MARTHA Project Final Report

-- November 5, 2008--

MARTHA Project Final Report
(**M**ulti-user **A**pplication of **R**eal **T**ime **H**armonic **A**lgorithm)
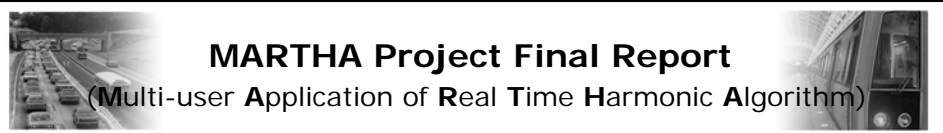
BACKGROUND

- Research project to develop inexpensive real-time bus arrival information system for rural, suburban, and small urban transit systems
- System uses inexpensive hardware such as cell phones and desktop PCs
- Simple IVR interface provides estimated arrival times to customers
- Software developed to open source standards, non-proprietary interfaces, code owned by DRPT
- Funded by $199,500 grant from DRPT

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DEVELOPMENT

- Final System Design approved in May of 2006 with several improvements
- System Development commenced in summer of 2006, development period extended due to improvements
- System development completed in September of 2007, bench testing began soon after
- Two flaws revealed during six month bench testing period: Durability of phones, and the need for a more powerful central computer

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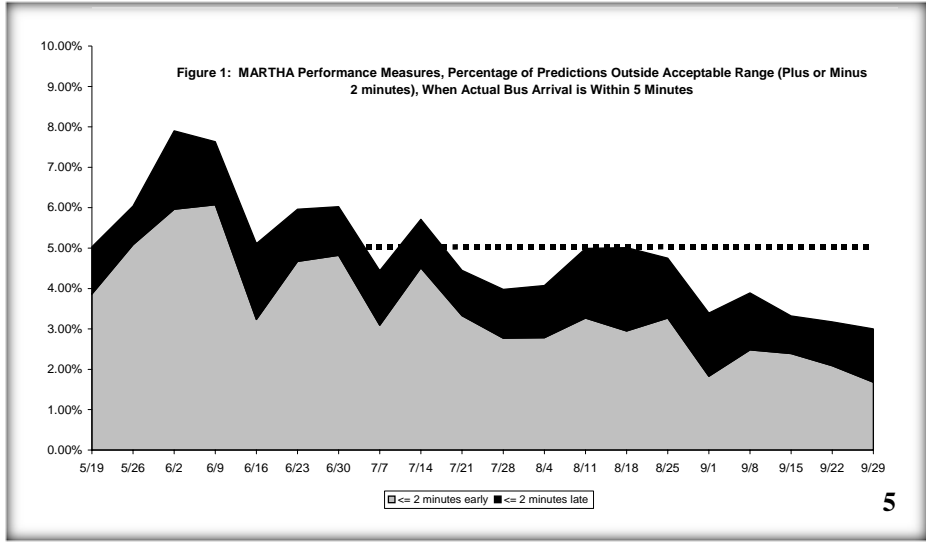(**M**ulti-user **A**pplication of **R**eal **T**ime **H**armonic **A**lgorithm)

TESTING

- In-service testing began in May of 2008 on GEORGE Bus system
- Small pilot group of four regular GEORGE bus riders recruited to provide qualitative feedback
- Primary focus was to test accuracy and reliability of software and predictions
- Predictions generated for every stop, every minute, then compared with actual arrival times to determine accuracy
- WMATA performance requirements utilized for evaluation:
  - When bus is <5 minutes from stop, 95% of predictions within $\pm$ 2 minutes
  - When bus is <10 minutes from stop, 95% of predictions within $\pm$ 3 minutes
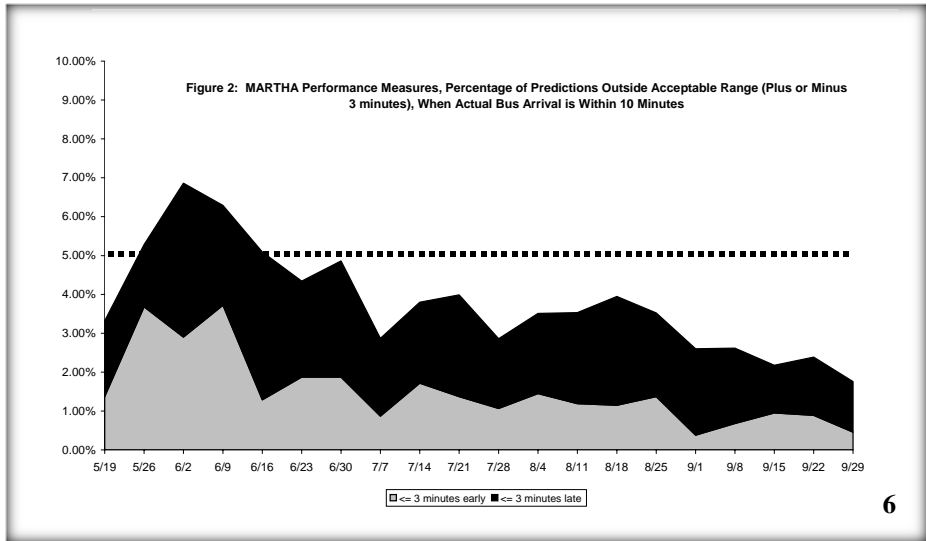
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Figure 1: MARTHA Performance Measures, Percentage of Predictions Outside Acceptable Range (Plus or Minus 2 minutes), When Actual Bus Arrival is Within 5 Minutes

□ <= 2 minutes early ■ <= 2 minutes late

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Figure 2: MARTHA Performance Measures, Percentage of Predictions Outside Acceptable Range (Plus or Minus 3 minutes), When Actual Bus Arrival is Within 10 Minutes

□ <= 3 minutes early ■ <= 3 minutes late

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NEXT STEPS

- Software and documentation will be presented to DRPT, for distribution

- Recommend that DRPT make the software available worldwide to transit community

- Recommend that the software be re-programmed to work with dedicated GPS tracking devices rather than cell phones

- Recommend a technical support services contract to maintain the software and manage updates and bug fixes.

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