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January 14, 2014

Bill Egan, P.E.
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Re: Connect historic Boston project

Date: January 11, 2014.

My credentials

I am a 40-year Boston-area resident, and I have a long track record in bicycling advocacy –read about it here: http://bikexprt.com/witness/bikeres3.htm.

Boston trends

Over the past couple of years, bicycle facilities design has been implicated in several fatal bicycle crashes. One of my discussions of the problem may be found here:

http://streetsmarts.bostonbiker.org/2013/05/28/you-too-can-prevent-fatal-truck-bicycle-collisions/

The City now proposes to move bicyclists from the street to the sidewalk. This does not resolve the crossing and turning conflicts implicated in these crashes. Meanwhile, there are other solutions which, with more imagination and boldness in planning, could really improve matters. We can do better than this. The current plan is:

A recreation plan, not a transportation plan

Now let me turn to a discussion of the Connect Historic Boston project, whose Web site may be found at http://connecthistoric-boston.org/ .

The project is essentially conceived as a "family friendly" recreational trail through Boston, a tourist sightseeing route like the Freedom Trail, but for bicyclists. To quote from the page footer of the documents published by the promoters,

> Connect Historic Boston is an initiative between the City of Boston and the National Park Service, funded by a grant from the Federal Transit Administation. [sic]

The Freedom Trail follows existing sidewalks. A trail suitable for "family-friendly" bicycling – that is, so casual bicyclists and children would feel safe (though not necessarily be safe) – also needs rights of way

separate from busy roadways. That is practical along riverfronts, through parks, along abandoned rail lines, and on the roadways of quiet local streets, but much less so on arterial city streets.

There are two fundamental problems. One is that Boston's arterial street corridors are narrow. The width allocated to most of the bikeways is insufficient, resulting in slow travel speeds and danger. The other problem is that most car-bike collisions occur at intersections. Crossing and turning conflicts are the major cause of fatal motor vehicle-bicycle crashes in the Boston area. With the sidewalk-like bikeways planned for this project, bicyclists are repeatedly forced into conflict with motor traffic at driveways, at intersections, and when crossing to the side of the street which a bikeway does not serve. Placing bicyclists in sidewalk space makes the intersections more complicated and confusing. Safe crossing can only be achieved at the cost of greater delay. The temptation is increased to ignore traffic signals, trading delay for risk.

The project creates these problems, while attempting to make bicyclists feel safe by removing the threat of rare but feared rear-end collisions.

Parts of the project will in fact be along riverfronts, through parks and along abandoned rail lines, and I support those. Other parts are planned to be on arterial city streets, and that is where I have issues.

Compromising travel on the streets

The designs I've seen will not safely and efficiently serve the needs of bicyclists who want to get from point A to point B at normal bicycling speeds – that Is, the daily users of bicycling for commuting and utility trips. The design also neglects impacts on other modes of transportation – pedestrians, motorized transportation both public and private, and connections to rail transportation. One problem begets another so the overall result is complicated, confusing and inefficient.

The consultants in the project have as of yet presented no information addressing these issues – no information about traffic signal timing or expected effects on level of service either for motorists or for bicyclists.

What most grates on me is the spending of large amounts of Federal funding to move curbs, narrowing streets. This radical change provides for only two categories of vehicles: motor vehicles, envisioned as capable of traveling at the

speed limit, and bicycles, envisioned as narrow and traveling slowly, and with a predetermined and fixed traffic volume for each.

This approach is not desirable or sustainable. Traffic volumes and speeds change with the seasons and also over the decades, in some ways which can be predicted, others not. Segregation of bicyclists reduces available space for bicyclists and also motorists – sometimes also pedestrians, because space cannot be used flexibly, and additional shy distance is required.

Bicycles of today are not the plodding 1960s one-speeds and three-speeds of the European bicycle facilities which the Connect Historic Boston designs attempt to imitate. Major changes in vehicle types and vehicle operation can be expected within the lifetime of the current project. Already, electrically-assisted bicycles are gaining popularity. These easily achieve speeds of 20 miles per hour, even uphill, speeds unsafe on narrow, crowded bicycle paths, yet still slower than with conventional motorized vehicles. Motor scooters also are gaining in popularity: while slower than other motor vehicles, they are illegal on the off-street paths which have been proposed. Robotic collision-avoidance systems in motor vehicles are beginning to appear already, and within thirty years can be expected to be nearly universal, greatly reducing the rate of car-bicycle collisions and rendering much of the planning for this project obsolete. Traffic signal timing and sensing technology is improving. These issues point to the increasing practicality of integrating different travel modes on the street, and to increased problems with segregated infrastructure.

Electrically-assisted bicycles, pedicabs, motor scooters and cargo bikes simply *do not fit* into either of the fixed categories which this system establishes. Motor scooters and motorcycles are in fact now overrunning the Amsterdam bikeways!

There are in fact some separated on-street facilities which I like (example: 9th Avenue, New York City), but they require much more ample design than in the present project.

We will come to regret moving the curbs, as Boston now regrets the 1958 demolition of the West End neighborhood and destruction of its social fabric. The West End project and the current project have much in common: a large amount of Federal money funneled through the Boston city government to bring about a radical transformation based on a flawed vision.

Curbs can be moved out only at an expense as great as was required to move them in. Creating separated bikeways at street level, using removable barriers would have the same operational issues but would be vastly less expensive, leaving money for other measures, and would not prevent future reconfiguration.

My comments here are mainly technical, but also it seems to me that the project is very rushed. The lack of public input for it till recently, while many organizations were quietly brought on board as supporters, suggests an attempt to avoid backlash against the project. Now we have conceptual design in the fall of 2013, with construction 9 months later. (See page 8 of the December 12 Causeway Street presentation.) A series of small public meetings on separate parts of the project is being held, with major elements of design already being set out, and no alternatives mentioned: compare another project with similar

impacts on transportation, the Longfellow Bridge project, where there were large public meetings for years and the final design was the result of long and hard thought, consideration of alternative plans and public input.

Traffic studies?

The project turns its back on crash studies, or examination of traffic capacity and level of service, both when traffic is so light that on-street bicycling is easy (Commercial Street) – and where it is heavy and the planned infrastructure will further increase congestion (Causeway street). We can have a bikeway on one side of the street, with no consideration of safe access to trip endpoints on the other side. We can ignore issues of snow removal, drainage, puddling, ice, where people will put trash barrels for pickup, etc. etc. All of these are problems generated by the project.

A basic assumption – or lack of concern -- in the design of these facilities is that the design-specific bicyclist is willing to put up with riding slowly on a crowded, narrow path where speed is limited to that of the slowest, and willing to wait for a minute or more, repeatedly, at traffic signals to avoid conflict with motor traffic which would not occur if bicyclists were integrated into the stream of motor traffic. A typical average speed on bikeways of the type planned here, when obeying the traffic signals, is five miles per hour – as measured on similar bikeways which have been constructed in New York City, Montreal and Washington, DC (examples are in the video album at https://vimeo.com/album/1632204).

This is the dark side of what is being described as “family friendliness.” A family of tourists who are sightseeing will put up with this. A Boston utility cyclist or commuter, however, wants to get from point A to point B in reasonable time. Cycling can be faster than motoring or public transportation over moderate distances in urban areas. The project accomplishes what has been called the pedestrianization of bicycling. Pedestrianizing bicycling removes its travel-time advantages, will promote lawbreaking and risk-taking, and will leave the faster bicyclists riding in the street, where they will be subject to harassment from motorists to use the special segregated space.

Also, there is an assumption that motorists are willing, in fact, pleased, to accept intersection delay and lane reductions, because what is supposed to be good for bicycling is supposedly good for everybody.

The challenge

Most Americans rode bicycles in childhood but gave up bicycling when they became able to drive motor vehicles. The thrust of bicycling advocacy these days is to make bicycling look more attractive to people who do not ride bicycles -- designing bicycling infrastructure to reflect the preferences and beliefs of people who do not ride bicycles. That is the thrust of the current project. Once people start riding, the facilities proposed won’t serve them.

Suggestions for a better way

A fundamental question is, how do we get from here to the future we need to go to without making things worse, at great expense and having to fix them later at great expense?

My recommendation: spend the available money instead on valuable, though expensive, links like the south-side connector over the tracks at North Station and the new Charles River crossings. Design more conservatively on streets. Specific recommendations:

Education and law enforcement are key –please see the video presentation at http://iamtraffic.org/news-views/our-vision-video-from-the-colloquium/ .

Also my tutorial on how to ride safely (as I have done for 40 years in Boston): http://bikexprt.com/streetsmarts/usa

And as to infrastructure, specifically in this part of Boston:

- Take a broad look at how to improve transfer between rail and other modes at North Station. This requires rethinking the development project at North Station, and of the use of other spaces adjacent to the station.
- Install secure bicycle parking at North Station and at downtown locations. (There is no mention of parking in the meeting presentations!)
- Improve connections between North Station and the Massachusetts General Hospital via paths in the West End.
- Install a south-side overpass over the commuter rail tracks between North Station and the Charles River, to connect the Charles River path system with the North End. On this issue, I agree with Connect Historic Boston
- Install "back door" connections from North Station to the riverfront paths on both sides of the tracks.
- Improve access to/from North Station via Portland Street and Lancaster Street, to *avoid* the traffic on Causeway Street instead of making it worse.
- Install wide bike lanes on Merrimac Street connecting with Portland Street and Lancaster Street and leading to the downtown Boston business district, and with right-turn pockets at intersections to prevent right-hook conflicts.
- Continue the existing path in Prince Street Park past the Procopio Athletic Field, crossings into the North End at Charter Street and Foster Street. (This would involve a sidewalk-like path between Procopio Field and Commercial Street; however, there are no driveways or cross streets in this segment.)
- Install bicycle routes through, not around, the North End, using small streets and bicycle boulevard/neighborhood greenway techniques (barriers and diverters) to keep out through traffic while allowing local access and improving safety and quiet for residents. This could provide truly family-friendly access to historic sites in the North End – lacking in the current proposal -- and a through route to Christopher Columbus Waterfront Park, Long Wharf, the New England Aquarium, Rowe's Wharf and the Roe Kennedy Greenway.

Let's now look at some specifics of plans made public on the project site. First, the Causeway Street presentations, online at http://connecthistoric-boston.org/wp-content/uploads/Causeway-Presentation_2013-12-17_as-presented.pdf

Causeway Street, December 17 presentation

On **page 6**, the recreational goals of the project are stated:

> Connect Historic Boston will make walking, biking and taking the T to National Park Service sites and other destinations easy, fun, accessible and convenient with discovery along the way.

Pages 7 and 11 show maps of the project, highlighting the "Connect Historic Boston Trail." The streets chosen for the project do not provide a direct or convenient route between the transit hub at North Station and the business districts of downtown Boston. Rather, they go around the periphery, with the goal of taking in historic sites. The route to the east meanders through a park, then takes Commercial Street, which is indirect. The other route goes south along Causeway Street and Staniford Street to Cambridge Street, where it faces Beacon Hill and must either go over the hill – not exactly a preferred bicycle route -- or turn east along Cambridge Street.

The fast and convenient bicycle route from North Station to downtown is by way of Lancaster Street to Merrimac Street; the return route, by Merrimac Street to Portland Street. The project as proposed would neglect and degrade that route.

Most of the on-street paths are to be narrow, two-way, one-side-of-the street so-called "cycle tracks". These have been consistently shown hazardous, because of the complications at intersections.

On **page 14** we see claims to

- Design corridor for commuters, residents, employees, and visitors
- Improve pedestrian environment
- Provide family-friendly bicycle facilities
- Support development (existing & proposed)
- Maintain adequate vehicular access
- Retain curbside transit access

I'll be addressing those one by one.

"Design corridor for commuters, residents, employees, and visitors" – but primarily, for visitors, as in "family friendly." For one thing, note that getting to the other side of the street in mid-block is not addressed. This is a trail plan, not a transportation plan.

"Improve pedestrian environment." The claim appears to be mostly one of beautification and creation of points of interest. The project will decidedly *worsen* safety for pedestrians, by creating a more confusing and complicated traffic pattern. A barrier-separated bikeway in the street corridor, especially if two-way, invariably does this, because the pedestrian must look for bicycle traffic in unexpected directions (e.g., look to the left as well as the right on the near side of the street). We used to call riding

opposite traffic "wrong-way riding." This plan legitimizes it but does not make it safe. The risk has been understood since the publication of the Cross and Fisher study in the 1970s – summary: http://truewheelers.org/research/studies/aaa/05types.htm. With the proposed design, there is no longer a clear distinction between safe sidewalk space, where pedestrians need not pay attention to traffic, and street space. Risks of bicycle-motor vehicle collisions at intersections also are increased.

Again we see the expression "family friendly" – appealing on the surface, but again, to the detriment of actual bicycle transportation.

"Maintain vehicular access" – in other words, it will be compromised, but that's OK as far as the planners are concerned.

"Retain curbside transit access" –this is an *afterthought* at the busy transit hub, North Station.

Starting on **page 15** is a list of problems which make this plan impractical, but without any discussion of alternatives. The list includes

• Cyclists ramping up and down

• Allow passing or ride side-by-side riding [sic]

Ramping up and down – creating pockets where it's impossible to plow away snow…Passing or side-by-side riding – on a 9-0oot wide two-way bikeway!? Read on.

Staniford Street

Now let's look at the plan for Staniford Street (**page 22**). This is to be a 9-foot-wide, two-way, one side of the street bikeway, adjacent to a travel lane, ramping up and down, crossing wide driveways (the three green segments) and connecting to other streets by bicycle crosswalks.

9 feet is substandard, not wide enough to allow overtaking in the face of oncoming bicycle traffic. The Minuteman bikeway, at 12 feet and with grass shoulders, is barely wide enough. Staniford Street slopes down from Cambridge Street and bicyclists headed down the slope will easily travel as fast as 20 miles per hour. The driveways expose bicyclists who arrive from unexpected locations and directions to crossing and turning motor traffic.

At the left side on **page 22**, the intersection with Cambridge Street has westbound bicyclists directed to the sidewalk on the northwest corner. How are they supposed to proceed on Cambridge Street? Swerve out into the street? Ride up onto the sidewalk?

The same intersection has eastbound bicyclists cross in a bicycle crosswalk. Entering an intersection from the right on the near side is wrong-way riding and is highly hazardous because motorists do not look in that direction for traffic at bicycle speeds. This has been demonstrated conclusively in one crash study after another, as far back as the 1970s.

Bike boxes

Page 22 also shows the two-way path crossing the end of Merrimac Street in conflict with traffic turning right form Staniford Street and entering from Merrimac Street At the right side of you also can see one of the "bike boxes" where bicyclists are expected to overtake motor traffic on the right, as in my Charlesgate example discussed at http://john-s-allen.com/blog/?p=5750 , only this time at the right of a right-turn lane – a violation of national design guidelines – and then swerve sharply left into the "bike box" to wait for the traffic signal, but not knowing when it will change.. Bike boxes have become the "cookie cutter" solution in Boston when bicyclists need to queue to prepare a left turn or cross from one side to another of a one-way roadway.

Research, observation and crash statistics show that bicyclists aren't stupid enough to swerve into the "bike box." This maneuver is obviously hazardous. Many bicyclists, however, incorrectly believe that motorists will reliably look back to the right and yield before turning right. It isn't usual or expected for traffic to overtake on the right of legal right-turning traffic, and bicyclists are being killed in increasing numbers in Boston and in in other cities around the USA as this type of installation becomes more common. For safety, bicyclists need either to merge to the left-turn lane like other traffic, or there needs to be a separate signal phase for motorist right turns.

Lowell Square

Proceeding to **page 23**, Lowell Square, we see how the bikeway now becomes, outright, a path along the sidewalk between Merrimac Street and Causeway Street, in conflict with pedestrians. Then bicyclists are directed onto an oddly curved two-way on-street bikeway which cuts across the path of right-turning traffic from Staniford Street and left-turning traffic from Lomasney Way Street (upper right in the

picture.) And there are two more bike boxes in this picture. Bicyclists appear suddenly from unexpected and unusual directions, some of them in motorists' right rear blindspots, others involving unexpected changes in direction.

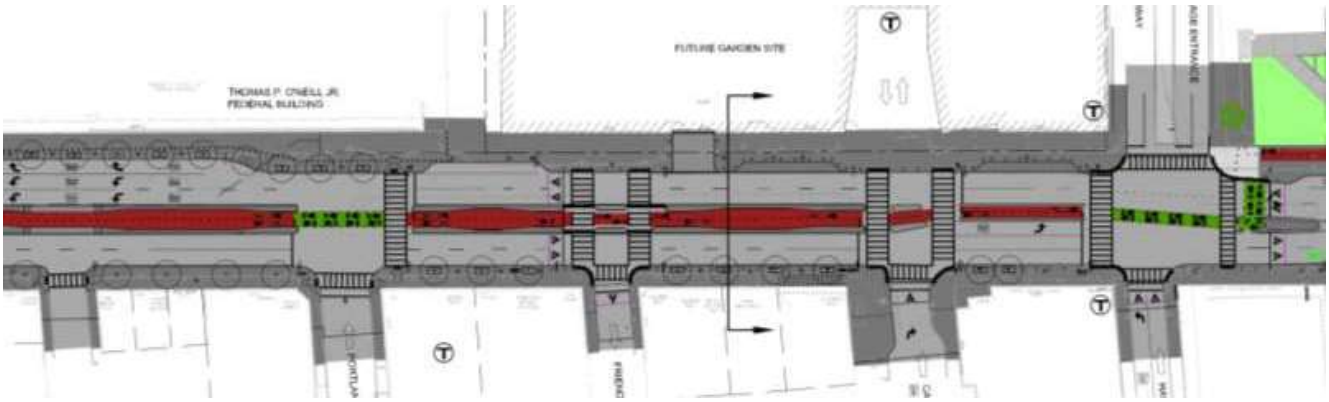
The bike lanes on Merrimac Street and Nashua Street are the usual narrow Boston door-zone bike lanes. That is, a bicyclist riding at a normal speed in these lanes is defenseless when a motorist opens a car door. I know of two bicyclists who have died when they struck car doors. One was flung out into the street and run over by a bus. See http://www.bikexprt.com/massfacil/cambridge/doorzone/laird1.htm . Others are dying when they overtake on the right of vehicles which turn right across these bike lanes. Wider bike lanes or right-turn pockets would encourage motorists correctly to merge right before turning.

A jughandle as shown on **page 24** attempts to make left turns easier for bicyclists who are not confident to merge to the normal left-turn position. A jughandle is not necessarily a bad idea, but it does necessarily involve compromises in traffic signal timing and a longer, slower route for a left turn. At the jughandle from southbound Massachusetts Avenue to Somerville Avenue in Porter Square in Cambridge, the green light is very short, and bicyclists invariably encounter a red light at the next intersection, only 100 feet after they turn left. This is a wink and nod to run the red light. Essentially, the bicycle provision was shoehorned into the signal timing. It's simpler and easier just to use the left turn lane.

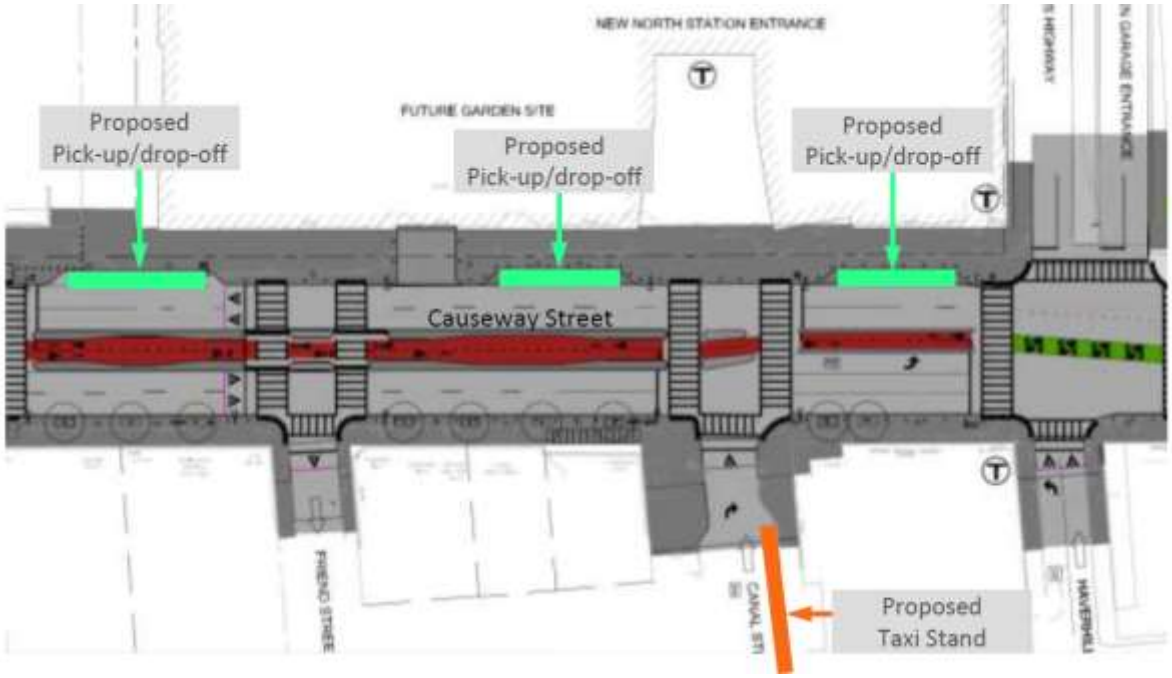
Causeway Street

Page 25 shows the design for Causeway Street – a bikeway in the median, between curbs, ramping up and down. The intent of the curbs is to prevent U-turns across the median (except, of course, at Portland Street, where they will be concentrated). These U turns are a problem on Pennsylvania Avenue in Washington, DC, a similar installation without curbs, see

http://wamu.org/news/13/11/08/cycling_advocates_say_not_even_zebras_stopping_u_turns_on_pennsylvania_avenue). On the other hand, the cross-section shown invites puddling, and ice patches in winter. These problems do not occur with a normal, crowned street cross-section.



The distinction between a pedestrian refuge at the median and a bikeway is lost. The left turn to Lancaster Street (leftmost one in the image) is impeded. Bicyclists are expected to wait for a signal, then turn 90 degrees to continue at Beverly Street (right side of picture). Loading zones, taxi stands and bus stops are an afterthought or must be relocated. (See **page 28.**) Where are the many buses which now unload on Causeway Street supposed to go? Why is the very large empty area in front of North Station is to be given over entirely to private development rather than at least in part serving as a bus and taxi loading and unloading area?



The lack of attention to public transit at this transit hub is distressing. Compare that with the improvements at South Station in connection with the Big Dig!

Bicyclists frequently collide with bollards, especially dark gray bollards like the ones on **page 29**.

Page 30 shows the proposed design for the intersection of Causeway Street and Friend Street in front of Boston Garden, with the massive new development. Is it really to be expected that pedestrians will clear the median bikeway when bicyclists have the green light? I predict chaos here.

Page 31: Red bikeway? Is this supposed only to illustrate ramping or is it in the design? This is a nonstandard color. Narrowing the bikeway before an intersection? There needs to be more rather than less room before intersections, for queuing and turning.

I'm also concerned with placing bicyclists in the middle of the street with oncoming left-turn lanes (**page 32**). I've discussed this issue elsewhere: see http://bikexprt.com/bikepol/facil/lanes/midstreet.htm

All of these illustrations, and also the one on **page 33** show one of the favorite tricks of designers to make their work look good: a volume of traffic which would only occur in an off-hour on a weekend, but shown as normal.

And, on **page 34**, we see a 25% design submission on December 31 of last year. That is very rushed for a project which would make such radical changes. Again, this design submission considers no alternatives presents no information about effects on travel times, congestion or safety.

The earlier November 21 meeting presentation

I have been describing the December 17 PDF. There is another from November 21, and substantially different. http://connecthistoric-boston.org/wp-content/uploads/Causeway-Presentation_2013-11-21.pdf. For one thing, this earlier presentation includes the list of supporting organizations.

I note on **page 17** a picture of the Pennsylvania Avenue, Washington, DC median bikeway I mentioned earlier, the one with the endemic U-turn problem. Also, the pie chart – which, by the way is cut from whole cloth, rather than based on research. Obviously, the sizes of the different categories vary greatly depending on terrain and customs, not to speak of weather. " Strong and fearless" – a phrase also used by Nick Jackson of Toole Designs at the November 21 meeting - -- is insulting and inaccurate. This canard perpetuates a spandex-clad road warrior stereotype. Fearlessness when bicycling results from skill, not speed. And the claim that cycle tracks support all categories of bicyclist is false. As mentioned earlier, cycle tracks like the one proposed have been shown through riding tests to reduce all bicyclists to an average speed of 5 miles per hour if they obey the traffic signals, due to congestion and long delays at intersections. The incentive to disobey the signals is greatly increased. Example: http://www.youtube.com/watch?v=zsSm4RkplSY

The claim "more space than bike lanes" is laughably false. On ordinary streets, including those with bike lanes, *bicyclists may use the entire travel lane*, but what is proposed for Staniford Street is two-way, 9 feet wide, and there is no merging to any other lane. Meanwhile, the bike lane is eliminated and the travel lane is narrowed.

"Special consideration at street crossings" – what this amounts to it that you get to wait a long time, and there is a greatly increased incentive to run the red.

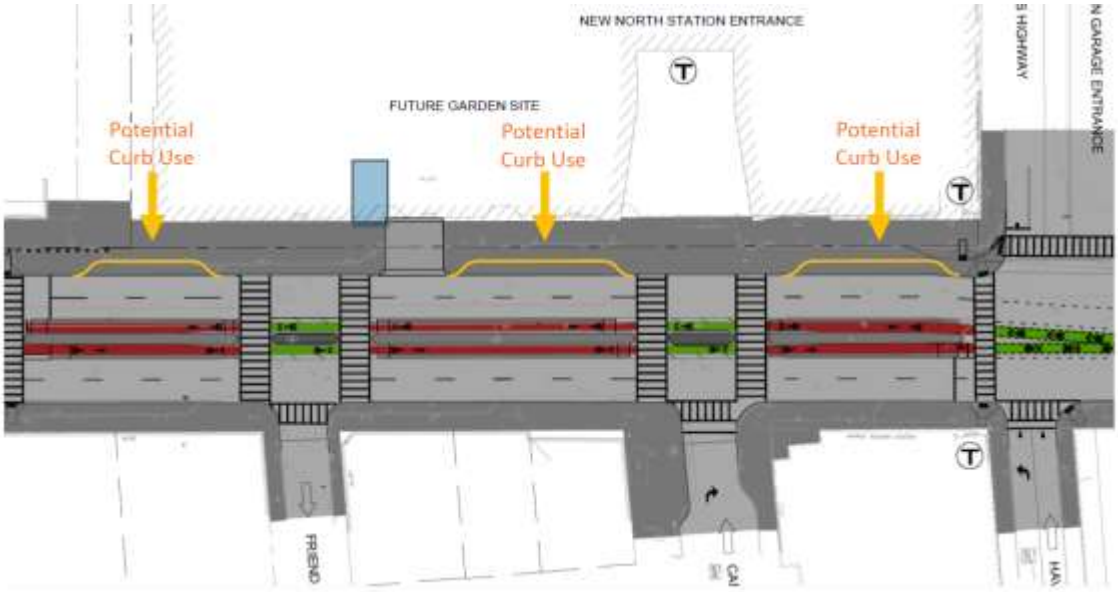
Page 18 – cycle tracks and pedestrians. What is shown at the left is a path along the Hudson River waterfront, not a cycle track. I have a photo of the same location here:

http://www.john-s-allen.com/galleries/NYC/wsgreenway1/17th%20to%20Laight/slides/IMG_5982.html. What is shown at the right is a pedestrian refuge, and there are none in the Causeway Street/Staniford Street segment. Also, the image is a Photoshop job. The pedestrians and parked cars have shadows but

the tree, lamppost and flex posts have none. .

Page 19 shows an alternatives comparison table, along with a very sketchy list of safety issues. Apparently the designers have in fact considered alternatives. However, they did not present alternatives at the public meeting. The table is presented on this page at such a small scale that it is unreadable. To my knowledge, it has not been put before the public in a readable form.

Page 25 shows the issues with pedestrian traffic and transit hub access as afterthoughts. "Potential curb use" isn't "potential." It is heavy and unavoidable.



Page 26 shows the very unusual termination of the cycle track in a crosswalk and also the alternative of riding on the street east of Beverly Street, with shared-lane markings. At the meeting, Nick Jackson of Toole Designs described it in this way: "you can take your life in your hands." A dimension is added to this comment by the need to merge from the bikeway in the middle of the street to the right lane where a traffic island is directly in the way. The alternative is to wait in a very cramped waiting area at the edge of an intersection, cross to a sidewalk, then ride along it and meander through a park, a much longer trip.

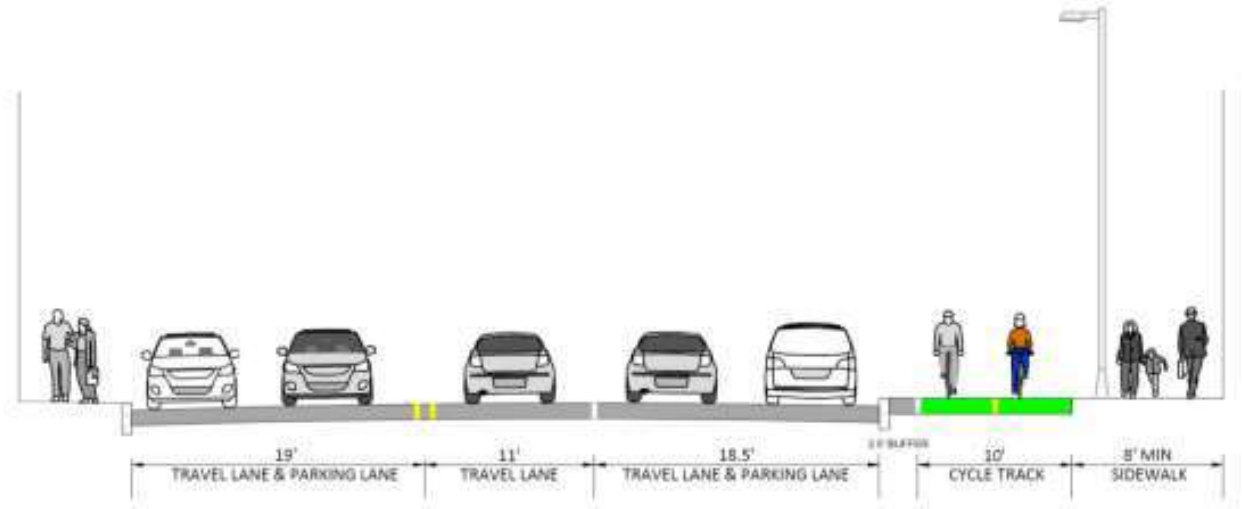
On **page 27**, note that the bikeway on Causeway Street is divided by a median (pedestrian refuge – but where there are no crosswalks?) and the two sides are too narrow for a bicyclist to overtake another. With an up curb on one side and a down curb on the other, there is no way to merge on and off the street. In the later, revised presentation, the bikeway has been widened and the median is gone. It looks as though there was some give and take between bicycle and pedestrian advocates.

Commercial Street:

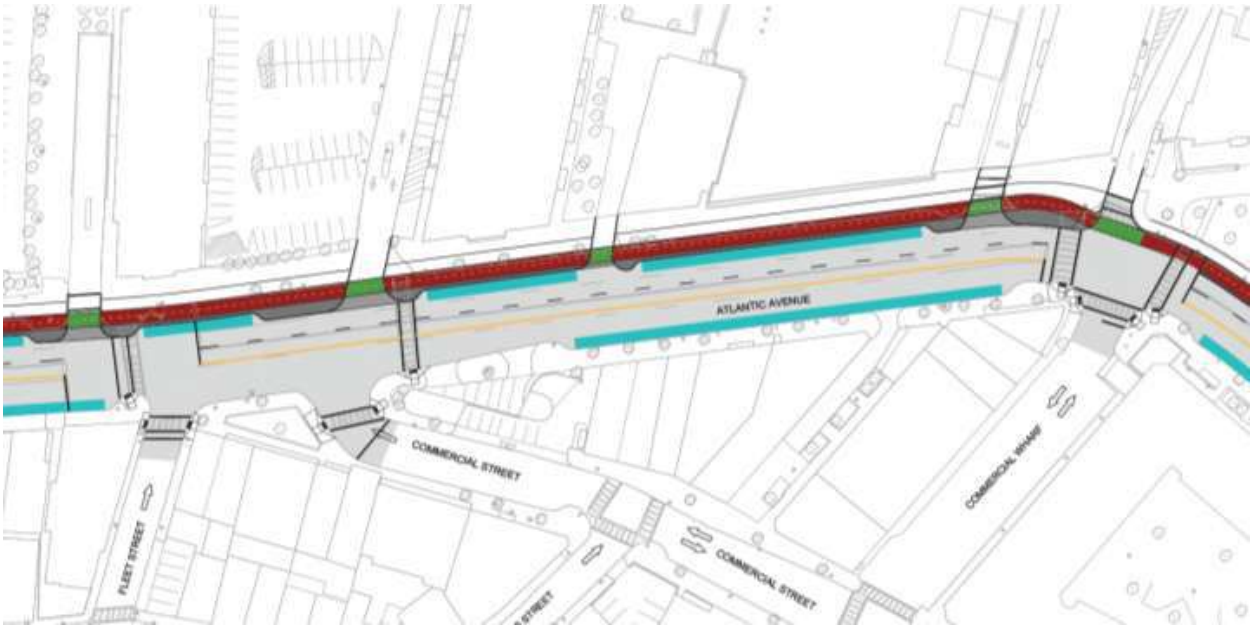
I now turn to the Commercial Street presentation materials.

http://connecthistoric-boston.org/wp-content/uploads/Commercial-Presentation_2013-11-20_FINAL_As-Presented.pdf

The introductory materials are the same as in the Causeway Street presentation, then **page 20** shows a two-way bikeway in sidewalk space, with a narrowed roadway. The bikeway is nominally 10 feet wide, one foot wider than on Staniford Street.



The following pages (here **page 22**) show how this bikeway will cross one street after another like a crosswalk, where bicyclists are concealed by parked cars and pedestrians waiting on the corner. Pedestrians also must cross the two-way bikeway to reach the crosswalks.



Because the street is narrowed, southbound motorists will be unable to overtake bicyclists (or motor scooter riders or pedicabs or any other slow vehicle) in the street, as only a single, narrow travel lane will remain. The images on **pages 27 and 28** show a favorite trick: show a segment with no intersections and again, almost no traffic. There are also no loading zones. Note how the curve and buildings in the background have disappeared in the concept illustration on **page 28**.

Below is a Google Street view of the same location, with intersection in foreground: http://goo.gl/maps/2ugv9 and below. It might also be asked how far pedestrians are going to be willing to walk along Commercial Street before crossing. There is no crosswalk for many hundreds of feet. (Note: this Street View dates from before the recent installation of bike lanes and reduction to one southbound travel lane).

This bikeway is on the opposite side of the street from the residential neighborhood of the North End. So, in the interest of safety for children, they are being asked to cross a major street twice to get from one end of their neighborhood to the other.

Why no bikeway through the large park to the east of Commercial Street?

If this bikeway is supposed to connect historic sites, why does it go around the outside of the North End and make no connection with the Old North Church, Paul Revere house and Paul Revere Square? A bicycle boulevard treatment through the North End neighborhood could access all of these landmarks.

Later Commercial Street presentation:

http://connecthistoric-boston.org/wp-content/uploads/Commercial-Presentation_2013-12-19.pdf -- differences:

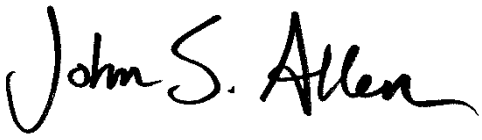
Addresses traffic volumes: **page. 20**. These are so low that one would have to wonder: what's the problem here? Also on this page note the meandering path in the park at the upper left corner, and the parallel bikeway on Commercial Street which requires bicyclists to cross the street diagonally. Apparently these are each intended for one-way travel.

Page 23: right-turn arrow from bikeway to a bike box on the far side of the street, but without a crossbike. This type of bike box location actually can work, because bicyclists enter on a protected signal phase. But this is poorly designed

Conclusion

That's all I have for now. Please feel free to contact me to discuss these issues and other bicycling issues. Thanks for reading through what has become a rather long communication!

I thank you for your attention.



John S. Allen