Automated Real-time Travel Time Monitoring in Western Massachusetts

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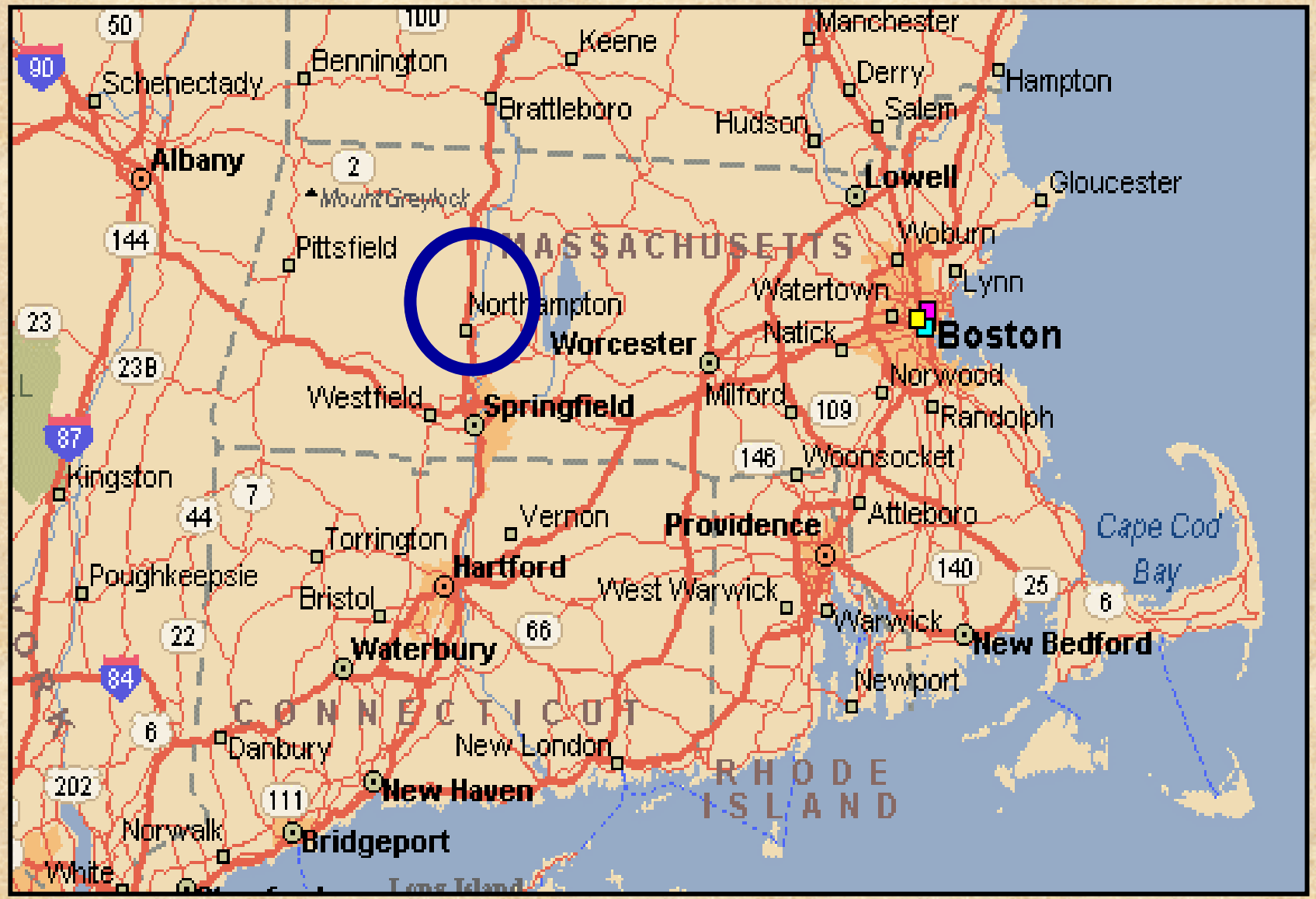
Paul W. Shuldiner
Director, Transportation Center
University of Massachusetts Amherst

Context Map


Albany
Schenectady
Bennington
Brattleboro
Keene
Manchester
Derry
Hampton
Salem
Hudson
Lowell
Gloucester
Mount Greylock
Pittsfield
MASSACHUSETTS
Northampton
Worcester
Woburn
Lynn
Watertown
Boston
Natick
Norwood
Randolph
Milford
Westfield
Springfield
Woonsocket
Kingston
Attleboro
Providence
Cape Cod Bay
Vernon
Torrington
Hartford
Poughkeepsie
Bristol
West Warwick
Warwick
New Bedford
Waterbury
Newport
CONNECTICUT
Danbury
New London
New Haven
RHODE ISLAND
Norwalk
Bridgeport
White
Long Island
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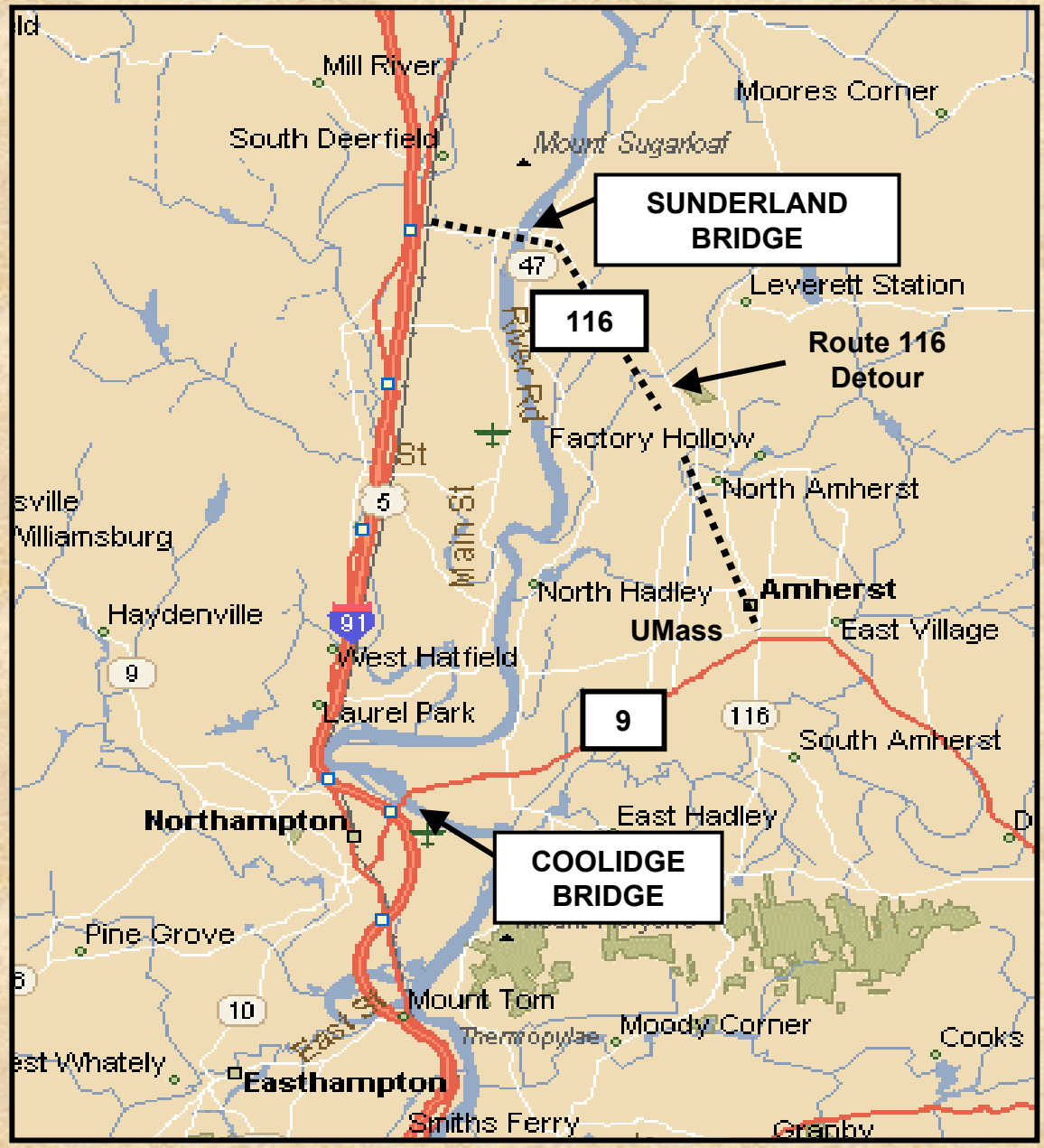
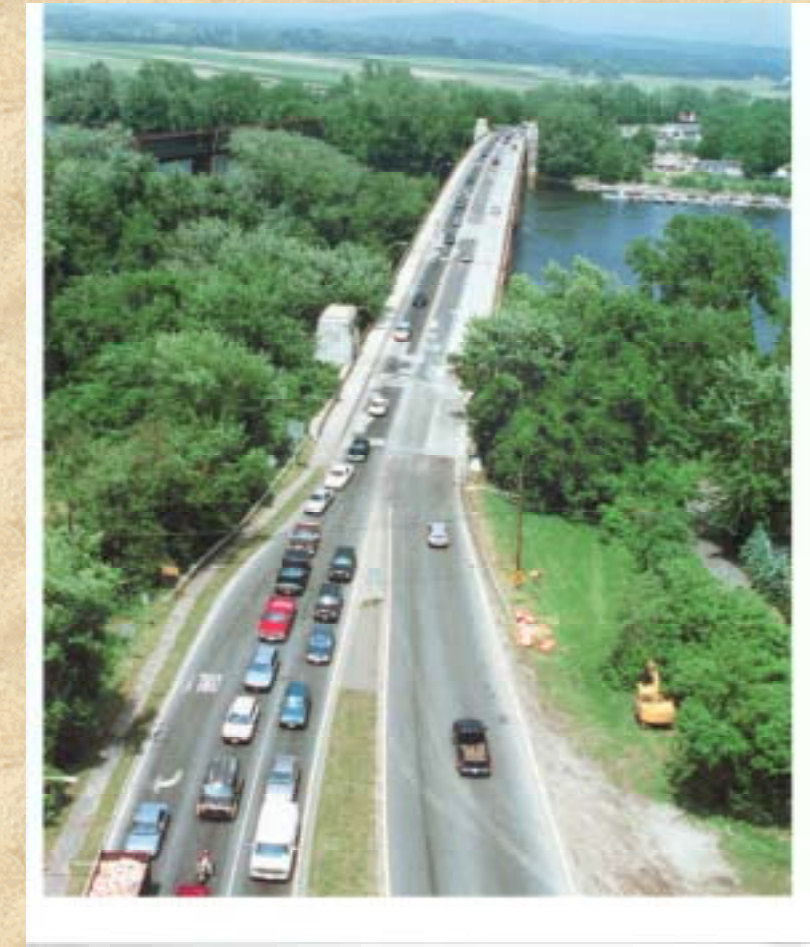


Coolidge Bridge Detour

Aerial Photograph of Coolidge Bridge, Northampton-Hadley, Mass. - Courtesy of Hampshire Gazette



Regional Traffic Management Challenges

- Coolidge Bridge Multi-Year Bridge Rehabilitation Project
  - Emergency Vehicle Delay Mitigation
  - Traffic Diversion During Peak Periods
- UMass Commuter/Event Traffic Management
  - Commencement, Arena Events, Sporting Events

Traffic Management Infrastructure

- MassHighway Advanced Traffic Management System (ATMS)
  - Motivated by Coolidge Bridge Reconstruction
- UMass Regional Traveler Information Center (RTIC)
  - Regional Collector, Processor, and Disseminator of Traffic and Travel Information

UMass RTIC – Current Operational Components

- Travel time estimation on Route 9
- Web Cam on Route 9
- Event Reporting System
  - Information exchange
    - MHD
    - UMass
    - UMass Transit/PVTA

UMass RTIC – Near Term Future Expansion

- Additional Web Cams
- RTMS Queue Detectors
- Expand Travel Time Estimation
- Interim Control Center
- Direct interface with MassHighway
- Interactive Voice Recording System

License Plate Reader Technology

- Video Image Processing at upstream and downstream stations
- Measurement of time lapse between matches
- Plate data can be matched with motor vehicle records

CoolidgeInfo.com
Travel Time Estimation

- Based on License Plate Reader Technology

Average speed through workzone: 12.3 +/- 4.1 mph
Average travel time: 19 +/- 6.3 minutes
Last Updated: 3/4/02 1:25:41 PM

Automated License Plate Reading System Installation

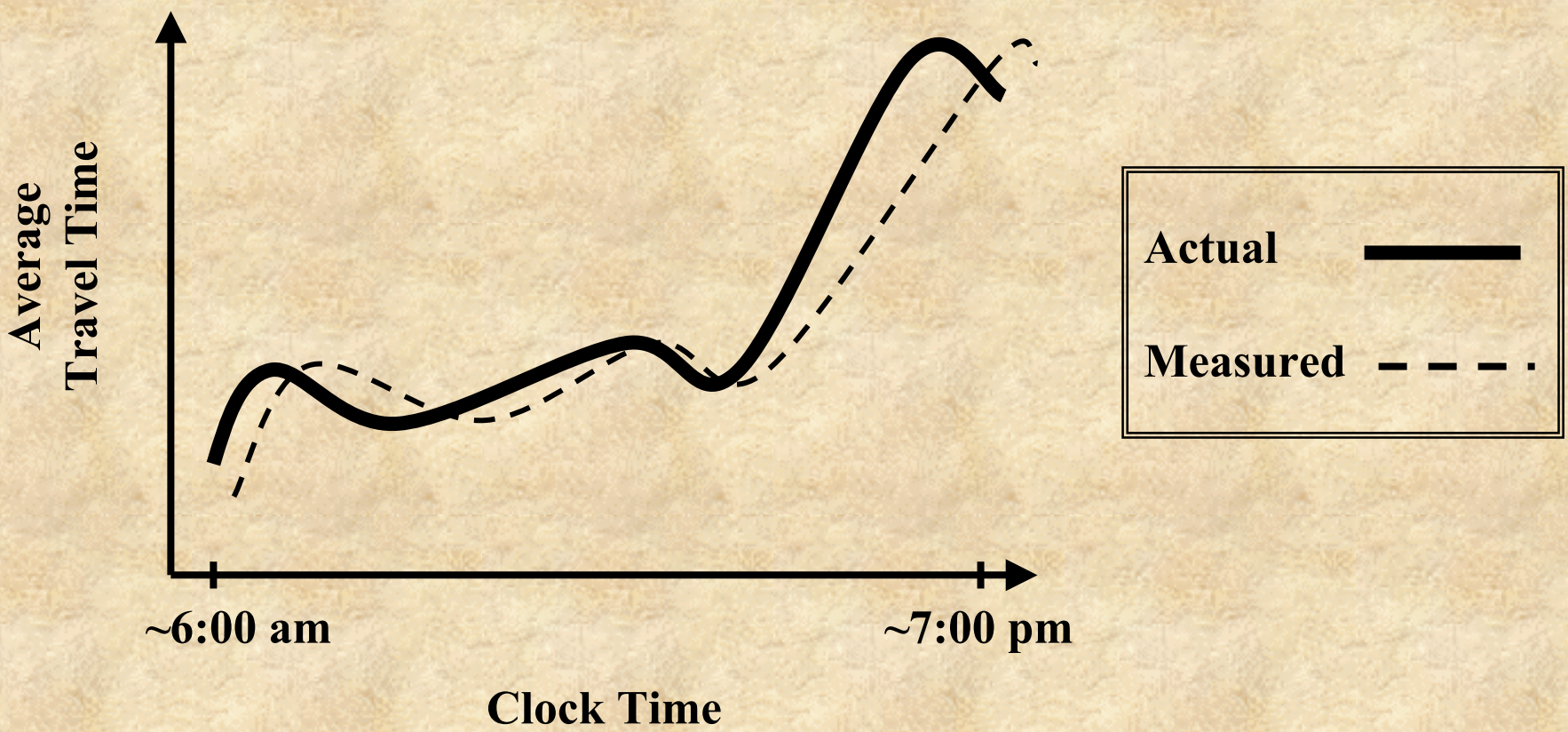
License Plate Readers- Experience and Issues

- Need sufficient stream of traffic to provide acceptable margins of accuracy
- Plate matching is more difficult in bright sun and after dark
- Privacy issues yet to surface
- Inherent time-lag

Relationship of Travel Measure to Link Flow Parameters

$$t_{i+\delta} - t_i = f(u_{i+\varepsilon}, \text{“}d\text{”}_{i+\varepsilon}, q_{i+\varepsilon})$$

Variations in Travel Time Throughout the Day



RTMS Microwave Traffic Detectors

- Measurement of point traffic characteristics
- Queue detection and prediction at congestion-prone locations
- Deploy in late 2002

Future Research Questions

- Comparison of traffic data accuracy and reliability for the two technologies
- Queue Prediction Algorithms
- Traffic Management response plans/Dynamic Traffic Assignment
- Planning Applications of the Data

Thank You for Your Attention