner NW1/4 NE1/4.	Replace existing bridge and construct SPPC.	0.00 0.00	Local	Pottawattamie	Bridge	48.00	0.00	0.00	12.00	60.00
1	KN-2 BROS-78(95)	Section 01-77-39, near NW corner NE1/4NE1/4.	Replace existing bridge, construct SPPC.	0.00 0.00	Local	Pottawattamie	Bridge	72.00	0.00	0.00	18.00	90.00
1	L66 : L-36 FM-78/STP	From US-6 to Minden, Iowa : From IA-183 to the end of current PCC.	ACC and PCC overlays.	16.00 25.75	Rural Major Collectors	Pottawattamie	STP-33E	495.48	0.00	1,004.52	0.00	1,500.00
1	LI-24 BROS-78(97)	Section 27-76-38, near S1/4 corner over Walnut Creek.	Replace existing bridge with concrete bridge.	0.00 0.00	Local	Pottawattamie	Bridge	160.00	0.00	0.00	40.00	200.00
1	NO-32 BROS-78(91)	Section 16-76-42, near SE corner NE1/4 NE1/4.	Replace existing bridge with concrete bridge.	0.00 0.00	Rural Minor Collector	Pottawattamie	Bridge	180.00	0.00	0.00	45.00	225.00
1	SC-14 BROS-78(93)	Section 15-74-41, near SW corner over Silver Creek.	Replace existing bridge with concrete bridge.	0.00 0.00	Local	Pottawattamie	Bridge	220.00	0.00	0.00	55.00	275.00
1	LFM-88-05 BROS-83(13)--5F-83	Sections 05-78-38 and 06-78-38.	Construct concrete beam bridge, grade approaches, and ROW.	0.00 0.00	Rural Minor Collector	Shelby	Bridge	320.00	0.00	80.00	1.00	401.00
1	County Road F-32 LFM-09-19p STP-S-83	US-59 east 7.0 miles	Reconstruct to 2-lane PCC facility with granular surfaced shoulders.	7.00 11.27	Rural Major Collector	Shelby	STP-33E	637.00	0.00	0.00	203.00	840.00

**MAPA DRAFT REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM**

Fiscal Year 1998 Annual Element

Fiscal Year	Project / Project Number	Location	Type of Improvement	Length Miles/ KM	Federal Functional Classification	Jurisdiction	Federal Funding Source	Estimated Project Cost (x 1,000)				Total
								Federal	State	Farm to Market	Local	
1	I-29 (Harrison Co.)	Bridge over drainage ditch 0.8 miles north of IA-301 interchange (NB and SB).	Bridge repair.	0.00 0.00	Interstate	Iowa DOT	IM	184.50	20.50	0.00	0.00	205.00
1	I-80 (Pott. Co.)	From IA-192 interchange to south JCT IA-244.	Pavement patching.	19.00 30.58	Interstate	Iowa DOT		0.00	250.00	0.00	0.00	250.00
1	I-80 (Pott. Co.)	From Missouri River to west of IA-192 interchange.	Pavement patching, pavement rehabilitation.	3.00 4.83	Interstate	Iowa DOT	IM	90.00	10.00	0.00	0.00	100.00
1	I-80 (Pott. Co.)	From south JCT IA-244 to I-680 interchange, westbound lanes.	Pavement rehabilitation.	6.00 9.66	Interstate	Iowa DOT	IM	5,760.00	640.00	0.00	0.00	6,400.00
1	IA-191 (Harrison Co.)	Bridge over Spring Creek 0.9 miles south of Persia.	Bridge deck repair.	0.00 0.00	Minor Arterial	Iowa DOT	----	0.00	74.00	0.00	0.00	74.00
1	IA-191 (Pott. Co.)	Bridge over drainage ditch at Underwood south city limits.	Bridge deck repair.	0.00 0.00	Interstate	Iowa DOT	----	0.00	47.00	0.00	0.00	47.00
1	IA-244 (Pott. Co.) BRFN-244-2(2)-39-78	Over Mosquito Creek at Neola.	Bridge replacement.	0.00 0.00	Major Collector	Iowa DOT	Bridge	514.40	128.60	0.00	0.00	643.00
1	IA-362 (Pott. Co.)	From southeast entrance of De Soto National Wildlife Refuge to I-29 interchange.	Pavement rehabilitation.	5.50 8.85	Rural Major Collector	Iowa DOT	----	0.00	600.00	0.00	0.00	600.00



**Iowa Statewide  
Transportation Improvement Program  
1997-1999**

Sorted by MPO and RPA

Approved by FHWA/FTA  
October 29, 1996

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## Introduction

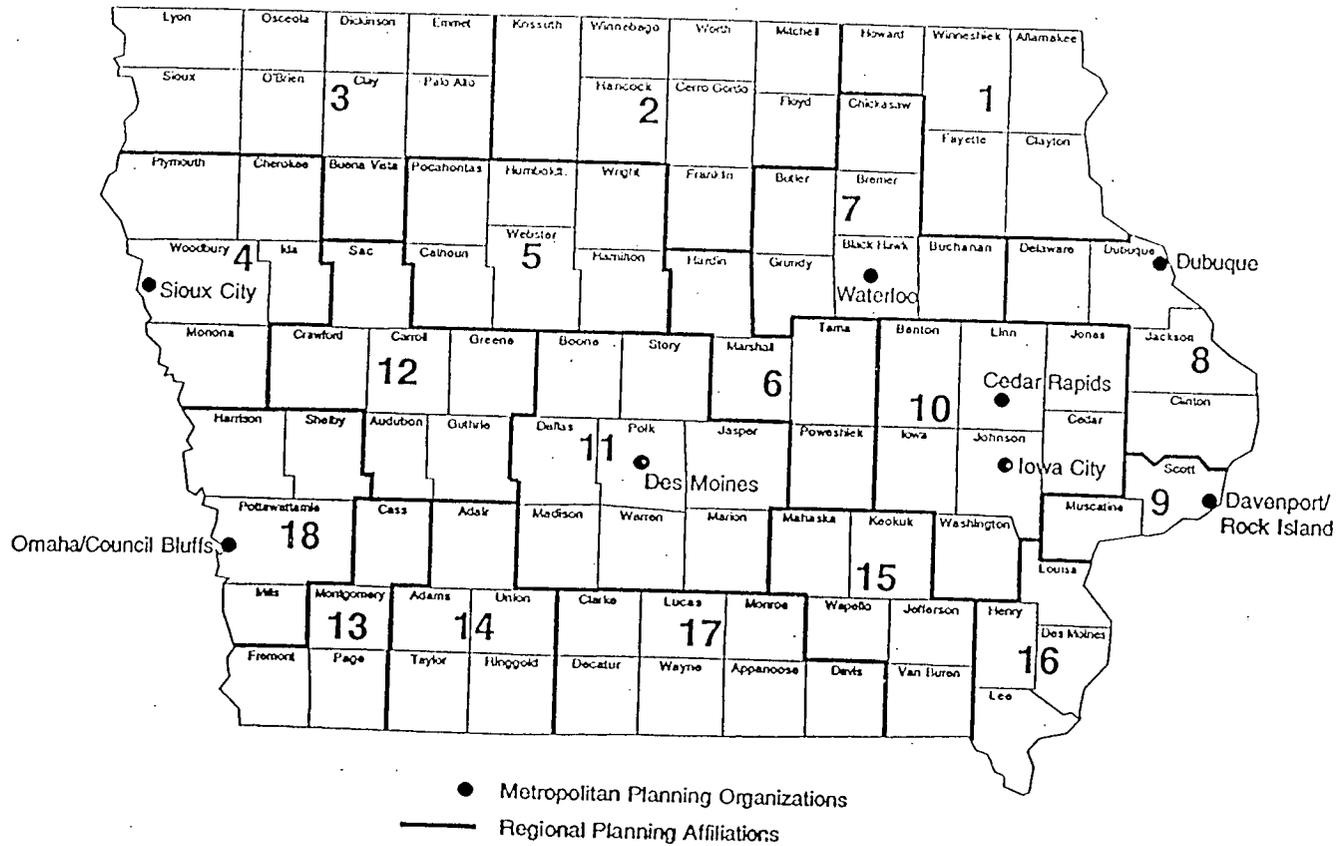
The Statewide Transportation Improvement Program (STIP) identifies investments for programs funded by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) for three federal fiscal years. Approval of Iowa's 1997-1999 STIP by the FHWA and FTA was effective October 29, 1996.

The projects identified within the 1997-1999 STIP are divided into two groups. Projects proposed for funding from FHWA programs are shown first. Projects are sorted in groups for Metropolitan Planning Organizations (MPOs) in areas of over 50,000 population and Regional Planning Affiliations (RPAs) for rural areas. Statewide items are shown last. Within each area, projects are identified by the specific FHWA programs they are expected to be administered under. The FHWA programs are preceded by a divider page and maps identifying the locations of the MPOs, RPAs and Transportation Center Planners.

FTA programs begin on page 37. Proposed investments are again grouped by MPO, RPA, and Statewide items. Proposals are further identified by the specific transit service provider administering the "project" and by the expected source of federal funds. This project listing is also preceded by a divider and by maps showing the locations of the MPOs/RPAs and the locations of the various transit systems.

If you require additional information concerning the STIP, please contact the respective MPO, RPA or Transportation Center Planner identified within.

# Metropolitan Planning Organizations and Regional Planning Affiliations





1997-1999 IOWA STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

Highway Element  
 Inclusion of a Project in the STIP does not Guarantee Federal-Aid Eligibility.  
 Eligibility will be Determined on a Case-by-Case Basis when Project Authorization is Requested from the FWA and the FIA

11/14/96  
 (97STIP)

Item Number	PROJECT NO.	COUNTY	CITY	ROUTE/ STREET	LENGTH (miles)	TERMINI	TYPE OF WORK	TOTAL COST (X\$1000)			FEDERAL AID (X\$1000)			SPONSOR	MPO/LRA FEDERAL AID CONTRIBUTION (X\$1000)			FHWA Bridge #	REMARKS
								1997	1998	1999	1997	1998	1999		1997	1998	1999		
<b>IHRCOG, WATERLOO</b>																			
Surface Transportation Program (STP)																			
70014	STP-U-8155(22)-70-07	Black Hawk	Waterloo	M L King Dr	0.98	Barclay to Idaho	Construction	3100.0			2480.0			City	2480.0				
70009	STP-U(-)-07	Black Hawk	Waterloo	M L King Dr	3.15	Idaho to Elk Run Rd/Bishop S	ROW, Grading	2819.0			967.4			City	554.4				
70011	STP-U(-)-07	Black Hawk	Waterloo	IHRCOG		Pavement Management System Implementation	Planning	10.0			8.0			IDOT	8.0				9.9 IX, 1288.0 RISE
	STP-U(-)-07	Black Hawk	Cedar Falls	Lone Tree Rd	0.60	US 218 to Leaverve	Construction							City					
	STP-S7(-)-07	Black Hawk	Cedar Falls	Ia 57 (W 1st St)	0.50	Hudson Rd to Magnolia Dr	Reconstruction	1700.0		150.0				City					Pending FA award
	STP-S7(-)-07	Black Hawk	Cedar Falls	Ia 57 (W 1st St)	1.20	Magnolia Dr to Union Rd	Reconstruction		2000.0					IDOT/City					Pending FA award
	STP-U(-)-07	Black Hawk	Cedar Falls	W 27th St	1.35	Nebraska St to Union Rd	Reconstruction			1500.0				IDOT/City					Pending FA award
	STP-U(-)-07	Black Hawk	Evansdale	Dubuque Rd	1.86	WCL to ECL	Reconstruction			1000.0				City					Pending FA award
Highway Bridge Replacement and Rehabilitation Program (HBRRP)																			
	BRM-1185(1)-4N-07	Black Hawk	Cedar Falls	Union Rd		CCRH	Bridge Replacement		800.0			640.0		City					
Transportation Enhancements Program (STP)																			
	STP-E	Black Hawk	Cedar Falls	Sergeant/Prairie Tr	2.50	Connector	Trail Construction	180.0	180.0		92.0	85.0		City	92.0	85.0			
	STP-E	Black Hawk	Waterloo	Local Trail	1.40	Greenhill/Walmsborough Connector	Trail Construction	135.0	135.0		65.0	85.0		City	65.0	85.0			
70389	STP-E	Black Hawk	Cedar Falls	12th St	1.50	Hudson Rd to Union Rd	Trail Construction	300.0			240.0			City	240.0				
	STP-E	Black Hawk	Cedar Falls	Illinois Depot		Renovation	Hist Trans Facilities		500.0					City					Pending FA award
	STP-E	Black Hawk	Cedar Falls	Prairie Lks Tr			Trail Construction							City					
	STP-E	Black Hawk	Cedar Falls	Hudson Rd Trail			Trail Construction	500.0			70.0			City	70.0				
	STP-E	Black Hawk	Cedar Falls	Big Woods Lk Trail			Trail Construction			450.0				City					Pending FA award
70387	STP-E/ES	Black Hawk	Waterloo	Gr Western Depot		Renovation	Hist Trans Facilities			150.0				City					Pending FA award
70391	STP-E	Black Hawk	Waterloo	Hawkeye CC		E Campus Trail Connection	Trail Construction	903.0			420.0			City	150.0				Part Stwd 269 902
	STP-E	Black Hawk	Waterloo				Trail Construction	50.0			40.0			City	40.0				
70390	STP-ES-8155(12)-81-07	Black Hawk	Waterloo	Trolley/218 Trail	2.06	Greenhill Rd to Westfield Ave (Phase 1)	Trail Construction	550.2			440.1			City					
70388	STP-ES-8155(12)-81-07	Black Hawk	Waterloo	Trolley/218 Trail	1.78	Mullan Ave to W 18th St (Phase 2)	Trail Construction	358.0			285.8			City					
70384	STP-ES	Black Hawk	Waterloo	Trolley/218 Trail	5.25	W 18th to Cedar Valley Mature Trail (Phase 3)	Trail Construction	724.4			579.5			City					
70392	STP-ES	Black Hawk	WauEvansdale	US 218		Window on Waterloo Gateway Development	Scenic Beautification	798.6			638.9			City					Stwd Award
Hazard Elimination (STP Safety)																			
70536	HES-(-)-2H-07	Black Hawk	Waterloo	US 57		Broadway & W Donald/Longfellow Sts	Intersection Improvement	1021.0			918.9			IDOT					
Interstate Substitution Program (IX)																			
70012	STP-U(-)-07	Black Hawk	Waterloo	M L King Dr	3.15	Idaho to Elk Run Rd/Bishop S	Grade	545.0			436.0			City					IX repay
	STP-U(-)-07	Black Hawk	Waterloo	M L King Dr	3.15	Idaho to Elk Run Rd/Bishop S	Construction		1678.0			488.0		City					IX repay plus RISE
	STP-U(-)-07	Black Hawk	Waterloo	M L King Dr	3.15	Idaho to Elk Run Rd/Bishop S	Construction		759.0			607.0		City					IX repay
70018	STP-U(-)-07	Black Hawk	Waterloo	NE Arterial		Feasibility Study	Planning	700.0			560.0			City	560.0				
70015	STP-U(-)-07	Black Hawk	Cedar Falls	Main St		At Greenhill Rd	Traffic Signals	100.0			85.0			City					
70010	STP-U(-)-07	Black Hawk	Cedar Falls	Waterloo Rd	0.50	Madison St to University Ave	Reconstruction	2000.0			1600.0			City					IX repay
70013	STP-U(-)-07	Black Hawk	Waterloo	MET		Radio System Replacement	Capital Improvements	87.5			70.0			City					IX repay
Iowa Clean Air Attainment Program (CMAQ)																			
70548	ICAP	Black Hawk	Waterloo	Hess Rd	1.00	Shaulik Rd to Orange Rd	Grade & Pave, Trail	930.0			744.0			County					

SYNOPSIS  
 # 50116  
 # 50117  
 10/1/96  
 01/1/97

1997-1999 IOWA STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

Highway Element  
 Inclusion of a Project in the STIP does not Guarantee Federal-Aid Eligibility.  
 Eligibility will be Determined on a Case-By-Case Basis when Project Authorization is Requested from the FHWA and the FTA

11/14/96  
 (97STIP)

Item Number	PROJECT NO.	COUNTY	CITY	ROUTE/ STREET	LENGTH (miles)	TECHNI	TYPE OF WORK	TOTAL COST (X\$1000)			FEDERAL AID (X\$1000)			SPONSOR	MPO/RPA FEDERAL AID CONTRIBUTION (X\$1000)			FHWA Bridge #	REMARKS
								1997	1998	1999	1997	1998	1999		1997	1998	1999		
NIACOG, RPA 2																			
Surface Transportation Program (STIP)																			
70027	STP-U	Cerro Gordo	Mason City	12th St NE	5.20		Plymouth Rd to California Ave												
	BROS-	Cerro Gordo		U20			Bridge B-28-C-19	257.0			204.8			City					
	STP-U	Cerro Gordo	Monroe		0.32		15th SW to 16th SW			200.0			106.4	City					
	STP-U	Cerro Gordo	Clear Lake	N 9th St	0.17		US 18 to W 10th Ave N and Village Rd			292.0			102.7	City					
70028	STP-S	Cerro Gordo		S56	5.50		From Mason City to U47	550.0	100.0		117.5	49.7		City		49.7			
	STP-S	Cerro Gordo		S18	4.50		B20 S to Clear Lake							County					
	STP-U	Cerro Gordo	Clear Lake	N 16th St	0.50		US 18 to NCL		450.0			112.4		City		112.4			
	STP-U	Cerro Gordo	Mason City	Taft Ave	1.00		4th St SW to 19th St SW			100.0			48.0	City					
70058	STP-U-1242(2)-70-34	Floyd	Charles City	Main St	3.30		Over Cedar River	300.0			150.0			City		150.0			
70058	STP-S	Floyd		B47	3.30		From Rockford City Limits 3.3 mi W	160.0			82.7			County		82.7			
70057	STP-S	Floyd		S70	4.50		From Nora Springs N 4.5 miles	220.0			103.6			County		103.6			
	STP-U	Floyd	Charles City	N Grand	7.50		W Line of Sec 18 95-15 E & N to Mitchell Co Line			275.0			207.2	County					
	STP-S-18(24)-5E-35	Franklin		C25	14.00		From S25 to S56		1000.0				94.2	City					
70059	STP-S-35(18)-5E-35	Franklin		C25	13.00		From I-35 E to S56				143.2			County		143.2			
	STP-S-35(1)-5E-35	Franklin		S25	5.00		From Courtier through L timmer to C25	1000.0			348.6			County		348.6			
	STP-S	Hancock		B20	7.00		NW 36-97-24 to NE 36-97-23			400.0			133.7	County					
	STP-S	Kossuth		B46	6.00		P40 to Ia 17			280.0			102.4	County		102.4			
	STP-15-3(8)-2C-55	Kossuth		IA 15	15.80		From E Jct US 18 to Emmet Co Line	325.0	3050.0		2440.0			IDOT		497.2			
	BROS-	Kossuth		P30			Sec 17-100-29			110.0			69.4	County					
	BROS-	Kossuth		A21			Sec 6-99-29			110.0			69.4	County					
	BROS-	Kossuth		A42			Sec 25-98-29			150.0			94.7	County					
	STP-U	Kossuth	Algona	Fair St	0.23					280.0			107.3	City					
	STP-S	Kossuth		Local Rd	2.50		From S 1/2 Cor 20-98-17 N 2.5 miles			175.0			139.2	County					
70125	STP-9-6(45)-2C-68	Mitchell		IA 9	10.10		Worth Co Line to 4-lane Switlon In Osage							IDOT		139.2			
70125	STP-	RPA 2		NIACOG			RPA 2 Transportation Planning	30.6	31.0	2224.0	24.5	24.8	1779.2	Other					
70124	STP-	RPA 2		NIARTS			2 light duty ADA equipped buses for N IA Area Hog Transit		70.0	32.3		55.7	25.8	Other		24.5	24.8	25.8	RPA RTA 2
	STP-5-95(1)-2C-95	RPA 2		RPA 2			Pavement Management System Implementation for RPA 2	11.0			8.8			Other		8.8			RPA
70152	STP-5-95(1)-2C-95	Winneshago		A38	3.95		From US66/14 9 E to R72			280.0		102.4		County					
70161	STP-S-98(1)-2C-98	Winneshago		R34	7.40		Ia 9 N to A16 W 1 MI	450.0			305.8			County		305.8			
	STP-S-98(1)-2C-98	Worth		Old 105	6.00		WCL Northwood W 6.0 mil to I-35 Interchange	360.0			243.1			County		243.1			
	STP-S-98(1)-2C-98	Worth		Old 105	8.50					575.0			154.5	County					
National Highway System (NHS)																			
70164	NHS-18-5(68&69)-19-17	Cerro Gordo		US 18	7.90		I-35 to E Jct US 65 (Includes Mason City Bypass) - 4 lanes	2940.0	12391.0	246.0	3152.0	9912.8		IDOT					
70163	NHS-18-5(70&71)-19-17	Cerro Gordo		US 18	8.90		E Jct US 65 to Floyd Co Line - 4 Lanes	12762.0	1265.0	11468.0	10209.6	1012.0	9174.4	IDOT					
70175	NHS-18-6(47)-19-34	Cerro Gordo	Mason City	US 65			19th St to Ave of Saints Interchange			180.0			144.0	IDOT					
	NHS-18-6(44)-19-34	Floyd		US 18	9.90		From Rudd to Charles City Bypass - 4 lanes				5886.4	5958.4		IDOT		646.1			
	NHS-18-6(1)-19-34	Floyd		US 18	0.80		Shell Rock Rd to Rudd - 4 lanes	7358.0	7448.0	240.0				IDOT					
70174	NHS-18-6(1)-19-34	Floyd		US 18	0.80		Cerro Gordo Co Line to Rudd - 4 lanes	883.0	4542.0	10841.0				IDOT		8672.8			
	NHS-218-6(1)-19-34	Floyd		US 218	0.80		Charles City Bypass - 4 lanes	2834.0	300.0	1612.0	3067.2			IDOT		1289.6			
	STP-89-1(1)-2C-95	Winneshago		US 69	1.00		Hancock Co Line to Jct IA 9 in Forest City	1172.0	13736.0	18252.0		10988.8		IDOT		210.4			

### IOWA DEPARTMENT OF TRANSPORTATION

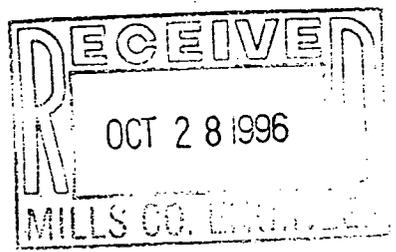
To Office County Engineer's Office Date October 24, 1996

Attention County Engineer or Plan Development Tech. Ref. No. 860

From John A. Buttolph, Plan Review Tech. *[Signature]*

Office Local Systems

Subject New County Project Listings



June 1996 the Office of Local Systems started to take the Mainframe database file and converted it to an Lotus Approach database file. It has taken until now to straighten out the transfer glitches plus add new features to the database that we did not have before.

First report **CO. LISTINGS** is what we plan on giving you as status of projects.  
 Second report **CO. DESCRIPTIONS** is included that has project descriptions.

Please review both reports and let me know of anything not right by your records.

The following is the column names, their descriptions and the codes with descriptions as used:

<u>Column Name</u>	<u>Description</u>
<u>Code</u>	<u>Code Description</u>
<b>County Name</b>	County Name
<b>Proj. No.</b>	Assigned Project Number
<b>BR#</b>	FHWA Bridge Number
<b>Miles</b>	Project length in Miles or Kilometers
<b>Type</b>	Major Type of Work, to be done
AC	Asphalt Cement Concrete Paving or Resurfacing
Br	Bridge Replacement
BG	Bridge and Grading
BM	Bridge Maintenance
BW	Bridge Widening
C	Culvert Replacement
E	Enhancement Project
G	Grading
GA	Grade and ACC Pave
GP	Grade and PCC Pave
GS	Grading and Granular Surfacing
M	Maintenance work
PC	Portland Cement Concrete Paving or Resurfacing
PM	Pavement Markings
S	Granular Surfacing

# CO. DESCRIPTION

County Name	Proj. No.	Location	Br#	Miles	Type	Est. Let
MILLS	BROS-65(25)--5F-65	ON L31 OVER KEG CR. IN SE 1/4 SEC. 32-72-43	246410		BR	10/28/97
MILLS	BROS-65(31)--8J-65	SEC. 7-72-40 OVER NISHNABOTA RIVER	245550		BR	01/01/99
MILLS	BRS-6169(1)--60-65	W. Line Sec. 15-71N-41W	245040		BR	01/01/00
MILLS	BRS-65(27)--60-65	ON M16 NW.COR SEC.19-72-40	036040		BR	08/20/96
MILLS	BRS-65(30)/POTT BR	OVER KEG CR. NORTH LINE SEC. 05-73- 42 W POTT	246960		BR	10/29/95
MILLS	FM-65(34)--55-65	H-12 FROM SEC. 01-73-40 US 59 TO CO. LINE		1	AC	01/01/97
MILLS	FM-65(35)--55-65	M-16 SEC 6-73-40 H-12 TO CO. LINE		1	AC	01/01/97
MILLS	FM-65(36)--55-65	OVERLAY H-38 NR NW COR SEC. 32-72-41 OVER RAINES	245940		BR	01/01/98
MILLS	FM-65(37)--55-65	OVERLAY H-46 IN SEC 20-71-40 OVER DEER CR.	244730		BR	01/01/99
MILLS	FM-65(38)--55-65	OVERLAY OVER KEG CR. NR NW COR SW 1/4 COR SEC.	246380		BR	01/01/96
MILLS	STP-S-65(39)--5E-65	COLD IN PLACE ACC ON H-12 FROM US 275 TO L-55		7	AC	01/01/98
MILLS	STP-S-65(40)--5E-65	RESURFACING L55 FROM SILVER CITY N. TO CO. LINE		3	AC	01/01/99

# CO. LISTINGS

County Name	Proj. No.	Br#	Miles	Type	Est. Let	Cost 000'S	Env. Status	Prel	Hyd	Str	Chk	Agm	Final	ROW
MILLS	BROS-65(25)--5F-65	246410		BR	10/28/97	300	Env Conc	App	Br					
MILLS	BROS-65(31)--8J-65	245550		BR	01/01/99	500								
MILLS	BRS-6169(1)--60-65	245040		BR	01/01/00	600	Fr SHPO	App	Br					
MILLS	BRS-65(27)--60-65	036040		BR	08/20/96	300								
MILLS	BRS-65(30)/POTT BR	246960		BR	10/29/95		Env Conc	App	Done	Done	Acpt	App		Appr
MILLS	FM-65(34)--55-65		1	AC	01/01/97	150								
MILLS	FM-65(35)--55-65		1	AC	01/01/97	125								
MILLS	FM-65(36)--55-65	245940		BR	01/01/98	100		App	Br	Done				
MILLS	FM-65(37)--55-65	244730		BR	01/01/99	105		App	Br	Done				
MILLS	FM-65(38)--55-65	246380		BR	01/01/96	125								
MILLS	STP-S-65(39)--5E-65		7	AC	01/01/98	863								
MILLS	STP-S-65(40)--5E-65		3	AC	01/01/99	360								

# UPDATE

Co. - City Name	Proj. No.	Br#	Miles	Type	Est. Let	Date Let -STIP Limit	Env. Status	Prel	Hyd	Str	Chk	Agm	Final	ROW
JACKSON ✓	FM-49(16)--55-49		2	GS	06/04/96	6/96	Env Conc	App	Br	Done	Acpt		Acpt	
JACKSON ✓	FM-49(20)--55-49		2	AC	07/09/96	7/96	Rec Conc	App	Br	Done	Acpt		Acpt	Appr
JEFFERSON ✓	BRS-51(9)--60-51	199890		BR	09/24/96	8/96 <sup>81000</sup>	To FHWA	App	Done	Done	Acpt	Out	Acpt	Appr
JOHNSON ✓	FM-52(42)--55-52		5	AC	06/04/96	6/96		App	Br	Done	Acpt		Acpt	
JOHNSON ✓	STP-S-52(37)--5E-52	203250		BR	06/04/96	6/96	Env Conc	App	Br	Done				
LINN ✓	FM-57(38)--55-57		2	G	07/09/96	7/96		App	Br	Done	Acpt		Acpt	Appr
LINN ✓	FM-57(39)--55-57		1	G	07/09/96	7/96		App	Br	Done	Acpt		Acpt	Appr
LINN ✓	FM-57(43)--55-57		2	AC	06/04/96	6/96								
LYON ✓	FM-60(45)--55-60		4	AC	07/09/96	7/96		App	Br	Done	Acpt		Acpt	Appr
LYON ✓	L-ACRES96--73-60		6	AC	07/09/96	7/96		App	Br	Done	Acpt		Acpt	Appr
MARION ✓	STP-S-63(39)--5E-63	240825		BW	06/04/96	6/96	Env Conc	App	Br	Done	Acpt		Acpt	
MILLS ✓	FM-65(42)--55-65		12	M	06/04/96	6/96		App	Br	Done	Acpt		Acpt	
MILLS ✓	FM-65(43)--55-65		5	ED	07/15/97	7/96		App	Br	Done	Acpt		Acpt	Appr
MILLS ✓	STP-S-65(33)--5E-65		10	ED	07/09/96	7/96	Env Conc	App	Br	Done	Acpt	App	Acpt	Appr

-New Form Developed by local systems

# Project Schedule Entering Form

TC Center <input type="text"/>	Co. - City Name <input type="text"/>	Br# <input type="text"/>	Proj. No. <input type="text"/>	Type <input type="text"/>	
Location <input style="width: 100%;" type="text"/>		Miles <input type="text"/>	STIP YR <input type="text"/>		

Est. Let <input type="text"/>	Let Date <input type="text"/>	STIP Limit <input type="text"/>	PE-FA <input type="text"/>	In House-FA <input type="text"/>	Forc. Act-FA <input type="text"/>
ROW-FA <input type="text"/>	Util. Reloc-FA <input type="text"/>	RR Agrm-FA <input type="text"/>	CE-FA <input type="text"/>	Constr.-FA <input type="text"/>	Total FA Cost <input type="text"/> \$0

Env. Status <input type="text"/>	Rec. Conc <input type="text"/>	To PP <input type="text"/>	To SHPO <input type="text"/>	Fr SHPO <input type="text"/>	To FHWA <input type="text"/>	Env. Conc. <input type="text"/>
-------------------------------------	-----------------------------------	-------------------------------	---------------------------------	---------------------------------	---------------------------------	------------------------------------

Prel Stat <input type="text"/>	In <input type="text"/>	TC App <input type="text"/>	Hyd <input type="text"/>	Hyd. Br. <input type="text"/>	Hyd. Out <input type="text"/>
<input type="radio"/> Recd <input type="radio"/> App			<input type="radio"/> Br <input type="radio"/> Done		

Str <input type="text"/>	Str. Br <input type="text"/>	Str. Out <input type="text"/>	Chk Stat <input type="text"/>	Chk. In <input type="text"/>	Chk. Out <input type="text"/>	Est/Let Amt. 000'S <input type="text"/>
<input type="radio"/> Br <input type="radio"/> Done			<input type="radio"/> Recd <input type="radio"/> Acpt			

Cont. Awd. <input type="text"/>	Agrm Stat <input type="text"/>	Agrm. Out <input type="text"/>	Agrm. App <input type="text"/>	Final <input type="text"/>	Pl. In <input type="text"/>	Pl. Out <input type="text"/>
<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Out <input type="radio"/> App			<input type="radio"/> Recd <input type="radio"/> Acpt		

ROW Par. <input type="text"/>	ROW Cert <input type="text"/>	ROW Recd. <input type="text"/>	ROW App. <input type="text"/>	Contractor <input style="width: 100%;" type="text"/>
<input type="radio"/> Recd <input type="radio"/> Appr				

435 <input type="text"/>	436 <input type="text"/>	Reimb. Amt <input type="text"/>	Retainage <input type="text"/>
-----------------------------	-----------------------------	------------------------------------	-----------------------------------

Original msg size  
 Fed and  
 TABS

NOT required?

- o - PRELIM INFO
- o - ENV. CLEARANCE STATUS
- o - CONCEPT REVIEW
- o - PRELIM PLANS
- o - CHECK/FINAL PLAN
- o - ROW/PROJ DEV
- o - BIDS & CONTRACT

need a class of project chart to show what steps are nec. for each one

# PROPOSED TPMS Directory structure

C:\

- TPMS                    Main TPMS directory
- XEQ                Subdirectory to hold program and system core data files
- USR                Subdirectory for user profile information
- DAT                Subdirectory for main data files
- LOG                Subdirectory for short and long term logs
- ARC                Subdirectory for archiving old projects
- MAP                Subdirectory for storing GIS maps of jurisdictions*
- NFO                Subdirectory for reference information files*
- PIC                Subdirectory for storing digitized images related to projects*
- TMP                Subdirectory for storing temporary files (esp. when INTERLIN
- ADM                Subdirectory reserved for server administration files

*Italics denotes long range items that won't be implement in first versions*

# PROPOSED TPMS File names and functions

B-2

C:\

TPMS

Main TPMS directory

<b>XEQ</b>	<i>Subdirectory to hold program and system core data files</i>	
	EXE files	TPMS primary executable files
	DLL files	TPMS library files
	TPS files	System operation parameters
<b>USR</b>	<i>Subdirectory for user profile information</i>	
	USRINFO.DAT	Record of user ID, location, system setup, etc.
	JURSLINK.TBL	Table showing links between user and others. Class of user. Upstream links, if any. Downstream links, if any.
<b>DAT</b>	<i>Subdirectory for main data files</i>	
	PROJLIST.DBF	Database of projects programmed for design, development, and construction
	PROJDVMT.DBF	Linked database containing project development info records
	PROJMAIL.DBF	Linked database to record all project related e-mail received or sent
	OKFORBR.DBF	Special database of bridges deemed eligible for BR & BROS funding. To be compiled and published by Office of Local Systems
	TGTDATES.DAT	Key deadlines and program activation dates for TPMS operation
<b>LOG</b>	<i>Subdirectory for short and long term logs</i>	
	TMPLOG.DBF	Database to record major system actions. To be used for review, security verification, and problem tracing
	SESSION.TXT	Special daily log maintained only until successful termination of work session
	USESTATS.DAT	Data file to count frequency of user of various system functions and files. Collects data to be used for later system refinements
<b>MAP</b>	<i>Subdirectory for storing GIS maps of jurisdictions</i>	
	COUNTYxx.DXF	
	CITYxxx.DXF	
	REGIONxx.DXF	??
<b>NFO</b>	<i>Subdirectory for reference information files</i>	
	CTYENGIM.HTM	
	LOCALSYS.HTM	
	CALENDAR.DAT	
<b>PIC</b>	<i>Subdirectory for storing digitized images related to projects</i>	
	COxxxxxy.GIF	
<b>TMP</b>	Subdirectory for storing temporary files (esp. when INTERLINKing)	
<b>ADM</b>	<i>Subdirectory reserved for server administration files</i>	
	USERSTAT.DBF	Database of usage statistics -- for each client user
	SYSSTATS.DAT	TPMS Server and client data: version in use, number of projects on file, size of files, system types, etc.
	PVPASSWD.DBF	Private (encrypted) passwords for all users
	PBPASSWD.DBF	Public passwords for all users
	PGMSTATUS	File to track status of pgm approval process - maintained by the server

*Italics denotes long range items that won't be implement in first versions*

JURSLINK TABLE CONCEPT SHEET

	Server	Lcl Agencies	MPO/RPA	DOT	Future
Server	1	99 + 50?	25	25	25

Local Agencies

Pottawattamie Co.	X	P PP S P	R M	OLS TC PS PP PM X X Y
Council Bluffs	X			

<Self>  
<Peer>

MPO / RPA

DOT - Dist. Plnns

DOT - Plng Svcs

DOT - Pgm Mgmt

DOT - OLS

DOT - Dist LSE's

DOT - Project Planing

(Future participants)

- Consultants
- SHPO?
- DNR/COE ?
- APA!
- ICPA

TPMS user's "domain" will consist of itself and related participants within TC & Region  
 JURSLINK will define the domain for each agency, jurisdiction, or firm.

Each cell right of the leftmost column will contain a coded string that defines how the entity corresponding to the column relates to the row's agency/jurisdiction.

Each coded string will record the following attributes:

- a) Agency type : Server, County, City, RPA, MPO, DOT..., other
- b) Relationship: Self, Peer, Source cust., Receiving cust.
- c) Project access authority: All, FM&FAS, FAS only
- d) Program action authority: Initiate, Approve, View only
- e) Field access authority: Lcl, Rgn, TCP, TC-LSE, PS, PM, PP, OLS
- f) Type of work authority: All, PCC ony, ACC only
- g)
- h)

The attributes will interact with "IF THEN", and "CASE" statements to control how TPMS software operates for each jurisdiction.

JURSLINK will also serve as the basis for permitting various e-mail options:

It will allow TPMS to automatically "know" who to send project based e-mail to: It will know which RPA belongs to a Local jurisdiction, what Counties are linked to a particular TC, etc.  
 It will permit broadcast mailings within a region, TC, or statewide -- to all or just to selected group.  
 It will permit non-project e-mail as well.

APPENDIX B-4a

PROJECT RECORD for TPMS Road Program

General Group title	Field #	Field Name	Type	Length	Description/Purpose	5yr Program	TIP's	Pick List Choices/or further info
<b>TPMS System ID code</b>	1a	TPMS ID number	Text	18	Gives unique ID to all jobs			Sponsor ID# + Yr started + Serial#
	1b	Date this project init	Date	10				
	1c	Date PN set	Date	10				
	1d	Date last local edit	Date	10				
	1e	Date last ext. update	Date	10				
	1f	Disposition code	Pick		Identify project status			New, Active, Inactive, Old, Delete
<b>Project sponsor info</b>	2a	Project sponsor ID	Text	24	Name of Sponsor			
	2b	Project sponsor type	Pick				TIP Column 14	City, County, DOT, RPA, RTA, MPO
	2c	County	Text	18	County of project		TIP Column 2	
	2d	City	Text	24	City of proj., if applicable		TIP Column 3	
	2e	RPA/MPO	Auto		ID's COG serving sponsor			
	2f	DOT TC	Auto		ID's TC linked to sponsor			
<b>Project identity</b>	3a	Official Project No.	Text	24	Set by DOT for FM/FAS	Col 1, Line 1	TIP Column 1	
	3b	Sponsor's Proj. ID	Text	12	Available for LJ use	Col 1, Line 2		
	3c	Project name	Text	32	Name or ID for project	Col 2, Line 1		
	3d	Project description	Text	32	General description	Col 2, Line 2		
	3e	Location / S-T-R	Text	32	Define location or give STR	Col 2, Line 3		
	3f	Route/Street ID	Text	18	Hwy 18, E23, or 1st Street		TIP Column 4	
	3g	Termini	Text	72	From .... to ....		TIP Column 6	
	3h	la DOT Fed Pgm ID#	Num	6			TIP Column 0	

General Group title	Field #	Field Name	Type	Length	Description/Purpose	5yr Program	TIP's	Pick List Choices/or further info	
<b>Program information</b>	4a	Traffic Count / AADT	Num	6	Current traffic volume	Col 3, Line 1			
	4b	Project length	Num	xx.yy	Miles / KM of road	Col 3, Line 2	TIP Column 5		
	4c	FHWA #	Text	6	Official SI&A structure #	Col 3, Line 3	TIP Column 18		
	4d	System	Pick		Identify system type	Col 4, Line 1		Local, FM, FAS	
	4e	5yr Pgm status	Pick		Tracks pgm status	Col 4, Line 2		New, Previous, Rescheduled	
	4f	\$ Day Labor	\$		Est. \$Amt of County crew wk	Col 5, Line 1			
	4g	Work type code	Num	3	DOT 300 series codes	Col 5, Line 2			
	4h	Type of Work	Pick	24			TIP Column 7	[derive pick list options from pre. STIP's]	
	4i	Special Fund source	Text	12	Identify largest spcl source	Col 5, Line 3			
	<b>Paving Points</b>	5a	Pvg Pts - AADT	Num	6	This section of the project record will hold data for computing the			
		5b	Pvg Pts - Func. Class	Pick					
5c		Pvg Pts - % Trucks	Num	2	Paving points number used to rank and justify paving jobs. This applies to Counties only				
5d		Pvg Pts - Detour Len.	Num	xx.y					
5e		Pvg Pts - Bonus	Num						
5f		Total Pvg Points	Num	3					
<b>Special Information</b>	6a	5yr pgm note	Memo	64	5yr pgm - link to last Col.				
	6b	TIP remark	Text	24	Text for TIP remark column		TIP: Last Col		
	6c	Latitude	Num		Future GIS/MAP link				
	6d	Longitude	Num		Future GIS/MAP link				
	6e	Joint financing?	Memo	64	ID 2nd jurisdiction				
	6f	Tied with another job?	Text		TPMS Serial # of other job				
<b>Cost/Pgm Yr / Funding</b>	7a	Est. Project cost	Num		Projected cost of construction contract				
	7b	Program target year	Num		Fiscal year in which project construction will start				
	7c	Primary Fund	Pick		ID fund from which pmts will be made			County Lcl, County FM, etc.	
	7d	Date Bd/Council Aprvl	Date						

Revenue sources

General	Field #	Field N	Type	Length	Description/P.5yr Program	TIP's
	8a1	LCL \$	Num		Local Jurisdiction \$	
	8a2	SpAssmt \$	Num		Special Asses. proceeds	
	8a3	FM \$	Num		Farm to market fund	
	8b1	RISE \$	Num		RISE pgm grant / loan	
	8b2	TSF \$	Num		Traffic Safety fund	
	8b3	IHRB \$	Num		Research Board funds	
	8b4	SBF\$	Num		State bridge funds	
	8b5	LRTF \$	Num		Lvg Roadside Trst fund	
	8b6	TJ \$	Num		Transfer of jurisdiction	
	8c1	STP S \$	Num		Surface Transportation Pgm	
	8c2	STP N \$	Num		RR Xing funds	
	8c3	STP 33E	Num		ISTEA enhancements	
	8c4	ER \$	Num		FAS emergency response\$	
	8c5	BR \$	Num		Fed bridge funds	
	8d1	FEMA \$	Num		FEMA disaster recovery\$	
	8d2	EWP \$	Num		NRCS Em. Wtrshd pgm \$	
	8d3	NRCS \$	Num		Other NRCS funds	
	8e1	Special \$ #1	Num		Three funds that may be custom defined by central server sysop	
	8e2	Special \$ #2	Num			
	8e3	Special \$ #3	Num			

General Group title	Field #	Field Name	Type	Length	Description/Purpose	5yr Program	TIP's	Pick List Choices/or further info
<b>State 5yr Pgm record</b>	<b>9</b>							
Next FY	a1	Date of Board apprvl	Date		Date pgm approved by Bd	From 7d		
SFY - 1	a2	Status code	Pick		Records state approval			Sent, Received, Approved, Denied
	a3	Status date	Date					
	a4	Amend status code	Pick		Records amend. action			Requested, Received, Approved, Denied
	a5	Amend status date	Date					
	a6	Pgm Year	Num	4		From 7b		
	a7	Lcl \$	Num			From 8a1		
	a8	FM \$	Num			From 8a2		
	a9	Spcl Fund \$	Num			7a - 8a1 - 8a2		
	a10	Spcl Fund ID	Text			From 4i		
Current FY	b1	Date of Board apprvl	Date		Date pgm approved by Bd			
SFY	b2	Status code	Pick		Records state approval			
	b3	Status date	Date					
	b4	Amend status code	Pick		Records amend. action			
	b5	Amend status date	Date					
	b6	Pgm Year	Num	4				
	b7	Lcl \$	Num					
	b8	FM \$	Num					
	b9	Spcl Fund \$	Num					
	b10	Spcl Fund ID	Text					
Previous FY	c1	Date of Board apprvl	Date		Date pgm approved by Bd			
SFY + 1	c2	Status code	Pick		Records state approval			
	c3	Status date	Date					
	c4	Amend status code	Pick		Records amend. action			
	c5	Amend status date	Date					
	c6	Pgm Year	Num	4				
	c7	Lcl \$	Num					
	c8	FM \$	Num					
	c9	Spcl Fund \$	Num					
	c10	Spcl Fund ID	Text					
	d	Current SFY	Num	4				

General Group title	Field #	Field Name	Type	Length	Description/Purpose	5yr Program	TIP's	Pick List Choices/for further info
<b>RTIP/STIP Record</b>	<b>10</b>							
Next FY FFY - 1	a1	Region TIP Status	Pick					Submitted, Received, Approved, Denied
	a2	Region TIP Date	Date	10				
	a3	State TIP Status	Pick					
	a4	State TIP Date	Date	10				
	a5	Yr Programmed	Num	4				
	a6	Total cost					From 7b	
	a7	Local match \$					From 7a	
	a8	FHWA \$					From 7a - 8c	
	a9	Type of FHWA \$					From 8c	
Current FY FFY	b1	Region TIP Status	Pick					Submitted, Received, Approved, Denied
	b2	Region TIP Date	Date	10				
	b3	State TIP Status	Pick					
	b4	State TIP Date	Date	10				
	b5	Yr Programmed	Num	4				
	b6	Total cost						
	b7	Local match \$						
	b8	Fed \$						
	b9	Fed Fund used						
Previous FY FFY + 1	c1	Region TIP Status	Pick					Submitted, Received, Approved, Denied
	c2	Region TIP Date	Date	10				
	c3	State TIP Status	Pick					
	c4	State TIP Date	Date	10				
	c5	Yr Programmed	Num	4				
	c6	Total cost						
	c7	Local match \$						
	c8	Fed \$						
	c9	Fed Fund used						
	d	Current FFY	Num	4				

General Group title	Field #	Field Name	Type	Length	Description/Purpose	5yr Program	TIP's	Pick List Choices/or further info
Links to other data	11							
	a	Map data						
	b	Digital images						
	c	Scanned Docs						
	d	TPMS e-mail						
Other items	12							
	a							
	b							
	c							
	d							
	e							
f								

sb\_tpms\filespec.wk4 : project rcd format

Main Menu - ICEA TPMS

(A) Project Programming

(B) Project Development

Project Forms

Project Finance

INTERLINK

MapLink

Instructional memorandums

Administrative Functions

TPMS Utilities

Exit TPMS

*Future*

(D)

**Iowa County Engineers Association**

**Transportation Program Management System**  
 (c) 1997/98 by ICEA

Developed with Acme software tools V3.2

**Menu item descriptions**

*This box will display a short description of the operations and subfunctions available for the currently selected menu button*

NEWS	(C) E-MAIL
------	------------

**System Status**

No. Projects on file : xxx	Disk capacity available: xxxkb
Last INTERLINK : mm/dd/yyyy	Current State FY : 1997
Changes since then? Yes/No	Current Federal FY : 1997

*Buttons for selecting which FY is in view*

Main menu item: 1-PROJECT PROGRAMMING

Sub-screen: a: Simple Project list - one per line

TPMS													
Project Program action Find Filter Sort E-mail Print Export													
Project List		Std 5yr Pgm		RTIP		STIP		BR eligibility		Single Project		Pgm X-Ref	
FY99		PREV		Current		NEXT				*****			
No.	Local Proj. ID	Official Project Number			Project name			Tgt Yr	5yr stat	RTIP	STIP	STIP#	
1	96J	SN-6189(2)--51-36			J-10 PCC Paving			1998	AP	IP	NA		
2*	OC-210	LCL-734009--BR202			Otter Creek Bridge rehab								
Note: Star, "*", will indicate unread e-mail for project													
R/O/Y/G color codes will show pgm status Red = no action Orange = submitted Yellow = received by reviewer Green = Approved													
TPMS V. 3.12      Sort : ON      Filter : OFF      Rcd # 0001      xxx Rcds of yyyy currently in view													

CEA TPMS						
Project Program action Find Filter Sort E-mail Print Export						
Project List	Pgm XRef	Std 5yr Pgm	RTIP	STIP	BR eligibility	Single Project
Project No.	STP-S-65(34)--53-65		TPMS ID:			
Project Name	H-12 Edgedrain installation		STIP #			
Sponsor	Mills County		Type Wk:			
RPA/ MPO :	MAPA, Omaha, NE		System:			
Trans. Ctr.	Southwest Iowa TC		Fund:			
<b>Program years</b>						
	Previous	Current	Next			
	FY 97	FY 98	FY 99			
Pgmd For:	1998	1999	1999			
5Yr Pgm Stat:	Out of date	Effective	Approved	7-1-98	Dates show when programs become effective	
RTIP Status :	Effective	Approved NYE	In Review	10-1-98		
STIP Status :	Effective	Approved NYE	No action	10-15-98		
	NO	YES	YES			
	BR Eligibility					
Linked projects:	<input type="text"/>			Linked sponsor:	<input type="text"/>	
When originated	<input type="text" value="mm/dd/yyyy"/>					
TPMS V. 3.12      Sort : ON      Filter : OFF      Rcd # 0001      xxx Rcds of yyyy currently in view						

ISPA TPMS						
Project Program action Find Filter Sort E-mail Print Export						
[1st 12vw]		[2nd 12vw]		[3rd 12vw]		< >
Project List	Pgm XRef	Std 5yr Pgm	RTIP	STIP	BR eligibility	Single Project
#	Project Number Local Project ID	Project Name Description of Work Twp/Rng/Sec - Location	AADT Length (km) FHWA #	System Fund Type Work	\$Day Labor Est. \$Cost Status	
1	SN-6189(2)--51-36 96J	J-10 PCC paving project Grade and 7" PCC pave 71-42-33 : West of Tabor, Ia	340 6.5 N/A	FAS FM/STP 367	\$0 \$1,200,000 Prev	
2	FM-65(39)--55-65 94T L-45	Dutch Boyer Dirt RCB replace Install 96" CMP culvert 73-42-32 2mi N. of H-20	300 0.1 N/A	FM FM/FEMA 331	\$500 \$87,000 New	
3	EWP-309-103 93X BR 271630	Mud Creek Stream stabilization Build in-stream grade control 73-41-25 / 200 ft S. of bridge	35 0 242560	Local LCL/EWP 384	\$0 \$120,000 Prev	
TPMS V. 3.12      Sort : ON      Filter : OFF      Rcd # 0001      xxx Rcds of yyyy currently in view						



ICEA TPMS						
Project	Program action	Find	Filter	Sort	E-mail	Print Export
						< < * * * * > >
Project List	Pgm XRef	Std 5yr Pgm	RTIP	STIP	BR eligibility	Single Project
County	City	Route/Street	Length	Project Termini	Type of Work	
Cerro Gordo	Mason City	12th Street NW	5.2	Plymouth Road to Cal Avenue	ACC Resurfacing	
Project	Add		Sort	By predefined categories		
	Edit			Set custom sort		
	Remove			Recall custom sort		
	Close					
Pgm action	Submit		E-mail	Memo to file		
	Approve 5Yr pgm			Memo to addressee		
	Approve STIP			Delete		
Find			Print	To printer		
				To text file		
Filter	By pre-defined criteria			Export	As displayed	
	Set custom filter				Entire file	
	Recall saved filter					
	Select Program Year(s)					
TPMS V. 3.12      Sort : ON      Filter : OFF      Rcd # 0001      xxx Rcds of yyyy currently in view						

*SAMPLE  
MENU  
COMMANDS*



IDEA TPMS							
Project	Program action	Find	Filter	Sort	E-mail	Print	Export
Project List	Pgm XRef	Std 5yr Pgm	RTIP	STIP	BR eligibility	Single Project	
Project ID	5yr Pgm data	Special Info	Prop. Funding	5yr pgm fields	TIP pgm fields	Misc	
<p>This screen will use seven sub-tabs to display all data about a single project                      If will also serve as the input screen for a new job.                      When entering a new job, the software will guide the user through all tabs                      and require inputs in all appropriate fields.</p>							
<p>TPMS V. 3.12      Sort : ON      Filter : OFF      Rcd # 0001      xxx Rcds of yyyy currently in view</p>							

TPMS Development Record

General Group title	Field #	Field Name	Type	Length	Description/Purpose	Pick List Choices/or further info
TPMS System ID code	1a	TPMS ID number	Text	18	Gives unique ID to all jobs	Sponsor ID# + Yr started + Serial#
	1b	Date last local edit	Date	10		
	1c	Date last ext. update	Date	10		
	1d	Disposition code	Pick		Identify project status	New, Active, Inactive, Old, Delete
Project sponsor info	2a	Project sponsor ID	Text	24	Name of Sponsor	
	2b	County	Text	18	County of project	
	2c	City	Text	24	City of proj., if applicable	
Project identity	3a	Official Project No.	Text	24	Set by DOT for FM/FAS	
	3b	Sponsor's Proj. ID	Text	12	Available for LJ use	
	3c	Project name	Text	32	Name or ID for project	
	3d	Project description	Text	32	General description	
	3e	Location / S-T-R	Text	32	Define location or give STR	
	3f	STIP ID for FA proj	Num	8	Cross ref. to RTIP/STIP ID's	
	3g	FHWA#	NUM	8	FHWA bridge ID number	
	3h	Primary pay fund	Pick	8	Lcl, FM, City	
	3i	Route Class	Pick	8	Lcl, FM, FAS, StHwy, Street	
Program status	4a	Tgt Yr - St. 5 Yr Pgm	Num	4		
	4b	Tgt Yr - RTIP	Num	4		
	4c	Tgt Yr - STIP	Num	4		
	4d	BR Pgm Eligible?	Y/N	1		

user checklist

General Group title | Field # | Field Name | Type | Length | Description/Purpose | Pick List Choices/for further info

**Development Status**

5a1	Project Design	Auto		Pending, In process, Complete
5a2	Status rcd date	Date		Date last updated by project sponsor
5b12	Clearances	A & D		Record status of environmental clearance reviews
5c12	Project Concept	A & D		Record permit application status
5d12	Preliminary Plans	A & D		Record prelim. plan review status
5e12	Permits	A & D		Record status of permit applications
5f12	Bridge & Structure	A & D		Hydraulic & Structural review status
5g12	Check Plans	A & D		Check plan review status
5h12	Final Plans	A & D		Final Plan review status
5j12	ROW-Proj. Dev.	A & D		Proj dev./ROW acq. status
5k12	Approved for Letting	A & D		Notes when job approved to be let
5l12	Const. Contract	A & D		Notes status of construction contract

**Federal Aid Auth.**

Edited only by OLS

6a	STIP LIMIT	\$	12	
6b	STIP YEAR	Num	4	
6c	Consultant FA	\$	12	
6d	In House Eng. FA	\$	12	
6e	ROW FA	\$	12	
6f	Utility Reloc. FA	\$	12	
6g	RR Agreement FA	\$	12	
6h	Force Account FA	\$	12	
6i	Const. Eng. FA	\$	12	
6j	Const. Contract FA	\$	12	

General Group title	Field #	Field Name	Type	Length	Description/Purpose	Pick List Choices/or further info
<b>Project Information</b>	7a	Route ID	Text	24		
	7b	AADT	Num	6		
	7c	System	Text	8		
	7d	Roadway length	Num	5		
	7e	Local Struct. ID	Text	12		
	7f	Structure type/ if any	Text	12		
	7g	Type of Work	Text	12		
	7h	Fund Info	Text	12		
	7i	STIP Status	Tggle	8		
<b>Project Responsibility</b>	8a	Survey by:	Text	15		
	8b	Design by:	Text	15		
	8c	Arch. Study by:	Text	15		
	8d	Borings by:	Text	15		
	8e	ROW by	Text	15		
<b>Work Status</b>	9a1	Surveys	Pick	12	Not Started, In process, complete	
	9a2	Svy status rcd date	Date	10	Date status set	
	9b	Design	P & D			
	9c	Archaeology	P & D			
	9d	Borings	P & D			
	9e	Svy & Eng. progress	Pick	12	0, 25, 50, 75, 100	

General Group title	Field #	Field Name	Type	Length	Description/Purpose	Pick List Choices/or further info
<b>Clearance Chk Status</b>	10a1	Wetlands check	Pick	12		
	10a2	rcd status date	Date	10		
	10b	Section 404 Permit Chk	P & D	12/10		
	10c	Farmland prot. chk	P & D	12/10		
	10d	Airport proximity chk	P & D	12/10		
	10e	4f/LAWCON lands?	P & D	12/10		
	10f	Need for EAS chk	P & D	12/10		
	10g	Flood zone check	P & D	12/10		
<b>Arch-Hist work status</b>	11a1	Arch. Phase 1 study	Pick	12		
	11a2	rcd status date	Date	10		
	11b	Arch. Phase 2 study	P & D	12/10		
	11c	Arch. Phase 3 study	P & D	12/10		
<b>Arch progress dates</b>	12a	Date sent to DOT	Date	10		
	12b	Sent to Proj. Planning	Date	10		
	12c	Sent to SHPO	Date	10		
	12d	Returned by SHPO	Date	10		
	12e	Sent to FHWA	Date	10		
	12f	Env. Concurrence Rcd Date		10		

General Group title	Field #	Field Name	Type	Length	Description/Purpose	Pick List Choices/or further info
<b>Level of Svc Selection</b>	13a	Primary design guide				
	13b	Secondary design gd				
	13c	Paving pts				
<b>Concept Statement</b>	14a1	Local Action status				
	14a2	rcd status date				
	14b	TC action status				
	14c	OLS action status				
<b>Proj. Design checks</b>	15a1	UAC bridge analysis				
	15a2	rcd status date				
	15b	Brdg railing check				
	15c	Design xcptn check				
	15d	Section 404 pmt				
<b>Preliminary Plans</b>	16a1	Local action status				
	16a2	rcd status date				
	16b	TC action status				
	16c	OLS action status				

TPMS														
Project Filter Sort E-mail Print Export														
Project List Dev. Status Info & Dsgn Clearances Conc / PP Brdg / Pmts Chk/Final ROW / Bids Const/Misc														
* * * * *														
Stat	Sponsor	Official Project Number	Project name	Dsgn	Arch	Con	Prlm	Brdg	Pmts	Chk	Final	ROW	Bids	Cont
Ahd	Mills Cty	SN-6189(2)--51-36	J-10 PCC Paving											
OK	Mills Cty	LCL-734009--BR202	Otter Creek Bridge rehab											
Late														
Menu commands:														
Project a) Open Dev. Rcd b) Deactivate c) Close out														
Filter a) Select Preset criteria b) Recall c) Set d) Apply														
Sort a) Select Preset criteria b) Recall c) Set d) Apply														
E-mail a) To file b) To address c) View/Set address list														
Print a) Single project b) Std Report c) Detailed report														
Export a) to DBF b) to Spreadsheet c) as text														
TPMS V. 3.12 Sort : ON Filter : OFF Rcd # 0001 xxx Rcds of yyyy currently in view														

Status column will show "Ahead" as Green, "OK" as Yellow, and "Late" as Red .

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Dev. Status items will be Not started (Red)  
In process (Yellow), Done (Green)

ES-10

ICEA TPMS

Project Filter Sort E-mail Print Export

Project List Dev. Status Info & Dsgn Clearances Conc / PP Brdg / Pmts Chk/Final ROW / Bids Const/Misc

PN:   
 Name:

FHWA #  Funding   
 STIP #  Funct. Class

**PROJECT DEVELOPMENT**

**PROJECT Information**

DEVELOPMENT STEPS	STATUS	Action date	Due dates	Project participants
1 Project Design		mm/dd/yyyy		Project co-sponsor
2 Cultural Resource Clmcs		mm/dd/yyyy		Linked project
3 Project concept review		mm/dd/yyyy		
4 Preliminary Plans		mm/dd/yyyy		
5 Permits		mm/dd/yyyy		City
6 Bridge Hyd & Struct. rw		mm/dd/yyyy		County
7 Check Plans		mm/dd/yyyy		
8 Final Plans		mm/dd/yyyy		
9 ROW / Project dev.		mm/dd/yyyy		RPA / MPO
10 Approved for letting		mm/dd/yyyy		DOT TC
11 Construction contract				

*IDENTIFIED FOR TARGET BID DATE 5/12/20*

TARGET BID DATE:  Progress:   
 Letting type:

Status settings : Not started / In Process / Done  
 RED YELLOW GREEN

IPEA TPMS								
<b>Project Filter Sort E-mail Print Export</b>								
Project List	Dev. Status	Info & Dsgn	Clearances	Conc / PP	Brdg / Pmts	Chk/Final	ROW / Bids	Const/Misc
PN :				FHWA #		Funding		
Name :				STIP #		Funct Class		
<b>Project Information</b>				<b>PROJECT DESIGN Information</b>				
<b>ROUTE</b>				<b>PROJECT RESPONSIBILITIES</b>				
Name/ID:		L-68 / 330th Street		Survey by:				
AADT:		250		Design by:				
System		FAS		Arch. by:				
Proj. Len.		0.05		Borings by:				
				ROW by:				
<b>STRUCTURE</b>				<b>WORK STATUS:</b>				
Local ID:		330657		Surveys		mm/dd/yyyy		
FHWA#		245694		Design		mm/dd/yyyy		
Type:		HT bridge		Arch.		mm/dd/yyyy		
<b>PROJECT</b>				Borings		mm/dd/yyyy		
Type Work		Deck Ovly		ROW		mm/dd/yyyy		
Fund		FM-BRS						
STIP status		FY						
				<b>1 Svy &amp; Design status</b>		mm/dd/yyyy		
<i>(MANUALLY SET BY LOCAL AGENCY)</i>								

IDEA TPMS																													
Project Filter Sort E-mail Print Export																													
Project List		Dev. Status		Info & Dsgn		Clearances		Conc / PP		Brdg / Pmts		Chk/Final		ROW / Bids		Const/Misc													
PN:										FHWA #						Funding													
Name:										STIP #						Funct. Class													
<b>Local agency envr. item research</b>										<b>ENVR. CLEARANCE PROCESS</b>																			
Local agency pre-design checklist										ARCH, HIST, & CULTURAL RESOURCES																			
Wetlands Assessment:										<input type="text"/>		mm/dd/yyyy								Arch. Phase 1 review		<input type="text"/>		mm/dd/yyyy					
Section 404 Permit										<input type="text"/>		mm/dd/yyyy								Arch. Phase 2 review		<input type="text"/>		mm/dd/yyyy					
Farmland prot. review										<input type="text"/>		mm/dd/yyyy								Arch. Phase 3 review		<input type="text"/>		mm/dd/yyyy					
Arlport within 2 mi. ?										<input type="text"/>		mm/dd/yyyy								Submitted to laDOT		<input type="text"/>		mm/dd/yyyy					
4f / LAWCON land?										<input type="text"/>		mm/dd/yyyy								Sent to Proj. Planning		<input type="text"/>		mm/dd/yyyy					
Env. Impact Study?										<input type="text"/>		mm/dd/yyyy								Sent to SHPO		<input type="text"/>		mm/dd/yyyy					
Located in Flood Zone?										<input type="text"/>		mm/dd/yyyy								Returned from SHPO		<input type="text"/>		mm/dd/yyyy					
																				Sent to FHWA		<input type="text"/>		mm/dd/yyyy					
																				Approved by FHWA		<input type="text"/>		mm/dd/yyyy					
																				2 Env. Conc. status		<input type="text"/>		mm/dd/yyyy					
																				(manually set by ALS)									

Not checked, In process, Not needed, Action Rqd.

NOT STARTED  
IN PROCESS  
DONE

ISBA TPMS

Project Filter Sort E-mail Print Export

Project List Dev. Status Info & Dsgn Clearances Conc / PP Brdg / Pmts Chk/Final ROW / Bids Const/Misc

PN:   
 Name:

FHWA #  Funding   
 STIP #  Funct Class

**CONCEPT REVIEW**

**LEVEL OF SERVICE SELECTION**

Primary Design Guide   
 Secondary Design Guide   
 Paving Pts.   
 AADT (Current)

**CONCEPT STATEMENT**

Local Action  mm/dd/yyyy  
**TC Action**  mm/dd/yyyy  
 OLS Action  mm/dd/yyyy

3 **Concept status** :  mm/dd/yyyy  
 (AUTO)

Note: Lcl Pick codes: No action, In process, Done, Submitted  
 TC Pick codes: Waiting, Received, Approved, Exception  
 OLS Pick codes: N/A, Xcptn rc'd, Xcptn Appr.

**PRELIM PLANS**

**PRELIMINARY DESIGN CHECKLIST**

UAC Bridge analysis  mm/dd/yyyy  
 Bridge railing analysis  mm/dd/yyyy  
 Design xcptn analysis  mm/dd/yyyy  
 Section 404 Permit  mm/dd/yyyy

**PLAN SUBMISSION AND REVIEW STATUS**

Project sponsor action:  mm/dd/yyyy  
**Transp. Center action**  mm/dd/yyyy  
 Office of Local Systems  mm/dd/yyyy

4 <sup>(AUTO)</sup> **Prelim. Plan status** :  mm/dd/yyyy  
 Federal Aid agreement  mm/dd/yyyy

SBA TPMS							
<b>Project   Filter   Sort   E-mail   Print   Export</b>							
Project List	Dev. Status	Info & Dsgn	Clearances	Conc / PP	Brdg / Pmts	Chk/Final	ROW / Bids   Const/Misc
PN : <input style="width:90%;" type="text"/> Name : <input style="width:90%;" type="text"/>				FHWA # <input style="width:90%;" type="text"/> Funding <input style="width:90%;" type="text"/> STIP # <input style="width:90%;" type="text"/> Funct. Class <input style="width:90%;" type="text"/>			
<b>BRIDGE INFORMATION</b>				<b>BRIDGE REVIEWS</b>			
Bridge Rating Information				BRIDGE/CULVERT FORM Preparation checklist			
Sufficiency Rating		46		Det. of need for 404 pmt:		<input style="width:100%;" type="text"/> mm/dd/yyyy	
Priority points		82		Section 404 Checklist		<input style="width:100%;" type="text"/> mm/dd/yyyy	
Load Posting		20T		Ia DOT Form 1-E		<input style="width:100%;" type="text"/> mm/dd/yyyy	
SI&A Status		SD & FO		Risk Assessment form		<input style="width:100%;" type="text"/> mm/dd/yyyy	
Flood Study ID		<input style="width:100%;" type="text"/>		Site Photos		<input style="width:100%;" type="text"/> mm/dd/yyyy	
				Hydraulic calculations		<input style="width:100%;" type="text"/> mm/dd/yyyy	
<b>PERMITS</b>				<b>STRUCTURE REVIEW RECORD</b>			
PERMIT APPLICATION AND APPROVAL				<i>Hydraulic Review</i> <input style="width:100%;" type="text"/> mm/dd/yyyy			
Iowa DNR		<input style="width:100%;" type="text"/> mm/dd/yyyy		<i>Structural Review</i> <input style="width:100%;" type="text"/> mm/dd/yyyy			
Corps of Engineers		<input style="width:100%;" type="text"/> mm/dd/yyyy		Design Number: <input style="width:100%;" type="text"/>			
Section 404 pmt		<input style="width:100%;" type="text"/> mm/dd/yyyy					
Wetland mitigation plan		<input style="width:100%;" type="text"/> mm/dd/yyyy					
Local Agency permits		<input style="width:100%;" type="text"/> mm/dd/yyyy					
<b>5 Overall permit status</b> <input style="width:90%;" type="text"/> mm/dd/yyyy (MANUALLY SET BY LOCAL AGENCY)				<b>6 Struct. Review stat.</b> <input style="width:90%;" type="text"/> mm/dd/yyyy (AUTO)			

IDEA TPMS										
Project Filter Sort E-mail Print Export										
Project List	Dev. Status	Info & Dsgn	Clearances	Conc / PP	Brdg / Pmts	Chk/Final	ROW / Bids	Const/Misc		
PN :					FHWA #		Funding			
Name :					STIP #		Funct Class			
<b>CHECK PLANS</b>					<b>FINAL PLANS</b>					
<b>CHECK PLAN Preparation checklist</b>					<b>FINAL PLAN Preparation checklist</b>					
Bid Item selection		<input type="text"/>	mm/dd/yyyy			Final PS&E		<input type="text"/>	mm/dd/yyyy	
Estimate Reference set		<input type="text"/>	mm/dd/yyyy			Estimated Cost		<input type="text"/>	mm/dd/yyyy	
Special provisions		<input type="text"/>	mm/dd/yyyy			Engineer's Certification		<input type="text"/>	mm/dd/yyyy	
Detour / Traffic plan		<input type="text"/>	mm/dd/yyyy			Board/Council Approval		<input type="text"/>	mm/dd/yyyy	
Permits listed on plans?		<input type="text"/>	mm/dd/yyyy			Check Plan followup		<input type="text"/>	mm/dd/yyyy	
Final Special Provisions		<input type="text"/>	mm/dd/yyyy					<input type="text"/>	mm/dd/yyyy	
<b>CHECK PLAN REVIEW</b>					<b>FINAL PLAN REVIEW</b>					
Project sponsor action		<input type="text"/>	mm/dd/yyyy			Project sponsor action		<input type="text"/>	mm/dd/yyyy	
<b>DOT TC action</b>		<input type="text"/>	mm/dd/yyyy			<b>DOT OLS action</b>		<input type="text"/>	mm/dd/yyyy	
DOT OLS action		<input type="text"/>	mm/dd/yyyy					<input type="text"/>		
<b>7 Check Plan Status</b>		<input type="text"/>	mm/dd/yyyy			<b>8 Final Plan Status</b>		<input type="text"/>	mm/dd/yyyy	
(AUTO)						(AUTO)				

CEA TPMS										
Project Filter Sort E-mail Print Export										
Project List	Dev. Status	Info & Dsgn	Clearances	Conc / PP	Brdg / Pmts	Chk/Final	ROW / Bids	Const/Misc		
PN:					FHWA #		Funding			
Name:					STIP #		Funct Class			
PROJECT CONSTRUCTION					DOT- Office of Local Systems					
11 CONSTRUCTION RECORD					FEDERAL AID AUTHORIZATIONS					OLS use only
Work completed				mm/dd/yyyy		STIP LIMIT				
<b>Form 435 action</b>						STIP YEAR				
<b>Form 436 action</b>						Consultant FA				
<b>Final Amount</b>						In House Eng. FA				
<b>Reimb. Amount</b>						ROW FA				
<b>Retainage</b>						Utility Reloc. FA				
<b>TC Audit status</b>				mm/dd/yyyy		RR Agreement FA				
<b>Final Payment status</b>				mm/dd/yyyy		Force Acct FA				
						Const. Eng. FA				
						Constr. Contr. FA				

## PROJECT, PROGRAMMING, PREPARATION, REVIEW AND APPROVAL PROTOCOL

A key challenge in the implementation of TPMS is handling project programming. This process is a repeating annual cycle of events. It involves three different types of Road-project programs put together by three different types of organizations and done at multiple locations at different times. The software has to be able to accommodate this and act as a funneling mechanism that takes the raw inputs from the project sponsor organizations and transmits it to the review organizations in proper sequence and then finally notifies the original sponsors when the programs are approved. Then it has to be a mechanism where by the programs become effective at specific points in the year.

This section outlines the basic annual protocol that will followed and identifies who will perform what roles and in what sequence. Fundamentally, there are two program processes:

- a) for the State five year program
- b) for the Federal Aid project programs

The former has to be approved by a single office in the State DOT, (Planning Services), while the later needs approval from Regionals, DOT Field planners, and DOT Project Programming. To accommodate this, we propose to build three-step fields groups for State program and for Federal Aid programs.

The field groups will record the previous fiscal year, (ie. most recently expired), the current fiscal year, and the next fiscal year. These triplicate data items will be embedded in the overall project programming record and will be used to "snapshot" key information out of the main record when the local jurisdiction electronically submits the projects for approval. The Interlink process will then transfer the records to the appropriate approval authorities who will stamp their approval electronically on the next-year fields.

DEA TPMS

Project Filter Sort E-mail Print Export

Project List Dev. Status Info & Dsgn Clearances Conc / PP Brdg / Pmts Chk/Final ROW / Bids Const/Misc

PN: [ ]  
Name: [ ]

FHWA # [ ] Funding [ ]  
STIP # [ ] Funct. Class [ ]

Project Development

Bid Preparations

ROW and PROJECT DEV. PROGRESS checklist

BID LETTING INFORMATION

Number of parcels: [ ]  
Plats and Legals [ ] mm/dd/yyyy  
Appraisals [ ] mm/dd/yyyy  
Notifications [ ] mm/dd/yyyy  
Negotiations [ ] mm/dd/yyyy

Target Bid date: [ ]  
Type of Project : [ ]  
To be let by: [ ]

# Parcels by Em. Domain [ ]  
Condemnation date: [ ]  
No. relocations required: [ ]  
Utility Relocation agrmnts [ ] mm/dd/yyyy

10 Submitted for Letting [ ] mm/dd/yyyy  
*(MANUALLY SET BY OLS)*  
Late Start date [ ]  
Work days [ ]  
Liquidated damages [ ]  
DBE percentage [ ]  
Davis Bacon? [ ]

ROW & UTILITY CERTIFICATION

LETTING RESULTS

Project sponsor action [ ] mm/dd/yyyy  
DOT OLS action [ ] mm/dd/yyyy

Low bidder [ ]  
Amount: [ ]

9 Row/Pr. Dev. Status [ ] mm/dd/yyyy  
AUTO

11 Contract Status [ ] mm/dd/yyyy  
*(MANUALLY SET BY TC)*

## TPMS Specification : Appendix

After that is done and approvals have been obtained for the State Five Year, Federal Aid Regional, Federal Aid State programs, the approvals will remain latent until effectiveness trigger dates occur. Upon arriving at a trigger date, the TPMS System will copy the current year into the previous, and the next year into the current, thereby automatically activating a new fiscal year.

The protocol enumerated below explains this process in more detail.

- **Step One:**

Local jurisdiction projects sponsors can enter/edit/update/delete projects at any time. This means that they can add a new one or update an old one. They can do this in the part of the project record that belongs to them; however, the officially approved program will not be changed.

- **Step Two:**

Each spring the TPMS Sysopp, in consultation with ICEA, the DOT, and the Regions, will set key dates in the TPMS calendar:

- (a) The opening date for program submission.
- (b) The last date for program submission.
  
- (c) The target date for five year program approval.
- (d) Target date for regional TIP approval.
- (e) Target date for State TIP approval.
  
- (f) Effective date for Five Year Program.
- (g) Effective date for the TIPS.

These date will govern and sequence the activities of the participants in the project identification, submission, and approval process. Unless unforeseen complications dictate otherwise this sequence of dates intends that the Five Year Program must be approved before the Regional TIP can be approved. And, likewise, the Regional TIP must be approved before the STIP can be approved.

TPMS Specification : Appendix

- **Step Three:**

Local jurisdictions will submit their programs for review by selecting the program menu item in TPMS for "Program" and selecting "Submit program" from the sub-menu. At this point the system will copy a "snapshot" of the client's program data from the areas table reserved for the local sponsor into the part of the record that is reserved for project reviewer action. Once the data has been copied over, the local jurisdiction will not longer be able to touch or change it except by repeating by the submission process.

Once they have activated the submission TPMS will transmit this to the Server upon the next Interlink. Then next time the a reviewer Interlinks, the data will be passed on to them. Thus, in a two step process, the proposed program will migrate from local jurisdiction to the DOT Office Planning Services , MPO's, RPA's, etc.

- **Step Four:**

The office of Planning Services must act first. It will review and evaluate the programs submitted by each local jurisdiction. They will handle this by having a mechanism to mark individual projects as Approved or Denied. Then they will access the program menu item for "Program" and select "Approve Program" from the sub-menu.

At the next Interlink session, the approvals will be passed back to the main Server. As other Interlinks take place, this information will be communicated back to the local jurisdiction and out to the MPOS and RPAS.

- **Step Five:**

Once the projects have received State Program approval, TPMS will permit the Regional Planning affiliations and MPO's to review and approve projects for their Regional Transportation Improvement Plans. The process will be the same of Office Planning Services.

## TPMS Specification : Appendix

- **Step Six:**

Once both the State Five Year Program and the Regional Program parts have been approved, the records will be opened for State Transportation Program approval. The intention is for these records to migrate to a computer that will be established in the DOT Office of Project Planning and the staff of that office will be authorized to review and execute project approvals at the State TIP level.

- **Step Seven:**

After Five Year Program has been approval has been received, it will remain latent and ineffective while the current year continues in effect. However at the date entered by the SysOp, usually July 1st of each year, the TPMS systems will automatically copy the current year to previous and next year to the current automatically -- activating the next years project program approval. This step may take place before either steps five or six of the Federal process are completed.

- **Step Eight:**

The RTIP and STIP programs will go into effect the same way as the State Five Year Program, only at a later date. Usually this will be October 1st, but could be later depending on FHWA and congressional action.

- **Amendments**

From time to time it becomes necessary to ammend a previously approved program before the fiscal year has run its course. We propose that TPMS handle this using the same system as for original project approvals . The local jurisdiction will edit the project or add a new project, depending on the circumstance, then go to the program menu item and select submit amendment. This will only be possible after the original Five Year Program, RITP and STIP approvals have been completed.

TPMS Specification : Appendix

When the local jurisdiction takes action, they will be asked to mark those projects that are to be candidates for amendment and the proposed changes will be snapshotted into the next program year fields for those projects. The projects will then go through the State and Federal project review sequence as needed .

When the final approved record returns to the original sponsor it will be placed into effect immediately by copying the amendment data record from the next year record immediately into the current period but unlike normal project approval the current won't be copied on over to the previous and will only affect those projects specifically identified for amendment .

After a project has been approved developed and let for construction TPMS will permit the local sponsor to enter the bid date contractor and amount. Once this occurs the project will be automatically deactivated and removed from inclusion in future programs.

## Protocol for TPMS Interlink Work Session.

This outline lists the sequence of steps that will take place when a TPMS client computer contacts the TPMS Server for an interlink session.

### 1. ACTIVATION OF INTER LINK SESSION

TPMS work sessions will be initiated by client systems. The user will have three options to select from:

- (a) to initiate an immediate Interlink attempt, overriding all other options.
- (b) to set the system to make an Interlink attempt later in the current day.
- (c) to set an automatic day of week and time of day trigger that will initiate Interlink connect attempts repeatedly until they succeed .

To perform Interlinks, the user will click the Interlink menu item and bring up the sub-menu of Interlink options. The user will choose immediate Interlink, time delayed, or automatic link, and then work through the appropriate dialogue boxes to set the specifics for the option selected.

The TPMS central server will always operate in host mode, waiting for contact for a Client. It will never dial out to a Client nor will any Client ever dial another Client. All Interlink transfers must pass through the server.

### 2. LOG ON PROCEDURE

When the process is activated, the TPMS software will commence the Interlink protocol to contact the server and exchange data with it. Although we anticipate that all Interlinks will someday occur via the Internet, direct dial-up connection must be used at first. This will permit debugging and refining the Interlink concept before trying to enable multiple telecommunication technologies. (When we do migrate to use of the Internet, each client preference outline will have to contain a notation as to which connection method they elect to be their primary mode.

TPMS SPECIFICATION -- Appendix

The rest of this outline is written presuming the work session goes through a direct dial up procedure . Therefore the protocol may be need to be modified for Internet use.

- Log on sequence

- (a) The Client will initialize its modem, dial the server's number, and then wait. If the number rings busy it will discontinue, wait a random time and then try again. This will continue until there is either a successful connect or the user terminates the operation.
- (b) When the Server answers the call, it will hand shake with the Client and establish the transmission speed. As soon as the connection is firm, the Server will send a request to the Client requesting its TPMS ID.
- (c) The Client will send its ID number back. Upon receipt, the Server will check the ID and if its valid, request the Client to send its public password for verification. If the ID is not valid the Server will log off and discontinue the process.
- (d) the Client will look up and send its public pass word.
- (e) the Server will look up and check the public pass word and if OK will send its own ID code to the Client and request that the Client repeat a special, private pass word transmitted by the Server to the Client at the end of the last work session.
- (f) the Client will then verify Server ID and if it proves valid, will then send the Server private pass word back.
- (g) the Server will check the private pass word against its records and, if OK, will confirm log on to the Client.
- (h) both Client and Server will record the log on in their work session logs.

#### 4. SERVER PROCESSING

Once all data has been received from the Client, the Server will process the uploaded files and copy changed fields from each record into the Server master records. The Server will update fields per the type of client and the client's Jurisdictional Link/Privilege settings. If the Client is a local jurisdiction, the Server will update fields within local domain. But if the Client is an RPA, the Server will only update those fields in Federal Aid Project records that relate to the RPA's responsibilities. If this all proceeds successfully, the Server will notify the Client and, upon receipt of acknowledgment, purge the temporary files.

#### 5. SERVER DOWN LOAD

After the Server has integrated all of the changes transmitted by the Client, it will then scan its records again -- according to the class of Client -- and prepare download files of all records that have had fields changed by other Clients since the last time the currently active Client had an Interlink session. It will scan first through the program data base, then development, then e mail, etc.

Server download will have two additional functions: it will download a new copies of the Jurisdictional Link Table, (if that has been changed since the last time the Client logged on), and will also download a news memo file -- if any has been prepared by the SysOp.

The Server will then send the temporary files to the Client. The Client will acknowledge receipt and store them in a temporary directory, counting the number of records received for each major module. The Client will transmit the number of records for each module back to the Server for verification. Providing the Server and Client agree the process will continue. If not the temporary files will be purged and procedure repeated.

If the procedure fails to succeed after three tries then the system will notify the Client user and Server, then terminate incomplete. Otherwise the Client will copy the server records into its files, overwriting previous record settings.

If this procedure comes to successful completion the Client will alert the Server and both units will make an entry of a successful Interlink in there permanent logs.

## 6. FINAL LOG OFF

Once the interlink session has reached successful conclusion the Server will send an official Interlink date and time to the Client and generate a special, private, encrypted password and send it to the Client as well. The Client will store this information internally for use at its next Interlink connection. After successfully receiving and storing information the Client will send a log off signal and then drop the carrier, (or disconnect from the Internet.) The Server will do likewise upon receipt of the signal. Both will record the date and time of the log off in their daily log.

## SPECIAL ITEMS

Prospective software developers should note that ICEA wants the status of the interlink process to be displayed on screen as it takes place. A dialog box should appear during Interlink that tells the user whether they are in activation, log on, Client up load, server processing, Server down load, or log off, and give a summary of how many files have been transferred and how much time has elapsed.

There should be contingency plans on how an interrupted interlink session could be resumed with minimal difficulty, loss of data, or sysop intervention.

There needs to also be an option for the Client to down load the same information that gets transferred during Interlink onto a disk, so that that disk could be mailed to and loaded onto the Server manually. This would be used in extreme cases where the telecommunications functions were not working and it was absolutely necessary to get information transferred to the Server from the Client or visa/versa .

Software developers will need to plan out how the system will handle things like how the Server will recognize that a new record has been added to a Client and therefore integrate it into the system rather than just copying fields. We also anticipate that at the start, the Server may need to enter the data for certain local jurisdictions. Later when those entities decide to go on line, the system will need to automatically recognize the change in the Jurisdictional Link Table and then transmit the files down to the Client computer for local use.