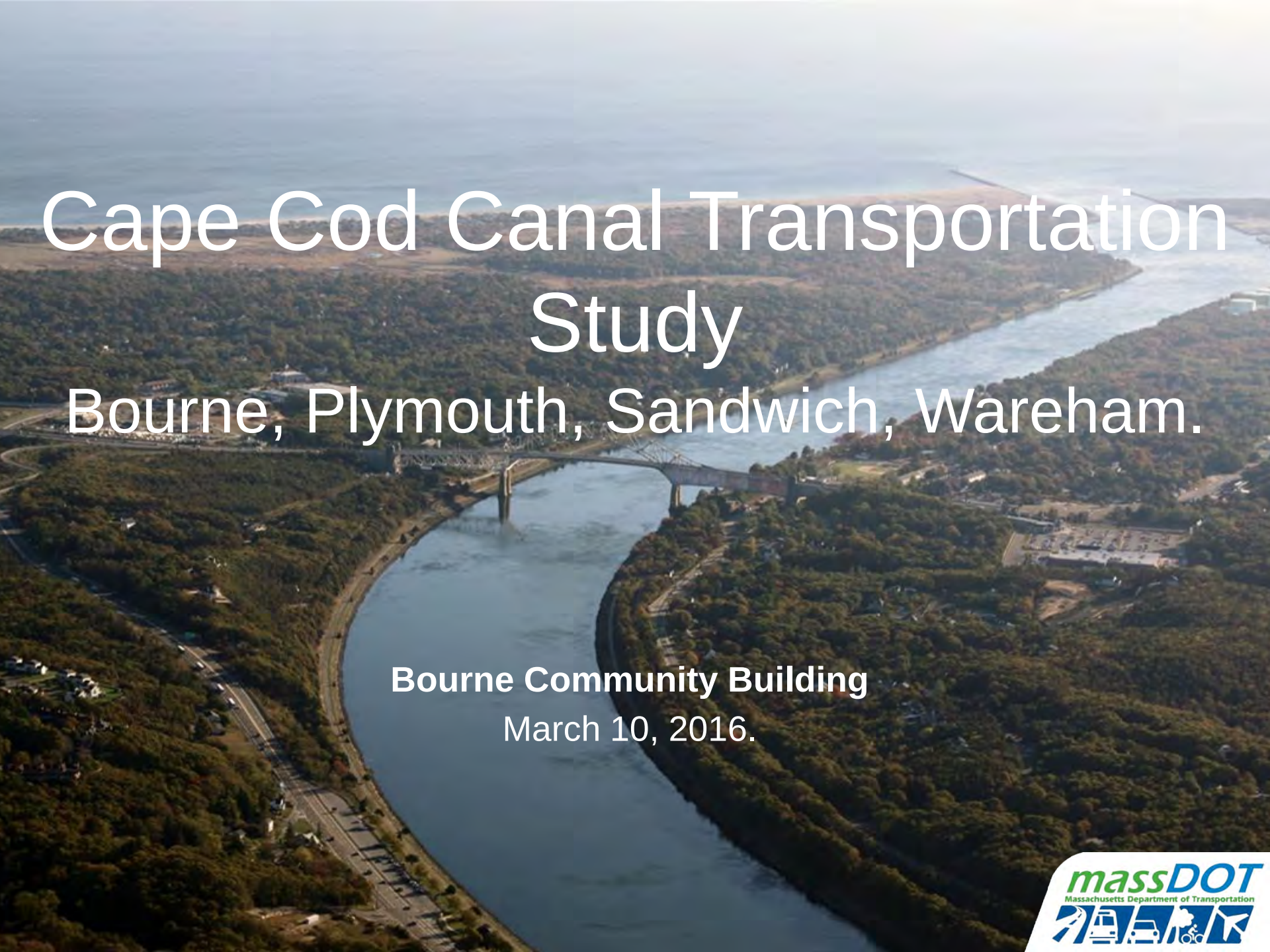

Cape Cod Canal Transportation Study

Bourne, Plymouth, Sandwich, Wareham.

Bourne Community Building

March 10, 2016.

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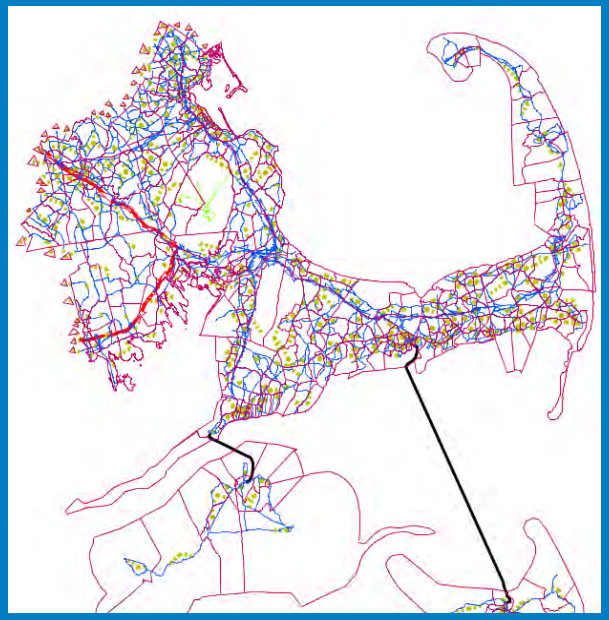
Agenda

- Introductions.
- Update on Visitors Percentages.
- Next Steps.
- Questions.

Introductions

- Ethan Britland – MassDOT.
- Michael Clark – MassDOT.
- Bill Reed – Stantec.
- Ed Hollingshead – Stantec.
- Michael Paiewonsky – Stantec.
- Heather Ostertog – Stantec.
- Steve Cecil – Harriman.
- Sudhir Murthy – TrafInfo.

Regional Travel Demand Model



- Includes roadway network for entire Cape Cod and portions of mainland.
- Used to forecast traffic for future years 2020 and 2035 for the No-Build and Build Alternatives

Model Development and Calibration Process

- Network and Traffic Analysis Zone (TAZ) Development.
- Trip Generation – based on socio-economic data (population & employment).
- Trip Distribution – development of an initial origin-destination trip table.
- Calibration – adjusting the trip table till assigned volumes matches actual counts.

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Model Time Periods

Seasons:

- Fall Weekday.
- Fall Weekend.
- Summer Weekday.
- Summer Weekend.

Weekday/Weekend:

- AM – 6:00 AM to 9:00 AM.
- MD – 9:00 AM to 3:00 PM.
- PM – 3:00 PM to 6:00 PM.
- NT – 6:00 PM to 6:00 AM.

Model Calibration Results – Fall.

2014 Model Calibration Results - Fall Weekday			
Location	*Count ADT*	*Model ADT*	*Percent Diff*
Sagamore Bridge	47,300	45,242	-4%
Bourne Bridge	47,650	46,529	-2%
Route 3 - North of Sagamore Bridge	28,150	28,015	0%
Route 25 - North of Belmont Circle	28,000	28,321	1%
Sandwich Road	10,850	11,436	5%
Scenic Highway	26,150	28,016	7%
Overall Network-wide	186,405	186,502	0%

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Traffic on the Bridges

Commute Trips:

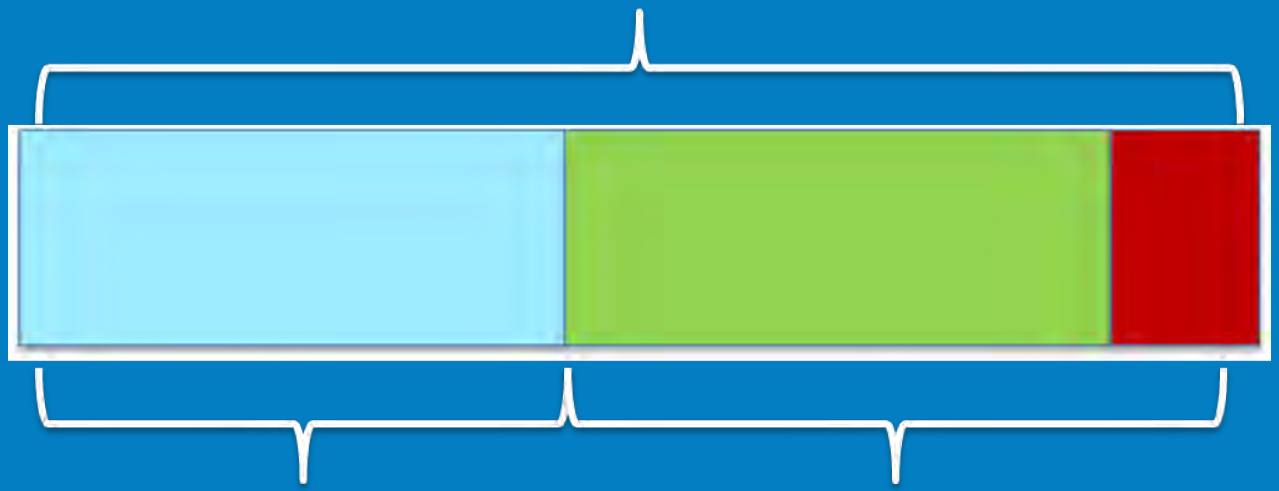
- Work Trips on/off the Cape.
- School Trips on/off the Cape.

Non-Commute Trips:

- Shopping, recreational, etc.
- Deliveries, lunch trips, etc.
- **AND visitor trips**

Estimating Current Visitor Trips on the Bridge Crossing – A CTPS Method

TOTAL DAILY BRIDGE VOLUME

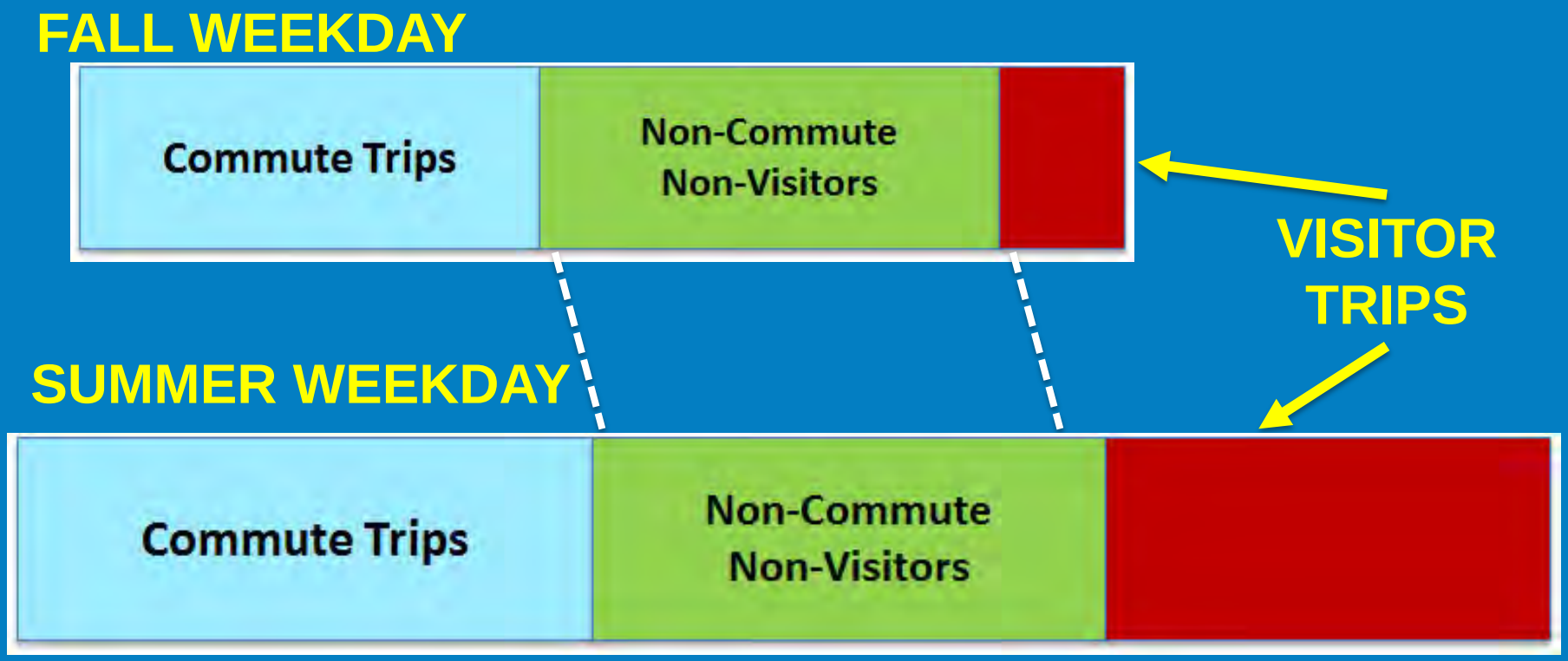


Commute Trips
(from Mass. Travel Survey)

Non-Commute Trips:

- **First estimated non-visitor trips**
- **Remaining are visitor trips**

Estimating Current Visitor Trips on the Bridge Crossing (CTPS Method)



Cape Cod Canal Crossing Study Estimates of Visitors

Previous estimates:

- Based on CTPS methodology for weekday.
- Adopted weekday methodology for weekend.

Fall Weekday	Summer Weekday	Fall Weekend	Summer Weekend
12.2%	37.7%	44.0%	58.6%

Recently CTPS updated weekday estimates based upon the recent 2011-MTS[1] data.

Fall Weekday	Summer Weekday	Fall Weekend	Summer Weekend
14.4%	39.4%	44.0%	58.6%

1: MTS – Massachusetts Travel Survey (www.mass.gov/massdot/travelsurvey)

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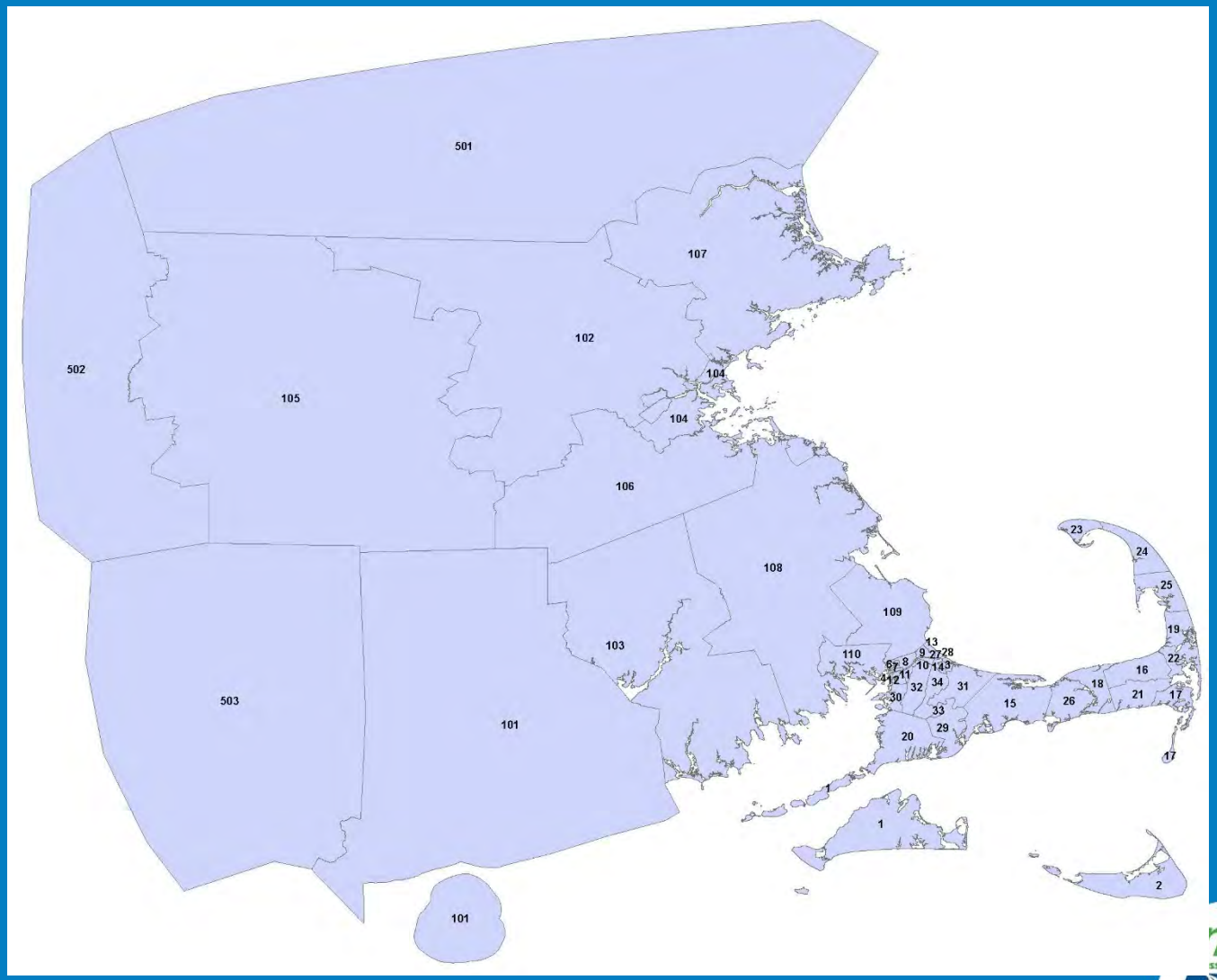
Review of AirSage Data

- Data collected by AirSage for MassDOT in August and October of 2015 was reviewed to confirm the estimates of visitor percentages.
- Data collected in terms of **devices** – devices that use the cellular network. Does not include Bluetooth or Wi-Fi capable devices.
- Data provided in terms of number of devices travelling between each origin-destination zone pairs.
- Data was reviewed for visitor percentages and the origin-destination of the visitor trips to/from the Cape.

AirSage Zone Boundaries



Summary of AirSage Data

Total Daily Bridge Crossing in comparison to ADT.

	Fall Weekday	Summer Weekday	Fall Weekend	Summer Weekend
Devices	186,313	278,826	284,004	454,070
ADT	94,950	131,980	104,200	153,950

Number of devices per vehicle significantly higher than average vehicle occupancy data collected by Cape Cod Commission in August 2012.

	Fall Weekday	Summer Weekday	Fall Weekend	Summer Weekend
Devices/Veh	1.96	2.11	2.73	2.95
Veh Occup	1.44			

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Review of AirSage Data

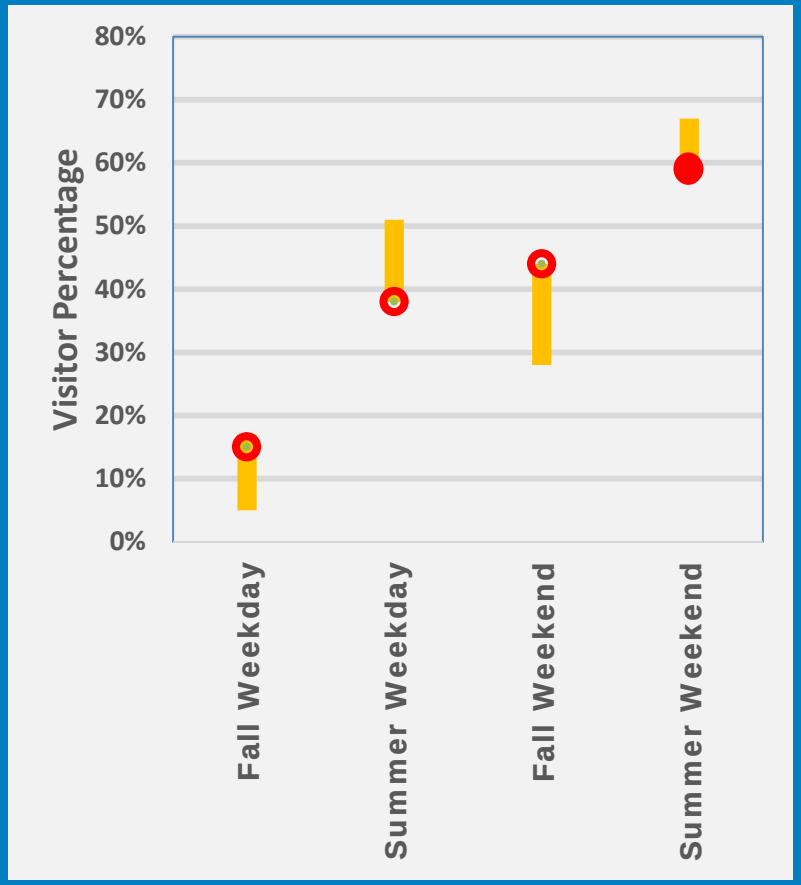
Comparing AirSage commute trips crossing the bridges with 2011 MTS data

	Fall Weekday	Summer Weekday	Fall Weekend	Summer Weekend
Devices	27,064	19,322	8,132	7,367
2011 MTS	38,000	40,000	13,000	15,000

Summary of AirSage Data (contd)

Approximate visitor percentages:

- Commute trips assumed to have one device per vehicle
- Non-commute non-visitors assume to have a vehicle occupancy in the range of 1.4 to 1.7
- Visitor trips and percentages determined based on ADT.



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Conclusion and Recommendation on Visitor Percentages

The AirSage data had the following issues:

- No valid data source on number of devices per vehicle to convert “device trips” to “vehicle trips.”
- Significant discrepancy between AirSage commute trips and 2011 Massachusetts Travel Survey (MTS) data.

Recommend using recently updated CTPS’ visitor percentages in the model.

AirSage O/D of Visitor Trips

Origin/Destination of Long and Short Term Visitors

Zone Groups	Fall Weekday		Summer Weekday		Fall Weekend		Summer Weekend	
	Long Term Visitor	Short Term Visitor	Long Term Visitor	Short Term Visitor	Long Term Visitor	Short Term Visitor	Long Term Visitor	Short Term Visitor
NH	2%	1%	2%	3%	3%	2%	1%	3%
NY/W. Mass	1%	1%	2%	2%	2%	1%	2%	1%
CT	10%	1%	12%	2%	9%	2%	14%	1%
RI	15%	6%	17%	6%	15%	6%	17%	5%
Central Mass	6%	6%	7%	10%	7%	10%	10%	9%
NE Mass	8%	13%	7%	25%	9%	24%	6%	28%
South Shore	38%	65%	35%	46%	41%	45%	38%	42%
Boston	20%	6%	16%	8%	14%	10%	11%	11%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

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Projecting 2040 Traffic Volumes.

Two Components of the Travel Demand Model

- Non-Visitors:
  - Future trips generated by area residents through work commuting, school, and other daily activities (based on projected 2040 socio-economic data supplied by CTPS).
- Visitors:
  - Based on visitor growth trends range
    - 0.26% to 0.69%

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Visitor Growth Trends: Sources and Methods

- No direct counts of visitors available, therefore indirect or proxy measures needed for analysis.
- Travel and tourism officials and professional analysts have traditionally used trends in employment in Accommodations & Food Services (NAICS 72: hotels and restaurants) as a proxy for trends in visitor activity.

Sources and Methods (continued)

- FXM compared trends in this sector with other economic indicators to construct a multiple regression model to estimate an average annual growth rate for visitors to Cape Cod.
- Economic and related data examined included peak season bridge crossings; total employment statewide as well as in Barnstable and other counties; room tax revenues; state and county population; state and county employment in hotels and restaurants.

Regression Model Parameters

- Measured traffic as combined top monthly volume of two bridges (not necessarily same month for each bridge) for historical changes in peak seasonal volumes (*bridges*).
- Used Accommodations and Food Services (A&FS) employment in Barnstable, Dukes, and Nantucket counties as proxy for visitors crossing the bridges (*allhotel*).
- Used Barnstable County share of total Massachusetts employment as proxy for non-visitor traffic (*empshare*).

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Regression Model Findings

Analytic Assumption	Projected Average Annual Visitor Growth
Growth in A&FS Employment at average annual rate 2001-2013	0.12%
Growth in A&FS Employment at average annual rate 2006-2013	0.26%
Growth in A&FS Employment at recent peak average annual rate	0.69%
A&FS employment as share of total state employment in 2040 (1)	0.27%
A&FS employment as share of total state employment in 2040 (2)	0.43%
Unweighted average of above forecasts	0.35%

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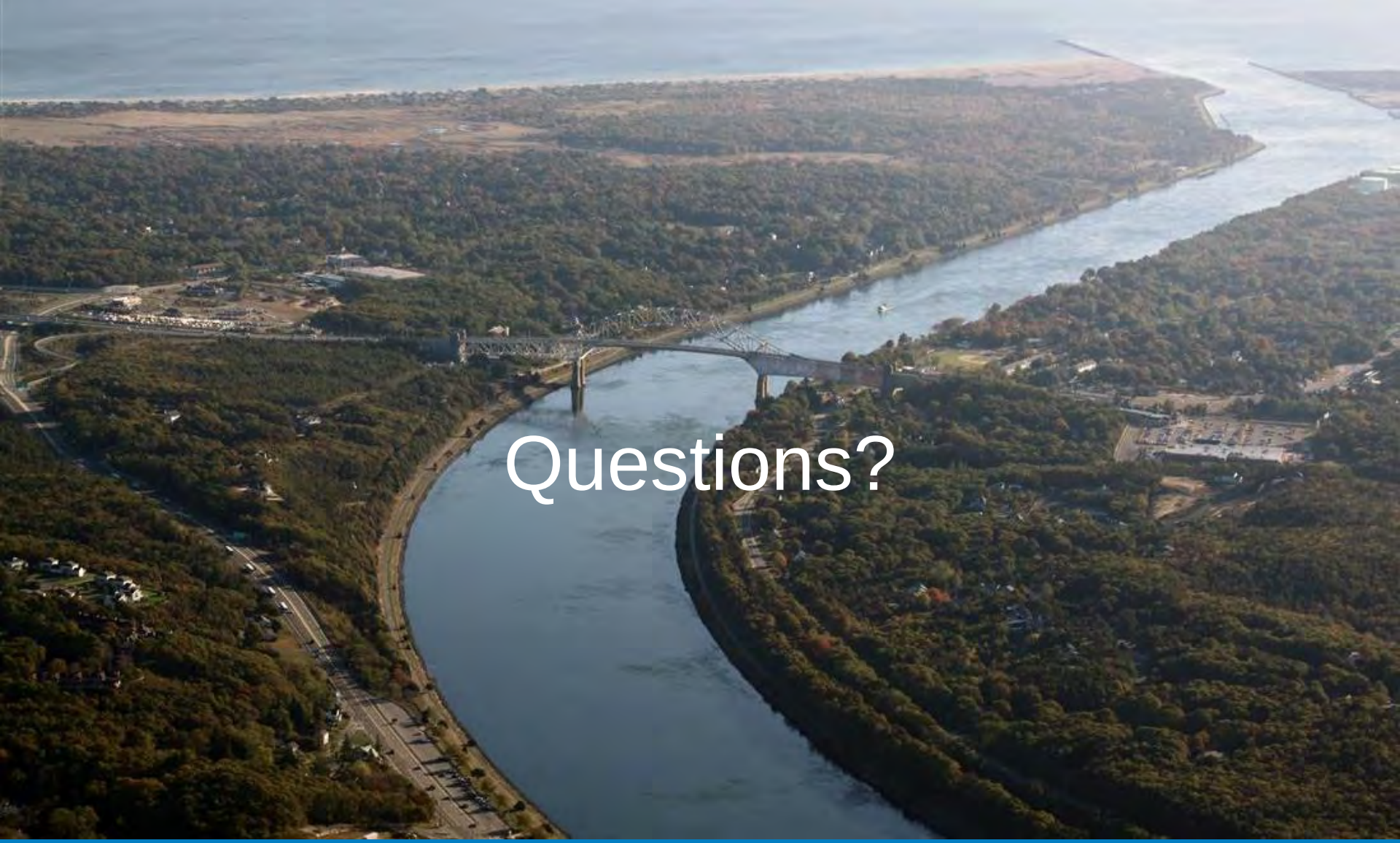
Next Steps.

- Project and analyze 2040 No-Build Traffic Volumes.
- Begin consideration of improvement alternatives.



Comments and feedback can be emailed to
Ethan Britland - ethan.britland@state.ma.us

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