Comm #30

Step-1 Report on

Cambridgeport Traffic

with Special Attention to Development

of the Polaroid Site and Bread & Circus

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and copies submitted to :

Cambridge Community Development Department

Cambridge Traffic and Parking Department

Spaulding and Slye / Polaroid Corporation

Bread & Circus

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Chapter 1 INTRODUCTION AND PURPOSE

The purpose of this community traffic report is to provide an initial assessment of traffic and safety impacts from the various developments which could the Cambridgeport area in the general riverfront area between Magazine Street and Western Avenue. A key impetus for the study is the concentration of new traffic affecting the area, most notably developments such as Osco, Bread & Circus, University Park and Polaroid. The Polaroid project is now proposed to include 295,000 s.f of office, 30 units of row housing and 607 parking spaces. Concerns have been expressed by several residents over the possible traffic impacts.

Currently, there are two traffic reports which have been prepared by private consultants for commercial developers. These are available for public review and being evaluated by the City :

- A study by Abend Associates for the Break & Circus near Osco (October 1997)

- A study by Vanasse Associates for Spaulding and Slye, acting as developer for the Polaroid Corporation. (November 1997)

This CNI report becomes the third traffic report now under review by the City and its consultant, Rizzo Associates. In addition to the Abend and Vanasse reports, several other references sources have been utilized in the preparation of this report, and these are listed in the Bibliography, Appendix B.

The CNI community traffic study is designated as a "Step-1 report" because it does not contain all of the necessary analysis needed for a comprehensive response and traffic plan. It does provide significant evaluation of traffic and safety data and makes specific recommendations for mitigation in the afternoon peak hour condition. A Step-2 report is planned for January 1998.

1.1 Origins of the Study

The desire for a traffic study was expressed by numerous residents in the Spring of 1997. CNI letter of May 16 to Spaulding and Slye asked the company *"to carry out a comprehensive traffic plan taking into account existing and proposed development in the neighborhood. Given the increased traffic problems, population density, and proximity of a grammar school to the site, what are the company's plans to relieve traffic tension? .....What alternatives are being considered to the proposed 500 (space) parking lot? How will the entrance/exit traffic be managed? Will the company consider off-site parking for employees with shuttle service to the headquarters?"*

The MDC in its letter of June 1997 noted that *"The development of this site can be expected to have a significant impact on Memorial Drive and the adjacent River Street and Western Avenue intersections. Each of these areas is a marginal traffic facility at this time due to peak hour volumes and resulting lengthy queues. ... it would seem that there is a significant new traffic burden on a road of the Commonwealth and that an evaluation of this burden and a program for traffic mitigation would be appropriate. "*

As a result, the Cambridge City Council passed an Order requesting the City Manager to prepare a traffic study on the effects of the Polaroid development. The City Manger turned to the Community Development Department (not Traffic and Parking), and CDD determined that Spaulding and Slye should be required to perform the study. On May 30, the CDD issued a draft scope for what the study should contain. The developer retained Vanasse Associates in July to do the study, which was paid for by Spaulding and Slye.

The City's decision arose from its belief that no City agency had the resources to perform such a study and hence there was no "in-house" way to respond to the City Council order. The City's traffic consultant – Rizzo Associates – also was judged not to have the staff or resources to do such a study. The current community traffic study is intended to provide some needed balance, so that the City can evaluate the reports from a more neutral position.

1.2 HISTORY OF THE POLAROID SITE

For most of the 19th century, the Polaroid site was a brackish tidal marsh, with the edge of the wetlands extending to the backyards of Florence Street. With the completion of the Charles River Dam around 1905, the river edge lost its tidal saltwater nature, and gradually was reclaimed. Much of the land close to the river channel was taken by the MDC in the 1890s, but the City of Cambridge constructed Memorial Drive around 1910, and transferred it to the MDC in 1924. Memorial Drive (full name : Veterans Memorial Drive) retained its special status as a park road for pleasure vehicles. It had very few driveways in the early days, so that alternate road access (such as Riverside Road) was necessary for the various private landowners. One of the key land uses before the turn of the century was Dover Stamping, and in 1936 the United Shoe Machinery Company built the existing historic structure at 784 Memorial Drive, adding two back buildings in the next couple of years. Site operations were taken over by a subsidiary, B&B Chemical, which used the site until 1967. MIT bought the property in 1966 and acquired Polaroid as a tenant in 1967. In 1979, MIT sold the property to Polaroid, who continued to use the site until 1993. There are about 300 open lot parking spaces on the Polaroid site, which were substantially filled during the busier Polaroid periods of the 1960s and 1970s, but in the 1980s activity became less intense and traffic generated from the site diminished. Four years ago, traffic effectively dropped to zero.

The original Polaroid proposal was a parking garage with 500+ spaces, which included 20 parking spaces for the row housing units which were proposed along Pleasant Street. By November of this year, the total parking had increased to 607 spaces. The plans retained the use by Polaroid of the front building for main corporate offices and for various other office users to occupy the back two towers, although Polaroid could possibly occupy part of this space.

1.3 The City's Scope of May 1997

There are several documents outlining the various scopes of work, as seen by the participants. The initial scope was drafted by the City on May 30, 1997, with subsequent scoping documents from Vanasse and CNI (August 1997). Each scoping document covers

a somewhat different area (see Appendix A). The CDD scope contained five sections, the three largest to be completed by the developer alone. The Polaroid report of November 1997 addresses only the first three sections at most, since the last two were to be prepared by the developer and the City, working together. Unfortunately, neither the Polaroid report nor the Bread & Circus report contains a scope of work, so the reader must search elsewhere to determine what work elements were done and which remain to be completed.

Parts I and II included trip generation for the morning and afternoon peaks, as well as trip distribution and a parking analysis. The City's scope did not specify traffic counts and a safety analysis, which were additional but vital elements included in the Vanasse report. The City and developer agreed to add the intersection of Memorial and Western to the study area but adamantly and successfully resisted proposals to include the two signals on the Soldiers Field Road side of the river. Mitigation was limited to a simple listing, without commitments or verification of effectiveness.

The CDD scope mentioned the problems of queues only with one marginal reference, but the concern for traffic queues has been a key issue for CNI. My May 27 letter to CDD noted that *"The proposed 500-car garage can be expected to release about 250 cars an hour onto Pleasant Street during the afternoon peak hour, with 70-75% of it headed towards the Turnpike and other points to the West. The resulting 175 cars would encounter long vehicle queues on both Memorial Drive and Putnam Avenue. Currently, there is no space for more traffic and no traffic mitigation plan. Since today's queues regularly extend to Strawberry's and often back to Magazine Street, the queuing problem should be obvious."*

Regarding the morning traffic problems, I noted that *"added traffic problems will occur at the bottlenecks on the Boston side, at the Turnpike exit. The morning problem in Cambridge will be one of safety for school children, since entering traffic would likely pass through two intersections on Putnam Avenue which today have traffic safety officers and a school bus stop."* Today, the only morning congestion on the Cambridge side occurs on Western Avenue approaching Memorial Drive, and the queues are solely the result of inefficient signal timing at the Memorial Drive signal. The queues regularly extend back to and block Putnam Avenue. There may be some justification to the policy because of the tendency for through traffic to try to use Cambridge as a mini-Inner-Belt coming from the North to get to points South and West. If holding back traffic is a value, I would suggest

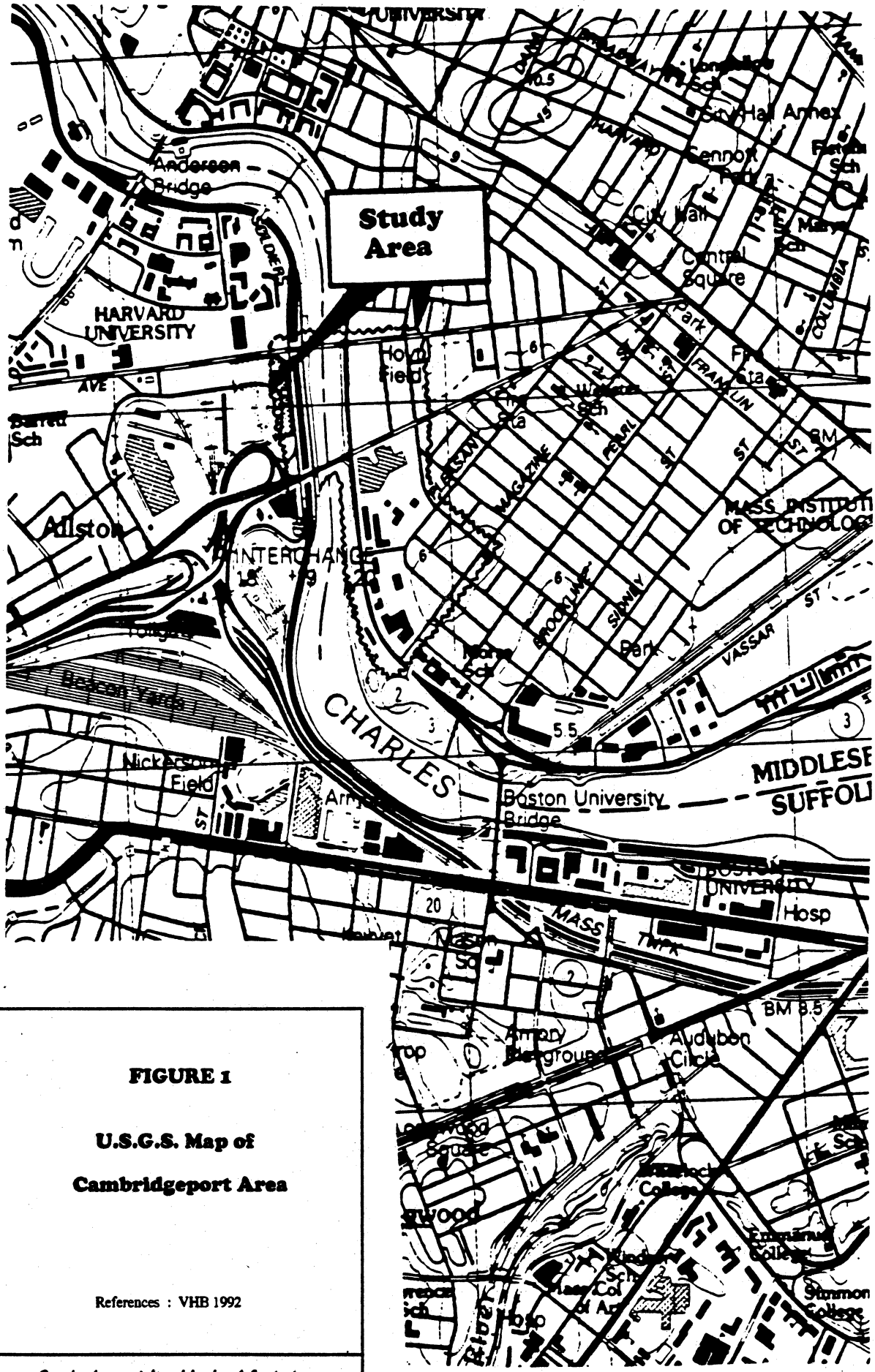

FIGURE 1

U.S.G.S. Map of

Cambridgeport Area

References : VHB 1992

Cambridgeport Neighborhood Initiative
December 1997

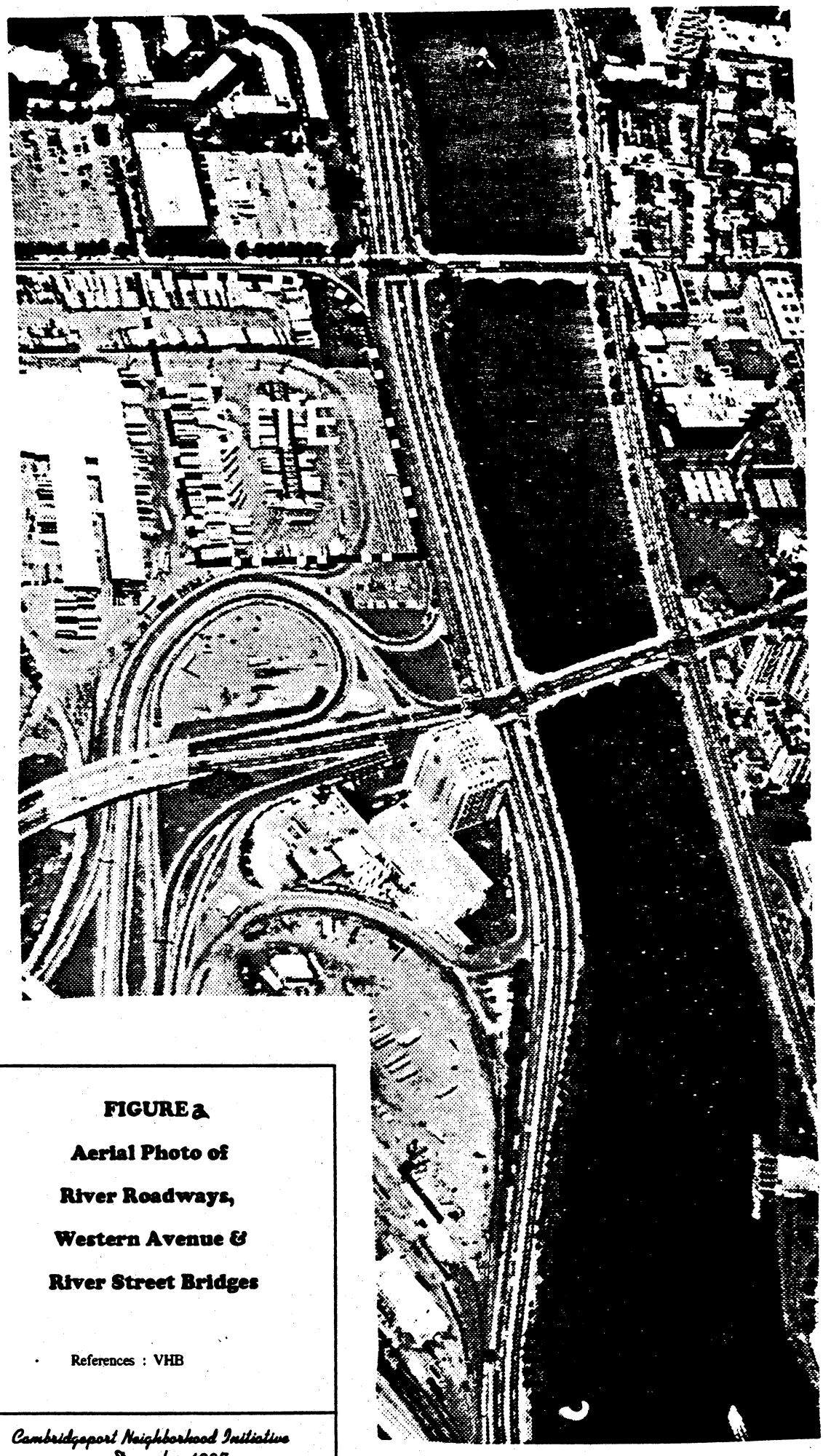

FIGURE 3

Aerial Photo of

River Roadways,

Western Avenue &

River Street Bridges

References : VHB

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that a program of regularly activated pedestrian lights during school hours would be a more honest and preferable strategy.

The CNI scope has been modified since the original submission, to include an additional and most critical intersection -- Soldiers Field Road and Western Avenue, which actually becomes the genesis of all congestion in the area (see Figure 1 and 2). Plans to use the CINCH model for intersection capacity analysis were abandoned, because of changes in the *Highway Capacity Manual* and other difficulties with computer models. A simple calibrated method of critical lane analysis was used instead (Appendix G). Finally, plans for production of a video and use of photos of congestion and other local traffic conditions were abandoned in favor of more comprehensive graphics displays which would show the general queuing in the study area, all within one traffic report or in a few easily copied handouts.

Topics to be deferred to the Step-2 report in January include the following :

- Development of a detailed traffic operations mitigation plan for the area -- especially with neutral or negative traffic progression.
- Analysis of computer modeling problems in the Polaroid and Bread & Circus reports
- Identification of pedestrian access improvements in the study area
- Identification of a comprehensive transit improvement plan
- Identify the requirements for trip reduction to shrink traffic queuing and consider how effective would be the various trip reduction ideas proposed so far.
- Specify roles for CDD, developers and Charles River TMA in the trip reduction process.
- Evaluation of additional accident data as it becomes available
- Review of special morning peak hour problems and pedestrian safety.

The CNI study area will extend from Magazine Street to Western Avenue and include Putnam Avenue to Memorial Drive, with the addition of the two Soldiers Field Road signals. This study area is dominated by the six signalized intersections between Putnam Avenue and Soldiers Field Road.

- **Putnam Avenue and River Street**
- **Putnam Avenue and Western Avenue**
- **Memorial Drive and river Street**
- **Memorial Drive and Western Avenue**
- **Soldiers Field Road and Cambridge Street**
- **Soldiers Field Road and Western Avenue**

The latter intersection is adjacent to the Harvard Business School and should be clearly distinguished from another intersection two miles up river where Western Avenue again connects with Soldiers Field Road. The intersection of Putnam Avenue and Magazine Street is the one other traffic signal in the study area, but while generally there is little congestion at this location, we shall see later in Chapter 7 that there is a serious safety problem here.

Overall, I find the Bread & Circus study scope much too confined because it only considered three of the critical six signalized intersection in the congestion area. The Polaroid study was only slightly better, since it looked at four location and left out two on the Boston side. Both scopes were approved by CDD.

In conclusion, the absence of active appreciation for the importance of the signals at Soldiers Field Road is a major deficiency of both the Polaroid and the Bread & Circus studies and renders them necessarily incomplete as useful traffic documents.

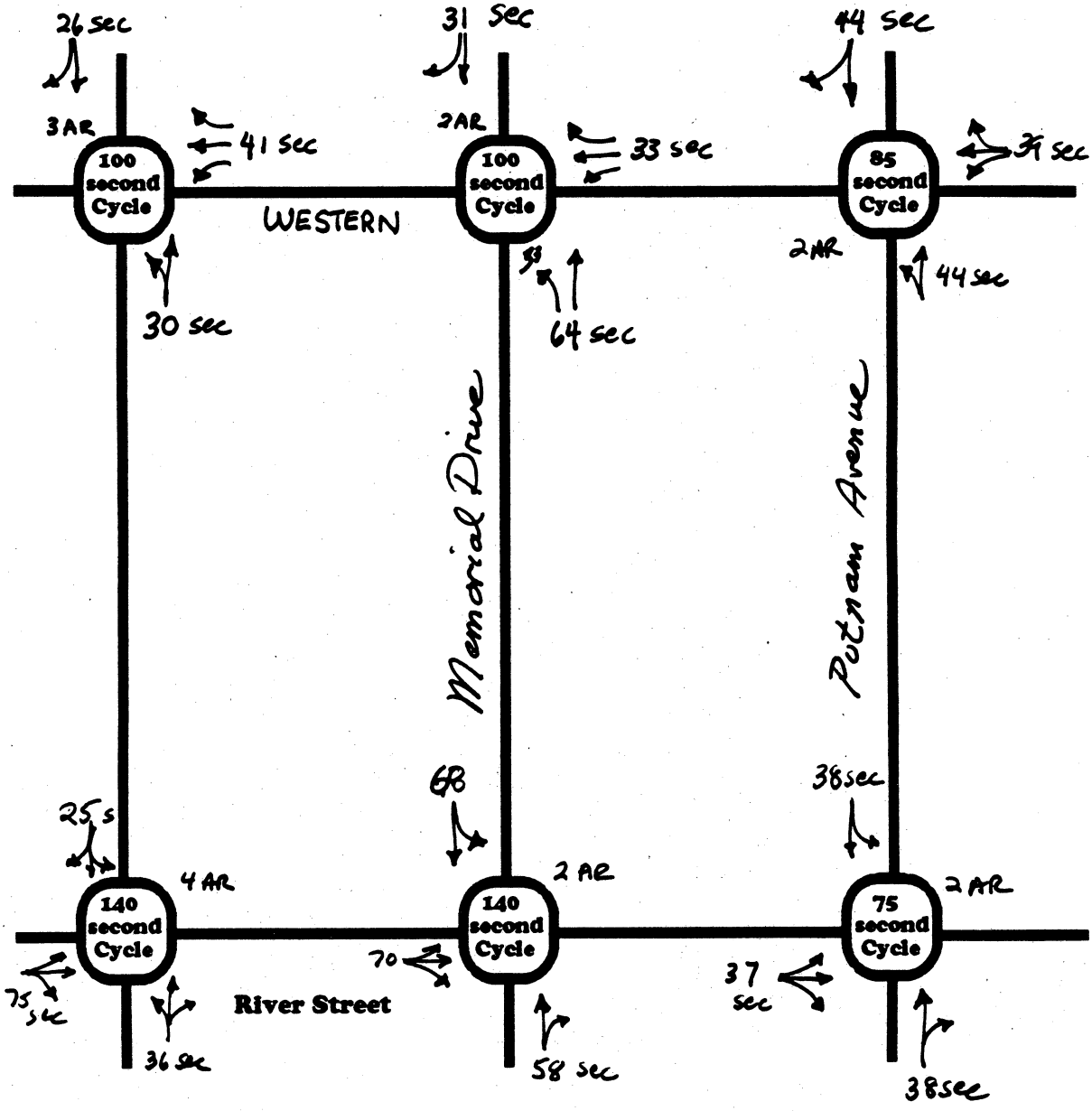

FIGURE 3

Traffic Signal Timing at Six Primary Arterial Intersections

Existing 1997 PM Peak

Cambridgeport Neighborhood Initiative *December 1997*	References : CNI 1997

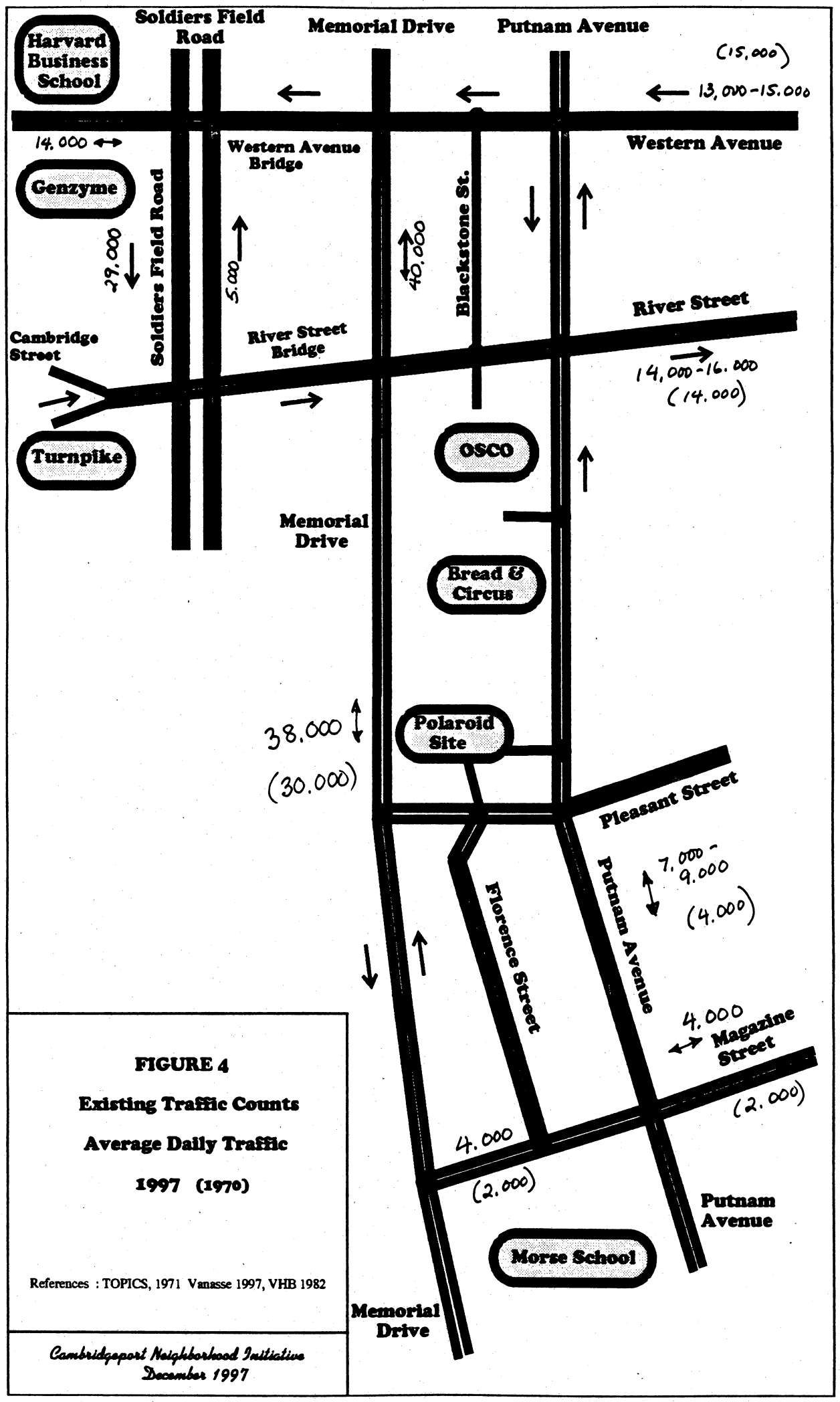

FIGURE 4

Existing Traffic Counts

Average Daily Traffic

1997 (1970)

References : TOPICS, 1971 Vanasse 1997, VHB 1982

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Chapter 2 TRAFFIC COUNTS AND SIGNAL TIMING

The six key signalized intersections form a ladder-like grid in a 2-by-3 array, as shown in Figure 3. By observation, of seven possible links in the grid, five can generate a queue which blocks a nearby signal. Of these seven links which could be subject to coordinated signal timing, there are only two which are now coordinated for signal timing, and this has been achieved only within the past two years. Pedestrian actuated buttons occur at three of the six, as do WALK lights. It is worth noting that despite the existence of central computer control in Cambridge, the Putnam Avenue signals at River and Western Avenue are not coordinated, nor do they have any relation to the operation of signals on Memorial Drive, which are under the control of the MDC.

Figure 3 represents field observations of afternoon peak hour signal timing, with both cycle times shown, total All-Red Clear, and the combined Green-and-Yellow times for each approach. The importance of field measurements cannot be overemphasized, simply because signal timings designated by headquarters may be quite different from those actually operating in the field -- especially if there is a power outage which throws an internal clock out of proper timing. There appears to be variable cycle timing on Putnam Avenue when the pedestrian phase is called, and the two Soldiers Field Road intersections show evidence of some variability in signal timing due to detection, but the desired purpose and effectiveness are unclear. For peak hour purposes, signal actuation generally proves to be ineffective, so that constant signal timing can be used as an assumption for capacity analysis, as was done in the Polaroid and Bred & Circus reports.

In summary, the three reports use the following signal timing :

	CNI	Bread & Circus	Polaroid
1. Putnam Avenue & Magazine St.	60 s Semi-Act	60 Actuated	(Not studied)
2. Putnam Avenue & River Street	75 s Pretimed plus peds	75 sec Actuated (no peds)	90 sec Semi-Act (17 sec Peds)
3. Putnam Ave. & Western Ave.	85 s Pretimed plus peds	90 sec Actuated (no peds)	90 sec Semi-Act (17 sec Peds)
4. Memorial Dr. and River Street	140 s Pretimed	105 sec Pretimed	100 sec Semi-Act
5. Memorial Dr. and Western Ave.	100 s Pretimed	(Not studied)	100 sec Pretimed
6. Soldiers Fld Rd & Turnpike	140 s Pretimed	(Not studied)	(Not studied)
7. Soldiers Fld Rd & Western Ave.	100 s Actuated?	(Not studied)	(Not studied)

As is apparent, the various traffic engineers have not been able to attain agreement on the existing signal timing.

The available traffic counts show less variation than the measured or assumed signal timing. Basically, traffic counts come from five sources :

- ∞ City of Cambridge daily counts
- ∞ Turning movement counts by Vanasse-Hangen for Genzyme, 1992
- ∞ Turning movements by Abend in 1995 and September 1997
- ∞ Turning movement counts by Vanasse in August 1997
- ∞ Traffic event recording for certain approaches by CNI

The Genzyme counts covered only four intersections, but included the vital Soldiers Field Road intersections with Western and River Street bridges. The Abend counts are of the greatest value because they were made over a two-year period and in particular were updated in September of 1997. There are some inconsistencies in these counts from one location to another, and three of the prime signalized intersections are not covered.

The Polaroid counts include a 1997 update at Western and Memorial, but not Soldiers Field Road. Moreover, there appears to be an error in two movements counted in the PM peak at River Street and Western Avenue for outbound Memorial Drive. In particular the through movement at River street and the left turn at Western Avenue show much higher volumes than expected. I suspect the problem may have been due to a defective counter which resulted in higher counts being registered, on the following grounds :

- ∞ Hose counts made on the same day show outbound Memorial Drive counts being lower and more consistent with past data. This source was a very important quality check.

∞ In laying out the count data, I found the suspect counts appearing in the same geometric location on my layout at the two intersection, which suggests that if the same counting board was used at both locations, the same recorder clicker could have been providing the extraneous counts.

The only other factor could be that the River Street count was taken in the rain, but all the other traffic movements counted were reasonable. Overall, I feel that the hose counts are the most significant evidence, since they show virtually the same hourly flow on outbound Memorial Drive during almost a four-hour period from 3 PM to 7 PM.

The only traffic data I could find from the 1970s came from the Cambridge TOPICS report of 1971, which showed about 30,000 cars a day on Memorial Drive in the vicinity of the Polaroid site. The Polaroid report indicates that this has grown to 37,000 to 38,000 cars today. From the hourly counts one suspects that most of the growth has occurred not in the peak hours but by extending the peak travel hours to other times of the day. Flows on Putnam Avenue are shown at 4,000 cars a day in 1970, while the Polaroid study shows volumes today in the 7,000 to 9,000 range. Unfortunately, we do not have any comprehensive study of traffic growth in any area of Cambridge, so our conclusions are inevitably fragmentary.

The daily flow data as known for 1970 and 1997 is shown in Figure 4.

The Bread & Circus report looks at only hourly counts, not daily flow, as tends to be the modern trends. Generally, it is desirable to have some sort of handle on both daily and peak hour counts. Even the Polaroid count was made for one day only, so we have little information on how traffic flows vary during the days of the week and on weekends.

The Polaroid report looks at weekdays only, for the AM and PM peak hours, which is appropriate for office operations. The Bread 7 Circus report considers the afternoon peak and Saturdays, which is appropriate for a food store. Given all of the various traffic counts and gaps in data, the CNI Step 1 report will concentrate almost exclusively on the afternoon peak hour, assembling the most credible data for two reasons : the largest counting effort has gone into afternoon counts, and the primary congestion problem for the neighborhood is in the afternoon.

One reference which has proven most historically useful is the 1986 traffic study made for University Park, which included four of the six key intersections for traffic counts and analysis. Although there are variations in counts from day to day, the 1985 counts provide us with a reasonable standard of comparison for traffic changes in the past dozen years. The Stop and Shop proposal on Memorial Drive produced counts in 1991 and 1993, while Genzyme yielded counts for 1992. Osco and Bread & Circus produced counts for 1995 and 1997, while Polaroid produced summer 1997 counts.

One way of showing the relative changes in traffic from intersection to intersection is to add up all the cars going through each intersection from every direction. The data is scattered for some locations, but is most complete at Memorial Drive and River street. The results show a general pattern of slight traffic growth in the morning on Putnam and Memorial Drive, but the afternoon results are much more mixed. The surprising results were the reductions in traffic serviced at the Memorial Drive intersections, with declines of 7 to 12% over the intervening years. Flows at Putnam and Western also have also dropped by 5 to 10%. The layman will surely challenge these results, because of the observed longer periods of congestion, but the explanation may lie directly in the realities of this congestion, whereby signal gridlock results in cars stopped, with nobody moving. For those period when no one moves, traffic counts must go down. What we are witnessing is the effect of Level of Service F, whereby under congested traffic conditions with gridlock, the number of cars through an intersection actually goes down, not up.

The data can be arranged to show afternoon peak hour traffic flow changes on certain road sections, such as Putnam Avenue at River Street .....440 in 1985 ..... 520 in 1995 ..... 550 in 1997, and Memorial Drive at River Street .....1620 in 1985 ..... 1245 in 1992 ..... 1440 in 1995 ..... 1355 and 1610 in 1997 (two counts). Of considerable interest are the changes on Western Avenue at Memorial Drive : ..... 1650 in 1985 ..... 1555 in 1992 ..... 1615 in 1993 and 1350 in 1997.

The evidence of the counts taken during the afternoon peak hour shows that traffic in the past 15 years appears to have gone down on Memorial Drive and Western Avenue, while it has increased on Putnam Avenue. Clearly, this result is quite the opposite of what would be desired from a community traffic perspective. Why Putnam Avenue and related Cambridgeport streets should be bearing the brunt of the traff.. increase in the area is a

matter which certainly lacks explanation and needs some discussion. In none of the past reports is there any discussion of these traffic shifts and trends.

The new traffic assignments for University Park appear to reflect some appreciation for how undesirable it maybe for there to be more traffic on Putnam Avenue. The new assignments from University Park differ from those in 1986 in that more of the traffic load is shifted from Putnam Avenue and onto Memorial Drive and River Street, but this matter will need to wait for more discussion in the next chapter.

The Polaroid report discusses its own traffic counts made in August of this year and the blanket adjustment to increase all traffic volumes by 5% -- based on data from a regular counting station in Somerville. From the engineer's discussion, it is apparent that this adjustment is not an entirely happy one. For example, there is no evidence that traffic flows indeed go up on congested routes such as Memorial Drive, when comparing August and September : the length of the peak period may simply expand from three to four hours. Meanwhile, local streets such as Putnam Avenue may get *more* than a 5% increase due to diverted trips -- thus the blanket 5% adjustment appears unduly crude. A distinct preference applies to actual counts made in September 1997, without adjustment, as provided in the Bread & Circus report. Even this data has some gaps and inconsistencies, so the Polaroid counts should be included as follows :

- Morning peak hour counts -- Use Polaroid figures, as they are the only ones now available
- Afternoon peak hour counts -- Use the Bread & Circus counts, with Polaroid counts at Memorial & Pleasant and Memorial and Western. On the Boston side, the Genzyme counts from 1992 are used, with slight adjustments to make them arithmetically consistent with 1997 counts on the Cambridge side.

- Saturday Midday counts -- Use the Bread & Circus numbers, since they are the only source available.

The resulting "existing traffic volume" map for the afternoon peak is shown in Figure 5 and includes the best information from three sources.

The next question is an important one for accuracy : who takes the various consultant data and seeks to resolve the differences? The different assumptions of the engineers clearly indicate that individuals can make different judgments, and no one is beyond error. The differing results have the positive benefit of checking for errors in both assumptions and results. If the public process can stand a little temporary messiness, it should be possible to respond to the differences, decide on the best assumptions and procedures and thereby produce a result which would be an improvement over than which could be attained by any one traffic expert. Who will perform this last step? Will it be the City of Cambridge or one of the traffic engineers? If the City cannot perform the study in the first place, can they be expected to do the final calculations? Would this be a task for Rizzo in their final review?

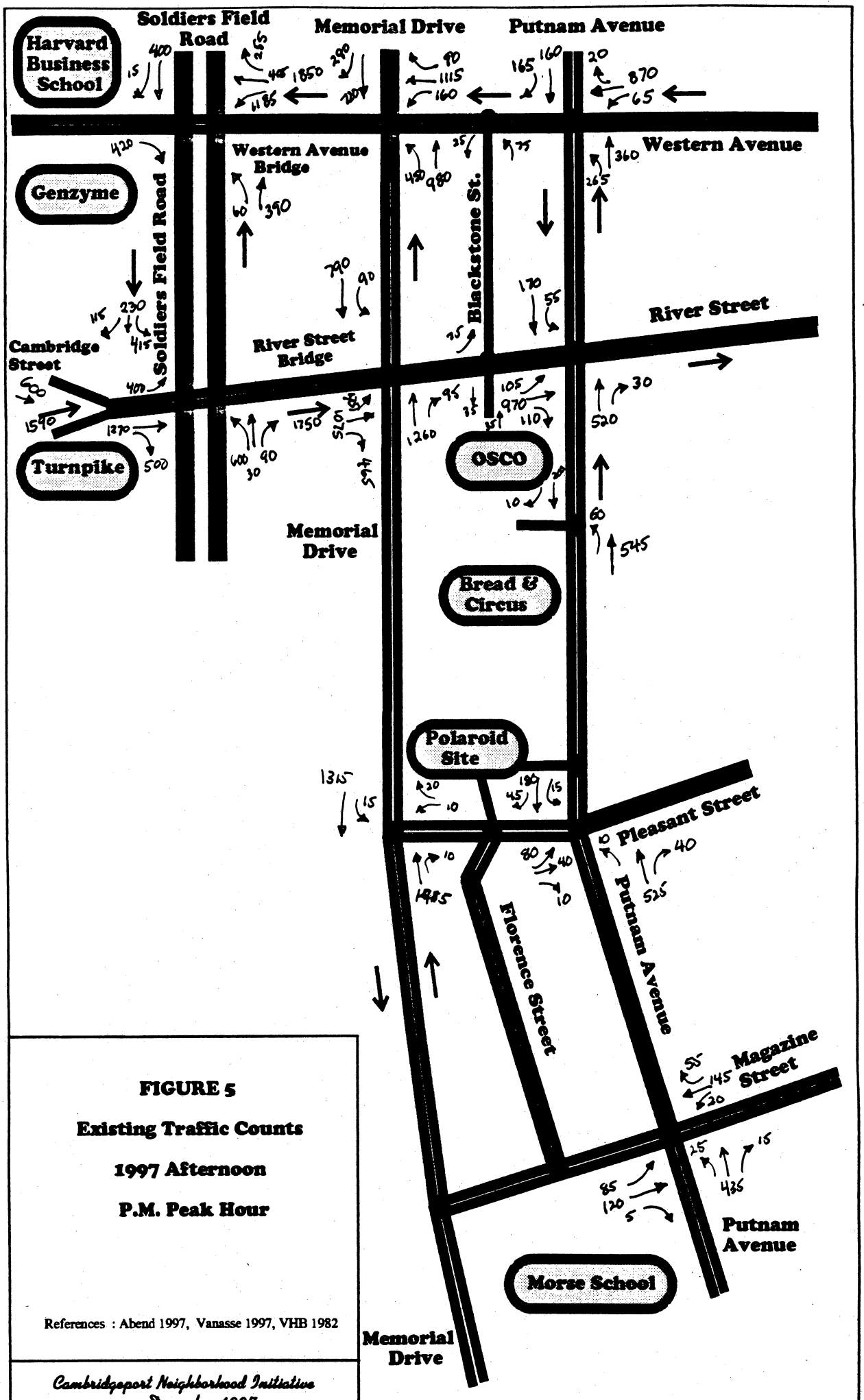

FIGURE 5

Existing Traffic Counts

1997 Afternoon

P.M. Peak Hour

References : Abend 1997, Vanasse 1997, VHB 1982

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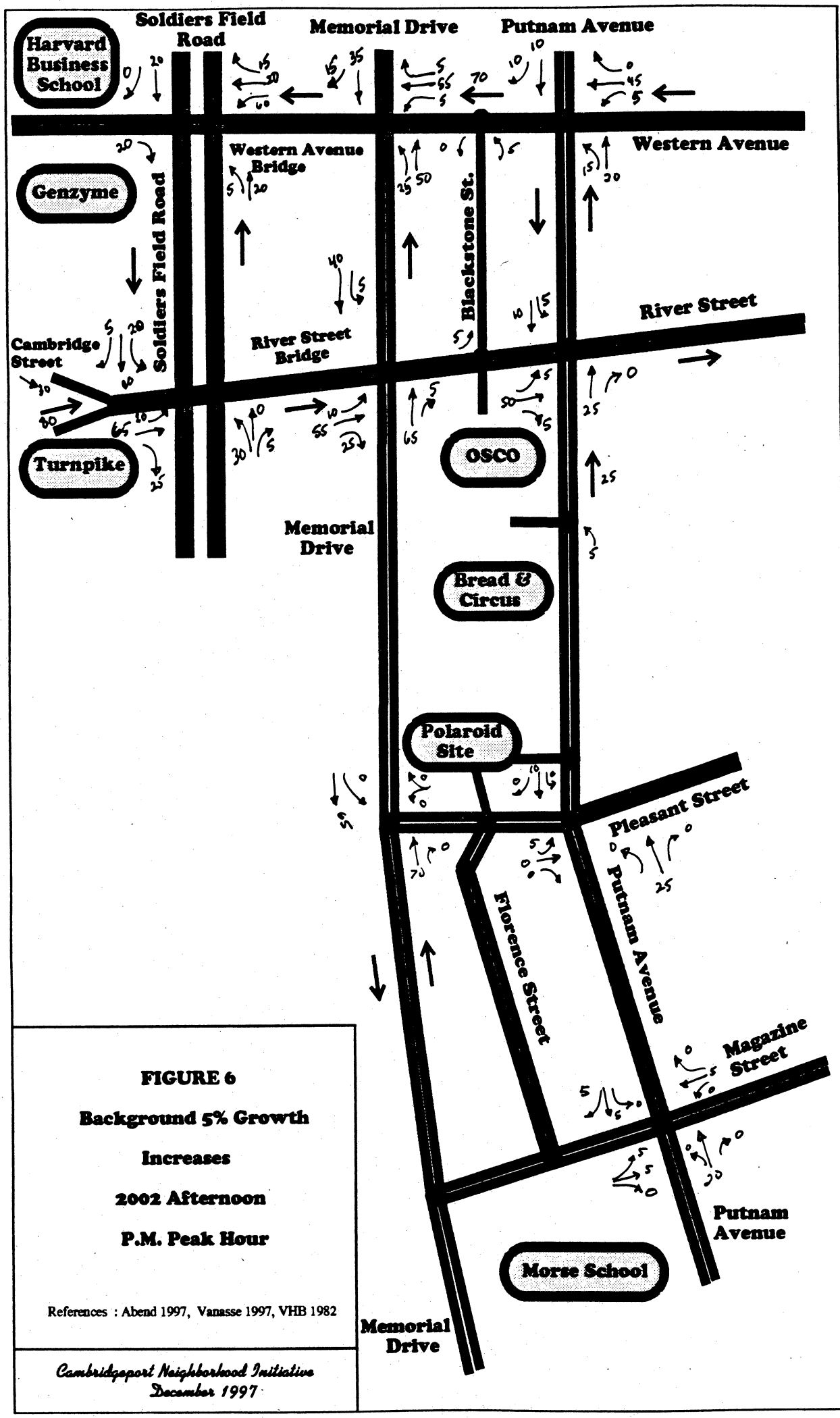

FIGURE 6

Background 5% Growth

Increases

2002 Afternoon

P.M. Peak Hour

References : Abend 1997, Vanasse 1997, VHB 1982

Cambridgeport Neighborhood Initiative
December 1997

3.0 TRIP GENERATION

The primary new trip generators affecting the study area are University Park, Bread and Circus, University Park and a final category called "other background growth." The last concept is that traffic from other areas of Cambridge beyond the identified main developments should be accounted for, and currently all parties seem agreed to using a 1% per year growth factor over 5 years, resulting in a general 5% increase in all traffic.

If we look at the driveway activity, we see that the three main developments would generate afternoon traffic of :

- University park ..... 1340 vehicle trips
- Bread & Circus ..... 250 vehicle trips
- Polaroid (285,000 s.f.)..... 455 vehicle trips

This trip generation data comes from the various project proponents, and the Polaroid data includes the entire development site as a traffic generator. The Polaroid report attempts to break out the existing front building of 45,000 s.f. as a "phase 1" or existing use -- which in traffic terms is not good practice. The existing site is not generating traffic, so the build alternative should be the entire 285,000 s.f. of development. From the Polaroid report, the front building represents a 25% increase in traffic generation, compared to the rest of the site, so the 440 peak hour trips represent the totality of all trips to and from the site. The Bread & Circus numbers represent an increase beyond the existing Osco uses, for a total square footage of 50,300 s.f. The existing Osco store is 13,000 s.f. and the Bread & Circus will represent a 37,000 s.f. addition -- which is about 1/2 of the area of the proposed Super Stop & Shop.

To avoid prolonged debate, the trip generation rates for Polaroid and Bread & Circus have been used verbatim in this CNI review. Trip generation rates are a fairly established procedure, and past checks of trip generation have shown general agreement. In terms of understanding overall traffic impacts, there would be little value in nitpicking trip generation assumptions, other than to treat the Polaroid development as a single project.

The University Park figures appear to be derived in a different manner. This large development is subject to a special "cap" on trip generation, which was assigned 10 years ago by City officials in an effort to implement a trip reduction program for new development. This limit of 1,700 vehicle trips per hour unfortunately is very high, and represents virtually no restriction on the operations of the developer and the 3,000 parking spaces in three parking garages. Typically, in the peak hour, half the number of spaces leaves a parking facility, so we might expect the parking garage to generate about 1,500 trips an hour, which is 12% under the cap.

In effect, the cap provides no restrictions to University Park trip generation, but the City has utilized it in specifying the expected number of trips from further University Park development. By determining that 340 peak hour trips are now actively being produced at University Park, the result is an incremental cap of 1,360 trips. CDD indicates that for 78% departures from the site and 22% arrivals, University Park may grow by 1,060 trips out and 300 in during the afternoon peak hour. These trips are distributed as follows :

∞ River Street (inbound only)	10%	30 trips
∞ Western Avenue (outbound only)	10%	105 trips
∞ At Cottage Farm Rotary (inbound)	24%	75 trips
(outbound)	18%	190 trips
∞ Putnam Avenue at River (inbound)	7%	20 trips
(outbound)	13%	135 trips

Unfortunately, this distribution is incomplete for the purposes of the Cambridgeport study, because it does not complete the assignment of traffic to Memorial Drive. The University park assignments are generally consistent with the 1985 report (same consultant) which estimated that 35% of the development traffic would go through the Western and River intersection, with 6% on the Cottage Farm Bridge, and leaving 12% on Memorial Drive outbound, 13% on Putnam Avenue and 10% on Western Avenue delivering a total of 35% to the Western and River intersection. Therefore, we need to provide for a Memorial Drive traffic increase in the afternoon peak hour from University Park as follows :

Memorial Drive (inbound)	18%	55 trips
(outbound)	12%	125 trips

This Memorial Drive volume was not specified in the data from University Park, so neither the Bread & Circus not the Polaroid report included it as part of the No-Build network. It represents an additional 3% in traffic at the Memorial Drive and River St. intersection, which is significant when congestion, queuing and traffic diversions to neighborhood streets are major concerns.

The 5% background growth increments of traffic are shown in Figure 6, the University Park growth increments are in Figure 7, the Bread & Circus in Figure 8, and the Polaroid growth in Figure 9. From these elements we create the future year 2002 No-Build traffic flow network of Figure 10 by combining the existing 1997 PM counts (Figure 5) with Figures 6, 7 and 8. The condition with the Polaroid development is defined as the "Build" (Figure 11) and is created by combining the Polaroid volumes of Figure 9 with the No-Build volumes of Figure 10.

It is worth noting that the City of Cambridge did engage another consulting firm to look at traffic growth in Cambridgeport. In 1990, Cambridge Systematics produced various estimates of future traffic conditions at four of the main intersections, using the 1985 traffic counts as a base starting condition. The initial scenario was 1985 existing counts plus "committed development" as of 1990, in the context of a rezoning study. This scenario showed traffic at Putnam and River Street increasing from 1,770 to 2,570 cars an hour, Western and Putnam from 2,030 to 3,105, while on Memorial Drive the traffic demand at the River Street signal would increase from 4,175 in 1985 to 5,250 in the year 2000. Memorial and Western showed the largest increase, with 1985 volumes of 4,335 growing to 6,000 cars. Typical increases were in the 25% to 50% range, and the rezoning of Cambridgeport would have allowed for another 10 to 25% more. At no point in the traffic discussions over Polaroid have this 1990 traffic impact study been discussed.

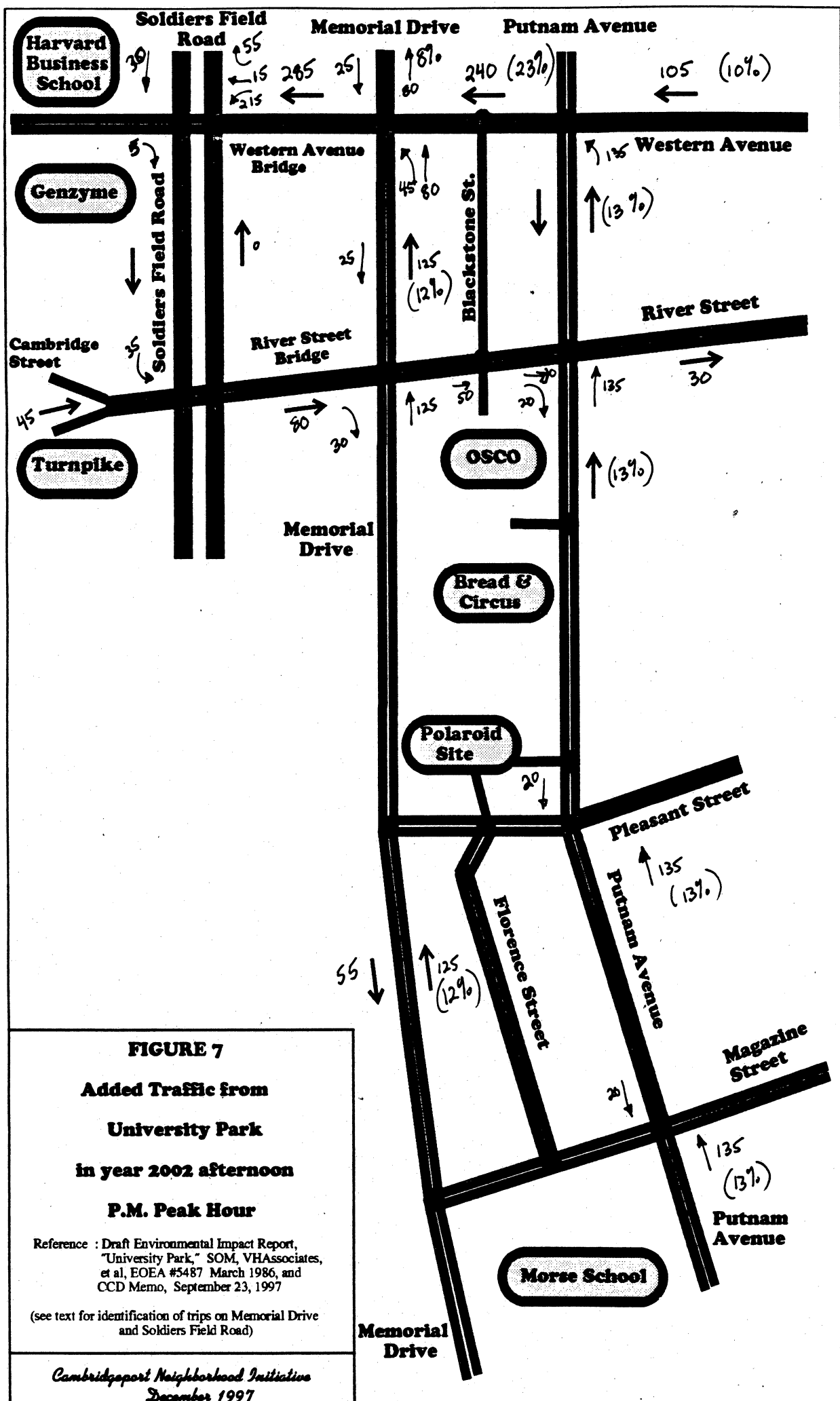

FIGURE 7

Added Traffic from

University Park

in year 2002 afternoon

P.M. Peak Hour

Reference : Draft Environmental Impact Report, "University Park," SOM, VHAssociates, et al, EOEA #5487 March 1986, and CCD Memo, September 23, 1997

(see text for identification of trips on Memorial Drive and Soldiers Field Road)

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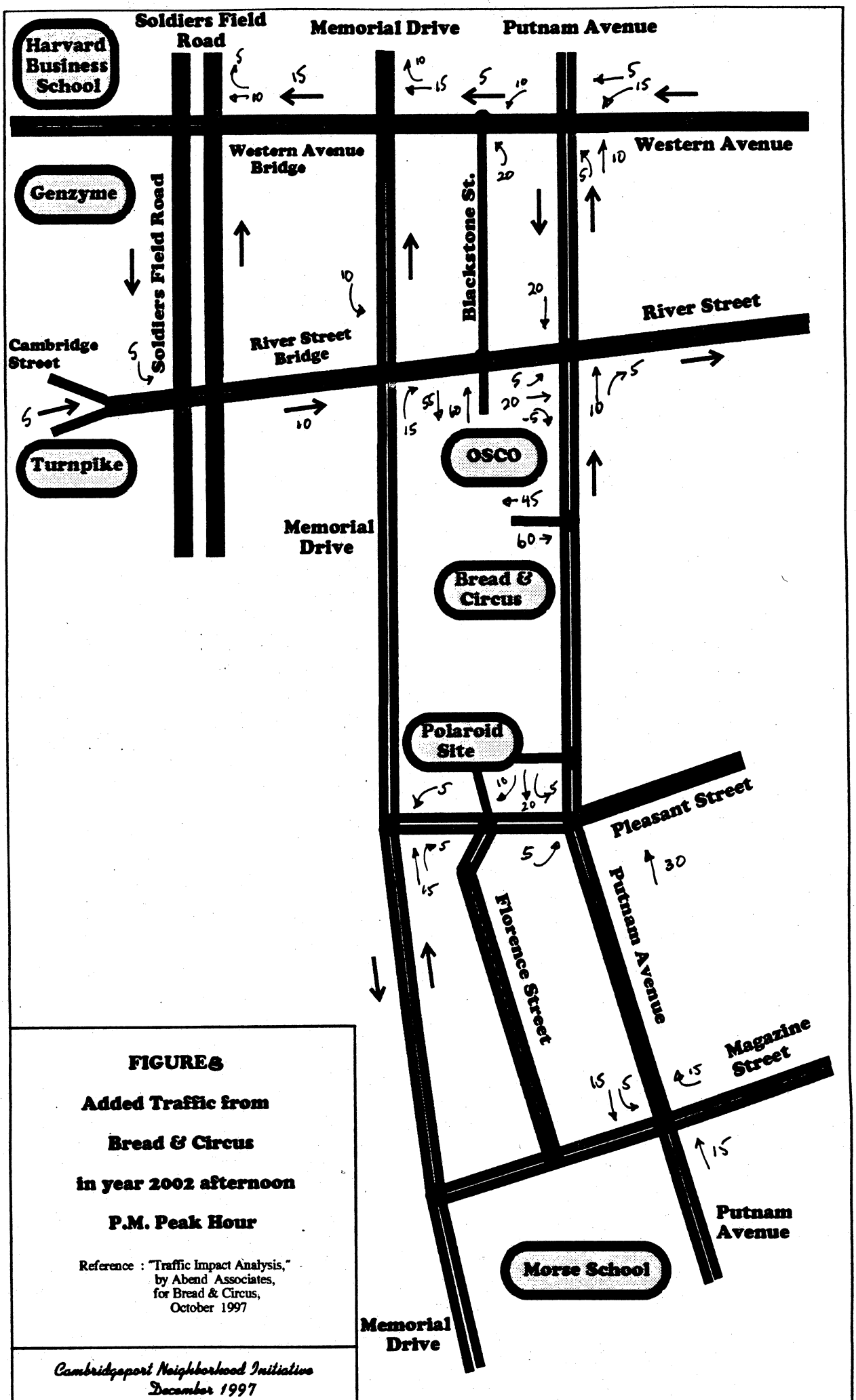

FIGURE 8

Added Traffic from

Bread & Circus

in year 2002 afternoon

P.M. Peak Hour

Reference : "Traffic Impact Analysis," by Abend Associates, for Bread & Circus, October 1997

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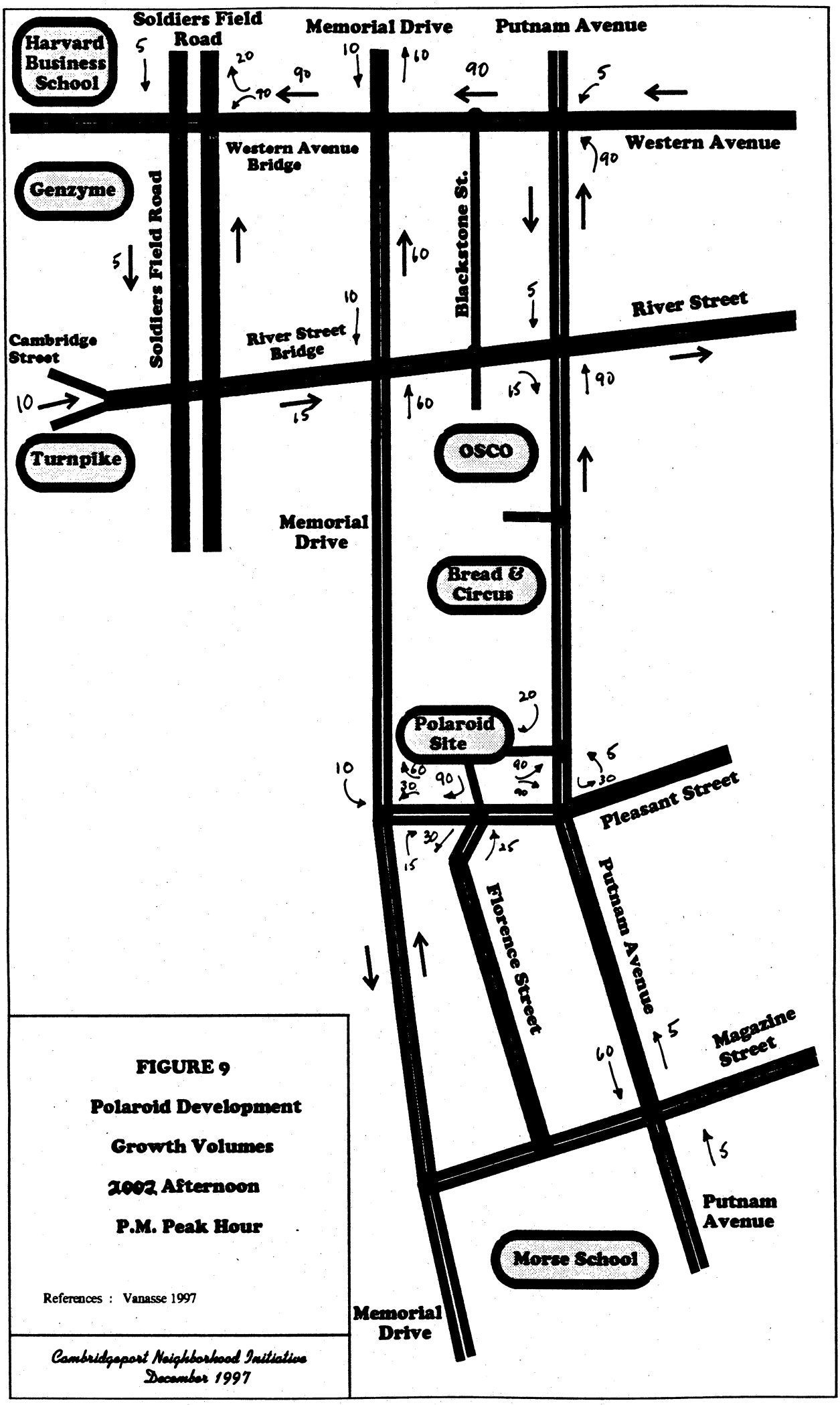

FIGURE 9

Polaroid Development

Growth Volumes

2002 Afternoon

P.M. Peak Hour

References : Vanasse 1997

Cambridgeport Neighborhood Initiative
December 1997

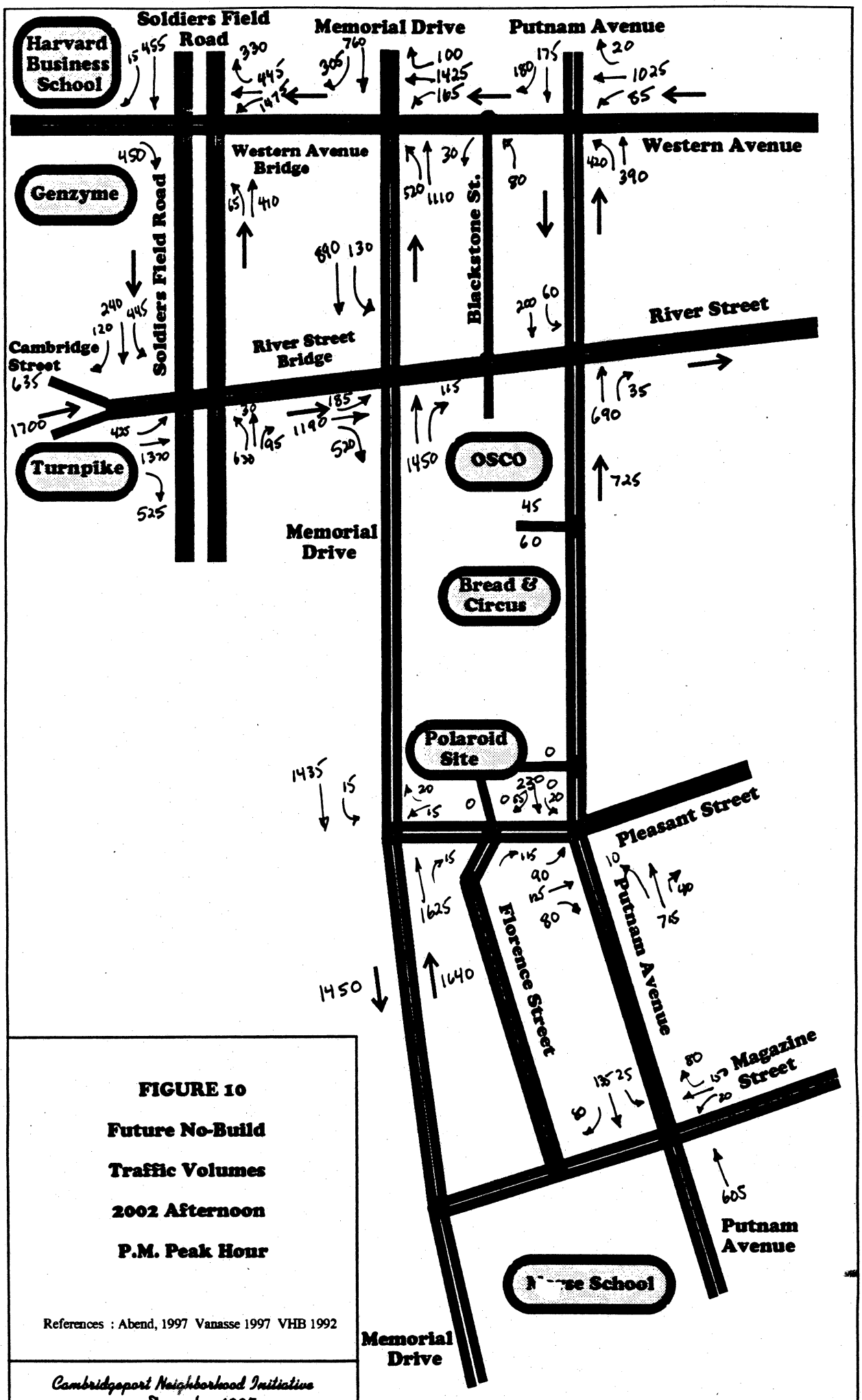

FIGURE 10

Future No-Build

Traffic Volumes

2002 Afternoon

P.M. Peak Hour

References : Abend, 1997 Vanasse 1997 VHB 1992

Cambridgeport Neighborhood Initiative
December 1997

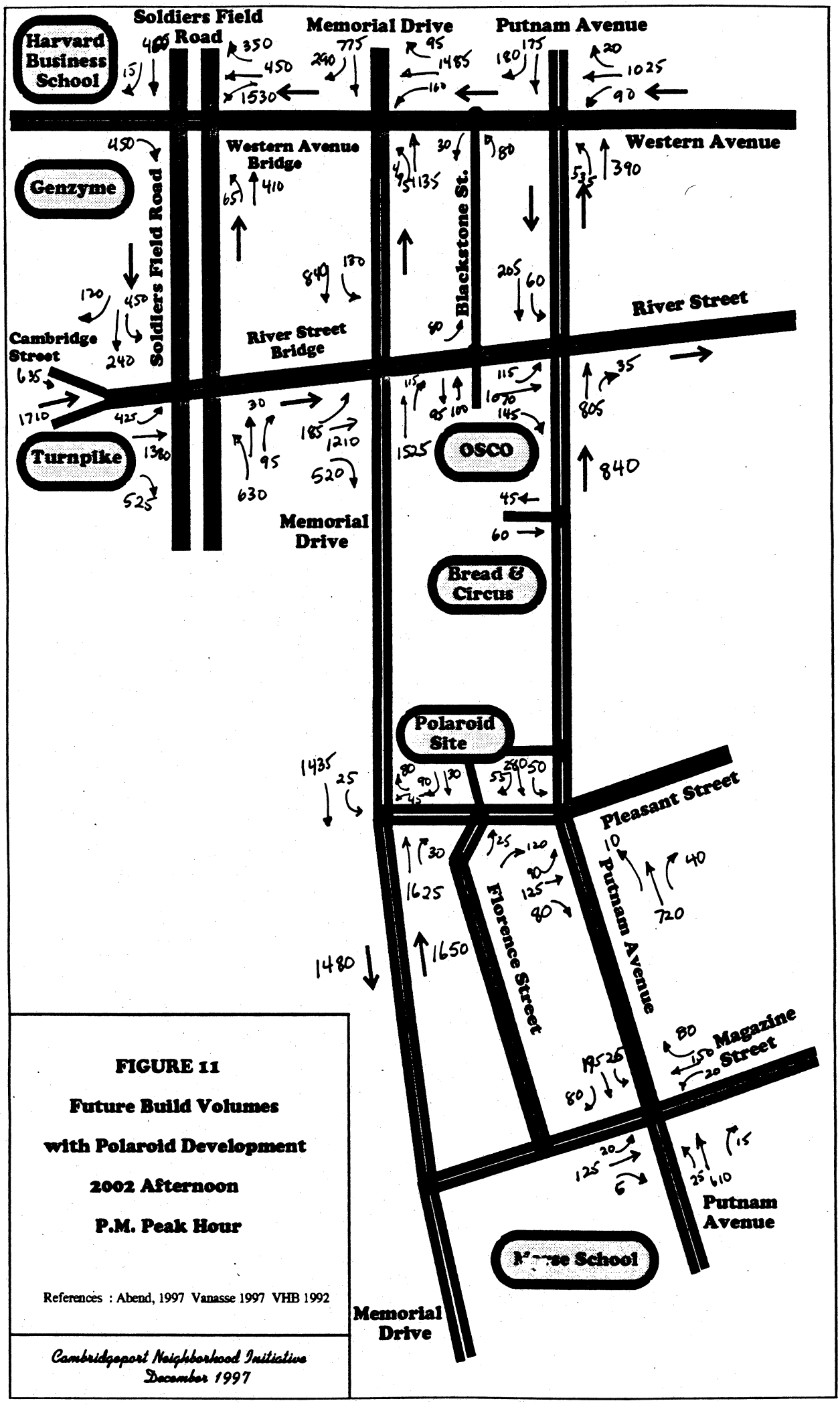

FIGURE 11

Future Build Volumes

with Polaroid Development

2002 Afternoon

P.M. Peak Hour

References : Abend, 1997 Vanasse 1997 VHB 1992

Cambridgeport Neighborhood Initiative
December 1997

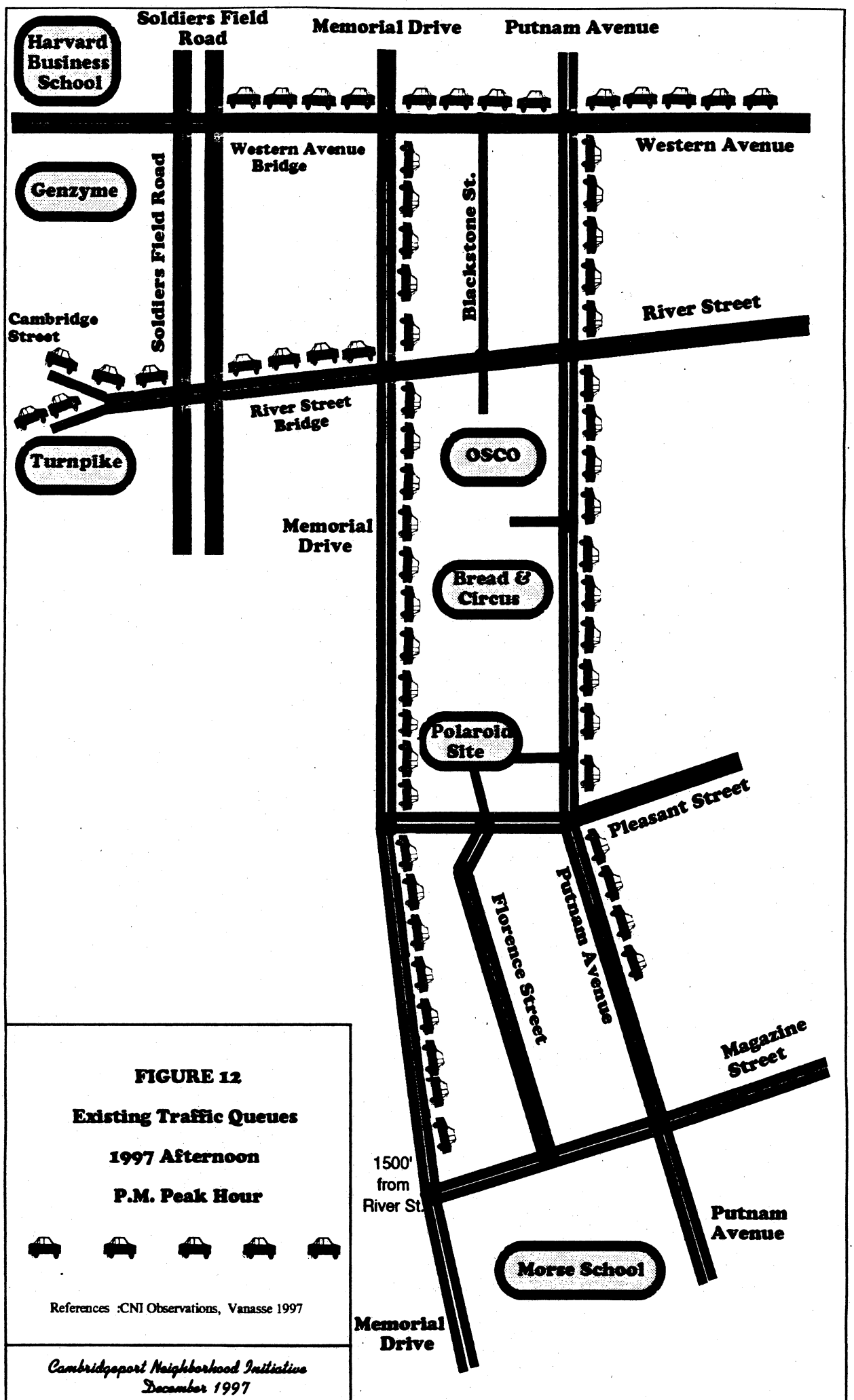

FIGURE 12

Existing Traffic Queues

1997 Afternoon

P.M. Peak Hour

References :CNI Observations, Vanasse 1997

Cambridgeport Neighborhood Initiative
December 1997

Chapter 4 TRAFFIC CONGESTION

As discussed in earlier chapters, the primary focus for afternoon traffic congestion will be centered on the 6 signalized intersections along Western Avenue and River Street. The first step is to observe traffic queues and travel patterns, since the queuing will show evidence both of heavy traffic demand and of inefficient traffic signal operations.

From my observations of Cambridge Streets over the past 30 years, I recall Memorial Drive in the afternoon peak always backing up almost to Magazine Street. This constant congestion raises the question why the queue does not increase, given the growth in daily traffic by 7,000 to 8,000 cars since 1970. The answer appears to be that peak hour traffic reaches a limit of tolerance, and hence there are several reactions :

- drivers choose to travel at other hours during the day ..... or

- drivers seek other routes, such as Putnam Avenue or Western Avenue

The seeking of alternative routes means that traffic on Magazine Street, Pleasant Street and through the MicroCenter parking lot is increased during periods of severe congestion. Indeed, the early Stop & Shop traffic study of 1992 included an assessment of cut-through traffic, which unfortunately was not included in any of the later Environmental Impact Report submissions. This cut-through traffic is reflected in the large volumes of traffic designated as coming from Florence Street in the afternoon peak yet probably arriving via the MicroCenter lot (115 cars in the PM Peak, according to the Polaroid report).

The typical queue lengths noted in the afternoon peak hour are shown graphically in Figure 12, with the most prominent queue being on Memorial Drive, but queues are also significant on Western Avenue and Putnam Avenue. Another queue which affects flows from the Boston side occurs on the River Street bridge.

The queues represent frustration and delay for drivers and pollution for residents, as well as the potential for cut-through traffic descending upon neighborhood streets. Clearly, the longer the queues, the more the delay and frustration, and more drivers will

tend to divert to local streets. These diversions bring safety and pollution concerns and other issues residents normally associate with the undesirability of traffic on their streets.

By observation, we can see how the traffic queues are spawned at one location and almost like dominos create queuing conditions elsewhere. As we can see from Figure 12, queues from 5 intersections can grow to interfere with other ones. These are :

∞ Western Avenue : from Soldiers Field Road across the bridge and into the Memorial Drive intersection

∞ Western Avenue : from Memorial Drive back and into the Putnam Avenue intersection

∞ Putnam Avenue : From Western Avenue into River Street

∞ Memorial Drive : From Western Avenue into River street

∞ River Street : From Memorial Drive into Soldiers Field Road and onto the Turnpike exit

Overall, the only reason that the intersections do not completely clog with gridlocked traffic is because drivers will often not enter an intersection if they will end up blocking the middle of the intersection. They will often halt at the stop line (Memorial Drive at River street, or Western Avenue at Memorial) and wait -- even through a green light is displayed. Generally, it is drivers who prevent lengthy gridlocking losses, not the traffic signal timing.

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Appendix F of this report provides a technical discussion of what possible improvements can be made in signal timing and traffic operations at the Charles River intersections. In summary, we should be able to improve on signal coordination between adjacent signals, and to trim the signal cycle time from 140 seconds to 80 seconds – and cut back on the gridlocking which now occurs. By various improvements, we should be able to

achieve 15% to 20% flow improvements at the four locations, and this time should be given primarily to pedestrians and other Charles River parkland users who must now battle traffic at the various crossings. Drivers would receive the benefit of less conflict with pedestrians as well as any additional capacity improvements which could be obtained from an effective mitigation program.

4.1 COMPUTERS THAT GO BUMP IN THE NIGHT

The Polaroid traffic study required that Spaulding and Slye retain a traffic engineer, Vanasse Associates, to perform the necessary technical analysis of traffic numbers and intersection capacity. In today's structured society, any consultant is required to follow accepted procedures of the *Highway Capacity Manual* -- which have become so complicated that use of a computer to help out is almost mandatory.

The computer model employed by both Vanasse and Abend is called the Highway Capacity Software, or HCS for short. The idea is that if we describe the intersection and type in data about traffic counts and numbers of lanes, the computer would do all the work and tell us how many cars can get through the intersection and how long the backup would be. The first problem is that the *Manual* and the HCS model cannot measure queues -- the backup of traffic. They simply stonewall the issue -- ignore it.

Fortunately, the state Highway Department has come to the rescue by providing a computer spreadsheet which allows the engineer to calculate a queue length. The problem now is that when Vanasse used the HCS to find out how well existing intersections worked, the model "failed" -- for example, it said that traffic now making left turns from Putnam Avenue to Western Avenue in the afternoon peak hour simply couldn't make it. The computer model said that between 50 to 80% of the cars could not make the turn, yet we can go out and see the cars doing it every day. Even worse, simple pencil-and-paper capacity estimates show there should not be a major problem, but in effect the computer model is producing the traffic equivalent of the world coming to an end.

What is a consultant to do? What happened, after lengthy internal review, was that the consultant went into the computer model and changed certain factors in order to give a more reasonable result. Normally, this is extremely risky business. Any time that a

computer engineer changes the working of a computer to get a desired result can result in a natural tendency to "tweak" the computer in order to get even more favorable results. In other words, the computer can become a "whitewash machine" if placed in the wrong hands.

From my review to date, it appears that the changes made to the model by Vanasse have been in the direction of being more reasonable. The computer printouts show a labeling of the intersections as being "calibrated", which is another way of saying that the unchanged HCS computer model is not calibrated and does not give credible results. While I must look in much greater detail into what happened with the model and how the consultant selected the new numbers he did, I can conclude that at this point the changes are not unreasonable. There is no evidence of fraud, although the potential is alarmingly there.

The Bread & Circus report looked at the same intersections on Putnam Avenue, and because of different assumptions (no pedestrian phase, different timing) the HCS performed somewhat less badly, but the evidence of problems is still there. Stated very simply, no traffic engineer should be required to use a traffic model with such staggering technical problems.

4.2 UNSIGNALIZED LOCATIONS

The primary unsignalized intersections which create problems within the study area are on Pleasant Street or immediately nearby. In the space of about 800 feet between Memorial Drive and Putnam Avenue, there are three unsignalized intersections : at Memorial Drive, at Florence and the Main site drive, and at Putnam Avenue. In addition, there is the easterly driveway on Putnam Avenue which has been expanded in function so that it would handle 59% of the Polaroid site traffic, with only 41% at the "main driveway."

As shown in Figure 3 of the Polaroid Report, this driveway is very close to the Pleasant and Putnam intersection -- only about 30 feet away. The safely of this situation will be discussed more fully in Chapter 7. The Polaroid report did *not* assess its potential to interfere with the adjacent Pleasant Street intersection. As an isolated intersection, cars

coming out the garage in the afternoon would have 2 minute delays getting onto Putnam Avenue and the peak queues would extend into the parking garage, with about a 250 foot queue within the garage itself (slightly more than the length of the garage).

At the Pleasant Street driveway, the Polaroid report describes a heavily gridlocked situation. For the year 2002 case with the Polaroid project in operation, traffic would be queued up on Pleasant Street in both directions – filling the 800-foot distance between Memorial Drive and Putnam Avenue. Waiting traffic from the Polaroid site would fill its own driveway and extend into the parking garage and go round and round for 1,500 feet, which is more than 7 times the length of the garage.

Thus we have evidence in the Polaroid report as to the traffic conditions which we expected all along : that there will be virtually continuous traffic queues along Memorial Drive on one side, extending along Pleasant street, into the Polaroid site and into the garage .... and along Western Avenue and Putnam Avenue to the east site entrance drive, into the Polaroid site and into the garage. Either way they go, any driver seeking to leave the Polaroid garage would be contemplating a 250- to 1500-foot queue just to get out of the garage. In addition, both directions of Pleasant Street will be queued solid between Putnam Avenue and Memorial Drive.

Here again, these results have come from the internal recesses of a computer model, and one may have reason to be skeptical. The problem is that this information has been presented in the Polaroid report without any commentary in the text and without any evidence of calibration of the computer model. Calibration in this engineering context would mean adjustment of the model to make it accurately reflect real world conditions. The Polaroid report simply publishes the computer printout, without commentary. If there was anything suspicious about the computer results, the report should have said so.

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The ultimate conclusions of both traffic studies is that traffic will not get noticeably worse as a result of their projects, so City officials should not enforce any obligation for meaningful mitigation upon the developers. The Polaroid report concludes in rather strange language that "*there are no locations where the project causes a deterioration of*

traffic conditions level of service." In fact, level of service is simply one measure of traffic conditions – queues and delays being another. What the report is saying is that traffic today is congested ("Level of Service F") and in the future will be congested ("Level of Service F"). By this technicality, the developer avoids any admission that they would be making traffic conditions such as queuing any worse.

It would have been much better if both traffic studies focused on *queues*, because the gridlocking is the key factor in inefficient intersection operation and long delays. The consequence of queues is to produce frustrated drivers who turn off major routes and cut through local residential streets. By their discussions of level of service, both reports deal with the wrong measure and fail to identify existing and future traffic problems. Having computer programs which work badly simply makes a difficult situation even worse. As we will see in Chapter 8, the absence of meaningful mitigation strategies limits the usefulness of both reports.

5.0 PARKING STUDY

The CDD scope called for a parking study which would have justified the size of the parking garage. This subject appears to have been addressed, in part, on pages 20 and 21 of the report. Table 8 has a footnote "b" which is not referenced in the table itself, and one can reasonably conclude that the last column of the table was edited out, showing the number of parking spaces for a 285,000 s.f. development. The figures would have been :

General Office Building = 1090 spaces

Corporate Headquarters Building = 610 spaces

Single Tenant Office Building = 950 spaces

Research and Development Center = 590 spaces

In addition, the next page, Table 9 refers to the 1989 survey of existing transportation for many employers, with Polaroid having 1.67 parking spaces per 1,000 s.f. This figure implies a need for 480 spaces -- which is very close to the original 500 spaces proposed. Instead, the latest parking plan is 607 spaces, which is very close to the 610 figure associated with the "Corporate Headquarters Building" category. How does Polaroid or Spaulding and Slye calculate the parking needs of tenants, especially as refined by trip reduction programs and other mitigation efforts? It is quite clear that the Polaroid report does not represent the parking study which was called for in the Cambridge scope.

Chapter 6 SAFETY ISSUES

One fundamental measure of safety is the number of vehicles passing through a location compared to the number of accidents which occur at the location. Traditionally, we calculate the reverse, or the accident rate –which is the number of accidents which occur for every million vehicles passing through. As a result, we see that the average statewide accident rate at traffic signals is expressed as 1.78 accidents per million vehicles, which is very difficult to understand. If we express it the other way as a safety rate, we would say that 530,000 cars pass through an intersection before there is an accident. We can understand the problem better, including the fact that with millions of vehicles a year passing through some busy intersections we can have situations of 10 or 20 accidents a year occurring at one spot.

The data sources on accidents are very few. I have a 1971 listing of MDC accidents, but the 1986 University Park report did no assess accidents at any locations close to the Polaroid site. Neither report for Osco or Bread & Circus contained any safety analysis. The 1992 DEIR for Stop & Shop includes accident summaries for 1988 and 1990 for Memorial Drive only -- there was no data for 1989. For this study of the Polaroid site in 1997, both Vanasse & CNI have the same basic source of information -- which is the Cambridge Police printouts for 1992 to 1997.

CNI efforts to obtain recent accident data from the MDC / State Police were not successful, but through good fortune an excellent historical record of accident data has survived : the March 23, 1972 listing of MDC accident frequency, prepared by Sergeant Myer Goldberg and Officer James Shea of the MDC Police. This report represents a compilation of every location having 5 or more accidents in calendar year 1971, and the listing has a summary of the most frequent types of accidents. Unfortunately, there is no identification of accident severity. The accuracy and completeness of the Goldberg report is well assured because of the meticulous nature of all of his work and his responsibility for maintaining quality control of the MDC accident reporting system.

The Polaroid study is the only document I have seen which seeks to calculate accident *rates* for intersections in the area. An accident rate is a measure of the number of accidents which occurs for a cer 'n amount of travel. For a length of roadway, the travel

is measured in millions of vehicle-miles. For intersections, the measure is accidents per million vehicles passing through the intersection. As noted above, we can also calculate *safety* as the number of cars passing through for every accident.

In 1971, Western Avenue and Memorial Drive had 29 accidents and had the same accident rate as today's statewide average. With 15,000 daily vehicles on Western Avenue and 30,000 on Memorial Drive, and with 300 effective traffic days per year, the annual vehicle load is 14 million cars, which is about one accident for every 500,000 cars. By contrast, Memorial Drive and River Street in 1971 had a safety rate of 1.7 million cars per accident -- or three times better than the statewide average. Within the Cambridgeport study area, every intersection during the period 1971 to 1997 performed at a level equal to or better than the statewide average for every year -- except for one location. The intersection of Putnam Avenue and Magazine Street achieved a safety rate of only about 350,000 cars per accident, significantly below the statewide average of 530,000. The detailed accident and safety calculations are contained in Appendix K. In addition, one needs to take into account the number of injury accidents, as well as pedestrian accidents.

The sources of accident data tend to limit the usefulness of any data. While there is no reason to expect that accidents will be underreported at one intersection compared to another in Cambridge, the fact that Memorial Drive is under the control of the MDC with accident reporting through the State Police inevitably makes the Cambridge Police records incomplete. This problem of incomplete data often occurs when state highways go through municipalities, and some accidents are reported only to the municipal police, some only to the state and some to both. The accident reporting for Memorial Drive and Western Avenue is an obvious case, where 29 accidents were reported in 1971, yet the Polaroid report lists no accidents for the years 1994 to 1997. It is quite clear that severe omissions in the data have occurred. My intent is not to place blame, but simply to point out how different jurisdictions can result in variations in accident reporting.

The problem in the Polaroid report occurs in Table 4 (page 14) where accident summaries and rates are calculated -- so far so good -- but then a judgment is rendered as to the "significance" of the accident rates calculated. Because of the limitations in the data for Memorial Drive, no judgment should have been offered for those locations. The listing does leave off Memorial Drive a... Western Avenue, without explanation, but the omission

of Putnam and Western is even more puzzling. I could find no evidence of any accidents occurring at Putnam/Western and I wonder whether the data is being recorded in another district or zone. Both intersections on Putnam Avenue are on school routes, so the information can be significant.

..... 6.1 Safety of Driveways

The City's May 30 scope identified the task to "*evaluate operations and safety at site entrances/driveways*" *and to "consider pedestrian safety, especially children, at school crossings.*" CNI has consistently raised the issues of driveway safety. In my letter to CCD on May 27, I noted that "*the location of driveways should be assessed, including the desirable relocation of the existing Putnam Avenue and Pleasant Street driveways.*" Figure 3 of the Polaroid Report shows the problems with both of these driveways. On pleasant Street, cars leaving the Polaroid site for Memorial Drive must make a 135-degree right turn -- and do so into an existing 9-foot travel lane. I know of no vehicle which can make this turn (except a motorcycle) without swinging into the opposite lane of Pleasant Street. The angle of the existing driveway is so acute that it makes no sense whatsoever. A proper driveway would meet Pleasant Street with a right-angle intersection, as would be achieved if the driveway were relocated 70 feet towards Memorial Drive. Such an alignment would also reduce the tendency to use Florence Street as a bypass to and from the Polaroid site.

The Putnam Avenue driveway shown in Figure 3 has been changed from the original alignment shown on the summer 1997 site plan prepared by the architect, Cannon Associates. The Putnam Avenue driveway as proposed has a kink in it and joins Putnam Avenue at a 60-degree angle, on a curve, only 30 feet away from the Pleasant Street intersection.

The obvious question for any traffic engineer is how could either of these driveway arrangements be rationally proposed as safe or in the public interest. Their use appears to be directly related to the desire of the project proponent to avoid any state or local permits. Under the circumstances, the best solution will be to ask the appropriate City Engineer whether he would be willing to put his professional stamp on any such driveway plan. Indeed, the consultants for Spaulding and Slye should be asked the same question.

With the expanded use of the Polaroid site, the viability of the intersection of Memorial Drive and Pleasant Street must be called into question. Should this location be controlled by a paid detail officer in peak hours or should be signalized? The Polaroid report contains no discussion of the safety implications of traffic associated with either the future No-Build or Build situation.

Chapter 7 ALTERNATE CIRCULATION ROUTES

There are several alternate routes which commuters might seek to use, including :

∞ Memorial to Putnam via Magazine Street, the MicroCenter lot or Pleasant Street ..... routes often used by drivers who seek to avoid the 6 to 10 minute delays on Memorial Drive. However, delays on Putnam and Western can also be significant.

∞ Polaroid site to Florence to MicroCenter lot to Granite ..... If congestion on Memorial Drive and Putnam Avenue becomes severe, many drivers heading east may be inclined to use this alternative.

∞ Memorial to River to Blackstone to Western ..... not so much to save time, which may be minimal but to avoid the problem of being boxed into the right lane on Memorial Drive at River Street and wanting to turn left ahead at Western Avenue.

∞ Putnam to the Osco lot to Blackstone to Western ..... may become less preferable with increased activity at the Bread & Circus site, but any cars which are still making this move would be traveling through a busy parking lot with many pedestrians.
The crossing of River Street to Blackstone Street can also be somewhat difficult in the peak hour.

7.1 ACCESS ALTERNATIVES FOR THE POLAROID SITE

There are several access alternatives to the site :

∞ The original proposal with two driveways — plus a third driveway for truck deliveries.

∞ A revised plan with relocated driveways having right-angle intersections

∞ Dead-ending of Pleasant Street at Florence Street and making all Polaroid traffic travel by Memorial Drive.

∞ Make Pleasant street one-way southbound between Florence and Memorial Drive

∞ Delete the driveway on Putnam Avenue

∞ Relocate the Polaroid Driveway to the north side of the main building and make all access from Memorial Drive.

∞ Signalize the intersection of Pleasant street and Memorial Drive, in combination with any option 1 thru 6 above.

With the existing driveway locations, safety remains a major concern. I would recommend against using the existing driveways as proposed. The Putnam Avenue driveway, if it exists at all, should be for residents only and should be located as far away from Pleasant street as possible.

A plan with relocated driveways would deal in part with safety issues and allow for ease of turning traffic, but queuing problems would remain. Dead-ending Pleasant Street at Florence would virtually require a traffic light on Memorial Drive. The strategy of forcing Polaroid traffic to use Memorial Drive could have undesirable side-effects, since this would likely result in more cut-through traffic via MicroCenter and other local Streets. This option would not be effective in keeping cars off local streets.

Making Pleasant Street one-way southbound between Florence and Memorial Drive would reduce congestion at the Memorial/Pleasant intersection, but instead the cars would drive around the block and enter via Putnam Avenue. Deleting the driveway on Putnam Avenue may be necessary if there are not conditions imposed on this location to restrict activities to very low volumes of traffic, such as residents only. Even then, the design and location is problematic.

Relocating the Polaroid Driveway to the north side of the main building and making all access from Memorial Drive would require a full environmental review and would concentrate most of the traffic impacts on Memorial Drive. Would the new access drive be signal- or officer-controlled in the peak hour? How would vehicles make left turns out onto Memorial Drive? One would still need to have specific controls to protect Cambridgeport from cut-through traffic from Memorial Drive.

Signalizing the intersection of Pleasant street and Memorial Drive, in combination with any option having driveways on residential streets, would encourage some vehicles to use Memorial Drive and hopefully to do so more safely. Consideration of a traffic signal might be warranted due to Polaroid and other traffic developments. It might reduce traffic on Granite Street, and could allow another point for pedestrian access across Memorial Drive. Heavy left turn traffic off inbound Memorial Drive could present a safety problem, but this was the original Stop & Shop proposal at Magazine Street.

6.2 Next Steps .....

We need to check into the accident situation at Putnam and Magazine and to seek recent data from the State Police. A review of nearby accidents should also be made to determine whether some accidents are being located by street addresses when they may actually be an intersection accident.

There is no comprehensive street calming program for Cambridgeport, to control either the volumes or the speeds of vehicles passing through the neighborhood. This matter should become a priority for neighborhood planners.

Chapter 8 MITIGATION

The mitigation offered as part of the Bread & Circus report is fairly clear from the discussion on pages 24 to 26 : "*... it is fair to conclude that the proposed Bread & Circus store will not create any particular traffic concerns.*" The claim is made that "*the store's impacts are small compared to other area projects during peak times....*"

The Polaroid report contains only the briefest description of possible mitigation actions, as listed under "Recommendations" on page 4. Virtually all of the items listed have no numerical target for completion. One could meet the conditions specified by over the space of one year selling one MBTA pass, running one shuttle bus, issuing one brochure and advertisement which refers to available transit service, reserving one parking space for car pools, providing a single bike rack, offering 5 minutes of flexible arrival or departure times, operating a single computer with information on some employees who are ride-sharing and engaging in meetings (cooperation) regarding demand management. The listing on page 4 refers to concepts for demand management, but there appear to be no demands being made on the managers of development for a vigorous and effective trip reduction program.

The last item on the list refers to working with City and state officials to retime traffic signals, as was first suggested in the September 1997 CNI preliminary report. The Polaroid report provides no more information or additional insights developed on the part of the Polaroid team, especially since improved traffic efficiency should be of notable benefit to Polaroid, as well as the general public. The introductory wording at the beginning of the mitigation listing suggests otherwise : "*Opportunities to improve operating conditions by geometric or traffic control modification are very limited.*" CNI concludes otherwise, based on observations of severe gridlock in the area and the evidence that 20% of the capacity of many intersections may be wasted by ineffective signal timing and pavement markings.

From the beginning I have taken the position that there should be no Divine Right to release traffic onto public roadways, especially when these streets are already congested. My July 21 memo to CDD stresses the goal of mitigation, but beginning with a condition of

zero allowable traffic, unless there is appropriate mitigation. I identified mitigation as including both improved traffic signal timing and trip reduction. Neither the Polaroid nor the Bread & Circus report provides us any enlightenment with regard to improved signal timing and effective trip reduction goals as applied to the new development proposed. I noted that the mitigation must come first and it must be effective – "*we cannot have a traffic disaster and then seek to desperately find solutions after the problems are well established.*" Such exploration for effective mitigation would constitute good planning, just as dumping large new traffic generators into congested circumstances would constitute bad planning.

I believe that there are effective improvements that can be made in signal timing, and I was hopeful that the two traffic studies might show ways of trip demand management which would contribute towards a reduction in new traffic. The new programs for trip demand management can either be effective, or they can be ineffective -- "*likely to be fictitious, ephemeral or otherwise vacuous.*" Most unfortunate is the lack of any evidence of specific activity or membership by Spaulding and Slye or Polaroid in the Charles River Transportation Management Association.

8.1 Signal Timing and Interconnection Strategy

There will undoubtedly be differences of organizational opinion about signal interconnection between the City of Cambridge and the MDC. Clearly all six intersections on River Street and Western Avenue may benefit from coordination, but who would control them? Normally, one would think that placing all controls with the City of Cambridge at their central computer might appear a logical solution. However, experience with transferring control of MDC signals has, in my view, been very negative, as evidenced by the signal timing at the intersection of Mass Avenue and Alewife, where cycle times used to be a Troglodytic 182 seconds, only recently reduced to a still wholly unacceptable 162 seconds. The fact that the MDC's signals on River Street have 140-second cycles suggests that the MDC is not blameless in using long-delay, long-queue signal timing, but for the moment let us consider a future when the six signals all operate with coordination and reasonable offsets. We should focus on peak hour cycles of 80 seconds, with 60-70 seconds possible in the off-peak. Neutral or negative progression timing should be applied to the

Western Avenue and River Street bridges, which is the opposite of the current progression strategy.

The first priority for benefits from improved signal timing efficiency should be the pedestrians, joggers and skateboarders using the Charles River pathway system. Today they receive virtually no help from the existing signals. Within the past two years, a pushbutton concurrent signal has been installed at the Western/Soldiers Field Road intersection, but this display should be automatic. Concurrent timing should work at this relatively uncongested crossing, but pedestrian exclusive phases are needed at the other three MDC locations. The biggest challenge will be finding and implementing improvements at the critical bottleneck -- Memorial and Western -- so that both pedestrians and vehicles can be adequately served.

Chapter 9 CONCLUSIONS and RECOMMENDATIONS

On the basis of the traffic information and studies available to it, the community would not be justified in feeling that developers and public officials have an adequate grasp of either the need for or the potentials for mitigation. While the traffic signal operations in the study area shown marked evidence of inefficiency and hence a potential for improvement, both studies show a marked reluctance to even engage in a discussion about mitigation of any sense. One is left with the impression that the only purpose of a traffic study from the developer's viewpoint is to run the numbers through a computer, announce the results, and depart the scene with only the most token of commitments to improvement. Surely there is more to good traffic engineering than this.

Admittedly, the developer has had to walk into a minefield of inadequacy -- traffic computer models which behave miserably and require manual intervention to avoid total embarrassment, and accident data which are about as easily obtained as the Holy Grail. The Polaroid and Bread & Circus sites are classic examples of modern zoning anomalies -- overzoned parcels located in the middle of traffic congestion. For anyone seeking evidence of the need for traffic zoning, the development proposals for these C-3 parcels demonstrates how floor-area-ratios are inadequate measures for limiting the intensity of development. If developers took seriously the need for traffic mitigation, the need for traffic zoning might be less pressing. Since neither developers/consultants nor City Planners appear willing to deal specifically with meaningful mitigation, the results of the Polaroid review – and University Park as well – remind us how important a pro-active trip management program can be for all parties in the City.

Other than CNI, no one has placed a specific mitigation plan on the table, with a rational and strategy for development which does not intensity existing congestion and result in more traffic cutting through residential neighborhoods. It is not known what role the City's traffic consultant Rizzo Associates will now play in the review, and it may be a very limited one. Will Abend and Vanasse be asked to come up with more and better mitigation ideas than they have shown so far? Will the City of Cambridge seek to implement the spirit of their 1990 Guidelines for the preparation of traffic studies and subsequent trip demand management? As a minimum, I would urge that the MDC be

contacted and presented with specific proposals. It would be best if the working group of public/private parties go into this together, although I believe that CNI would be willing to approach the MDC independently, if that is required.

Finally, something must be done about the deplorable state of the computer models now being employed for traffic capacity analysis. The quality of the results seems to diminish as the models and their underlying equations gets increasingly more complicated. For this reason, I am urging that all traffic studies in Cambridge be done using simple critical lane methods, as demonstrated in Appendix G of this report. Simultaneously, we should be investigating what it is that has caused the computer models to behave so badly, and to report our findings to the appropriate local, regional and national authorities in an expeditious manner.

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CCM-101

City of Cambridge

Consent Communication #30

IN CITY COUNCIL

December 15, 1997

COUNCILLOR DAVIS

ORDERED: That the City Manager be and hereby is requested to report on whether expected traffic conditions will impede access by emergency vehicles to Pleasant Street, Putnam Avenue and surrounding streets if the Polaroid project is built as proposed.

In City Council December 15, 1997.
Adopted by the affirmative vote of nine members.
Attest:- D. Margaret Drury, City Clerk.

A true copy; D. Margaret Drury

ATTEST:-
D. Margaret Drury
City Clerk

To: the Honorable,the City Councillors,
From: the Co-Chairs of the Cambridgeport Neighborhood Initiative (CNI):
Daphne Abeel, Gordie Fellman, Stash Horowitz, Anastasia Leotsakos,
Laurie Taymor-Berry, Maureen Van Stry, Elie Yarden
For: City Council Meeting of December 15, 1997
Subject: Spaulding & Slye Neighborhood Meeting of December 11, on their plans for proposed partnership with Polaroid for the real estate office project, 784 Memorial Drive

Last week, Spaulding & Slye sent out a notice to abutters within one block of their proposed project at 784 Memorial Drive, about a December 11 meeting to provide information about this proposal.

On November 26, Spaulding & Slye's traffic study on this proposal was issued, and a copy was provided to the CNI on December 1. Our members are currently reviewing this study, and will comment further on it to the City Council at its December 22 meeting.

On December 10, traffic engineer Stephen H. Kaiser, of 191 Hamilton Street, in our neighborhood, prepared a ***Step-1 Report on Cambridgeport Traffic; with Special Attention to Development of the Polaroid Site and Bread & Circus.*** Mr. Kaiser is acting as consultant and advisor to the CNI on all aspects of traffic impacts upon our neighborhood and areas surrounding it.

We hope that each City Councillor will be provided with a copy of the Spaulding & Slye study, which was mandated by unanimous order of the City Council on June 2. CNI will be providing, at its expense, a copy of the Kaiser study to each councillor. We hope you will have the time and interest to study thoroughly these carefully prepared reports.

Additionally, a traffic consultant hired by the City with monies appropriated by the Council, Barry Pell of Rizzo Associates, will present his analysis of both above mentioned studies, sometime in January.

CNI hopes that Mr. Pell's report will be a thorough one, addressing all the issues raised in both studies. We further hope that it will be in writing and be made available to the CNI when it is issued to CDD and the Council, so we will be able to comment on it as well.

Since Spaulding & Slye's notice of their December 11 meeting was sent to such a small number of neighbors, and since CNI believes that the implications of this proposal affect a much larger part of Cambridgeport, we distributed 400 flyers to the homes on adjacent streets which would be most directly affected. We include this sheet for your information. We will present our view of this December 11 meeting to the Council at subsequent Council meetings.

Attachments:
Spaulding & Slye meeting notice
CNI meeting notice
Sunday, December 7 Boston Globe article on Spaulding & Sly study

submitted by hand by CNI Co-chairs;

Elie Yarden
Stash Horowitz

30-1

MEETING ANNOUNCEMENT

Dear Neighbor,

Cambridge Community Development, Polaroid and Spaulding & Slye would like to announce a neighborhood meeting to provide an update on the status of the 784 Memorial Drive project. The meeting is scheduled from 7 to 9 PM on Thursday, December 11 at the Graham & Parks School, 15 Upton Street, Cambridge, in the cafeteria. This announcement is being sent to residents within one city block of the development project. Please pass this announcement along to appropriate parties that you believe are interested in attending this meeting.

AGENDA

- Project description
- Project status
  - Building design
  - Construction mitigation
  - Housing
- Traffic review

In the event that you cannot attend the meeting, the following is a status summary.

SUMMARY

The proposed project includes the rehabilitation of the 45,000 square foot historic building at 784 Memorial Drive as Polaroid's headquarters, the entry addition of approximately 10,000 square feet to same, the construction of two new office buildings totaling 240,000 square feet, and a parking garage. In addition, 25 to 30 new residential units along Pleasant Street are proposed.

Construction is progressing on schedule with the interior demolition and asbestos abatement nearing completion on the front, historic building, and now commencing on the back buildings. Demolition of the back buildings is scheduled to begin in late December. The renovation of both the interior and exterior of Polaroid's new headquarters will also begin in late December.

A traffic review is being completed by the consulting firm R.D.Vanasse & Associates. This traffic review will be forwarded to the City of Cambridge Traffic Parking & Transportation Department and Community Development for review by their traffic consultant.

We look forward to meeting with you to review the status of this project.

30-2

In May of this year, Spaulding & Slye, a real estate and construction firm, announced that they will be partners with Polaroid in a proposed development at 784 Memorial Drive.

In response, a group of abutters and near-neighbors formed the **Cambridgeport Neighborhood Initiative** (CNI) to request more information and express some concerns.

CNI encourages you to attend a meeting **Thursday, December 11, 7:00 PM,** in the cafeteria of the **Graham & Parks School, 15 Upton Street.** This meeting is sponsored by the partners Spaulding & Slye and Polaroid, to present their plans.

Here are some important facts about the project:

- 300,000 sq. ft. of commercial office space and 600-car parking garage, and the possible sale of one acre to a builder of low and middle income housing.
- all traffic enters and exits this 600-car garage at peak hours through neighborhood streets, Pleasant Street and Putnam Avenue.
- all traffic will use existing, hazardous curb cuts on these neighborhood streets, instead of coming off Memorial Drive, *to avoid any City or State official review.*
- resulting traffic will increase congestion through a much larger section of Cambridgeport.

* * * * *

CNI members spoke at several Cambridge City Council meetings in June. The City Council responded by unanimously passing two Orders:

1. that a traffic study be done because "significant traffic and parking issues will arise from this project."

2. that additional soil testing be done throughout the site. The site has a long history of industrial and chemical usage, from before the introduction of required safeguards. The Council Order requests the "communication of the results to the City, before any demolition and construction occurs."

Regarding the traffic

The main conclusion of Spaulding & Slye/Polaroid's traffic study, submitted November 26, is that traffic conditions at all intersections surrounding the site are already so bad, that the traffic from this project won't make things any worse.

Spaulding & Slye/Polaroid wants to use two existing curb cuts. This dumps all the project's traffic onto our already congested neighborhood streets, and not directly onto Memorial Drive where it belongs.

Regarding soil testing

The state Department of Environmental Protection (DEP) wrote Polaroid's environmental engineer in July: "Based on our telephone conversation earlier this week, I understand that you intend to recommend that an environmental consultant be hired to evaluate the need for additional soil-testing for the project. DEP requests that the result be forwarded to this office, so we can assure the public that future soil excavation will be done safely."

Conducting such tests would address a justifiable neighborhood concern. So far, Spaulding & Slye/Polaroid has refused.

BOSTON • BROOKLINE Boston Sunday Globe CAMBRIDGE •
DECEMBER 7, 1997
CITY WEEKLY

CAMBRIDGE NOTES

Study looks at development, traffic

According to a traffic study conducted for the firm Spaulding and Slye, a proposed development at the currently vacant Polaroid property on Memorial Drive would have little impact on already snarled traffic conditions in Cambridgeport.

The report projected that by the year 2002, the majority of Cambridgeport intersections near the site would receive "level of service F," a traffic classification set by the Federal government, which denotes the worst traffic conditions possible. Site development, the report concluded, could do little to make traffic any worse.

"The 784 Memorial Drive office project will generate additional vehicle trips on project area roadways; however, there are no locations where the project causes a deterioration of traffic conditions," the report says. "There are intersections within the study area that currently and will continue to operate at or over capacity in the future, with or without the current proposal."

Traffic caused by a proposed 577-car garage will be mitigated by providing discounted public transport passes, shuttle buses, staggered work hours, and ride-sharing information for employees, the report recommends.

The City Council requested the study earlier this year in response to neighborhood concerns that new site parking would cause further traffic problems in the already congested streets of Cambridgeport. A meeting between residents and representatives of Spaulding and Slye is scheduled for 7 p.m. on Thursday at the Graham & Parks School.

Compiled by Theo Emery.

30-4

Consent Communication #30 S-762

Communication ws received from CNI Co-Chairs, Elie Yarden and Stash Horowitz, regarding a Spaulding & Slye Neighborhood Meeting on their plans for the Polaroid site at 784 Memorial Drive.

Cambridgeport Traffic Report enclosed.

In City Council December 15, 1997

ORDER ADOPTED