Transportation Impact Study (TIS) Guidelines Update

Cambridge Transit Advisory Committee Meeting

March 3, 2022

Purpose, Outcome, and Process of Presentation (POP)

- Purpose: Receive feedback from TAC members on ways that the City may modify the Transportation Impact Study (TIS)
- Outcome: City staff will understand feedback from TAC, TAC members will understand current TIS procedure.
- Process: Presentation that describes the TIS and current ways that transit is included in the study, followed by group discussion.
- Next Steps: City staff will take your input into account in developing new TIS Guidelines for development projects.

What is a TIS

(Transportation Impact Study)

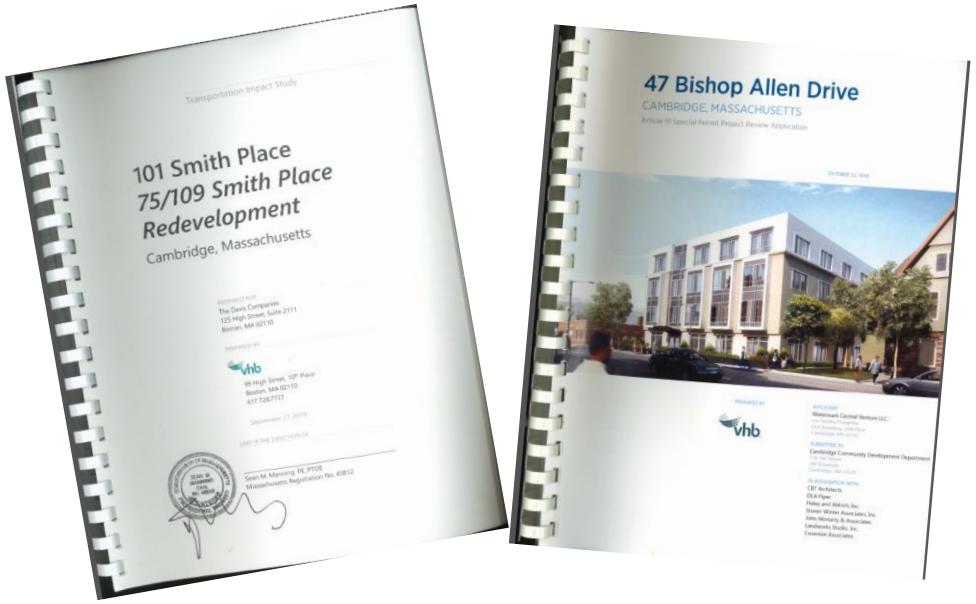
Why does the Zoning Ordinance require a TIS?

- For City staff and the Planning Board, we need information from a project proponent to determine potential transportation impacts. We want to avoid or mitigate for any negative impacts.
- The project proponent provides an analysis using standard, accepted transportation estimates, so that City staff and Planning Board, and the public, can understand the project's transportation impacts.

Transportation Impact Study (TIS)

- A Transportation Impact Study (TIS) is required under zoning Article 19 Project Review for projects that meet certain thresholds, such as:
  - Projects over 50,000 sf
  - College/university that create 150 new parking spaces or relocation of 250 spaces or any combination thereof
  - Retail and Consumer Service projects over 25,000 sf.
  - Primary school over 40,000 sf

Examples of a TIS

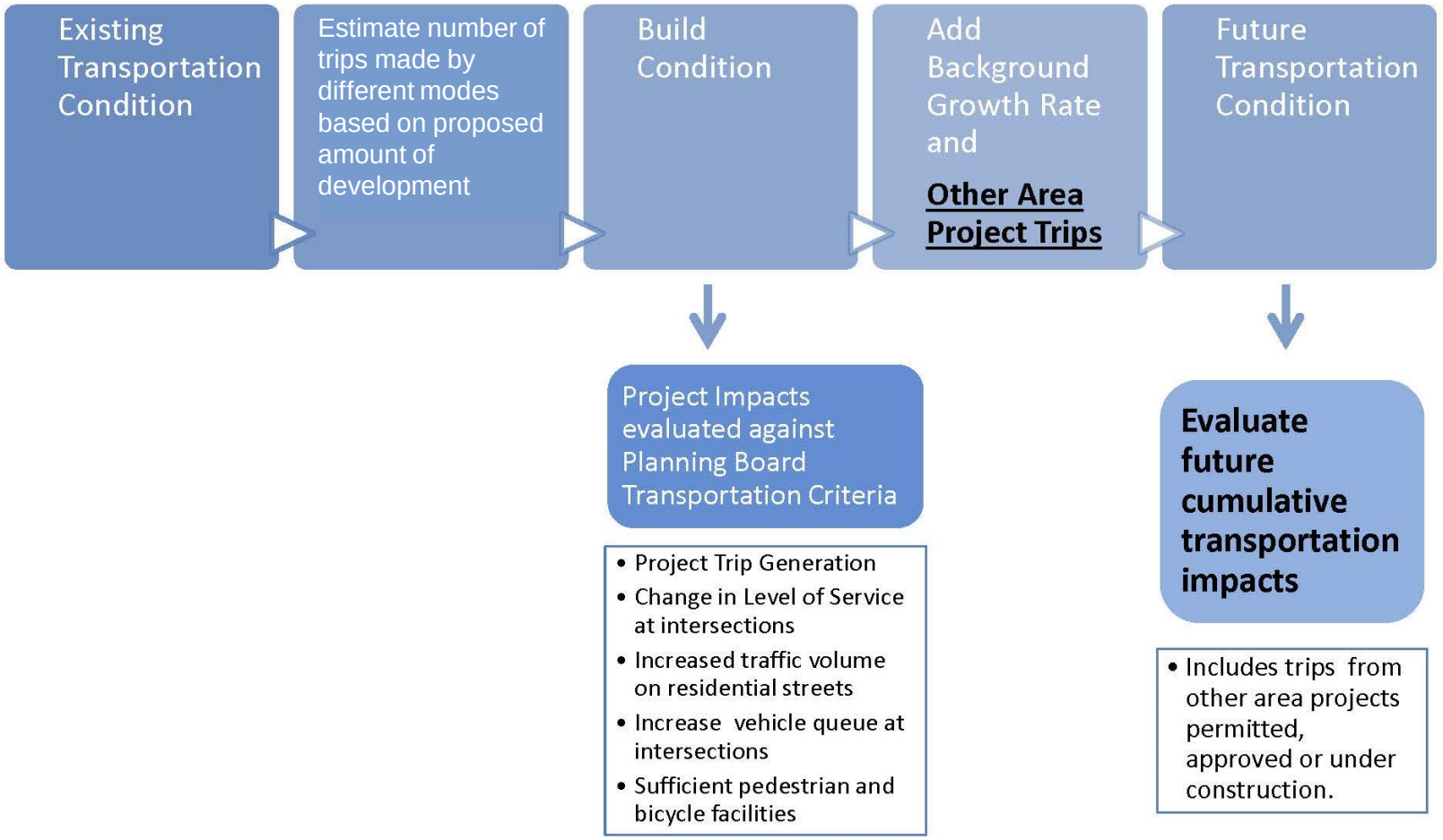


Transportation Impact Study (TIS)

- A TIS reviews current transportation conditions in the proposed development project's area.
- Estimates the new trips that a project will create for all modes (i.e., new vehicles, transit, pedestrian and bike trips).
- Evaluates the impacts that the new trips will have.

Transportation Impact Study (TIS)

TIS Process



TIS Impact Criteria (if exceeded = potentially substantial adverse impacts on city traffic)

1. Project Vehicle Trip Generation

- 2,000 daily vehicle trips; or
- 240 peak hour (AM, PM or Saturday midday trips)

How many new daily and peak hour vehicle trips will the project create.

2. Change in level of service (LOS) at study area intersections

Existing	With Project
VLOS A	VLOS C
VLOS B, C	VLOS D
VLOS D	VLOS D or 7% roadway volume increase
VLOS E	7% roadway volume increase
VLOS F	5% roadway volume increase

Will the project cause study area intersections to degrade in rush hour LOS grade.

3. Increased volume of trips on residential streets

Parameter 1: Amount of Residential[1]	Parameter 2: Current Peak Hour Street Volume (two-way vehicles)		
	< 150 Vehicles per Hour (VPH)	150 – 400 VPH	> 400 VPH
1/2 or more	20 VPH[2]	30 VPH[2]	40 VPH[2]
>1/3 but <1/2	30 VPH[2]	45 VPH[2]	60 VPH[2]
1/3 or less	(No max.)	(No max.)	(No max.)

Notes: 1. Amount of residential for a two block segment as determined by first floor frontage.
2. Additional project vehicle trip generation in vehicles per lane, both directions.

Will the project add more vehicle trips on residential streets.

TIS Impact Criteria (if exceeded = potentially substantial adverse impacts on city traffic)

4. Increase in length of vehicle queues at intersections

Existing	With Project
Under 15 vehicles	Under 15 vehicles, or 15+ vehicles with an increase of 6 vehicles
15 or more vehicles	Increase of 6 vehicles

→ Will the average number of vehicle queues at rush hours increase at study area intersections.

5. Lack of sufficient pedestrian and bike facilities

a. pedestrian level of service (PLOS)

Existing	With Project
PLOS A	PLOS A
PLOS B	PLOS B
PLOS C	PLOS C
PLOS D	PLOS D or increase of 3 seconds
PLOS E, F	PLOS D

→ Will the average pedestrian crossing delays at intersections get longer.

b. Safe pedestrian facilities - Sidewalks, crosswalks or walkways meet City Design standards

→ Do safe pedestrian facilities (i.e., sidewalks or paths) exist adjacent to the project.

c. Safe bicycle facilities- must exist or be preserved where sufficient ROW exists.

→ Do safe bicycle facilities exist, or space being preserved for safe bicycle facilities adjacent to the project site.

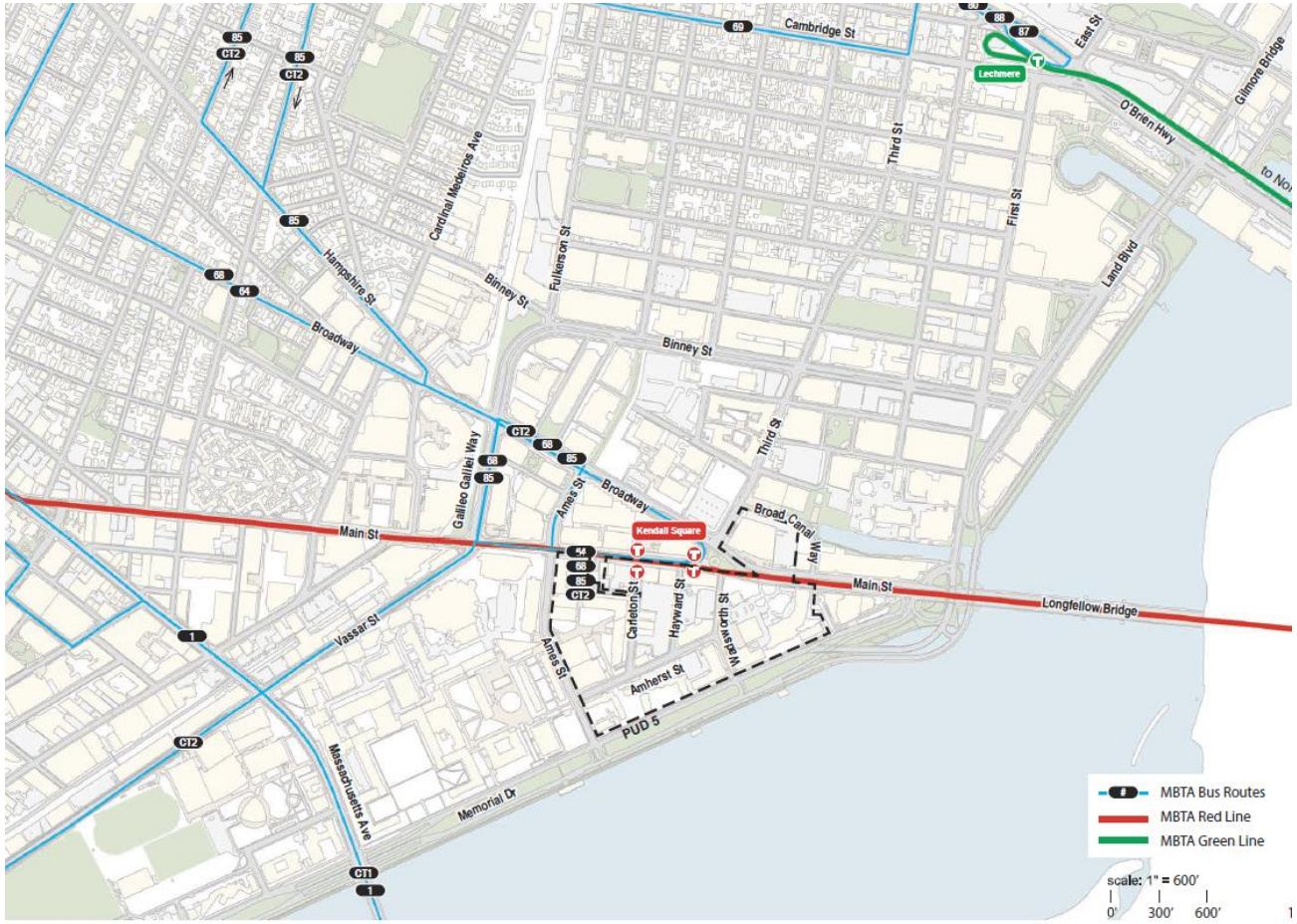
Currently we only evaluate and describe transit impacts

Transportation Impact Study (TIS)

Transit Impacts evaluated in a TIS, such as:

- Location of bus and transit stops, shelters, stations and routes.
- Existing daily and peak hour ridership
- Estimated new transit trips from the proposed project
- Transit impacts calculated based on peak hour ridership to transit service capacity

Typical graphics in a TIS showing transit facilities near the development project



MIT Kendall Square

Opportunities for changes

- We have an opportunity to change how transit impacts are evaluated in a TIS.
  - One way is to add a transit specific criteria
  - Another way is to modify existing criteria, such as:
    - Modify Criteria 1. Replace **new vehicle trips** criteria with **new persons trips criteria and** establish impact thresholds for number of trips by mode, such as number of new public transit trips.
    - Modify Criteria 5. Replace **Lack of pedestrian and bicycle facilities** with **Lack of pedestrian, bicycle and transit facilities** and develop a threshold such as, nearby bus stops must meet MBTA bus stop design standards.

What do you want to know about a projects impact on transit?

- Think about the goals in the Cambridge Transit Strategic Plan, how a development project may impact the goal, and how to align impact metrics to transit goals:

Transit Strategic Plan Goals:

- **T1. Maximize transit ability to serve all trips**
- **T2 Increase and prioritize transit funding**
- **T3 Increase efficiency and reliability of transit services**
- **T4. Expand transit service**
- **T5. Improve useability, accessibility and safety of transit**
- **T6. Improve public outreach and participation**
- **T7. Improve resiliency to and preparedness for climate change**

One way to think about aligning goals with metric is to think about transit in three ways:

OPERATIONAL

T3 Increase efficiency and reliability of transit services

T4. Expand transit service

PHYSICAL

T1 Maximize transit ability to serve all trips

T5 Improve useability, accessibility and safety of transit

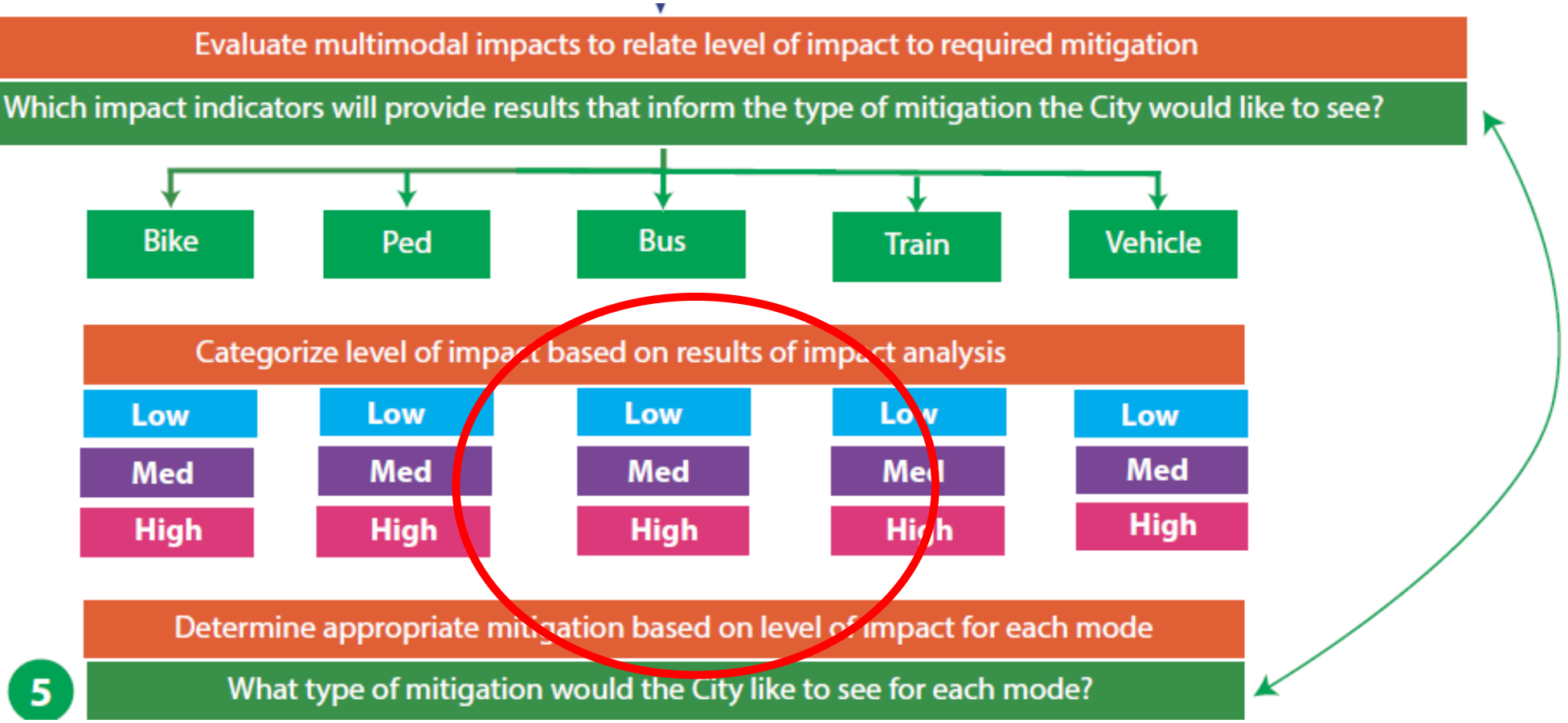
POLICY

T2 Increase and prioritize transit funding

T6 Improve public outreach and participation

T7 Improve resiliency to and preparedness for climate change

- One idea is to develop metrics and thresholds for the level of impacts (such as, Low, Medium or High) that a project would have on buses and trains.



Potential Transit Metrics and Thresholds

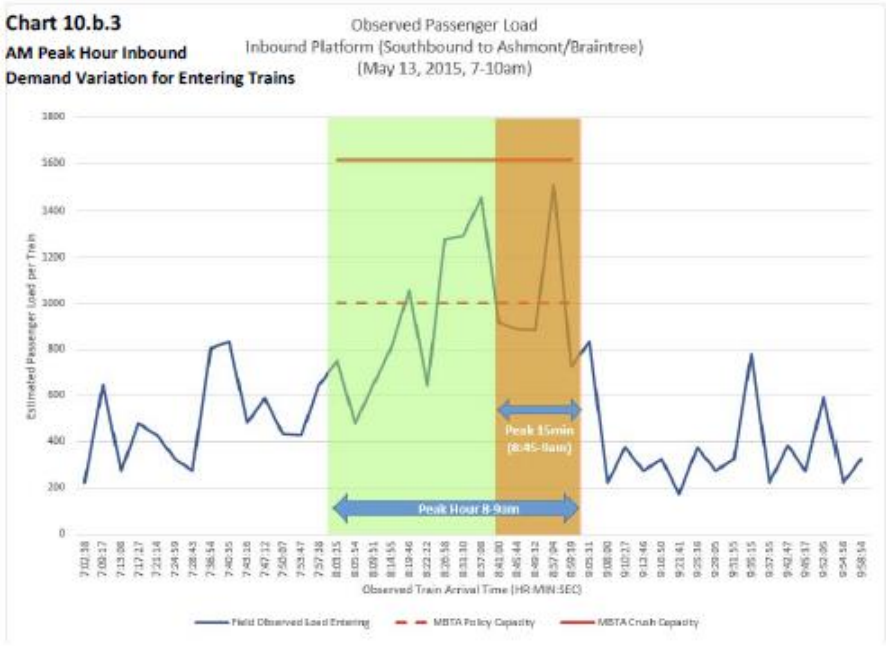
Potential Transit Metrics and Thresholds

Metrics	Low Impact	Medium Impact	High Impact	Notes
# peak hr. transit trips	< 20 transit trips	20-50 transit trips	>50 transit trips	But more transit trips may be better not worse.
Transit utilization (e.g., how new transit riders will impact transit capacity	< 0.8 v/c	0.8 – 1.00 v/c	> 1.0 v/c	Considerations: peak hr. or peak of peak, or closest stops to project, or stops with peak load points.
Access to transit	Bus stops meet design standards	Half of stops meet standards	Bus stops do not meet standard	MBTA bus stop planning and design standards
New vehicle trips on bus delay/ reliability	< 60 peak hr. auto trips	60-120 peak hour auto trips	> 120 peak hour auto trips	More vehicle trips on roadway could impact bus travel times.
Yes/No policy question.	100% T pass subsidy Real-time transit screen	50% T-pass subsidy Real-time transit screen	No T-pass subsidy No real-time transit screen.	

Other potential transit impact metrics

- Multimodal level of service (MMLOS)
- Passenger load at peak of route, even if not in Cambridge. (peak load point for each route)
- Hours of transit operation (weekdays/weekend service hours and frequency
  - Note, this is controlled by MBTA not development project.

We want to avoid a lot of data and analysis without a clear conclusion



A = Seats available / Few standees

Plenty of seats available, a few people standing. Estimated range of passengers between 0 and 58 persons per car (there is an average of 58 seats provided on each car).

B = Seats full / Comfortable standing

Most seats are taken and people are standing comfortably and are able to hold on to the pole. Estimated range of passengers between 59 and 100 persons per car.

C = Seats full / Comfortably loaded

All seats are taken, people are comfortably loaded and can still hold on to the pole. Estimated range of passengers between 100 and 167 persons per car. Assumes policy capacity of safe & comfortable load at 167 as high end of range.

D = Train full / Crushed at door

Train is full, uncomfortable standing inside the car, crushed standing near doors. Estimated range of passengers between 168 and 269 persons per car. Assumes MBTA average crush capacity (1.5 Square Foot / person) of 269 as high end of range.

E = Super Crushed

Unacceptable condition, crushed inside the car and near doors, cannot board the train without pushing people in, people left behind on platform. Estimated passenger load at 269 persons per car + left behinds on the platform (if any).

Table 10.b.4 Observed Train Loads – Inbound Platform (to Ashmont/Braintree) May 13, 2015

	Morning Peak Hour				Evening Peak Hour			
Load Level	Arriving Load		Departing Load		Arriving Load		Departing Load	
	# occurrences	%	# occurrences	%	# occurrences	%	# occurrences	%
A	0	0%	0	0%	2	17%	1	8%
B	1	7%	3	21%	8	67%	8	67%
C	8	57%	6	43%	1	8%	0	0%
D	2	14%	4	29%	1	8%	2	17%
E	3	21%	1	7%	0	0%	1	8%
	14	100%	14	100%	12	100%	12	100%

Source: VHB Observation May 2015

Questions and group discussion

Q: What do you want to know about a projects impact on transit?

Thank you

Transportation Impact Study (TIS) Guidelines Update

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Back burner

Typical 8-step transit analysis in a TIS

1. Determine Existing transit bus/train capacity including the average On-time performance factor.
2. Determine Existing transit ridership
3. Determine **Existing transit utilization** (peak hour riders per capacity = volume/capacity (v/c).
4. Determine Project's new transit trips
5. Add new transit trips to existing transit system
6. Determine v/c with Project transit trips **(Build transit utilization).**
7. Add transit trips from other projects and background growth rate.
8. Determine **Future transit utilization** (v/c).

What do you want to know about a projects impact on transit?

T1. Maximize transit ability to serve all trips	Will the Project help maximize transit systems ability to serve all trips?
T2 Increase and prioritize transit funding	Will the Project increase and prioritize transit funding?
T3 Increase efficiency and reliability of transit services	Will the Project increase or decrease transit efficiency and reliability?
T4. Expand transit service	Will the Project expand or impact transit service?
T5. Improve useability, accessibility and safety of transit	Will the Project improve useability, accessibility and safety of transit?
T6. Improve public outreach and participation	Will the Project improve public outreach and participation in transit?
T7. Improve resiliency to and preparedness for climate change	Will the Project improve or impact transit services resiliency to and preparedness for climate change?