

1. Report No. FHWA/TX-06/0-5213-1	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle DEVELOPMENT OF GUIDELINES FOR DATA ACCESS FOR TEXAS TRAFFIC MANAGEMENT CENTERS		5. Report Date Sep 2005 Published May 2007	
		6. Performing Organization Code	
7. Author(s) Edward J. Seymour, James D. Carvell, Darrell W. Borchardt, Robert E. Brydia, Christopher M. Poe, Marsha Anderson-Bomar		8. Performing Organization Report No. Report 0-5213-1	
9. Performing Organization Name and Address Texas Transportation Institute The Texas A&M University System College Station, Texas 77843-3135		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. Project 0-5213	
12. Sponsoring Agency Name and Address Texas Department of Transportation Research and Technology Implementation Office P. O. Box 5080 Austin, Texas 78763-5080		13. Type of Report and Period Covered Technical Report: 09/2004 – 08/2005	
		14. Sponsoring Agency Code	
15. Supplementary Notes Project performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. Project Title: Data Access Requirements for Texas Traffic Management Centers URL: http://tti.tamu.edu/documents/0-5213-1.pdf			
16. Abstract This document provides guidelines and recommended action items for Texas Department of Transportation in the pursuit of the most appropriate way to handle the administrative concerns of ownership of traffic management center (TMC) information, revenue opportunities associated with the data, and contractual agreements among agencies involved in the collection and dissemination of traffic management center data.			
17. Key Words Data Access, TMC, Traffic Management Center		18. Distribution Statement No restrictions. This document is available to the public through NTIS: National Technical Information Service, Springfield, Virginia 22161 http://www.ntis.gov	
19. Security Classif.(of this report) Unclassified	20. Security Classif.(of this page) Unclassified	21. No. of Pages 80	22. Price

DEVELOPMENT OF GUIDELINES FOR DATA ACCESS FOR TEXAS TRAFFIC MANAGEMENT CENTERS

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Report 0-5213-1

Project 0-5213

Project Title: Data Access Requirements for Texas Traffic Management Centers

Performed in cooperation with the
Texas Department of Transportation
and the
Federal Highway Administration

September 2005

Published May 2007

TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System

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ACKNOWLEDGMENTS

This project was conducted in cooperation with TxDOT and FHWA. The authors would like to thank the project director Sally G. Wegmann, from the Houston TxDOT District for her leadership and guidance. The authors also wish to recognize the TxDOT Project Advisors for their time, initiative, and valuable insight:

- Carol Rawson, program coordinator, Traffic Operations Division
- Wallace Ewell (Deceased), Fort Worth District
- Patrick Irwin, San Antonio District
- Carlos Chavez, El Paso District
- Brian Burk, Austin District
- Charlie Farnham, Traffic Operations Division

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1 Introduction

The objective for Project 0-5213, Data Access Requirements for Texas Traffic Management Centers, is to develop guidelines and procedures for the Texas Department of Transportation (TxDOT) for handling information provided by Texas transportation management centers (TMCs). Of particular importance are the administrative concerns of ownership of the information provided by the various TMC resources, revenue opportunities for such information, and contractual agreements with third party Information Service Providers (ISPs) for utilizing the information.

TxDOT funding supports many TMC resources, such as Closed Circuit Television (CCTV) cameras, freeway operational data, and traffic incident information. Many of the TxDOT TMCs have been successful in providing public access to available TMC information via the Internet and portable devices such as cellular telephones and personal digital assistants. Both Houston TranStar and San Antonio TransGuide have been nationally recognized by the Federal Highway Administration (FHWA) as the best Internet destinations providing travelers with real-time information.

ISPs are also receiving information free of charge from Texas TMCs that is similar to that available to the public. The ISPs typically repackage this information, add value and features to the data, and subsequently charge a fee to travelers, media outlets and other private customers. In general, TxDOT does not charge for furnishing such information to the ISPs, but there may be an opportunity to do so and generate additional revenue for TxDOT. To examine the issue, this research project conducted the following activities.

- Identification of what traffic data are currently available;
- Examination of current and anticipated practices for furnishing traffic data to private entities;
- Inspection of the diverse uses for traffic data;
- Review of the potential use of traffic data as a revenue source; and
- Identification of prominent administrative concerns associated with sharing and/or selling the data.

2 Guidelines for Data Access for Texas Traffic Management Centers

2.1 Introduction

The following guidelines are suggestions for data access based on the findings from TxDOT Project 0-5213, Data Access Requirements for Texas Traffic Management Centers. They are not policy statements or operational procedures that have been endorsed or adopted by TxDOT. They are suggestions from which TxDOT may or may not choose to develop subsequent policies and/or procedures.

2.2 Value of Data (Revenue Opportunities)

TMC data benefits the community by allowing public agencies to more effectively manage recurring congestion and incidents. Delivery of these data to the public also provides a benefit to the public by allowing travelers to make informed choices based on the condition of the transportation system. But TMC data is also an asset with value to private sector organizations – especially those that repackage and resell it to media outlets.

A review was conducted on how public agencies are sharing Intelligent Transportation Systems (ITS) data with other agencies or outside firms. The appraisal was conducted by contacting TMCs around the country. In addition, inquiries were made about how floor space within TMCs was being shared with outside firms. This examination revealed three general models for data sharing with other agencies and private sector companies: no cost to registered users, barter for in-kind services, and fee for ITS data.

There are few examples of data produced by transportation management centers being sold or bartered. But the few that exist illustrate a value of approximately \$0.10 per person per year for the population of the applicable metropolitan area. The observed values ranged between \$0.08 and \$0.13 per person per year. Using this estimate the value of data in six Texas metropolitan areas with TMCs is shown in Table 1.

Table 1. Approximate Value of TMC Data.

Location & TMC	Year 2000 Metropolitan Population	Approximate Value of TMC Data Per Year
Austin (CTECC)	1,300,000	\$130,000
Dallas – Fort Worth (DalTrans & TransVision)	5,200,000	\$520,000
El Paso (TransVista)	680,000	\$68,000
Houston (TranStar)	4,700,000	\$470,000
Laredo (STRATIS)	190,000	\$19,000
San Antonio (TransGuide)	1,600,000	\$160,000

TxDOT could seek to make effective use of its TMC data assets by seeking a value for the data commensurate with that provided by other deployments – on the order of \$0.10 per person per year for the population of the applicable metropolitan area.

Guideline 1: Make effective use of TMC data assets by seeking a value for the data commensurate with that provided by other benchmark deployments – on the order of \$0.10 per person per year for the population of the applicable metropolitan area.

Based on an interview of ISPs in Houston, a large fraction of the perceived value of this TMC data for the ISPs is having a physical presence at the center (more than 50 percent). However, the interview also revealed that this presence could be established offsite if adequate connectivity, video control/monitoring capability, and TMC floor intercom communications were provided.

Guideline 2: In order to ensure high value to information service providers that are TMC customers, provide them access to TMC floor operations either onsite in the TMC or offsite using a high bandwidth connection.

Given the value of TMC data identified in [Guideline 1](#), it is reasonable to require the ISPs to pay the cost for an offsite TMC physical presence or onsite TMC physical presence especially in larger urbanized areas where the value of TMC data is hundreds of thousands of dollars per year.

Guideline 3: Based on the value of TMC data, information service providers should pay the cost for TMC floor access and data whether it is provided onsite in the TMC or offsite using a high bandwidth connection.

The Houston interviews also revealed a strong demand from the information service providers that all ISPs be treated in the same manner. Because of the perishable nature of transportation information, no ISP wanted to be at a disadvantage in the marketplace. As an important example, access to TMC floor operations should be provided in the same manner for all ISPs. It would be effective to house the ISPs next to each other so that each ISP could help monitor and verify equal access to TMC data.

Guideline 4: Give the same opportunity for data and access to data to all TMC information service providers. A preferred deployment is to house the ISPs next to each other so that each information service provider can help monitor and verify equal access to TMC data.

Guidelines 2 through 4 highlight principles of TMC floor access for information service providers. Experience in TMCs within Texas and outside of Texas indicates that ISPs will continue to highly value TMC floor access for at least the next decade. Therefore, it is prudent for TxDOT to develop a strategy for each TMC that leads to eventual offsite access by ISPs to TMC floor operations. The principle is that over time many TMCs gain additional

tenants, and TMC floor space becomes a scarce resource. Because of the value of TMC data and the ability to locate ISPs offsite, ISPs should know that they are likely to be located offsite, especially as a TMC matures and additional tenants are added. This configuration could be declared through a formal strategy and communicated to the ISPs.

Guideline 5: Develop a strategy for locating information service providers offsite using a high bandwidth connection as a TMC matures.

Through a review of practices in other TMCs and through interviews with ISPs, two major services were identified as preferred compensation by ISPs for TMC data access. These are

- supply of incident and congestion information gathered from ISP sources and
- spot content on radio and TV outlets (e.g., public service announcements).

Incident and congestion information from ISP sources might be garnered from deployed physical assets like vehicle patrols, helicopter patrols, and ISP-owned cameras. It may also be developed through telephone call-ins from ISP customers. In the Houston interviews it was noted that spot content did not significantly impact ISP operating budgets or ratings. Therefore, spot content may be an area where TxDOT can easily seek additional value.

Guideline 6: In-kind services should be sought as compensation for access to TMC data.

Because of the compensation preferences of ISPs and the challenges of ensuring that a fee paid by a private sector ISP could be used to offset the costs of providing the data, in-kind services should be sought as a compensation mechanism for access to TMC data. The value of these in-kind services should be commensurate with the value established in [Guideline 1](#) above.

2.3 Administrative Concerns of Ownership

The review of the contract agreements described in [Section 2.4](#) below distinguished two philosophies regarding crediting the TMC and affiliated public agencies. TranStar and DalTrans are examples where there is a desire to credit the TMC for its contribution of the data. An example of this is the posting of applicable TMC/State logos on video images that are shown to the public by the ISP. A counter example is Tucson, Arizona where the forthcoming re-compete of its ISP contract says the following:

“Contractor shall not indicate the City of Tucson or the Traffic Management Center is the originator, sponsor or in any manner involved or associated with the broadcast or the traffic information being broadcast or transmitted.”¹

The policy issue of crediting the TMC and/or TxDOT could be revisited on a statewide basis. If the desire is to build better name recognition for TxDOT then a statewide policy can be more effective than an unevenly applied practice. If the objective is more regional than

¹ Tucson solicitation was posted at http://www.tucsonaz.gov/procure/html/ifb_rfps/061004.doc during the summer of 2005.

statewide, then the requirement for crediting the TMC and/or TxDOT could be defined at the TxDOT District level.

Guideline 7: Structure contractual agreements with entities that use TxDOT data and reflect a statewide policy or strategy for posting credit for the source of TxDOT information.

As a task of this research project the TMCs were classified by the types of business models that have been used to structure the operations of the centers. A federal TMC Pooled Fund document titled *TMC Business Planning and Plans Handbook* was used as the source for the classifications. Researchers concluded that the TxDOT centers are primarily multiple-agency, multiple-jurisdictional TMCs operated by public agency staff. The handbook indicates these configurations require formalized agreements for resource sharing – like TMC data. This requirement is especially the case for co-located agencies.

Guideline 8: Ensure that appropriate cooperative agreements with TMC partner agencies have been executed for data sharing before TxDOT makes arrangements with information service providers for use of data.

One of the lessons learned from the Virginia Department of Transportation (VDOT) Tri Chord agreement is the need for the DOT to retain certain data rights. In this case, the contract was written in such a way that VDOT cannot use its own data, either directly or through Tri Chord, to publish speeds. Therefore, dynamic message signs were not displaying travel time messages in Virginia.

TxDOT could structure agreements with ISPs that allow TxDOT use of the data supplied by the TMC at no additional cost to TxDOT even if value has been added to the data by an ISP. This value could include the addition of data collected in the field by the ISP such as vehicular volumes or speed estimates. In order to assist in the negotiations TxDOT could agree to a limited use of any data that have had substantial value added. Uses to consider include posting on dynamic message signs or web sites.

Guideline 9: Structure agreements with information service providers that allow TxDOT use of the data supplied by the TMC at no additional cost to TxDOT even if value has been added to the data.

In order to cost effectively share TMC data it is necessary for TMCs to be designed and built with appropriate access points and communications infrastructure to support this activity. This strategy will likely add costs to TMC design and construction, but the recovery of value for TMC data should be a mitigating incentive that encourages an enabling TMC infrastructure.

Guideline 10: Build TMC building and communications system infrastructure that supports the sharing of data.

It may be effective for TxDOT and its partner TMC agencies to gather summaries of the distribution of TMC-sourced data by ISPs. This information, especially when viewed from a statewide perspective, might provide a measure of market penetration and the demand for TMC data. In turn, this assessment may guide TMC agencies toward prudent investments in their TMC infrastructure. However, care should be taken with this ISP request since some ISPs may consider the information proprietary. In addition the ISPs may need to make their data non-proprietary before turning data over to TxDOT. This transformation cost should be counted as an ISP contribution toward the value of data described in [Guideline 1](#).

Guideline 11: Meet with information service providers and formulate performance measures concerning the distribution of TMC-sourced data that could be reported to TMC agencies as a gauge of public utility and a guide for future investment. Collect these performance measures and aggregate them on a statewide basis.

A strategy for addressing this information is for TxDOT to meet with the ISPs and determine if some measures of the distribution of TMC-sourced data could be reported to the TMC agencies as a gauge of public utility and a guide for future investment.

Guideline 12: Meet with information service providers and devise common procedures for typical activities involving TMC operations including disruption and restorations of data flows and onsite access to a TMC during times of emergencies. Include these procedures or references to them in contractual agreements with ISPs.

When data flow is interrupted from the TMC it is important to have a protocol of procedures to follow that assist in the repair and recovery of the system, the continued delivery of TMC information by ISPs to the public, and the notification to the TMC of traffic conditions discovered by the ISPs. In addition when ISPs are located offsite they may want to stage some aspects of their operations in the TMC during times of emergency. These and other procedures could be discussed on a statewide basis in order to identify common protocols. This procedure can be a high-leverage activity since a limited number of ISPs operate in Texas and operate in multiple Texas markets.

2.4 Contractual Agreements

As a part of this research project existing TxDOT agreements for data access were compared with agreements obtained for similar activities in other locations. In some locations those agreements are available on public Internet web sites. An example of this is the TravInfo® system in the San Francisco Bay Area. Its contract with PB Farradyne (a division of Parsons Brinckerhoff Quade & Douglas, Inc.) to redistribute and add value to TMC data is located at the following web address: <http://ops.fhwa.dot.gov/travel/app2mtc.pdf>. At the time of this research project the City of Tucson, Arizona, was soliciting a new contract to provide traveler information services in their metropolitan area. The contract in Tucson's

procurement request was published in a solicitation on the Internet at the following web address: http://www.tucsonaz.gov/procure/html/ifb_rfps/061004.doc. This pending contract is very similar to the one used in the 1998 Tucson contract. In other locations the project research staff was able to review existing contracts but was not allowed to share the details of them publicly. In most cases the agreements were limited to a few pages and covered only general requirements.

The review of existing agreements reinforced the concept that only a limited number of ISP companies have been actively involved in this business. Because of the small number of ISP value-added resellers, TxDOT could leverage its ability to return equitable value for the data provided to ISPs by including consistent requirements in TxDOT contracts with private sector data partners.

Guideline 13: Work toward including consistent requirements in TxDOT contracts with private sector data partners in TMCs throughout Texas.

The purpose of the review of contracts was not to develop or write a legal document, but it was to highlight topics that have been cited in these agreements that may be applicable for TxDOT. These topics listed below are not going to address terms such as the contract period, indemnification, working relationships, venue, termination, remedies, and contract assignment. Incorporation of these topics into a contract will require that TxDOT work with its legal counsel to vet the topics and to develop appropriate contract language.

The following list identifies draft topics that could serve as the basis for a consistent set of requirements. The wording has been paraphrased from existing contracts and no attempt has been made to structure the text for applicable Texas law. A recommended approach is for representatives from the various TxDOT TMCs to convene a forum and work to develop a consistent document and requirements.

Rights of Agency

- Agency reserves right to publish ISP involvement.
Note: This is an issue in some TMCs where the ISP desired that the terms of their contract not be made publicly available. It was also an issue in one TMC where the ISP did not wish to be publicly identified.

Rights of the ISP, Value-Added Reseller, or Licensee

- ISP has a non exclusive, non-transferable license for data and logo.
Note: This kind of term was included in most agreements. However, the logo was not always cited in the agreements.
- ISP is entitled to use, redistribute, enhance, repackage, display, duplicate, create derivative works or otherwise add value to the data.
Note: This kind of terminology was routinely included.

- Data that have been combined, modified, or enhanced, in whole or in part, by the ISP may be sublicensed through the ISP to third parties of products and services that incorporate or otherwise use the data. Any such sublicense shall be subject to the terms and conditions of the Agency – ISP agreement.
Note: Sublicensing capability was not always included. However with use of the data expanding (e.g., for in-vehicle navigation routing decisions), sublicensing may be an expeditious mechanism to enhance use of the data.
- ISP has a right to stage some aspects of its operations in the TMC during times of emergency.
Note: This kind of topic was not found in the contracts that were reviewed. However, as noted in [Guideline 5](#), offsite access to the TMC floor could be a strategy for the TMCs. Even if they were offsite the ISPs indicated a preference to have onsite access to the TMC floor during times of emergency. The agreement could identify what constitutes an emergency, how the ISP would be notified of permission to gain onsite access, the specifics of the access that would be granted, what aspect of ISP operations would be permitted, and how onsite access would be terminated.

Responsibilities of the Agency

- Agency will identify the specifications and procedures for accessing the data.
Note: This kind of terminology was frequently included. If use of the data is limited (e.g., rebroadcast of specific images that infringe on privacy) these limitations should also be described.

Responsibilities of ISP

- Provide infrastructure modifications needed to acquire the rights granted by the agency including third party software and hardware. All costs are to be assumed by the ISP for these modifications.
Note: As noted in [Guideline 5](#), offsite access to the TMC floor could be a strategy for the TMCs. This topic could be expanded to include communications to the offsite location, cost for offsite space, commuting to/from the offsite location and the TMC, and other considerations applicable for the offsite TMC floor access.
- ISP agrees to provide the agency with monthly summaries of data access and dissemination. These summaries will be transmitted in a manner and format agreed upon by the agency.
Note: This was not a routine requirement. But collection of these data should enable better assessment of the economic value of the data and the effectiveness of data distribution. It might be helpful to collect and consolidate these data statewide.
- The ISP agrees to provide in writing to the agency a description of the intended use and audience of the data for TxDOT to approve before the data are used.
Note: This kind of terminology was not frequently included.

General Topics

- ISP agrees that the agency does not guarantee the availability of data or a minimum response time to reestablish the broadcast of data due to network or system failures.
Note: This topic should also include procedures or references to procedures for the ISP to follow that assist in the repair and recovery of the system, the continued delivery of TMC information by ISPs to the public, and the notification to the TMC of traffic conditions discovered by the ISPs.

License Fee

- State shall be provided the non-monetary compensation described in the agreement.

3 TxDOT TMC Data Sharing: A Review of Practice

3.1 Introduction

Data and information sharing practices of TxDOT TMCs were inventoried during this project. A standardized data collection format was developed for use in the process. Although not all data and information collection items were applicable in the six TMCs, the standardized format helped ensure that data were collected consistently among the systems. A copy of the questionnaire document is provided in [Appendix 3](#). Personal interviews were held with staff in the following six TxDOT Freeway Management Centers.

- Austin CTECC
- Dallas DalTrans
- Fort Worth TransVision
- Houston TranStar
- Laredo STRATIS
- San Antonio TransGuide

El Paso had been on the potential interview list, but the system software and hardware were being upgraded at the time of the survey and the system was not included. The new system will be the latest TxDOT ATMS system and will have capabilities consistent with other TxDOT systems. Laredo was added to represent newer, smaller systems.

[Section 3.2](#) provides a summary of the results from the interviews. [Section 3.3](#) provides a series of tables that categorize the results of the interviews for sharing data monitoring information. [Section 3.4](#) provides a series of tables that categorize the results of the interviews for sharing incident management information. [Section 3.5](#) provides a series of tables that categorize the results of the interviews for sharing roadway construction information.

3.2 Summary of TxDOT Practices

Traffic Data Collected by TxDOT

Virtually all of the TMCs collect the following traffic data:

- Speed,
- Volume,
- Occupancy, and
- Video.

Travel time is collected and calculated in two of the centers (Dallas and Houston) and is planned for most of the other TMCs.

Traffic Data Collected from Other Sources

Most TMCs also collect traffic incident data from external sources including local emergency service providers, EMS, fire, police and sheriff departments. Incident data are generally collected by monitoring emergency radio frequencies, although at least two TMCs monitor police web sites and one TMC (DalTrans) has a direct digital feed from a regional 911 center.

Telephone calls to the TMCs also provide incident information.

TMCs also monitor radio and television media and private ISPs where available.

Current and Future Practices for Furnishing Data to External Entities

All TMCs provide notification of incidents to external sources where appropriate. Telephone contact to the affected agency is the most common method although city radios are present in some TMCs. Austin is a shared facility with local 911 and other emergency agencies onsite and, as such, has opportunity for direct communication. Other TMCs have representation from local police agencies, and communication is thereby enhanced.

Some TMCs provide notification to local agencies by email and/or fax and emails to individual subscribers who wish these notifications.

Live video is provided by agreement with local television media in most centers. Live video is also provided to some local cities and counties by agreement. Video snapshots are available on TxDOT TMC websites.

Traffic data, where available, is provided to authorized users as requested.

All TMCs provide planned road closure information as supplied by their TxDOT District Public Information Office (PIO) on their TMC web sites and on dynamic message signs as appropriate.

Existing Practices and Agreements

All TxDOT TMCs which provide live video to private entities (primarily commercial television stations) have a formal signed agreement in place. At the time the survey was conducted, Laredo did not provide a video feed to private entities. While there is no standard agreement, the agreements are similar in their wording and most were developed according to previous agreements. Houston TranStar personnel indicated that future agreements may require approval by TxDOT's Austin headquarters. Agreements do not require that TxDOT be compensated for the information, but the private entity is responsible for all equipment and installation to access the data. However, most agreements do require that TxDOT be credited for any live video displayed. Some agreements require that the media outlet provide public service announcements for TxDOT. [Table 2](#) summarizes the findings.

Table 2. Overview of Current TxDOT Information Sharing Agreements ².

	Austin		Dallas		Fort Worth		Houston		Laredo		San Antonio	
	Video	Data	Video	Data	Video	Data	Video	Data	Video	Data	Video	Data
Non-Exclusive	Yes	N/A	Yes	Yes	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A
Graphic Display	Licencee	N/A	Licencee	N/A	Licencee	N/A	Licencee	N/A	N/A	N/A	Licencee	N/A
Use of Licensee's Video	Future	N/A	Yes	N/A	Yes	N/A	No	N/A	Future	N/A	---	N/A
Guaranty of Signal	No	N/A	No	No	No	N/A	No	No	N/A	N/A	No	N/A
PSA	---	N/A	Yes	Yes	Yes	N/A	---	Yes	N/A	N/A	---	N/A
Credits / Logo	Yes	N/A	Yes	Yes	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A
Fee	Waived	N/A	Waived	No	Waived	N/A	Waived ^b	Yes ^a	N/A	N/A	Waived	N/A
Indemnification	Yes	N/A	Yes	Yes	Yes	N/A	Yes	Yes	N/A	N/A	Yes	N/A

N/A Not Applicable

--- Not Addressed

^a Compensation is either a fee or service exchange

^b A monetary compensation of \$5000 is assessed to cover the cost of software modifications to limit pan, tilt, and zoom capabilities

Note: Laredo is the newest TMC and has not developed agreements for video sharing.

Only Houston and Dallas provide real-time data (speed) to private ISPs. Both have signed agreements with two ISPs for transmittal of speed data.

No significant inappropriate requests for data were reported. There have been requests for videos of incidents, but TxDOT TMCs do not record operations except for special studies and that information is erased after data are collected. One concern that was expressed was that some private ISPs and commercial television stations have asked for exclusive rights to the TxDOT information.

Concerns Raised During TxDOT Interviews

TxDOT managers expressed few concerns regarding furnishing traffic data to external entities. One potential concern was traffic service companies that wanted to “sell” the data to other companies. It was noted that some private entities do not always credit TxDOT for the data they receive. Both of these violate the current agreement.

The interview included a series of questions to determine TxDOT practices for gathering and distributing traffic monitoring data. This included determining what types of data are collected, the source of the data, the quality of the data, policies for archiving the data, and agreements for the data if an industry or governmental partner is involved.

² Adapted from TTI Research Report 4951-1, June 2001 (updated 2005)

3.3 TxDOT Traffic Monitoring Practices

Tables 3 and 4 summarize the traffic monitoring data entering the TMCs and the data leaving the TMCs. They reflect the exchange of data and not the capability of the TMCs.

Table 3. Traffic Monitoring Data Coming Into TxDOT TMCs.

Element	Q1. DATA			Q2. MEDIUM							Q3.-Q.5 SOURCE					Q6. QUALITY					Q7. STORAGE					
	Currently Collecting	Planned Collection	Desired Access	Electronic Loops	Radar/Acoustic Detectors	Microwave Detectors	Video Image Vehicle Detection Systems	Closed-circuit Television	Probe Vehicles	Manual Methods	Other	TXDOT	Other				Very Good	Good	Neutral	Poor	Very Poor	Archived	Format			
													Source	Medium	Frequency	Written Agreement							"Barter" Agreement	Costs	CD	On-line via the Web
Speeds	A D F H L S	F	F	A D F	A D L	F	D S				S	S L				A D S L	F D A		F		A S H	A S H		H		
Volumes	A D F H L S	F	F	S L D F	S L D A	S F D	S	F		F	S	L F D A				S L H	F D A				A S H	A S H		H		
Classifications	L D F A		F	L D	L D A	F D						L F D				L	A D	D			A S	A S				
Occupancy	S L D F			S L D	S L D A	S D	S				S D	L F D				S L	A D		F		S A	S A				
Travel Times	H	F				H F				H	H	H F				H	A				H	H		H		
Air Pollution												F D				F D	A							H		
Video	F A	F	F A									F D				F D	A									A

A= Austin D= Dallas F= Fort Worth H=Houston L=Laredo S=San Antonio

Table 4. Traffic Monitoring Data Going Out of TxDOT TMCs.

Element	Q8. DESTINATION										Q9. MEDIUM										Q10. FREQUENCY					Q11-Q15. SHARING				
	TXDOT	Other State or Federal Transportation Agencies	County or City Traffic Departments	Transit Agencies	State, County or City Public Safety/ Law Enforcement Agencies	Private Corporations	Private Citizens	Other	Hard Copy Mail/Fax	Electronic Files/Email	Direct Link	Dynamic Message Signs	Highway Advisory Radio	Website	Pagers/ Personal Data Assistants	Dedicated Cable TV	511 Telephone System	Other	Regular Schedule	Continuously	Event-driven Schedule	On Request	Other	Within TXDOT	Outside of TXDOT					
																									Process	Written Agreement	Potential Concerns	Inappropriate Requests	Policy Changes	
Speeds	L	S F	S			H	F	F	F A	F			D S H		S		H	S	D H	A L F			A D L		H	H	F			
Volumes	L	S F	S F				F	F	A	F			S		S			S		L F A			L							
Classifications	L	F							A						S		H	S	H	L A			L							
Occupancy	L	S F	S										S		S		H	S	H	L A			L							
Travel Times	F	F				H F					H F		H S						F						H	H				
Air Pollution													H F												S H					
Video	F D	F D	F D	D	F D	F D	H F	F D	F D	H F	D		H F							F D	H A		H		S H		S F A			

A= Austin D= Dallas F= Fort Worth H=Houston L=Laredo S=San Antonio

3.4 TxDOT Incident Management Data Sharing Practices

Tables 5 and 6 summarize the incident management data entering the TMCs and the data leaving the TMCs. It does not reflect the capability of the TMCs but only the exchange of data.

Table 5. Incident Management Data Coming Into TxDOT TMCs.

Element	Q1. DATA			Q2. MEDIUM							Q3.-Q.5 SOURCE						Q6. QUALITY					Q7. STORAGE										
	Currently Collecting	Planned Collection	Desired Access	Incident Detection Algorithms	Road Weather Information Systems	Closed-circuit Television	Radio/Cell within TxDOT	Radio/Cell from other Public Agency	Public Reports (Cell)	Private Traffic Reporting Service/Media	Other-TxDOT Courtesy Patrol	TXDOT	Other					Very Good	Good	Neutral	Poor	Very Poor	Archived	Format								
													Source	Medium	Frequency	Written Agreement	"Barter" Agreement							Costs	CD	On-line via the Web	Paper Reports	Other	Length			
Vehicular incidents	S					D	F	DA	F	DA	DA	DA	HL					LS	D	A			D	D								
Unplanned lane or road closures	H					D	F	DA				DA						L	D				H	H								
Special events	H											HL							D	H			H	H								
Planned lane or road	H											DH						L	D				H	H		F	F					
Road conditions	H					D						DA						L	A	H			A	A								
Weather conditions	H				F	D	F	F				DA							D	A	H		A	A								

A= Austin D= Dallas F= Fort Worth H=Houston L=Laredo S=San Antonio

Table 6. Incident Management Going Out of TxDOT TMCs.

Element	Q8. DESTINATION										Q9. MEDIUM							Q10. FREQUENCY					Q11-Q15. SHARING										
	TXDOT	Other State or Federal Transportation Agencies	County or City Traffic Departments	Transit Agencies	State, County or City Public Safety/Law Enforcement Agencies	Private Corporations	Private Citizens	Other	Hard Copy Mail/Fax	Electronic Files/Email	Direct Link	Dynamic Message Signs	Highway Advisory Radio	Website	Pagers/ Personal Data Assistants	Dedicated Cable TV	511 Telephone System	Other	Regular Schedule	Continuously	Event-driven Schedule	On Request	Other	Within TXDOT	Outside of TXDOT								
																									Process	Written Agreement	Potential Concerns	Inappropriate Requests	Policy Changes				
Vehicular incidents	D					D	D		D	D	D	D	D	D				A	F	D	LS			AL									
Unplanned lane or road closures	D		D		DA	D	D		D	D	D	D	D	D	A		A			D	A	L		AL									
Special events	H					D	H		H		H	H	H							H	L			L									
Planned lane or road	D	F	DF	F	F	F	F	F	F	F	F	F	F					F		H	L			L									
Road conditions	D						H		D	H	D	D	D							D	L			D	AL								
Weather conditions	L						F													F	L			L									

A= Austin D= Dallas F= Fort Worth H=Houston L=Laredo S=San Antonio

3.5 TxDOT Roadway Construction Data Sharing Practices

Tables 7 and 8 summarize the roadway construction data entering the TMCs and the data leaving the TMCs. It does not reflect the capability of the TMCs but only the exchange of data.

Table 7. Roadway Construction Data Coming Into TxDOT TMCs.

Element	Q1. DATA		Q2. MEDIUM							Q3.-Q.5 SOURCE					Q6. QUALITY					Q7. STORAGE							
	Currently Collecting	Planned Collection	Desired Access	Electronic/Email Notification within	TxDOT Website/HCRS	Hardcopy/Fax from other Public Agency	Electronic/Email from other Public Agency	Public Reports (Cell)	Private Traffic Reporting Service	Other	TXDOT	Source	Medium	Frequency	Written Agreement	"Barter" Agreement	Costs	Very Good	Good	Neutral	Poor	Very Poor	Archived	CD	On-line via the Web	Paper Reports	Other
Planned lane or road	S	H	L	S	H	D	S	D		S	H	F	D			S	S	H				S	H				
	A= Austin	D= Dallas		F= Fort Worth	H=Houston	L=Laredo	S=San Antonio																				

Table 8. Roadway Construction Data Going Out of TxDOT TMCs.

Element	Q8. DESTINATION							Q9. MEDIUM							Q10. FREQUENCY					Q11-Q15. SHARING								
	TXDOT	Other State or Federal Transportation Agencies	County or City Traffic Departments	Transit Agencies	State, County or City Public Safety/ Law Enforcement Agencies	Private Corporations	Private Citizens	Other	Hard Copy Mail/Fax	Electronic Files/Email	Direct Link	Dynamic Message Signs	Highway Advisory Radio	Website/HCRS	Pagers/ Personal Data Assistants	Dedicated Cable TV	511 Telephone System	Other	Regular Schedule	Continuously	Event-driven Schedule	On Request	Other	Within TXDOT	Process	Written Agreement	Potential Concerns inappropriate Requests	Policy Changes
Planned lane or road	S		S	H	D	S	H	S	D	H	D	H	S	D						S	D	S	D	S				S
	A= Austin		D= Dallas		F= Fort Worth	H=Houston	L=Laredo	S=San Antonio																				

4 ITS Data Sharing: A Review of Practice Outside of Texas

4.1 Introduction

A review was conducted on how public agencies are sharing ITS data with other agencies or outside firms. The review was conducted by contacting individuals familiar with several of the TMCs around the country. In addition, inquiries were made about how floor space within TMCs was shared with outside firms. The section describes the data sharing models, highlights some example contracts and discusses the value of the ITS data.

4.2 ITS Data Sharing Models

The review revealed three general models for data sharing: no cost to registered users, barter for in-kind services, and fee for ITS data.

Registered Users Receive ITS Data at No Cost

Agencies in several states make ITS data available at no cost to recipients. The recipient of the data generally must accept the data in the format provided by the public agency and must bear the cost of any equipment or networking necessary to receive the data. Two examples of giving the data away at no cost are the Navigator system in Atlanta, Georgia, and the TravInfo system in San Francisco, California.

- Georgia DOT gives their data away as long as the recipient agrees to their terms of use. The data is available from the Navigator website at <http://mynav.georgianavigator.com/www/services.jsp>.
- In TravInfo®, the data are provided free of charge to anyone who signs an agreement. The agreement essentially requires that the recipient report usage to the Metropolitan Transportation Commission. TravInfo can also supply video to third parties, but the video feed comes from the California DOT and has some limitations on quality.

In-Kind Services

A few state DOTs have attempted to structure arrangements for barter in-kind services for use of the studio space in the TMC. The DOTs were looking for broadcasts of DOT announcements, Public Service Announcements (PSAs), and assistance in disseminating the traffic data. Utah and Minnesota are two examples of this model.

- Utah DOT solicited proposals (one for radio and one for TV) from companies interested in broadcasting from the TMC. The DOT would allow use of the studio facilities in the TMC in exchange for DOT announcements, PSAs, and recognition. The Utah DOT received good response and was able to barter for airtime for their messages and PSAs.

- Minnesota DOT solicited a similar arrangement for use of the TMC studio facilities. The contract fell through and was not awarded because Minnesota law states that "the state cannot barter goods/services if the value of the services the state receives exceeds \$100,000." The DOT determined that the air time and ad time far exceeded that the \$100,000 amount and thus violated state law.

The City of Tucson, Arizona, also uses a barter arrangement formalized through a concessionaire's contract. Tucson structured their contract so that a private sector company would provide build-out for their TMC, flight time for emergency situations, public service announcements, control center staffing, and a portion of any resale of video in return for access to their data. Under the initial year of the contract in 1998, the value was determined to be \$68,000 in build-out costs for the TMC and \$106,660 for the annual services of flight time, public services announcements and control center staffing. This contract has been continuously renewed since 1998 without changing its terms. A case study of the Tucson arrangement and excerpts from their contract are included in Appendix 1.

Shared Costs

Mobility Technologies, the government services division of Traffic.com, has partnered with a number of states to add infrastructure and enhance the capabilities in major metropolitan areas. These metropolitan areas include Detroit, Los Angeles, Oklahoma City, Phoenix, San Diego, Seattle, San Francisco, St. Louis, and Washington DC. In May 2005 their Intelligent Transportation Infrastructure Program (ITIP) was approved by the Massachusetts Highway Department (MHD).

Mobility Technologies deployed wireless traffic sensors on Boston's major expressways. The traffic data obtained by these sensors is provided to MHD. The real-time, lane-by-lane traffic speed and volume data will be used by public agencies in managing work zone safety, crash responses, and highway operations. The Boston ITIP program is funded under a U.S. DOT contract using \$2 million of federal funds, \$500,000 of state funds, and \$500,000 of Traffic.com funds. In addition, Traffic.com is responsible for all of the ongoing operating and maintenance costs.

Fee for ITS Data

Only one example of a TMC selling its ITS data was found. TRANSCOM is the regional committee of 18 public agencies in the New York / New Jersey area responsible for traffic and transit management. TRANSCOM awarded a design/build/operate contract to the NorthEast Consultants (NEC is a joint venture of Parsons Brinckerhoff and TransCore). NEC has the rights to enter into data sharing agreements to sell ITS data. There are three contracts for selling the data.

- The main recipient of the traffic and transit data is Mobility Technologies. Mobility Technologies signed a contract to buy the data for three years at \$300,000 per year. The \$300,000 is a split of cash payment and in-kind advertising on television and radio. The split varies by year. The first year was a 50/50 split. Subsequent to this

contract, Mobility Technologies negotiated to have space on the operations floor. A request has been made to get copies of any of the contracts from TRANSCOM.

- The National Center for Crisis and Continuity Coordination (NC4) also purchases the incident data. It is understood that NC4 extracts the incident data from a File Transfer Protocol (FTP) site and pays approximately \$50,000 for 6 months of data.
- There is also one trucking company that is purchasing the traffic and incident data. The details of this arrangement were not available, but it is understood that the trucking company pays approximately \$10,000 per year for the data.

4.3 Contracting

Contracts were requested for greater information on the ITS data sharing details. Excerpts from the data dissemination agreement with TravInfo are included in Appendix 1. Excerpts from the Tucson agreement are also included. At this time, details are still forthcoming on the TRANSCOM contracts.

4.4 Value of ITS Data

Based on the practices observed there is no direct method of determining the exact value of ITS data. Thus, surrogate measures must be analyzed to determine what agencies and private firms view as the value of this data. Two of the arrangements reviewed included a fee transaction for the use or dissemination of ITS data.

- In the case of TRANSCOM, Mobility Technologies pays an annual fee of \$300,000 for the ITS data.
- In the case of TravInfo, the Metropolitan Transportation Commission (MTC) negotiated an “award” fee with the consultant selected for the design/build/operate contract of their 511 system. The award fee is in addition to the consultant’s reduced fee for professional services. The award fee has a maximum of \$580,000 per year and represents 8% of the professional services contract. The actual amount of the award fee paid to the consultant is dependent on the “usage” of the ITS data. The usage is measured by three factors: access (via 5-1-1 calls or web sessions) to the traffic data, access to the transit data, and customer satisfaction measured by a survey conducted by the MTC. Usage thresholds were set in the contract. Thus, if the customers found the data useful and accessed the data via one of the data dissemination methods (e.g., phone or internet), then the MTC was willing to pay \$580,000.

In the case of Tucson a concessionaire’s contract formalized a barter arrangement that valued data at \$68,000 in build-out costs for the TMC and \$106,660 for the annual services of flight time, public services announcements and control center staffing (in 1998 dollars).

In order to develop some surrogate benchmark dollar value estimates for Texas metropolitan areas, the costs listed above were normalized based on year 2000 metropolitan area population estimates. Assuming 800,000 people in the Tucson area, a value for data access at that location is approximately \$0.13 per person. Assuming about 7,000,000 people in the San Francisco metropolitan area, a value for data access at that location is approximately

\$0.08 per person. These estimates are based on exclusive arrangements with private sector partners.

The TRANSCOM example is not readily applicable to per person representation. Located in Jersey City, NJ, TRANSCOM is administratively and legally a unit of its host agency, the Port Authority of New York and New Jersey, although it is governed, funded and staffed by all of its member agencies. TRANSCOM's Operations Information Center (OIC) is open 24 hours a day, seven days a week. It shares incident, construction and special event information simultaneously and selectively among over one hundred highway, transit, police agencies, and media traffic services, by phone, fax and alpha numeric pager. TRANSCOM acts as an integrator for the coalition along the I-95 Corridor and does not replace existing TMC centers or operations. TRANSCOM is essentially a backroom operation for the I-95 Corridor Coalition linking existing centers and systems. But the order of magnitude in the TRANSCOM example is clear; the arrangement is valued in the hundreds of thousands of dollars.

This same order of magnitude is evident in the Mobility Technologies example in [Section 4.2](#) of this chapter in the Shared Cost discussion. Mobility Technologies entered into an arrangement with the Massachusetts Highway Department and invested \$500,000.

Based on these findings, the estimated value of Transportation Management System data is \$0.10 per person per year in the applicable metropolitan area.

5 Public Access to Data and Information

The following discussion is based on a laymen's reading and review of Texas Government Code, Chapter 552 Public Information and is not intended to be a legal opinion. TxDOT may wish to seek further advice from legal counsel.

5.1 General Open Records Provisions

In discussing the rights of private citizens to traffic data, it is helpful to review definitions in the current Texas Statutes. The Texas version of the open records act, now known as the Public Information Act (located at Texas Government Code, Chapter 552, *et seq.*), recognizes in SUBCHAPTER A General Provisions, Section 552.001 that: *“the fundamental philosophy of the American constitutional form of representative government that adheres to the principle that government is the servant and not the master of the people, it is the policy of this state that each person is entitled, unless otherwise expressly provided by law, at all times to complete information about the affairs of government and the official acts of public officials and employees. The people, in delegating authority, do not give their public servants the right to decide what is good for the people to know and what is not good for them to know. The people insist on remaining informed so that they may retain control over the instruments they have created. The provisions of this chapter shall be liberally construed to implement this policy.”*

Under the Section 552.002, "public information" is that which is collected, assembled, or maintained under a law or ordinance or in connection with the transaction of official business by a governmental body or for a governmental body, and the governmental body owns the information or has a right of access to it. Under Section 552.003 "governmental body," in turn, means (among other things) a board, commission, department, committee, institution, agency, or office that is within or is created by the executive or legislative branch of state government and that is directed by one or more elected or appointed members.

Under Section 552.022 some kinds of information are explicitly not exempt from disclosure, including without limitation the following. Items which may apply to the project at hand are shown in **bold**.

- *A completed report, audit, evaluation, or investigation made of, for, or by a governmental body;*
- *The name, sex, ethnicity, salary, title, and dates of employment of each employee and officer of a governmental body;*
- *The name of each official and the final record of voting on all proceedings in a governmental body;*
- ***All working papers, research material, and information used to estimate the need for or expenditure of public funds or taxes by a governmental body, on completion of the estimate;***
- *A description of an agency's central and field organizations, including:*

- *The established places at which the public may obtain information, submit information or requests, or obtain decisions;*
- *The employees from whom the public may obtain information, submit information or requests, or obtain decisions;*
- *In the case of a uniformed service, the members from whom the public may obtain information, submit information or requests, or obtain decisions; and*
- *The methods by which the public may obtain information, submit information or requests, or obtain decisions;*
- *A policy statement or interpretation that has been adopted or issued by an agency;*
- *Information regarded as open to the public under an agency's policies; and*
- *Information that is also contained in a public court record.*

However, certain types of information are exempt from disclosure. In Chapter 552, SUBCHAPTER C, this type of information falls under the category of personal information, i.e., records of registration, emergency room/accident data (names, injuries, etc.), names of job applicants, contents and amounts of bids and proposals, trade secrets, etc.

Although traffic data are not explicitly addressed, it would likely be considered information under the above definitions.

5.2 Procedures Related to Access to Information

Accommodation of requestors of data is delineated in SUBCHAPTER E of the Chapter 552. It generally describes how quickly the agency must respond, what questions may be asked of requestors (in general they can not be asked what they will do with the data), how long they can keep the information, etc. As can be seen these provisions appear to address record information and data, not real time data. However, by extension one can infer how they might be applied to real time data in accommodating requests.

5.3 Charges for Providing Copies of Public Information

Procedure for charges for providing copies of public information is delineated in SUBCHAPTER F of the Chapter 552. SUBCHAPTER F states that “*The charge for providing a copy of public information shall be an amount that reasonably includes all costs related to reproducing public information, including costs of materials, labor, and overhead.*” As discussed previously, these provisions appear to address record information, not real time data. However, by extension one can infer how they might be applied to charges for real time data.

As an action associated with this project, TxDOT asked the Texas Office of General Counsel whether TxDOT can charge fees for TMC data collected as part of their normal freeway management activities. The answer was yes.

5.4 Summary

While the Public Information Act does not specifically address providing real time data (such as traffic data), it could be inferred that the provisions might extend to such data. There is no provision for a charge for the public access information beyond the cost of materials, labor and overhead to provide the requested material. It is also a motivation to license the use of the data for commercial purposes. The foregoing discussion does not purport to be a legal opinion.

6 TMC Business Models in Texas

6.1 TMC Business Model Overview

Traffic management systems and their associated traffic management centers are deployed in many different configurations. The federal TMC Pooled Fund Study sponsored a *Traffic Management Center Business Planning and Plans Handbook* activity that grouped TMCs into various management and functional categories as follows.³

- Geographic area covered
 - Single jurisdiction TMC
 - Multiple jurisdictions TMC
 - Regional or district TMC
 - Statewide TMC
- Number and type of agencies involved
 - Single agency TMC
 - Multiple transportation agencies
 - Multiple agencies and disciplines
- Operating mechanism
 - Public agency staffed and operated TMC
 - Private sector staffed and operated TMC

6.2 Geographic Area Covered

The most basic decision to be made in developing a traffic management system (TMS) is geographic definition. Although other categorizations (e.g., multiple agencies, disciplines, operating mechanism) may influence the design and mission of the TMS, geographic definition is basic to any structure.

Single Jurisdiction Management Structure

The most common model is the single jurisdiction model. It is probably the easiest structure to operate because decisions and supervision are vested in one entity. In an urban area where there may be multiple autonomous agencies, there may be a measure of cooperation and coordination without a unified management structure or data communication system.

Multiple Jurisdictions Management Structure

The multiple jurisdictions management model has application in larger metropolitan areas where multiple jurisdictional boundaries may abut. In a large urban area, a driver can travel on a major thoroughfare and pass through several cities each with its own computer-based signal system. While drivers are not necessarily aware when they cross a jurisdictional boundary, they may be aware if the signal systems are not compatible.

³ The TMC Pooled Fund Study sponsored a project to develop a Traffic Management Center Business Planning and Plans Handbook during the 2004–2005 time period. The Pooled Fund web site is located at <http://tmcpfs.ops.fhwa.dot.gov>. Drafts of the Handbook are located at http://tmcpfs.ops.fhwa.dot.gov/cfprojects/new_detail.cfm?id=54&new=0.

Regional or District Management Structure

The regional or district model is a further iteration of the multiple jurisdictional model. While the multi-jurisdictional model will likely involve jurisdictions in which boundaries abut or a cluster of jurisdictions, a regional or district model will involve clusters that may be more distantly located. Rural areas may also be incorporated.

Statewide Traffic Management Structure

A statewide management structure will be influenced by the geographical size of the state as well as the number of major metropolitan areas contained therein. Although usually the initiator is the state transportation department, other related agencies, such as state highway patrols, may be co-located.

6.3 Number and Type of Agencies Involved

Previously described models have centered on geographic and jurisdictional considerations; the agency focus expands the jurisdictional aspects to related agencies. Geographical considerations may still influence some of the agency models.

Single Agency Management Structure

This structure, with a single agency (e.g., traffic department) within a jurisdiction, has many of the same characteristics of the single jurisdictional structure.

Multiple Transportation Agency Management Structure

This structure is characterized by the alliance of several transportation agencies, e.g., transportation departments of two or more cities combine forces to operate the multiple traffic signal systems as a single system.

The definition of this structure would not include related agencies such as enforcement.

Multiple Agency and Disciplines Structure

Because of the complex nature of multiple agency and disciplines structure, it is the most difficult to implement. Numerous interagency agreements and agreed upon operating policies and procedures must be negotiated. However, the cost efficiencies and the benefits of coordinated management will usually outweigh these complexities.

6.4 Operating Mechanism

Either of the two operating mechanisms described below may apply to the previously described management structures.

Public Agency Staffed and Operated Management Structure

This structure is perhaps the preferred model for most agencies since they will have direct control and management of their system. This assumes that adequate funding is available for both operational activities and personnel.

Contract Operation Management Structure

Depending on available funding, all or a part of the operational responsibilities may be contracted to a private organization or even another agency.

6.5 TxDOT TMC Business Models

TxDOT currently operates ten transportation management centers across the state in Amarillo, Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Laredo, San Antonio and Wichita Falls. The TxDOT TMCs are all freeway management centers although other transportation agencies are co-located in some TMCs. The TxDOT TMCs vary widely with regard to services provided, size of coverage, maturity, and partnering with other agencies, but they fall under the same business model representation. They are primarily multiple agency, multiple jurisdictional TMCs operated by public agency staff. [Table 9](#) provides a summary of six of the TxDOT TMCs' operating system characteristics as described in the preceding sections.

The *Transportation Management Center Business Planning and Plans Handbook* states the following guidance about multiple agency transportation management centers.

“Agreements are necessary to define the overall operation of the transportation system, as well as operational, resource sharing, personnel, systems, and institutional integration arrangements of the partner agencies. Documenting and formalizing agreements may require compromise, on the part of each agency, in terms of how facilities are operated.”⁴

This comment suggests the following guidance for TxDOT: ensure that appropriate cooperative agreements with TMC partner agencies have been executed for data sharing before TxDOT makes arrangements with ISPs for use of data.

⁴ TMC Business Planning and Plans Handbook, available at the Pooled Fund web site <http://tmcpfs.ops.fhwa.dot.gov>, Section 4.1.2, page 4-5.

Table 9. TxDOT TMC Business Models.

Traffic Management Center	Geographic Area	Number and Type of Agencies	Operating Mechanism
Austin CTECC	Regional (City & County)	Multiple Agencies and Disciplines 4 agencies, 4 disciplines TxDOT ITS, TxDOT Courtesy Patrol Austin PD, Austin FD Austin Transportation Austin/Travis Co. EMS Sheriff, Constables Office of Emergency Management Capital Transit Dispatch	Public Sector Operated
Dallas DalTrans	Regional (Multiple jurisdictions in large metro area connected for data exchange)	3 Agencies, 3 disciplines TxDOT ITS DART (transit) HOV Sheriff dispatch of Courtesy Patrol City of Dallas (police / fire / EMS / traffic)	Public Sector Operated
El Paso TransVista	Regional (City & County)	Single agency TxDOT ITS, TxDOT Courtesy Patrol City of El Paso (police / fire / EMS / traffic)	Public Sector Operated
Fort Worth TransVision	Regional (Multiple jurisdictions in large metro area connected for data exchange)	Single agency TxDOT ITS, TxDOT Courtesy Patrol City of Fort Worth (police / fire / EMS / traffic)	Public Sector Operated
Houston TranStar	Regional (City & County)	4 agencies, 4 disciplines TxDOT ITS, TxDOT Courtesy Patrol METRO Transit City of Houston (police / fire / EMS / traffic) Harris County Emergency Management	Public Sector Operated
Laredo STRATIS	Regional (City & County)	Single Agency TxDOT ITS, TxDOT Courtesy Patrol City of Laredo (police / fire / EMS / traffic)	Public Sector Operated

7 TMC Control Room Floor Access by Information Service Providers

7.1 Introduction

Although the benefit of private Information Service Provider companies operating on the control room floor at Houston TranStar and other transportation management centers is considered to be an advantage to all parties involved, the availability of floor space for the agency staff, security issues, and the economic “value” of TMC data access have raised the question of whether the practice should continue. In addition, some traffic reporting services have expressed concerns over “noise” generated by the staff from the operating agencies which negatively impacts their ability to do quality live traffic reports from the control room.

In order to assess the perspectives of the ISPs and to explore alternatives to existing ISP floor arrangements, an interview and brainstorming meeting was held in Houston with three private sector information service providers.

7.2 Houston Information Service Provider Interviews

During July 2005 three Houston area ISPs met with the research staff of this project. The three providers were Clear Channel, Metro Networks and Traffic.com. The objective of the meeting was to explore issues and alternatives regarding access to the TranStar floor for these ISPs. The ground rules of the brainstorming session were that specific responses would not be attributed to individual organizations.

The three organizations developed and generally agreed to the following statements about their affiliation with TranStar.

- Objectives for the ISPs when working with TranStar.
 - Provide better information for their customers.
 - Share information gathered by the ISPs with the public and private sector organizations present at TranStar.
 - Get the most accurate information possible for distribution to customers.
- Scope of influence for the ISPs in the Houston metropolitan area.
 - The three ISPs represent the entire media market in Houston [virtually 100% of radio and TV outlets].
 - There are some ISP data clients that are not media related (e.g., freight and delivery companies).
 - Without any one of the ISPs a large percentage of the population will be “missed.”
- Impacts of gathering data from TranStar.
 - ISPs do not anticipate that their presence in the TMC will give better public ratings for their organizations.
 - A large portion of the “value” of TranStar data for the ISPs is having a physical presence at the center (perhaps as much as 75%).
- Value that the ISPs can contribute related to their affiliation with TranStar.
 - Inform public about traffic conditions via radio and TV.

- Some can inform public about traffic conditions via email alerts.
- Demonstrate to the public that transportation tax dollars are being well spent.
- Deliver PSAs for TxDOT and other TranStar partners.

Since the ISPs indicated that they were receiving value from their affiliation with TranStar, each was asked to identify additional mechanisms to compensate the TranStar agencies and the public for the value they were receiving. The following items were mentioned during the course of this discussion.

- Give information to TranStar that was gathered from their information sources.
 - This information might be garnered from deployed physical assets like vehicle patrols, helicopter patrols, and ISP-owned cameras. It may also be developed through telephone call-ins from ISP customers.
 - It was noted that the ISPs are currently providing much of this information.
- Provide spot content on radio media outlets.
 - The economic value of radio PSAs and other spot content might not be significant based on the discussion. The ISPs were willing to provide a substantial amount of this content. They indicated that this spot content didn't significantly impact their operating budgets or ratings.
- Cash (either for capital investments or recurring costs).
 - No ISP wanted to pay a significantly different amount of cash than the other ISPs. They desired "equal" payments. A premise of this cash parity is that each ISP would contribute equal value in non-cash contributions (e.g., PSAs).
 - If cash is requested then the ISPs want to program this payment into their budget process.

The ISPs were asked to suggest alternatives to their existing use of TranStar floor space. The following six alternatives were discussed.

- Provide each of the three ISPs with their own console that can be staffed individually by each ISP.
 - One option for this strategy is to allow use of Harris County Toll Road Authority's console space which is not currently being used.
 - Another option is to transform the first floor viewing room into additional TranStar floor space for added consoles.
- Require all three ISPs to share a single console and staff it simultaneously with a staff person from each ISP.
- Require all three ISPs to share a single console staffed with a single pooled staff person.
 - Since the ISPs want uniquely skilled individuals to staff TranStar consoles, the most viable solution for this alternative is for the pooled staff person to be provided by each ISP on a rotational basis.
- Provide a single off-site space from which all three ISPs can set-up their operations.
 - The site in Houston is likely to be at the local TTI office because of existing connections, bandwidth of interconnect, and data aggregation activities.
 - ISPs would need access to the TranStar floor intercom and the ability to move cameras (directly or indirectly).

- In the case of a hurricane, flooding or homeland security event the ISPs would like to set up operations in TranStar.
- Allow only a limited number of console positions for ISP use (perhaps only a single one) and allocate that console(s) based on a bid exclusively to one ISP.
 - The ISPs indicated that they may be unwilling to pay a significant amount for such access.
- Provide no TranStar floor or building access and no off-site operations site.

7.3 Conclusions from the Houston Interviews

Some conclusions from the Houston interviews include the following.

- The public-private partnership does offer benefits to the public by providing traffic information to the public sector via radio and television traffic reports.
- Although Houston TranStar has provided traffic information to the general public free-of-charge via the Internet (<http://www.houstontranstar.org/>) since 1994, and has over the past several years provided traffic information via text pagers, web enabled PDA's and cell phones, a significant portion of the population relies upon the private sector and local news organizations to provide current traffic information.
- The traffic information gathered and distributed by the agencies at Houston TranStar (TxDOT provides much of this information) is used by the private companies as a substantial basis for their traffic reports.
- Traffic information (mostly incident reports) that the private companies gather on their own is provided to the operators on the Houston TranStar control room floor.
- This partnership between the public and private sectors is a good working relationship in that each benefit from working together in gathering and sharing traffic information that is passed on to the general public.

7.4 Off-Site Alternative to Existing ISP Floor Usage in Houston TranStar

One alternative to providing the existing access to TranStar floor space was explored in more detail – provide a single off-site space for use by the ISPs.

Off-Site Location and Costs in Houston

In this scenario, all of the ISP companies could jointly lease office space in the Lafayette Building at 701 North Post Oak – this would place the companies in the same building as the TTI-Houston Office which plays a role in Houston TranStar operations.

The TTI-Houston Office has a direct link to Houston TranStar to facilitate the traffic map and web site operations as well as to support transportation research projects in the region. The existing wireless and planned fiber-optic reinstallation between the TTI-Houston Office and TranStar could provide the connectivity to allow the private companies access to selected systems for traffic information.

Technical Considerations for Off-Site Location in Houston

During their interview the ISPs indicated they needed the following types of access to TranStar if they were to be successfully located off-site.

- A high-bandwidth connection to TranStar.
- The ability to monitor and move cameras (directly or indirectly).
- Access to the TranStar floor intercom.

The bandwidth of the existing connection between TranStar and TTI could be used for any type of information transmission that TranStar deems necessary. Currently there is about 54 Mb of available capacity on the wireless link. In order to provide the least impact on the bandwidth needed to effectively operate the TranStar website during periods of high demand, a limit would be placed on the amount available for video (i.e., only a fraction of the available bandwidth would be allocated for video). Limiting the bandwidth will have an adverse impact on the quality of the video that could be transmitted to the ISPs on this link.

Currently TranStar provides video and camera control to Williams Brothers Construction Company for monitoring selected freeway construction projects. This is accomplished over the Internet using a virtual private network (VPN) configuration. The TranStar connection to the Internet is large enough to accommodate two such connections using a VPN. If this approach is pursued, the ISPs would need to secure a T1 connection to the Internet and purchase video encoders, decoders, and a manual control panel for the connection. The cost of the video equipment with installation would likely be \$25,000 or less. This cost could be shared among the ISPs. The installation and cost of the T1 communications line could also be shared.

If the T1 connection were provided as a part of the existing TTI-Houston Office to TranStar connection, it would consume no more than 1.5 to 2.0 Mb of bandwidth and would not adversely impact existing operations under normal conditions. Since the ISPs prefer to relocate to TranStar in major emergencies, their connection could be withdrawn in these emergencies with minimal impact if they are sharing the existing connection. In addition, when the bridge work over the Katy Freeway is completed in the next year, the fiber connection between Houston TranStar and TTI will be restored and bandwidth availability will be increased. The impact to the ISPs during emergency conditions can be mitigated at that time.

Internet-based streaming video is on the TranStar schedule for future development. This may provide yet another migration path for distribution of video to ISPs.

The intercom system used on the floor of TranStar uses a proprietary format that may present some challenges for distribution off-site. But the requirement for floor intercom access does not appear to be insurmountable.

APPENDIX 1. CITY OF TUCSON, ARIZONA CASE STUDY

The City of Tucson, Arizona covers approximately 195 square miles and is home to more than 500 thousand residents, according to the 2003 census. This makes Tucson the second largest city in Arizona. In addition, the surrounding metropolitan area adds another 350 thousand in population. The City is served by two interstates. I-10 runs East-West, crossing the City in a North-South orientation. I-19 originates at a junction with I-10 and runs south to the USA-Mexico border.

Tucson has some significant infrastructure in place on the arterial street system. The Metro area contains more than 400 traffic signals, of which more than 120 have intersection cameras. As construction projects are performed across the city, a fiber-based communications system is being developed, one section at a time. Currently, a mixture of communication options serves the infrastructure on the streets. In addition to the City capabilities, the Arizona Department of Transportation (ADOT) has 12 cameras on the I-10 freeway which are currently available to Tucson.

Several years ago, Tucson realized that they needed some sort of control center to consolidate operations and allow for the effective management of the transportation system. However, funds were limited, especially with regard to staff positions for operating the center on a daily basis. It was recognized that a resource was available in the data that the City had, from traffic signals, to 911 and 511 systems, as well as video. An option existed to sell this information to a Third party provider. However, any funds received from the sale of information would be required to go into the general revenue account of the City, where it would be difficult to utilize for transportation purposes.

Because of the constraints involved in contracting through normal mechanisms, Tucson utilized an innovative approach called a concessionaire's contract. This type of contract is an exchange of goods and services and typically does not involve the exchange of funds. Tucson prepared a scope of work under this type of contract and conducted an open bid process. METRO Networks won the bid and after a 2-year contract negotiation with the City, began work.

In the Tucson area, METRO Networks has 20 media outlets (17 radio stations and 3 TV stations), reaching a population base of several hundred thousand people. METRO operates under an ad or sponsorship system, whereby companies sponsor a public service announcement, such as traffic conditions, in exchange for a lead-in advertisement. Sponsorship rates vary, but typically run \$500 per 10-second PSA.

The scope of work under the Tucson contract had several distinct areas. [Table 10](#) briefly identifies each area and relates the estimated value of the contract in 1998 dollars.

Table 10. Components of City of Tucson Data Sharing Contract.

Area	Estimated Value	Basis
Outfitting of City Traffic Control Center	\$68,000.00	Initial Cost
Flight time for emergency situations	\$1,020.00	Annual
Public Service Announcements for Traffic Updates	\$52,000.00	Annual
Availability of video recordings for resale	10% of resale	Annual
Control Center Staffing	\$53,640.00	Annual

Under the initial year of the contract, the value was determined to be \$68,000 in cost avoidance by the City for outfitting the center, \$106,660 for annual services, and 10% of video resale as a recurring funding stream which was to be redirected back to the control center infrastructure.

The \$68,000 line item in Year 1 of the contract was allocated for outfitting the control center by METRO Networks. The center, housed in the City of Tucson offices, is approximately 2,500 square feet and receives data feeds from traffic signals and video systems, and houses the communications equipment necessary for METRO networks to broadcast information across their media outlets. Maintenance of the center equipment is the responsibility of METRO.

The contract provided for an initial period of work of 3 years and allowed up to five 1-year extensions for a total potential contract length of 8 years. In subsequent years of the contract, the initial cost of outfitting the center would not be present and the value was stated as the annual cost items. However, the 1998 dollar values for the contract line items were not changed in any of the contract extensions.

The dollar figures in the initial contract for staffing were allocated for one staff person (from METRO) manning the center from 6AM to 6PM. Over the lifetime of the contract, the City of Tucson has received additional benefits above the contract value, as METRO has staffed the center with additional employees. The center is typically staffed with a total of 4 employees, all from METRO, between 6AM and 6PM.

Over the time period of the contract, several adjustments took place. Perhaps most important was that METRO Networks decided not to pursue the recording and resale of video information. Additionally, it was found that the City did not extensively utilize the available flight time in METRO aircraft. The contract was adjusted to increase the number of PSAs. Today, METRO airs 1,060 PSAs per week devoted to traffic reports. Each PSA is tagged with a credit to the City of Tucson for providing the traffic data. PSAs air equally across all media outlets, from 5AM to 6PM, with an increased frequency during peak traffic periods. The current value of the PSAs to the City is now estimated at \$104,000, making the annual value of the contract equal to \$158,660. In addition to traffic reports, METRO and the City often cooperate to disseminate information when unique situations such as weather events or natural disasters occur.

Apart from the initial outfitting of the center, a unique aspect of the contract is that METRO provides all of the personnel to run the center. One person operates the center on a full-time basis, but other employees supplement the staffing during peak times. Although the center is staffed and operated by METRO employees, the final operational control is retained by the City. METRO does not change normal city operations, such as traffic signal timing, phasing or emergency response. This information is available to METRO, however, as the operations center has ties to both 911 and 511 systems. It is estimated that incidents are reported to the City operations center within 30 seconds of their receipt at 911. This enables METRO to be very responsive in airing incident information to the traveling public. The City has expansion plans to link the Center to other dispatch centers, such as the sheriff's office.

The City of Tucson has been pleased with this contracting arrangement and is currently entering a new bidding process, as the original 8-year term is nearing completion. Their new request was posted at http://www.tucsonaz.gov/procure/html/ifb_rfps/061004.doc during the summer of 2005. Although the future will bring changes to the information received in the center, such as increased video, the scope of work will remain substantially the same. The City's main goal under this contract is to facilitate the rapid and efficient dissemination of traffic information to the traveling public. Through the use of innovative contracting mechanisms and a strong and cooperative partnership with the private sector, Tucson believes they are not only accomplishing this goal but showcasing the potential for data sharing applications.

APPENDIX 2. VIRGINIA DOT CASE STUDY

In 1997, Smart Travel was established by Virginia Department of Transportation (VDOT) to manage the ITS component of the department. In 2001 guidelines were issued with respect to the center's data and video imagery. They were to apply to all non-governmental entities and stressed the following principles:

- Improving safety on the transportation system
- Providing information and choices for travelers
- Development of traveler information services by the private sector.

Since that time the document has been modified to accommodate agreements with private entities for the provision of information and services to the public. The 2004 document stressed ensuring public privacy while maintaining the opportunity to distribute data and images.

The Virginia Department of Transportation Smart Traffic Center is based in Northern Virginia and operates three shifts (24/7) with five controllers and one supervisor per shift. Their functions include: monitoring traffic, dispatching emergency personnel and responding to calls/complaints from citizens. Currently they are monitoring more than 80 miles of Interstates with 117 CCTV cameras, more than 5,000 loop detectors, and weather stations. They have 206 Dynamic Message Signs, four highway advisory radio outlets, and 24 call boxes on the Dulles Toll Road. They use two-way radios to communicate with field personnel and are part of the National Warning System (NAWAS) operated by D.C. Emergency Management.

The system further includes 22 vehicle classification detector stations, 24 High Occupancy Vehicle (HOV) reversible gates, 24 ramp meters and 29 lane control signals.

The state is divided into nine districts for the purpose of project management. Currently both 911 and 511 systems are operational. The 511 system receives input from all available regional centers to create a consolidated system. It has been operational as VOIS-511 in the I-81 corridor for 3 years and is now operating. The Statewide 511 is provided via telephone and web. Virginia Tech Transportation Institute (VTTI) provides the clearinghouse. Data are provided by VDOT, State Police, weather by Meteorologix and the National Weather Service, travel services by NavTeq and targeted advertising and promotions. The website is maintained by MapTuit, and the phone system is maintained by Logictree.

Virginia DOT does not have any outside agencies or private companies "on the floor" of their Smart Traffic Center; however, they do have a broad agreement with a team headed by Trafficland, Inc. for the provision of Video distribution. VDOT determined that it was in the State's best interest to have a private entity provide the video distribution rather than setting up their own infrastructure for this purpose. They paid an initial set-up fee, and now they pay a monthly service fee. There is also the opportunity for other agencies to participate, and the fees are structured based on the provider's cost recovery assessment. [Table 11](#) shows the fees as presented in the 2002 proposal.

Table 11. Video Distribution Costs

	VDOT Cost	Participating Agency Cost
1. Cost to implement Video Distribution for VDOT Cameras (up to 75 cameras pre-selected by VDOT)	<ul style="list-style-type: none"> • \$250,000 Mobilization Cost • \$20,000 per month in Service Year 1 (Project Months 5-17) • \$15,000 per month in Service Year 2 (Project Months 18-29) • \$10,000 per month in Service Year 3 (Project Months 30-41) 	\$50.00
A. Turnkey approach for Virginia State Police (Level 1 Service)		\$18,000 mobilization charge \$1,500 monthly service charge
B. Turnkey approach for Fairfax County Police (Level 1 Service)		\$18,000 mobilization charge \$1,500 monthly service charge
C. Turnkey approach for Fire and Rescue (Level 2 Service)		\$350 Registration Fee \$0.10 per minute connection fee, not to exceed \$750 per month
2. Cost to implement Video Distribution System for MSHA cameras	\$0.00	
3. Cost to implement Video Distribution System for MCDPWT cameras	\$0.00	
4. Cost to implement Video Distribution System for DCDOT cameras	\$400,000	
5. Total cost if all options are implemented	\$790,000	TBD by Participating Agency

Trafficland, Inc. not only provides the video distribution for VDOT and other partner agencies but retains the right to market value-added traffic video. They have two key products for the general public: My Roads Express and Air Video. My Roads Express is a subscription service costing \$5.95 per month or \$60.00 per year which sends views of selected cameras to a desktop or laptop computer. There is an add-on available called Air Video which will send camera views to cell phones and other personal devices with appropriate capabilities for a fee of \$2.00 per month. Trafficland has other services for emergency responders which are priced on an individual basis.

As part of the Trafficland team, Tri Chord introduced their services to Virginia DOT. They use acoustic traffic monitors to collect volume and occupancy information on major northern Virginia roadways to derive speed and travel times. They have their own sensors to collect

data and will only use VDOT data if it meets their standards. They have an application called Traffic Viewer™ to display maps, track incidents and compute point-to-point travel times. Individual subscriptions begin at \$6.95 per month and increase as add-ins are incorporated into the service.

They have a wide variety of other tools which are available through subscription services to the general public, to fleet operators and to emergency responders. Fleet fees begin at \$2,000.00 per month.

One of the most important lessons learned from the Tri Chord agreement is the need for the DOT to retain certain data rights. In this case, the contract was written in such a way that VDOT cannot use their own data either directly or through Tri Chord, to publish speeds. Therefore, changeable message signs do not carry travel time messages in Virginia.

Other Agreements

VDOT has a number of Interagency Agreements existing or planned, for the provision of images, data or information. They maintain control of the cameras but in some cases provide feeds to others. It does not appear that there are any fees associated with these agreements and in most cases the recipient pays the cost of connecting to the feed.

There are also some other Operational Agreements in place. VDOT has an agreement with TrafficCast to integrate traffic information to provide licensed access to their travel time and other GIS-based applications.

A number of other agreements are for local governments to implement video cameras and to provide images to VDOT for inclusion in the overall system.

APPENDIX 3. TXDOT TMC INTERVIEW QUESTIONNAIRE

PRO FORMA FOR TMC DATA SHARING PRACTICES

Introduction

Hello, my name is _____ and I'm with the Texas Transportation Institute, which is a part of the Texas A&M University System. As you may or may not know, TxDOT is sponsoring a research project entitled, *Data Access Requirements for Texas Traffic Management Centers*, which generally looks at the types of data coming into TxDOT TMCs, the types of data going out of TxDOT TMCs and any opportunities and concerns surrounding this data exchange. As a first step in this project, we are talking to each of the six urban-area TMCs operated by TxDOT to document their data exchange activities. I want to thank you for meeting with me today and assisting with this project. Please feel free to ask questions at any point in this meeting and don't hesitate to volunteer additional information.

Contact Information

First, let me make sure that I have your name and contact information listed correctly. (*Read what you have and make any corrections necessary*)

Name:	Address:
_____	_____
Title:	_____
_____	_____
Employer/Unit:	_____
_____	_____
Phone:	Email:
_____	_____

Now, we can begin the interview.

Data Exchange

The types of data collected by TMCs can generally be grouped into three categories by purpose: (1) general traffic monitoring, (2) incident management, and (3) roadway construction and maintenance. In each of these categories, I'm going to list common data elements and ask you to respond to a series of simple questions for each. I apologize - this may become a bit tedious, but it will help us to most accurately reflect your data exchange operations.

Traffic Monitoring Data

Data Coming Into TxDOT TMCs

1. Are you currently collecting traffic monitoring data related to (e.g., vehicular speed)? Yes/no (*a preliminary list of data element types for traffic monitoring activities*)

(Attachment A) has been developed and the final will be included as part of the interview instrument)

If yes: skip to Question 2.

If no: Do you have any plans to collect this type of data in the future?

If yes: skip to Question 2.

If no: Do you have any desire to have access to this type of data?

If no: return to Question 1 and next data element in list.

2. What mechanism or method is used to capture these data (i.e., CCTV, electronic loops, cellular call in, etc.)? *(See Attachment A)*
3. Is data fully captured using TxDOT resources or is some of it obtained from another public agency (i.e., city traffic departments, police, transit agencies, etc.) or private entity (i.e., media stations, private traffic reporting services)?

If fully captured within TxDOT: skip to Question 4a.

If obtained outside TxDOT: From whom do you specifically obtain these data?

In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you actually obtain the data from this outside source? Is this the best format or medium for you? Please explain.

How frequently do you receive these data?

Does a formal written agreement exist for obtaining these data? If yes, may we get a copy?

4. Would you rate the quality of these data as very good, good, neutral, poor or very poor? Please explain.
 - a. From TxDOT sources
 - b. From external sources
5. Does your agency store traffic and incident data? Which data? In what format? For how long?

Data Going out of TxDOT TMCs

6. Who is these data “shared” with after it is collected? (See Attachment B, Data out)

Within TXDOT _____

Other State or Federal Agencies _____

Transit Agencies, Cities and Counties _____

Private Corporations _____

Private Citizens _____

7. In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you provide these data to this outside source? Is this the best format or medium for you? Is this the best format or medium for them? Please explain.

8. When do you provide these data?

- a. On a regular schedule? How often?
- b. Continuously?
- c. On an event driven basis?
- d. On request?

9. Does a formal written agreement exist to facilitate this exchange? If yes, may we get a copy?

10. Can you describe current practices regarding data requests?

- a. From entities within TxDOT?
- b. From outside entities?

11. Do you see any potential concerns with these data exchanges? If yes, please explain.

12. Have you ever been asked for data that you were unable or unwilling to send? If yes, please describe the circumstance(s).

13. Have there been any subsequent policy changes related to data sharing (i.e., data that have been furnished in the past but are no longer permitted to be furnished)?

Incident Management Data

Repeat Questions 1 through 12 with a unique list of incident management data elements.

Roadway Construction and Maintenance Data

Repeat Questions 1 through 12 with a unique list of roadway construction and maintenance data elements

This is all of the questions I have at this time. Do you have any further comments? If I have any further questions, do you mind if I contact you again? Again, it was a pleasure meeting with you, and thank you for your assistance.

APPENDIX 4. AUSTIN TMC DATA SHARING DESCRIPTION

INTRODUCTION

The Texas Department of Transportation, Austin District participates in the newly established (opened in January 2004) Combined Transportation, Emergency and Communications Center (CTECC). Other participants in the CTECC include the following:

City of Austin	Police Department Austin-Travis County Emergency Medical Services Fire Department Office of Emergency Management Transportation, Planning and Sustainability
Travis County	Sheriff Constables Office of Emergency Management
Texas Department of Transportation	Freeway Service Patrol (HERO) Intelligent Transportation System
Capital Metropolitan Transportation Authority	Fixed Route Dispatch

Motivating the development of the CTECC was a need and desire to share information and resources among public safety and transportation agencies. Typically, agencies operate independently with limited information and communication sharing between agencies. With advances in technology, interoperability was a desired function. CTECC brings all agencies together under one roof, allowing better integration of transportation and public safety applications and communications, which ultimately will provide the community with enhanced services.

While other multidisciplinary traffic management centers have been developed nationally, the CTECC facility is unique in the level of participation by different agencies. When fully operational, approximately 150 personnel from up to 11 different agencies may be on shift. Emergency response personnel staff the Center continuously; TxDOT provides services 24-hours a day, 7 days a week, everyday of the year. Because of its emergency operations center status, the CTECC is a secured site with restricted access.

On February 16, 2005, TTI researcher, Jodi Carson, met with Mr. Brian Burk, Traffic Operations Engineer with TxDOT, to discuss the CTECC's activities related to data exchange. Specifically, the types of data coming into TxDOT TMCs, the types of data going out of TxDOT TMCs and any opportunities and concerns surrounding this data exchange were discussed. The findings from this interview are provided below.

DATA COMING INTO TXDOT TMCS

DATA ELEMENTS (Q1)

1. Are you currently collecting traffic monitoring data related to:

Traffic Monitoring	Speeds Volumes Classifications Occupancy Travel times Environmental conditions (air pollutant levels) Other
Incident Management	Vehicular incidents Unplanned lane or road closures Special Events Planned lane or road closures Road conditions Weather Conditions Other
Roadway Construction and Maintenance	Planned lane or road closures Other

↳ If no, do you have any plans to collect this type of data in the future?

↳ If no, do you have any desire to have access to this type of data?

Traffic Monitoring

The TxDOT Austin District TMC currently collects data related to vehicular speeds, volumes and classifications and detector occupancies. In addition, the TxDOT Austin District TMC captures video snapshots for incident management review.

Travel time data is not currently collected although a strong desire exists to make this data available within TxDOT and subsequently to the motoring public. A modification in the data processing algorithm is required before travel time data can be made available. Because this modification brings with it a real cost, this project must compete internally for resources.

Additionally, the TxDOT Austin District TMC would like to exchange video and detector information with the City of Austin Public Works Department, Traffic Signal Section that is implementing more than 260 cameras at key intersections throughout the city. Access to this data could greatly enhance the TMC's ability to direct motorists to alternate routes.

Incident Management

Incident related data is captured by the TxDOT Austin District TMC through their expert system software. In general, the data captured relates to the incident's location and impact (i.e., lanes blocked), the incident type, the occurrence of injuries, the number of vehicles involved and the incident duration. The expert system also prompts for information related to surface, road, light and weather conditions. The expert system also provides documentation on how the incident was detected and verified and allows the operator to initiate lane control signals, dynamic sign messages and notification of up to 11 response agencies and/or the media.

Computer-aided Dispatch (CAD) system information for Austin and Travis County is available within the CTECC. CAD system information for Round Rock and Williamson County will also be available within the CTECC, allowing for area-wide traffic management and notification in the event of a major incident or emergency.

At the time of the interview, special event related data was not directly captured by the TxDOT Austin District TMC. Instead, these events and their subsequent traffic impacts were addressed through either the TxDOT Traffic Safety Office or TxDOT's Public Information Office.

Road surface conditions and weather conditions are subjectively determined and recorded as part of the expert system entry fields. Operators make the determination either visually using the CCTV images and/or based on input from response personnel at the incident scene or other sources. The fields were developed for consistency with the law enforcement accident report forms. This information is not required to be completed for every incident and as such, has not been comprehensively recorded historically. Operators have since been requested to be more diligent in recording this information.

No information is directly collected by the TxDOT Austin District TMC regarding flooding conditions although slow speeds and congested conditions due to water on the roadway is detected by the inductive loops. When flooding becomes problematic at the two critical Interstate locations, TxDOT is the point of contact for reporting. The TxDOT Austin District TMC will initiate the lane control signals indicating that one or more lanes is blocked ahead but dynamic message signs (DMS) signs are not appropriately located to be of any use in directing traffic.

Temperature is the only condition indicator that is directly measured in the field although these measurements are not readily used to support either incident-related data entry or any response action for adverse weather conditions. Temperature sensors were installed simultaneously with new installations of DMS. The TxDOT Austin District TMC would like to use the data from these sensors to initiate messages pertaining to icy bridge conditions but has not yet received support to do so.

Roadway Construction and Maintenance

Roadway construction and maintenance information is handled through TxDOT's Public Information Office or TxDOT's Traffic Safety Office. The PIO is responsible for updating both the Highway Conditions Report that is available on TxDOT's website and the Highway Advisory Radio system, updated each afternoon. Infrequently, the TxDOT Austin District TMC will be notified (typically by the Public Information Officer) of roadway construction or maintenance activities but the information is generally lacking in detail useful for traffic management (i.e., duration of closure, lanes affected).

DATA COLLECTION METHODS AND MEDIUMS (Q2)

2. What mechanism or method is used to capture this data?

Traffic Monitoring

Data related to vehicular speeds, volumes and classifications and detector occupancies are predominantly captured using inductive loops embedded in the roadway. More than 30 miles of freeway in the greater Austin area are instrumented. In addition, limited data on vehicular speeds, volumes and classifications is captured using acoustic and microwave detectors which were originally installed as part of a research project to investigate detector performance. These detectors cover approximately one freeway mile. The TxDOT Austin District TMC is not using video image vehicle detection systems (VIVDS); the inductive loops provide sufficient accuracy and reliability except where pavement infrastructure has degraded sufficiently to affect performance. The data is reported by station, direction and lane in regular time intervals.

Video is captured as a continuous stream from more than 60 closed-circuit television cameras located in the greater Austin area.

Incident Management

The TxDOT Austin District TMC is notified of an incident through: (1) incident detection algorithms that detect when speeds fall below or volumes exceed a certain threshold, (2) visual observance via CCTV, (3) notification from TxDOT's Highway Emergency Response Operator (HERO) freeway service patrols in the field, (4) notification from other public agencies (Austin Fire Department, Austin-Travis County Emergency Medical Services, etc.) or (5) notification from the media. Public calls via cell phone go directly to the 9-1-1 Center and are not fielded by TxDOT personnel.

DATA ORIGINIZATION SOURCES (Q3-Q5)

3. Is this data fully captured using TxDOT resources or is it obtained from another public agency (i.e., city traffic departments, police, transit agencies, etc.) or private entity (i.e., media stations, private traffic reporting services)?

↳ Who specifically do you obtain this data from?

↳ In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you obtain the data? Is this the best format or medium for you?

↳ How frequently do you receive this data?

↳ Does a formal written agreement exist for obtaining this data? If yes, may we get a copy?

4. Did TxDOT agree to share infrastructure (i.e., coaxial lines, towers, right-of-way) or other assets/resources to obtain this data?

5. Are any direct costs or fees paid to agencies outside of TxDOT to obtain these data?

Traffic Monitoring

Currently, all traffic monitoring data is fully captured using TxDOT resources. In the near term, video data exchange may occur with the City of Austin Public Works Department, Traffic Signal Section.

Incident Management

Much of the incident management data is captured using TxDOT's inductive loop system and CCTV in combination with TxDOT's HERO freeway service patrol personnel. Additional data is captured through notification from outside sources including the Austin Fire Department, Austin-Travis County Emergency Medical Services, or the media. These outside notifications are informal in nature (in-person, via radio or via cell phone), are event driven and require no formal agreement, infrastructure exchange or additional costs.

The TxDOT Austin District TMC does not receive incident-related information from other transportation system managers, such as the City of Austin.

DATA QUALITY (Q6)

6. Would you rate the quality of these data as very good, good, neutral, poor or very poor?

TxDOT Sources

Other Sources

Traffic Monitoring

The quality of traffic monitoring data obtained from the inductive loops is generally good, with higher than 90 percent of the data collected being considered "reasonable".

Incident Management

Although the quality of incident management data is generally good, a few specific shortcomings have been identified. In addition to the subjective nature of the surface, road and weather condition entry fields, the prompt for the "cleared" time of the incident may be interpreted differently among agencies. "Cleared" may mean that the lane blockage has been

removed or it may mean that the traffic queue has fully dissipated. Depending on the circumstances of the incident, these two different interpretations may lead to significantly different estimates of incident duration and also pose a liability concern. TxDOT operators “clear” an incident when all response vehicles, emergency and non emergency, leave or “clear” the scene. Also, with respect to capturing HERO freeway service patrol activity data, TxDOT is only capturing what the HERO freeway service patrols actually responds to and not capturing the requests for HERO response. A planned integration with the CAD system will alleviate this problem by allowing Patrol requests to be queued. In the short-term, it prevents a justifiable case for Courtesy Service Patrol program expansion.

DATA STORAGE (Q7)

7. Does TxDOT store these data?

- ↳ If yes, what data?
- ↳ If yes, in what format?
- ↳ If yes, for how long?

Traffic Monitoring

Vehicular speeds, volumes and classifications and detector occupancies are archived and are made available by request, typically in CD format. The full video stream is not archived, however, video snapshots – taken whenever TxDOT personnel perform significant traffic management activities – are archived for liability purposes. Each snapshot is time and date stamped.

Incident Management

Incident-related data captured through the expert system software are archived and made available by request in CD format. The full video stream is not archived, however, video snapshots – taken whenever TxDOT personnel perform significant traffic management activities – are archived for liability purposes. Each snapshot is time and date stamped.

DATA GOING OUT OF TxDOT TMCS

DATA DESTINATION SOURCES (Q8)

8. Who is this data “shared” with after it is collected?

- Within TxDOT
- Other State or Federal Agencies
- Transit Agencies, Cities and Counties
- Private Corporations
- Private Citizens
- Other

Traffic Monitoring

Within TxDOT, traffic monitoring data is requested on an as needed basis and has been offered to the Transportation Planning and Programming Division (TPP) to supplement their portable automatic traffic recorder (ATR) data. Despite the offer, the TPP has not made use of the data available through the TMC, citing a concern over data quality.

Outside of TxDOT, data requests primarily initiate from research organizations, such as TTI, to support special investigations.

Active data sharing with other public agencies, such as local transportation or law enforcement agencies, is limited. All personnel located at the CTECC have access to the video and can informally exchange information about a particular incident or condition. Ultimately, the speed data from the inductive loops will be directed to the CAD system on regular intervals and used to direct emergency response personnel along the fastest route to a vehicular incident or other call.

Video is shared directly with four media stations in Austin. The media have pan/tilt/zoom capabilities but their use of the feature has been limited; a meeting was held with TxDOT and the media participants to agree upon mutually acceptable camera angles to prevent excessive independent camera movement, particularly in the morning peak traffic period.

Incident Management

Incident management data is requested on an as needed basis and exchanged in real-time and post-event between the TxDOT Austin District TMC personnel and the Courtesy Service Patrol personnel.

Up to 11 emergency response agencies and/or the media are notified of an incident via the expert system software system. The media can subsequently access the video feed to observe the incident management activities.

As soon as the incident has been verified, information and guidance is also provided to the motoring public. Because no information is currently available regarding the status or condition of alternate routes, TxDOT does not suggest a particular route but will instead simply suggest that motorists should detour, picking their own route. If an arrangement is made with the City of Austin to access their 290+ intersection CCTVs, more specific guidance for alternate routes may be provided.

DATA DISSEMINATION METHODS AND MEDIUMS (Q9)

9. In what format or through what medium do you provide the data to this outside source?

- Hardcopy mail/fax
- Electronic files/email
- Direct link
- Video - full motion or snapshot
- Dynamic message signs (DMS)

Highway advisory radio (HAR)
Website
Other

- ↳ Is this the best format or medium for you?
- ↳ Is this the best format or medium for them?

Traffic Monitoring

Vehicular speed, volume and classification and detector occupancy data is typically provided as a comma delimited file in a CD format. A more desirable exchange medium is a website format, with data files regularly posted to an ftp site; interested parties could download the desired data without making a formal request to TxDOT.

Incident Management

Up to 11 emergency response agencies and/or the media are notified of an incident via the expert system software system. The media can subsequently access the video feed to observe the incident management activities.

Information is provided to the motorists through DMSs, with more limited direction provided through the lane control signals. Motorists also can tune to the participating media stations to receive the latest updates on traffic conditions.

DATA DISSEMINATION FREQUENCY (Q10)

10. When or how frequently do you provide this data?
- On a regular schedule (if yes, how often?)
 - Continuously
 - On an event-driven basis
 - On request
 - Other

Traffic Monitoring

Traffic monitoring data is almost always provided on a by request or as needed basis; data is not pro-actively distributed by the TxDOT Austin District.

Incident Management

Incident notification data is provided on an event-driven basis. Other data (i.e., annual summaries of Courtesy Service Patrol activities) is provided on a by request or as needed basis; data is not pro-actively distributed by the TxDOT Austin District TMC.

DATA SHARING PROCESS AND ISSUES (Q11-Q15)

11. Does a formal written agreement exist to facilitate this exchange? If yes, may we get a copy?

12. Can you describe current practices regarding data requests?

Within TxDOT
Outside TxDOT

13. Do you see any potential concerns with this data exchange?

14. Have you ever been asked for data that you were unable or unwilling to send?

15. Have there been any subsequent policy changes related to data sharing (i.e., data that have been furnished in the past but are no longer permitted to be furnished)?

Traffic Monitoring

Currently, two separate written agreements are in place to facilitate the exchange of video data with the local Austin media: (1) the Combined Transportation, Emergency and Communications Center Print and Broadcast Media Memorandum of Understanding and (2) the License Agreement for the Use of the Texas Department of Transportation Austin District Intelligent Transportation System Infrastructure. Ultimately, the TxDOT Austin District TMC would like to see these two documents merged into a single CTECC agreement.

Because TxDOT is not proactively sharing data, a process for exchange has not been formalized; requests are addressed on a per request basis.

Limitations related to the video/CCTV viewing and control capabilities (i.e., the availability of supporting hardware and software) and the communications infrastructure may challenge any future involvement of media beyond the existing participants.

Requests have been received by individuals who want the video/CCTV feed directed to their home. These requests were denied and resulted in TxDOT's informal policy to only provide the video data to entities who will further disseminate the information (i.e., not for personal use). Initially, TxDOT was asked to provide exclusive rights to the video data for a single media outlet. TxDOT instead opted to make the video widely available for dissemination with no exclusive rights.

Incident Management

Because TxDOT is not proactively sharing data, a process for exchange has not been formalized; requests are addressed on a per request basis.

APPENDIX 5. HOUSTON TMC DATA SHARING DESCRIPTION

PRELIMINARY PRO FORMA FOR TMC DATA SHARING PRACTICES

Contact Information

Name: John M. Gaynor, P.E.	Address: 6922 Old Katy Rd Houston, TX 77024
Title: TxDOT Agency Manager at Houston TranStar	Mailing address:
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Data Exchange

The types of data collected by TMCs can generally be grouped into three categories by purpose: (1) general traffic monitoring, (2) incident management and (3) roadway construction and maintenance. In each of these categories, I'm going to list off common data elements and ask you to respond to a series of simple questions for each. I apologize. This may become a bit tedious but it will help us to most accurately reflect your data exchange operations.

Traffic Monitoring Data

Data Coming Into TxDOT TMCs

1. Are you currently collecting traffic monitoring data related to (e.g., vehicular speed)? Yes/no A preliminary list of data element types for traffic monitoring activities (Attachment A) has been developed and the final will be included as part of the interview instrument.

If yes: skip to Question 2.

If no: Do you have any plans to collect this type of data in the future?

If yes: skip to Question 2.

If no: Do you have any desire to have access to this type of data?

If no: return to Question 1 and next data element in list.

2. What mechanism or method is used to capture these data (i.e., CCTV, electronic loops, cellular call in, etc.)? (*See Attachment A*)

Travel time and speed data using Automated Vehicle Identification (AVI) technology as installed throughout the freeway system in the region. There are loops installed along the freeways, but these are essentially not being utilized for data collection at this time. CCTV is also used for incident detection / verification of incident. Newer video installations are being developed using “Internet” cameras [video and/or snapshots delivered to TranStar using newer technologies instead of the regular TxDOT fiber system]. Video Identification Systems (VIDS) had been installed along portions of the freeways, but are not being used for any data collection activities. The Wavetronics SmartSensor technology is being installed along freeways to supplement the speed data being collected as well as to provide volume information. The data is presently being sent to TranStar. A railroad monitoring system is being installed along a portion of US 90A in Sugarland to detect train movement and intersection blockages along the SPRR. Flood sensors installed along the freeway provide real-time rainfall and water depth information. The most prevalent and primary data source is the AVI data.

3. Is these data fully captured using TxDOT resources or is some of it obtained from another public agency (i.e., city traffic departments, police, transit agencies, etc.) or private entity (i.e., media stations, private traffic reporting services)?

All of this data is mostly funded with TxDOT resources, especially in terms of infrastructure and installation costs. The other TranStar partners do share in the operational costs [communication and maintenance costs] of the AVI system. Specific to the AVI system, TxDOT has TransCore under contract to provide maintenance services at the field sites, and TTI is under contract to provide development services in terms of system operation and data analysis/distribution processes.

If fully captured within TxDOT: skip to Question 4.

If obtained outside TxDOT: From whom do you specifically obtain these data?

In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you actually obtain the data from this outside source? Is this the best format or medium for you? Please explain.

How frequently do you receive these data?

Does a formal written agreement exist for obtaining these data? If yes, may we get a copy?

4. In order to obtain the data did TxDOT agree to share infrastructure (e.g., coax, towers, ROW) or other resources / assets? If so what are the terms of these agreements?

No, the current information is delivered to TranStar via their own fiber network.

5. Are any direct costs or fees being paid to agencies outside TxDOT to obtain the data? If so what are the terms of these agreements.

No, the only outside costs are an Inter-Agency Contract with TTI and the TransCore maintenance contract for AVI.

Would you rate the quality of these data as very good, good, neutral, poor or very poor? Please explain.

- a. From TxDOT sources

All of the data being collected within TxDOT is of high quality [very good] and provides a valuable resource for the staff at TranStar. Most of the data resources have been utilized for many years and therefore a good track record and long term high data quality exists. The Wavetronics SmartSensor technology is new and is being evaluated for accuracy and reliability. The newer methods of getting the data to TranStar [such as wireless] are also being evaluated.

- a. From external sources

6. Does you agency store traffic and incident data? Which data? In what format? How long?

The AVI data is presently being stored by TTI. All of the “raw” data [i.e., tag reads] collected for the system are archived on a monthly basis. TTI also develops yearly averages for the AVI data in addition to graphical representations of the data that are used in various capabilities on the Houston TranStar web site. Through requests to TTI, additional analyses are routinely completed using the AVI data as a basis for evaluating operational issues along the freeway system monitored by AVI. TranStar also operates RIMS [Regional Incident Management System] which provides detailed information on each incident as recorded at TranStar. All of the data recorded into RIMS is archived for further analyses as needed.

Data Going out of TxDOT TMCs

7. Who is these data “shared” with after it is collected? (*See Attachment B, Data out*)

Within TXDOT _____

Other State or Federal Agencies_____

Transit Agencies, Cities and Counties_____

Private Corporations_____

Private Citizens_____

The main format for providing the traffic information to others is the Houston TranStar web site. Traffic service companies receiving direct access to a data feed also complete the access via the Internet. In terms of CCTV access, TV stations with agreements have been provided with real-time access to the Houston TranStar cameras; they do not have any controls over the cameras but can view and broadcast the video.

8. In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you provide these data to this outside source? Is this the best format or medium for you? Is this the best format or medium for them? Please explain.

Analyses as completed by TTI for the AVI data are provided to TxDOT in electronic format and hardcopies as needed. Data representation is also provided to others on the TranStar web site; some of these are of a historical nature while others are in “real-time” mode. The traffic service companies have access to a password-protected data set which they are free to use according to their respective agreements.

9. When do you provide these data?
 - a. On a regular schedule? How often?
 - b. Continuously?
 - c. On an event driven basis?
 - d. On request?

As the most common medium is through the Internet, the data is essentially provided continuously in a “real-time” mode.

10. Does a formal written agreement exist to facilitate this exchange? If yes, may we get a copy?

Yes, formal agreements do exist.

11. Can you describe current practices regarding data requests?

- a. From entities within TxDOT?
- b. From outside entities?

Data requests from within TxDOT would be responded to by internal e-mail. Outside entities, could be in the form of an open records request or through the Leadership Team or the Executive Committee as they have requested monetary compensation for outside data requests.

12. Do you see any potential concerns with these data exchange? If yes, please explain.

The only major concern is how the traffic service companies may be using the data in terms of a company “selling” the Houston data to other companies; this would be a violation of their agreement. The companies are also required to provide credit to TxDOT/Houston TranStar when using the data; some of these companies may not be doing this as well as they probably could.

13. Have you ever been asked for data that you were unable or unwilling to send? If yes, please describe the circumstance.

Yes, but I cannot recall the circumstance.

14. Have there been any subsequent policy changes related to data sharing (i.e., data that have been furnished in the past but are no longer permitted to be furnished)?

Yes, the data agreements can no longer be authorized by this office. Austin will now review all agreements for data sharing. The Leadership Team and Executive Committee must approve the amount of compensation. There are some exceptions such as the government office of emergency management or police agencies. Exclusive agreements where an outside entity “owns” the data will not be signed.

Incident Management Data

Repeat Questions 1 through 12 with a unique list of incident management data elements

The incident data is entered in real-time into the TxDOT RIMS system at TranStar. The incident information is posted on the TranStar web site. The public also can sign up for “Traffic Alerts” in which incident information is emailed to the registered user based upon user-specified criteria. No additional agreements specific to incident data distribution are currently being used. Direct access to RIMS is not allowed. The only incident information made available includes location, time stamp information, incident status [detected, verified,

moved, cleared, etc], and the number of lanes blocked [HOV lane, freeway mainlane, frontage road lane, shoulder, ramp, etc.].

Roadway Construction and Maintenance Data

Repeat Questions 1 through 12 with a unique list of roadway construction and maintenance data elements

As with the incident information, no additional agreements specific to construction and maintenance data are required. The Houston District PIO is the direct link for daily distribution of scheduled roadwork activities to the local media. In addition, the Houston TranStar web site provides a listing of current activities [lane closures] and displays real-time icons [indicating an active or inactive lane closure] on the traffic map. The data for this information is maintained by the PIO.

This is all of the questions I have at this time. Do you have any further comments? If I have any further questions, do you mind if I contact you again? Again, it was a pleasure meeting with you and thank you for your assistance.

APPENDIX 6. LAREDO TMC DATA SHARING DESCRIPTION

Contact Information

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Data Exchange

The types of data collected by TMCs can generally be grouped into three categories by purpose: (1) general traffic monitoring, (2) incident management and (3) roadway construction and maintenance. In each of these categories, I'm going to list off common data elements and ask you to respond to a series of simple questions for each. I apologize. This may become a bit tedious but it will help us to most accurately reflect your data exchange operations.

Traffic Monitoring Data

Data Coming Into TxDOT TMCs

1. Are you currently collecting traffic monitoring data related to (e.g., vehicular speed)?

Yes

2. What mechanism or method is used to capture these data (i.e., CCTV, electronic loops, cellular call in, etc.)?

CCTV, inductance loop detectors, and side-fire radar (Wavetronics); all cell phone-based reports of incidents go directly to Laredo PD, with traffic-related notices getting passed along to TxDOT.

3. Are these data fully captured using TxDOT resources or is some of it obtained from another public agency (i.e., city traffic departments, police, transit agencies, etc.) or private entity (i.e., media stations, private traffic reporting services)?

Camera views from City of Laredo cameras are accessible by TxDOT – most of these camera feeds are from traffic signal VIVDS units, but a few (3 at present) City of Laredo cameras have been deployed that have PTZ capabilities. TxDOT can access these camera views but have no control over the cameras at any time.

4. In order to obtain the data did TxDOT agree to share infrastructure (e.g., coax, towers, ROW) or other resources / assets? If so what are the terms of these agreements?

Yes, TxDOT shares some of their fiber lines with the City of Laredo in return for the camera access. The terms of the agreement are verbal/gentleman's agreement.

5. Are any direct costs or fees being paid to agencies outside TxDOT to obtain the data?

No

6. Would you rate the quality of these data as very good, good, neutral, poor or very poor? Please explain.
 - a. From TxDOT sources – very good
 - b. From external sources – good (would be better if TxDOT had at least some control of camera view in accordance with some agreed upon protocol)

7. Does your agency store traffic and incident data?

No – they only use data feeds for real-time applications at present.

Data Going out of TxDOT TMCs

8. Who are these data “shared” with after it is collected?

Data are only shared regularly internally within TxDOT

9. In what format or through what medium (i.e., hard copy, electronic copy, direct link) do you provide these data to this outside source? Is this the best format or medium for you? Is this the best format or medium for them?

Not applicable at this time.

10. When do you provide these data?

Very rarely – only upon an open records request, but the sharing is anecdotal, since they do not store any data at present.

11. Does a formal written agreement exist to facilitate this exchange? If yes, may we get a copy?

No formal agreement for data exchange at present.

12. Can you describe current practices regarding data requests?

a. From entities within TxDOT?

Typically handled with an e-mail summary based upon the internal request (e.g., whatever exists within their incident management log)

b. From outside entities?

Typically handled with a formal letter, but only done in the event of an open records request. They get such requests an average of about once per month.

13. Do you see any potential concerns with these data exchange?

No – no significant problems to date in these regards.

14. Have you ever been asked for data that you were unable or unwilling to send?

Yes, unable in several circumstances where, for example, video from an incident is requested. Since they do not archive any data (particularly video, which is the most common request), they are unable to meet most requests for data.

15. Have there been any subsequent policy changes related to data sharing (i.e., data that have been furnished in the past but are no longer permitted to be furnished)?

No.

Incident Management Data

Does not apply in any different way than as outlined above.

Roadway Construction and Maintenance Data

Does not apply at this time.

General Note: The Laredo District is in the process of making several system upgrades to their STRATIS TMC and related additions to the ITS infrastructure being deployed in that region. A specific upgrade that will take place over the next six-to-nine months is the installation of a new server that will facilitate the implementation of an official STRATIS website. Accompanying this deployment will be new activities related to data sharing with other regional operating agencies and the general public. Laredo is also in the early stages of developing a formal Traffic Management Team that should also facilitate new and improved information sharing activities. The aforementioned activities should be followed closely for the purposes of this research project.

APPENDIX 7. SAN ANTONIO TMC DATA SHARING DESCRIPTION

Project 5213 Interview

Introduction

Contact Information

TransGuide
Brian Fariello
Traffic Management Engineer
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Traffic Monitoring Data

Data Coming Into TxDOT TMCs

1. Yes, we collect speed, volume, and occupancy data.
2. We use loops, VIVDS, Wavetronix SmartSensor, and acoustic equipment. About 60% of our detection is done with loops; however, we are phasing these out due to the difficulty in maintaining them with a large amount of pavement overlay projects. We are phasing out the acoustic equipment; it should be gone with the next reconstruction contract for IH 410 (Broadway to Perrin Beitel) which begins in 2006. We have a 93-mile core traffic management system. Detection equipment is spaced at approximately ½-mile intervals. In addition to this core system, we have a 60-mile system where we use VIVDS for detection; this is where we use to have AVI equipment. We subsequently removed the AVI readers and now have VIVDS on those freeway segments. We have very few Wavetronix SmartSensor devices, but we like them and view them as our new standard.
3. SAT does not obtain traffic management data from others.
4. No, SAT does not place its equipment on others' infrastructure. The lone exception is a pan/tilt/zoom camera located on the top of the Alamodome (City of San Antonio facility), adjacent to IH 37.
5. No direct costs of fees being paid to others.
6. I would rate data quality as follows:
 - a. TxDOT sources
 - i. Loops – very good.
 - ii. Wavetronix SmartSensor – we have a lot of confidence in these
 - iii. VIVDS – their cost and difficulty with maintenance ranks them below Wavetronix.
 - iv. Acoustics – these are maintenance-intensive and are being phased out.

- b. Other sources
 - i. None
7. Yes, we store speed, volume and occupancy data. These are in text flat files (human readable). We have been storing them since TransGuide's opening day (July 1995), except for during an occasional computer downtime. In addition, we post about 30-days of data online at its ftp site for researchers and others to use.

Data Going Out of TxDOT TMCs

8. When do you provide these data?
- a. Sharing within TxDOT? No one. The district planning folks do not use it, although sometimes their consultants will ask for it.
 - b. Other state users? MPO, universities
 - c. Federal users? Livermore National Lab, Mitretek monitor TransGuide's data.
 - d. Transit/Local government? VIA Transit and the City of San Antonio get TransGuide video.
 - e. Private users? Media outlets get their video and the public get data from TransGuide's website.
9. As noted in #7 above, TransGuide posts 30 (or more) days of data on its ftp site (<http://www.transguide.dot.state.tx.us>). These data are updated by SAT personnel on a non-scheduled basis. We also share video with the local media and we post travel time data via our website.
10. We provide video through an agreement with the local media outlets. Local TV stations provided the equipment (external access video switch) necessary to allow 20 camera views to be fed to each of the stations. Each station (and TxDOT Area Offices) can then control which image they display to their viewers. This arrangement began in 2003. Prior to that, the TV stations were at the mercy of TransGuide operators who might be changing the pan/tilt/zoom views while the image was being broadcast.
11. Firms that want to share TransGuide's video data must enter into a written agreement; however there is no agreement required for anyone to use TransGuide images on websites. Users, e.g., researchers, of data on the ftp site are not required to enter into an agreement. However, private firms that will market TransGuide data are required to have an agreement.
12. Have you ever been asked for data that you were unable or unwilling to send?
- a. None.
 - b. We occasionally get requests for non-video traffic data beyond what is still posted on the ftp site. We require that they download those data after midnight. We require that those who use TransGuide images, i.e., media, do not alter the TransGuide logo on their websites or broadcasts.
13. We believe we have sufficient safeguards in place so that we are not concerned with the data exchanges. We also can shut down the ftp site at will if someone is abusing access to it.

14. Yes, we had to pull the plug on a URL site that was consuming all the access capacity our site had, i.e., they were swamping our website. We responded by blocking access to their URL.
15. No, there haven't been any subsequent policy changes.

Incident Management Data

Data Coming Into TxDOT TMCs

1. Yes, we collect incident data. As with construction/maintenance data, we archive "scenario" data, which includes an incident's start time, end time, DMS message, and the lane control signal display; no other incident-related information is saved. We do not videotape incidents. We display incident information on our website with a banner on each TransGuide website page while the incident is underway.
2. We become aware of incidents primarily through 911 and incoming cell phone calls. These represent about 80% of the incidents. About 15% are initially detected by TransGuide operators via cameras, and about 5% are detected using the original freeway loops and algorithms. Because the method of incident detection is not included in the scenario data that are archived, these reported percentages are simply estimates.
3. As noted in #2 above, some of the incidents are detected through 911 and private citizens' cell phone calls. TransGuide operators are co-located with Police Department staff. The terms of this agreement includes sharing some office space maintenance costs. No formal written agreement exist for obtaining these data.
4. The 911 and cell phone data are very good quality.
5. We store these data in two Sybase tables, since approximately 2001. Prior to that, incident data were archived only in hardcopy form. Those hardcopies are now gone.

Data Going Out of TxDOT TMCs

6. Who is the data "shared" with after it is collected?
 - a. Within TxDOT, incident data are dispatched via alphanumeric pagers to numerous staff from the District Engineer to maintenance foremen.
 - b. No federal or other state agencies use these data.
 - c. VIA Transit and City police, fire and traffic engineering get these pager messages.
 - d. Private entities do not get pager messages.
7. Incident data are stored electronically and include only start time, end time, DMS messages and LCS displays.
8. These data can obtain archived incident data only through Texas Open Records request or subpoena.
9. N/A
10. N/A
11. No, we don't see potential concerns with data exchange. We have sufficient safeguards in place, e.g., we limit the information we save in our scenarios. Regarding our video image sharing, we control the pan/zoom/tilt. Our operators are

- instructed that they can be dismissed if they pan/zoom/tilt a camera to display an inappropriate subject.
12. We have been asked to provide video of incidents; however, our policy is to not record video images. Also, we do not provide access to archived information regarding how TxDOT responds to incidents, e.g., DMS messages, travel times, etc.
 13. No.

Roadway Construction and Maintenance Data

Data Coming Into TxDOT TMCs

1. We post lane/road closure data on our website and we archive DMS messages, but we do not archive lane/road closure data. We do not calculate travel times for lane/road closures.
2. TxDOT field office staff fax the planned closure information to TransGuide at least one week in advance of the closure.
3. No other construction/maintenance data are obtained from outside sources.
4. The quality of the data (DMS messages) is very good.
5. Yes, we store the data in Sybase format, in perpetuity. The Department's Information Services Division webpage reportedly shows roadway condition reports in tabular format.

Data Going Out of TxDOT TMCs

6. Who is the data "shared" with after it is collected?
 - a. Within TxDOT, this information is shared with the public information office and on TxDOT's intranet.
 - b. It is not shared with other state or federal agencies
 - c. VIA Transit uses it for rerouting its buses; theoretically the City of San Antonio uses it for deploying signal timing changes on a parallel diversion route in one corridor
 - d. Private corporations can access info via TransGuide's website.
 - e. Private citizens can access info via TransGuide's website.
7. The information is shared with VIA by virtue of VIA staff being co-located with TxDOT within TransGuide's operations room.
8. These data are shared on an event-driven basis.
9. These data are shared with the media through the PIO. No written agreement is involved.
10. Can you describe practices regarding data requests?
 - a. None
 - b. We occasionally get requests for non-video traffic data beyond what is still posted on the ftp site. We require that they download those data after midnight.
11. No, we don't see concerns regarding this data exchange.
12. If there is a lawsuit related to roadway construction or maintenance, we will provide archived "scenarios" in response to a Texas Open Records request or a subpoena.

(We save “scenario” date, which includes an event’s start time, end time, DMS message, and the lane control signal display; no other event-related information is saved.)

13. No changes.