

WIMAP: Work Zone Interactive Monitoring Application (Paper No: 15-4257)

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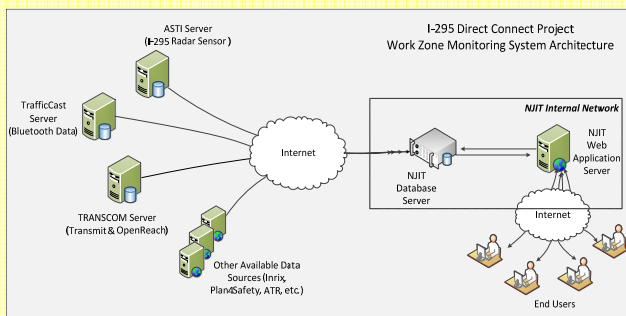


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Introduction

WIMAP is developed to systematically monitor the impact of long-term freeway work zone activities may be caused by the I-295 Direct Connection project in New Jersey. Through an interactive web-based interface, WIMAP is designed to provide users with instantaneous performance measure reports based on MAP-21, such as Travel Time Index, Buffer Index, Planning Time Index, and percentile Travel Time. With historical events records (e.g., incident, lane closure activity, and roadway maintenance), WIMAP also enables users to investigate the mobility impact of work zones. The prototype WIMAP is deployed for its internal beta test with currently available data sources.

System Architecture



System Architecture

DATA SOURCES

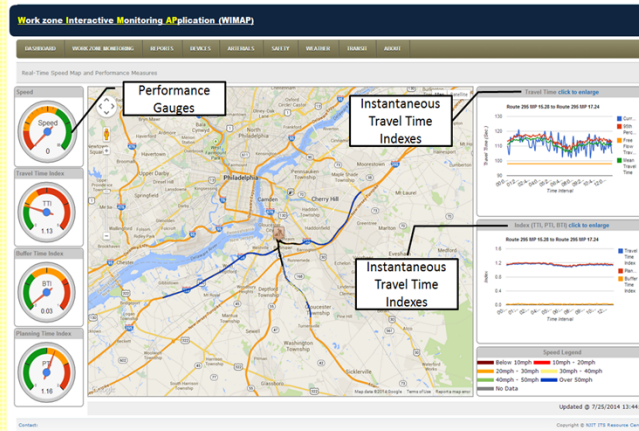


1. Bluetooth reader
2. Remote traffic microwave sensor
3. Electronic toll collection data
4. Transit ridership
5. OpenReach event data
6. Plan4Safety (Historical Accident) data

WIMAP Key Components

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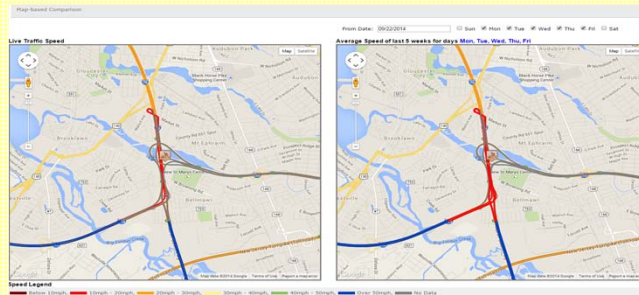
- Dashboard
- Congestion Comparison Map
- Volume
- Report Generator
- Safety Monitoring
- Device Status



WIMAP Dashboard



Customizable Report Generator



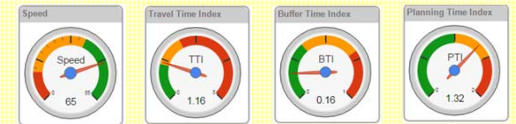
Congestion Comparison Map

Performance Measures

MAP-21 Performance Measures

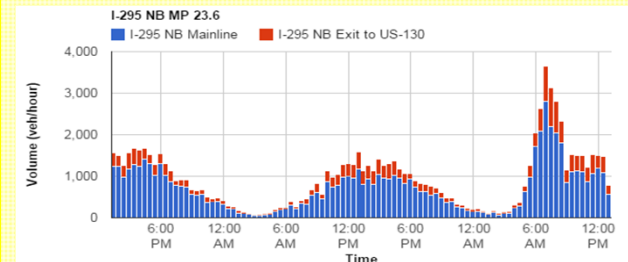
MAP-21, Moving Ahead for Progress in the 21st Century, is a recently-passed transportation reauthorization bill which features a new federal emphasis on performance measurement to improve the safety, reliability, and efficiency of transportation system. To achieve such a goal, State DOTs Metropolitan Planning Organizations (MPOs), and local transportation agencies must establish proper performance measures and keep monitoring those measures for managing their transportation facilities

- 95th percentile travel time
- Free-flow travel time
- Travel time index
- Planning time index
- Buffer time index



Real-time Performance Measure Gauges

Traffic Volume/Speed Measures



Real-time Volume Chart

Conclusions

The prototype of WIMAP has been deployed for a web service and is being beta-tested by the research team. The test results show that the real-time mobility performance reports produced by WIMAP enable users to rapidly and precisely capture prevailing mobility conditions of work zone area through MAP-21-based performance measures.