

ANALYSIS OF BIG DATA IN TRANSPORTATION RESEARCH

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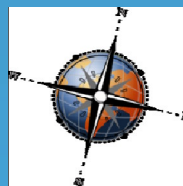
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The Transit Consumer's Needs

How do I get from point A to point B (Plan A)?

Where is the bus (ferry / train) now?

What is my Plan B (when expectations fail to meet reality)?



Plan B

Web-based Trip Planner

Real-time Information on Bus Location, Direction
and Speed

How do I get from point A to point B?

Google from: Hyannis, Barnstable, MA

Get directions My places

Get directions icons

A Hyannis, Barnstable, MA

B Woods Hole, Falmouth, MA

Add Destination - Show options

Leave now 10/08/13 1:02pm

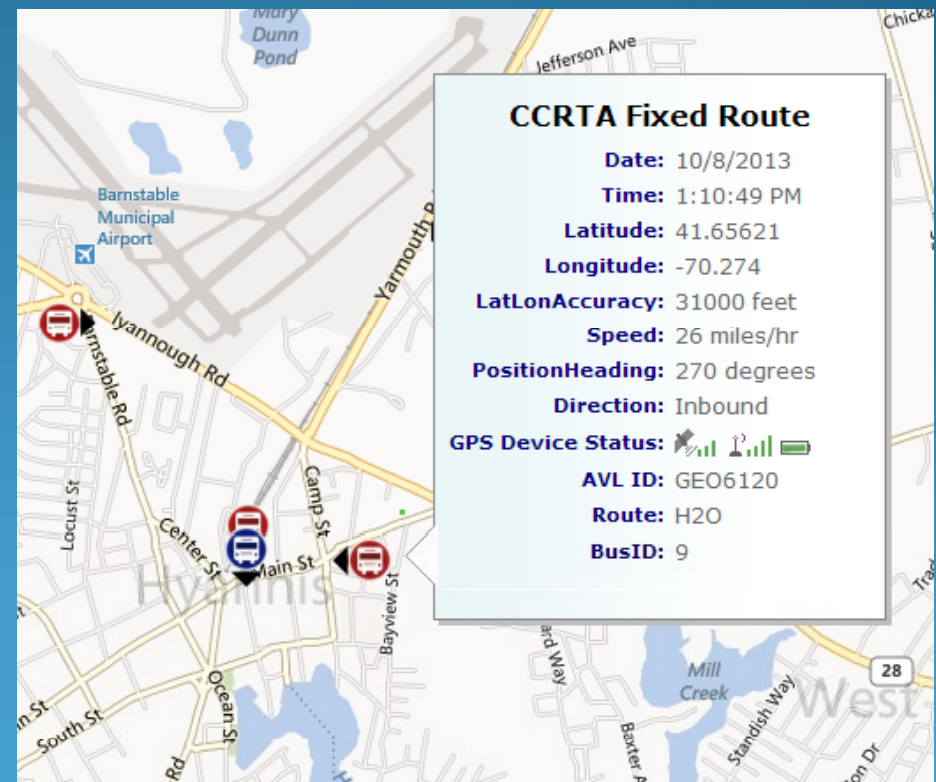
GET DIRECTIONS

Suggested routes

1 hour 50 mins
Sealine Hyannis-Falmouth/Woods Hole
1:17pm - 3:06pm

1 hour 50 mins
Sealine Hyannis-Falmouth/Woods Hole
4:17pm - 6:06pm

Transit directions to Woods Hole, Falmouth, MA



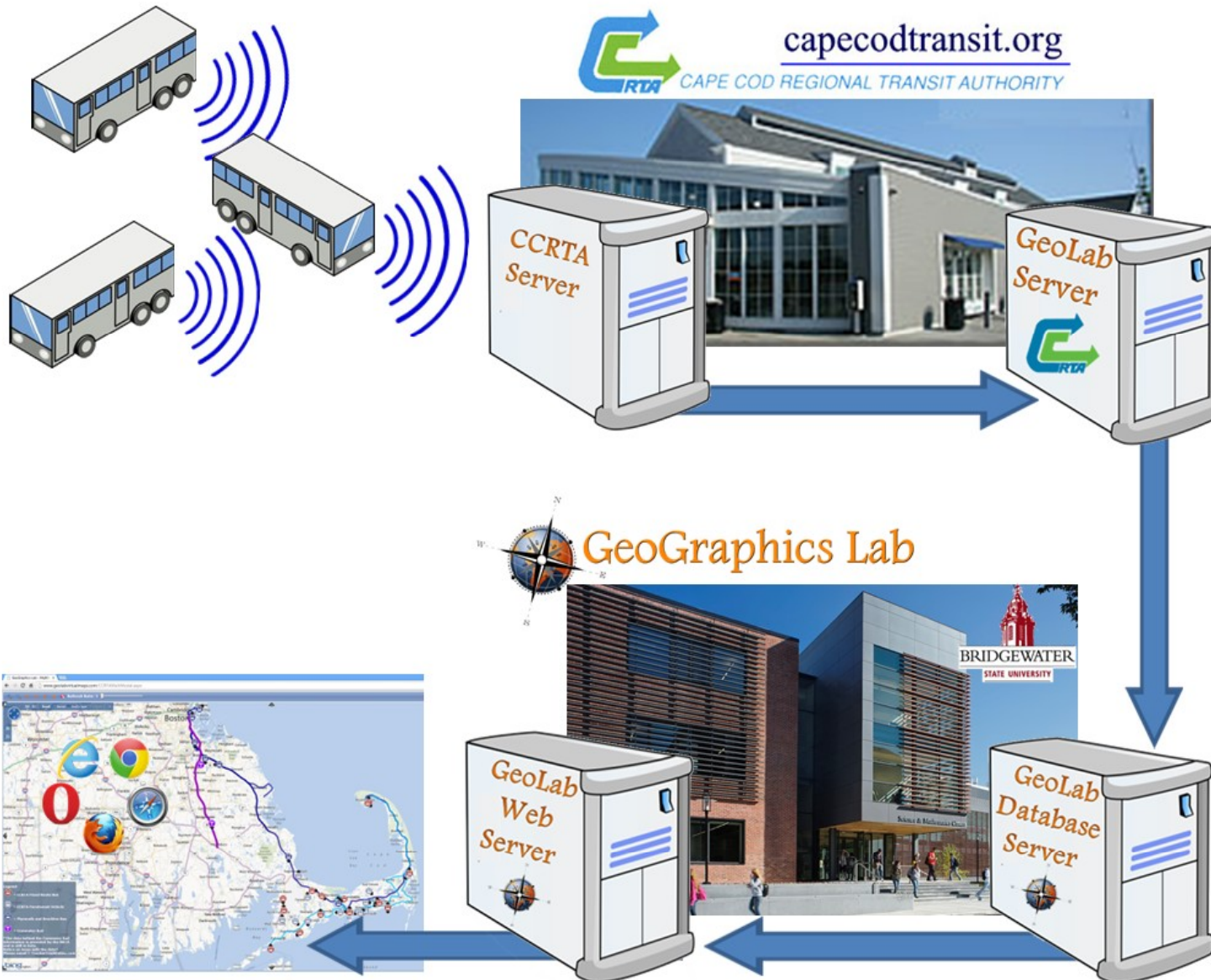


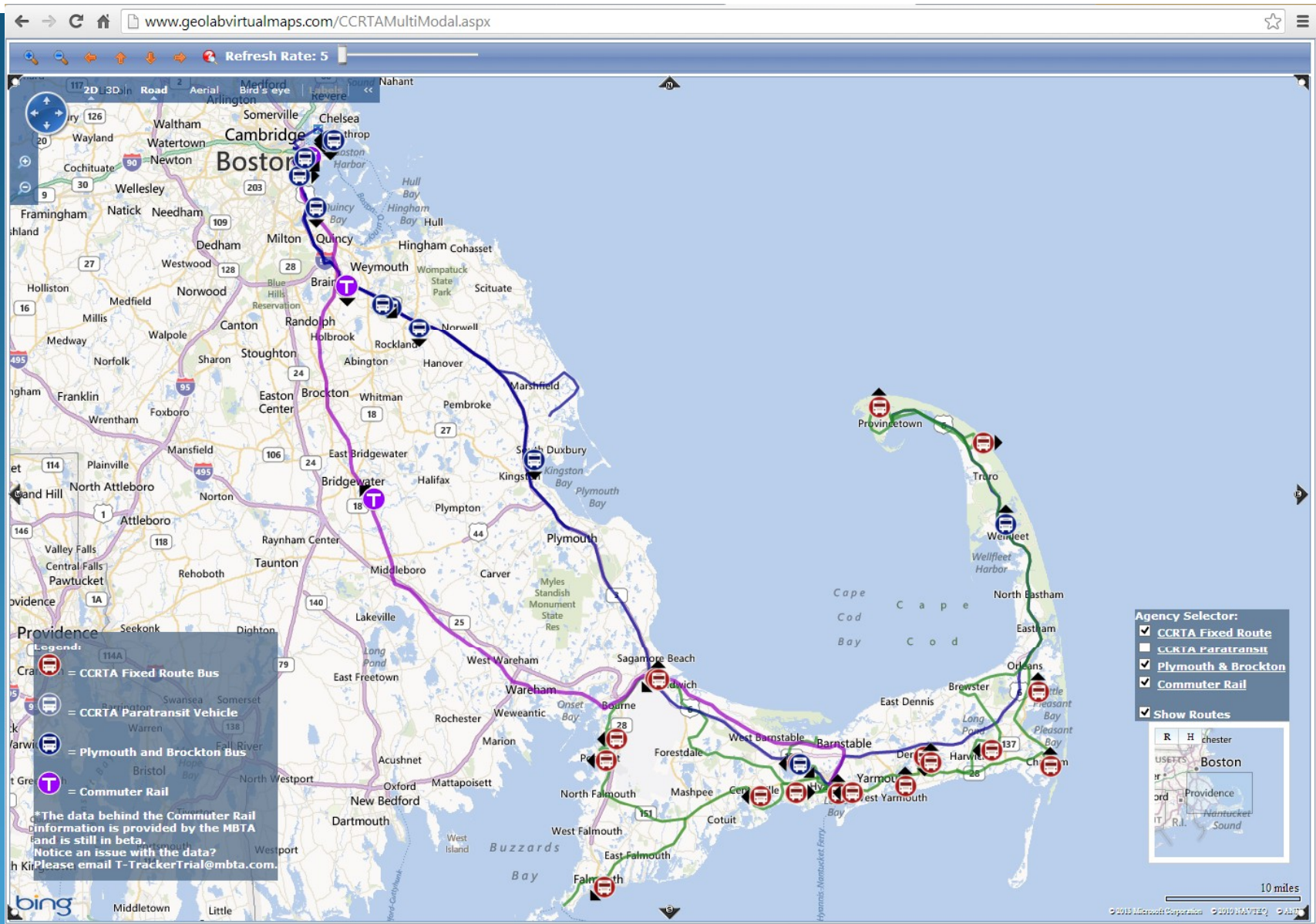
State of the Art Technology Applications

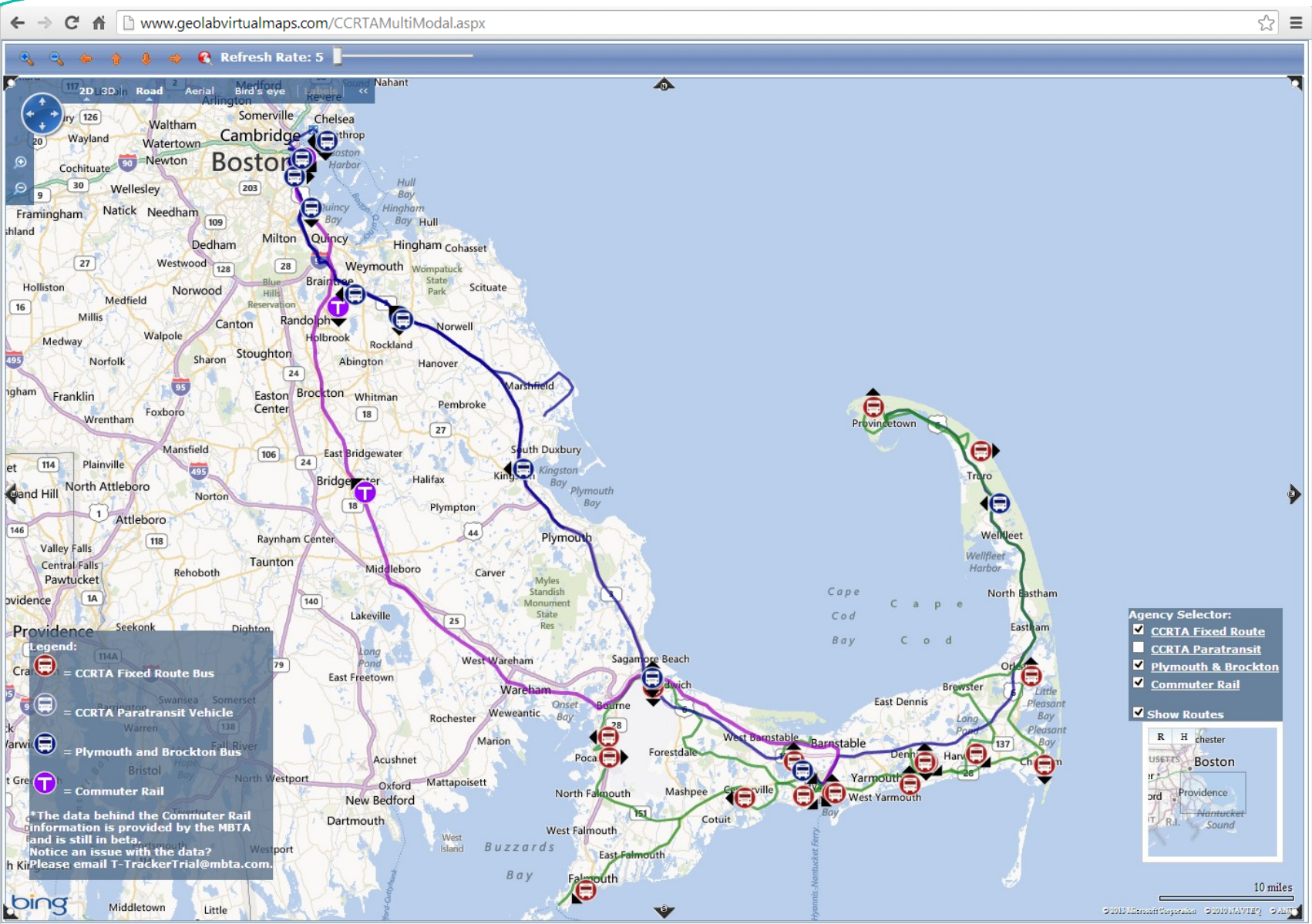
Global Positioning System

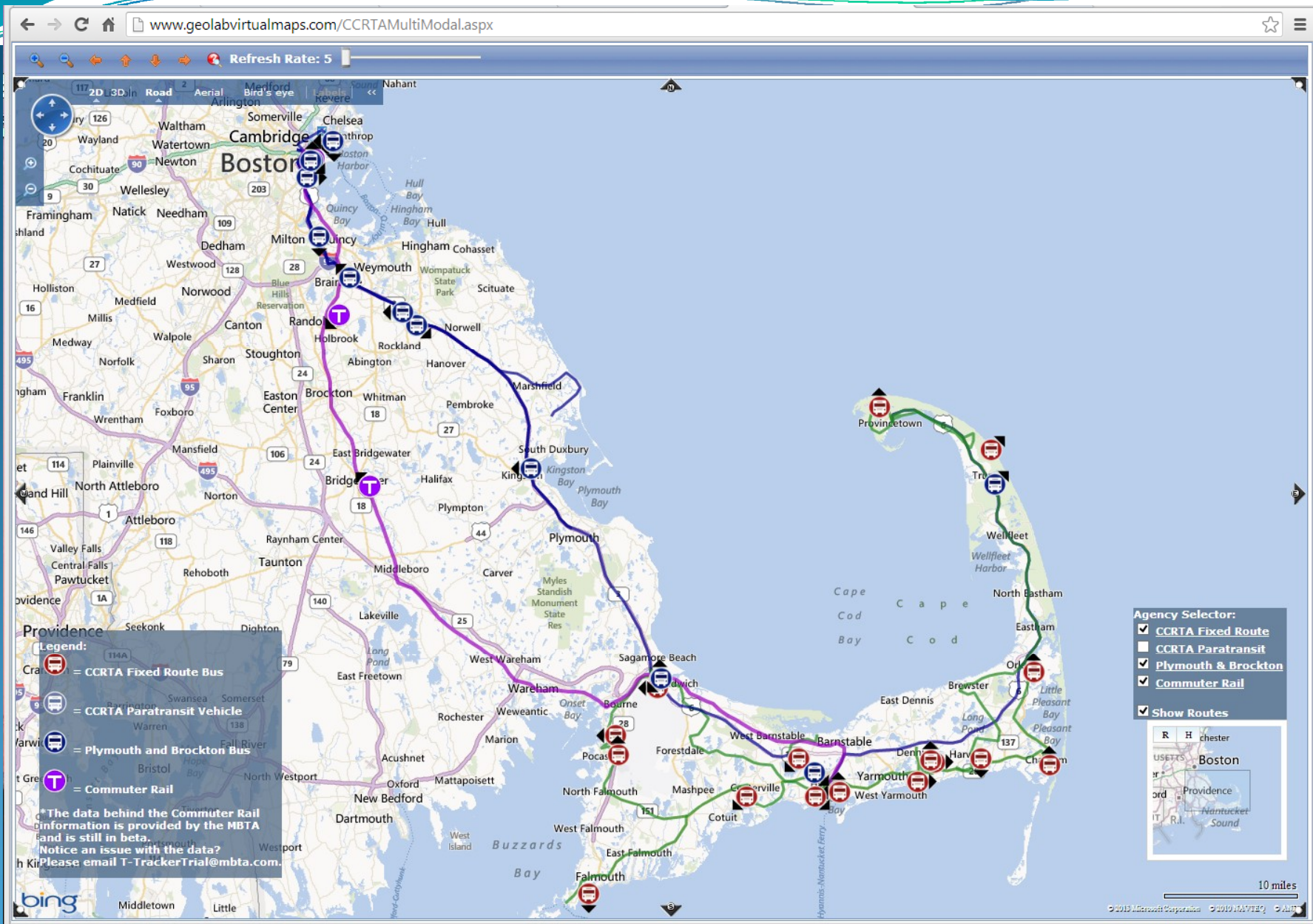
Estimated Time of Arrival

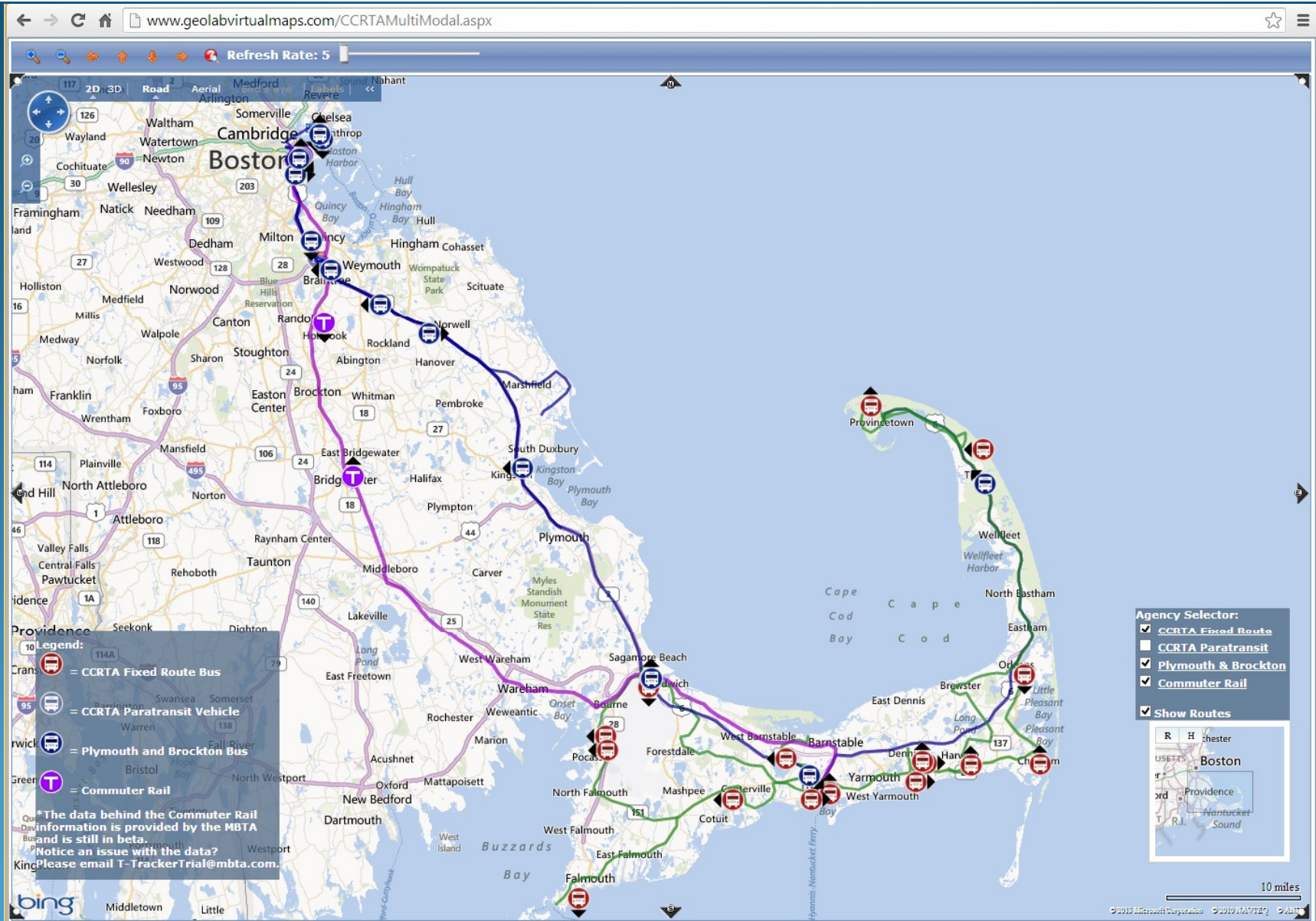
Web-based Manifest

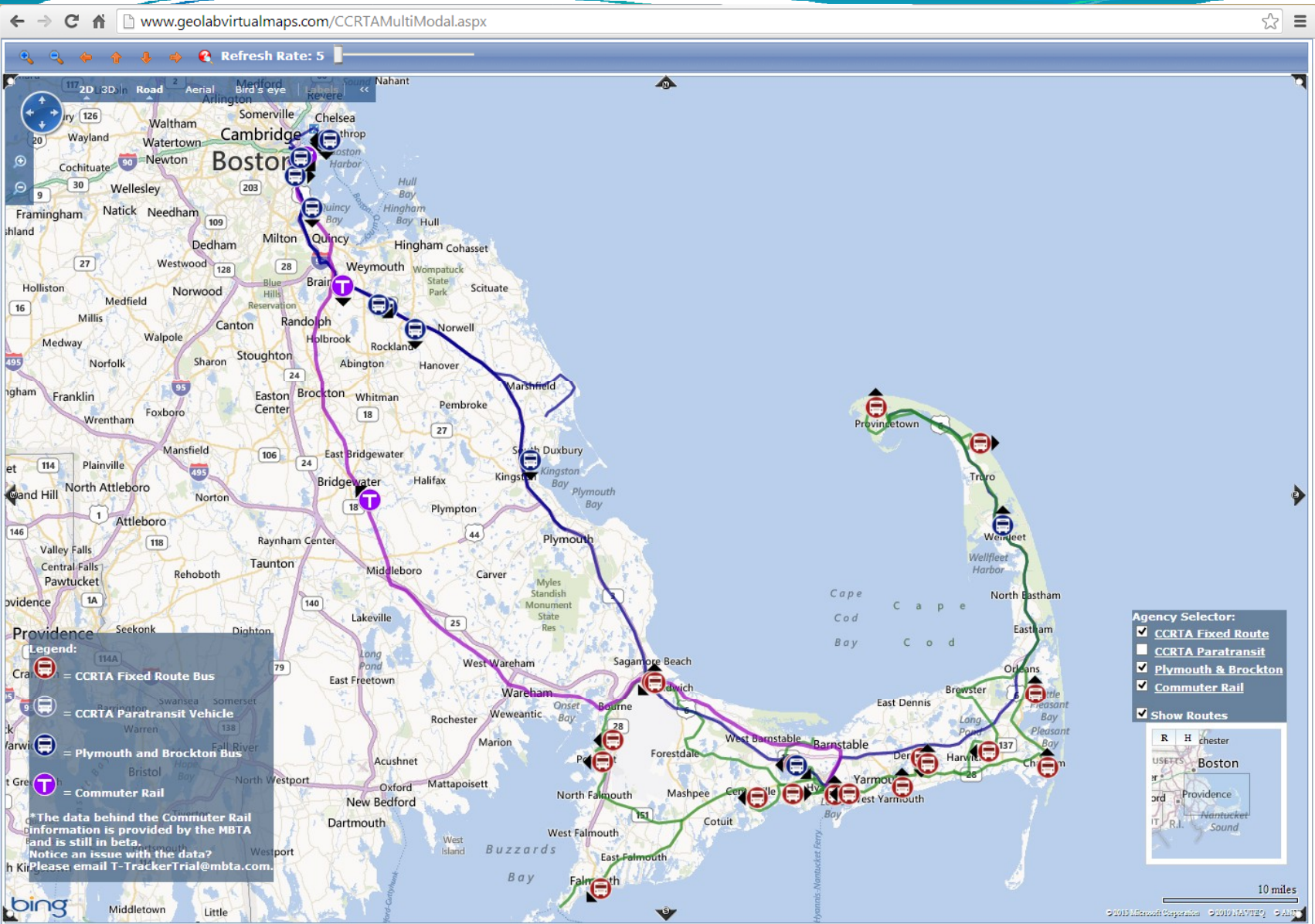












Cape Cod Regional Transit Authority Bus Information

Barnstable Villager

To: Hyannis Transportation Center

To: Barnstable Harbor

8:55 AM	1:55 PM	7:42 AM	1:42 PM
9:55 AM	2:55 PM	8:42 AM	2:42 PM
10:55 AM	3:55 PM	9:42 AM	3:42 PM
11:55 AM	4:55 PM	10:42 AM	4:42 PM
12:55 PM	5:55 PM	11:42 AM	5:42 PM
	6:55 PM	12:42 PM	6:42 PM

Fare Information

One-Way Ride:

\$2

\$1

Day pass:

\$6

\$3

Exact fare only. Drivers will not make change.

Current Time:
1:53 PM

www.capecodrta.org



Next Barnstable Villager Bus Estimated to Arrive At:

To Hyannis
Transportation
Center

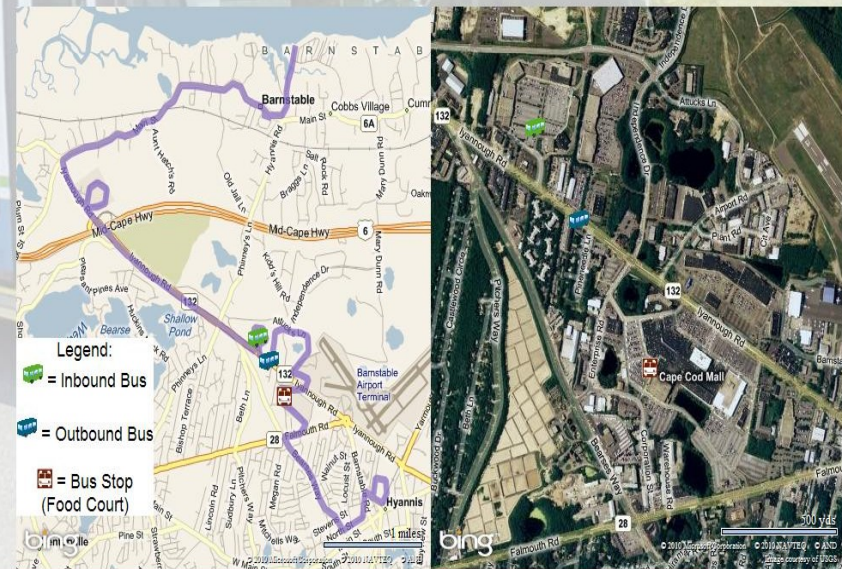
4 minutes

To Barnstable
Harbor

2:44 PM

Time shown above is an estimation of arrival- bus may arrive prior to stated time.
Please make sure to arrive at stop by scheduled departure time(left).

Where's MY Bus?



CCRTA CIS Display

CCM CIS1 - Paint



1:53 PM

Cape Cod Regional Transit Authority Bus Information

Barnstable Villager

To: Hyannis Transportation Center

To: Barnstable Harbor

8:55 AM	1:55 PM	7:42 AM	1:42 PM
9:55 AM	2:55 PM	8:42 AM	2:42 PM
10:55 AM	3:55 PM	9:42 AM	3:42 PM
11:55 AM	4:55 PM	10:42 AM	4:42 PM
12:55 PM	5:55 PM	11:42 AM	5:42 PM
	6:55 PM	12:42 PM	6:42 PM

Fare Information

	Adults and Youth	People 60+ and People w/ Disabilities
One-Way Ride:	\$2	\$1
Day pass:	\$6	\$3

Exact fare only. Drivers will not make change.

Current Time:
1:58 PM

www.capecodrta.org



Next Barnstable Villager Bus Estimated to Arrive At:

To Hyannis
Transportation
Center

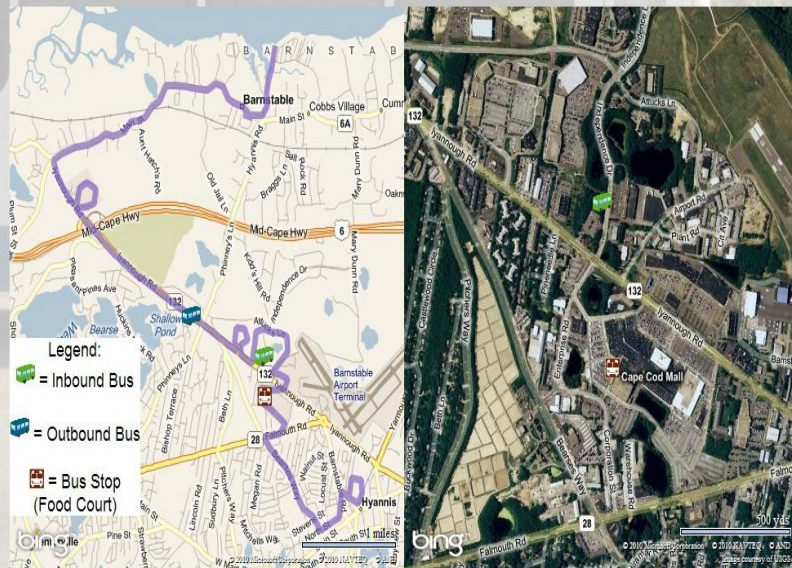
Approaching

To Barnstable
Harbor

2:44 PM

Time shown above is an estimation of arrival- bus may arrive prior to stated time.
Please make sure to arrive at stop by scheduled departure time(left).

Where's MY Bus?



Cape Cod Regional Transit Authority Bus Information

Barnstable Villager

To: Hyannis Transportation Center

To: Barnstable Harbor

8:55 AM	1:55 PM	7:42 AM	1:42 PM
9:55 AM	2:55 PM	8:42 AM	2:42 PM
10:55 AM	3:55 PM	9:42 AM	3:42 PM
11:55 AM	4:55 PM	10:42 AM	4:42 PM
12:55 PM	5:55 PM	11:42 AM	5:42 PM
	6:55 PM	12:42 PM	6:42 PM

Fare Information

	Adults and Youth	People 60+ and People w/ Disabilities
One-Way Ride:	\$2	\$1

Day pass:	\$6	\$3
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Exact fare only. Drivers will not make change.

Current Time:
2:01 PM

www.capecodrta.org



Next Barnstable Villager Bus Estimated to Arrive At:

To Hyannis
Transportation
Center

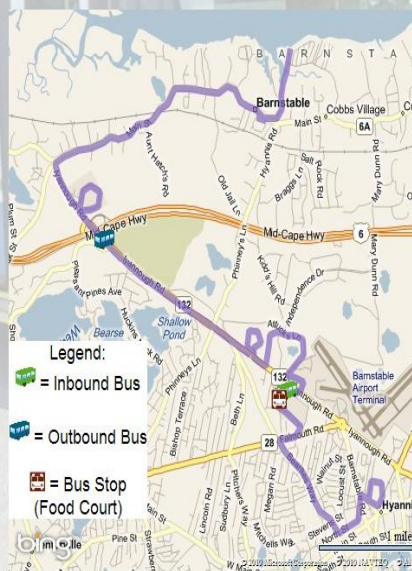
In Area

To Barnstable
Harbor

2:44 PM

Time shown above is an estimation of arrival- bus may arrive prior to stated time.
Please make sure to arrive at stop by scheduled departure time(left).

Where's MY Bus?



CCRTA CIS Display

COM CIS7 - Paint

2:01 PM

Real Time AVL For Blind and Low Vision Consumers at CCRTA

Information Retrieved at: 10/13/2009 2:34:02 PM

Refresh

Route Name	Bus ID	Time	Speed	Location	Heading
	GEO0318	10/10/2009 7:36 PM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Unassigned	GEO0337	2:29 PM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Barnstable Villager	GEO0338	8:48 AM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Barnstable Villager	GEO0339	2:25 PM	0 MPH	Barnstable Town,MA	N (0°)
Barnstable Villager	GEO0341	2:29 PM	0 MPH	Barnstable Town,MA	N (0°)
H2OLine	GEO6116	2:26 PM	6 MPH	Orleans,MA	SE (135°)
Flex Route	GEO6117	2:26 PM	26 MPH	43 G A R Hwy Orleans,MA 02653	NE (45°)
Flex Route	GEO6120	2:29 PM	0 MPH	,MA	N (0°)
Sealine	GEO6281	2:25 PM	24 MPH	94 Nye Rd Falmouth,MA 02540	E (90°)
Sealine	GEO6282	11:14 AM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
H2OLine	GEO6283	2:26 PM	4 MPH	563 Main St Dennis Port,MA 02639	NE (45°)
H2OLine	GEO6284	2:29 PM	0 MPH	Barnstable Town,MA	N (0°)
H2OLine	GEO6297	2:29 PM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Sealine	GEO6298	2:25 PM	0 MPH	Barnstable Town,MA	N (0°)
H2OLine	GEO6299	2:29 PM	24 MPH	316 Main St Northwest Harwich,MA 02646	SW (225°)
H2OLine	GEO6300	2:26 PM	0 MPH	Orleans,MA	N (0°)
Sealine	GEO8226	2:23 PM	24 MPH	127 Center St Barnstable Town,MA 02601	SE (135°)
Sealine	GEO8227	2:30 PM	20 MPH	95 E Falmouth Hwy East Falmouth,MA 02536	W (270°)
Flex Route	GEO8228	2:29 PM	22 MPH	5 Highland Rd ,MA 02671	SW (225°)
Sealine	GEO8229	2:22 PM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Flex Route	GEO8230	2:29 PM	0 MPH	Northwest Harwich,MA	N (0°)
Sealine	GEO8231	12:42 PM	0 MPH	98 Bertran Ave South Dennis,MA 02660	N (0°)
Unassigned	GEO8232	12:31 PM	0 MPH	South Dennis,MA	N (0°)

Legacy Devices

CCRTA Mobile Application





BRIDGEWATER
STATE UNIVERSITY

Cape Cod

Regional Transit Authority

e-Kiosk

View ETA

View Schedules

Track Buses

Tutorial

About

Schedule Information

- Villager**
➤ Inbound towards -> Hyannis
Outbound towards -> Barnstable Village
- H2O**
➤ Inbound towards -> Hyannis
Outbound towards -> Orleans
- Flex**
➤ Inbound towards -> Harwich
Outbound towards -> Provincetown
- Sealine**
➤ Inbound towards -> Hyannis
Outbound towards -> Woods Hole



Map

ETA

Main
Menu

Schedule Information
Cape Cod Community College,
Barnstable

Towards Hyannis

<< Previous

Next >>

2:38 PM

3:38 PM

4:38 PM

Towards Barnstable Village

<< Previous

Next >>

3:03 PM

4:03 PM

5:03 PM

Please visit the CCRTA website
www.capecodrta.org for more

View Full
Schedule

Close

Cape Cod Community College, Barnstable

Towards Hyannis	Towards Barnstable Village
8:38 AM*	8:03 AM*
9:38 AM	9:03 AM
10:38 AM	10:03 AM
11:38 AM	11:03 AM
12:38 PM	12:03 PM
1:38 PM	1:03 PM
2:38 PM	2:03 PM
3:38 PM	3:03 PM
4:38 PM	4:03 PM
5:38 PM	5:03 PM

Legend

Plot Stop

ETA

Main
Menu

Location Tracker

Choose a route:

12:41 PM

Villager



Show me!



Show all stops!



Refresh in:
00:28

Schedules

ETA

Main
Menu

Location Tracker

Choose a route:

12:41 PM

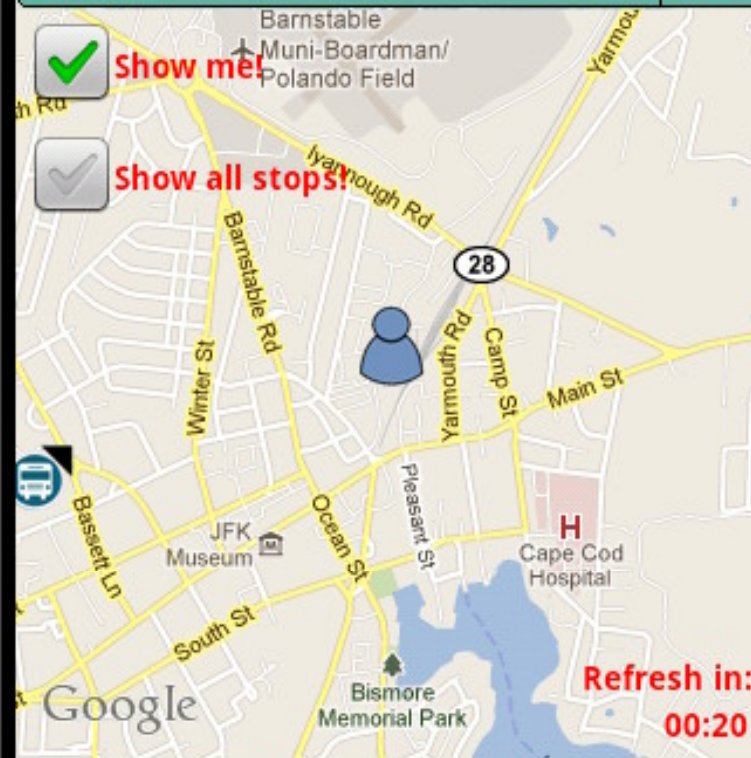
Villager



Show me!



Show all stops!



Refresh in:
00:20

Schedules

ETA

Main
Menu

Location Tracker

Choose a route:

12:42 PM

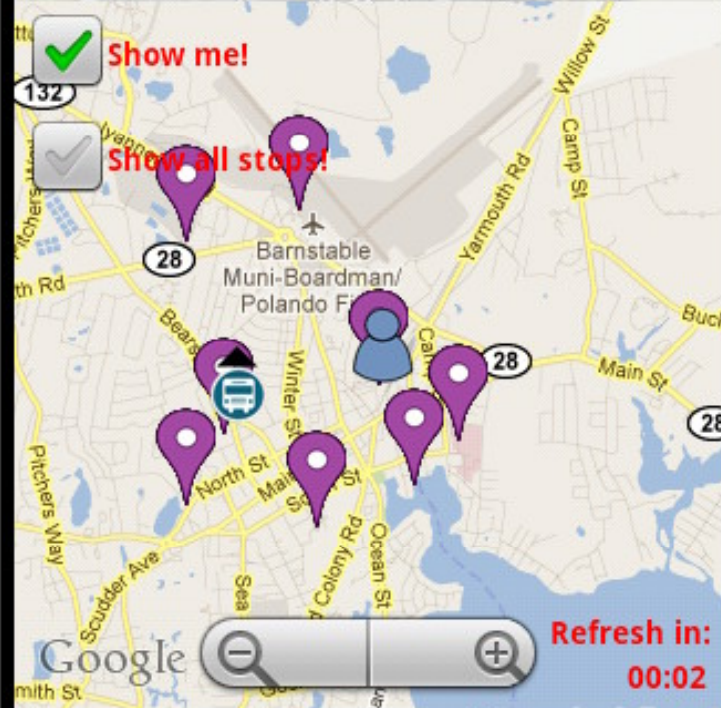
Villager



Show me!



Show all stops!



Refresh in:
00:02

Schedules

ETA

Main
Menu

Estimated Time of Arrival Information

Choose a route:

Villager



Choose a stop:

Cape Cod Community College



Towards Hyannis

2:38 PM

Towards
Barnstable Village

3:07 PM

Current Time:

6:14 PM

***Disclaimer**

Map

Schedules

Main
Menu



Analysis Methods

Ridership Trends

Cost Indicators

Productivity Indicators

Trends in Public-Private Services

Geographic Gaps in Services

Spatial and Temporal Dimensions

Approaches

Integrated interoperable software and hardware for scheduling

Dispatching and evaluating the performance of Transit and Paratransit Services based on a rigorous spatial and temporal optimization scheme

Origin-Destination (O-D) Desire Lines

Spatial Schema

Analysis of Dial-a-Ride Services

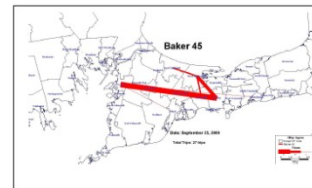
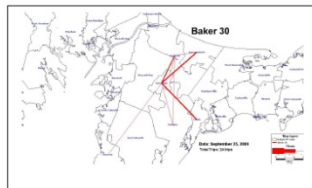
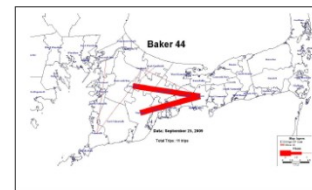
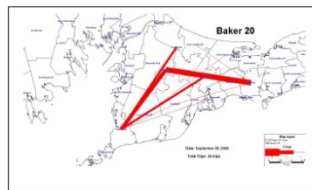
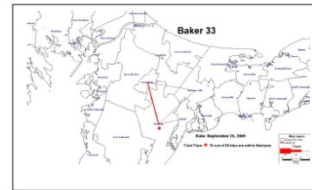
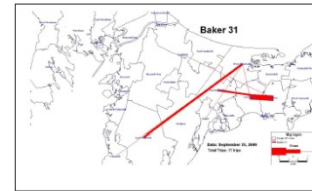
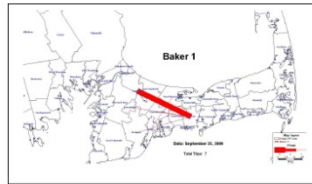
Geocoding the origin and destination by street addresses of Paratransit trips and creating a line database to analyze by routes

Plotting the geographic location of passenger pick up and drop off data collected by the paratransit vehicle's MDT

Creating a hierarchal spatial schema

C-1 West [Bourne, Sandwich, Falmouth, Mashpee, Barnstable, Yarmouth, Dennis]

Friday, September 25, 2009





Application of Research on Policy & Operations

Full cost recovery

Scheduling practices

Geographic areas underserved by demand responsive services

Compliance with the ADA requirements for complementary paratransit services

Re-designing Cape Cod's Dial-A-Ride (DART)



Future Research

Cape Cod Geographic Information Systems/Decision Support Environment

Cape Cod SmarterCape Transit Project

Data Standardization & Interoperability

Use of Unmanned Aerial Vehicles

Remote Drivers/Better Drivers



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