



Kimley-Horn and Associates, Inc.

* Bluetooth Detection: State of the Industry

Presented by:

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Kimley-Horn & Associates, Inc.

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PRESENTATION OVERVIEW



Technology Background

Technology Uses

Equipment

Business Models

Data Sharing / Reporting

Current / Planned Projects

Future Developments



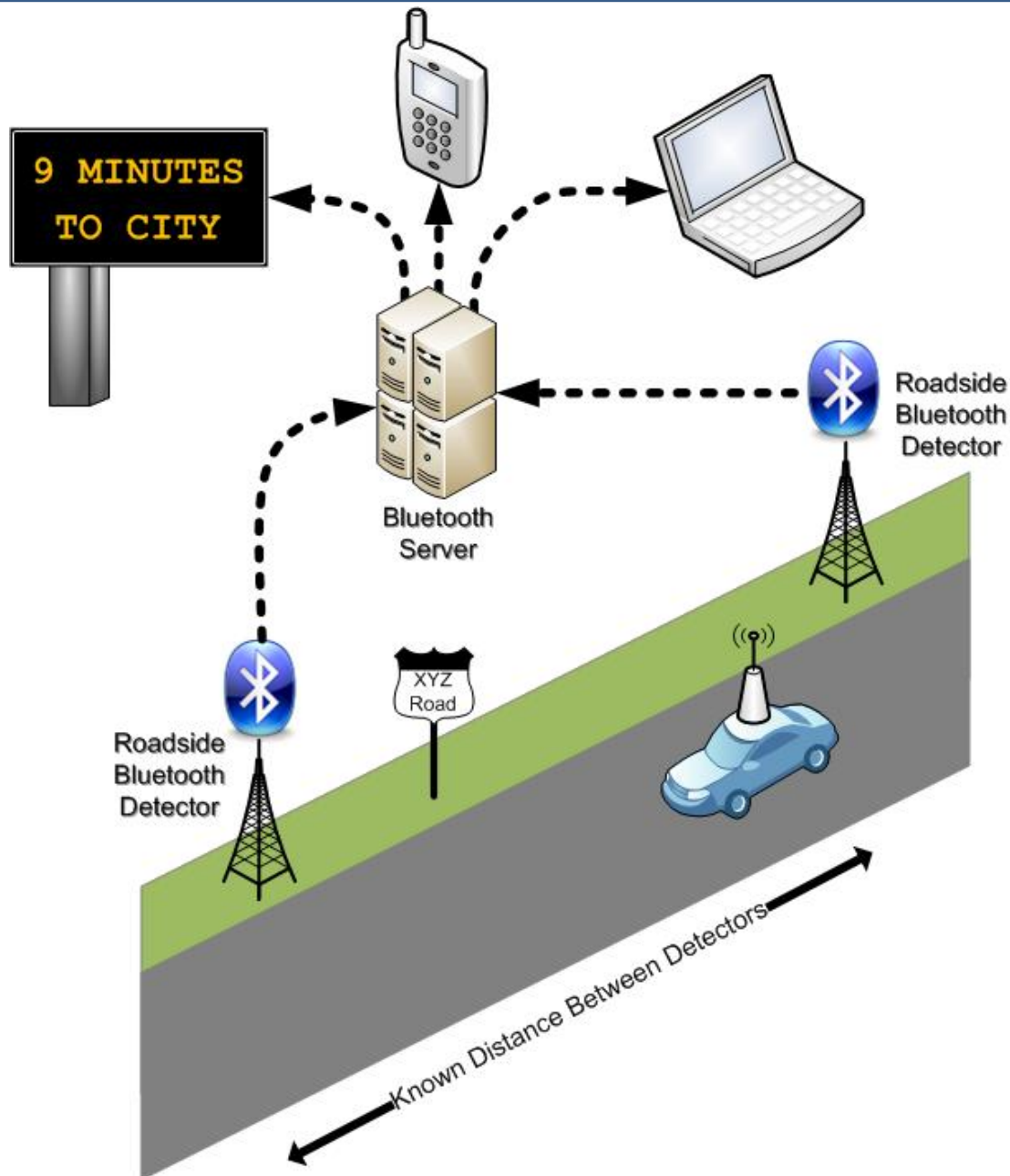
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Slide
2 of 16

TECHNOLOGY BACKGROUND



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Slide
3 of 16

TECHNOLOGY USES



Real Time

Freeway & arterial
travel time reporting

Pedestrian travel
time reporting / wait
times

Non- Real Time

Signal timing
performance
monitoring

Origin & destination
studies

Data validation

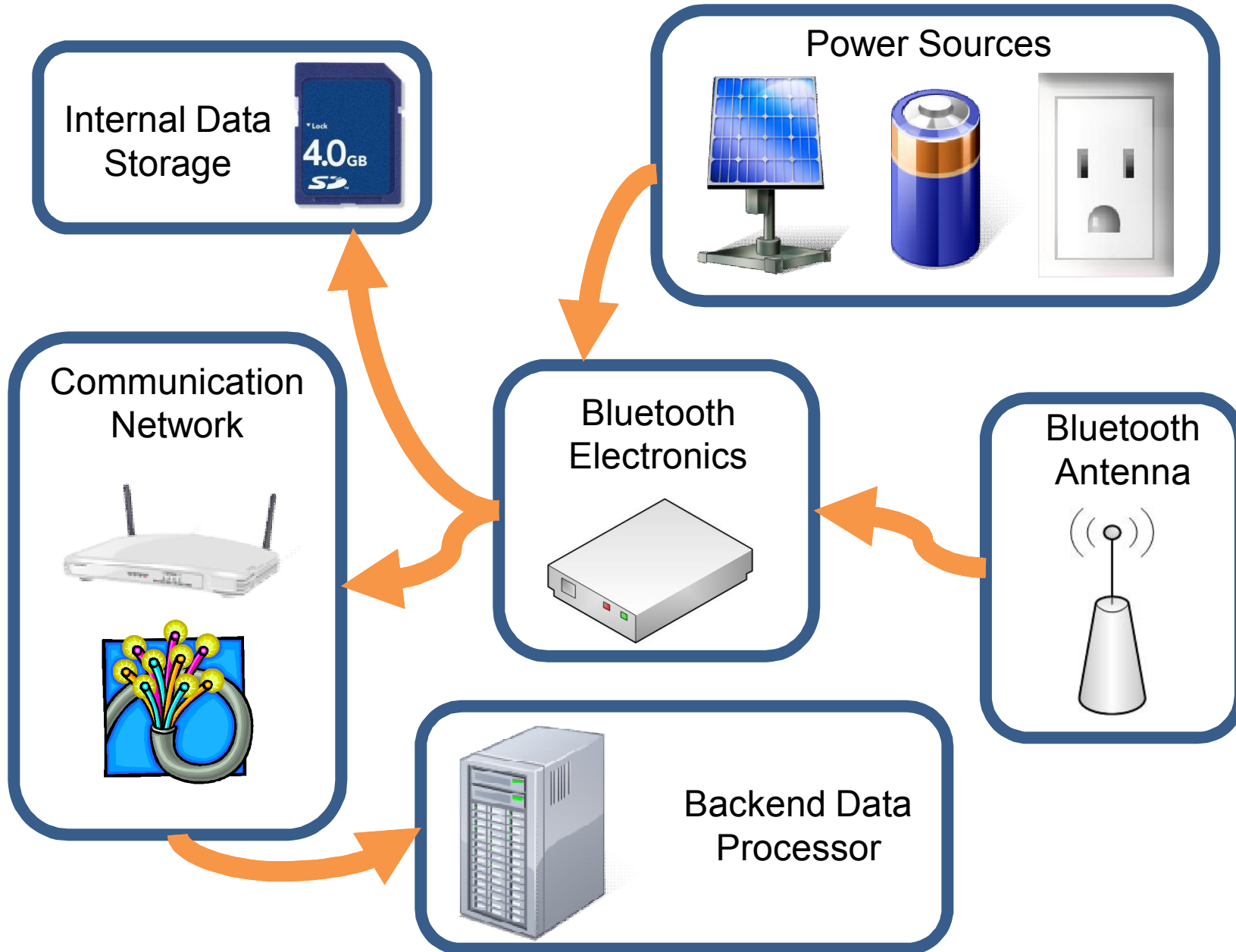
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Slide
4 of 16

SYSTEM COMPONENTS



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Slide
5 of 16

EQUIPMENT CHARACTERISTICS



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Temporary

Typically battery or solar powered

Portable units or pole mounted

Wireless comm.

Internal data storage

Typically used for data validation

Internal mounted antenna

Permanent

Typically mounted in cabinet

Detector rack mounted options

Power from cabinet

Standalone solar powered options

2070 controller

Comm. options (wireless, fiber, etc.)

External mounted antenna




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Slide
6 of 16

EQUIPMENT FORM FACTOR



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Slide
7 of 16

EQUIPMENT FORM FACTOR



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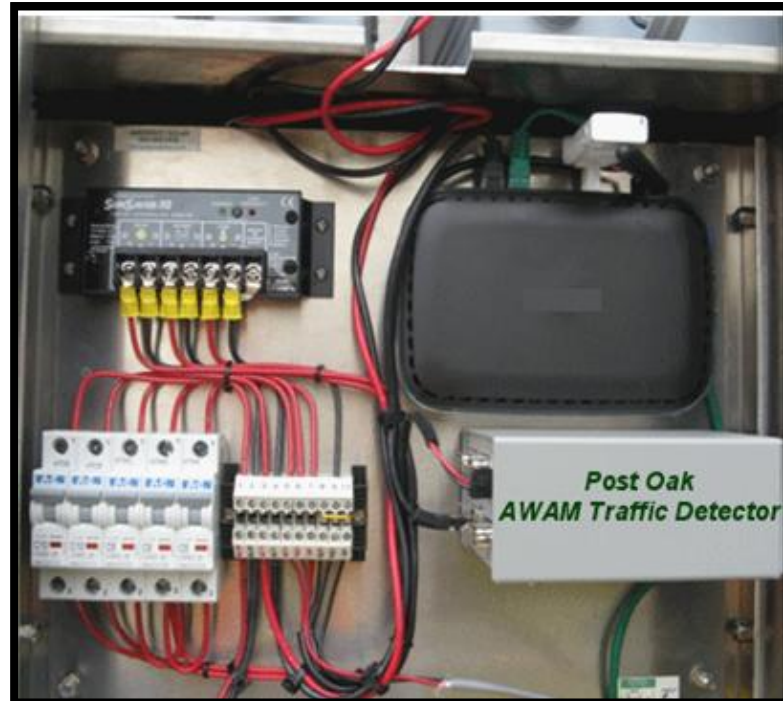

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Slide
8 of 16

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Slide
9 of 16

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Slide
10 of 16

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Slide
11 of 16

BUSINESS MODELS



**Own &
Operate**

- **Full data ownership**
- **Fewer recurring costs**

Subscription

- **Minimal upfront costs**
- **Lower maintenance costs**

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12 of 16

OVERALL BENEFITS



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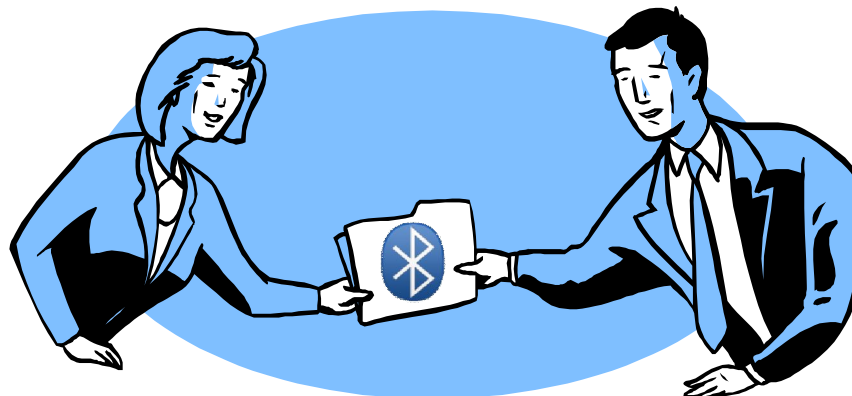
Provides accurate travel time information

Affordable data collection

Easily integrated with existing infrastructure

Equipment is non-intrusive and inconspicuous

Facilitates data sharing (Websites)

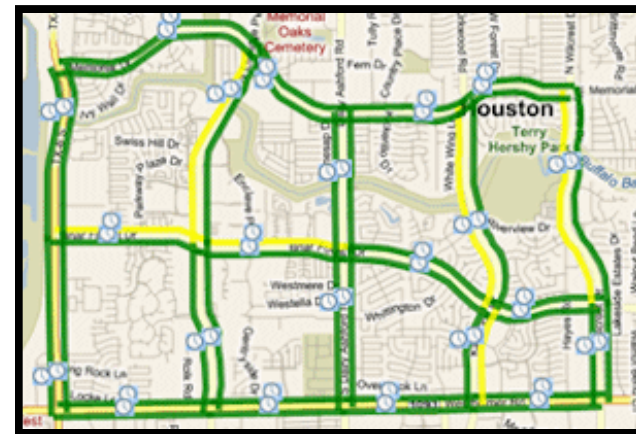
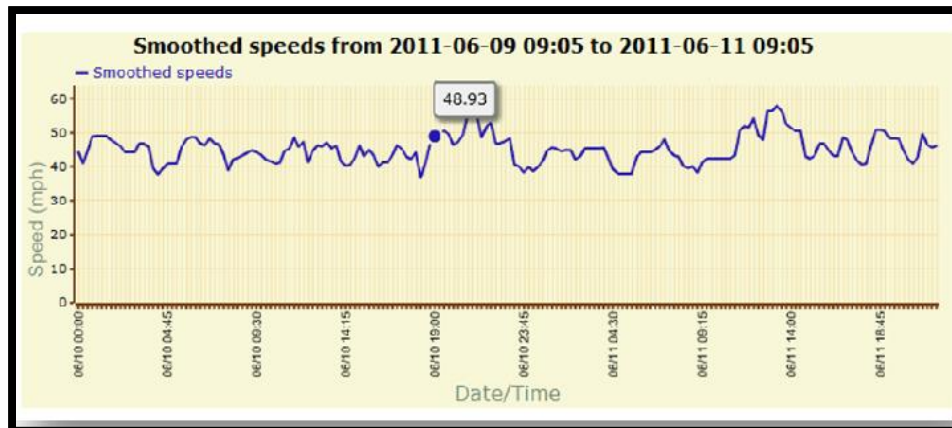


DATA SHARING / REPORTING



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- XML / CSV feeds
- Web portal with map and report making capabilities
- Extensive reporting features



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Slide
14 of 16

WEBSITE / DATA INTERFACE



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Bluetooth Travel Time Monitor - Matches

Roadway: US-50 | Direction: Eastbound | Roadway Segment: Patrick Henry to Glebe

Date: 12/9/2010

Data Type: Average Speed Individual Matches

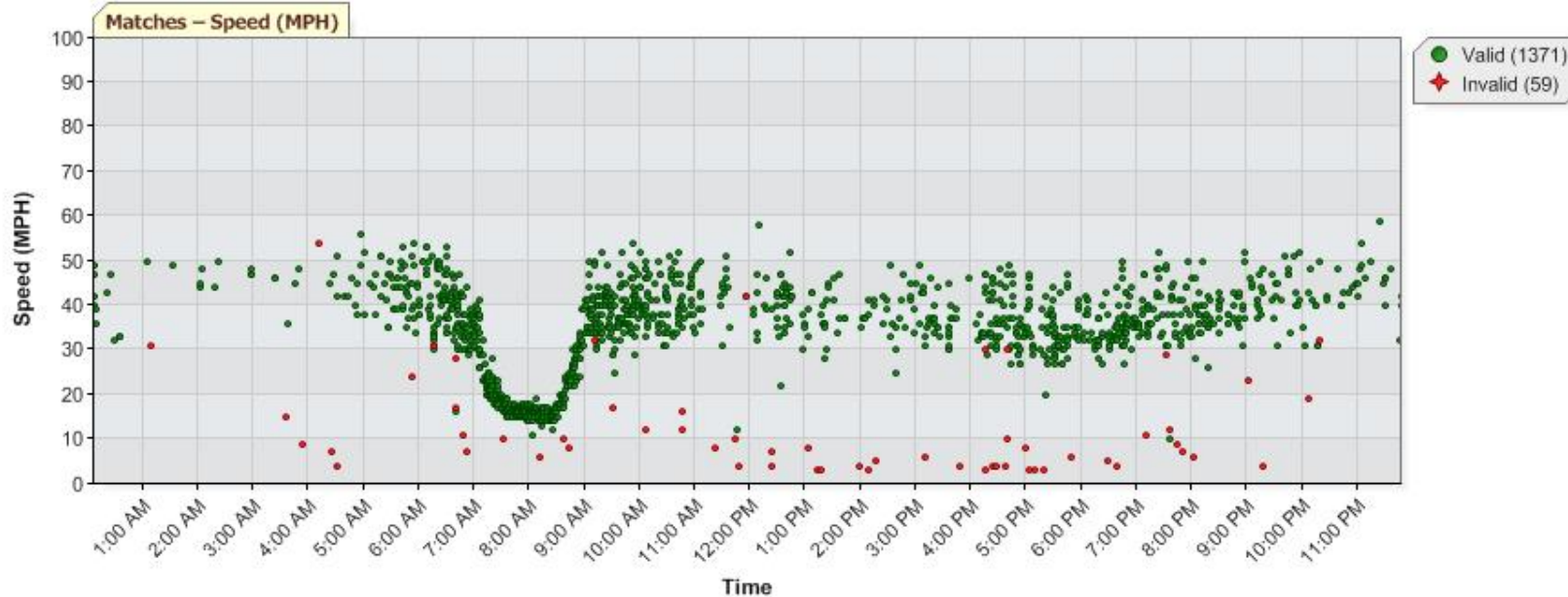
Y-Axis: Speed Travel Time

Show Invalid Matches: Yes No

Get Chart

US-50 Eastbound

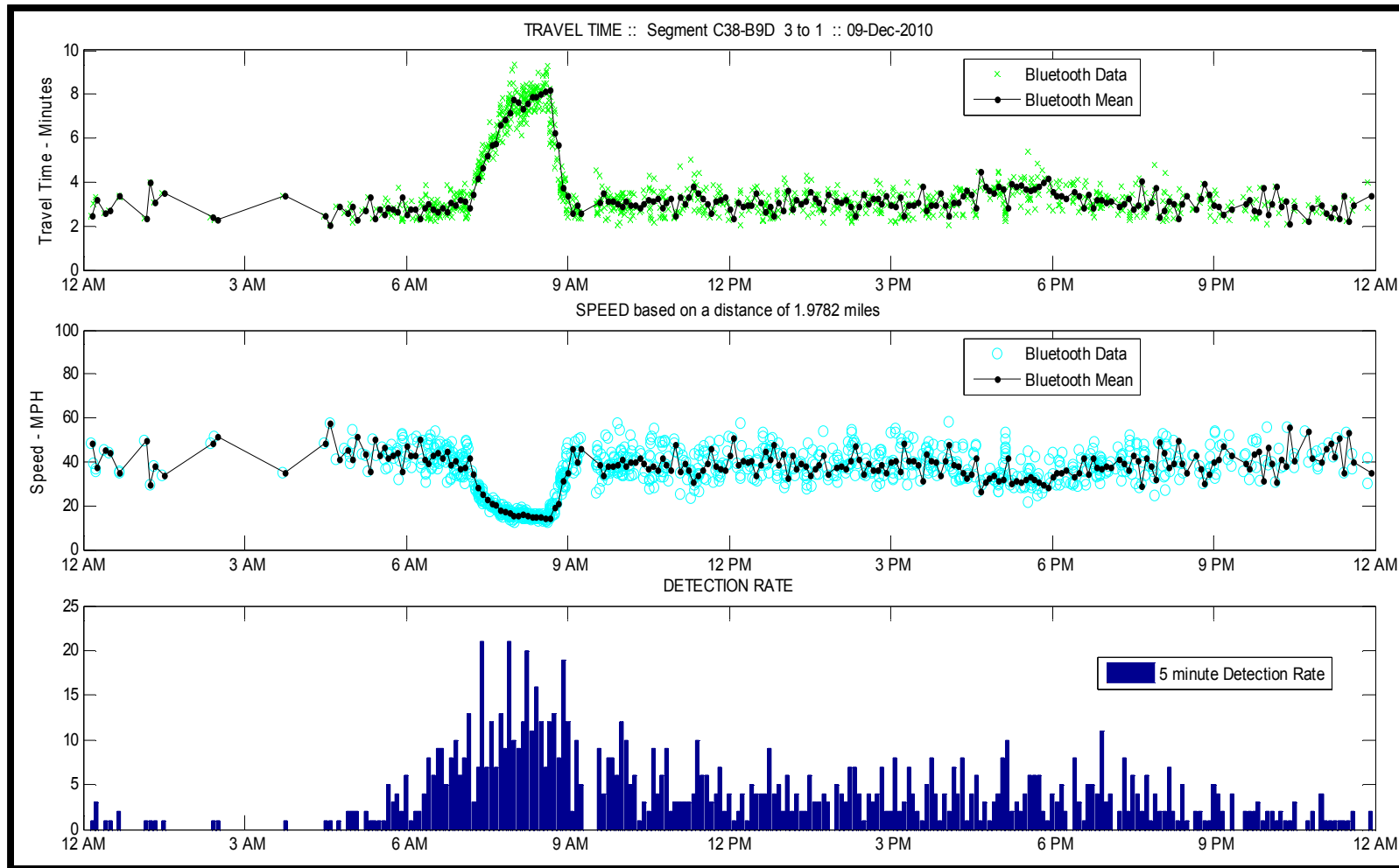
From Patrick Henry to Glebe (2.7 miles) - Individual MAC Address Matches - 12/9/2010



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Slide
16 of 16

WEBSITE / DATA INTERFACE



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Pair/Route Category: Show these items: Bluetooth Route, Bluetooth Pairings

Speed Indicator	Type	Title	Origin	Destination	Last Match	Speed / Travel Time
+	Bluetooth Pairings	Cascade Rd & Danforth Rd (Device 210) to Cascade Rd & Fairburn Rd (Device 220)	Cascade Rd & Danforth Rd	Cascade Rd & Fairburn Rd	2011-06-11 21:50:33	35.0 mph / 46.2 seconds
+	Bluetooth Pairings	Cascade Rd & Fairburn Rd (Device 220) to Cascade Rd & Danforth Rd (Device 210)	Cascade Rd & Fairburn Rd	Cascade Rd & Danforth Rd	2011-06-11 21:53:22	40.5 mph / 40 seconds
+	Bluetooth Pairings	Cascade Rd & Hwy 285 (Device 215) to Cascade Rd & Fairburn Rd (Device 220)	Cascade Rd & Hwy 285	Cascade Rd & Fairburn Rd	2011-06-11 21:54:19	39.0 mph / 41.5 seconds
+	Bluetooth Pairings	Cascade Rd & Fairburn Rd (Device 220) to Cascade Rd & Hwy 285 (Device 215)	Cascade Rd & Fairburn Rd	Cascade Rd & Hwy 285	2011-06-11 21:53:21	25.5 mph / 1 min 3 sec
+	Bluetooth Pairings	Cascade Rd & Danforth Rd (Device 210) to Cascade Rd & New Hope Rd (Device 213)	Cascade Rd & Danforth Rd	Cascade Rd & New Hope Rd	2011-06-11 21:28:05	39.4 mph / 2 min 17 sec

Matches Reads Match Sample Rates Congestion Map/Real-Time Summary Export Data

Arlington, Virginia Bluetooth Demonstration

Street Congestion
 Moving Well
 Slow
 Heavy Traffic
 No Data

US-50 Eastbound				
Origin	Destination	Length (mi)	Travel Time	Speed (mph)
Patrick Henry	Glebe	2.7	4 minutes 59 seconds	33

US-50 Westbound				
Origin	Destination	Length (mi)	Travel Time	Speed (mph)
Glebe	Patrick Henry	2.7	7 minutes 20 seconds	22

TRAVEL TIME TO GLEBE
5 MIN AT 5:49 PM

TRAVEL TIME TO PATRICK HENRY
8 MIN AT 5:49 PM



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CURRENT / PLANNED PROJECTS



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Arlington County
Arterial Travel
Time System



I-95 Corridor
Coalition Data
Validation



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FUTURE DEVELOPMENTS



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- Origin & destination
- Integration into all roadside devices
- Person trips




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Slide
19 of 16

CONTACT INFORMATION



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Slide
20 of 16