

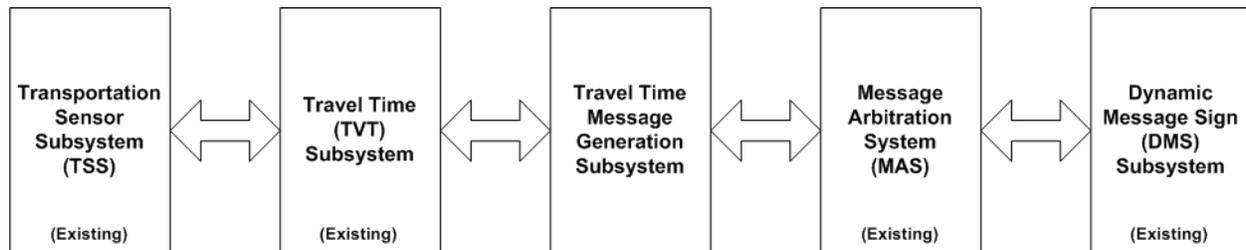
Travel Times on DMS Devices

Purpose:

FDOT has expressed an interest in displaying travel times on DMS devices. Since the SunGuideSM software already computes travel times, a software application that generates messages (based on the travel time data) to send to the Message Arbitration Subsystem (MAS) for display on the DMS devices needs to be developed. Additionally, other DOTs have begun posting travel time data to their public Web Site as an alternative form of traveler information.

High-Level Concept:

Approximately four years ago the Texas Department of Transportation TransGuide system started displaying travel time messages on their DMS devices. This project has received significant public acclaim and was a simple system to implement because of the highly modular TransGuide software. SunGuideSM shares the same architectural style that TransGuide does and currently SunGuideSM has an application to compute travel times (called the TvT subsystem) based on data reported by the Transportation Sensor Subsystem (TSS). SunGuideSM already has a message queuing subsystem so the only missing piece of software is the one that would format the messages and send them out for display. Conceptually, the needed software fits into the SunGuideSM architecture as depicted in the following figure:



The source of the data (e.g. type of sensor) is independent of the process as the TvT subsystem would provide the data. During the development of the TransGuide travel time subsystem, a number of questions were asked as to what format the messages should take. It was decided that the public would be provided with major cross streets and the times would always be given in a range. The TransGuide software has a configuration utility that the system administrator uses to configure which travel time segments should be used to display the travel time for each DMS. Based on the geometry of the DMS, a messaging generation rule is established for each DMS that is to display travel times. Travel time messages are displayed at the lowest priority so that incident related messages always appear when they are generated by an operator. The following is an example of a DMS that shows travel times to two cross streets:



For segments of highway that only have a single major cross street, the following type of message is generated:



In the event that cross streets are close and travel times very good (TransGuide never publishes a travel time of less than five minutes) the following type of message is generated:



SunGuideSM is at a great advantage in implementing this capability because a travel time computation module already exists and a message queuing subsystem exists. If SunGuideSM chooses to implement a DMS travel time message generation subsystem, the following questions would need to be answered before development could be initiated:

- What format would used to display the travel time messages?
- What words should be used to create the messages (standardization across the state would be preferred)?
- How should times be display: specific value, in ranges, etc?

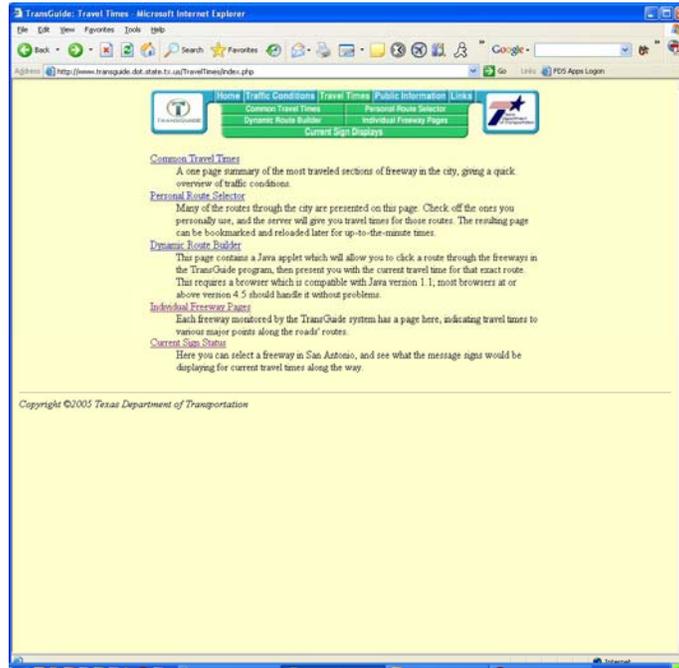
Once these questions are understood, the following software could be developed:

- Travel Time Message Generation Subsystem: a subsystem that would take data from the travel time subsystem (TvT) and generate messages for each DMS device configured to receive travel time messages; these messages would be sent to the Message Arbitration Subsystem (MAS) for processing to the devices.
- Travel Time DMS Editor: a graphical editor that would allow a systems administrator to indicated what travel times should be displayed on which DMS devices (i.e. configure which cross streets would have travel times displayed).

Additional Functionality to Consider:

Functionality that extends beyond displaying to DMS devices would include displaying travel time data on web site. TransGuide quickly learned that users wanted to have access to travel time messages on the web site so they could perform trip planning before leaving the their source destination. The following images have been taken from the TransGuide web site (<http://transguide.dot.state.tx.us>). SwRI recommends that FDOT consider adding this type of functionality to the SunGuideSM web site when the Travel Time Message Generation Subsystem is developed.

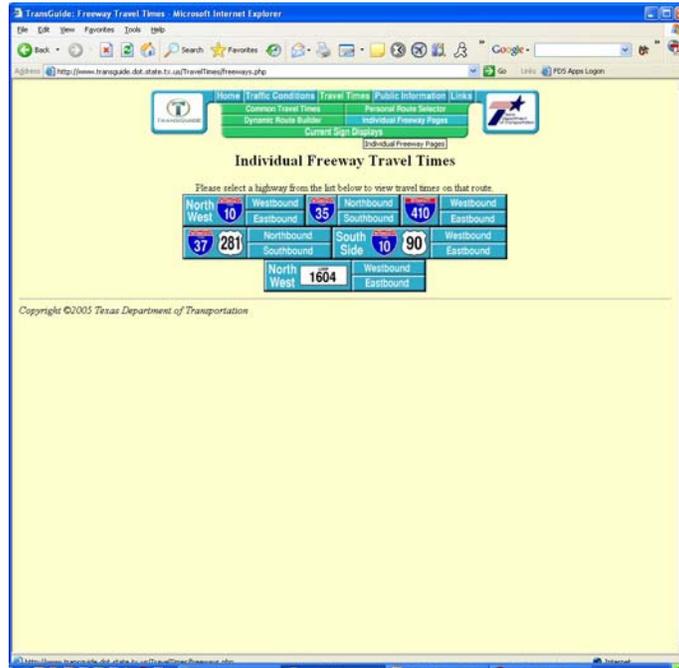
The following graphic shows the options provided to the user when they enter the travel time section of the web site:



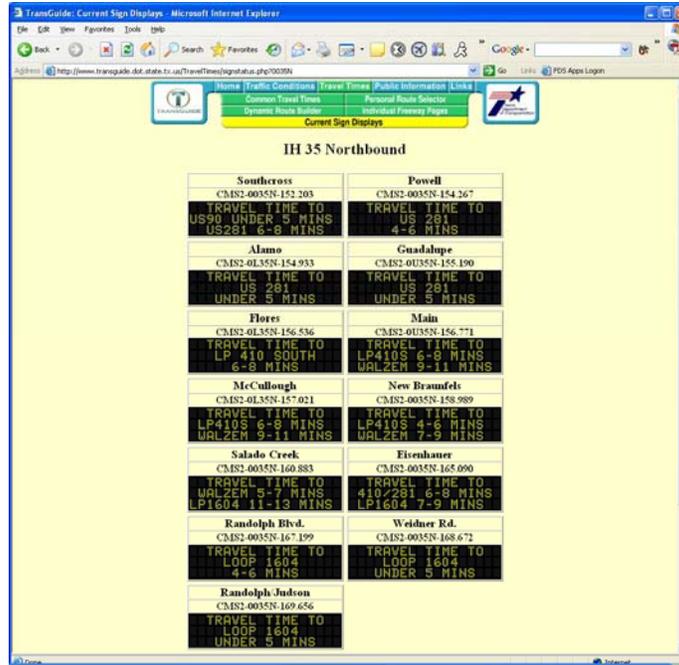
The user has the variety to go to a number of different pages. If they wish to see common travel times they are presented with the following screen:

Highway	Starting Point	Ending Point	Distance	Segment Travel Time	Average Speed (MPH)
I-10 Eastbound	Loop 1604	Loop 410	7.0 mi.	10 min.	100
	Loop 1604	I 35 Interchange North of Downtown	13.2 mi.	13 min.	100
	Loop 410	I 35 Interchange North of Downtown	6.2 mi.	No data	No data
	Harbort	Hidalgo	6.7 mi.	7 min.	100
I-10 Westbound	I 35 Interchange North of Downtown	Loop 410	6.2 mi.	No data	No data
	Loop 410	Washburn	2.3 mi.	20 min.	100
	Loop 410	Loop 1604	7.0 mi.	7 min.	100
	Hidalgo	Harbort	6.9 mi.	7 min.	100
I-410 Westbound	I 35 Interchange North of Downtown	Loop 1604	13.2 mi.	13 min.	100
	Permco Blvd.	US 281	4.5 mi.	14 min.	100
	US 281	IH 10	4.5 mi.	Construction	No data
	IH 10	Blanders	3.6 mi.	1 min.	100
I-410 Eastbound	Permco Blvd.	Blanders	8.1 mi.	Construction	No data
	Blanders	IH 10	3.6 mi.	14 min.	100
	IH 10	US 281	4.5 mi.	14 min.	100
	US 281	Permco Blvd.	4.5 mi.	14 min.	100
I-37 / US 281 Northbound	Blanders	Permco Blvd.	9.0 mi.	Construction	No data
	IH 10	Permco Blvd.	9.0 mi.	Construction	No data
	US 181	LP 410 South	1.5 mi.	2 min.	40
	LP 410 South	IH 10	6.3 mi.	7 min.	50
US 281 / IH 37 Southbound	LP 410 South	IH 35	9.4 mi.	10 min.	57
	SB Midway	IH 10	4.5 mi.	14 min.	57
	IH 10	IH 35	3.2 mi.	14 min.	100
	IH 35	Besse	3.2 mi.	14 min.	54
I-37 / US 281 Southbound	Besse	IH 35	4.1 mi.	14 min.	59
	IH 35	IH 10	3.1 mi.	14 min.	100
	IH 35	LP 410 South	9.1 mi.	9 min.	100
	IH 10	SB Midway	4.2 mi.	1 min.	100
	IH 10	LP 410 South	6.0 mi.	9 min.	100
	LP 410 South	US 181	1.5 mi.	14 min.	100

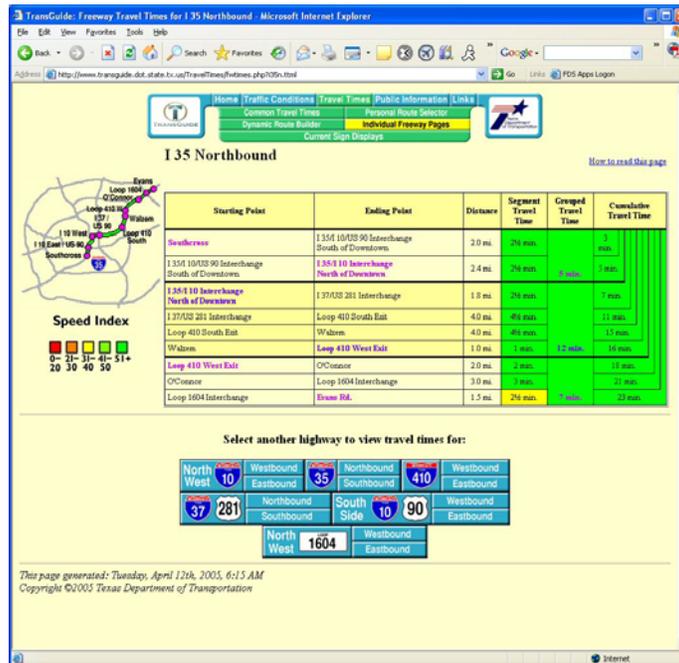
If the user wishes to see all of the highways for which travel time data is available they are presented with a screen similar to the following:



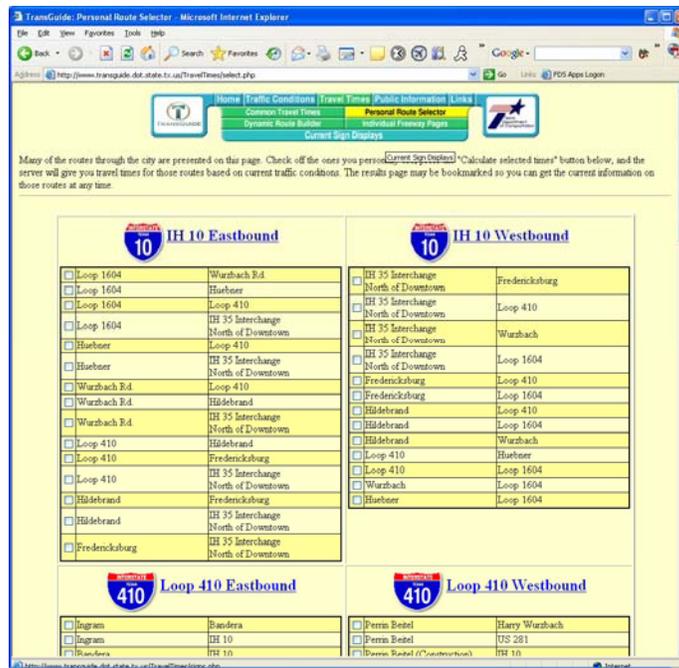
If the user wishes to see all of the DMSs along a specific highway they are presented with a screen similar to the following:



If the user wishes to see the travel times along a specific highway they are presented with a screen similar to the following:



The web site also provides the capabilities for a user to build custom “routes” so that they may see all of the DMS devices along their intended route of travel, the screen to specify this route is contained in the following screen:



The screens images are presented in this section are included to stimulate thoughts on other applications of the travel time data available within the SunGuideSM system.