

**IT Professional Technical Services  
Master Contract**

**Statement of Work (SOW)  
For Technology Services  
Issued by**

**Minnesota Department of Transportation (Mn/DOT)**

|                            |   |
|----------------------------|---|
| <b>Project Title:</b>      | <b>Transportation Information System (TIS) Recovery</b> |
| <b>Service Categories:</b> | <b>Analyst - Re-engineering</b>                         |

**1. Business Need**

Mn/DOT's Office of Transportation Data and Analysis (TDA) has decided to conduct a mainframe recovery project. The current TIS is in need of replacement, but significant functions of the mainframe application are currently black-box operations for Mn/DOT support staff. A recovery effort is designed to link workflows conducted by Mn/DOT to data elements via portions of code that execute various functions.

The primary goal of this project is to create a clear understanding of the full functionality of TIS so that Mn/DOT can make informed decisions regarding what code to rebuild in a new system, and which to abandon as no longer needed. Without an effort such as this, TDA is concerned that particular functions or processes may not be replicated in the new system due to lack of awareness.

- 1.1 The business and functional need is to document the processes and functions conducted on the mainframe TIS so that informed decisions can be made about what should be brought forward into the TIS replacement system.
- 1.2 TIS was developed in the 1970s as an integrated solution to managing the roadway inventory, traffic safety, pavement, traffic volume, bridges, and other data systems needed by Mn/DOT at that time. Since its creation, new management systems have been adopted for some of the data systems, such as PONTIS for the bridge system. In addition, Mn/DOT needs have changed resulting in certain data systems no longer being utilized or maintained, such as the Sufficiency files. Over the nearly forty years of operations, Mn/DOT has lost most of its expert knowledge of the PL/1 code and is largely dependent upon the original programmer of the system, working under contract with Mn/DOT, to modify and maintain the system.
- 1.3 Business Case
  - 1.3.1 The focus of this project is to document TIS code, and connect it to its related data and workflows.
  - 1.3.2 The project stakeholders are:
    - Office of Transportation Data and Analysis
    - Office of Traffic, Safety, and Operations (OTSO)
    - Office of Materials
  - 1.3.3 The following constraints have been identified for this project:
    - Project needs to be completed by June 30, 2010
- 1.4 Project fits into the enterprise/agency strategic direction or plan by building the knowledge base needed to replace a key data management system for Mn/DOT's planning, safety, and asset management operations, allowing Mn/DOT to work better via innovative new data management systems and increasing the transparency of our functions.
- 1.5 Responder Required Work Location – Work on site should include sufficient time to document workflows as needed, access mainframe for analysis, and deliver project deliverables. Actual analysis and documentation may be completed off-site.

**2. Project Duties and Deliverables**

- 2.1 The Selected Responder will complete the following project duties:

- 2.1.1 Follow all technical specifications and processes identified in this SOW
  - 2.1.2 Due to the expeditious requirements, assign persons to satisfy SOW.
  - 2.1.3 Maintain sufficient resources (staff) to stay on schedule, support change management incidents. Change management staff should be available for potential meetings with Mn/DOT staff.
  - 2.1.4 Provide formal training and knowledge transfer to key Mn/DOT staff as specified in this SOW.
  - 2.1.5 Submit a best practice work plan/schedule, and estimated durations to complete each deliverable with response (See section 2 and 3 for the list of deliverables). In-depth discussion of work plans may occur at contract negotiations.
  - 2.1.6 Report all work plans and completed requirements to the Mn/DOT Project Manager.
  - 2.1.7 Provide a 6 month warranty against defects, and correct any defects found within the warranty period.
  - 2.1.8 Adhere to Mn/DOT's Project Documentation.
  - 2.1.9 Provide weekly status reports to Mn/DOT Project Manager.
- 2.2 The Selected Responder will provide the project deliverables detailed in this section.
- 2.2.1 TIS Code Documentation to include:
    - 2.2.1.1 Descriptions of data entities utilized in TIS transactions, reports, and batch processes.
    - 2.2.1.2 Data models relating data entities.
    - 2.2.1.3 Use cases describing TIS workflows employed by various TIS subject matter experts.
    - 2.2.1.4 Dependencies between data entities, program code, and workflows or processes.
  - 2.2.2 Tools for accessing and navigating documentation as required.
  - 2.2.3 Training on use of any tools required.

**3. Project Milestones and Schedule**

- 3.1 Project start date: **03/2010**
- 3.2 Key deliverable dates:
  - 3.2.1 Documentation DUE DATE: 05/31/2010
  - 3.2.2 Training DUE DATE: 06/18/2010
- 3.3 End date: **06/30/2010**

**4. Project Environment (Mn/DOT Resources)**

- 4.1 Mn/DOT will provide technical and business resources to assist with the project as follows:
  - 4.1.1 Approximately 3 TDA business staff to assist with the project, on an as-needed basis. In addition, subject matter experts from the various business offices will also be made available as needed throughout the project. Subject Matter experts will be provided for:
    - 4.1.1.1 Roadway Inventory
    - 4.1.1.2 Roadway History
    - 4.1.1.3 Pavement Management
    - 4.1.1.4 Traffic Safety Management
    - 4.1.1.5 Traffic Volume Management
    - 4.1.1.6 TIS Maintenance and Support
    - 4.1.1.7 Standard TIS Reporting
  - 4.1.2 Mn/DOT's Project Manager will be Matthew Koukol from the Office of Transportation Data and Analysis. For all inquiries regarding this SOW contact the Mn/DOT Contract Administrator Melissa McGinnis at 651-366-4644. Contact with any other Mn/DOT personnel regarding this SOW may result in disqualification.
  - 4.1.3 The basic project organizational structure consists of the Project Manager (TDA - Transportation Program Supervisor Senior), and a Project Steering Team (TDA - Office Director and OTSO - Representative). Other subject matter experts will be consulted in the project but are not part of the formal organization structure.
  - 4.1.4 Mn/DOT Staff Proficiency Levels and Experience relevant to the project are as follows:
    - 4.1.4.1 Project Manager: 10 years experience with business areas and their needs, but not a technical resource on the mainframe.
    - 4.1.4.2 Subject matter experts will include:

- Information Technology Specialist-4 (TDA-TIS support): 12 years experience supporting the TIS Mainframe application in-house. Updates many data files and executes support functions.
- Research Analyst Intermediate (TDA-TIS Roadway maintenance): Conducts roadway inventory maintenance and support functions as well as some reporting functions.
- Engineering Specialist (TDA-TIS Roadway History maintenance): Many years conducting roadway history maintenance.
- Management Analyst-2 (TDA-TIS reporting): Many years experience modifying and running batch reports and managing user access.
- Transportation Specialist (OTSO – Traffic Safety maintenance): Several years updating traffic safety system and running related reports.
- Engineering Specialist (Materials – Pavement maintenance): Several years updating pavement system, extracting data, and running related reports.
- Research Analyst Specialist (TDA – Traffic Volume maintenance): Several years updating traffic volume information and running related processes and reports.

4.2 The technical infrastructure and support structures currently in place or expected to be in place for this project include the TIS Mainframe application maintained by the Office of Enterprise Technology. For further information on this application, see Mn/DOT's Transportation Information System Overview, the TIS User Manual, Coding Manual, and Detail Manual (see below).

**EXHIBIT A: Mn/DOT's Transportation Information System Overview:** This document provides a brief overview of the history and purpose of TIS as well as identifying the various parts of the system, both in use and inactive. The document is attached.

**EXHIBIT B: TIS User's Manual:** This is a comprehensive document (1400 pages) covering TIS from a user's perspective. It contains information on TIS including table structures and relationships, user commands, and an extensive data dictionary (taking up the final 600 or so pages). The TIS User Manual is available at <http://www.dot.state.mn.us/roadway/data/docs/USER.pdf>

**EXHIBIT C: TIS Coding Manual:** This manual provides a comprehensive compendium of each of the files that make up TIS as well as the relevant procedures and commands. Included are various edit checks performed as part of the data entry process. The TIS Coding Manual is available at: [ftp://ftp2.dot.state.mn.us/pub/outbound/TDA/TIS\\_Info/TIS\\_Manuals\\_1999.zip](ftp://ftp2.dot.state.mn.us/pub/outbound/TDA/TIS_Info/TIS_Manuals_1999.zip)

**EXHIBIT D: TIS Detail Manual:** This document provides detailed information on functions and routines within the TIS system. It is provided as additional information for vendors interested in the specific details of the TIS operations. The TIS Detail Manual is available at: [ftp://ftp2.dot.state.mn.us/pub/outbound/TDA/TIS\\_Info/TIS\\_Manuals\\_1999.zip](ftp://ftp2.dot.state.mn.us/pub/outbound/TDA/TIS_Info/TIS_Manuals_1999.zip)

## 5. Project Requirements

Mn/DOT implementation requirements include:

- 5.1 Compliance with the Statewide Enterprise Architecture.
- 5.2 Compliance with Statewide Project Management Methodology.
- 5.3 Compliance with applicable industry/agency standards.
- 5.4 Mn/DOT locations where the system might be implemented: Documentation and tools will be accessible via Mn/DOT's internal network. Appropriate location and deployment of these elements will be determined during the project.
- 5.5 Training of Mn/DOT staff includes key TIS management staff to include TDA Office Director, Data Systems and Coordination Section Lead, TIS/GIS Unit Lead, as well as a representative from each stakeholder office as deemed appropriate by TDA.

**6. Required Skills (These are to be rated on a pass/fail basis)**

Required minimum qualifications are shown in the following table. The proposal must specifically indicate how members of the Responders team meet these minimum qualifications. This portion of the proposal review will be conducted on a pass/fail basis. If Mn/DOT determines, in its sole discretion, that the Responder fails to meet one or more of these requirements (or that the Responder has not submitted sufficient information to make the pass/fail determination), then the proposal will be eliminated from further review.

|     | Master Contract Resource Type/Categories | Minimum Number of Years Experience | Required Skill Type   |
|-----|--|------------------------------------|---|
| 6.1 | Project Manager - Basic                  | 4                                  | <ul style="list-style-type: none"> <li>• Planning skills sufficient to prepare Project plan including a written plan, time lines, resourcing guides, gant charts, etc.</li> <li>• Written communication skills sufficient to complete project documents, communication plans, and status reports</li> <li>• Resource management</li> <li>• Excellent verbal communication skills</li> </ul> |
|     | System Analyst - Senior                  | 5                                  | <ul style="list-style-type: none"> <li>• Analysis &amp; evaluation of existing or proposed systems</li> <li>• Preparing detailed flow charts and diagrams outlining systems capabilities and processes</li> </ul>   |
| 6.3 | Trainer - Basic                          | 2                                  | <ul style="list-style-type: none"> <li>• Develop and deliver training on project deliverables</li> </ul>  |

**7. Desired Skills**

N/A

**8. Process Schedule**

|     |  |  |
|-----|--|--|
| 8.1 | Deadline for Questions                     | 02/16/2010 2:00 PM Central Standard Time |
| 8.2 | Posted Response to Questions               | 02/17/2010 2:00 PM Central Standard Time |
| 8.3 | Proposals due                              | 02/19/2010 2:00 PM Central Standard Time |
| 8.4 | Anticipated proposal evaluation begins     | 02/22/2010                               |
| 8.5 | Anticipated proposal evaluation & decision | 03/01/2010                               |

**9. Questions**

All questions regarding this SOW must be addressed to the Mn/DOT Contract Administrator listed below. Proposers may not discuss the content of this SOW with other Mn/DOT staff. Any questions regarding this SOW must be received via e-mail by 02/16/2010, 2:00PM Central Standard Time.

|                        |  |
|------------------------|--|
| Contract Administrator | Melissa McGinnis   |
| Email Address:         | <a href="mailto:melissa.mcginis@state.mn.us">melissa.mcginis@state.mn.us</a> |

It is anticipated that questions and answers will be posted on the Office of Enterprise Technology's web site by 02/17/2010, 2:00pm Central Standard Time ([www.ot.state.mn.us](http://www.ot.state.mn.us)). Note that questions may be posted verbatim as submitted.

**10. Liability for Work Performed**

The Contractor must indemnify, save, and hold the State and the State's agents and employees harmless from any claims or causes of action, including attorney's fees incurred by the State, arising from the performance of this contract by the Contractor, or the Contractor's agents and employees. This clause will not be construed to bar any legal remedies the Contractor may have for the State's failure to fulfill its obligations under this contract.

The “Standard Liability Clause” (see above) will apply to this project and will be incorporated into the work order issued for this project. No exceptions to, or deviations from, this clause will be permitted. Do not submit a proposal if you cannot accept this liability clause. Proposals which the State determines, in its sole discretion, indicate non-acceptance of this liability clause, will be rejected by the State.

## 11. SOW Evaluation Process

The selection process being used for this project involves a two step process. Step one will include the pass/fail assessment and a qualitative evaluation of Contractors’ technical proposal. Step Two will be an analysis of the cost proposal.

Mn/DOT will review proposals according to the following criteria:

|   |   |     |
|---|---|-----|
| • | Company background and expertise  | 20% |
| • | Experience of personnel assigned to this project  | 10% |
| • | Proposed work plan, including the apparent ability to complete project on time and budget | 25% |
| • | References and previous performance reviews (if any)                                      | 5%  |
| • | Cost  | 30% |
| • | Location of Service Disclosure  | 10% |

Mn/DOT reserves the right to check references and to review previous performance reviews for work performed for Mn/DOT or other state agencies, and to take such references and reviews into account for consultant selection purposes.

The following contains additional information describing the proposal evaluation process:

### Step One

In step one the proposals will first be reviewed to verify whether the proposer meets the “Required Skills” (see section six). Proposals receiving a “fail” on one or more of the required skills will not be reviewed further. Proposals which pass the Required Skills review will then be scored on the non-cost and non-interview factors listed above.

### Step Two

Cost proposal will be evaluated and scored in accordance with the percentage listed above. Cost will not be revealed to selection committee members until after the technical scoring has been completed.

## 12. Response Requirements

- 12.1 Introduction.
- 12.2 Company overview. Including responder’s company name, business address, the contact person’s name, telephone number, fax number and email address (as available).
- 12.3 Project overview.
- 12.4 Detailed response to “Mn/DOT Project Requirements”.
  - 12.4.1 Explain how the project will meet the requirements. Describe responder’s methods of developing and documenting TIS workflows, dependencies, and units of code. Where possible, include examples of previous work to illustrate format and nature of final deliverables, including data models, use cases, and relationships/dependencies.
- 12.5 Detailed response to “Project Approach”.
 

Explain how the responder will approach their participation in the project. This includes:

  - 12.5.1 Organization and staffing. Include staff qualifications in the chart below **AND** a resume that will allow Mn/DOT to easily determine if assigned key staff meet the required skills and the extent to which assigned staff meet or exceed the desired skills. The resumes must clearly identify the skills and experience that are detailed in the chart. No change in personnel assigned to the project will be permitted without the written approval of Mn/DOT’s Project Manager.

| Required Skill type | Personnel/<br>Years of<br>Experience | Project(s) worked<br>on demonstrating<br>these skills | Reference (name,<br>company, phone number) |
|---------------------|--------------------------------------|---|--|
|                     |                                      |   |  |
|                     |                                      |   |  |
|                     |                                      |   |  |
|                     |                                      |   |  |

- 12.5.2 A detailed work-plan, including a realistic plan to meet the project target completion date. The work plan must include a timeline and identify major tasks. The work plan must present the responder’s approach, work breakdown, deliverable milestones, dates, and a staffing plan to deliver the project results.
- 12.5.3 Contract/change management procedures.
- 12.5.4 Project management (e.g. quality management, risk assessment/management, etc.).
- 12.5.5 Documentation of progress such as status reports.
- 12.5.6 Description of the deliverables to be provided by the responder.
- 12.6 The forms and documents required under any other section of this SOW.
- 12.7 References: Provide three clients for similar type projects.
- 12.8 Submit a cost proposal in a separate sealed envelope. Rates proposed may not exceed the rates approved under this program. Cost proposal must include the number of anticipated hours, classifications of personnel, personnel hourly rates and a total project cost. If direct expenses are anticipated they must be detailed in the cost proposal. **The cost estimate must correspond to the detailed work plan and schedule that includes time estimates, associated deliverables, and staff assigned to each task.**
- 12.9 Required forms to be returned or additional provisions that must be included in proposal
  - 12.9.1 **Location of Service Disclosure Form.**
  - 12.9.2 **Conflict of Interest Form**  
 Proposer must provide a list of all entities with which it has relationships that create, or appear to create, a conflict of interest with the work that is contemplated in this request for proposals. The list should indicate the name of the entity, the relationship, and a discussion of the conflict.  
  
 The proposer warrants that, to the best of its knowledge and belief, and except as otherwise disclosed, there are no relevant facts or circumstances which could give rise to organizational conflicts of interest. An organizational conflict of interest exists when, because of existing or planned activities or because of relationships with other persons, a proposer is unable or potentially unable to render impartial assistance or advice to Mn/DOT, or the proposer’s objectivity in performing the contract work is or might be otherwise impaired, or the proposer has an unfair competitive advantage. The proposer agrees that, if after award, an organizational conflict of interest is discovered, an immediate and full disclosure in writing must be made to Mn/DOT which must include a description of the action which the proposer has taken or proposes to take to avoid or mitigate such conflicts. If an organization conflict of interest is determined to exist, Mn/DOT may, at its discretion, cancel the contract. In the event the proposer was aware of an organizational conflict of interest prior to the award of the contract and did not disclose the conflict to Mn/DOT, Mn/DOT may terminate the contract for default. The provisions of this clause must be included in all subcontracts for work to be performed similar to the service provided by the prime contractor, and the terms “contract,” “contractor,” and “contracting officer” modified appropriately to preserve Mn/DOT’s rights. Proposers must complete the attached “Conflict of Interest Checklist and Disclosure Form” and submit it along with the response, but not as a part of the response.
  - 12.9.3 **Affidavit of non-collusion**  
 Proposers must complete the attached “Affidavit of Noncollusion” and include it with the response. The successful proposer will be required to submit acceptable evidence of compliance with workers' compensation insurance coverage requirements prior to execution of the Contract.
  - 12.9.4 **Immigration Status Certification Form**  
 For all Contracts estimated to be in excess of \$50,000.00, responders are required to complete the attached “Immigration Status Certification Form” page and include it with the response.

**12.9.5 Affirmative Action Certification**

For all Contracts estimated to be in excess of \$100,000.00, responders are required to complete the attached “Affirmative Action Certification” page and include it with the response.

**12.9.6 Veteran-Owned/Service Disabled Veteran-Owned Preference**

In accordance with Laws of Minnesota, 2009, Chapter 101, Article 2, Section 56, eligible certified veteran-owned and eligible certified service-disabled veteran-owned small businesses will receive a 6 percent preference in the evaluation of their proposal.

Eligible veteran-owned and eligible service-disabled veteran-owned small businesses should complete the Veteran-Owned/Service Disabled Veteran-Owned Preference Form in this solicitation, and include the required documentation. Only eligible, certified, veteran-owned/service disabled small businesses that provide the required documentation, per the form, will be given the preference.

Eligible veteran-owned and eligible service-disabled veteran-owned small businesses must be **currently** certified by the United States Department of Veterans Affairs prior to the solicitation opening date and time to receive the preference.

Information regarding certification by the United States Department of Veterans Affairs may be found at <http://www.vetbiz.gov>.

**13. Proposal Submission Instructions**

Submit 7 copies of the response. Responses are to be submitted in a mailing envelope or package, clearly marked “Proposal” on the outside. Cost proposals are to be submitted in a separate sealed envelope. An authorized member of the firm must sign each copy of the response in ink.

**All responses must be sent to:**

Melissa McGinnis, Contract Administrator  
Minnesota Department of Transportation  
395 John Ireland Boulevard  
Consultant Services Section, Mail Stop 680  
St. Paul, Minnesota 55155

All responses must be received not later than 2:00 p.m. Central Standard Time on 02/19/2010, as indicated by the time stamp made by the Contract Administrator. **Please note that Mn/DOT Offices have implemented new security measures.** These new procedures do not allow non-Mn/DOT employees to have access to the elevators or the stairs. You should plan enough time and follow these instructions for drop-off:

- Enter through the Rice Street side of the Central Office building (1<sup>st</sup> Floor).
- Once you enter through the doors, you should walk straight ahead to the Information Desk.
- **Proposals are accepted at the Information Desk only.** The receptionist will call the Contract Administrator to come down and to time stamp the proposal. Please keep in mind Mn/DOT is very strict on the proposal deadline. Proposals will not be accepted after 2:00pm.

**14. General Requirements**

**14.1 Proposal Contents**

By submission of a proposal, Proposer warrants that the information provided is true, correct and reliable for purposes of evaluation for potential award of a work order. The submission of inaccurate or misleading information may be grounds for disqualification from the award as well as subject the proposer to suspension or debarment proceedings and other remedies available by law.

**14.2 Disposition of Responses**

All materials submitted in response to this SOW will become property of the State and will become public record in accordance with Minnesota Statutes, section 13.591, after the evaluation process is completed. Pursuant to the statute, completion of the evaluation process occurs when the government

entity has completed negotiating the contract with the selected Proposer. If the Proposer submits information in response to this SOW that it believes to be trade secret materials, as defined by the Minnesota Government Data Practices Act, Minn. Stat. § 13.37, the Proposer must: clearly mark all trade secret materials in its response at the time the response is submitted, include a statement with its response justifying the trade secret designation for each item, and defend any action seeking release of the materials it believes to be trade secret, and indemnify and hold harmless the State, its agents and employees, from any judgments or damages awarded against the State in favor of the party requesting the materials, and any and all costs connected with that defense. This indemnification survives the State's award of a contract. In submitting a response to this RFP, the Proposer agrees that this indemnification survives as long as the trade secret materials are in possession of the State.

Mn/DOT will not consider the prices submitted by the Proposer to be proprietary or trade secret materials.

**15. No State Obligation**

Issuance of this Statement of Work does not obligate Mn/DOT to award a contract or complete the assignment, and Mn/DOT reserves the right to cancel this solicitation if it is considered to be in its best interest. Mn/DOT reserves the right to reject any and all proposals.

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**STATE OF MINNESOTA  
LOCATION OF SERVICE DISCLOSURE AND CERTIFICATION**

**LOCATION OF SERVICE DISCLOSURE**

**Check all that apply:**

- The services to be performed under the anticipated contract as specified in our proposal will be performed ENTIRELY within the State of Minnesota
- The services to be performed under the anticipated contract as specified in our proposal entail work ENTIRELY within another state within the United States.
- The services to be performed under the anticipated contract as specified in our proposal will be performed in part within Minnesota and in part within another state within the United States.
- The services to be performed under the anticipated contract as specified in our proposal DO involve work outside the United States. Below (or attached) is a description of:
  - The identity of the company (identify if subcontractor) performing services outside the United States;
  - The location where services under the contract will be performed; and
  - The percentage of work (in dollars) as compared to the whole that will be conducted in each identified foreign location.

**CERTIFICATION**

By signing this statement, I certify that the information provided above is accurate and that the location where services have been indicated to be performed will not change during the course of the contract without prior, written approval from the State of Minnesota.

Name of Company: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

**STATE OF MINNESOTA  
AFFIDAVIT OF NONCOLLUSION**

I swear (or affirm) under the penalty of perjury:

- 1. That I am the Responder (if the Responder is an individual), a partner in the company (if the Responder is a partnership), or an officer or employee of the responding corporation having authority to sign on its behalf (if the Responder is a corporation);
- 2. That the attached proposal submitted in response to the Request for Proposals has been arrived at by the Responder independently and has been submitted without collusion with and without any agreement, understanding or planned common course of action with, any other Responder of materials, supplies, equipment or services described in the Request for Proposal, designed to limit fair and open competition;
- 3. That the contents of the proposal have not been communicated by the Responder or its employees or agents to any person not an employee or agent of the Responder and will not be communicated to any such persons prior to the official opening of the proposals; and
- 4. That I am fully informed regarding the accuracy of the statements made in this affidavit.

Responder's Firm Name: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Subscribed and sworn to me this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

## CONFLICT OF INTEREST CHECKLIST AND DISCLOSURE FORM

**Purpose of this Checklist.** This checklist is provided to assist proposers in screening for potential organizational conflicts of interest. The checklist is for the internal use of proposers and does not need to be submitted to Mn/DOT, however, the Disclosure of Potential Conflict of Interest form should be submitted in a separate envelope along with your proposal.

**Definition of “Proposer”.** As used herein, the word “Proposer” includes both the prime contractor and all proposed subcontractors.

**Checklist is Not Exclusive.** Please note that this checklist serves as a guide only, and that there may be additional potential conflict situations not covered by this checklist. If a proposer determines a potential conflict of interest exists that is not covered by this checklist, that potential conflict must still be disclosed.

**Use of the Disclosure Form.** A proposer must complete the attached disclosure form and submit it with their Proposal (or separately as directed by Mn/DOT for projects not awarded through a competitive solicitation). If a proposer determines a potential conflict of interest exists, it must disclose the potential conflict to Mn/DOT; however, such a disclosure will not necessarily disqualify a proposer from being awarded a Contract. To avoid any unfair “taint” of the selection process, the disclosure form should be provided separate from the bound proposal, and it will not be provided to selection committee members. Mn/DOT’s Contract Management personnel will review the disclosure and the appropriateness of the proposed mitigation measures to determine if the proposer may be awarded the Contract notwithstanding the potential conflict. Mn/DOT’s Contract Management personnel may consult with Mn/DOT’s Project Manager and Department of Administration personnel. By statute, resolution of conflict of interest issues is ultimately at the sole discretion of the Commissioner of Administration.

**Material Representation.** The proposer is required to submit the attached disclosure form either declaring, to the best of its knowledge and belief, either that no potential conflict exists, or identifying potential conflicts and proposing remedial measures to ameliorate such conflict. The proposer must also update conflict information if such information changes after the submission of the proposal. Information provided on the form will constitute a material representation as to the award of this Contract. Mn/DOT reserves the right to cancel or amend the resulting Contract if the successful proposer failed to disclose a potential conflict, which it knew or should have known about, or if the proposer provided information on the disclosure form that is materially false or misleading.

**Approach to Reviewing Potential Conflicts.** Mn/DOT recognizes that proposer’s must maintain business relations with other public and private sector entities in order to continue as viable businesses. Mn/DOT will take this reality into account as it evaluates the appropriateness of proposed measures to mitigate potential conflicts. It is not Mn/DOT’s intent to disqualify proposers based merely on the existence of a business relationship with another entity, but rather only when such relationship causes a conflict that potentially impairs the proposer’s ability to provide objective advice to Mn/DOT. Mn/DOT would seek to disqualify proposers only in those cases where a potential conflict cannot be adequately mitigated. Nevertheless, Mn/DOT must follow statutory guidance on Organizational Conflicts of Interest.

**Statutory Guidance.** Minnesota Statutes §16C.02, Subdivision 10 (a) places limits on state agencies ability to Contract with entities having an “Organizational Conflict of Interest”. For purposes of this checklist and disclosure requirement, the term “Vendor” includes “Proposer” as defined above. Pursuant to such statute, “Organizational Conflict of Interest” means that because of existing or planned activities or because of relationships with other persons: (1) the vendor is unable or potentially unable to render impartial assistance or advice to the state; (2) the vendor’s objectivity in performing the contract work is or might otherwise be impaired; or (3) the vendor has an unfair advantage.

**Additional Guidance for Professionals Licensed by the Minnesota Board of Engineering.** The Minnesota Board of Engineering has established conflict of interest rules applicable to those professionals licensed by the Board (see Minnesota Rules Part 1805.0300) Subpart 1 of the rule provides “A licensee shall avoid accepting a commission where duty to the client or the public would conflict with the personal interest of the licensee or the interest of another client. Prior to accepting such employment the licensee shall disclose to a prospective client such facts as may give rise to a conflict of interest”.

**An organizational conflict of interest may exist in any of the following cases:**

The proposer, or its principals, own real property in a location where there may be a positive or adverse impact on the value of such property based on the recommendations, designs, appraisals, or other deliverables required by this Contract.

The proposer is providing services to another governmental or private entity and the proposer knows or has reason to believe, that entity's interests are, or may be, adverse to the state's interests with respect to the specific project covered by this contract. **Comment:** the mere existence of a business relationship with another entity would not ordinarily need to be disclosed. Rather, this focuses on the nature of services commissioned by the other entity. For example, it would not be appropriate to propose on a Mn/DOT project if a local government has also retained the proposer for the purpose of persuading Mn/DOT to stop or alter the project plans.

The Contract is for right-of-way acquisition services or related services (e.g. geotechnical exploration) and the proposer has an existing business relationship with a governmental or private entity that owns property to be acquired pursuant to the Contract.

The proposer is providing real estate or design services to a private entity, including but not limited to developers, whom the proposer knows or has good reason to believe, own or are planning to purchase property affected by the project covered by this Contract, when the value or potential uses of such property may be affected by the proposer's performance of work pursuant to this Contract. "Property affected by the project" includes property that is in, adjacent to, or in reasonable proximity to current or potential right-of-way for the project. The value or potential uses of the private entity's property may be affected by the proposer's work pursuant to the Contract when such work involves providing recommendations for right-of-way acquisition, access control, and the design or location of frontage roads and interchanges. **Comment:** this provision does not presume proposers know or have a duty to inquire as to all of the business objectives of their clients. Rather, it seeks the disclosure of information regarding cases where the proposer has reason to believe that its performance of work under this Contract may materially affect the value or viability of a project it is performing for the other entity.

The proposer has a business arrangement with a current Mn/DOT employee or immediate family member of such employee, including promised future employment of such person, or a subcontracting arrangement with such person, when such arrangement is contingent on the proposer being awarded this Contract. This item does not apply to pre-existing employment of current or former Mn/DOT employees, or their immediate family members. **Comment:** this provision is not intended to supercede any Mn/DOT policies applicable to its own employees accepting outside employment. This provision is intended to focus on identifying situations where promises of employment have been made contingent on the outcome of this particular procurement. It is intended to avoid a situation where a proposer may have unfair access to "inside" information.

The proposer has, in previous work for the state, been given access to "data" relevant to this procurement or this project that is classified as "private" or "nonpublic" under the Minnesota Government Data Practices Act, and such data potentially provides the proposer with an unfair advantage in preparing a proposal for this project. **Comment:** this provision will not, for example, necessarily disqualify a proposer who performed some preliminary work from obtaining a final design Contract, especially when the results of such previous work are public data available to all other proposers. Rather, it attempts to avoid an "unfair advantage" when such information cannot be provided to other potential proposers. Definitions of "government data", "public data", "non-public data" and "private data" can be found in Minnesota Statutes Chapter 13.

The proposer has, in previous work for the state, helped create the "ground rules" for this solicitation by performing work such as: writing this solicitation, or preparing evaluation criteria or evaluation guides for this solicitation.

The proposer, or any of its principals, because of any current or planned business arrangement, investment interest, or ownership interest in any other business, may be unable to provide objective advice to the state.

**DISCLOSURE OF POTENTIAL CONFLICT OF INTEREST**

Having had the opportunity to review the Organizational Conflict of Interest Checklist, the proposer hereby indicates that it has, to the best of its knowledge and belief:

- Determined that no potential organizational conflict of interest exists
- Determined a potential organizational conflict of interest as follows:

Describe nature of potential conflict:

Describe measures proposed to mitigate the potential conflict:

Signature \_\_\_\_\_ Date \_\_\_\_\_

If a potential conflict has been identified, please provide name and phone number for a contact person authorized to discuss this disclosure form with Mn/DOT Contract personnel.

Name \_\_\_\_\_ Phone \_\_\_\_\_

**CERTIFICATION REGARDING LOBBYING**  
For State of Minnesota Contracts and Grants over \$100,000

The undersigned certifies, to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, A Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned will complete and submit Standard Form-LLL, Disclosure Form to Report Lobbying in accordance with its instructions.
- (3) The undersigned will require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans and cooperative agreements) and that all subrecipients will certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification will be subject to a civil penalty of not less than \$10,000.00 and not more than \$100,000.00 for each such failure.

\_\_\_\_\_  
Organization Name

\_\_\_\_\_  
Name and Title of Official Signing for Organization

By: \_\_\_\_\_  
Signature of Official

\_\_\_\_\_  
Date

**State of Minnesota — Immigration Status Certification**

By order of the Governor (Governor’s Executive Order 08-01), vendors and subcontractors MUST certify compliance with the Immigration Reform and Control Act of 1986 (8 U.S.C. 1101 et seq.) and certify use of the *E-Verify* system established by the Department of Homeland Security.

*E-Verify* program information can be found at <http://www.dhs.gov/ximgtn/programs>

If any response to a solicitation is or could be in excess of \$50,000.00, vendors and subcontractors must certify compliance with items 1 and 2 below. In addition, prior to the delivery of the product or initiation of services, vendors MUST obtain this certification from all subcontractors who will participate in the performance of the Contract. All subcontractor certifications must be kept on file with the Contract vendor and made available to the state upon request.

1. The company shown below is in compliance with the Immigration Reform and Control Act of 1986 in relation to all employees performing work in the United States and does not knowingly employ persons in violation of the United States immigration laws. The company shown below will obtain this certification from all subcontractors who will participate in the performance of this Contract and maintain subcontractor certifications for inspection by the state if such inspection is requested; and
2. By the date of the delivery of the product and/or performance of services, the company shown below will have implemented or will be in the process of implementing the *E-Verify* program for all newly hired employees in the United States who will perform work on behalf of the State of Minnesota.

**I certify that the company shown below is in compliance with items 1 and 2 above and that I am authorized to sign on its behalf.**

Name of Company: \_\_\_\_\_ Date: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_ Telephone Number: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

If the Contract vendor and/or the subcontractors are not in compliance with the Immigration Reform and Control Act, or knowingly employ persons in violation of the United States immigration laws, or have not begun or implemented the *E-Verify* program for all newly hired employees in support of the Contract, the state reserves the right to determine what action it may take. This action could include, but would not be limited to cancellation of the Contract, and/or suspending or debaring the Contract vendor from state purchasing.

**For assistance with the *E-Verify* Program**

Contact the National Customer Service Center (NCSC) at **1-800-375-5283** (TTY 1-800-767-1833).

**For assistance with this form, contact:**

Mail: 112 Administration Building, 50 Sherburne Avenue, St. Paul, Minnesota 55155  
E-Mail: [MMDHelp.Line@state.mn.us](mailto:MMDHelp.Line@state.mn.us)

**STATE OF MINNESOTA  
VETERAN-OWNED/SERVICE DISABLED VETERAN-OWNED PREFERENCE FORM**

In accordance with Laws of Minnesota, 2009, Chapter 101, Article 2, Section 56, eligible certified veteran-owned and eligible certified service-disabled veteran-owned small businesses will receive a 6 percent preference in the evaluation of their proposal.

Eligible veteran-owned and eligible service-disabled veteran-owned small businesses include certified small businesses that are majority-owned and operated by either (check the box that applies and attach the certification documents required with your response to this solicitation):

Recently separated veterans, who are veterans as defined in Minnesota Statutes §197.447, who have served in active military service, at any time on or after September 11, 2001, and who have been discharged under honorable conditions from active service, as indicated by the person's United States Department of Defense form DD-214 or by the commissioner of veterans affairs. Required Documentation:

Certification by the United States Department of Veterans Affairs as a veteran-owned small business  
Discharge form (DD-214) dated on or after September 11, 2001 with condition honorable

OR

Veterans who are veterans as defined in Minnesota Statutes §197.447, with service-connected disabilities, as determined at any time by the United States Department of Veterans Affairs. Required Documentation:  
Certification by the United States Department of Veterans Affairs as a service-disabled veteran-owned small business.

Eligible veteran-owned and eligible service-disabled veteran-owned small businesses must be **currently** certified by the United States Department of Veterans Affairs prior to the solicitation opening date and time to receive the preference.

Information regarding certification by the United States Department of Veterans Affairs may be found at <http://www.vetbiz.gov>.

You must submit this form and the documentation required above with your response in order to be considered for this preference.

## SAMPLE WORK ORDER LANGUAGE

### STATE OF MINNESOTA IT Professional Services Master Contract Work Order

This work order is between the State of Minnesota, acting through its Commissioner of Transportation ("State") and [fill in name of contractor, be sure to indicate if corporation, partnership, limited liability company, sole proprietor, etc] ("Contractor"). This Work Order is issued under the authority of Master Contract T-Number 502TS, CFMS Number [fill in CFMS number from the contractor's master contract], and is subject to all provisions of the Master Contract which is incorporated by reference.

#### *Recitals*

1. Under Minn. Stat. § 15.061 [Insert additional statutory authorization if necessary] the State is authorized to engage such assistance as deemed necessary.
2. The State is in need of [Add brief narrative of the purpose of the contract].
3. The Contractor represents that it is duly qualified and agrees to perform all services described in this work order to the satisfaction of the State.

#### *Work Order*

#### **1 Term of Work Order; Incorporation of Exhibits; Survival of Terms**

- 1.1 Effective date.** This Work Order will take effect on the date the State obtains all required signatures as required by Minn. Stat. § 16C.05, subd. 2.  
*The Contractor must not begin work under this work order until it is fully executed and the Contractor has been notified by the State's Authorized Representative to begin the work.*
- 1.2 Expiration date.** This Work Order will expire on [fill in date], or when all obligations have been satisfactorily fulfilled, whichever occurs first.
- 1.3 Exhibits.** Exhibits [fill in, e.g. A – D] are attached and incorporated into this Work Order.
- 1.4 Survival of terms.** All clauses which impose obligations continuing in their nature and which must survive in order to give effect to their meaning will survive the expiration or termination of this Work Order.

#### **2 Contractor's Duties**

The Contractor, who is not a state employee, will:

[Provide a detailed scope of services. The services must define specific duties, deliverables, and deliverable completion dates. Do not simply attach the same scope that was used in the "Statement of Work" (RFP) as a greater level of detail is needed in this work order. If using a separate attachment, use "Perform the duties specified in Exhibit A, "Scope of Services".]

#### **3 Consideration and Payment**

##### **3.1 Consideration**

The State will pay for all services performed by the Contractor under this work order as follows:

##### **3.1.1 Compensation.** The Contractor will be paid as follows:

[Provide a detailed explanation of how the Contractor will be paid, for example a fixed hourly rate, or a lump sum per deliverable, some examples may be:  
an Hourly Rate of \$ \_\_\_\_\_ up to maximum of \_\_\_\_\_ hours, but not to exceed \$ \_\_\_\_\_.

a Lump Sum of \$ \_\_\_\_\_.]

[Rate: rates paid may not exceed the Contractor's rates specified in their Master Contract.]

- 3.1.2 *Travel Expenses.* Reimbursement for travel and subsistence expenses actually and necessarily incurred by Contractor, as a result of this Work Order, will be reimbursed for travel and subsistence expenses in the same manner and in no greater amount than provided in the current Minnesota Department of Transportation Travel Regulations. Contractor will not be reimbursed for travel and subsistence expenses incurred outside Minnesota unless it has received State's prior written approval for out of state travel. Minnesota will be considered the home state for determining whether travel is out of state. See Exhibit \_\_\_\_ for the current Minnesota Department of Transportation Reimbursement Rates for Travel Expenses.
- 3.1.3 *Total Obligation.* The total obligation of the State for all compensation and reimbursements to the Contractor under this Work Order will not exceed \$ [fill in].

### 3.2 Payment

- 3.2.1 *Invoices.* State will promptly pay Contractor after Contractor presents an itemized invoice for the services actually performed and State's Authorized Representative accepts the invoiced services. Invoices must be submitted in the format prescribed in Exhibit \_\_\_\_ and according to the following schedule:

[INDICATE WHEN YOU WANT THE CONTRACTOR TO SUBMIT INVOICES, FOR EXAMPLE: "MONTHLY" OR "UPON COMPLETION OF SERVICES," OR IF THERE ARE SPECIFIC DELIVERABLES, LIST HOW MUCH WILL BE PAID FOR EACH DELIVERABLE. THE STATE DOES NOT PAY MERELY FOR THE PASSAGE OF TIME.]

- 3.2.1.1 Each invoice must contain the following information: Mn/DOT Contract Number, Mn/DOT Contract invoice number (sequentially numbered), billing address if different from business address, and Contractor's original signature attesting that the invoiced service and costs are new and that no previous charge for those services or goods has been included in any prior invoice.
- 3.2.1.2 Direct nonsalary costs allocable to the work under this Work Order must be itemized and supported with invoices or billing documents to show that such costs are properly allocable to the work. Direct nonsalary costs are any costs that are not the salaried costs directly related to the work of Contractor. Supporting documentation must be provided in a manner that corresponds to each direct cost.
- 3.2.1.3 The original of each invoice must be sent to State's Authorized Representative for review and payment. A copy of the invoice will be sent to State's Project Manager for review.
- 3.2.1.4 Contractor must provide, upon request of State's Authorized Representative, the following supporting documentation:
- 3.2.1.5 Direct salary costs of employees' time directly chargeable for the services performed under this Work Order. This must include a payroll cost breakdown identifying the name of the employee, classification, actual rate of pay, hours worked, and total payment for each invoice period; and
- 3.2.1.6 Signed time sheets or payroll cost breakdown for each employee listing dates and hours worked. Computer generated printouts of labor costs for the project must contain the project number, each employee's name, hourly rate, regular and overtime hours, and the dollar amount charged to the project for each pay period.
- 3.2.1.7 If Contractor is authorized by State to use or uses any subcontractors, Contractor must include all the above supporting documentation in any subcontractor's contract, and Contractor must make timely payments to its subcontractors. Contractor must require subcontractors' invoices to follow the same form and contain the same information as set forth above.
- 3.2.2 *Retainage.* Under Minnesota Statutes § 16C.08, subdivision 5(b), no more than 90% of the amount due under this Contract may be paid until State's agency head has reviewed the final

product of this Contract. The balance due will be paid when State's agency head determines that Contractor has satisfactorily fulfilled all the terms of this Contract.

3.2.3 *Federal Funds.* If federal funds are used, Contractor is responsible for compliance with all federal requirements imposed on these funds and accepts full financial responsibility for any requirements imposed by Contractor's failure to comply with these federal requirements.

3.2.4 *Progress Reports.* Contractor will submit progress reports in a format and timeline designated by the State's Project Manager.

#### 4 **Liability**

[Note: the following clause is the "standard" liability clause, an alternative liability clause may have been agreed to as part of the Statement of Work, in which case the liability clause offered by a vendor should have been part of the selection criteria. The contract must include a liability clause, either the standard clause or an approved alternate. Contact Contract Management if you have questions about whether to use the standard clause or an alternative]

The Contractor must indemnify, save and hold the State, its agents, and employees harmless from any claims or causes of action, including attorney's fees incurred by the State, arising from the performance of this Work Order by the Contractor or the Contractor's agents or employees. This clause will not be construed to bar any legal remedies the Contractor may have for the State's failure to fulfill its obligations under this Work Order.

#### 5 **Foreign Outsourcing**

The Contractor agrees that the disclosures and certifications made in its Location of Service Disclosure and Certification Form submitted with its proposal are true, accurate and incorporated into this work order contract by reference.

#### 6 **Authorized Representatives**

**6.1 State's Authorized Representative.** State's Authorized Representative will be:

NAME, TITLE  
ADDRESS  
TELEPHONE NUMBER  
FAX NUMBER  
E-MAIL ADDRESS

State's Authorized Representative or his /her successor, will monitor Contractor's performance and has the authority to accept or reject the services provided under this Work Order.

**6.2 State's Project Manager.** State's Project Manager will be:

NAME, TITLE  
ADDRESS  
TELEPHONE NUMBER  
FAX NUMBER  
E-MAIL ADDRESS

State's Project Manager, or his/her successor, has the responsibility to monitor Contractor's performance and progress. State's Project Manager will sign progress reports, review billing statements, make recommendations to State's Authorized Representative for acceptance of Contractor's good or services and make recommendations to State's Authorized Representative for certification for payment of each Invoice submitted for payment.

**6.3 Contractor's Authorized Representative.** Contractor's Authorized Representative will be:

NAME, TITLE  
ADDRESS  
TELEPHONE NUMBER

FAX NUMBER  
E-MAIL ADDRESS

If Contractor's Authorized Representative changes at any time during this contract, Contractor must immediately notify State.

- 6.4** Contractor's Key Personnel. Contractor's Key Personnel will be:  
(names, titles)

Key Personnel assigned to this project cannot be changed without the written approval of the State's Project Manager. Contractor will submit a change request in writing to the State's Project Manager along with a resume for each potential candidate. Potential new or additional personnel may be required to participate in an interview. Upon approval of new or additional personnel, the State's Authorized Representative may issue a change order to add or delete key personnel.

**7 Time**

The Contractor must comply with all the time requirements described in this Work Order. In the performance of this Work Order, time is of the essence.

**8 Employee Status**

Pursuant to the Governor's Executive Order 08-01, if this contract, including any extension options, is or could be in excess of \$50,000, Contractor certifies that it and its subcontractors:

- 8.2** Comply with the Immigration Reform and Control Act of 1986 (U.S.C. 1101 et. seq.) in relation to all employees performing work in the United States and do not knowingly employ persons in violation of United States immigrations laws; and
- 8.3** By the date of the performance of services under this contract, Contractor and all its subcontractors have implemented or are in the process of implementing the E-Verify program for all newly hired employees in the United States who will perform work on behalf of the State of Minnesota.

Contractor must obtain certifications of compliance with this section from all subcontractors who will participate in the performance of this contract. Subcontractor certifications must be maintained by Contractor and made available to the state upon request. If Contractor or its subcontractors are not in compliance with 1 or 2 above or have not begun or implemented the E-Verify program for all newly hired employees performing work under the contract, the state reserves the right to determine what action it may take including but not limited to, canceling the contract and suspending or debaring the contractor from state purchasing.

**9 Additional Provisions**

[Use this space to add information not covered elsewhere in this Work Order. If not needed, delete this section or state "None". The following should be used in any Work Order that includes web design:

The Contractor will comply with the "Minnesota Office of Enterprise Technology: Web Design Guidelines" available at the URL: <http://www.state.mn.us/portal/mn/jsp/content.do?programid=536911233&id=-536891917&agency=OETweb>.

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## **Exhibit A: Mn/DOT's Transportation Information System Overview**

### **Background and Current Status**

In the 1970s Mn/DOT became one of the first DOTs to implement an integrated roadway information system. The Transportation Information System (TIS) was developed on a mainframe architecture and provides integrated information on roadway jurisdictions and characteristics, crash data, traffic data, bridges and rail grade crossings, and intersections. Other systems and applications have been developed for various items not included in TIS, such as video-log or roadway furniture, but TIS remains the main storehouse of roadway data within the department.

Since the inception of TIS, Minnesota has been nationally recognized as a leader in quality, integrated data systems. In the mid-1980s, the Federal Highway Administration (FHWA) assembled a multi-state database bringing together the best available data on roadway, traffic, and safety information to support decisions regarding highway design and operation. The resulting project, the Highway Safety Information System (HSIS), included Mn/DOT as one of the eight initial states, largely due to the quality and scope of data within the TIS system. Mn/DOT continues to participate in this program.

TIS also provides the core of the data supplied to the FHWA as part of the annual Highway Performance Management System (HPMS), used to produce a number of federal reports for Congress and others. TIS provides the basis for the "universe" roadway information and various elements, including traffic, for the HPMS sample segments.

### **Description and Contents of TIS**

Mn/DOT's TIS integrates a number of different tables pertaining to a variety of roadway characteristics and features or events along the roadways themselves. The core business tables in the TIS are listed below.

#### ***Roadlog and Logpoint Files***

These files contain an inventory of Minnesota's roadways. The roadlog file contains complete descriptions of all roadways, including physical characteristics (such as surface width) and jurisdictional information (such as county number). The logpoint file contains verbal descriptions of various intersecting features and their associated mileage along the route. Typically, users interact with a merged version of these two tables so they see the entire listing of events along a route. The merged file is officially called Mergelog, however, most users refer to it as Roadlog.

#### ***True Mileage File***

The true mileage (TRM) file is the heart of TIS. It allows roadway locations to be identified in terms of reference points without placing undue constraints on the location of reference posts. All trunk highways and some non-trunk roadways are physically reference posted (or mile posted). When a route is originally posted, an attempt is made to place the posts exactly one mile apart - reference post 1 is placed one mile after the beginning of the route, post 2 is placed one mile past post 1, etc. Some posts cannot be placed exactly one mile past the preceding posts (e.g., if the exact location would be in the middle of an intersection), and some posts wind up being a little less than a mile apart while others wind up being a little more than a mile apart. As time passes, roadway construction will change the lengths of portion of the route making more of the posts misplaced.

Non-trunk roadways that are not physically reference posted are assigned "paper reference posts" that are exactly one mile apart. Again, as time passes, roadway construction will eventually move the paper reference posts less or more than one mile apart. The true mileage file allows the reference posts to be used for locating points along roadways. It contains one record for each reference post in the system, and provides the distance from the beginning of the route to the reference post.

#### ***Intersection/Interchange Files***

The intersection/interchange (II) files contain information pertaining to only the intersections and interchanges for which accident analysis reports are desired. They do not contain a complete inventory of Minnesota's intersection and interchanges. The II files are physically stored as two separate files: (1) the INT file (intersection details) and (2) the INX file (cross-reference file). The INT file contains one record per intersection. The INX file contains one or more records per intersection.

The records stored in the INT file are variable-length records. Each record consists of one INT segment (intersection details) and 1-9 INL segments (leg details). One record is stored in the INX file for each INL segment stored in the INT file. Application programs view the II files as three separate files: (1) the INT file (details), (2) the INL file (leg information), and (3) the INX file. The INT and INX files are seen as fixed-length records. The INL file is seen as an array containing 1-9 fixed-length records.

The INT file (as seen by application programs) contains data elements that apply to individual intersections as a whole. Examples of data elements in this file are:

- Key of intersection (route system, route number, and reference point of one of the intersecting routes).
- Intersection type (e.g., interchange or railroad crossing).
- Traffic control devices installed at the intersection.

The INL file (as seen by application programs) contains 1-9 records for each INT record. Each record describes one intersecting route, and can describe either 2 legs (the route continues through the intersection) or 1 leg (the route begins or ends at the intersection). Examples of data elements in this file are:

- Key of intersecting route (route system, route number, and reference point)
- ADT on each leg.
- Number of lanes on each leg.

The INX file (as seen by application programs) contains one record for each INL record. It allows access to the INT record via the key of any intersecting route of an intersection. The data elements in the INX file include:

- Key of intersecting route.
- Key of intersection.
- Construction district, maintenance area, patrol station.

- City number and county number.

### ***Accident File***

The accident file contains data translated from the Department of Public Safety accident records database. The accident file in TIS does not include any data categorized as sensitive or confidential from the accident record. Each record in the file contains:

- ACD - Accident details segment (exactly one)
- ACP - Accident person segment (0-99), one per person involved
- ACV - Accident vehicle segment (0-99), one per vehicle involved
- ACJ - Accident person/vehicle segment (0-99), one per person

The file contains data for accidents from 1978 to the present. Accidents that could not be exactly located by reference point location are termed "non-geocoded." These accidents contain route system and route number location information only.

### ***Traffic File***

The traffic file contains traffic volume information. Each record in the file contains volumes at one particular location. Up to 40 volumes can be stored in each volume record. The volumes are stored as annual average daily traffic volumes for particular years. For example, one record might contain three volumes - one for 1977, one for 1978, and one for 1979. Descriptor records, which contain no volumes, are also stored in the file. These are gap and endpoint records which correspond to those stored in the roadlog file.

### ***Sections File***

The sections file contains information used to define sections of roadway for accident analysis reports. The file is maintained by individual construction districts for their own analysis purposes, and is not a complete inventory of the state's roadways. The information pertaining to each section is not at the level of detail as found in the roadlog file. Data elements include:

- Codes describing general design and environment.
- Speed limit.
- Categorization codes.
- Verbal description.

### ***Bridge File***

The bridge file is no longer maintained in TIS. It is an inventory of bridges (including culverts, pedestrian bridges, etc.) in the state. The file is linked to the other TIS files through reference point location. Bridge file data elements include:

- Administrative and jurisdictional.
- Span types, construction, and lengths.
- Clearances.
- Roadway and sidewalk widths.
- Condition ratings and appraisals.
- Defense requirements.
- Proposed improvements.
- Numerous miscellaneous items.

This data is currently updated on a semi-annual basis by accessing PONTIS (bridge management system) maintained by Mn/DOT's Bridge Office.

### ***Rail Grade Crossing File***

The rail grade crossing file is no longer maintained in TIS. It contains information about at-grade railroad/roadway intersections, including:

- Types of protection and warning signs.
- Traffic data for railroad and roadway.
- Physical characteristics (such as number of tracks).
- Location information.

This data is currently updated on a periodic basis by personnel in Mn/DOT's Office of Freight & Commercial Vehicle Operations (OFCVO).

### ***Condition Rating File***

The condition rating file contains information about the surfaces of roadways. The information is historical, dating back to 1967, and includes:

- Surface rating.
- Present serviceability rating.
- Condition rating.
- Percentage defects.

## ***Roadway History File***

The roadway history file includes construction and maintenance data for trunk highways, such as:

- Contract number and dates.
- Layers of work:
- Roadway (undivided, road-1 or road-2).
- Layer position, material, width, and depth

Note: The Condition Rating File and the Roadway History File together form the core data for Mn/DOT's Highway Pavement Management System. TIS creates the base files for the pavement condition measuring vans; data is collected and then returned to TIS for processing. After processing, the data is exported to the actual pavement management system for further analysis.

## **Support Files**

Several support files are also maintained in TIS. These files are not part of Mn/DOT's standard business data, but are essential to the internal functioning of the reporting operations and internal maintenance of the system. These files are as follows:

- *The Coincident File:* Where multiple trunk highways cover the same pavement, one of the routes is determined to be the "Primary Route" and all data in the business tables are referenced according to mileage along this primary route. The Coincident File maintains the connection between the name and mileage of trunk highways that run concurrently on a primary route and the name and mileage on the primary route itself.
- *The Street Name File:* This file maintains street name information for routes in TIS. For many data providers, particularly local road authorities, street names provide an essential description of location. The Street Name file provides an index to associate a particular street name to a route and mileage that is used in the rest of TIS.
- *The Township Name file:* This relatively simple file is comprised of township names and IDs and is used as a look up table for various TIS functions.
- *The City Name file:* This relatively simple file is comprised of city names and IDs and is used as a look up table for various TIS functions.
- *The County Name file:* This relatively simple file is comprised of county names and IDs and is used as a look up table for various TIS functions.
- *The Cross-Reference Files:* There are several cross reference files (City, County, Maintenance Area, Patrol Station, and Construction District) which have the same format and function. Each one lists the portions of roads by route name and mileage that exist within each of the various organizational boundaries of the table. For instance, the County Cross Reference table lists all of the routes and the mileages of those routes that exist in each of the counties in the state. These tables are used extensively for report generation as information is commonly asked for grouped by the various organizational units.

## ***Non-tabular TIS Contents***

In addition to the tables of business data listed above, there are database functions and report functions that are carried out by the TIS mainframe.

System Maintenance functions: TIS has 35 system maintenance commands that are used by the TIS administrator to manage the system and carry out system checks.

User Commands (roughly 200): This is a broad category that encompasses both significant report generation, and data processing and maintenance functions. Of these 200, at least 30% are not believed to be used at this time.

TIS serves as the system of record for many reports supplied to a variety of customers including the federal government, Mn/DOT customers outside of TDA, and local customers and partners. Annual federal reports include the Highway Performance Management System and the Highway Safety Information System. Other reports cover everything from crash safety analysis to cross-sectional pavement information. Ad hoc reports can also be generated to answer most requests made of the many integrated data sets within the system. In addition, information from TIS is extracted for import into several other Mn/DOT systems, including the Highway Pavement Management System and the Route Builder application.

Data processing and maintenance functions are also varied and complex. Perhaps the most critical of the processing functions conducted by TIS is the multi-file operation. This process manages the conversion of all the data sets maintained in TIS when a route is redesignated or mileage along a route is adjusted. Since the route and reference point system is the key for locating TIS data sets relative to one another, improper or incomplete changes to this data can result in lost data or data that is inadvertently assigned to the wrong section of pavement.

In addition to this multifile process, there are other data maintenance and processing commands available to TIS users that carry out a variety of functions.

- Maintaining system data tables internal to TIS that are required for effective data integration and retrieval
- Preprocessing data for the evaluation of statistically significant differences in crash rates among a collection of route segments
- Supplying system management information to evaluate and diagnose system errors

## **Transportation Information System Specifications**

Language: PL/1 procedural code makes up about 75% of the total lines of code with the remaining 25% providing file access routines written in IBM Assembler.

Lines of Code: JCL – 300K to 375K; IBM Assembler: 100K to 125K

Size of the Database: Roughly 4.2 GB

Number of Programs: 398 panvalet source Modules in Assembler; 1855 panvalet source modules in PL/1. Source Modules of either type are roughly 250 lines of code each.

Number of Files: Business data files in use: 29  
Business Support files: 11  
Business data files no longer in use: 16  
System Decode files: 8  
For details see end of this document.

Number of Screens: SPF dialogs (185 clists, 206 panels)

Number of Reports: Roughly 100 – less than 50% used currently

Number of Transactions/Day: Roughly 100/day

Number of Records: Roughly 12 Million

## TIS Files in Use

| Category       | Table Abbreviation | Name                                  | Business  | Business Support | Columns |
|----------------|--------------------|---------------------------------------|-----------|------------------|---------|
| Datum          | LPT                | Logpoint                              | 1         |                  | 111     |
| Datum          | RLG                | Roadlog                               | 1         |                  | 111     |
| Datum          | STR                | Street File                           | 1         |                  | 21      |
| Datum          | TRM                | True Miles Table                      |           | 1                | 7       |
| Maint.         | DTU                | User Listing Table                    |           | 1                | 7       |
| Maint.         | USG                | Usage Tracking Table                  |           | 1                | 17      |
| Pavement       | CR1                | Condition Rating Most Current Year    | 1         |                  | 52      |
| Pavement       | CRD                | Condition Rating Data                 | 1         |                  | 13      |
| Pavement       | CRG                | Condition Rating Data Generation      | 1         |                  | 14      |
| Pavement       | CRR                | Condition Rating Record               | 1         |                  | 22      |
| Pavement       | CRS                | Pavement Defects                      | 1         |                  | 40      |
| Pavement       | CRY                | Condition Rating Segment              | 1         |                  | 52      |
| Pavement       | RDD                | Roadway History Driving Layer         | 1         |                  | 13      |
| Pavement       | RDH                | Roadway History                       | 1         |                  | 24      |
| Pavement       | RDL                | Roadway History Layers                | 1         |                  | 10      |
| Pavement       | RDX                | Roadway History Segment Cross Section | 1         |                  | 39      |
| Pavement       | RDY                | Roadway History Cross Section Layer   | 1         |                  | 13      |
| Safety         | ACD                | Accident                              | 1         |                  | 67      |
| Safety         | ACJ                | Accident Person Vehicle               | 1         |                  | 82      |
| Safety         | ACP                | Accident Person                       | 1         |                  | 47      |
| Safety         | ACV                | Accident Vehicle                      | 1         |                  | 36      |
| Safety         | ASA                | Accident Section Analysis             | 1         |                  | 46      |
| Safety         | INA                | Intersection Analysis                 | 1         |                  | 34      |
| Safety         | INL                | Intersection Legs                     | 1         |                  | 31      |
| Safety         | INT                | Intersections                         | 1         |                  | 38      |
| Safety         | INX                | Intersection Cross Reference          | 1         |                  | 20      |
| Safety         | SEC                | Safety Sections                       | 1         |                  | 14      |
| Support        | CIT                | City Table                            | 1         |                  | 8       |
| Support        | CNT                | County Table                          |           | 1                | 2       |
| Support        | COF                | Coincidence File                      |           | 1                | 10      |
| Support        | TWN                | Township Table                        |           | 1                | 2       |
| Support        | XCD                | Construction District Cross-Reference |           | 1                | 4       |
| Support        | XCI                | City Cross-Reference                  |           | 1                | 4       |
| Support        | XCN                | County Cross-Reference                |           | 1                | 4       |
| Support        | XMN                | Maintenance Area Cross-Reference      |           | 1                | 4       |
| Support        | XPT                | Patrol Station Cross-Reference        |           | 1                | 4       |
| Volume         | ADT                | ADT                                   | 1         |                  | 14      |
| Volume         | TRF                | Traffic                               | 1         |                  | 10      |
| Volume         | TRV                | Traffic Volume Segment                | 1         |                  | 5       |
| Volume         | TRX                | Traffic Segment Cross Reference       | 1         |                  | 5       |
| <b>Totals:</b> |                    |                                       | <b>29</b> | <b>11</b>        |         |

## TIS Files No Longer in Use

| Category    | Table Abbreviation | Name                           | Columns |
|-------------|--------------------|--------------------------------|---------|
| Bikes       | BIK                | Bikes                          | 62      |
| Bridge*     | BDG                | Bridge                         | 172     |
| Bridge      | BNA                | Bridge Accident Analysis       | 56      |
| Pavement    | RLS                | Roadway History Left Shoulder  | 13      |
| Pavement    | RRS                | Roadway History Right Shoulder | 13      |
| Rail        | RGC                | Rail Grade Crossing            | 103     |
| Rail        | RPT                | Rail Line Point Log            | 8       |
| Rail        | RTM                | Rail Line True Miles           | 7       |
| Rail        | RWY                | Rail Line Information          | 56      |
| Rail        | STA                | RailRoad Station File          | 17      |
| Safety      | TIM                | Time of Day Table(?)           | 7       |
| Sufficiency | SUF                | Sufficiency                    | 140     |
| Sufficiency | SUH                | Sufficiency Hazards            | 14      |
| Volume      | ATM                | ATM                            | 6       |
| Volume      | ATR                | ATR                            | 22      |
| Volume      | ESL                | ESAL Table                     | 7       |

\*While the BDG file is no longer used for the purpose of Bridge Asset Management, the existence and location of active bridges is still maintained via regular updates from the bridge management system, PONTIS. Bridge locations are used in several reports and interfaces for TIS.

## Business Data File Descriptions

Note: Some of the tables listed above are not in this list due to the lack of the information in our source documentation. The tables still in use lacking this information are: CIT, CNT, COF, CRS, DTU, INX, LPT, TRM, TRX, TWN, USG, XCD, XCI, XCN, XMN, and XPT. The tables not in use that lack this information include ATM, ATR RPT, RTM, RWY, STA, and TIM.

### *Accident - ACD*

- Data: One accident.
- Scope: All Minnesota roadways, all history.
- Record types: Point hierarchical. Each record has two child records: one child record per person, one child record per vehicle.
- Significant fields: Interchange element - used to associate accidents with interchanges.
- Oddities: Not all accidents are available (since not all records have reference points).
- Related files: Accident person, vehicle, and person/vehicle.

### *Accident Person - ACP*

- Data: Person(s) in accident.
- Scope: All persons in this accident.
- Record type: Child of point (accident record).
- Related files: Accident record is parent record, accident person/vehicle is combination of person child record and the associated vehicle child record.

### *Accident Vehicle - ACV*

- Data: Vehicle(s) involved in accident.
- Scope: All vehicles involved in this accident.
- Record type: Child of point (accident record).
- Related files: Accident record is parent record, accident person/vehicle is combination of vehicle child record and the associated person child record.

***Accident Person/Vehicle - ACJ***

- Data: Person(s) in an accident, together with data for the vehicle they occupied.
- Scope: All persons involved in this accident.
- Record type: Child of point (accident record). Made by combining accident person record with vehicle record (associated by person "vehicle occupied" and vehicle "vehicle number").
- Related files: Accident record is parent.

***ADT - ADT***

- Data: Length-weighted Annual Average Daily Traffic.
- Scope: All roadways in Minnesota, available from 1978 to last year. Available at a point or over any valid segment.
- Record types: Computed between command START-DATE and END-DATE, subject to +SELECT on time intervals. Source is traffic volume file.
- Significant fields: ADT.
- Related files: Traffic and traffic volume.

***Section Accident Analysis - ASA***

- Data: Section accident rate analysis file.
- Scope: Depends upon creation parameters.
- Record type: Segment (flat).
- Significant fields: Accident rate, statistics.
- Oddities: Non-permanent file, generated as part of crash analysis request.
- Related files: Sections, accidents.

***Bridge – BDG:***

*Note:* The BDG file no longer serves as the department system of record for Bridges. However, bridge ID number, length, and location information is maintained via twice annual updates from the PONTIS bridge management system as this is used in mergelog reporting.

- Data: Bridge information (includes culverts).
- Scope: All Minnesota bridges with at least one roadway involved.
- Record types: Point file.
- Significant fields: Functional use (to determine mainline bridges). Over-under (to determine if going over or under structure). Usage (to limit which of three reference point keys is being used).
- Oddities: Multiple records in the file for a single structure (one for each route involved). Many data elements have differing interpretations depending on which record is accessed. Each record has 1 to 3 reference point keys.
- Related files: Bridge accident analysis.

***Condition Rating Record - CRR***

- Data: Condition ratings for several years by lane by roadway (PSR - Present Serviceability Rating, SR - Structural Rating, CR - Condition Rating, PQI - Pavement Quality Index).
- Scope: Trunk highways, 1967-present. Each record applies to ONE roadway (two records for divided roadways).
- Record types: Segment hierarchical. Segment breaks can occur at different locations on each roadway of a divided highway.
- Significant fields: Roadway ID (defines roadway). Record type (defines "design" breaks).
- Oddities: Separate records for multiple roadways. Each type of roadway must be processed in a separate pass. These fields have been coded as follows: Roadway ID: "U" means undivided roadway. "I" and "D" mean divided roadway, increasing or decreasing milepost direction, respectively. Record type: "D" means a design change in one or both roadways at this reference point. This includes changes in surface type or number of lanes. All other records have type "M", which is an intermediate record location at a milepost.
- Related files: Condition rating segments (child) and condition rating data (computed from condition rating segments).

***Condition Rating Segment - CRY***

- Data: One year of condition ratings and percent defects by lane for the roadway segment.
- Scope: 2 lanes of data, valid within reference point limits of parent condition rating record.
- Record types: Child of segment. All children are for same location, each is for a different year. Records are sorted in order from most recent to earliest.
- Significant fields: Year. Surface type determines which defects subfields are present and what their interpretation is.

- Oddities: Specific defects fields depend upon surface type code, i.e., only certain names have meaning for each surface type. For example, if the surface type is "C" (concrete), then the defects are stored in fields beginning with "CONC:".
- Related files: Condition rating record (parent), condition rating most recent year, condition rating data.

### ***Condition Rating - Most Recent Year - CR1***

- Data: First selected generation of condition rating data segment.
- Scope: One year of data by lane for the parent record location.
- Record types: Child of segment.
- Significant fields: Year. Surface type determines which defects subfields are present and what their interpretation is.
- Oddities: Specific defects fields depend upon surface type code, i.e., only certain names have meaning for each surface type. For example, if the surface type is "C" (concrete), then the defects are stored in fields beginning with "CONC:".
- Related files: Condition rating record (parent), condition rating segment, condition rating data.

### ***Condition Rating Data - CRD***

- Data: Length-weighted condition rating data in "design" segments.
- Scope: Trunk highways, 1967-present.
- Record type: Segment hierarchical. Segment breaks can occur at different locations on each roadway. Each record corresponds to one or more CRR records.
- Significant fields: Roadway ID, Number of generations.
- Oddities: One record for each segment of each roadway (two records for divided roadways).
- Related files: Condition rating record and condition rating data generation (child).

### ***Condition Rating Data Generation - CRG***

- Data: One generation of condition rating data for the roadway "design" segment.
- Scope: Two lanes of data, valid for the roadway within the reference point limits of the "design" segment (CRD).
- Record type: Child of segment.
- Significant fields: Year.
- Oddities: The year is a length-weighted average, e.g., the first year is the average year of the first generation of ratings.
- Related files: Condition rating data segment (parent), condition rating segment (CRY).

### ***Intersection Accident Analysis – INA***

- Data: Intersection accident rate analysis file.
- Scope: Depends upon creation parameters.
- Record type: Point file.
- Significant fields: Accident rate, statistics.
- Oddities: Non-permanent file, generated as part of crash analysis request.
- Related files: Intersection, accidents.

### ***Intersection - INT***

- Data: Intersection and interchange type, volumes, signalizations.
- Scope: Trunk highways. Used for accident analysis and varies according to district interest.
- Record type: Point hierarchical. Each record has 1-9 routes and 1-9 legs. Each intersection leg child records describes one leg.
- Significant fields: Intersection type.
- Oddities: Also used for rail grade crossing accident analysis (intersection type 5), by allowing programs to link to rail grade crossing file.
- Related files: Intersection leg (child), intersection accident analysis.
- Approx. Number of records: 9,000

### ***Intersection Leg - INL***

- Data: Describes one leg of an intersection.
- Scope: Applies only to one intersection and/or interchange.
- Record type: Child of point (intersection).
- Significant fields: Interchange element code, leg number, route system, route number, reference point (of leg).

- Oddities: None.
- Related files: Intersection (parent).
- Approx. Number of records: 33,000

### ***Roadway History - RDH***

- Data: Construction and maintenance history of roadway. Each record describes a continuous segment of road work for a particular contract.
- Scope: Trunk highways, by contract.
- Record type: Segment hierarchical. Contains children that describe each layer of work in this segment of the contract.
- Significant fields: Road ID (road-1, road-2, undivided), and contract number.
- Oddities: Use the roadway history cross-section file to get data for a roadway cross-section (generated from this file). Records in this file are not "end-to-end" like other segment files, i.e., they can overlap each other. For this reason, RDH data cannot be extracted in combination with any other segment file(s) except RDL. Make a separate pass for the other segment data (see Sample #1).
- Related files: Roadway history layer (child), roadway history cross-section.

### ***Roadway History Layer - RDL***

- Data: One layer of work on one segment of a contract (construction and/or maintenance).
- Scope: Applies to one continuous segment of one contract.
- Record types: Child of segment. Location determined by roadway history parent.
- Significant fields: Cross-section position, transverse direction, work item.
- Oddities: Order of layers in record is not consistent. RDL data elements cannot be extracted in combination with any other segment file except RDH (see RDH oddities above).
- Related files: Roadway history (parent), roadway history cross-section layer.

### ***Roadway History Cross-section - RDX***

- Data: Cross-section for segment of one roadway. All physical data of roadway and its construction and maintenance history.
- Scope: Trunk highways. Applies to one roadway for the indicated segment.
- Record type: Segment hierarchical. Contains children that describe each layer in the roadway. Children are ordered from top to bottom.
- Significant fields: Road ID (road-1, road-2, or undivided), number of layers children).
- Oddities: Most useful information about the cross-section is in computed data elements of this record. Percent predominance should not be used.
- Related files: Roadway history cross-section layer(child), roadway history, roadway history layer.

### ***Roadway History Cross-section Layer - RDY***

- Data: One layer of a cross-section for a particular segment of a roadway.
- Scope: One layer of one roadway defined by parent location (roadway history cross-section).
- Record type: Child of segment. Similar to roadway history layer with addition of contract number.
- Significant fields: Cross-section position, work item, transverse direction.
- Oddities: "CURRENT" or "HISTORY" option affect what layers are present. See the EXTRACTION command for explanation of this option.
- Related files: Roadway history cross-section, roadway history layer, roadway history.

### ***Roadway History Cross-section Top Driving Surface Layer - RDD***

- Data: Top layer of a cross-section for a particular segment of a roadway in the driving surface.
- Scope: One layer of one roadway defined by parent location (roadway history cross-section).
- Record type: Child of segment. Similar to roadway history layer with addition of contract number.
- Significant fields: Work item.
- Oddities: "CURRENT" or "HISTORY" option affect what layers are present.
- Related files: Roadway history cross-section, roadway history layer, roadway history.

### ***Roadlog - RLG***

- Data: Jurisdictional boundaries, physical data.

- Scope: All roadways in Minnesota.
- Record types: Segment flat. Also contains "non-mileage" segments (gap, coincident, and non-existent mileage), which are never seen by extraction.
- Significant fields: Remark code. Note: "DS" should be treated no differently than " ".
- Oddities: Intersection category (indicates route system of intersecting route), and verbal description. Both really describe the beginning point of the segment and not the segment as a whole.
- Related files: None.

### ***Sections - SEC***

- Data: Used for accident section rate analysis. Contains general design characteristics.
- Scope: Trunk highways.
- Record type: Segment (flat).
- Significant fields: None.
- Oddities: Maintained by individual districts. Level of detail may vary.
- Related files: Section accident analysis.

### ***Traffic - TRF***

- Data: Raw ADT (non-directional).
- Scope: All roadways in Minnesota, from 1978 to the year before the current year.
- Record type: Segment hierarchical. Each child contains one year of ADT.
- Significant fields: Full volumes (number of volume children selected).
- Oddities: None.
- Related files: Traffic volume segment (child).
- Approx Number of Records: 2.2M

### ***Traffic Volume Segment - TRV***

- Data: One year of raw ADT for a roadway (non-directional).
- Scope: ADT for location in parent record (traffic).
- Record type: Child of segment (traffic).
- Significant fields: AADT, year.
- Oddities: Heavy commercial AADT is -1 if unknown.
- Related files: Traffic volume.
- Approx Number of Records: included in TRF

## **Business Support Tables**

**Coincident File:** Where multiple trunk highways cover the same pavement, one of the routes is determined to be the "Primary Route" and all data in our business tables is referenced according to mileage along this primary route. The Coincident File maintains the connection between the name and mileage of trunk highways that run concurrently on a primary route and the name and mileage on the primary route itself.

**Street Name File:** This file maintains street name information for routes in TIS. For many data providers, particularly local road authorities, street names provide an essential description of location. The Street Name file provides an index to associate a particular street name to a route and mileage that is used in the rest of TIS.

**Township Name File:** This is a relatively simple file comprised on Township names and IDs used as a look up table for various TIS functions.

**City Name File:** This is a relatively simple file comprised on City names and IDs used as a look up table for various TIS functions.

**County Name File:** This is a relatively simple file comprised on County names and IDs used as a look up table for various TIS functions.

**Cross-Reference Files:** There are several cross reference files (City, County, Intersection, Maintenance Area, Patrol Station, and Construction District) all of which have the same format and function. Each one lists the portions of roads by route name and mileage that exist within each of the various organizational boundaries of the table. For instance, the County Cross Reference table lists all of the routes and the mileages of those routes that exist in each of the counties in the state. These tables are used extensive for report generation as information is commonly asked for grouped by the various organizational units.

## **Business Data Files No Longer in Use**

### ***Bikeway - BIK***

- Data: Bikeway rating analysis file. Generated by programs from raw data files.
- Scope: Depends upon creation parameters.
- Record type: Segment (flat).

- Significant fields: Bikeway formula rating points.
- Oddities: Non-permanent file.
- Related files: None.

### ***Bridge Accident Analysis - BNA***

- Data: Bridge accident rate analysis file. Generated by programs from raw data files.
- Scope: Depends upon creation parameters.
- Record type: Point file.
- Significant fields: Accident rate, statistics.
- Oddities: Non-permanent file.
- Related files: Bridge, accidents.

### ***ESALS - ESL***

- Data: Length-weighted ESALS (equivalent standard axle load). Currently estimated by formula from physical road data (roadway history cross-section) and heavy commercial average daily traffic (estimated from traffic volume).
- Scope: Trunk highways in Minnesota. Available at a point or over any valid segment.
- Record types: **Computed** between command ESAL-START-DATE and ESAL-END-DATE, subject to +SELECT on time intervals and available roadway history cross-section data.
- Significant fields: Type (different number if flexible or rigid surface).
- Oddities: If all relevant roadway history cross-section data is not also extracted (meaning uniform throughout segment), ESALS will be computed using roadway history cross-section at start of segment (even if it varies throughout the segment). Traffic used will be valid over the entire segment. See "Introduction to ESALS" in chapter 8 of the User's Manual for more on ESAL calculations.
- Related files: Roadway history cross-section and traffic volume.

### ***Roadway History Cross-section Top Right Shoulder Layer - RRS***

- Data: Top layer of a cross-section for a particular segment of a roadway in the right shoulder.
- Scope: One layer of one roadway defined by parent location (roadway history cross-section).
- Record type: Child of segment. Similar to roadway history layer with addition of contract number.
- Significant fields: Work item.
- Oddities: "CURRENT" or "HISTORY" option affect what layers are present.
- Related files: Roadway history cross-section, roadway history layer, roadway history.

### ***Roadway History Cross-section Top Left Shoulder Layer - RLS***

- Data: Top layer of a cross-section for a particular segment of a roadway in the left shoulder.
- Scope: One layer of one roadway defined by parent location (roadway history cross-section).
- Record type: Child of segment. Similar to roadway history layer with addition of contract number.
- Significant fields: Work item.
- Oddities: "CURRENT" or "HISTORY" option affect what layers are present.
- Related files: Roadway history cross-section, roadway history layer, roadway history.

### ***Rail Grade Crossing - RGC***

- Data: Rail grade crossing.
- Scope: All active rail grade crossings in Minnesota.
- Record type: Point file.
- Significant fields: None.
- Oddities: None.
- Related files: Intersection, intersection accident analysis.

### ***Sufficiency Rating - SUF***

- Data: Trunk highway sufficiency ratings and related data.
- Scope: Trunk highways.
- Record type: Segment (flat).
- Significant fields: Sufficiency ratings, spring loads.

- Oddities: Most data is duplicated in other TIS files.
- Related files: Sufficiency hazard.

### ***Sufficiency Hazard - SUH***

- Data: Trunk highway sufficiency hazards (deficient curves, no passing zones).
- Scope: Trunk highways.
- Record types: Segment (flat).
- Significant fields: Hazard type.
- Oddities: Records in this file are not "end-to-end" like other segment files, i.e., they can overlap each other. For this reason, SUH data cannot be extracted in combination with any other segment file(s). Make a separate pass for the other segment data (see Sample #1).
- Related files: Sufficiency rating.

### **Decoder Tables Used by System**

**Equivalence table:** Provides load module names for those load modules not found in the program name table.

**Program name table:** Provides load module names for TIS application programs.

**Pass parameter table:** Provides default PARM parameters for TIS application programs.

**Required keyword table:** For each TIS application program, provides a listing of all keyword parameters and subcommands that **MUST** be included whenever the program is run.

**Required DD statement table:** For each TIS application program, provides a listing of all DD statement required for its execution other than those DD statements also needed by the supervisory software.

**Optionword table:** For each TIS application program, provides a listing of the valid optionword parameter.

**Keyword table:** Provides information on how to decode keyword parameters.