

RET Project #5
Overview
Summer 2009

Measuring Travel Time Reliability of Transportation Systems

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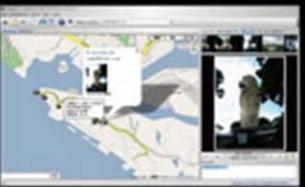
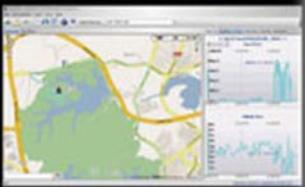
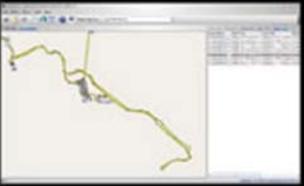
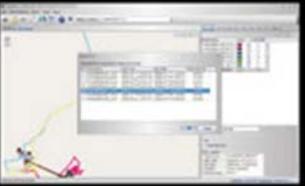
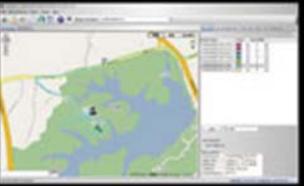


Overview

- Research experience in measuring mobility reliability of a selected freeway (I-75). Such reliability indices are quantified using statistics and algebraic methods.
- Advanced data collection technology using Global Positioning System (GPS) Travel Recorder Data Loggers.
- Computer simulated learning made to understand how to interact with informative feedback with animation functionality and make decisions without running risks through simulation running.
- Field trip for better understanding of mobility reliability with live observations in the Cincinnati traffic information center (i.e., ARTIMIS).
- Develop a lesson plan on the basic theme of “Transportation Impact on Your Community and Daily Life?” which introduces students to analyzing impact of mobility on our daily life.

Methodology

- Advanced data collection technology using Global Positioning System (GPS) Travel Recorder Data Loggers.

			
Visualized UI	Photo Geotag and display immediately on Google Map	Photo Preview and Slide Show	Visualized Speed and Altitude Graphs of your travel
			
Manually edit incorrect waypoints by Track Editor	Freely Split or Merge tracks	Review your trip by means of Animation Player	Fully integrated with Google Earth

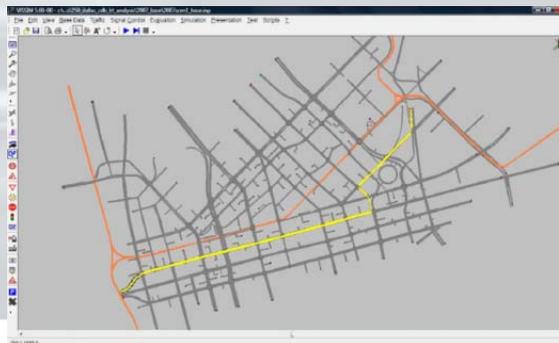
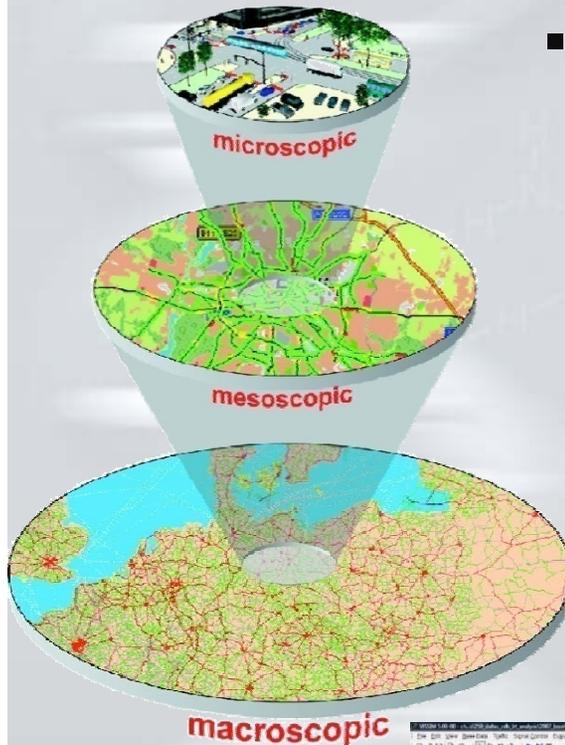
					
Dual Power Supply	Smart Power Control	One Touch	Multi-language	Dual Log mode	WAAS + EGNOS + MSAS
					
200,000 waypoints	Multi-Mode Setting	Photo Geotag	Google Earth Integration	Built-in Google Map	Track Edit



Methodology

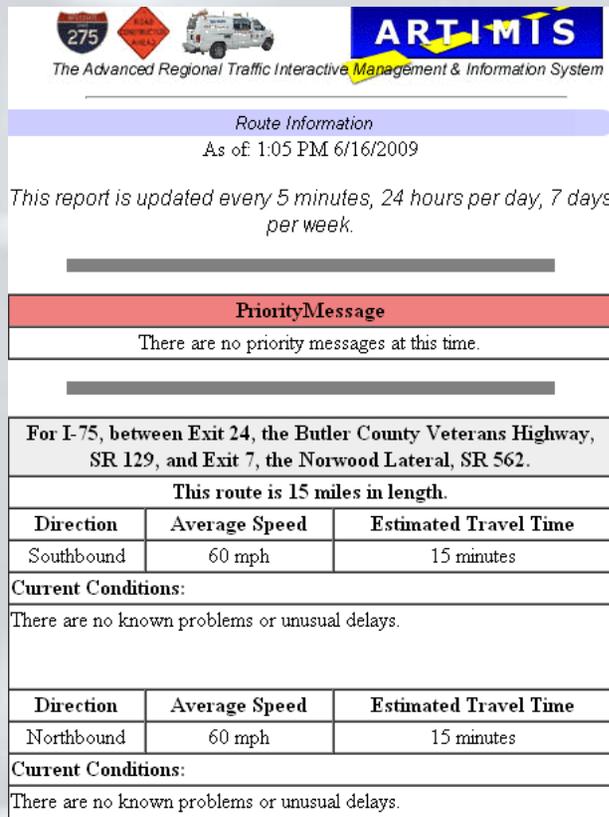
- Computer simulated learning will occur to understand how to interact with informative feedback with animation functionality and make decisions without running risks through simulation running.

“Microscopic simulation”, sometimes called microsimulation, means that **each entity (car, train, person) of reality that is to be simulated is simulated individually**, i.e. it is represented by a corresponding entity in the simulation, thereby considering all relevant properties. The same holds for the interactions between the entities.



Methodology

- Field trip will be scheduled for better understand mobility reliability with live observations in the Cincinnati traffic information center.



ARTIMIS
The Advanced Regional Traffic Interactive Management & Information System

Route Information
As of 1:05 PM 6/16/2009

This report is updated every 5 minutes, 24 hours per day, 7 days per week.

PriorityMessage
There are no priority messages at this time.

For I-75, between Exit 24, the Butler County Veterans Highway, SR 129, and Exit 7, the Norwood Lateral, SR 562.

This route is 15 miles in length.

Direction	Average Speed	Estimated Travel Time
Southbound	60 mph	15 minutes

Current Conditions:
There are no known problems or unusual delays.

Direction	Average Speed	Estimated Travel Time
Northbound	60 mph	15 minutes

Current Conditions:
There are no known problems or unusual delays.

ARTIMIS -

The Advanced Regional Traffic Interactive Management & Information System provides incident, congestion, and freeway management for the Cincinnati-Northern Kentucky Region. The project is funded by the Ohio Department of Transportation (ODOT) and the Kentucky Transportation Cabinet (KYTC) to improve traffic conditions and safety along 88 miles of the region's highways.

Tasks

- Measure travel times and delays during morning peak- and non-peak-hours along I-75 from the Montgomery/Warren County Line to the Montgomery/Miami County Line for three days
- Use the field data to measure travel time reliabilities with the techniques learned from the training courses;
- Use SpeedInfo radar-based speed measurements (provided by ODOT) to compare our individual GPS-based observations;
- Use HCS to estimate the level of service of the selected freeway facilities (work together with REU team using volume data provided by OKI);
- Build a part of the freeway within VISSIM with the field data, including validation of the simulation models, and visually simulate mobility reliabilities under varied scenarios of traffic volumes (inquire volume data from OKI for comparison);
- Summarize analysis results and develop classroom implementation plan.

Timeline

Week 1 Opening, Lectures, Discussions

Week 2 Field data collection and extraction, HCS training

Week 3 Field data collection and extraction, VISSIM training

Week 4 Freeway simulation

Week 5 Freeway simulation, summary of data analysis

Week 6 Final report and presentation

Resources

Previous RET Experiences



This Project Offers Opportunities to Learn Simulation-Based Method for Traffic Analysis of Concerned Transportation Infrastructures



Field Trip to Advanced Regional Traffic Interactive Management & Information System (ARTIMIS)
ARTIMIS provides incident, congestion, and freeway management for the Cincinnati-Northern Kentucky Region

- Computer Lab
- GPS data loggers
- GA's assistance:
 - Vijay Nimalapuri (RET GA)
 - Zhuo Yao (RET GA)
 - Zhixia Li (VISSIM training helper)
 - Qingyi Ai (REU coordinator)
- Field trip (ARTIMIS)
- Faculties

QUESTIONS?