

April 6, 2000

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To : Karst Hoogeboom, CA/T Project
Cara Seiderman, Cambridge Community Development

From : Stephen H. Kaiser

SUBJECT: Potential for Bike Lanes on O'Brien Highway @ Dam

There is a legitimate logic for having bike lanes on the old Charles River Dam/O'Brien Highway. Claim #1 is based on the number of new expressway lanes crossing the Charles River. Claim #2 is based on not overloading downstream intersections in Boston (along Merrimack and Congress Streets). Claim #3 says that the bike lane concept is compatible with the A65 traffic volumes generated by the TRANPLAN computer model.

CLAIM #1 – New Expressway Lanes

Since there are 8 new expressway lanes being constructed over the Charles River (including 4 lanes on the new Leverett Connector) the logical question to ask is whether one of the existing inbound arterial lanes on the Charles River Dam could be converted into a bike lane plus a widened sidewalk.

How much inbound traffic should be on the new expressway lanes? How much should be on the remaining arterials, such as the Charles River Dam, Charlestown Bridge and other routes which also serves pedestrians and bicycles? Since the 14-lanes of Charles River bridge crossing include no capacity for pedestrians or bicycles, it should be only fair to look at improving how they are handled on existing arterials.

CLAIM #2 – Overloading of Downstream Intersections

The TRANPLAN model assigns additional traffic to congested intersections – even though there may be no more remaining capacity. Therefore, there are several intersections in Boston which show dramatic increases in traffic flow, compared to existing volumes :

Staniford Street and Causeway AM 170% increase PM 150% increase

Sudbury and Congress Streets AM 150% increase PM 23% increase

State and Congress Streets AM 70% increase PM 65% increase

[Note : existing AM/PM ped volume is 9,525 vs. 5,100 vehicles]

Therefore, Leverett Circle is unlikely to be the bottleneck. Because traffic cannot get through these downtown bottlenecks, it will not be traveling through Leverett Circle.

CLAIM #3 -- a bike lane is compatible with the A65 Traffic Volumes

It is probably best at our initial meeting not to debate the merits of computer models -- or whether we would like to see different traffic volumes in future years. One approach (without getting agreement on accepting the model) is to take the CA/T numbers and see what they might mean for traffic flow -- at least at Leverett Circle and at O'Brien Highway and Land Boulevard.

I am unaware of any new improvements being proposed for the signals at O'Brien and Land. I have also ignored any reduction in capacity resulting from the adjacent Industrial Way access and signal. At Leverett Circle, I have identified three "intersections within the intersection." The one closest to the Police station I have called the West Crossing (and includes an exclusive pedestrian phase for the Esplanade path connection) while the one closest to Martha Road is the East Crossing. The North Crossing near the jail does not appear to be a capacity issue.

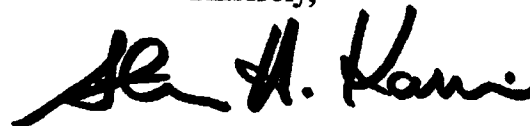
The proposed alternate design would have a widened sidewalk and a bike lane (each about 5 feet wide) replacing the far right inbound lane on O'Brien Highway from the Science Museum to Leverett Circle. The traffic question is : what is the bigger bottleneck -- O'Brien & Land or Leverett Circle?

I have attached a critical lane capacity calculation sheet which looks at both intersections for the year 2010 AM and PM. The results are :

Critical Lane Sum at O'Brien/Land 2010 AM 2035
 Critical Lane Sum at O'Brien/Land 2010 PM 2008
 Critical Lane Sum at Leverett Circle - West Crossing 2010 AM 1870
 Critical Lane Sum at Leverett Circle - West Crossing 2010 PM 1893
 Critical Lane Sum at Leverett Circle - East Crossing 2010 AM 1726
 Critical Lane Sum at Leverett Circle - West Crossing 2010 PM 1992

These calculations show that Leverett Circle with the bike lane would have a lower critical lane sum than would O'Brien Highway & Land Boulevard for both the morning and afternoon peak hour, so Leverett Circle would not be the bottleneck.

Sincerely,



Stephen H. Kaiser
 Traffic and Transportation Engineer

cc. BTB, MAPC

SIMPLE CALCULATION FORM for CRITICAL SUMS
Land Boulevard at O'Brien Highway

April 6, 2000

AM Peak 2010 "A65"								By S. Kaiser	
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
SB Bridge	0	1,035	355	1,390	2	695	Y	695	
NB Land Boulevard	414	0	0	414	1	414	Y	414	
Eastbound O'Brien Lefts	418	0	0	418	1	418	Y	418	
Eastbound O'Brien Thru	0	1,132	0	1,132	3	377	N	0	
Westbound O'Brien	508	0	0	508	1	508	Y	508	
CRITICAL LANE SUM								2035	

PM Peak 2010 "A65"									
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
SB Bridge	0	518	358	876	2	438	Y	438	
NB Land Boulevard	0	986	0	986	2	493	Y	493	
Eastbound O'Brien Lefts	357	0	0	357	1	357	Y	357	
Eastbound O'Brien Thru	0	996	0	996	3	332	N	0	
Westbound O'Brien	720	0	0	720	1	720	Y	720	
CRITICAL LANE SUM								2008	

Leverett Circle West Crossing

AM Peak 2010 "A65"									
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
EB Charles R. Dam	0	1,352	390	1,742	2	871	Y	871	
SB Nashua Street	160	1,102	257	1,519	3	506	Y	506	
NB Charles St (Storrow)	185	0	0	185	2	93	Y	93	
Pedestrian Exclusive	0	0	0	400	1	400	Y	400	
CRITICAL LANE SUM								1870	

PM Peak 2010 "A65"									
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
EB Charles R. Dam	0	1,693	246	1,939	2	970	Y	970	
SB Nashua Street	70	851	275	1,196	3	399	Y	399	
NB Charles St (Storrow)	250	0	0	250	2	125	Y	125	
Pedestrian Exclusive	0	0	0	400	1	400	Y	400	
CRITICAL LANE SUM								1893	

Leverett Circle East Crossing

AM Peak 2010 "A65"									
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
EB Charles R. Dam	0	1,512	390	1,902	2	951	Y	951	
SB Nashua Street	511	0	0	511	2	256	Y	256	
NB Charles St (Storrow)	0	1,558	0	1,558	3	519	Y	519	
Pedestrian Exclusive	0	0	0	0	0	0	N	0	
CRITICAL LANE SUM								1726	

PM Peak 2010 "A65"									
APPROACH	Left	Thru	Right	Totals	# Lanes	CLV Sum	Critical ?	CLV Sum	
EB Charles R. Dam	0	1,763	246	2,009	2	1005	Y	1005	
SB Nashua Street	730	0	0	730	2	365	Y	365	
NB Charles St (Storrow)	0	1,867	0	1,867	3	622	Y	622	
Pedestrian Exclusive	0	0	0	0	0	0	N	0	
CRITICAL LANE SUM								1992	