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August 28, 2017

Mr. Michael Kulesza, Chairman
Zoning Board of Appeals
Town of Norfolk
One Liberty Lane
Norfolk, MA 02056

Subject: Responses to Comments from Traffic Peer Review for Abbyville Commons, dated July 21, 2017

Dear Chairman Kulesza:

In response to peer review comments prepared by BETA Group, Inc. (BETA) for the Board, Green International Affiliates (Green), is pleased to submit the following responses on behalf of the Applicant and pertaining to the traffic analysis and plan. The essence of the comments are repeated in bold and followed by the relevant response. The comments were made in relation to the April 2017 updated TIAS[1] of the proposed Abbyville Commons project in Norfolk, MA.

Existing Traffic Volume Conditions

1. **While we find this methodology of increasing the traffic counts to represent current traffic-volume conditions to be reasonable, MassDOT guidelines state that historical traffic counts should be increased by a seasonal adjustment, a background growth rate, and any new traffic from developments that have been completed subsequent to the time of the original counts. Since the traffic study states that MassDOT guidelines were used in preparing the assessment, it is recommended that the Applicant confirm with the Norfolk Town Planner that no additional developments have been constructed after the September 2015 traffic counts that would increase traffic volumes within the study area.**

   Response: Correspondence with the Norfolk Town Planner, the Norfolk Zoning Board of Appeals (ZBA), the Wrentham Town Planner, and the Franklin Department of Planning & Community Development was originally conducted in September 2015. Updated correspondence with the Norfolk Town Planner and the Norfolk ZBA was conducted in February 2017. There was nothing identified that would require further adjustment in developing base 2017 volume networks.

2. **Based on ITE methodologies, standard traffic engineering practice is to evaluate the impacts of a development during the time periods that would result in the highest cumulative directional demands (i.e., the combination of adjacent street traffic and site trips). … Since the traffic study states that MassDOT and ITE guidelines were used in preparing the assessment, it is recommended that the Applicant confirm that the Saturday Midday peak hour is not a critical time period for the proposed development based on the combination of site trips and adjacent street traffic volumes. This effort could be accomplished by either collecting traffic counts within the study area during the Saturday Midday peak period (11 AM-1 PM) or researching available**

[1] Green International Affiliates, Inc., Traffic Impact & Access Study, Proposed Abbyville Commons, Norfolk, MA, April 2017.

traffic counts on a Saturday from the records of the Town of Norfolk, Metropolitan Area Planning Council (MAPC), and MassDOT.

Response: Weekday peak hour analysis is considered sufficient for residential projects, per Section II.D of the March 13, 2014, Transportation Impact Assessment Guidelines ("while most office / industrial / residential studies include the weekday a.m. and p.m. peak hours", as opposed to just "weekday evening … peak hour analysis"). This is also consistent with ITE guidelines, which we have attached a relevant excerpt from the ITE Recommended Practice[2] that indicates the typical study periods for residential based developments. The predominant land use in the vicinity of the proposed development is residential. All of the roadways intersecting Lawrence Street and Park Street have only residential or some farm land uses. In conclusion, this is not a retail area or a unique (i.e. resort area) environment in which Saturday conditions could be substantively higher than the weekday periods. Consequently, it can be reasonably concluded that the study periods used for this assessment are adequate to understand its impacts and access requirements.

Safety Analysis

3. **The traffic study notes a visibility constraint at the Park Street and Main Street intersection due to the horizontal curvature of Main Street to the west. Based on field reconnaissance, we noted limited sight lines from Park Street to the east and west due to vegetation on the southeast and southwest corners of the intersection. It is recommended that the Applicant coordinate with the Norfolk Police Department to determine whether any safety concerns exist within the study area. If safety issues are identified, it is recommended that the Applicant coordinate with the Norfolk Planner, Director of Public Works, and Police Department in developing safety improvement measures that should be considered.**

   Response: The sight distance constraint that has been noted is related to the existing condition on Main Street in which the combination of horizontal alignment and vertical grade approaching Park Street from the west reduces the available visibility of Park Street. This was previously noted years ago when the MBTA rebuilt the Park Street bridge over the tracks, which is why they installed the flashing beacons including an overhead and one on a post. The problem with the MBTA installation is that the beacons are not as effective as they should be for motorists approaching Park Street from the west. We have met with the police chief to discuss this issue and have included a mitigation action to improve the situation. The proposed mitigation action is discussed later. As for the vegetative growth on the intersection corners, this is within town layout and vegetative control should be part of the normal local maintenance program. If verified to be an issue in the future, the Applicant will, however, provide assistance with vegetative trimming within the town layout at this location at the start of construction.

Vehicle Speed Data

4. **With the lack of pedestrian and bicycle facilities provided along Lawrence Street adjacent to the site, the high number of vehicles traveling faster than the posted speed limit (85th percentile speeds up to 6 mph above posted speed limit), and the horizontal and vertical curvatures of Lawrence Street, it is recommended that the Applicant coordinate with the Norfolk Planner, Director of Public Works, and Police Department in determining speed reduction measures that should be considered.**

[2] Institute of Transportation Engineers, Traffic Impact Analysis of Site Development, A Recommended Practice, Washington, D.C., 2010.

Response: We recognize that Lawrence Street has had a "tight" pavement width since it was originally established and given the existence of Bush Pond, it is not proposed to widen this road where it abuts the pond. Our collection of speed data does show that motorists in the vicinity of the site access drives are traveling generally higher than the posted speed, although the large majority (approximately 61% to 65%) within 30 mph and 39 mph. In general, walking and bicycling are being encouraged throughout the region and as noted by Beta, there are no pedestrian or bicycling facilities on Lawrence Street. Reducing speeds on Lawrence Street would be a safety benefit for pedestrians and bicyclists. The Applicant will continue working with the town in an effort to improve the pedestrian environment between Park Street and the site. Signage and/or pavement markings can also be potentially added to Lawrence Street between the western site drive and Park Street as part of the overall traffic mitigation plan in an effort to increase awareness to motorists of potential pedestrians and bicyclists which could also have a positive effect on reducing travel speeds. Coordination with town staff will be completed to finalize preferred actions.

5. **With the lack of pedestrian and bicycle facilities provided along Park Street between Bush Pond Road and Lawrence Street combined with the high number of vehicles traveling faster than the posted speed limit (85th percentile speeds up to 8 mph above posted speed limit), it is recommended that the Applicant coordinate with the Norfolk Planner, Director of Public Works, and Police Department in determining speed reduction measures that should be considered.**

   Response: While Park Street is not a direct abutting street to the proposed development, the Applicant will discuss this issue with town staff and determine if there are preferred actions that can be implemented as part of the proposed development to help address this issue.

Future No-Build Traffic Volumes

6. **Since there were no MassDOT historical traffic data provided in the Town of Norfolk, it is recommended that the Applicant coordinate with the Norfolk Planner and MAPC staff to confirm an appropriate growth rate for this area. This request is consistent with MassDOT guidelines in developing 'general background growth' for the area and is important since the traffic study desires to use an arbitrary growth rate that is lower than actual annual traffic-volume trends.**

   Response: In response to Beta review comments, Green did correspond with the Metropolitan Area Planning Council on growth rates for the area of Norfolk including in vicinity of the project. The projected MAPC growth in this area indicates an annual growth rate of 0.5%. Relative to this percentage developed my MAPC, the one percent annual growth rate used in the April 2017 report represents a conservative assumption. Furthermore, it should be kept in mind that our approach to developing future No-Build volumes uses a combination of background growth trend rates and site specific developments as appropriate. The MAPC growth projection is a long range modeling projection that is based on population projections over the next 20 to 30 years. Consequently, the method used in conducting traffic impact studies will tend to be on the conservative side of the spectrum.

7. **Since the traffic study did not state whether coordination efforts took place with Town of Norfolk officials, it is recommended that the Applicant coordinate with the Norfolk Planner and MAPC staff to determine whether additional developments should be considered within the future traffic volume projections.**

   Response: The study report should have stated that research was done through contact with the town planning staff in Norfolk as well as in Wrentham and Franklin. Updated coordination with the

Norfolk Town Planner and the Norfolk ZBA was conducted in February 2017 in preparing the April 2017 report.

Future Build Traffic Volumes

8. **Although the traffic study describes that Lane Use Code 221 (Low-Rise Apartment) was used to estimate site trips for the proposed apartment development, the trips tabulated within Table 3.2 and provided in the Appendix were calculated using Land Use Code 220 (Apartment). Therefore, it is recommended that the methodology used in determining the projected site trips be clarified.**

   Response: The analysis is based on Land Use Code (LUC) 220, the use of "221" is a typographical error. We made a determination that an analysis based on LUC 220 is likely more accurate due to the larger data sample size available for this land use code. The references to LUC 221 should be to LUC 220.

9. **Projected site trips were not provided for a Saturday or during the Saturday Midday peak hour. Consistent with ITE and MassDOT guidelines, it is recommended that traffic generation estimates be provided for these conditions to help determine whether the Saturday Midday peak hour is a critical time period for the proposed development based on the combination of site trips and adjacent street traffic volumes.**

   Response: See previous response.

10. **The full build-out traffic volume estimates tabulated in Table 3.2 may need to be modified depending on which land use code is supposed to be used for the proposed apartment component.**

    Response: There is no modification to the full build-out trip generation estimates required as the trip generation used in the analysis and Build traffic volumes was based on LUC 220 as is presented in the Appendix.

11. **There appears to be a typo in Table 3.2 for the full build-out projections as the entering site trips and the total site trips during the Weekday PM peak hour are the same (194 trips). It is recommended that the estimated site trips for the full build-out of the site be reevaluated.**

    Response: There is a typographical error in Table 3.2. The number of entering trips for the weekday PM peak hour the full build-out projection should indicate 124 while the total trips during the PM peak hour is estimated to be 194. The numbers of vehicles shown in Figure 7 (Estimated Site-Generated Trips) and used in the analysis are correct. An updated Table 3.2 is attached to this response.

Intersection Analyses

12. **Based on MassDOT guidelines, the proponent may need to commit to a mitigation program if the development is anticipated to add vehicle trips to an intersection that is already performing with poor operations (e.g., LOS D or below in rural areas and LOS E or below in urban areas). In addition, state guidelines suggest that a development might have a significant impact at an intersection that should be mitigated if the addition of site trips results in an increase of 10 seconds of delay (Weekday AM = +17.5 seconds, Weekday PM = +38.2 seconds). Since the traffic study states that MassDOT guidelines were used in preparing the assessment, it is recommended that the Applicant coordinate with the Norfolk Planner and Director of Public Works to develop and**

implement mitigation measures to improve operations and offset the project's impacts at this intersection.

Response: A proposed mitigation program has been outlined by the Applicant and is summarized later in the response as well as described in the April 2017 study. The intersection of Main Street at Park Street experiences long estimated delays during the peak hours under current conditions, however, there are no feasible alternatives to alleviate the delays due to the location and design of the MBTA bridge on Park Street. Safety related actions at this intersection, however, have been included in the proposed mitigation plan.

Sight Distances

13. **The traffic study identified that the horizontal curvature of Lawrence Street hinders sight lines. In addition, our field reconnaissance revealed that Lawrence Street adjacent to the site has a vertical curve that could contribute to limited sight lines at the proposed site driveways. It is recommended that Sight Line Profile Plans be prepared to demonstrate that sight lines would be available to meet minimum AASHTO requirements to provide safety for the future residents of the development as well as for the traveling public along this section of Lawrence Street.**

    Response: Analysis of sight lines has been completed and we have worked closely with the site engineer in developing the site access drive intersections. As indicated in the traffic report, there will be clearing and re-grading in the vicinity of the proposed site drives to ensure adequate visibility. The sight line triangle necessary to meet minimum criteria was demonstrated in the traffic report. A more detailed sight line profile plan will be prepared and submitted separately.

14. **On the sight line plan for the west site driveway (Figure 10), site lines from the site driveway to the east are shown cross onto an abutting property. If this abutting property is not part of the subject site, it is recommended that the Applicant pursue a sight line easement to prevent the use of the land identified.**

    Response: Sight lines based on desirable distances and minimum required (per Federal Highway Administration "Green Book") distances are both shown in Figures 9 and 10. The sight line triangle crossing onto an abutting property in Figure 10 is a desirable sight distance line. The critical sight line triangles, for meeting minimum requirements, that are proposed to be kept clear <u>all lie entirely within the right-of-way.</u>

Improvement Measures

15. **In addition, the Applicant should develop and propose measures to alleviate safety issues and improve vehicular operations at the Park Street and Main Street intersection (see Comments T3 and T12); reduce vehicle speeds along the Lawrence Street and Park Street corridors (see Comments T4 and T5); and ensure available sight lines would be provided at the site driveways in accordance with AASHTO requirements (see Comments T13 and T14).**

    Response: The Applicant has been working with the town on a comprehensive package of improvements that would enhance conditions along Lawrence Street and the study intersections. At this point, the proposed mitigation plan is summarized in Table A attached to this response. The actions are intended to enhance safety for both motorists and non-motorists and assist the town in addressing the bridge condition and improve pedestrian/bicycle travel in the project area.

With the exception of providing the updated sight line profile plan as indicated above, we believe all pertinent questions, comments and requests have been responded to in a sufficient manner. Should the Board have any further questions, we would be happy to meet and discuss.

Sincerely,
GREEN INTERNATIONAL AFFILIATES, INC.

William J Scully

William J. Scully, P.E.
Director of Transportation Planning

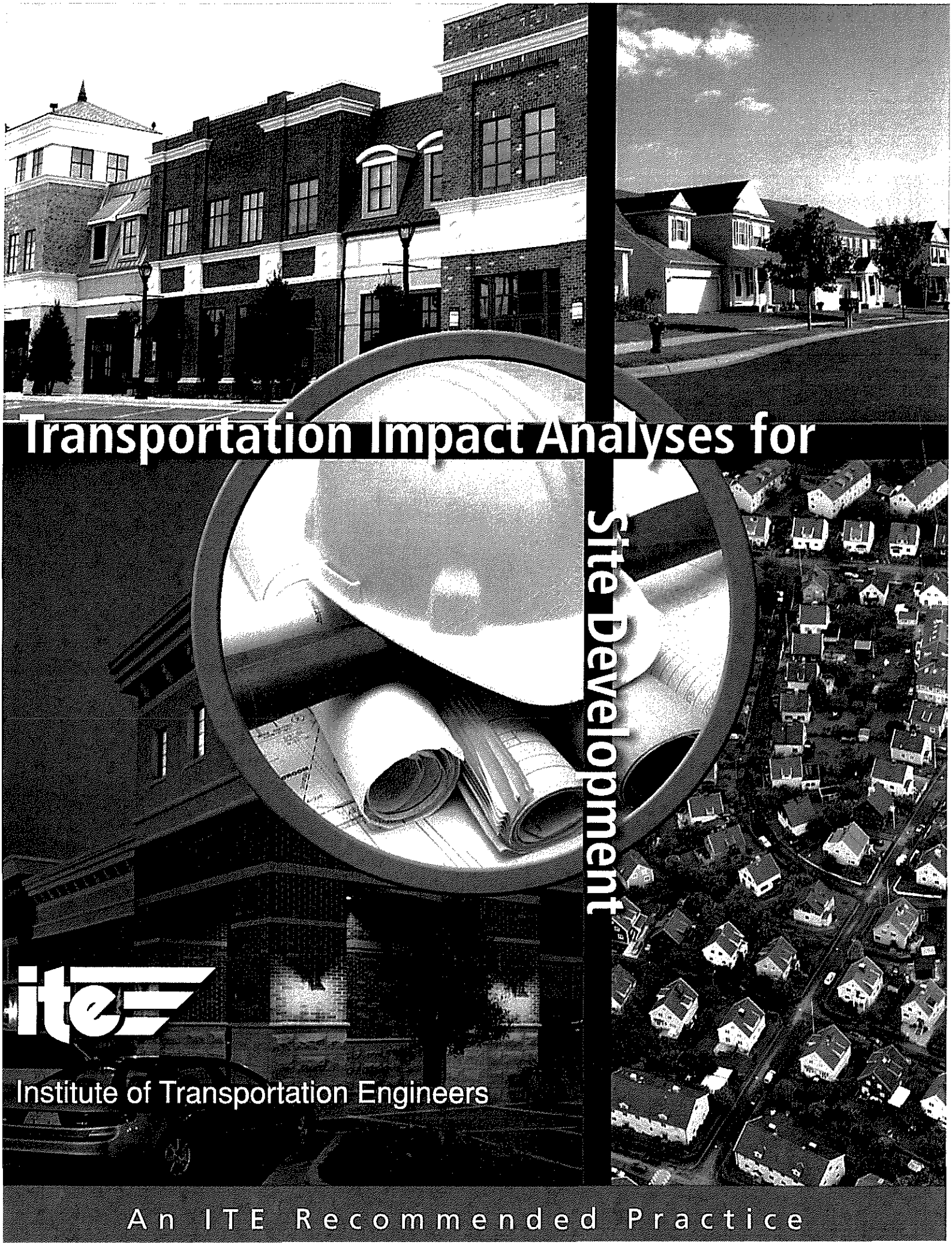
Attachments

Cc: T. DiPlacido
J. Smolak
J. Plourde, Beta Engineering

WJS/sm

TABLE A
SUMMARY OF PROPOSED TRANSPORTATION MITIGATION ACTIONS
ABBYVILLE COMMONS & THE PRESERVE AT ABBYVILLE

PROPOSED ACTION	LOCATION	NOTES
Vegetation clearing	Abutting site drives	Sight line triangle will be defined on approved site plans
Regrade roadside	On Lawrence Street abutting site drives	
STOP signs and markings	Site drive approaches to Lawrence Street	MUTCD compliant
Lawrence Street Bridge	East of site	Assist town with design and grant MassWorks application
Lawrence Street Improvement	Park Street to bridge	Includes 24-foot section with sidewalk; assisting town by providing design services
Lawrence Street Boardwalk	Bridge to Cranberry Village Drive/Site Drive intersection	Proposed as part of grant; would provide safe pedestrian connection without filling pond; providing design & permitting services
Advance warning signage	Eastbound approach to the Park Street / Main Street intersection	Could be W2-2R sign. Signage with LED lighting and solar power source; also possible vegetative trimming within town layout
Advance warning signage	Both approaches of Park Street at Lawrence Street	W2-2 signs



Transportation Impact Analyses for Site Development

Institute of Transportation Engineers

An ITE Recommended Practice

- The weighted average rate falls within the data cluster in the plot.

Collect local data when

- The study site is not compatible with the ITE land use code definition (Institute of Transportation Engineers, 2008);
- There are only one or two data points (preferably if there are five or fewer data points);
- The independent variable does not fall within the range of data; or
- Neither the weighted average rate line nor the fitted curve falls within the data cluster for the size of this specific development.

Choosing the Independent Variable

The choice of the independent variable can be one of the most important decisions in estimating trip generation. The selected variable should be easily projected with reasonable accuracy. When information is available for more than one independent variable, the predictive accuracy of both the independent variable and the trip generation rate or equation should be considered. Ideally, the independent variable having the strongest logical relationship with trip making should be selected (for example, gross square feet of building instead of site acreage). However, it is also important to check the sample size for each given independent variable. In the case of two variables with similar correlations, the variable with the larger sample should be used. Trip rates or equations based on small sample sizes should be used with care.

In the planning stage, some variables, such as employment and parking, are estimated on the basis of other variables, such as gross square feet of building space. When little is known about the size of the generator except the proposed use of the land to be developed, common development densities can be used to obtain a preliminary estimate of the independent variable. The local zoning ordinance should also be checked to ensure density compatibility.

Floor area is one of the most commonly used independent variables. There are, however, different ways to compute floor area, and there are different definitions. These must be consistent when determining a trip generation rate and should correspond to accepted floor area definitions. For example, office buildings include gross floor area, gross rentable area and net rentable area (Mehra and Keller, 1985; Hooper, 1989). Care should be taken to exclude areas such as large atriums, which do not by themselves generate trips (in other words, use net leasable area or subtract atrium areas from gross floor area). Gross leasable area is commonly used for shopping centers (Hooper, 1989). (Definitions for each of these terms are included in *Trip Generation*.)

Choosing the Appropriate Time Periods

The range of average rates for different time periods should be examined to determine when the generator in question peaks in traffic flow and to define the relationship between the peak generation and the peaking characteristics of the adjacent street system.

Transportation impacts should be evaluated for weekday peak hours if the site generates significant traffic during those periods. Analyses should generally be completed for other peak periods of site trip generation to assess ingress and egress capacity and turn lane storage needs.

For example, residential and general office developments share the same peak periods as the adjacent streets. Other uses, such as shopping centers, may generate an impact during the normal afternoon (p.m.) peak hour of the street system but may have an even greater impact later in the evening or on Saturdays. Shopping centers also normally generate only minor (or negligible) impacts during the morning (a.m.) street peak hour. *Therefore, the critical time periods should be analyzed to determine both site-specific design requirements (such as storage lengths) and the effect on normal peak traffic flow on the street system.* Table 5–3 shows typical peak periods for several land uses.

Daily and Seasonal Variations

Trip generation estimates for the average weekday are appropriate analyses for most but not all land uses. Uses such as shopping centers, banks and restaurants exhibit different daily patterns, which should be taken into account. For some land uses (such as movie theaters), more trips are generated on Friday or Saturday than on the average weekday (Institute of Transportation Engineers, 2008). Since there are 104 Fridays and Saturdays in a year, those days, rather than the average weekday, may be the design or analysis period for those land uses.

Table 5–3. Typical Peak Traffic Flow Hours for Selected Land Uses

Land Use	Typical Peak Hours[a]	Peak Direction
Residential	7:00–9:00 a.m. weekdays 4:00–6:00 p.m. weekdays	Outbound Inbound
Regional Shopping	5:00–6:00 p.m. weekdays 1:00–2:00 p.m. Saturdays 4:00–5:00 p.m. Saturdays	Total[b] Inbound Outbound
Office	7:00–9:00 a.m. weekdays 4:00–6:00 p.m. weekdays	Inbound Outbound
Industrial	Varies with employee shift schedule	---
Recreational	Varies with type of activity	---

[a] Hours may vary based on local conditions.
[b] Period of maximum weekday traffic impact.

SOURCE: Institute of Transportation Engineers, 2008.

Seasonal variations are also important for some land uses. As a prime example, U.S. shopping centers traditionally are busiest during the period between Thanksgiving (fourth Thursday in November) and Christmas. Consideration should be given to how such seasonal demands will be accommodated. Recreational and hotel land uses are often seasonal. Offices, resort hotels and tourist attractions are subject to vacation period impacts. Other types of development also vary by season.

Appropriate daily and seasonal variations should be taken into account in the collection and analysis of trip generation rates for such land uses.

Locational Variations

The use of trip generation data should take into account where the data were collected. For example, the database listed in *Trip Generation* contains data that were collected almost exclusively at suburban locations or outlying areas within the central cities (Institute of Transportation Engineers, 2008). Adjustments to estimates like these may have to be considered to reflect site-specific conditions, including the availability of public transportation and paratransit, the amount of walk-in business and the proximity of other developments (Institute of Transportation Engineers, 2008; Institute of Transportation Engineers, 2004; Mehra and Keller, 1985.)

Age of Database

Use of older trip generation data to predict future trips can be unreliable. The most recent data available should be used, even though a study conducted by the Federal Highway Administration showed no significant difference between pre-1973 and post-1973 trip generation data (except for apartments) (Mehra and Keller, 1985). A study conducted by ITE before the release of the 8th edition of *Trip Generation* in 2008 showed a difference between pre-2000 and post-2000 trip generation data for both drive-in banks and walk-in banks. The primary advantage of using up-to-date databases is that they may more accurately reflect the characteristics of current activity associated with a given land use.

Transit, Ridesharing and Other Demand Management Techniques

As previously indicated, most data currently available are from measurements made primarily at suburban locations, where there is little or no public transportation and few, if any, programs to manage traffic demand. If appropriate, the rates and/or equations may be adjusted to reflect the availability and use of alternate travel modes, ridesharing and other demand management programs. However, since a great deal of effort is often associated with such adjustments, any conclusions employing such assumptions should be discussed with the study reviewers in advance and then, if accepted, be carefully documented, scrutinized for reasonableness

Attachment

(Revised) Table 3.2 - Summary of Estimated Site Trip Generation

Apartment Component Only

TIME	ENTERING	EXITING	TOTAL
Weekday Daily	207	207	414
AM Peak Hour	5	22	27
PM Peak Hour	29	15	44

Source: ITE Trip Generation, 9th Edition, 2012; LUC 220

Single Family Housing Component Only

TIME	ENTERING	EXITING	TOTAL
Weekday Daily	753	753	1506
AM Peak Hour	28	85	113
PM Peak Hour	95	56	151

Source: ITE Trip Generation, 9th Edition, 2012; LUC 210

Total Site Including Single Family Housing & Apartments

TIME	ENTERING	EXITING	TOTAL
Weekday Daily	960	960	1920
AM Peak Hour	33	107	140
PM Peak Hour	124	71	195

Source: ITE Trip Generation, 9th Edition, 2012; LUC 210, 220