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TRANSPORTATION IMPACT STUDY (TIS) GUIDELINES

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Guidelines for Transportation Impact Study (TIS)

I. Overview

1. Reason for TIS. The Transportation Impact Study (TIS) is a required engineering analysis of existing transportation infrastructure and anticipated transportation impacts from the development of a new real estate project. The TIS is required by Article 19 of the Cambridge Zoning Ordinance. The Traffic, Parking & Transportation (TP&T) Department is designated in the ordinance as the City department responsible for reviewing this study and certifying its completeness and accuracy to the Cambridge Planning Board, prior to their review of the development proposal. The TP&T Department is given the authority to provide guidance for any TIS, and these “Transportation Impact Study Guidelines” represent a regularly updated set of uniform guidance for project proponents in Cambridge.
2. Indicators of Impact. The primary results of the TIS are an evaluation of any “substantial adverse impact on city traffic” as determined by five indicators:
 - a. Project vehicle trip generation weekdays and weekends for a twenty-four hour period and A.M. and P.M. peak vehicle trips generated
 - b. Change in level of service at identified signalized intersections
 - c. Increased volume of trips on residential streets
 - d. Increase of length of vehicle queues at identified signalized intersections
 - e. Lack of sufficient pedestrian and bicycle facilitiesThese indicators and the criteria for evaluating them are described in detail in Section IV.
3. Submission schedule. No TIS may be submitted until a study scope is approved by the TP&T Department. After submission of a TIS, including all required electronic documents, the TP&T Department has 21 days to either certify that the study is complete and reliable or issue a denial. If denied, the proponent may submit a revised TIS. The TP&T Department has 14 days to either certify the revised study or issue a denial.

II. Study Scope

To be approved by the City of Cambridge prior to the start of the study based on the following information which should be submitted in a scoping request letter to the Director of the TP&T Department:

1. Project Description and Overview, to include project location, site program (land uses and gross floor areas), location of site access driveway(s), location of site access walkway(s) and door(s) to the extent known.

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2. Previous or Existing Use(s), to include floor area, occupancy, use of existing building(s), and counts of entering and exiting vehicles during the AM and PM peak hours (according to the guidance under Section III.2.c below).
3. Trip Generation, Including Any Remaining Use(s):
 - a. New project AM, PM and daily trip rates shall be based on ITE *Trip Generation* (latest edition) data. Person trips shall be derived from ITE trips by multiplying by the Average Vehicle Occupancy (AVO) for the corresponding Census tract from the most current U.S. Census journey-to-work data. Modal splits from the corresponding Census tract shall be applied, unless an alternate is approved by the City. Total vehicle trips shall be calculated as the “drive alone” plus “carpool” percentages, divided by the AVO. Anticipated truck trips shall be added to the vehicle component. The balance of ITE trips shall be allocated as person-trips among other modes, including transit, bicycle, walking, taxi, etc. Trips listed as “other” in Census data shall be proportionately assigned to all other modes. The project trip analysis shall be summarized in a table format, indicating daily and peak hour (entering/exiting/total) trip rates, adjustments, and summarized with project trips by mode (see attached example);
 - b. Any existing trips may be subtracted from new trips with TP&T approval. Existing peak-hour vehicle trips to/from the site shall be based on direct AM and PM peak hour counts by a certified traffic counting company. If these are no longer possible due to a use discontinued within the previous year, ITE trip rates may be used with TP&T approval. Daily trip estimates may be made based on ITE trip rates. Any trips created by a previous use that has been discontinued for over one-year may not be discounted from new trips;
 - c. If different trip rates or modal split allocation are proposed from the methodology described in II.5.a, the proponent shall submit additional recent data for two days from specific, comparable single use land uses. Vehicle access to/from these land uses also shall include vehicle trips parking at off-site areas and on-street. If the forecast modal split for single occupant vehicles is less than what could be expected based on U.S. Census data and City of Cambridge guidelines, then a very strong justification for those assumptions and an aggressive Transportation Demand Management (TDM) program commitment must be made by the proponent;
 - d. For projects including retail (non-ancillary), a pass-by factor of up to 25 percent can be applied for site traffic assigned on the major through street;
 - e. Trip distribution shall be based, in part, on the most recent U.S. Census journey-to-work data. This will require submission of U.S. Census Journey-to-Work data (by city/town) for trips to/from the project Census tract and a description of the methodology to determine the trip assignment. The AM and PM project trip assignment shall be displayed on a schematic diagram of nearby roads, including all segments carrying 5 or more vehicle trips; and

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- f. Quantify project truck trips by time of day (by vehicle type) and routes in a separate table.
4. Scope Approval. The TP&T Department will issue a scope approval letter to allow preparation of the TIS which will indicate the following:
 - a. Any necessary changes to trip generation, trip distribution, or mode split assumptions;
 - b. Which roadway intersections are to be analyzed (the study area). The TP&T Department generally uses a rule of thumb to include all intersections that have a total of 40 new vehicle trips in the AM and PM peak hours combined. The Department may identify other important intersections for analysis. The Department will also specify where, if any saturated flow analysis should be performed and where, if any queue counts and analysis at unsignalized intersections should be performed;
 - c. Where daily vehicle, bicycle and pedestrian counts are to be conducted;
 - d. What specific development projects are to be included in the future condition analysis; and
 - e. And any other pertinent information about the specific TIS.

III. Components of TIS

All TIS sections, tables and figures shall be numbered according to the following outline. All pages (including figure/table pages) must be numbered and the report must be printed double-sided.

1. Inventory of Existing Conditions. Provide figures or plans as requested below with brief labels or descriptions and no written summary.

Provide sketch plans in an engineering scale for:

- a. **Roadways** (Figure(s) 1.a.x) adjacent to the site and between all study area intersections, indicating their width, travel lanes, bicycle lanes or guidelines, approximate layout of ALL pavement markings, all posted street regulations, and, within 1-block and along principal pedestrian access routes (see Section III.9 below), sidewalks, indicating their width, curb cuts, curb ramps, and any significant obstructions and street furniture that reduce the effective width of the sidewalk;
- b. **Intersections** (Figure(s) 1.b.x) within the study area, indicating number of lanes, lane width and alignment, designated lane use, traffic controls, approximate layout of all pavement markings, and location of crosswalks with their striping pattern and width;

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- c. **Parking** (Figure(s) 1.c.x), indicating existing motor vehicle and bicycle on-site parking layout. Include a parking registration form from the TP&T Department's Citywide Parking Inventory;

Provide figures for:

- d. **Transit Services** (Figure(s) 1.d..x), indicating bus and transit stops, shelters, stations and routes. Include private shuttle bus services, school bus stops, etc.; and
 - e. **Land Use** (Figure(s) 1.e.x), indicating study area land uses, including schools, parks, playgrounds, hospitals, etc.
2. **Data Collection.** Data shall be collected not earlier than 12 months before submission of *TIS* to the City of Cambridge. Data will include the following:
 - a. **Automatic traffic recorder (ATR) count(s)** with full vehicle classification (i.e. trucks, buses, motorcycles, etc.) for a minimum 48-hour weekday period; non-ancillary retail projects must include a 24-hour Saturday period. Location(s) must receive prior approval by the TP&T Department. ATR data shall be seasonally adjusted, in accordance with the nearest Massachusetts Highway Department permanent count station (non-limited access highway) data. Full 15-minute increment results must be submitted electronically. An average daily summary in one-hour increments should be included in the report (Table(s) 2.a.#);
 - b. **Pedestrian and bicycle counts**, to be 12-hour counts at the entrance to the site and at the ATR count locations or other locations as determined by the City of Cambridge. Indicate the side of street and direction. Include date and weather. Counts are not valid in inclement weather (heavy rain or snow). If counts are not collected during the months of April, May, September or October, then a second set of counts must be taken during these months as part of mitigation for the project. One-hour summaries should be reported (Table(s) 2.b.#);
 - c. **Intersection turning movement counts (TMC's) and queues** must be collected at all signalized traffic study intersections. TMC's must be collected at all unsignalized intersections, with queues collected only where specified by the Department during scoping. TMC's will be for the weekday periods 7:30 to 9:30 A.M. and 4:30 to 6:30 P.M. (retail projects must include a Saturday 11:00 to 1:00 midday peak). Counts should be avoided during weeks with public and major religious holidays and school break weeks, and during the period between two weeks before Christmas and New Years week. Include date and weather. Counts are not valid in inclement weather (heavy rain or snow). If counts are not collected during the months of April, May, September or October, then a second set of counts may be required during these months as part of mitigation for the project. Locations must receive prior approval by the City of Cambridge. Counts to include:
 - (1) Total cars, trucks, and buses, reported separately by movement;

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- (2) Pedestrians, by each crossing, each direction, and each side of street;
- (3) Bicycle turning movements, by street and direction, including bikes on sidewalks;
and
- (4) Average queue counts, by lane, for each approach at signalized intersections.
(Queues are measured by counting the number of waiting vehicles immediately before receiving a green indication);

TMC's should not be taken at the following times where possible. If necessary, they must be approved by the City. Such data shall be seasonally adjusted, as follows (these guidelines are cumulative):

- When colleges are not in regular session, increase by 3 to 6 percent, depending on proximity to colleges. Adjustment to be approved by the City of Cambridge;
- When public schools are not in session, increase by 3 to 5 percent, depending on proximity to public schools. Adjustment to be approved by the City of Cambridge;
and
- During July and August employee summer vacations. Increase by 4 percent.

Raw TMC and queue data collection sheets shall be included in the Appendix. Data shall be submitted electronically to the City in an approved format (JMAR files or an Excel template available from TP&T). TMC's for total vehicles in the AM and PM shall be summarized on separate figures (Figures 2.c.1 & 2.c.2). TMC's for pedestrians and bicycles shall be Figures 2.c.3-4. and 2.c.5-6. respectively. Vehicle queues shall be summarized in Table(s) 2.c.#;

- d. **Traffic crashes**, summarized from the Massachusetts Highway Department records; to be for the previous 3-year period, summarized by date, crash type, injury, involvement of trucks, involvement of pedestrians and/or bicycles, lighting, surface condition, and weather (Table(s) 2.d.#);
 - e. **Public Transit**; obtain most recent daily, AM, and PM boarding and alighting information (include Saturday for residential or retail projects) for stops/stations within 1/2 mile of the project site from the MBTA for buses and subways. Include a summary of transit schedules and headways for each service (Tables 2.e.#); and
 - f. **Parking**. For any existing parking to remain with the project, perform a utilization study, including peak accumulation for motor vehicles, carpools, and bicycles (Table(s) 2.f.#).
3. **Project Traffic**. The trip generation material in the approved scope (Section II.3.a, e, & f) shall be repeated here as Table(s) 3.a.# and Figures 3.a.#, with truck trips summarized on Table(s) 3.b.#. This methodology also shall be used to satisfy the "Project Vehicle Trip Generation" special permit criteria in Section IV.1.a. below.

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4. Background Traffic. The study forecast period shall be five years or the anticipated completion of building(s) occupancy, whichever is later.
 - a. Generalized background growth shall be 0.5 percent annually, unless otherwise approved by the City of Cambridge;
 - b. Off-site project background growth shall be based on projects and occupancy rate approved by the City of Cambridge. Off-site project traffic and assignment shall be based on approved traffic studies prepared for the project or, if unavailable, on ITE rates adjusted in accordance with City of Cambridge guidelines (see Section II.3.); and
 - c. Determine programmed changes in the roadway and intersection infrastructure for the traffic analysis below, based on discussion with the City of Cambridge.
5. Traffic Analysis. Analyses for two peak hours (and the Saturday midday peak for retail projects) shall be performed, to include **TMC's**, **capacity analysis** and **queue analysis**, for the following conditions:
 - a. **Existing Condition**. Existing traffic at all study area intersections;
 - b. **Build Condition**. Existing Condition plus project traffic for existing and site access intersections, without any future off-site roadway infrastructure changes. Distributed existing plus project trips shall be shown for the AM and PM in Figures 5.b.1 & 2. This condition shall be evaluated by the special permit indicators;
 - c. **Build with Mitigation Condition (Only if mitigation is planned)**. Build Condition with assumptions for off-site transportation infrastructure changes, including traffic signal operation changes. All assumptions for off-site transportation infrastructure changes to be approved by the City. For projects that have an approved Parking and Transportation Demand Management (PTDM) plan, this analysis must include trip generation based on their PTDM mode split; and
 - d. **Future with Mitigation Condition**. Build Condition traffic, with assumptions for off-site transportation infrastructure changes (if any), plus background traffic to study planning horizon. Distributed future AM & PM trips shall be shown in Figures 5.d.1 & 2.
6. Capacity Analysis Methodology. Standard VLOS analysis as determined through the use of SYNCHRO software shall be used. At rotaries, the United States Method for Roundabouts or an alternate methodology approved by TP&T shall be used. These methodologies shall be used to satisfy the "Vehicle Level of Service" special permit criteria in Section IV.1.c below. Capacity analysis results for Existing, Build, Build With Mitigation (if applicable), and Future With Mitigation Conditions are to be summarized on

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Table(s) 6.# for level-of-service, V/C, and delay, for each intersection and each intersection approach (see attached example).

- a. Analysis will be in accordance with latest edition of the *Highway Capacity Manual*;
 - b. The ideal saturation flow rate shall be 1900 vehicles per lane. RTOR is not allowed. Peak hour factor shall be by approach as shown in TMC results. Area type is CBD. Lost time shall be yellow plus all-red plus LPI. Any other calibrated factor adjustments shall be explained in the TIS text.;
 - c. Signalized intersection capacity results shall be presented for all approaches. Unsignalized intersection capacity results shall present all minor intersection movements. Unsignalized intersection LOS shall be for the most restrictive minor movement; and
 - d. Capacity analyses shall not be conservative. All attempts to match modeled operations to existing conditions shall be made. For intersections that have approaches with a tremendous amount of side-friction (driveways, parking, bus maneuvers, etc.), the City may ask for a saturation flow study for that approach. This can happen during scoping or TIS preparation if the proponent's engineer cannot match the analyzed condition to the observed.
7. Queue Analysis. This methodology shall be used for the "Lane Queue" special permit criteria in Section IV.1.d. Summarize actual Existing, modeled Existing, modeled Build, modeled Build with Mitigation, and modeled Future with Mitigation queues in Table 7.
- a. For adjacent signalized intersections use the SYNCHRO model (or an equivalent approved by the City of Cambridge) with vehicle length = 25 feet;
 - b. Queue analysis applies to signalized intersections; unsignalized intersections may be included by the City of Cambridge if relevant for project impact; and
 - c. Queue analysis shall be presented for all lane groups for average queue.
8. Residential Street Volume Analysis. Existing, Build, Build With Mitigation (if applicable), and Future With Mitigation Condition peak hour volumes and percentage increase on all study area roadway segments which are forecast to carry project traffic shall be summarized in Table 8, including an indication of traffic on residential streets, as determined below.
- a. Traffic on residential streets, which will be indicated to satisfy the "Vehicle Traffic on Residential Streets" special permit criteria in Section IV.1.b., shall be presented as follows:
 - Identify all street segments evaluated by beginning and ending cross street, and confirm street segments to be evaluated with the City;

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- Traffic on residential streets will be analyzed for each one-block segment of street in the study area; and
 - The fraction that residential uses represent will be determined by the amount of first floor frontage that is residential on each segment.
9. Parking Analysis. Provide an analysis and summary of Build and Build with Mitigation parking demand consistent with vehicle trip generation assumptions and modal split assumptions for project traffic in Table 9. The methodology to determine the future parking demand generally consists of the following steps but must be approved by the City of Cambridge for certification:
- a. Determine the employee density and an appropriate parking rate (per 1,000 square feet building area or other relevant parameter, generally as determined by the ITE Parking Generation manual); and
 - b. Multiply parking rate by employee density and automobile mode split (SOV plus rideshare; see Section II.5) to determine parking demand.
10. Transit Analysis. Provide an analysis and summary of Existing, Build and Build with Mitigation public and private transit usage, capacity and headway in Table(s) 10.#. The analysis should involve the following:
- a. A distribution and assignment of peak-hour project transit demand among all available services; and
 - b. Analysis of increase in transit system use during the peak hours due to the project and changes in available reserve capacity. For retail, include analysis of midday Saturday peak service headways, capacity and demand. For residential developments, analyze off-peak and weekend headways & capacity.
11. Pedestrian Analysis. This methodology shall be used to satisfy the “Pedestrian & Bicycle Accommodation” special permit criteria in Section IV.1.e. Provide an analysis and summary of Existing, Build, Build with Mitigation, and Future conditions in Table(s) 11.#.
- a. Analyze pedestrian level-of-service for the AM and PM peak hour of pedestrian demand at all study area intersections and crosswalks that have project vehicle trips and project pedestrian trips accessing transit. Use equations 18-5 and 18-21 in the HCM 2000. The effective pedestrian green time shall be the walk time plus 4 seconds. This methodology also applies for marked mid-block crossings. Results shall be reported for each crosswalk in Table 11.a;
 - b. Analyze pedestrian crossing gap at unprotected crosswalks (those without signal or stop control) and mid-block crosswalks in Table 11.b. Determine minimum acceptable gap at each crossing and number of gaps available during the peak hour.

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- Minimum gap shall be computed according to the following formula:

$$G_{\min} = (W / S) + R$$

where, W = crossing distance

S = walking speed (3.5 ft./sec. unless otherwise approved)

R = pedestrian start-up time (3 sec. unless otherwise approved)

- A yielding survey shall be conducted when special permit criteria are not met and the number of minimum gaps falls below 60/hour; and
- c. Analyze pedestrian access to/from the site within a one-block radius and along principal access routes (to and from transit, parking, nearby retail, etc.) and summarize in Table 11.c.
- Identify needed improvements to side sidewalks and walkways based on the survey conducted in Section III.1.a.; and
 - Conduct a walk time study on principal access routes.

12. Bicycle Analysis. This methodology shall be used to satisfy the “Pedestrian and Bicycle Accommodation” special permit criteria in Section IV.1.e. Provide an analysis and summary of the Existing, Build and Build with Mitigation conditions in Table(s) 12.#.

- a. Identify conflicting vehicle turning movements at all study area intersections where bicycle facilities are present or peak hour bicycle volume exceeds 10 on any approach (Table 12.a.);
- b. Evaluate bicycle access to site along streets and at intersections along all paths where vehicle trips are distributed, or on likely suitable alternatives (Table 12.b.), including roadway cross-sections, presence of bicycle facilities, and ability to install new on- and off-street bike facilities; and
- c. Evaluate available bicycle parking on- and off-site, including access to parking, quality and security (Table 12.c.).

IV. Guidelines for Presenting Information to the Planning Board

1. Reporting on Planning Board Special Permit Criteria, Approved November 27, 2001

In determining whether a proposal has substantial adverse impact on City traffic, the Planning Board shall apply the following indicators (results to be reported in the TIS in the attached format). When one or more of the indicators is exceeded, it will be

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indicative of potentially substantial adverse impact on City traffic. In making its findings, however, the Planning Board shall consider the mitigation efforts proposed, their anticipated effectiveness, and other supplemental information that identifies circumstances or actions that will result in a reduction in adverse traffic impacts. Such actions and efforts may include, but are not limited to, transportation demand management plans; roadway, bicycle and pedestrian facilities improvements; measures to reduce traffic on residential streets; and measures undertaken to improve safety for pedestrians and vehicles, particularly at intersections identified in the Traffic Study as having a history of high crash rates.

a. Project vehicle trip generation weekdays and weekends for a twenty-four hour period and A.M. and P.M. peak vehicle trips generated

Project Vehicle Trip Generation is the average number of new vehicles (including truck deliveries, if any) which arrive and depart as a result of a development project, as determined by the latest edition of Trip Generation (by the Institute of Transportation Engineers).

Criteria: Project-based trip generation in excess of:

- 2,000 weekday or weekend (24-hour) trips; or
- 240 peak hour (A.M., P.M. or Saturday midday) trips.

b. Change in level of service at identified signalized intersections

Vehicle Level of Service (VLOS) is a measure of the operation of a signalized intersection, unsignalized intersection, or rotary during peak traffic hour, as determined by the 2000 Highway Capacity Manual (HCM 2000).

Criteria: A project-induced VLOS reduction or roadway volume increase at any study area intersection in excess of the amount allowed in the following table:

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

c. Increased volume of trips on residential streets

Vehicle Traffic on Residential Streets refers to the magnitude of project vehicle trip generation during any peak hour that may reasonably be expected to arrive and/or depart by traveling on a residential street.

Criteria: Based on the following two parameters, a project-induced traffic volume increase on any two-block residential street segment in the study area, in excess of:

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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.

d. Increase of length of vehicle queues at identified intersections

Lane Queue refers to the average number of vehicles during the peak hour waiting in a given lane from the front of the intersection to the last vehicle stopped in the lane, as determined and modeled by the HCM 2000.

Criteria: A project-induced lane queue or increase in lane queue in excess of the amount allowed in the following table:

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

e. Lack of sufficient pedestrian and bicycle facilities

Pedestrian Delay is a measure of pedestrian crossing delay during the peak hour at signalized, unsignalized or mid-block crossings, as determined by Pedestrian Level of Service (PLOS) analysis in the HCM 2000 and approved by the City.

Criteria 1: A project-induced increase in pedestrian delay at any study area crosswalk in excess of the amount allowed in the following table:

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

Safe Pedestrian Facilities are sidewalks, crosswalks or walkways on any publicly-accessible street or right-of-way (ROW) which meet City design standards, including handicap treatments.

Criteria 2: Safe pedestrian facilities must exist on any adjacent publicly-accessible street or ROW; and they must connect to site entrances, interior walkways, and adjoining pedestrian facilities.

Safe Bicycle Facilities are on-street bicycle lanes or off-road paths along a publicly-accessible street or right-of-way which meet City design standards.

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Criteria 3: Where sufficient ROW currently exists, safe bicycle facilities must exist or sufficient ROW must be preserved on any adjacent publicly-accessible street or ROW; and they must connect to site entrances, interior pathways, and adjoining bicycle facilities.

2. Additional Information for Presentation to the Planning Board In addition to summarizing the TIS and reporting on the indicators of impact, the following areas should receive special attention in any transportation-related presentation to the Planning Board. (this information shall NOT be submitted with the TIS.)

Parking and TDM Summary. Describe future parking demand based on the analysis in Section III.8. Identify all existing and proposed on-site and off-site parking locations to be used by this project. Identify any TDM measures including any approved PTDM plan. Projects that plan to request zoning board approval for parking that is less than the zoning minimum must provide justification for the request including a comprehensive Transportation Demand Management (TDM) program.

Transit Summary. Describe transit demand and service as analyzed in section II.9. Include summary of capacity and headways for public and private transit services within a 5-minute walk and within a 10-minute walk.

Crash Summary. Provide a summary of crash data for all study area locations with an average of 5 or more crashes per year as identified in III.2.d.

3. Reporting on Mitigation Measures. Indicate transportation system improvement measures that will be made to mitigate the impact of the proposed development. This information shall be included in the TIS. Measures should be presented in any of the following three categories:.
 - a. Special Permit Criteria Failures. Indicate the actions that will be made to satisfy the Planning Board's special permit criteria if any of the criteria are not met, and indicate the results of the proposed mitigation. Transportation system improvements should be recommended for all locations predicted to fail a trip generation, residential traffic, VLOS, queue, or bicycle and pedestrian criterion. Improvements may include, but are not limited to, the following:
 - Intersection geometry improvements, signal controls and equipment, signal timing, pavement markings, curb cut locations, etc.;
 - Pedestrian crossing markings, pedestrian signals, sidewalks, etc.; and
 - Bicycle lanes, bicycle signals, off-street bicycle facilities, etc.
 - b. Transit Service Enhancements. Indicate any public or private transit service enhancements that will be made by the proponent. These enhancements may include, but are not limited to, any provisions of an approved PTDM plan and/or any of the following:

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- MBTA infrastructure and service enhancements, including station improvements & relocations, new service, improved routing, new transit infrastructure, etc.;
 - Private transit services, including shuttles, guaranteed ride home, shared automobile, bad-weather ride home, etc.; and
 - Transit information, including automated service notification, schedule information, signing, etc.
- c. Adjacent Public & Private Infrastructure Improvements. Indicate any public or private infrastructure improvements that will be made to improve the transportation infrastructure on-site or adjacent to the site, including any of the following:
- Transit stops, transit shelters, benches, vestibules, etc.;
 - Pedestrian crossings, countdown signals, sidewalk ramps, street furniture, pathways, etc.; and
 - Bicycle access, parking, lockers, showers & changing rooms, “bike stations,” etc.

V. Reporting Procedures.

1. The TIS shall be prepared under the direction of and signed by a Massachusetts Registered Professional Engineer.
2. The TIS report shall be printed double-sided and distributed as follows:
 - a. Two (2) copies to the Cambridge Traffic, Parking & Transportation Department;
 - b. Two (2) copies to the Cambridge Community Development Department; and
 - c. One (1) copy directly to the Cambridge traffic consultant or other designated representative for peer review.
3. Report will include:
 - a. A list of tables and a list of figures on the front cover;
 - b. Table and figure numbers to follow the numbering format identified in the Guidelines;
 - c. All pages to be printed double-sided and numbered;
 - d. A completed summary page using the attached format, also to be submitted electronically;
 - e. A summary of the project performance against the Planning Board criteria of no more than three pages using the attached format, also to be submitted electronically;
 - f. All ATR, TMC and SYNCHRO files; and

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- g. All of the above materials **MUST BE RECEIVED** at the TP&T Department before the 21-day response window begins.

Revised 11-28-11 (Sixth revision)