

Toll Free 800.835.8666 Tel 617.723.8882 Fax 617.723.9995 www.fstinc.com

July 28, 2005

Mr. Joseph F. Tulimieri Executive Director Cambridge Redevelopment Authority One Cambridge Center Cambridge, MA 02142

Subject: Kendall Square Urban Renewal Area

2005 Traffic Count Program and Trip Generation Analyses

Dear Mr. Tulimieri:

Fay, Spofford & Thorndike, LLC (FST) is pleased to submit this summary annual update of the Kendall Square Urban Renewal Area (the "Area") traffic count program to reflect May 2005 traffic conditions in the Area in compliance with the Area's Section 61 Finding requirements. Also included in this letter is an updated evaluation of the Area's existing trip generation characteristics compared to earlier projections FST made in connection with Plan Amendment # 7 in our letter dated January 28, 2005. Year 2005 tenant/employee travel surveys and parking garage data compiled by Boston Properties, LLP and Spaulding & Slye during the month of June have also been analyzed and summarized. The 2005 count program represents the eleventh year of the annual count update program.

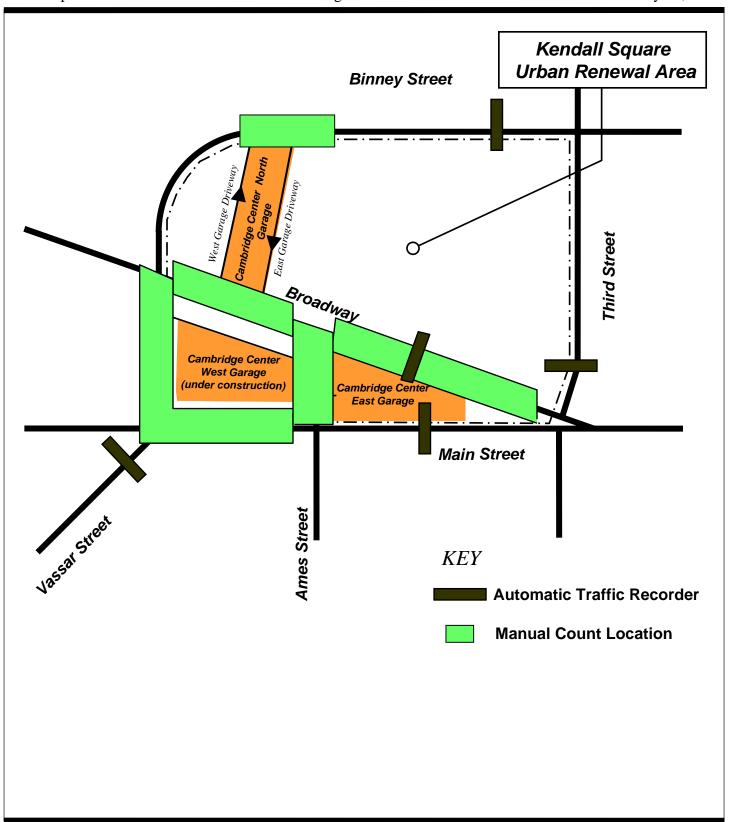
Task I - Traffic Count Program

Figure 1 illustrates the program of ATR and the manual vehicle count locations conducted within the Area. Copies of the ATR and manual count field sheets are provided in the attached Technical Appendix. The latest automatic traffic recorder count program was conducted during the fourth week in May 2005. Counts were conducted at the following locations:

- Main Street, east of Ames Street (May 23 27).
- Broadway, east of the Mid-Block Connector (May 23 27).
- Binney Street, west of Fifth Street (May. 23 27).
- Third Street, north of Broadway (May 23 27).
- Vassar Street, southwest of Main Street and the Western Connector (May 23 27).

Additionally, on Tuesday, May 24, 2005, manual vehicle counts were conducted to determine drop-off/pick-up activity and ins/outs from the Cambridge Center East and North garages between 7 AM - 9 AM, 11 AM - 1 PM, and 4 PM - 6 PM in the following seven block face areas:

- Main Street, between Ames Street and Wadsworth Street.
- Main Street, between Ames Street and Vassar Street.
- Broadway, between the Mid-Block Connector and Third Street.
- Broadway, between the Mid-Block Connector and Binney Street.
- Mid-Block Connector, between Main Street and Broadway.





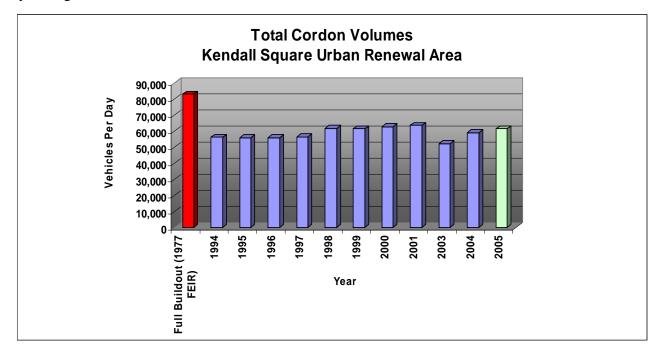
Schematic Diagram: Not to Scale Kendall Square Urban Renewal Area

Traffic Count Locations

Cambridge Redevelopment Authority

- Western Connector, between Main Street and Broadway.
- Binney Street, in the vicinity of the Cambridge Center North Garage driveways.

Refer to the Technical Appendix for detailed automatic and manual count data. Table 1 provides a comparison of the Average Annual Weekday Traffic volumes (AAWDT) projected in the 1977 FEIR to the Area's AAWDT volumes counted by FST during 1989-2005. Locations of the 1994-2005 AAWDT volumes summary comparison are illustrated on Figure 2. Highest volumes counted over the years are highlighted. Overall, AAWDT volumes increased 4.1% in 2005 compared to 2004. The increase in traffic may be partially related to on-going construction activity on Parcel 3 of the Area. New Parcel 3 buildings, including an 1,100 space garage, were not open during the count program. During the eleven-year period between 1994 and 2005, the Area's AAWDT volumes have increased 9.4% or approximately 0.8% annually. From the chart below, overall AAWDT volumes measured in 2005 were slightly lower than those measured seven years ago in 1998.



Two types of field data were collected manually -- vehicles entering and exiting to/from the Cambridge Center East and North Garages, and curbside drop-off/pick-up activities on Area streets and in designated zones at the local land uses. A summary of this data, by type and location, is contained in Table 2, which compares year 2005 to year 2004 manual count data compilations.

Between the 2004 and 2005 manual count programs, the total occupied development square footage in the Area has remained the same. We note, however, that new Parcel 3 development and Cambridge Center West parking garage in the block bounded by Main Street to the south, Ames Street to the east, Broadway to the north, Galileo Gallilei Way was under construction during the count program. Measured overall trip generation during the combined AM, mid-day, and PM peak hours increased by approximately 4%, inclusive of drop-off/pick-up activity.

Table 1

Kendall Square Urban Renewal Project Area

Comparison of Projected FEIR Full Buildout Average Weekday Traffic Volumes

To Actual 1989 - 2005 Average Weekday Traffic Volumes

1

ROADWAY	1977 FEIR Maximum Plan (vpd)	1989 Volume (vpd)	1994 Volume (vpd)	1995 Volume (vpd) ³	1996 Volume (vpd) ⁴	1997 Volume (vpd)	1998 Volume (vpd) ⁴	1999 Volume (vpd)	2000 Volume (vpd)	2001 Volume (vpd) ⁴	2003 Volume (vpd)	2004 Volume (vpd)	2005 Volume (vpd)
Main Street; 5 Near MBTA Station	7,900	4,230	6,320	5,400	4,050	5,250	5,900	5,800	5,500	5,950	5,700	5,400	5,100
Broadway; west of Mid-Block Connector	36,700	17,690	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M	N/M
Broadway; east of Mid-Block Connector	32,900	N/M	18,200	18,700	17,850	18,200	21,350	20,400	20,150	21,500	18,200	19,250	19,300
Binney Street; west of Third Street	11,500	8,820	10,900	11,200	11,750	12,050	13,400	13,850	14,100	14,250	13,200	12,800	13,550
Third Street;	16,300	N/M	10,600	10,350	12,400	11,000	11,200	11,050	11,750	11,650	11,550	10,600	9,200
Vassar Street; west of Main Street	14,700	N/M	10,300	10,600	9,950	10,000	10,100	10,550	11,300	10,400	3,900 ⁶	11,150	14,450
TOTAL ⁶	83,300	N/A	56,320	56,250	56,000	56,500	61,950	61,650	62,800	63,750	52,550 ⁶	59,200	61,600

¹ FEIR volume projections illustrated on FEIR Figures II.5.10 & II.5.11. Volumes include Main Street, Broadway east of the Mid-Block Connector, Binney Street west of Third Street, Third Street north of Broadway, and Vassar Street west of Main Street.

N/M = Not Measured. N/A = Not Applicable

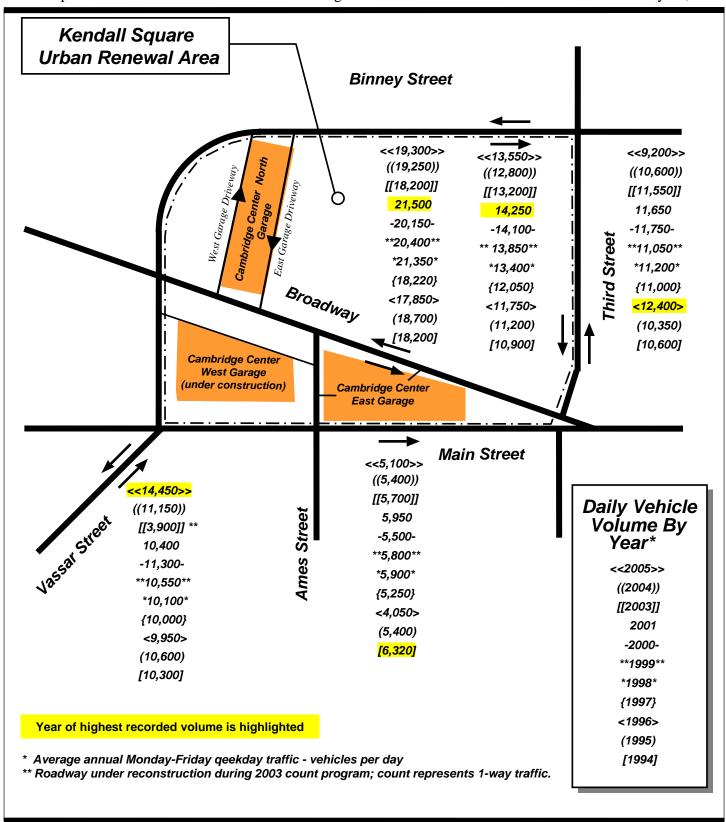
² vpd = vehicles per day on an average annual basis.

³ March 11-18, 1996 measured volumes calibrated (increased by 2 %) to reflect 1995 average annual conditions.

⁴ October 1996-2001 measured volumes assumed to reflect average annual conditions.

⁵ Eastbound AAWDT only.

⁶ Vasser Street was under reconstruction during the 2003 survey, and limited to one-way operation.





Schematic Diagram: Not to Scale Kendall Square Urban Renewal Area

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Area trip generation increased approximately 11% during the AM peak hour, was approximately 6% higher during the mid-day peak hour, and decreased approximately 5% during the PM peak hour. The year 2005 count program took place during a period when drop-off/pick-up activity represented approximately 41% of all trip making, which is within the average range of drop-off/pick-up activity observed during prior years. Overall, rates of AM, mid-day, and PM peak hour trip generation from Area developments are generally comparable to trip generation rates found during previous count programs.

During the combined AM, mid-day, and PM peak hours, Cambridge Center East and North garage activity increased by approximately 6% compared to the year 2004. Year 2005 drop-off/pick-up activity increased overall by approximately 23% compared to the year 2004. Drop-off/pick-up activity continues to represent the largest single variable in the Area's trip generation totals. During 2005, a street job action during the morning peak period resulted in higher drop-off/pick-up activity on Main Street than in prior years.

Binney Street remains the only roadway that has exceeded its projection of average weekday volumes at full buildout provided in the 1977 EIR. Overall, actual year 2005 average weekday volumes measured on the Area roadway cordon are approximately 26% below those projected at full buildout of the Area in the 1977 EIR.

As it has in prior years, the AM peak hour within the Area varies by location but typically occurs between the one-hour period from 8AM to 9AM. The Area's PM peak hour also varies by location but typically occurs during 5 PM to 6 PM. Count data indicates that the mid-day peak hour is typically between 12:00 Noon and 1 PM.

Table 3 provides a breakdown of the existing year 2005 land use quantities and types within the Area, and compares these development quantities to the maximum Area development permitted under Plan Amendment No. 7. As of May 2005, buildings in the Area contained approximately 2,381,700 square feet of gross floor area (sf GFA). This represents approximately 77% of the Area's maximum approved build-out potential of 3,077,100 gross square feet with Area Plan Amendment No. 7.

FST's January 28, 2005 letter to you contained estimates of AM peak hour, PM peak hour, and daily trip generation projected for the Area at maximum buildout with Area Plan Amendment No. 7. In that letter, trip generation rates (i.e., trips per 1,000 sf GFA of development) were developed for each of the development land use types using the ITE Trip Generation manual. FST adjusted these rates to reflect the Area's localized proximity to transit, walk-in activity, employer shuttles, carpool promotion, etc. The adjusted trip generation rates, verified by eleven years of counts performed between1994-2005, were used as the basis for trip generation estimates associated with the maximum buildout condition under MEPA-approved Area Plan Amendment No. 7. Table 4 provides a summary of adjusted trip generation rates for Area land uses from FST's January 18, 2005 letter.

Table 2 **Kendall Square Urban Renewal Project Area**Peak Hour Vehicle Count Summaries -- 2005 vs. 2004

	AM PEAK HOUR May 2004 May 2005				MIDDAY PEAK HOUR May 2004 May 2005				PM PEAK HOUR May 2004 May 2005									
LOCATION	IN	OUT	D/P ¹	IN	OUT	D/P	IN	OUT	D/P	IN	OUT	D/P	IN	OUT	D/P	IN	OUT	D/P
Cambridge Center North Garage	305	20		294	24		71	94		58	69		28	314		28	312	
Cambridge Center East Garage	210	21		254	18		38	31		103	47		38	200		51	193	
Main Street; Near MBTA Station			68			170			56			108			104			144
Broadway; east of Mid-Block connector			146			52			172			94			182			96
Broadway; west of Mid-Block connector	9	10	42	1	1	104	5	5	32	5	5	90	13	12	56	5	5	106
Mid-Block Connector; south of Broadway	39	9	70	12	5	164	14	13	26	5	7	32	12	44	38	4	5	38
Binney Street; vicinity of North Garage Driveways			0			8			0			4			2			4
Vassar Street/Main Street/ Western Connector Area	115	45	16	77	35	30	58	83	32	36	87	26	31	115	18	31	96	30
RAW SUBTOTALS	678	105	342	638	83	528	186	226	318	207	215	354	122	685	400	119	611	418
HOURLY TOTALS		1,125		1,24	9 (+11.0	0%)		730		770	6 (+6.3%	6)		1,207		1,1	48 (-4.99	%)

¹ D/P = Drop-off/Pick-up vehicle trips in or out counted on Tuesday, May 24, 2005 and Tuesday, May 18, 2004.

² Based on peak hour garage activity counted on Tuesday, May 24, 2005 and Tuesday, May 18, 2004 for the Cambridge Center East and Cambridge Center North garages.

Includes vehicles entering and exiting the surface lot west of the Mid-Block Connector.

⁴ A work stoppage occurring on Main Street during the morning of the count contributed to higher than usual drop-off/pick-up activity.

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Table 3

Existing 2005 and Future Development Quantities By Land Use Category

LAND USE TYPE	2005 EXISTING	PROJECTED MAXIMUM AREA DEVELOPMENT WITH PLAN AMENDMENT NO. 7
Biotech Manufacturing	2,000	214,550
General and Technical Office	1,769,700	1,977,550
Retail	90,000	90,000
Multi-family Residential	0	275,000 ²
Business Hotel	190,000	190,000
Hotel	330,000	330,000
TOTAL	2,381,700	3,077,100

- 1 Quantities indicate square feet (sf) of Gross Floor Area (GFA) from Plan Amendment #7.
- 2 The multi-family residential land use category increased by 75,000 square feet under approved Plan Amendment # 7.

Table 4

Kendall Square Urban Renewal Project Area

Adjusted Trip Generation Rates

LAND USE TYPE	AM PEAK HOUR	PM PEAK HOUR	DAILY	
Biotech Manufacturing	0.48	0.49	2.48	
General and Technical Office	0.62	0.55	4.41	
Hotel	0.46	0.48	5.71	
Business Hotel	0.35	0.38	4.39	
Retail	0.26	1.71	13.79	
Multi-family Residential ²	0.26	0.27	2.84	

- 1 Trips per 1,000 sf GFA based on trip generation adjustments made in FST's January 28, 2005 letter concerning Plan Amendment No. 7.
- 2 Trips per unit.

Table 5 applies adjusted trip generation rates from FST's January 28, 2005 letter. Table 5 contains an estimate of the number of trips projected for land uses in the Area assuming existing 2005 development quantities from Table 3 above. From Table 5, combined AM and PM peak hour trips to/from the Area constitute approximately 22.9% of the Area's 2004 projected total daily trip ends (i.e., 1,341 AM peak hour + 1,359 PM peak hour trips represent 22.9% of the 11,770 daily trips).

Drop-off/pick-up and goods delivery trips measured during May 2005 accounted for approximately 41% of Area trips occurring during the combined AM, mid-day, and PM peak hours -- 44% of the AM, 46% of the mid-day, and 36% of the PM peak hour trips. Measured drop-off/pick-up activity in the year 2004 was 6% higher than measured during the year 2003, but is generally consistent with earlier Area projections made by FST. Drop-off/pick-up activity has been the most variable Area trip generation factor over the years.

Table 6 provides a summary comparison of projected 2005 Area AM and PM peak hour trip generation to 2004 rates calculated from measured 2004 Area ground counts from Table 2. These are compiled from rates contained in the FST's January 28, 2005 Plan Amendment No. 7 letter and summarized in Table 5. Table 6 also contains a comparison of 2004 daily Area trip ends based upon measured AM and PM peak hour volumes to 2004 daily trip end volumes based on the adjusted trip generation rates contained in the Plan Amendment No. 7 analysis and reiterated in Table 5.

Table 5

Kendall Square Urban Renewal Area

Adjusted ITE Rate Trip Generation Computations for May 2005¹

	<u>Gross</u> Floor Area	<u>AM</u> <u>Peak Hour</u>			<u>M</u> : Hour	<u>Daily</u>		
LAND USE TYPE	(000's SF)	RATE	TRIPS	RATE	TRIPS	RATE	TRIPS	
Biotech Manufacturing	2	0.48	1	0.49	1	2.48	5	
General and Technical Office	1770	0.62	1,098	0.55	974	4.41	7,806	
Business Hotel	190	0.35	67	0.38	72	4.40	836	
Hotel	330	0.46	152	0.48	158	5.71	1,884	
Retail	90	0.26	23	1.71	154	13.79	1,241	
Residential	0	0.26	0	0.27	0	2.84	0	
TOTAL	2,382		1,341		1,359		11,772	

¹ Trips per 1,000 sf GFA adjusted to reflect assumed high use of transit and other non-single occupant vehicles per FST's January 28, 2005 letter concerning Plan Amendment No. 7.

From Table 6 on the page that follows, the year 2005 actual trip generation for Area uses in the AM peak hour is 10% lower than the level calculated by applying the Amendment No. 7 trip generation projection methodology (1,249 trips versus 1,341 trips). Similarly, the actual PM peak hour trip generation is 16% lower than the projected volume from the Amendment No. 7 trip generation projection methodology (1,148 versus 1,359 trips). Area development continues to generate traffic at rates generally lower than projected.

Similarly, daily trip ends to and from Area land uses during the year 2005, estimated at 10,451 are calculated to be 11% lower than would be expected using the 2005 Plan Amendment No. 7 analysis methodology.

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Table 6

Kendall Square Urban Renewal Area

Actual vs. Projected 2005 Trip Generation

	AM PEAK HOUR ¹	PM PEAK HOUR ¹	DAILY TRIP ENDS
2005 PROJECTED (FORECAST) ²	1,341	1,359	11,772
2005 EXISTING ³	1,249	1,148	10,451 ³
NET DIFFERENCE (%)	(- 7%)	(-16%)	(- 11%)

- 1 AM and PM peak hour trips represent both entering and exiting vehicle trip ends.
- 2 Predicted trip totals are based on adjusted trip generation rates developed for FST's January 28, 2005 letter regarding Area Plan Amendment No. 7 and the 2005 Area development quantities reported in Table 3 of this correspondence.
- Refer to Table 2 for existing May 2005 AM and PM peak hour trip counts. Daily trip ends were **estimated** from the actual AM and PM peak hour trip generation totals and their expected relationship to daily trip generation based upon the relationship of AM and PM peak hours to daily generation reported in Table 5 (adjusted ITE rates).

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Task II - Review of Tenant/Employee Travel Surveys

Two types of tenant/employee travel surveys were reviewed: 1) a survey by Boston Properties and Spaulding & Slye of their tenants; and 2) surveys of tenant garage use in the North and East Cambridge Center garages.

During June 2005, Boston Properties and Spaulding and Slye conducted surveys of their Cambridge Center tenants to provide an indication of employee travel mode choices and use within the Area. This information is supplemental to the actual count data. Refer to the Technical Appendix for a copy of the overall survey results.

The tenant survey was completed by a total of 14 firms and businesses representing 829 employees or approximately 21% of the Area's total number of employees, estimated at approximately 4,000. Overall tenant survey results are generally consistent with prior year surveys. Respondents to the June 2005 survey indicated that their employees arrive to Kendall Square as follows:

- 36% drive alone;
- 48% use MBTA services;
- 13% walk or bicycle; and
- 3% carpool with 2 or more people.

Approximately 64% of respondents indicated they use alternative modes of transportation to and from work rather than drive alone. The proportion of employees who indicated they drive alone decreased by 8% compared to respondents of the 2004 survey. However, the proportion of respondents who report using MBTA services also decreased by 14% over those who responded to the 2004 survey. Akamai, the largest of the employer respondents, estimates 34% of its employees use the MBTA. All of the responding Area businesses start business operations between 7:00-9:00 AM. Approximately 86% conclude business hours between 5:00-6:00 PM. Of the respondents, 71% offer flextime hours. Of employers surveyed, 43% offer incentives for free or subsidized parking (i.e., driving) incentives, while 50% offer MBTA (i.e., transit) pass use incentives. Approximately 71% of the employers offering transit incentives also offer driving and parking incentives. Overall, survey responses are compatible with earlier FST projections. Survey responses continue to indicate a very strong reliance on alternative travel modes compared to typical suburban areas where 90% or more employees drive alone to work sites.

The ITE Trip Generation report (7th Edition, 2003) indicates that the vehicle trips per employee for the General Office category are 0.48 during the AM peak hour and 0.46 during the PM peak hour. The May 2005 update data indicates that 0.30 vehicle trips are actually generated per employee during the AM peak hour. During the PM peak hour, 0.29 vehicle trips are actually generated per employee. Therefore, during 2005, actual employee-based trip generation rates were 37% to 38% lower than unadjusted ITE employee-based AM and PM peak hour rates estimated for the Area.

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Task III - Review of Area Parking Garage Data

Boston Properties and Spaulding & Slye provided a weeklong usage survey of the Cambridge Center North and East parking garages for the period from May 23-27, 2005. These records indicate that a maximum of 1,721 tenant employees who leased monthly parking in the East and North Cambridge Center garages and transient parkers were parked in the garages simultaneously. This represents a 3% increase in parked vehicles compared to the 1,667 parked vehicles, at maximum occupancy, counted during the May 2004 survey period. If the number of employees is assumed to be relatively constant throughout the year, during peak demand times, the Area averaged approximately 0.43 occupied parking spaces per employee during 2005.

May 2005 traffic counts at the garages were assumed to reflect average annual conditions. Detailed hour-by-hour garage occupancy data was compared to garage data collected for a similar period during May 2004 are summarized on Table 7.

The number of trips destined for the Area that park outside the Area, and subsequently would not have been accounted for in the data collection program is likely to be small. Similarly, the amount of vehicles that may have parked in the Area, and were not destined for the Area is also likely to be small.

Copies of comparative weeklong garage surveys are contained in the attached Technical Appendix.

Table 7 summarizes and compares average trip activity data during the AM and PM peak hours when one-day garage surveys were conducted on Tuesday May 18, 2004 and Tuesday May 24, 2005. The AM peak hour at both garages continues to occur from 8 to 9 AM, and the PM peak hour continues to occur between 5 to 6 PM. Findings of the garage peak hours are consistent with findings for the Area's street peaks (from the ATR data) and the Area's drop-off/pick-up activity.

Table 8 contains an estimated comparison of average peak parking accumulation during a week in May 2005 for the Cambridge Center North and East garages to the average peak parking accumulation during a comparable week of May 2004. While there was no change in the occupied building square footage, overall garage utilization during May 2005 was higher than what it was in May 2004, probably reflecting increased daytime activity in the Area compared to 2004.

This count program accurately accounts for the vast majority of vehicle trips related to the Area. This finding is due to the proximity of the East and North Garages to the Area's land uses, the modest price differential to surface lots external to the Area, and the slight increase in overall traffic growth on the Area's roadways.

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Table 7

Kendall Square Urban Renewal Project Area

Cambridge Center East and North Garages Summary and Comparison of 2004-2005 Garage Vehicle Trip Activity During AM and PM Peak Hours¹

	May 18	, 2004 ³	May 24	, 2005 ³	PERCENT CHANGE BETWEEN MAY 2004 AND MAY 2005		
LOCATION	AM	PM	AM	PM	AM	PM	
Cambridge Center North Garage	325	342	318	340	-2%	<-1%	
Cambridge Center East Garage	231	238	272	244	<1%	+3%	
COMBINED TOTAL	556	580	590	584	6%	<1%	

- 1 Volumes represent total peak hour vehicular movements entering and exiting the two garages.
- 2 Volumes represent the AM and PM peak hours on Tuesday, May 18, 2004.
- 3 Volumes represent the AM and PM peak hours on Tuesday, May 24, 2005.

Table 8

Kendall Square Urban Renewal Project Area

Cambridge Center East and North Parking Garages Summary and Comparison of Peak Parking Occupancy - 2004 to 2005

	CAPACITY	OCCU	ARKING PANCY /28/04 ²	PEAK PARKING OCCUPANCY 5/23-5/27/05 ³		
LOCATION	Number of Spaces	Number Occupied	% of Capacity	Number Occupied	% of Capacity	
Cambridge Center North Garage	1,170	927	79%	985	84%	
Cambridge Center East Garage ¹	767	740	96%	736	96%	
COMBINED TOTAL	1,937	1,667	86%	1,721	89%	

- Does <u>not</u> include 75 spaces in the Marriott "nest"; garage capacity has been increased from 762 to 767 since 2000, according to Spaulding & Slye occupancy data.
- Average peak garage occupancy data during the week of May 24-28, 2004 for the Cambridge Center North and East Garages.
- Average peak garage occupancy data during the week of May 23-27, 2005 for the Cambridge Center North and East Garages.

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While higher than the 2004 survey, but similar to the results of the 2001 survey, the peak 89% combined garage data for May 2004 indicates the two Area garages are at their practical capacity during peak demand periods. Monthly garage occupancy data for the Cambridge Center East garage indicates that it regularly exceeds its practical capacity (85% of actual capacity) during the peak demand period of 11 AM – 2 PM. The 79% occupancy of the Cambridge Center North garage is also approaching its practical capacity. Therefore, the data indicates that additional parking provided by the 1,100-space Cambridge Center West Garage (under construction) will be needed to accommodate the remainder of the Area's buildout. While the Area is well served by public transportation, enough additional parking must be provided to ensure that Area parking demands are accommodated within the Area.

Conclusion

'Background' traffic found during May 2005 was found to be comparable to that found six years ago during 1998. The Area continues to generate vehicle trips at rates far lower than those contained in the *ITE Trip Generation* report (7th Edition, 2003).

Actual Area vehicle trip generation rates -- including garage trips plus drop-off/pick-up trips -- continue to be similar to, but lower than, those contained in FST's January 28, 2005 Plan Amendment No. 7 letter to you. We therefore conclude there is no 'significant variation' to report regarding the traffic generation and its impacts within the Area.

Please do not hesitate to contact me should you have questions on the study update or require additional information.

Very truly yours,

FAY, SPOFFORD & THORNDIKE By

Gary L. Hebert, P.E., PTOE Vice President

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GLH:gh LG-038B:000E57

Attmts: Technical Appendix

cc: Mr. M. Cantalupa, Boston Properties Mr. A. Spaulding, Spaulding & Slye

Mr. D. McGarrah, Foley, Hoag & Eliot

City of Cambridge Traffic and Parking Department