

March 19, 1998

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To : Cambridgeport Neighborhood Initiative

From : Stephen H. Kaiser, traffic engineer, CNI

SUBJECT: Progress Report on Traffic Issues, 784 Memorial Drive

As a result of various Council and resident initiatives, we can record several established or potential achievements in the area of traffic analysis and mitigation for the Polaroid/Spaulding & Slye site. Beginning in May/June of last year, the City Council passed an order for the City Manager to prepare a traffic study. After extensive community review, the arrangement was agreed that Spaulding & Slye would prepare one traffic study and the Cambridgeport Neighborhood Initiative would prepare a separate study, and both would be reviewed by Rizzo Associates -- the traffic consultant for the City.

In sequence, the various reports issued were :

September 29 Potential Traffic Mitigation Report, for CNI

November 26 Vanasse Report for Spaulding & Slye

December 10 Kaiser Report for the Cambridgeport Neighborhood Initiative

February 2 Rizzo review of two reports, with proposals for mitigation
CDD prepared draft proposals for Demand Management.

Since early Summer of last year, CDD had been convening various meetings of all parties to discuss the traffic matters and assigned an information coordinator to circulate basic traffic data. In mid-December, the first review meeting was held on the Vanasse Report, at which time Rizzo/CDD proposed that a mitigation initiative could begin based on some of the concepts proposed in the September CNI report. The emphasis would be on minor traffic signal adjustments and other changes which could result in more efficient traffic flow and more time for pedestrian crossings.

Because of the complexity of both the roadway and political systems, the decision was made to start small. The first step was to approach the MDC on signal timing improvements at both ends of the Western Avenue bridge. The political complexity is caused by the fact that the signals are under the control of the MDC and one of them is located in the City of Boston.

Two small meeting groups were created -- one of traffic engineers to discuss the Western Avenue situation and another for Demand Management. I was the CNI representative on what came to be called the traffic engineers' "Team" but to my knowledge there was no CNI representation on the Demand Management committee.

The traffic engineers group has met fairly continuously about once every two weeks since mid-December. For a six-week period from Christmas through January Spaulding & Slye chose not to participate and would not authorize Vanasse to perform any work. However, CNI, Rizzo, CDD, Traffic & Parking continued to meet and keep Vanasse informed of all discussions and progress. By early February, Spaulding and Slye returned to the meetings and authorized Vanasse to do traffic analysis for Western Avenue. February was the most intense month of joint traffic analysis, with memos prepared by Vanasse, Rizzo and CNI. From this interaction came a consensus among the engineers on traffic signal timing changes. These proposals were communicated to the MDC in the City's letter of March 11. We are currently in a holding pattern awaiting a response from the MDC, although we are also preparing to consider signal timing changes at River Street, the possibility of a signal at Pleasant and Memorial, and more extensive changes to other intersections (curbing and lights).

Summary of Phase One Proposals to the MDC

The suggestions made to the MDC so far relate entirely to traffic signal timing changes, to be applied for a 30-trial period. Measurements and monitoring of traffic would be made by all parties involved.

Today's problem is that current traffic flows are somewhat inefficient, in that traffic on the bridge often blocks the Memorial Drive intersection and prevents any traffic flow or pedestrian crossings. In this sense, the time is "wasted". I contend that the losses are the order of 15 to 20% of the time and that such inefficiencies are fairly common at many traffic lights (Porter Square and Alewife being notable examples).

Our initial proposal is to retime the traffic lights so that there is more green time on the bridge at the Boston side. This way, blockage of Memorial Drive will not occur. In addition, the timing is arranged so that there will be less delay for turning traffic from Memorial Drive. The goal is to try to make Memorial Drive a more preferred route with less delay than Putnam Avenue, so that traffic flows on Putnam Avenue and other residential streets can be reduced.

Once Spaulding and Slye rejoined the process, their traffic contribution was significant. Vanasse produced traffic flow diagrams which formed the basis for our ultimate understanding of flows and signal timing. Rizzo produced calculations showing how the queues grew on the bridge and how we would estimate the number of stopped cars for various different signal timings. CNI produced colored traffic flow, timing and queuing diagrams which showed the extent of existing intersection blockage and how the new signal timing could avoid it.

I would emphasize that all of these mitigation efforts have been made using today's traffic numbers -- with no allowance for future traffic growth. Vanasse has stated that the initial changes will not result in a change in capacity -- I disagree. We will be able to make the intersection operate more efficiently and thus increase its capacity. The engineers have not as a group calculated the capacity increase, but based on available data and traffic counts I have made, I estimate that the increased efficiency of the entire River and Western traffic light system could result in the addition of a minimum 15-second pedestrian exclusive phase at Memorial and Western, plus a potential for up to 125 more cars an hour through the intersection. This estimate is admittedly optimistic and assumes that all of the proposed efficiency measures are adopted and are as effective as I think they might be.

Pedestrian Crossings at Memorial Drive & Western Avenue

The existing crosswalk on the Charles River path system at Western Avenue is one of the most difficult along the entire MDC system. The MDC is currently engaged in a master plan process for the entire Charles River basin, and current proposals are to have all path crossings with a pedestrian exclusive phase, every time without a pushbutton. I believe this objective can be met at Western Avenue if we take advantage of the existing inefficient operation and use some of the time saved for a pedestrian-only crossing phase.

This new signal operation means much less conflict between cars and pedestrians, but moderate construction activity would be required, possibly occurring next year. I would emphasize that the signal timing changes currently proposed to the MDC do NOT include a pedestrian phase. Pedestrian waiting times would be reduced by 10%, but the conflict with cars would remain until the signals are physically improved. The new signal timing gives us better knowledge about efficient traffic movement and how much time can be saved for pedestrians.

I realize that 15-seconds for pedestrians is a minimum, and activity for all the path users (bicyclists, joggers, skaters, runners, etc.) might justify more time. However, the compromise of giving the minimum time for pedestrians and providing the balance to reduce congestion on Memorial Drive appears to be the proper balanced strategy.

As part of our proposals to the MDC, we have significantly improved the pedestrian path crossing on the Boston side of the bridge. Currently, even if traffic is stopped, pedestrians on the Boston side must press the button to get a WALK light. Rizzo developed a proposal to use approaching cars to trigger the WALK light automatically, so the pedestrian pushbutton is no longer necessary. These additional pedestrian benefits can be achieved without interfering with vehicular flow in any way, and indeed jaywalking might be reduced. This improvement occurs in Boston and is an obvious enhancement for both the MDC and the City of Boston.

TRAFFIC GROWTH FROM DEVELOPMENT

The traffic engineers will need to look next at traffic growth and its implications for Western Avenue. For the key bottleneck of Memorial Drive and Western Avenue, we can see that an estimated half of all Polaroid site traffic would pass through this point, as would 35% of the University Park traffic. In studies to date, there has also been an allowance for some growth from Bread and Circus and for general background traffic growth (about 5 per cent).

Adding up the new traffic growth at Memorial and Western, the studies estimate a future growth of about 960 new vehicle trips in the peak hour, composed of :

University Park 450 cars
Polaroid site 230 cars
Bread and Circus 50 cars
Background growth 230 cars

As I noted above, I can optimistically foresee a potential for improved capacity at Memorial and Western of 125 cars an hour. I think we can see the problem : we have a demand for 960 more cars and we have room for only 125 more.

How Do We Mitigate for Traffic Growth?

Traffic impacts can be mitigated by a combination of roadway capacity increases or a reduction in trips generated from the site. There are two ways to reduce the number of vehicle trips -- emphasize ways to get single drivers to use other means to get to work, or to reduce the size of the project or intensity of activity on the site.

The Vanasse report included all of the developments listed above, and concluded that the Polaroid project would not change the traffic level of service. I interpret this position to be that today the traffic is congested at Level-of-Service F and in the future it would still be congested at Level-of-Service F. They did not discuss what this would mean for traffic backups either on Memorial Drive or in the Cambridgeport community.

Moreover, there needs to be a heightened awareness of how all of this combined new traffic would tend to overload local residential streets because of the limited current and future capacity of Memorial Drive. Even today, if Memorial Drive backs up, the traffic splits off and takes short cuts through the neighborhood via the MicroCenter lot, Pleasant Street and other routes such as Sidney and Pearl Streets in order to get to Putnam Avenue.

I question the presumption that all of this traffic growth is acceptable or reasonable. All developers so far have publicly shirked responsibility for the collective congestion that their activities often produce. University Park has a negotiated cap of 1700 vehicles trips in the peak hour from its 3000 parking spaces in 3 garages. This is a massive outpouring of traffic onto the streets of Cambridgeport. The Polaroid site would have a 577-car parking garage, disgorging traffic onto Memorial Drive (already backed up) and Putnam Avenue (also backed up). Moreover, the Vanasse report indicates that there would be extensive queuing in both directions on Pleasant Street, possibly blocking off the Polaroid driveway on Pleasant Street. Elsewhere in the Cambridgeport area there are proposals for new development activity which will add more traffic.

In a sense, the Polaroid site is in eye of the traffic storm -- becalmed by traffic which cannot move on any side of the site. The tragedy for the trapped drivers and afflicted residents is that no one has a valid reason to be tranquil. Traffic calming has usually been proposed for traffic which travels too fast, but the goals are sometimes undermined by the frustrations of congested traffic. Both Spaulding & Slye and Polaroid can feel justified in their disappointment over the lack of traffic planning for the area and the presumed inevitability of University Park, with its 3000 parking spaces -- the true 800-pound Gorilla of Cambridgeport. To date, no developer has been able to provide complete mitigation for their large parking structures and the traffic dumping onto public roadways which is the inevitable result of such structures.

The interesting exception to the pattern has been Spaulding and Slye. With their constructive participation in the traffic engineers' committee, they have demonstrated an ability to improve traffic flow while also assisting pedestrian crossings. The Vanasse contributions to the overall traffic strategy for the solution were very significant. Throughout the process, I have asserted that the allowable traffic activity from the Polaroid site -- given existing congestion -- should begin at zero. Only after mitigation through trip reduction and capacity improvements would I feel that new trips from the Polaroid site can be justified.

Several times I have stated this position of no new trips without mitigation, such as December CNI report. Moreover, I have consistently received a very cold reception from Vanasse & Spaulding & Slye. However, through their contributions to the engineers' committee, they clearly have shown mitigation. They have earned the right to move from zero up to some level of site development through their mitigation activity. In my belief they have at least mitigated for the traffic likely to be generated by the front headquarters building at 784 Memorial Drive. By contrast, University Park has not participated in trip reduction from the 3,000 parking spaces and continues to plan for a 1,500-car parking garage as a coming phase for the project.

If we consider the key bottlenecks along River and Western Avenue, we can see that Spaulding and Slye has earned traffic and development credits through the work they have done to date. University Park has not, and thus I do not accept either the appropriateness or the inevitability of 450 more cars from University Park going though Western Avenue. Bread and Circus also has presented no traffic mitigation plan and proposes to operate trailer trucks to the site which in size can fairly be described as simply humongous.

I should emphasize that the above conclusions are offered in my capacity as traffic engineer for the Cambridgeport Neighborhood Initiative, and may not reflect the conclusions of its Co-Chairs or its membership. I do believe that we should be tough but fair when it comes to traffic -- that anyone with a large parking garage is a traffic dumper who pours out their private traffic problems onto residential streets and turns them into public traffic problems. Given the incredibly widespread range of traffic problems in the City and the constant complaints of residents over traffic problems, traffic dumping should be perceived as a severe environmental hazard.

On the other hand, if any developer works in a demonstrably constructive manner towards the resolution of these traffic impacts -- as Spaulding and Slye has done in Cambridgeport -- there should be a reward mechanism for such participation, just as there should be punishments for those who do not participate in traffic issues in a quality way (of which the Holmes site is the most recent example).

DRIVEWAYS / CURBCUTS

The news on driveway changes is not as encouraging. Last May I told David Vickery that use of the existing driveways was most unwise and that both driveways have safety problems. He persisted in the official policy in development that -- except for the Historic Commission -- the project involved no permits and no MEPA review. Recognizing the powers of the City Council relative to driveway permits, he asked me at one point : "Would you want to go before City Council?"

My December report for CNI was very critical of the prevailing strategy of offering a site plan with the two existing driveways, both of which I considered unwise and unsafe. The City originally asked the developer "to evaluate operations and safety at site entrances/driveways" and to "consider pedestrian safety, especially children, at school crossings." The Vanasse report contained no such discussion. The CNI report on page 25 discussed the safety problem in some detail :

"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."

"... 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."

On February 2, Rizzo issued its review of the Vanasse report and declared the Putnam Avenue driveway to be "unsafe". No such judgment was rendered for the Pleasant Street driveway, which Rizzo felt should be relocated to make it "safer." Now, quite clearly the official site plans included at least one driveway which had been determined to be clearly unsafe. The consequence of this judgment was the February 5 application for relocating the driveways, after demolition and building permits had already been obtained. In the building permit issued on February 5, the Office of Inspectional Services made the notation that the "Putnam Avenue curbcut will not be used in connection with this garage." It appears that the strategy was to issue the building permit for the garage and the Pleasant street driveway only and to ignore all of the previous plans which had shown a Putnam Avenue driveway connecting directly to the garage.

This exclusion of the Putnam Avenue driveway allows for some sense of compliance with the procedures for building permits. These require that "Existing curb cuts shall be reviewed every time a building permit is obtained for a major renovation, new construction, site work, and/or landscaping work." In effect, the City has found the Putnam Avenue driveway to be unsafe and has excluded it. A new problem arises in the review of the Pleasant Street driveway. The difficulty is in the requirement that no driveway be located within 25 feet of a street intersection. As I understand the position of the Deputy City Solicitor, there has been some strange legal determination that the Pleasant/Florence location is not an intersection, because it is a T rather than a cross pattern. The problem for the Law Department is that all three traffic engineers for this project have referred to this location as an intersection -- most notably Rizzo's discussion on page 18 of their February 2 report, and Spaulding & Slye's letter of February 5.

If the Law Department or any other legal entity is trying to claim that the intersection of Pleasant Street and Florence street is not an intersection, I would take the strongest objection. We should listen to how the traffic engineers define what an intersection is and not engage in some sort of legal make-believe.

I contend that the existing Pleasant Street driveway at Florence Street is unsafe -- not primarily because of its proximity to an intersection but because it requires a hairpin right turn from the Polaroid site into a 9-foot lane. Not even a small car can make this turn without swinging into the opposite lane of traffic. I conclude that the current Pleasant Street driveway is unsafe, and a proper City review should have so determined. The responsible approach would have been to submit proper and safe driveway designs in the Summer of 1997, without having to deal so evasively with the unsafe nature of the existing driveways.

Finally, there is a serious safety problem with the Putnam Avenue driveway -- regardless of its location. Originally, I had presumed that this driveway would be used for the residences only and would be a fairly low flow passage. However, it is clear from the Vanasse study that the traffic flow would have 60 % of the Polaroid traffic coming out onto Putnam Avenue, through a driveway located on a curve. Traffic today comes sweeping eastbound around the curve, and if outbound Putnam Avenue is queued with traffic, the view of the driveway or any car trying to make the left turn out would be obstructed. This is not a good design.

Unfortunately, the technical issues of driveway safety were not discussed at the engineers' meetings. The negotiations over driveway safety appear to have occurred in an entirely separate venue, involving city officials, the developer and Rizzo. I do not agree that the morning left turn in is the most serious safety problem, nor that moving the driveway will significantly improve the situation.

For the Pleasant Street driveway, there is no question that relocating the driveway and making it into a T-intersection would be an improvement in terms of safety, traffic control and fewer vehicles on Florence Street. This design should have been an integral part of the Polaroid site proposal from Day One.

As I understand the situation, the notification of abutters about the driveway changes can charitably be described as bungled. Even given the tardiness of the developer in circulating the notices to abutters, and the replies were not submitted to the City Clerk until March 11, four

departments signed off their approvals before February 20. This action is contrary to the established procedures of the Inspectional Services Department that the abutter responses should be received first, and only then can action proceed on the curbcut permit.

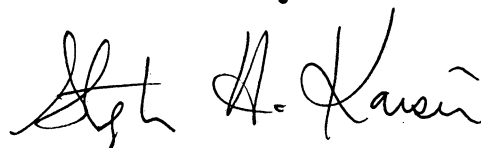
I consider the driveway permitting process in this case to be so technically and procedurally defective that I would recommend that all applications should be declared void and the process should begin all over, with proper respect for engineering, law and procedure.

A Traffic Signal at Pleasant Street and Memorial Drive

One of the possible solutions to the Putnam Avenue and Florence Street problems is the potential for a traffic signal on Memorial Drive. Here again, Vanasse has done a professional analysis of the traffic and signal warrants and has found that under current traffic conditions, a traffic signal is not warranted for existing traffic. However, with the garage in operation it probably would be -- even if 70 to 80 % of the traffic exited by Putnam Avenue and other local streets. Since it is a reasonable community and city goal to have as much Polaroid traffic exit by Memorial Drive and not use local streets, it appears that the Pleasant Street signal does offer a partial traffic solution to the circulation problems elsewhere around the site.

No traffic solution is ever perfect, but I would conclude that the best circulation package may be a relocated Pleasant Street driveway, a traffic light on Memorial Drive, and a Putnam Avenue driveway for residential use only. In combination with traffic signal improvements at River and Western to help both pedestrian and vehicle flow, and effective programs to reduce vehicle trips, this seems the best traffic operations package that can be assembled. In addition, there must be action on the part of other developers to match and exceed the mitigation contributions that Spaulding and Slye has achieved to date.

Submitted by :



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Traffic Engineer for CNI

Consent Communication #16 *S 191*

Communication was recieved from
Stephen H. Kaiser, transmitting
a progress report on traffic
issues relative to 784 Memorial
Drive.

In City Council March 23, 1998

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