Design Strategies for the Somerville Case Study

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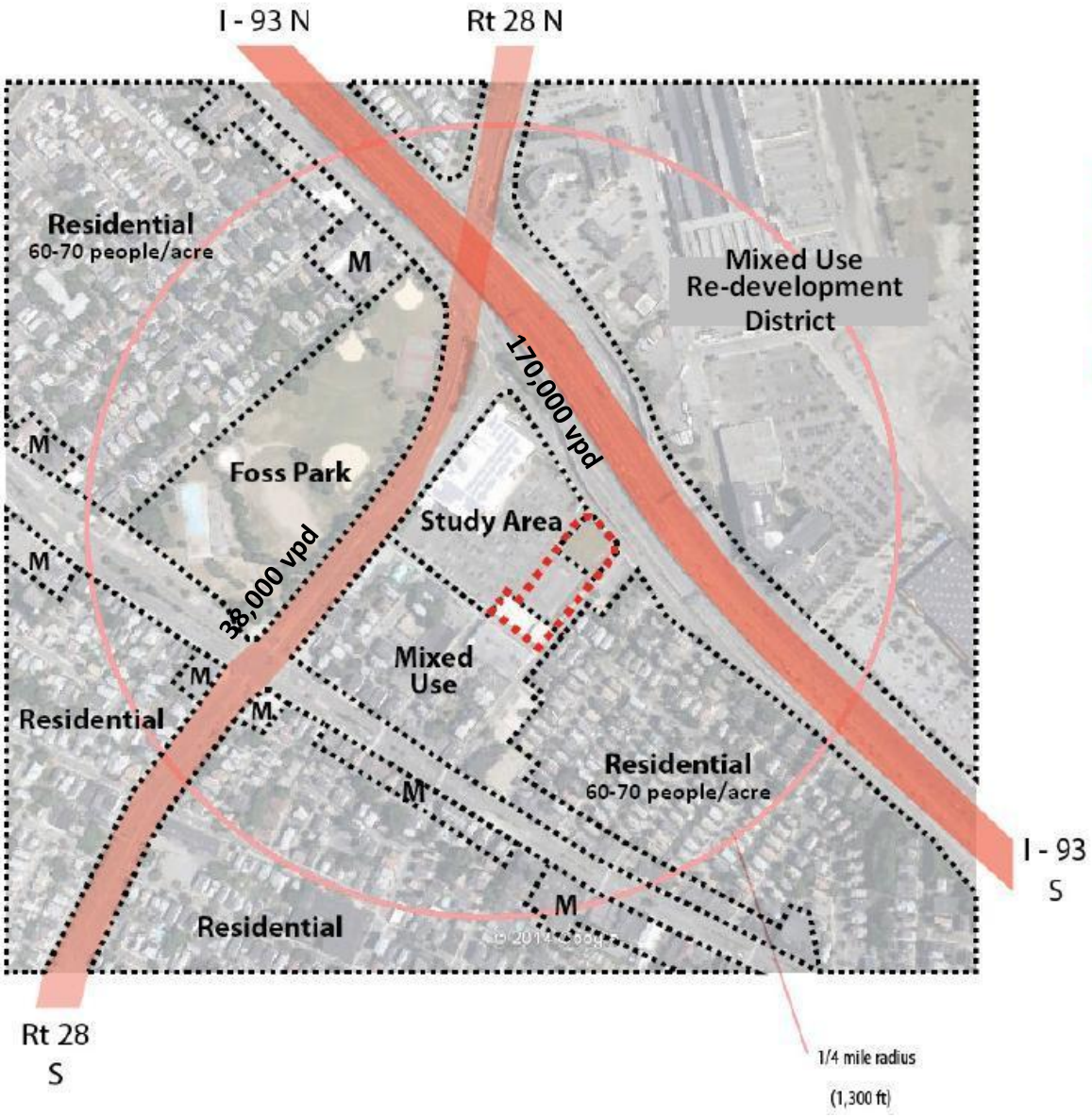
The Somerville Site and Surroundings



M - Mixed Use - Ground Floor Retail and top story residential

Above-Ground Highway

Ground-level Highway

Site Location

Local Factors

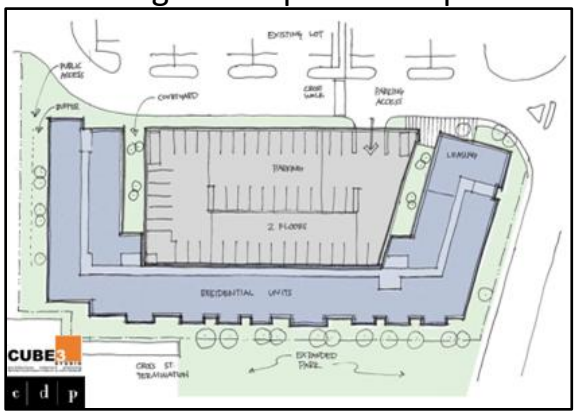
- **High Density**
- **Mix of Uses**
- **Existing vs. Future Users**

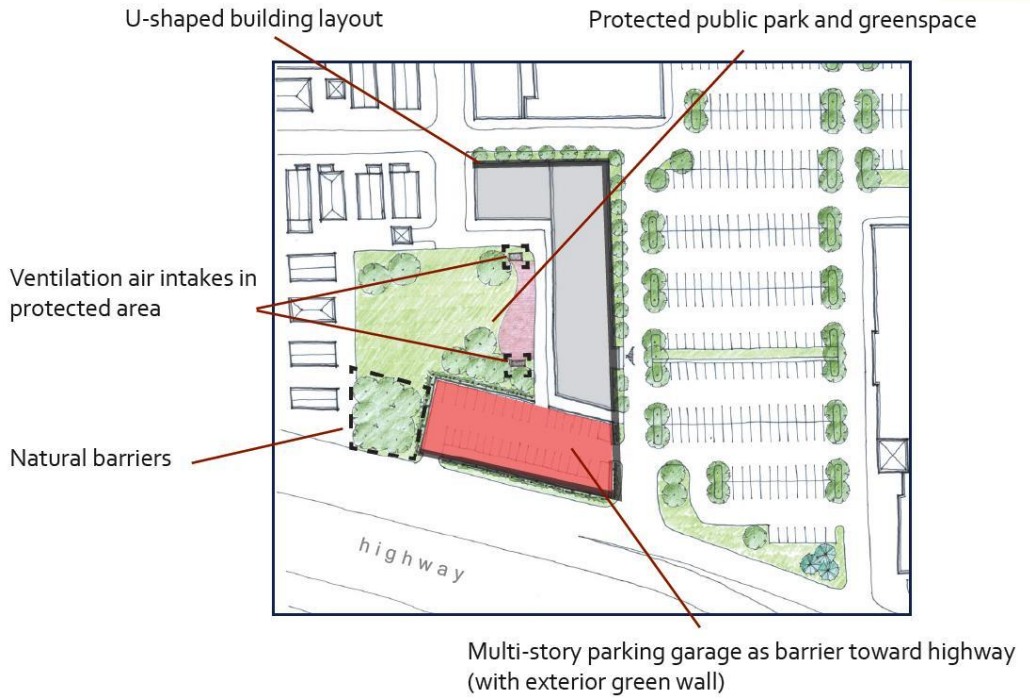
The Stop & Shop site is sandwiched between highways I-93 and Rt. 28. In the immediate vicinity is a parking lot, supermarket a neglected pocket park, a neighborhood of 1 to 3 family houses, and large and heavily used Foss Park.

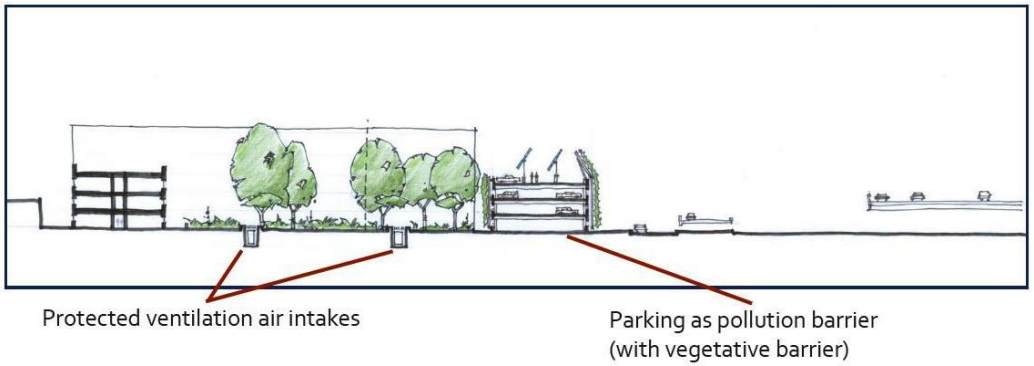
Graphic Credit: Linnean Solutions.

Design Ideas for Stop & Shop Parcel

Existing Development Proposal







Tactics Used:

- Built Barriers - 'U' shaped exterior protects interior park space
- Urban Design - structured parking sited on highway side, blocks pollutants
- Filtration - filtered HVAC system protects future residents in development
- Air Inlet Locations - draw air from protected park space and underground duct cools/warms air
- Trees and Plantings - marginally effective at blocking and filtering polluted air

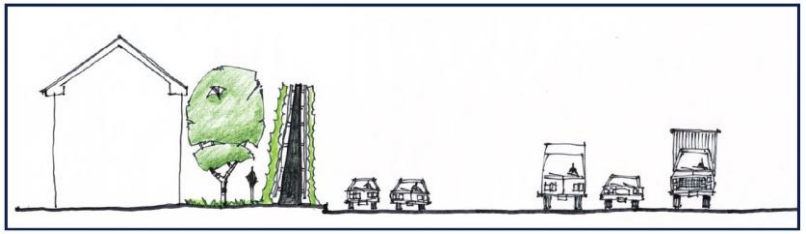
*drawings are meant to illustrate possible implementation of mitigation tactics but do not represent final full solutions

Drawing Credit: Giamportone Design.

Barriers to Near-Highway Pollution

Beyond the Traditional Sound Wall

Vegetative Built Wall Barrier



Integration of Barrier Tactics:

- Combine concrete sound wall with green, living wall, trees and other plantings
- Improves neighborhood aesthetic
- May be more effective than traditional sound wall

New Buildings as Physical Barrier

Enhanced building enclosure close to highway (with green exterior walls)

Functional Barriers:

Structures with uses other than barriers can act as pollution barriers

Recognizing density, site less sensitive buildings (garages, storage spaces, filtered offices) near highways

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Strategies to Protect Foss Park

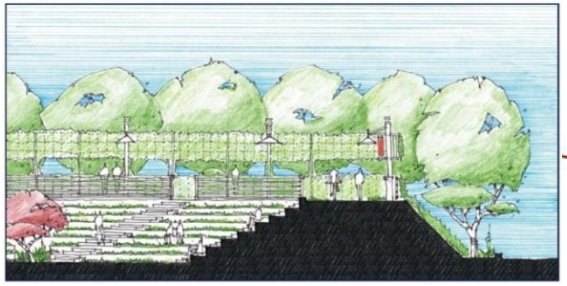
About Foss:

- Surrounded by most high volume roads in the city
- Largest park in Somerville
- Heavily used for sports and community events

Redesign Ideas:

- Vegetative and Built Wall Barriers - band shell and berms
- Land Use - active use (fields, playgrounds) farther from roads
- Trees and Plantings – small effect as barriers and natural filters

Continuous Berm Design

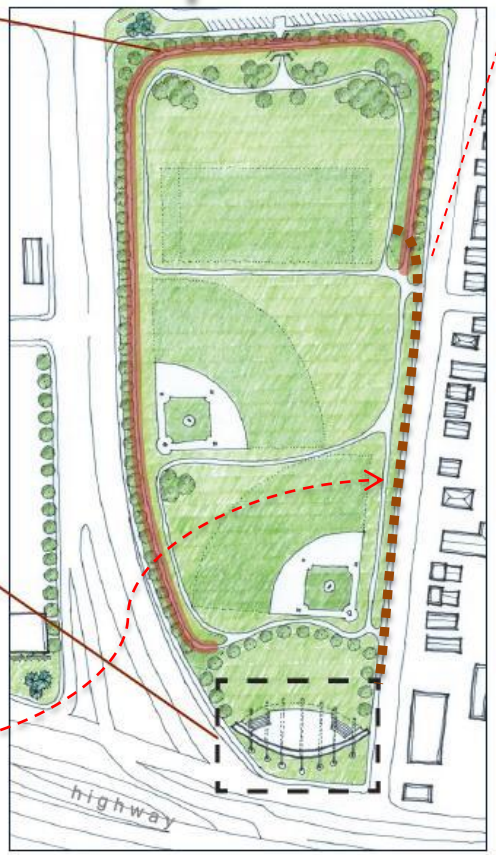


Solid Band-Shell Sheltering Park

Berm might be added here to better protect highway side of park

Berm could be removed between lines to provide access for community

Foss Park Design - Plan View



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Retrofits for Existing Housing

How do we protect the existing residential neighborhood?
Houses are directly adjacent to I-93, no barrier or buffer

- Provide loans for retrofitting HVAC and weatherization
- (A lawsuit settlement in Mira Loma, CA won all households $1700 for filtration systems)
- Weather sealing and filtration/ventilation must be done in concert to prevent infiltration traffic pollution and build-up of indoor pollutants

Neighborhood Retrofits within 200' from Highway

200' buffer from highway - area of highest pollution

Neighborhood Estimations:

200 foot buffer around freeway

35 buildings in the buffer in this neighborhood

200 buildings per mile

15 Windows per House ($1,000 per unit)

$15,000 per building to upgrade ventilation and filtering

$30,000 per building total

~$6,000,000 per linear mile of highway

Graphic Credit: Linnean Solutions.