

An ISS Canada Ltd. Product Description



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Travel Time Module

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Introduction

Past and current experimentation and development of systems that measure and report travel time information for the purpose of dissemination by transportation management departments have entered into the forefront of requested products.

The following document describes the travel time solution developed by ISS Canada Ltd., that utilizes the raw detection traffic provided by the company's market leading RTMS sensor

Problem Statement

ISS Canada has evaluated the existing solutions and experimental testing of products related to travel time dissemination.

It has been determined that travel time is only useful if it is of a predictive nature, rather than based on historical (near past information). Most transportation corridors consist of multiple lanes that may have differing average speeds and volume levels associated with them.

Along a route that is to be measured and therefore applied with a travel time value, it is necessary that variables such as volume, occupancy and speed be used to provide real-time, and eventually predictive timing.

Design Considerations

Rather than identifying a vehicle entering and exiting a zone or capturing a single vehicles relative speed, it is the belief of ISS Canada that the following points need to be addressed for eventually being able to predict travel time, rather than providing "near past" times based upon floating vehicles.

The Travel Time Module must:

- Monitor the entire corridor on a minute per minute basis with about 1 mile station spacing
- Utilize each lanes average speed of travel
- Utilize the volume of traffic on a per lane basis

ISS Canada Solution

During the discover stage, ISS Canada identified that the core necessity for a travel time module already exists in our product offerings.

Foremost, the RTMS sensor which has had great success world wide as a data collection device already provides the required raw data to allow the calculation of travel time information.

Furthermore, the software platform known as WATER provides the storage and organization of the raw data collected by the RTMS in a useable form.

Finally, a module that can compile and convert the raw data from the SQL database into useable information (i.e. travel time).

The RTMS

The RTMS sensor collects and communicates traffic information such as volume, speed, occupancy, and classification on a per lane basis utilizing multiple communication possibilities.

WATER Software

The WATER software package utilizes a standards based SQL database schema. Within that schema, tables are populated to provide the traffic management operation center the ability to extract the relevant data through queries. This data is then populated in reports or other technologies providing information. See Figure 1.



Figure 1 - WATER Administration

The administrator of the WATER database adds the appropriate nodes (RTMS sensors) to the database. Once added, these RTMS units, including their zones (monitored lanes) can be populated into defined stations. A station can consist of one (1) or many (x) RTMS units. See Figure 2.

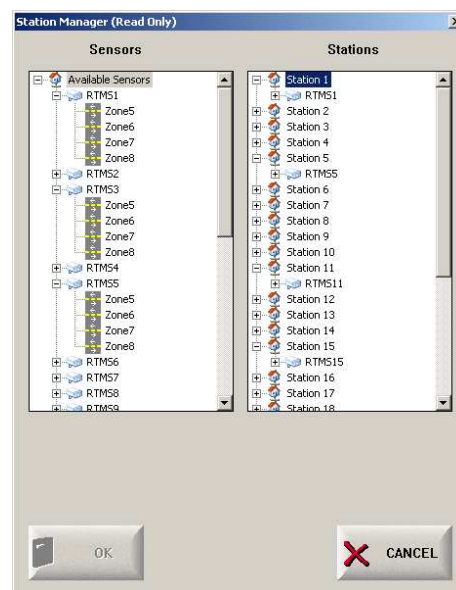


Figure 2 - Station Manager

The WATER software allows GPS coordinates to be entered for each RTMS sensor. Using the coordinate information, raw data can be extrapolated and utilized in calculation of distance between segments as well as the population of travel data and travel time information to graphical speed maps.

The scope of this document does not describe the features and functionality of the WATER software, but it is important to note that the WATER platform can support thousands of RTMS units. Refer to the WATER function specification or the WATER manual for specific information.

Travel Time Module

The Travel Time Module utilizes the WATER database. Since the database is populated with the RTMS nodes and their zone information, this is a logical progression of software integration.

The module integrates itself and applies its database schema to interact directly with the existing WATER database schema. Raw data is then extracted to calculate travel times on a segment to segment basis (or station to station).

Travel time is calculated at each station by extracting the appropriate information for each zone associated with the RTMS sensor.

Individual stations are then associated in a route hierarchy that consists of a collection of station

definitions. Route time, or the travel time associated with traveling from point A to point B is then an aggregate of the collection of stations belonging to that route, such as that:

$$\text{Route TT} = \text{Segment}_a + \text{Segment}_b + \dots + \text{Segment}_n$$

Figure 3 is an illustration of the travel time module GUI. Observation shows the similarity between the travel time module and the WATER management utility. Note that Stations are used for continuity in this document, but Segments are the defined parameter. Each segment is a physical distance from the next segment along the corridor being timed.

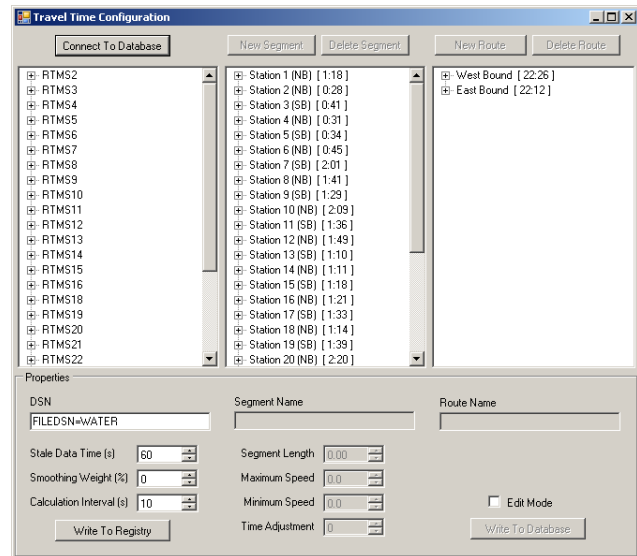


Figure 3 - Travel Time Module

Each segment (station) is added to a route name and the aggregate value becomes the total travel time.

Benefit 1

Utilizes the RTMS sensor, a proven device to monitor traffic.

Benefit 2

Utilizes a standard based SQL database structure to extrapolate data and consolidates that data into useful information while still allowing other traffic management departments to use other data for reporting or managing purposes

Benefit 3

Provides real travel time information based on existing traffic conditions at each segment along a measured route

Implementation

Non-intrusive RTMS sensors, integrated with a communication device such as an IP module or modem, are deployed along a route to monitor and collect traffic information.

WATER software is installed at the traffic management center and connected to the appropriate communication medium to communicate with the RTMS sensors. Sensors are configured and populated to the database.

Travel Time Module is installed and connected to the WATER database. Segments are defined based on measuring requirements and populated to a route hierarchy.

Travel time information is extracted from the database and published to variable message signs, web sites, Speed Maps, or archived for future analysis.

Summary

ISS Canada continues to develop and integrate traffic management solutions that serve a viable purpose in the industry. Travel time information is a good example of ensuring that customers requirements and concerns are addressed and a solution that works is available.

The travel time solution from ISS Canada Ltd., provides a combination of hardware and software that consolidates raw data into a usable form of information.

The company's commitment to provide usable solutions to the industry is illustrated in its integration of proven solutions and standards based technologies.