Designing a healthier Community

All drawings and designs by:
Charrette participants & Pilar Botana

Thank you to all the participants who contributed to this project!

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All Charrette Participants

An introduction by Doug Brugge

Research has shown that living adjacent to highways and major roadways is associated with increased risk for a wide range of adverse health outcomes including cardiovascular (heart attack, stroke), respiratory (asthma) and neurological diseases (autism and cognitive decline). Evidence that exposures from highway air pollutants and vehicle noise contributes to these health problems.

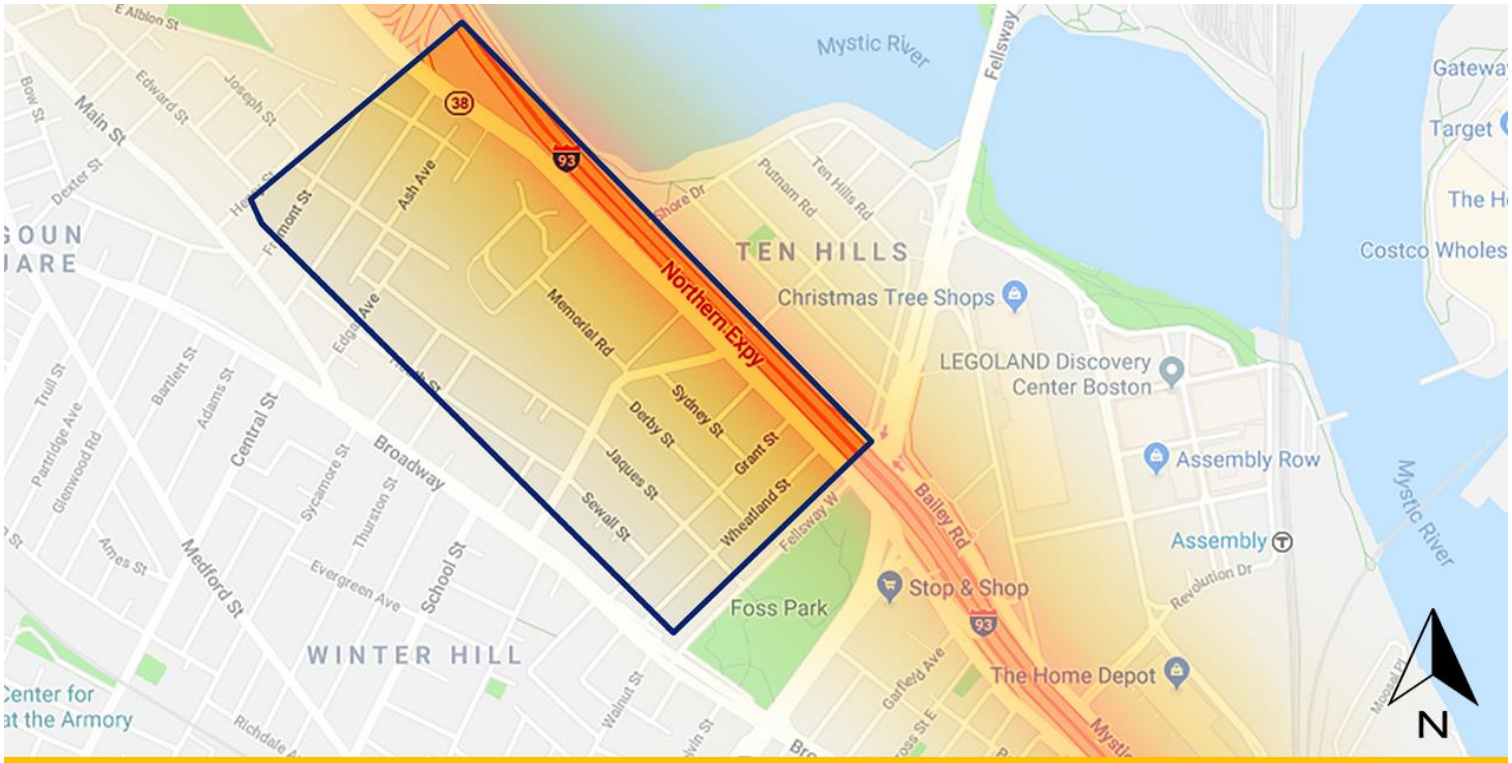
In Somerville, we have shown that ultrafine particles (extremely small particles in the air) are elevated next to I-93 and that people living in the area with higher exposure to these particles have higher levels of markers for inflammation and cardiovascular risk in their blood (http://sites.tufts.edu/cafeh/progress/academic-publications-and-factsheets). We have also shown that sound levels next to the highway exceed both regulatory and health-based thresholds.

As part of a collaborative university-agency-community effort to respond to these environmental health threats, we conducted a health lens analysis (HLA) to assess the implications of noise barrier installation along I-93 in Somerville on health outcomes. The process involved extensive engagement, including meetings with elected and agency officials, neighborhood residents, stakeholders and experts.

While a wide range of health concerns related to noise barrier installation were discussed during these sessions, air quality, noise, and the quality of the near-highway neighborhood's physical environment surfaced as a priority areas for participants. The goal of the HLA was to describe the degree of exposure to air and noise pollution, as well as the quality of social and environmental conditions, and collect evidence on the efficacy of noise barriers to reduce negative exposures for near highway neighborhoods.

Concluding the health lens analysis, we conducted a design charrette. Design charrettes are creative exercises that typically engage design professionals, municipal planning staff and community members to develop land use and building design solutions. Our charrette engaged a wide range of people that included many designers, community members, academic researchers, and agency officials. Conducting a charrette is typically not done for such an HLA, but rather is an innovation we introduced based on our prior successful use of charrettes in both Somerville and other near highway communities.

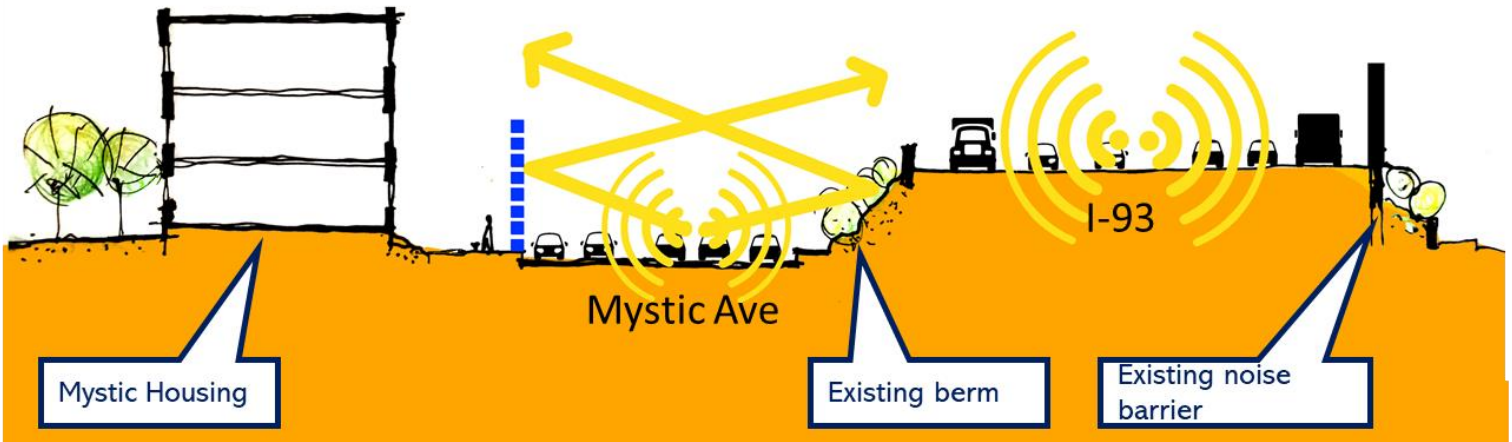
This report is based on the outcomes of our design charrette held on November 17th at the Partners HealthCare facilities in Somerville. The design charrette followed presentations on air pollution, noise pollution, quality of life and the study process. Over 50 people comprised of planners, landscape and urban designers, architects, community residents and the members of the local government participated in the design charrette. The attendants were divided into six groups representing various sections of the study areas. In two separate rounds each group developed their ideas, suggestions and wishes. At the end of the charrette all of the contributions were collected analyzed and incorporated into the report that follows.



Mystic Housing

Design Challenges

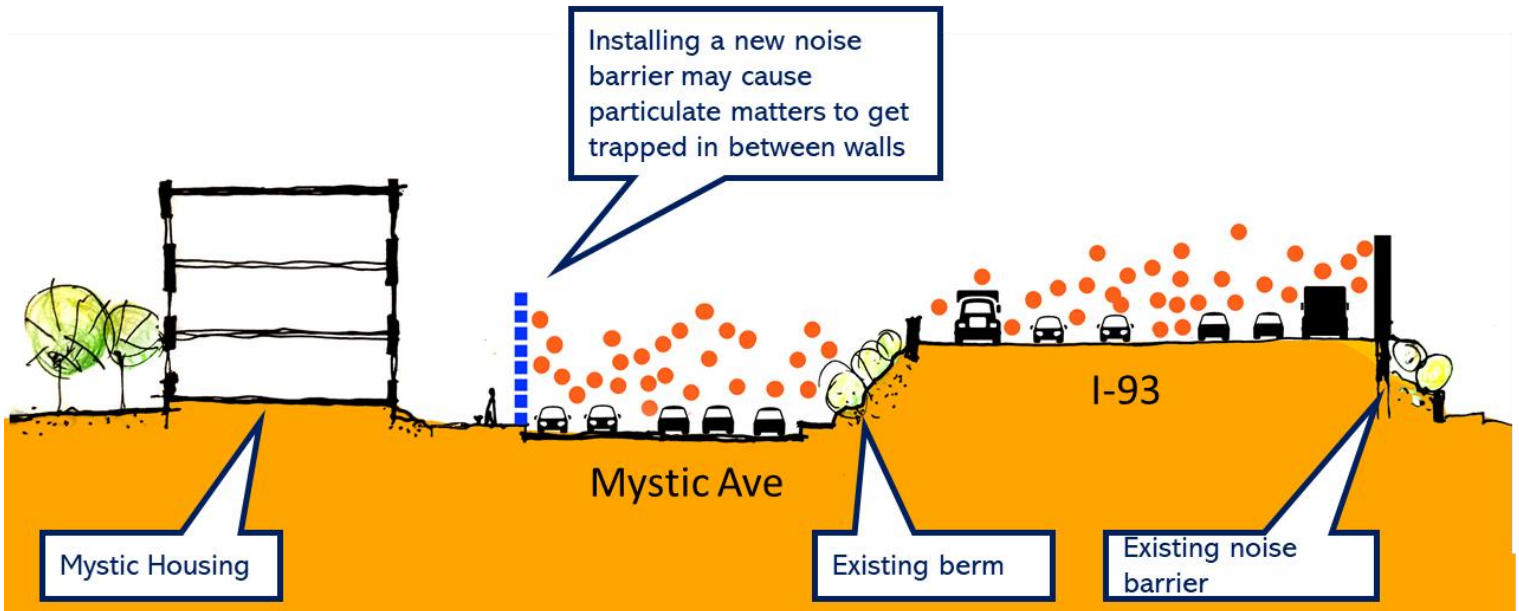
NOISE



Because there are two existing barriers along the roads -a dividing berm and an existing wall noise barrier- installing a new wall noise barrier may reflect some noise towards the buildings along Mystic Avenue.

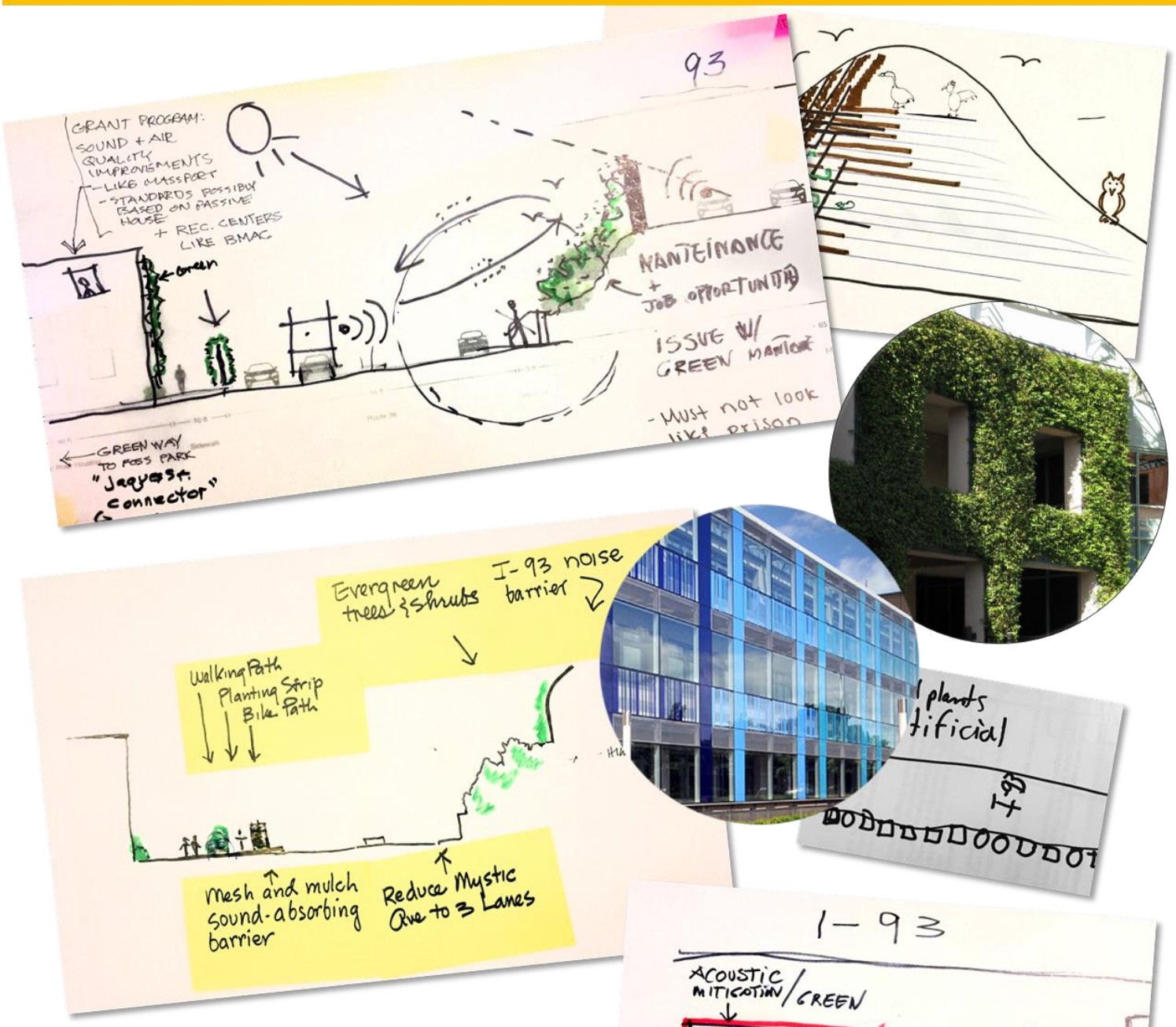
Design Challenges

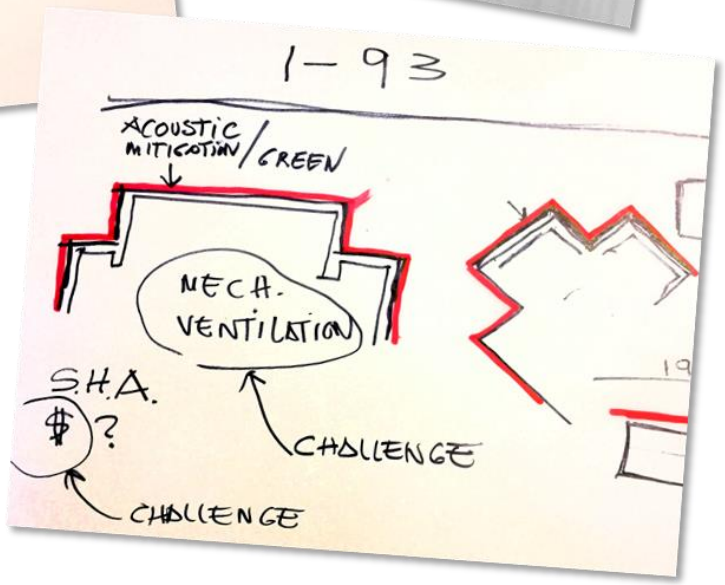
AIR



Because there are two existing barriers along the roads -a dividing berm and an existing wall noise barrier- installing a new wall noise barrier may promote particulate matter trapping along both roads.

Charrette Ideas





TAKEAWAY:

Noise intervention should be done at the building level

Possible Solutions

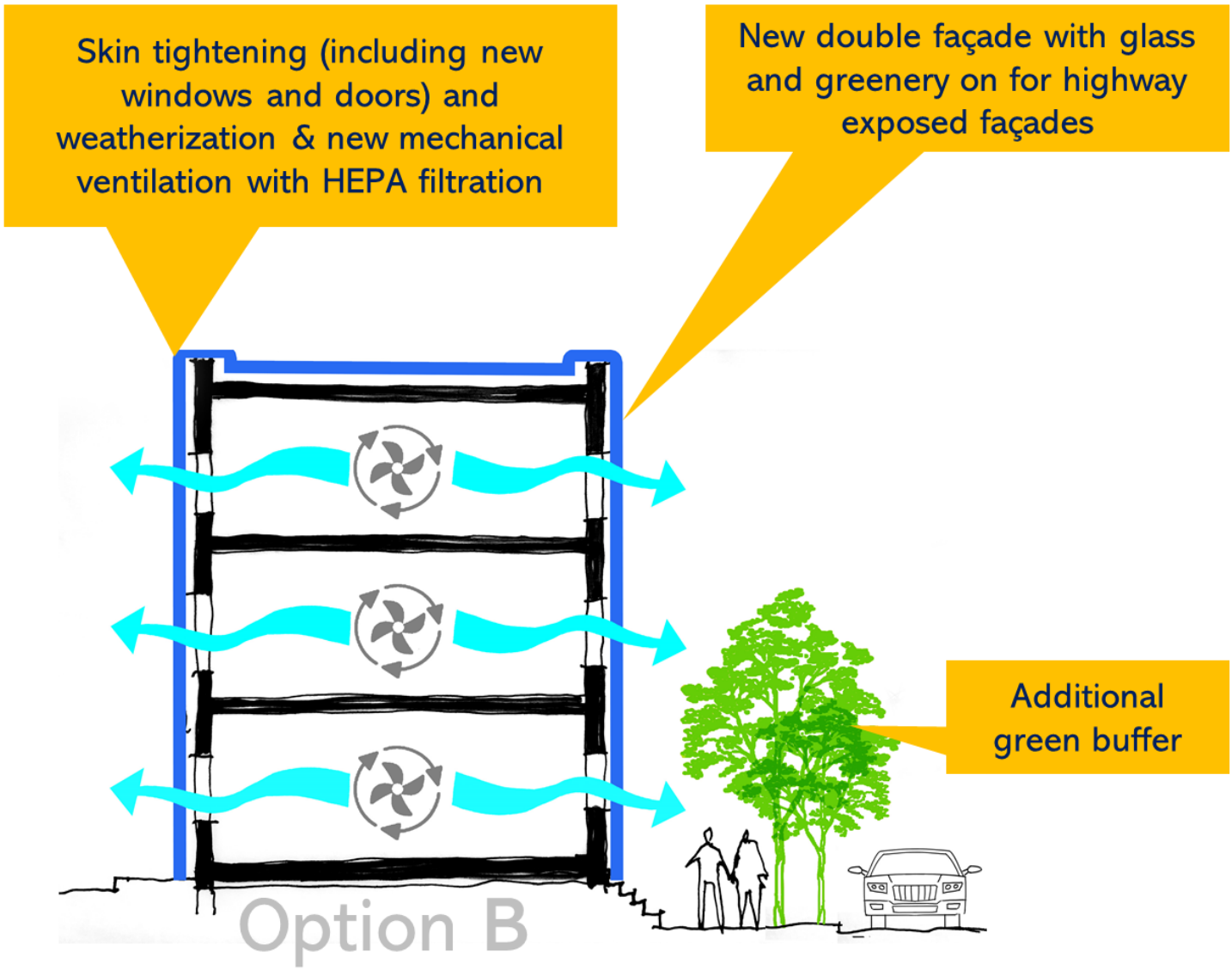
Occupied buildings should be weatherized, including mechanical ventilation with HEPA filtration

Additional green buffer should be added to protect public open spaces

Remediation at building level

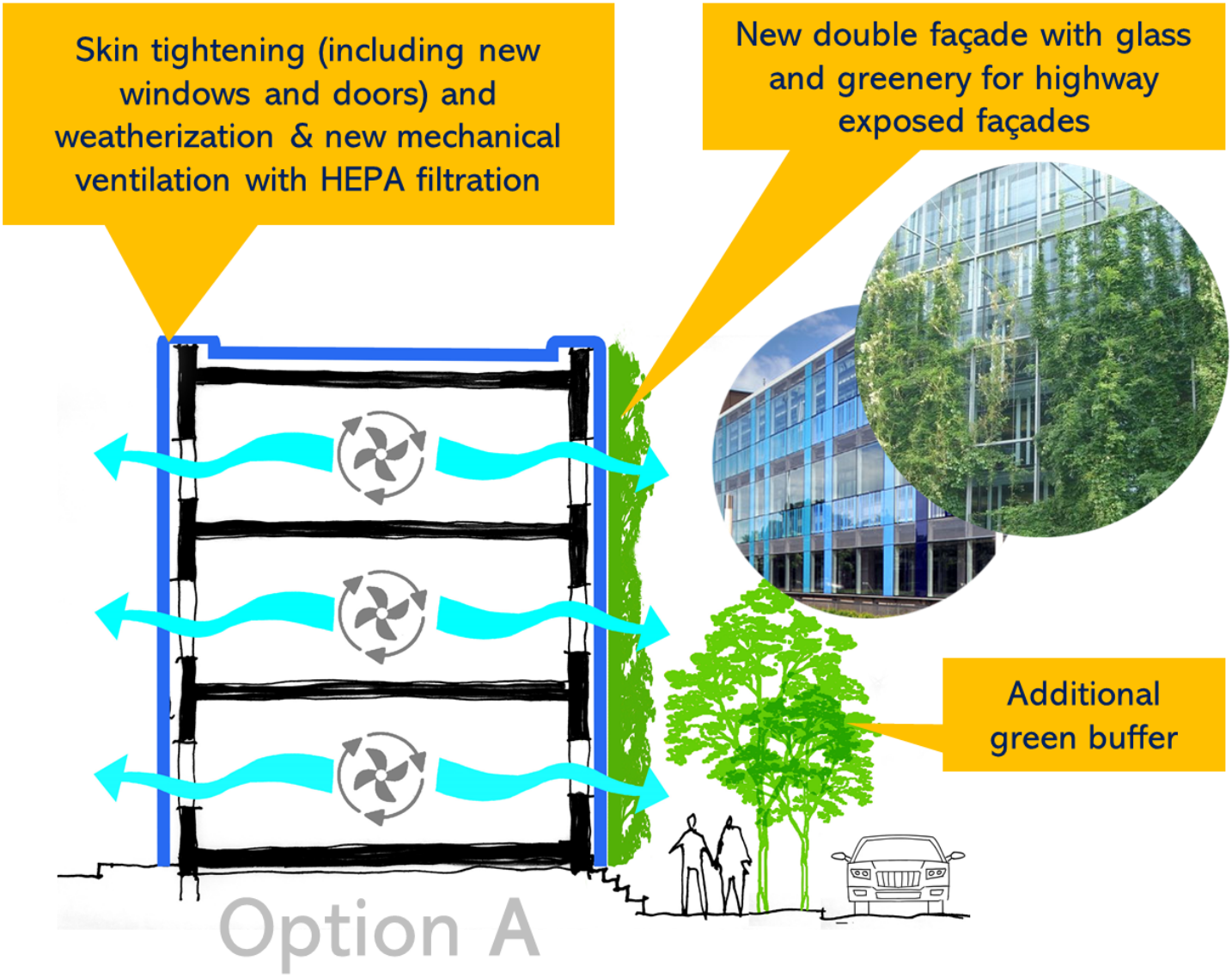
Possible Solutions

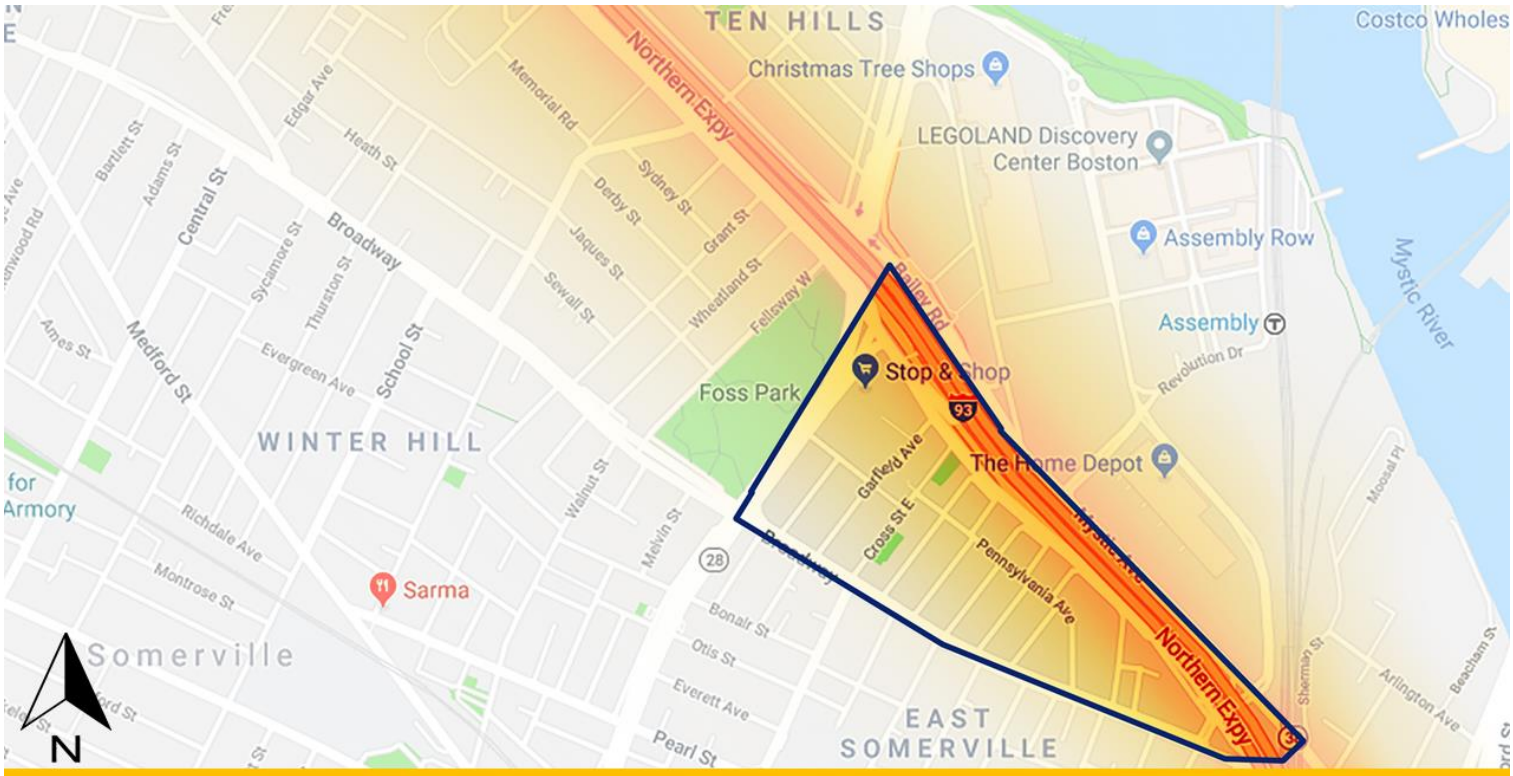
- Weatherized building
- Mechanical ventilation with HEPA filtration
- Additional green buffer



Possible Solutions

- Weatherized building
- Mechanical ventilation with HEPA filtration
- Additional green buffer
- **Green/acoustic double façade**





States Avenues

Design Challenges

A noise barrier could work in this area. The noise barrier design should address aesthetics and views carefully because some of the homes are extremely close to the proposed intervention

Research in this area has shown that upper floors receive more noise from the highway than lower floors. A noise barrier should be tall to address the findings

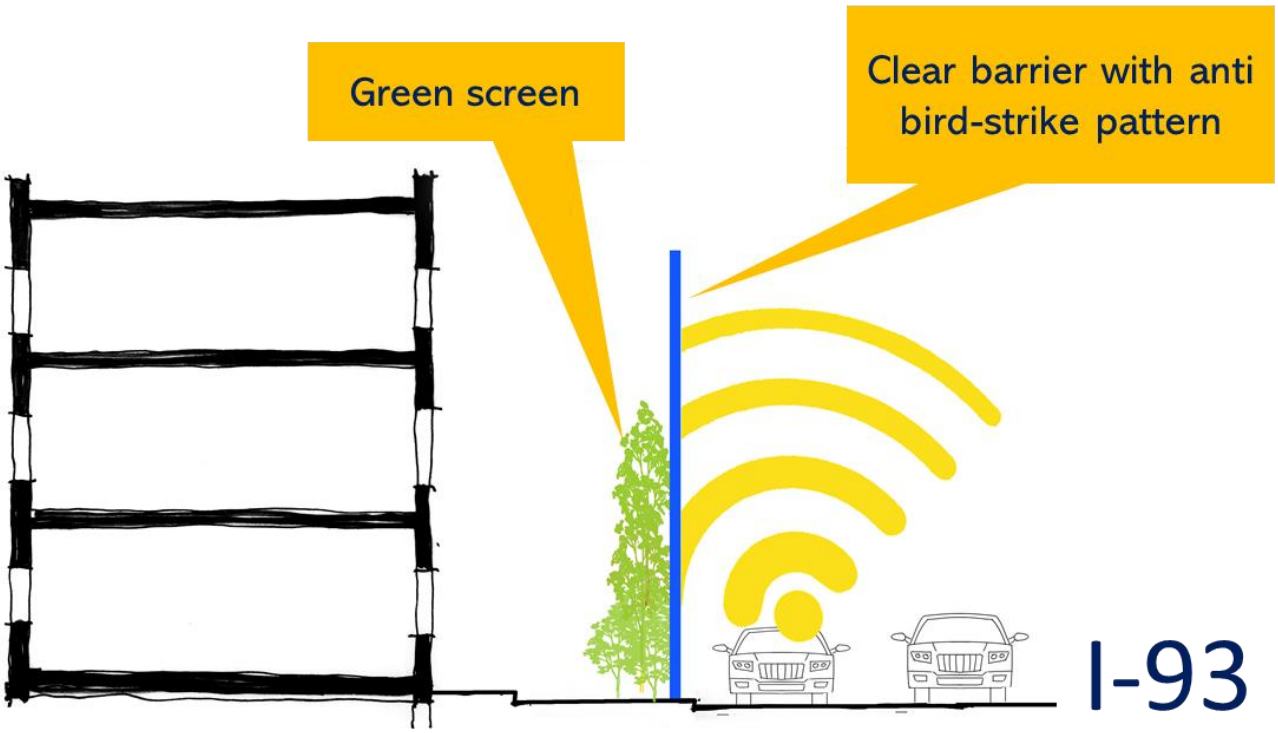
Charrette Ideas

TAKEAWAY:

Everyone agrees: noise intervention should incorporate a green noise barrier and look appealing.

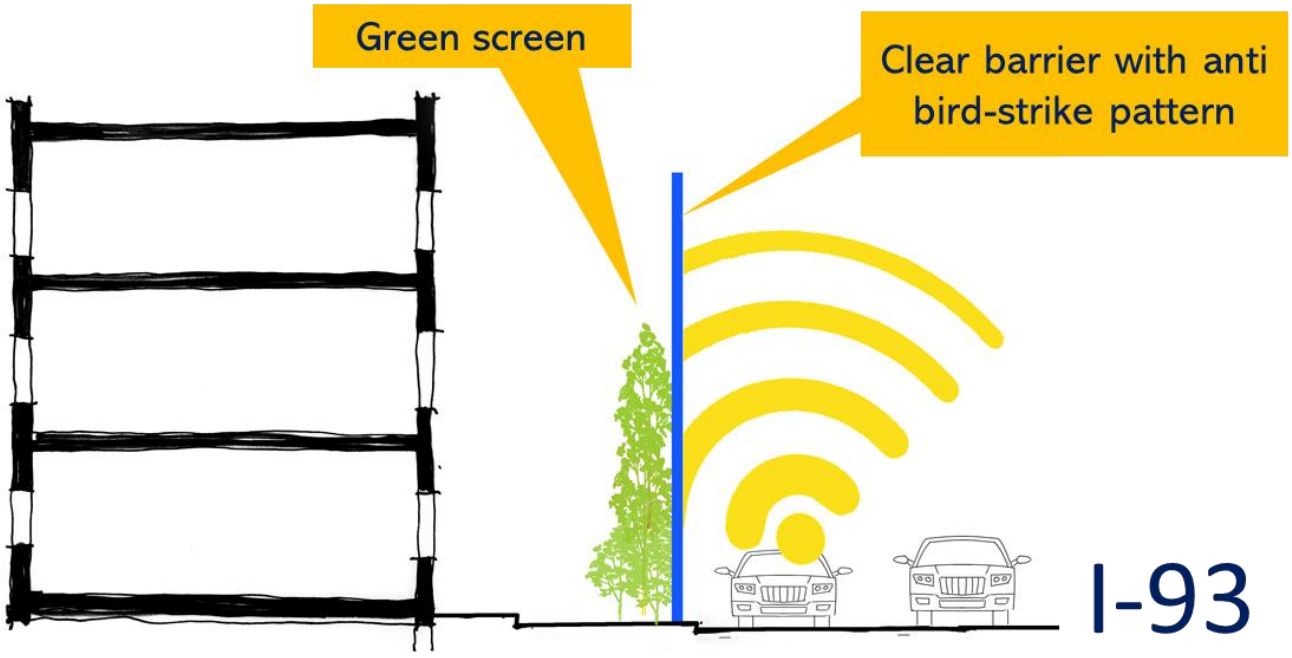
Possible Solutions

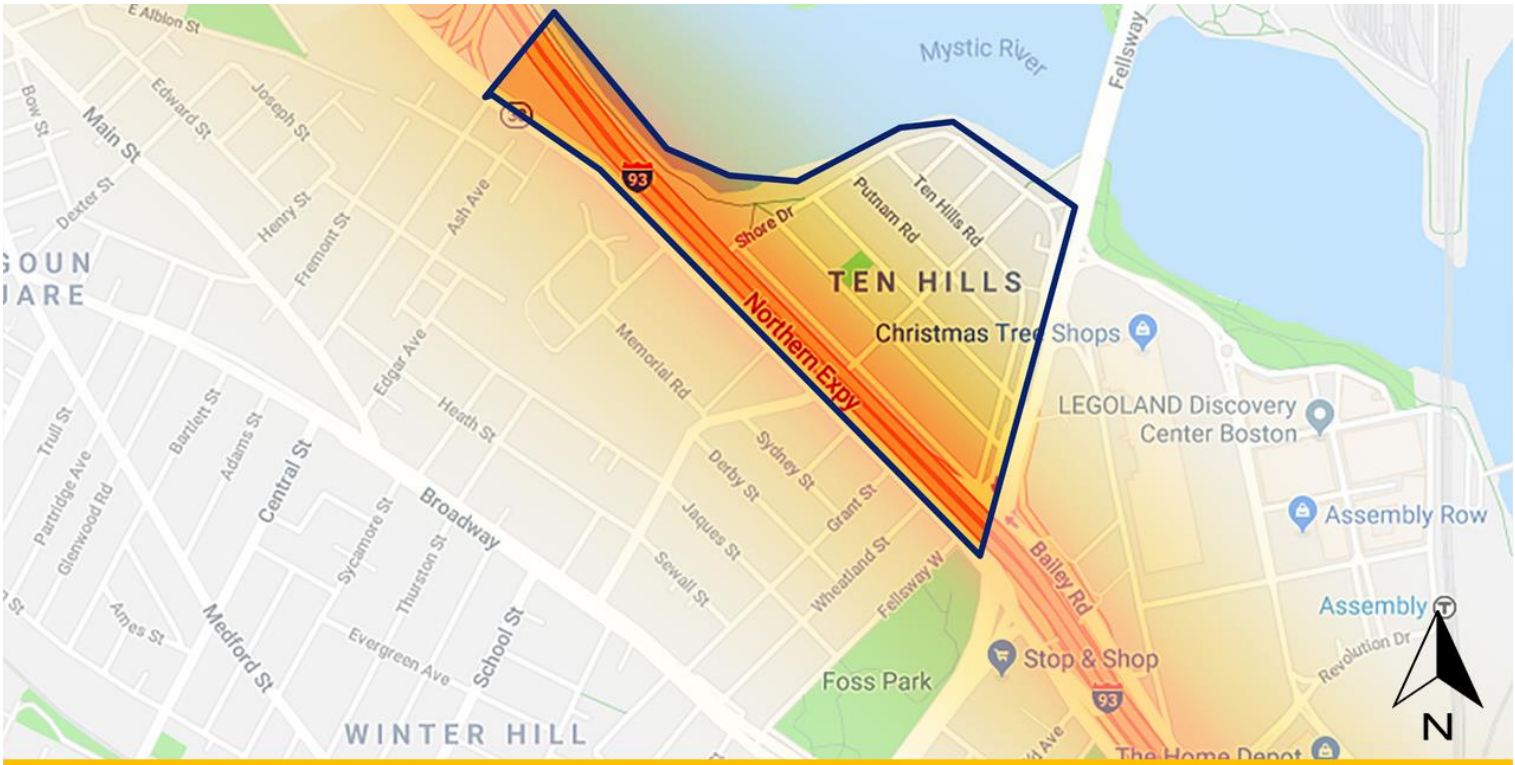
Clear & green noise barrier combo



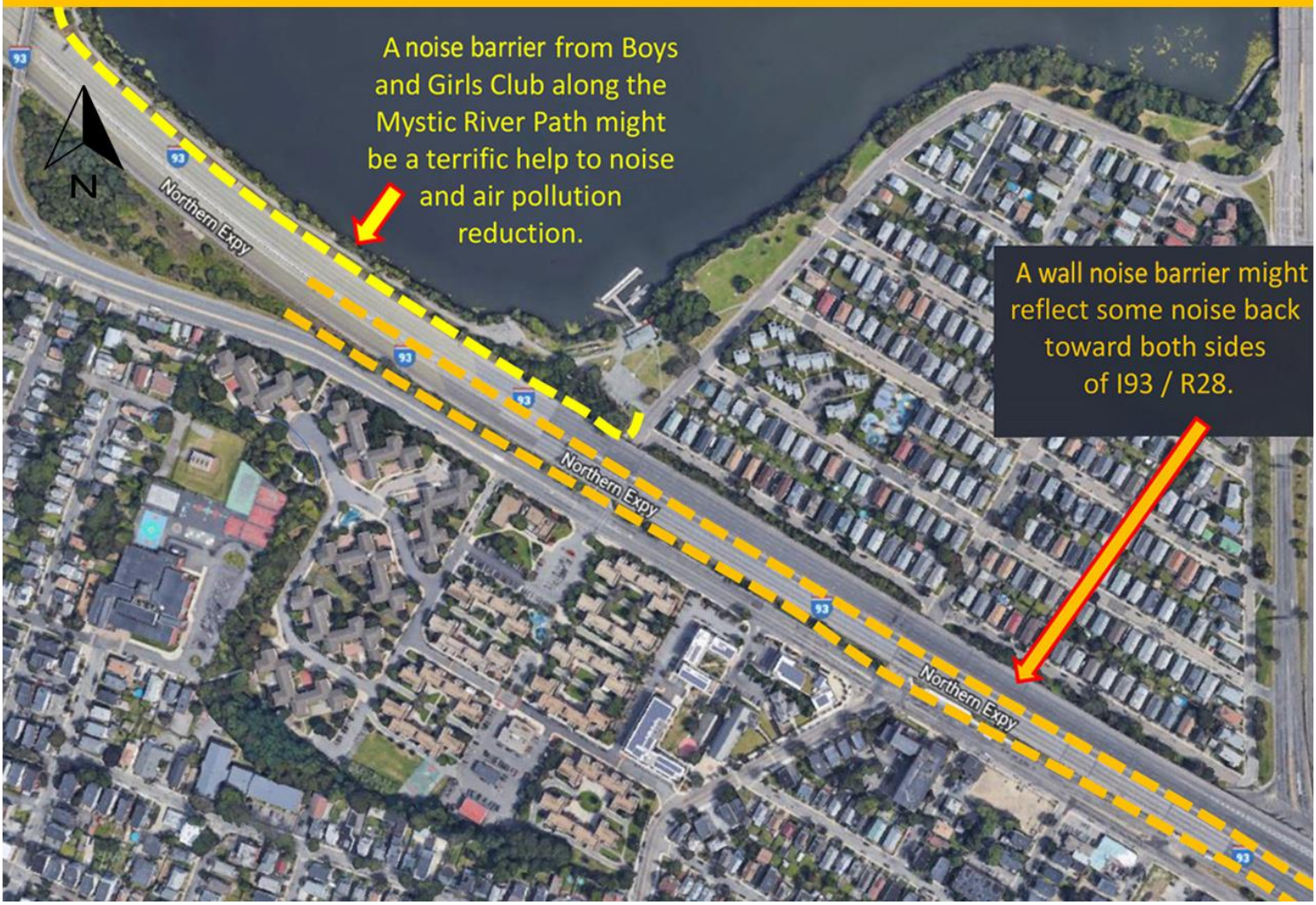
Possible Solutions

Clear & green noise barrier combo





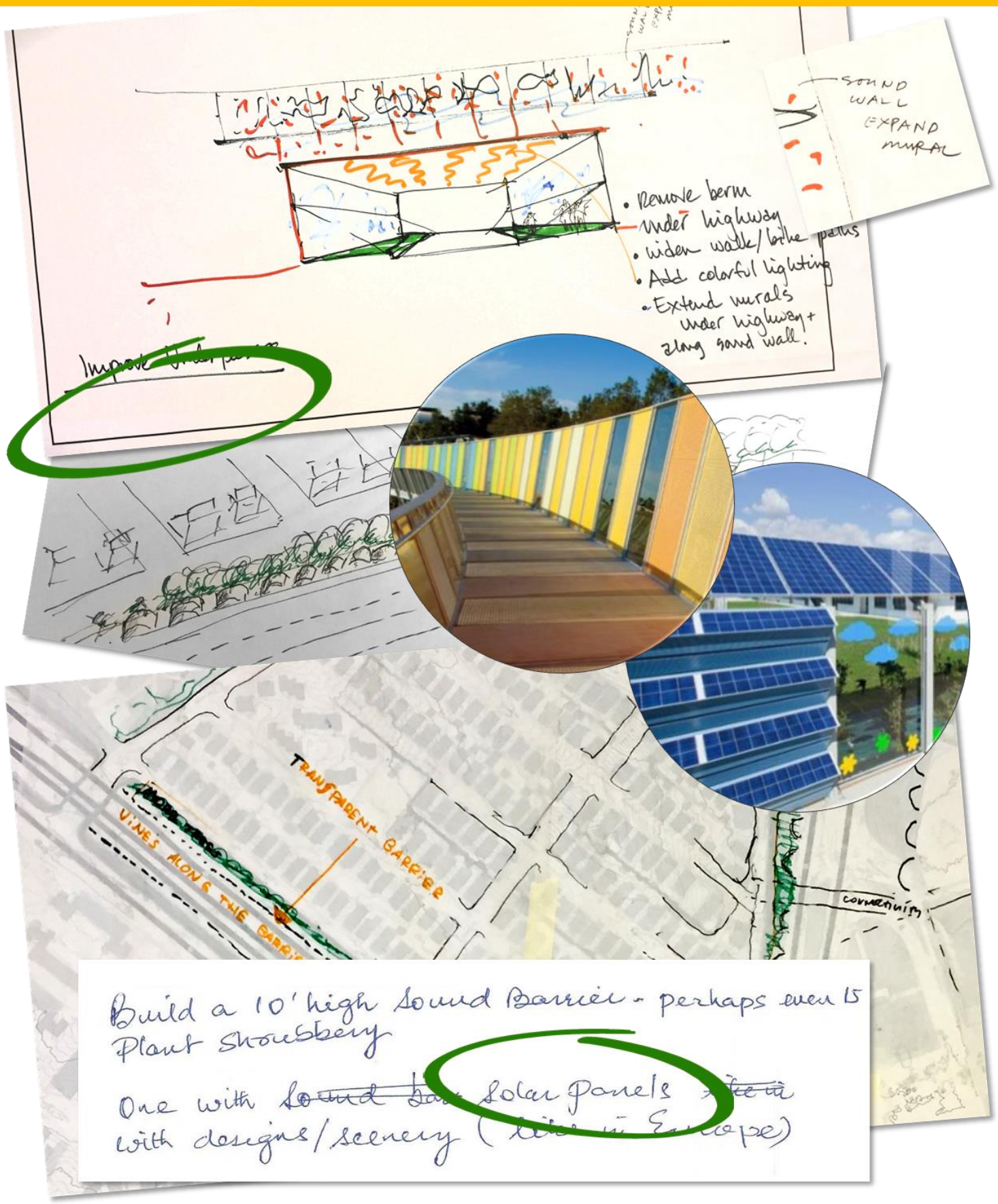
Ten Hills & Boathouse



Design Challenges

The Boathouse and walking/bike paths are also close to the highway, requiring a similar health intervention. The path could garner a huge benefit from a relatively short clear wall.

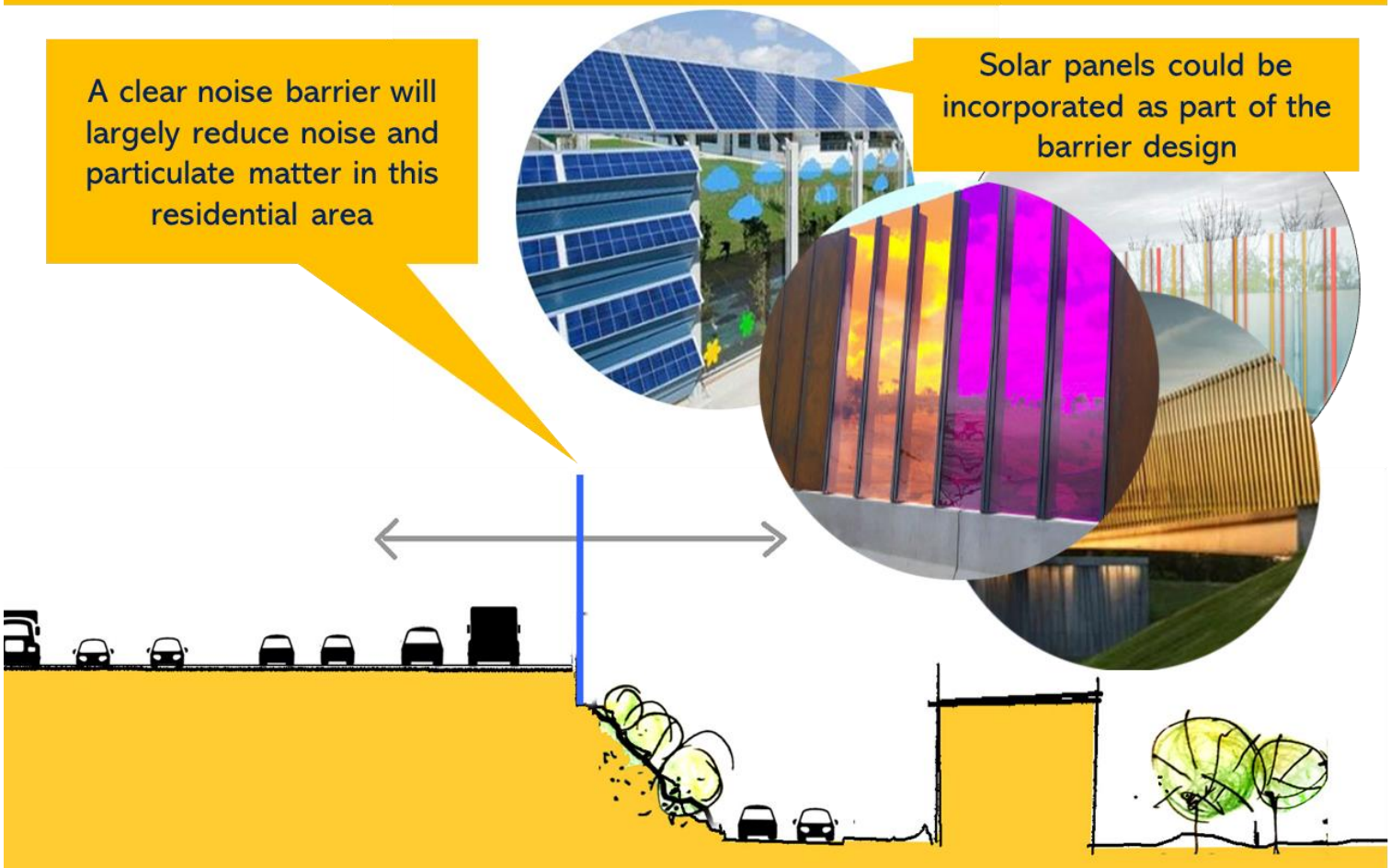
Charrette Ideas



Possible Solutions

A clear noise barrier will largely reduce noise and particulate matter in this residential area

Solar panels could be incorporated as part of the barrier design



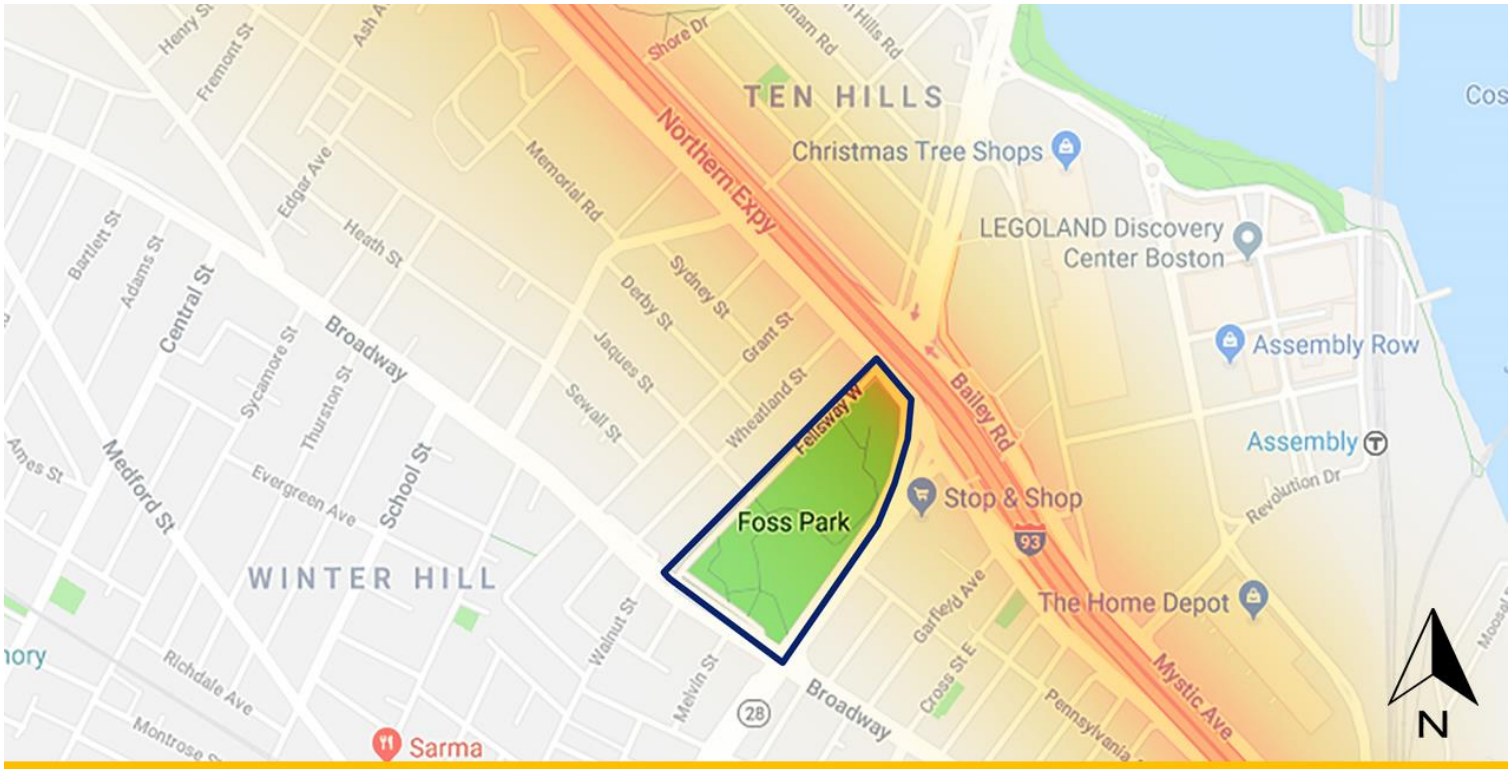
Clear noise barrier & improved underpass

Possible Solutions

The health intervention offers an opportunity to make additional improvements at the highway underpasses

A noise barrier along the bike path would reduce noise and particulate matter

Clear sections allow for increased visibility and safety, and small openings at the base of the barrier allow animals to cross over


TEN HILLS
Northern Expy
Christmas Tree Shops
LEGOLAND Discovery Center Boston
Assembly Row
Assembly
Stop & Shop
The Home Depot
Foss Park
Fellsway W
Bailey Rd
Mystic Ave
WINTER HILL
Broadway
Sarma
N

Foss Park


A noise barrier around Foss Park, double height facing elevated I93, might be a terrific help to noise and air pollution reduction. Air lock gateways except Jaques Street open.
Northern Expy
Northern Expy
93
N

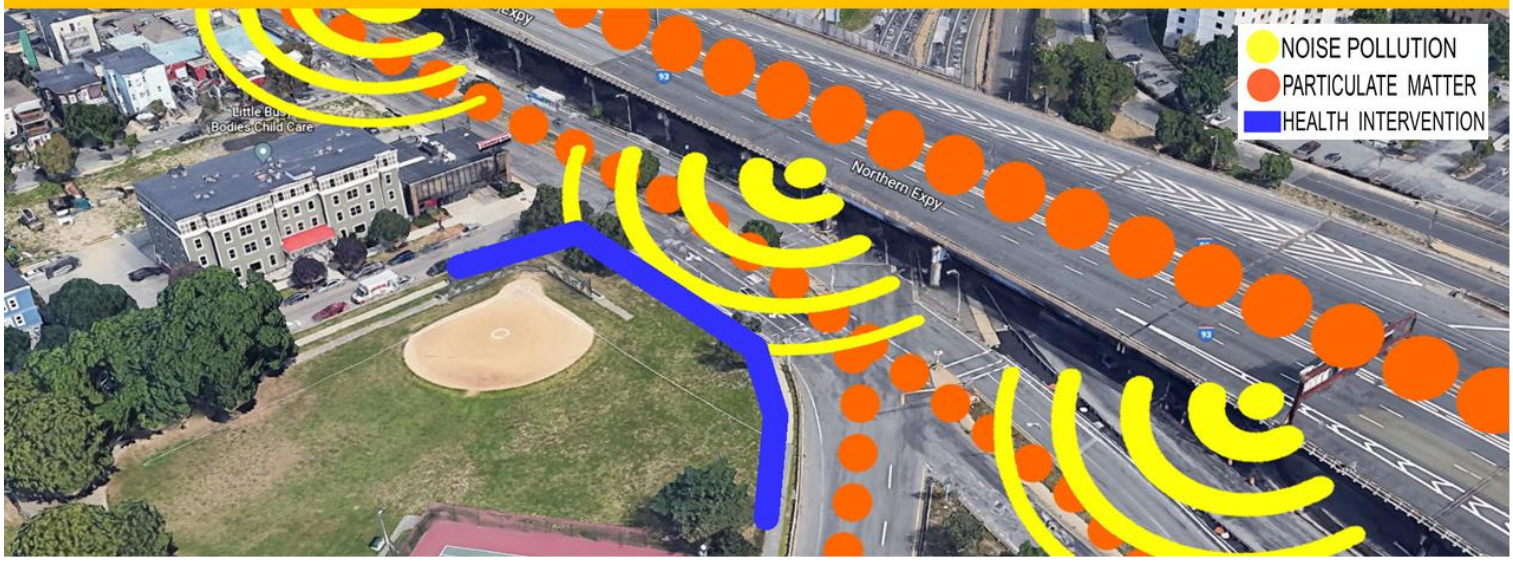
Design Challenges

Northeastern side of the park is most exposed to highway noise and pollution. Because the noise and pollution sources are high, the barrier needs to be tall.

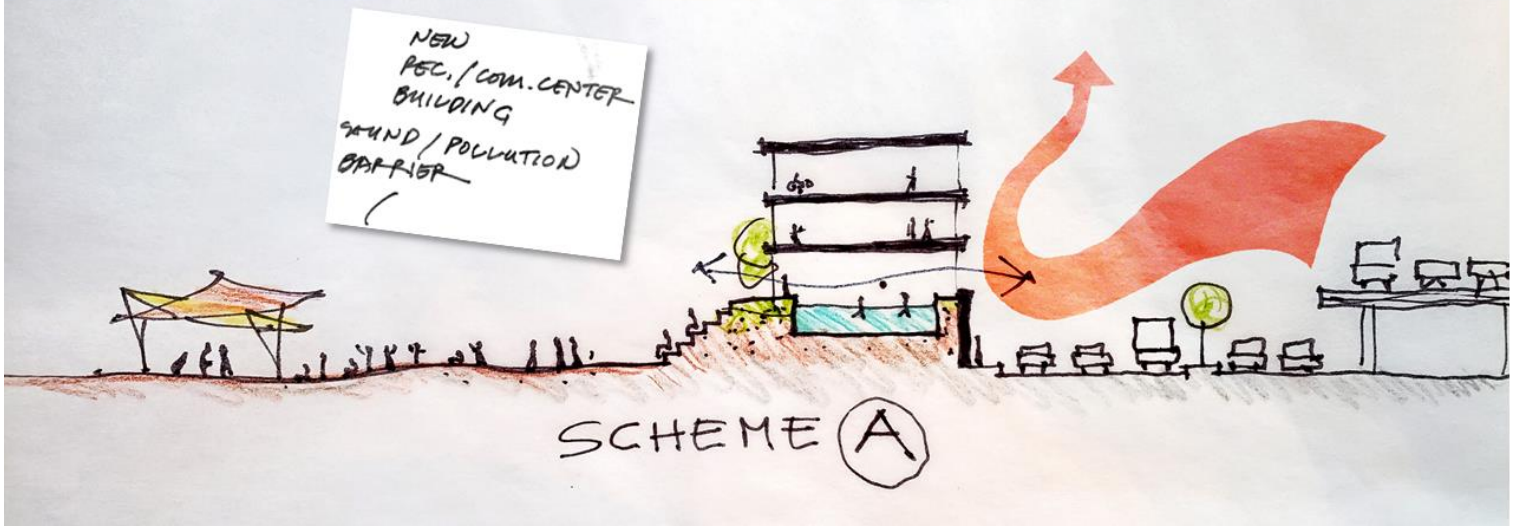
Park edge along McGrath also needs noise and pollution protection. A continuous wall is a good solution here, but it should be clear with small entrances along the barrier, for safety reasons

Charrette Ideas

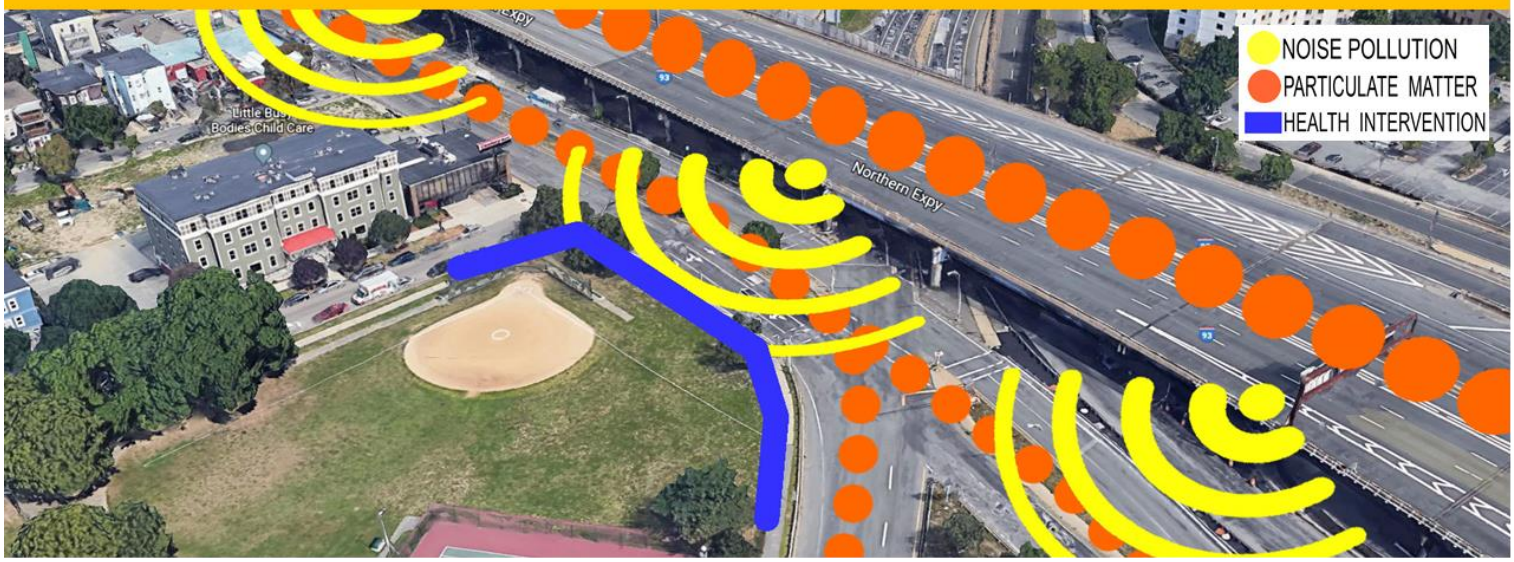
Possible Solutions



Multi-purpose sports building as barrier



Possible Solutions

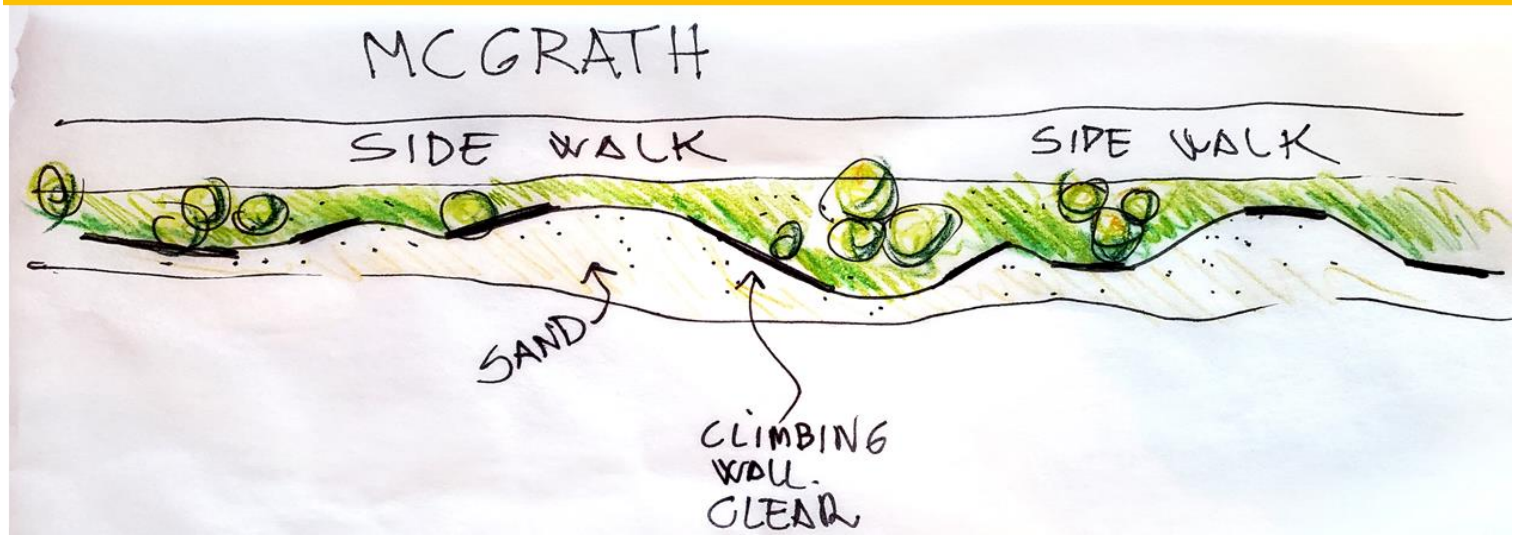


Large vegetated berm as natural barrier

Possible Solutions

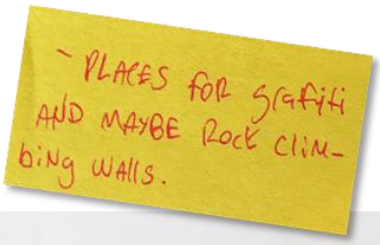
Barrier ideas

Murals along McGrath



Possible Solutions

Barrier ideas



Clear barrier with anti bird-strike pattern

Clear climbing walls along McGrath

Possible land uses

Possible land uses

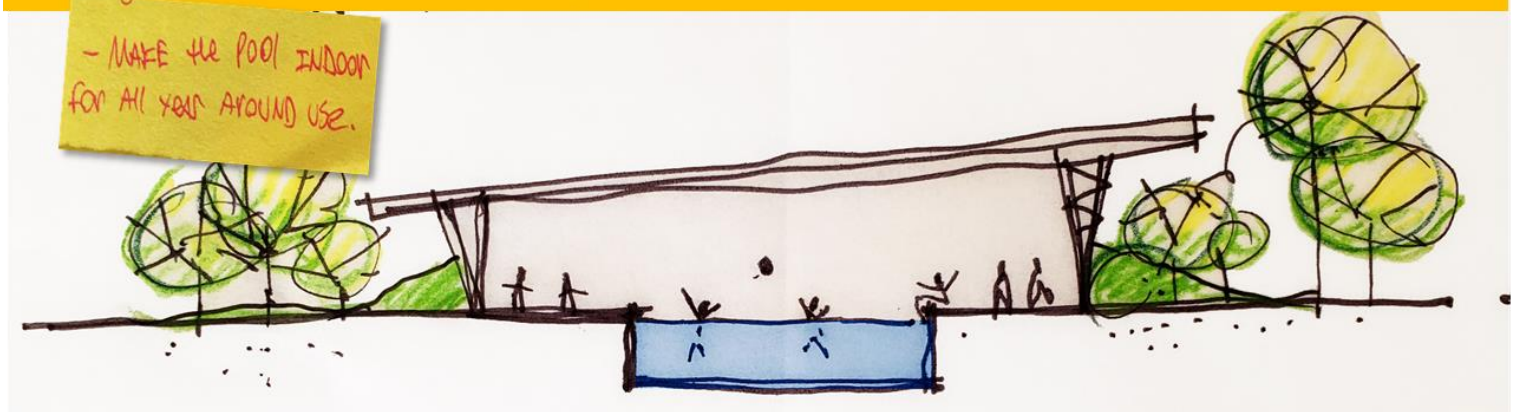
Multi-generation park + climbing berm

Community garden + terraced berm

Possible land uses

Family picnic areas

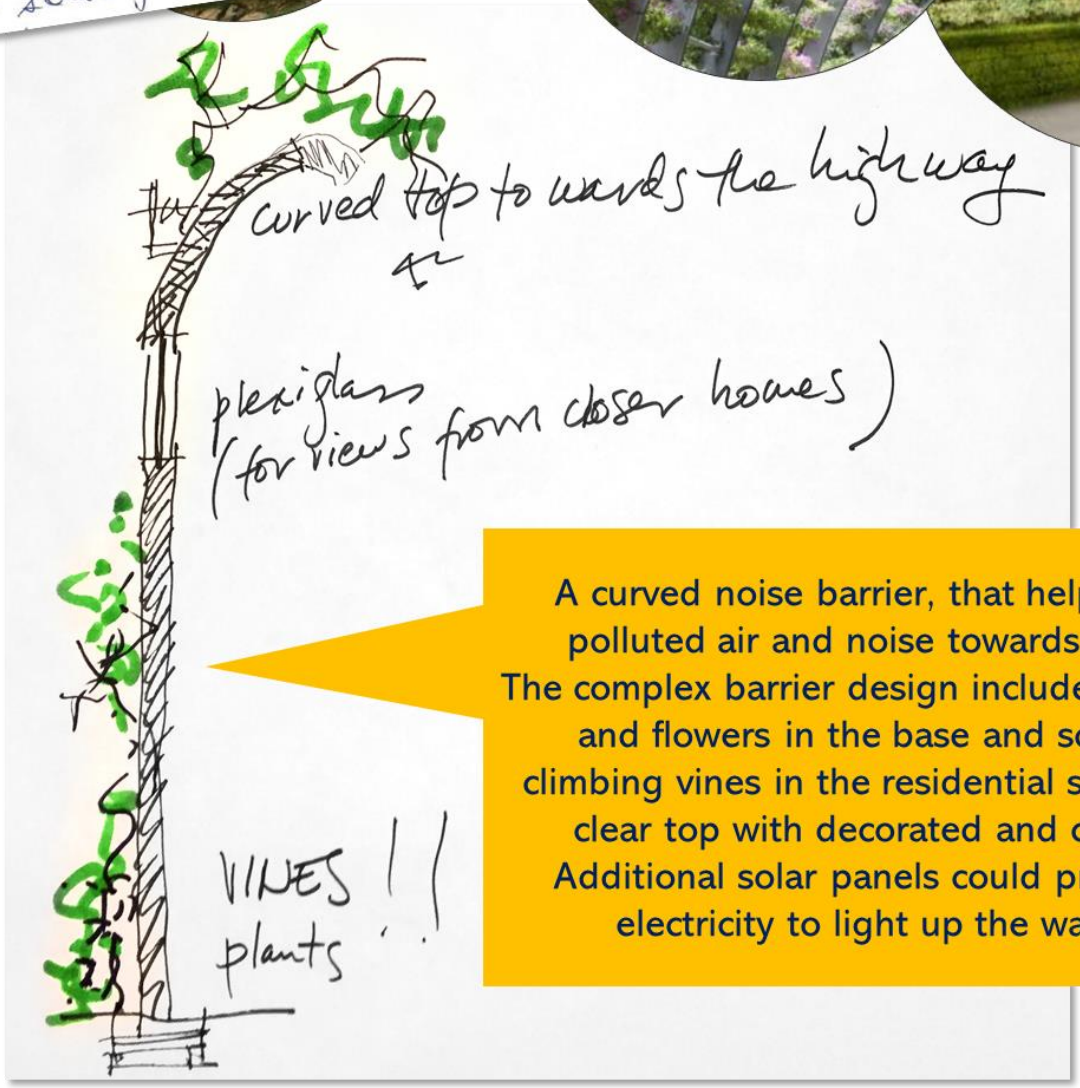
Outdoor performance/movies



Four seasons indoor pool

All interventions

Innovative Ideas

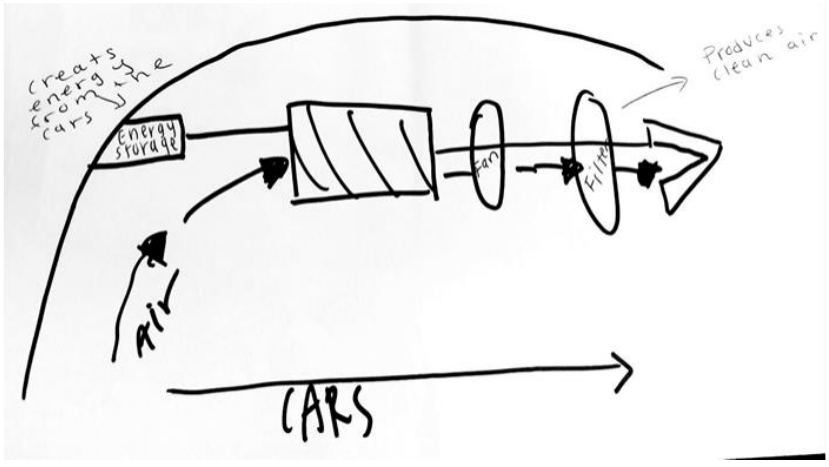


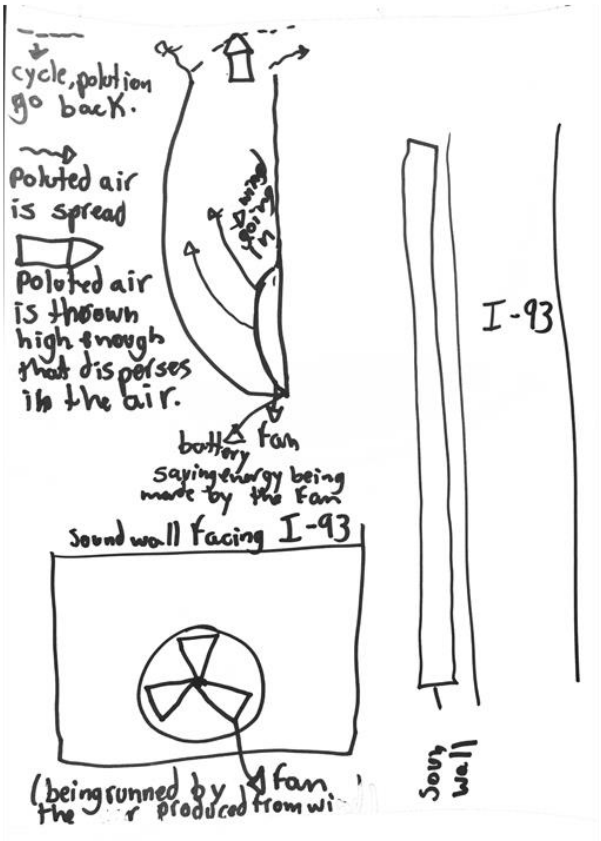
A curved noise barrier, that helps re-directing polluted air and noise towards the highway. The complex barrier design includes a bed of plants and flowers in the base and scaffolding for climbing vines in the residential side, as well as a clear top with decorated and colored glass. Additional solar panels could provide enough electricity to light up the wall at night.

Innovative Ideas

Air-purifying wall

A wall noise barrier built like a chimney shaft, with a mechanical system that sucks air from the lower and forces it throughout a filtering system, releasing cleaner air at the top.





Charrette participant thoughts

Why did you attend the community planning charrette on sound barriers and air pollution?

-"I am interested in noise pollution study and community meetings."

-"Martha Ondras has a relationship with our firm, Jones Payne Group, and reached out to us because one of our specialties is noise mitigation."

-"Unfortunately, I was out of town but live in the Ten Hills area and very concerned about air and noise quality."

-"I am a member of the research team and was also a presenter."

-"Interested in being helpful with the effort."

-"I'm a City of Somerville employee who is interested in the community's ideas about the topic."

What concerns did you have about air quality or noise pollution before attending the event?

-"They are both extremely harmful to living beings. However, noise pollution is still extremely under-researched."

-"Specific to this site, I was concerned about how addressing the air quality/noise pollution on one side/area of the highway could potentially make it worse on the other side/area of the highway."

-"Concerned about air pollution from traffic coming off of 93, Mystic Ave, McGrath Highway and truck noise downshifting in this area as well. Of course concerned about airplane noises."

-"I initiated near roadway air pollution research in Somerville over a decade ago and a little more recently became interested in noise pollution as well."

-"Just general concerns; nothing specific to the planning area."

-"That we should be doing more."

Charrette participant thoughts

In what ways was the event helpful?

-"It taught people about those issues while giving the community hands-on opportunity to change their environment."

-"The event brought a diverse group together to brainstorm about potential solutions. We will continue to talk about what we saw/learned and awareness will spread."

-"It was nice to meet and interact with so many interested citizens."

-"It laid out the issues and the existing data and the professional resources available to address the issue."

-"Very impressed with the variety of ideas and people from all ages and cultural backgrounds."

What is the most important thing you learned?

-"That sometimes organizers are not too concerned about mediating meetings. There was not a mediator for my group so I had to step in and take that position. A lot of people - that are not from the neighborhood - attended the meeting for ego boosting - putting their fingerprint on Somerville. These people took a lot of space out of actual Somerville residents."

-"I learned about the geography and population of the specific area."

-"I've been a volunteer for Tufts since CAFEH began and have followed all their studies since. Learned a lot about noise and pollution problems."

-"People, including the general public, have an interest in these topics and lots of interesting suggestions for mitigation."

-"Specific data is being collected by Tufts personal, Somerville Planning is part of the effort."

-"There are many, many people that care about the sites of the charrette."

What additional information would you like to have?

-"What types of rent control and counter-gentrification efforts are happening to benefit current Somerville residents, not the wealthy that will move in once gentrification kicks in."

-"Steps I could take or websites I could go to in order to be more involved in what happens next and the decisions being made."

-"A nice set of summary materials would be a nice way to continue to share thoughts would both be terrific."

-"Just progress memos as the effort goes forward."

-"It would be great to see the work from the other groups."

Charrette participant thoughts

What topics would you like to see covered at future meetings?

"How to make sure you are giving enough space for everyone in your group to share their ideas."

"Local government policies and civil or architectural planning projects."

"Ongoing mitigation tactics and associated implementation plans."

"traffic counts and pollution amount per hour"

How can we engage more Somerville residents?

"Talk to teachers and sports trainers. We need more young people."

"Use hashtags and social media."

"Outreach through multiple community organizations."

"Put articles in local papers as to the results of this and other meetings/next steps."

"Maybe tap into Assembly Row's marketing machine."

What additional thoughts do you have for addressing these issues?

"A lot of those designs and ideas were not reflective of actual residents. Don't use "smart growth" as an excuse once people are displaced."

"It was very inspiring to see so much representation, from a wide range of ages and experience, collaborating. Keep people involved."

"Deeper education in environmental health."

"Very interesting group of participants."

Afterword, by Ellin Reisner

Older cities such as Somerville face challenges trying to address the air pollution and noise impacts of excessive traffic. Additionally, the city has very limited open space available for the use and enjoyment of residents. Foss Park, the city's largest park, is also impacted by traffic related air pollution (TRAP) and excessive traffic noise.

The design charrette revealed that Somerville residents, local elected officials, community organization members, designers and city staff are committed to improving the quality of life of Somerville residents. This report reveals both creativity and readiness to address traffic related quality of life problems through innovative land use, building design and transportation approaches.

It is our hope that the charrette will inspire even more great ideas to address the transportation related pollution and noise affecting our community. We look forward to sharing these results and using them to stimulate action to improve our neighborhoods.

Ellin Reissner, PhD