



CITY OF CAMBRIDGE

Community Development Department

To: Planning Board
From: Community Development Department (CDD) Staff
Date: September 9, 2019
Re: **Utility Service Zoning Petition**

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Overview

This zoning petition, submitted by the City Council, proposes to amend Article 19.000 of the Zoning Ordinance to require the Planning Board to consider the energy utility impacts of large development projects that require a Project Review Special Permit.

The proposal seeks to add language to Section 19.20 that would require applicants to account for the utility infrastructure needs of their projects, specifically electricity and gas. It proposes four changes:

- Adding an Electric Service Infrastructure Narrative to existing Section 19.24;
- Adding a Gas Service Infrastructure Narrative to existing Section 19.24;
- Editing the Urban Design Findings requirement in existing Section 19.25.2; and
- Adding a Utility Impact Findings clause to a new Section 19.25.3.

This memo provides a summary of the effects of the proposed zoning changes and issues the Board might consider in its deliberation. Additional comments are provided in a letter from the Department of Public Works (DPW).

Background on Article 19

According to the Zoning Ordinance, the intent of Article 19.000 is “to establish traffic and urban design standards for development projects that are likely to have a significant impact on abutting properties and the surrounding urban environment.” The Project Review Special Permit (Section 19.20) was created through the Citywide Rezoning Petition, adopted by the City Council in 2001, which also established incentives for housing, adjusted the density of development allowed in many districts, and revised parking requirements.

The Project Review Special Permit is a Planning Board review process required for all projects exceeding a certain threshold, typically 50,000 square feet of Gross Floor Area (GFA) in most parts of the city. Projects exceeding that threshold must receive a special permit even if they otherwise comply with underlying zoning requirements. Section 19.20 outlines the application and review procedures for the Project Review Special Permit as well as the findings that the Planning Board must make in granting the special permit.

While the review focuses mainly on traffic impacts and urban design standards, it also requires the Planning Board to make findings related to the anticipated impact of the project on the City's infrastructure. Section 19.24(5) requires the applicant to submit a report to DPW explaining the sanitary, stormwater, and combined sewer infrastructure needs of the project, as well as how the project would mitigate its impact on the system and any infrastructure improvements that may be necessitated by the additional development. Similarly, Section 19.24(6) requires the applicant to submit a report to the Water Department explaining the water needs of the project and any anticipated impact of the project on the City's water delivery infrastructure and supply.

The Planning Board is guided in its review of infrastructure impacts by indicators set forth in Section 19.34 and must consider whether the project meets the overall objective of avoiding adverse impacts on City infrastructure services, such as roads, the water supply, and the sewer system. The Planning Board makes its determination with support from DPW, which usually provides a report outlining any potential issues in meeting the City's infrastructure standards and, in some cases, recommending mitigating improvements.

One of the major benefits of the Project Review Special Permit is that it provides a mechanism for evaluating the holistic impacts of a given project and requiring mitigation to offset those impacts, which can be incorporated into the conditions of a special permit decision. Along with DPW staff, CDD and Traffic, Parking, and Transportation (TP&T) Department staff support the Board in this process.

Energy Utility Planning and Net Zero Goals

Over the past several years, the City has undertaken several large-scale studies related to future energy planning. The 2015 Net Zero Action Plan outlined steps to significantly reduce citywide energy use in existing buildings with the goal of offsetting all greenhouse gas emissions from building operations by using carbon-free energy production. According to the plan, buildings generate over 80% of Cambridge's total greenhouse gas emissions. As a result, the focus of much of the City's energy planning work has been to reduce the energy consumption and increase the energy performance of new and existing buildings. For example, the City is partnering with large-building owners and Eversource, the utility provider for electric and gas service in Cambridge, to create a program for comprehensive energy-efficiency retrofits. The City has also been working with Eversource on a Multifamily Energy Pilot to provide efficiency measures in midsize multifamily buildings. In addition, the City is working with Eversource on retrofit programs for other multifamily and large commercial buildings. The Net Zero Action Plan also recommends improvements to the Green Building Requirements in the Zoning Ordinance (Section 22.20) and other standards for new development.

As part of this ongoing planning effort, the 2016 Kendall Square Energy Analysis and the 2018 Low Carbon Energy Supply Strategy both projected total annual energy demand, the former for Kendall Square and the latter for the entire city. While the City is focused on reducing the demand for electricity, it recognizes that supply generation may be required to meet projected energy needs, especially as a result of increased electrification. Specifically, the City seeks to achieve full electrification, meaning that gas would no longer be used as a source of energy. Although the long-term goal is to reduce demand for electricity through the implementation of energy efficiency strategies, in the near-term, there may be an increase in the demand for electricity as consumers transition from gas to electricity.

Electrical supply in the city, particularly in eastern Cambridge, has been a topic of recent discussion between the City and Eversource. The issue has risen to prominence because Eversource has indicated that additional electrical infrastructure is needed in the eastern part of the city to meet load growth and has acquired a site on Fulkerson Street for the purpose of constructing a substation, which has raised concerns in the community. There have been a series of public hearings to address this issue and Eversource is also in discussion with developers, larger property owners, and the City to identify potential alternative sites for a new substation. Two items of background material are attached to brief the Board on this issue: a presentation made by Eversource to the City Council’s Transportation & Public Utilities Committee on June 25, 2019 and a memo from CDD and DPW dated July 22, 2019, submitted to the City Council.

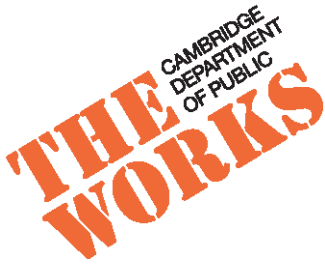
Zoning Considerations

The petition, if adopted, would add requirements to the Project Review Special Permit review process. It suggests that adding these requirements will ensure that new development does not exceed the capacity of the City’s electrical and gas infrastructure. Specifically, the petition would require the Planning Board, in granting a special permit, to find that “the project would not cause undue adverse impacts on the residents and the environment by requiring extensive additional utility infrastructure to be added to the city.” The pertinent question is how this requirement would help the Planning Board evaluate development projects and enable the City to advance its energy and infrastructure objectives.

The following are some potential issues for the Board to consider:

- Unlike roads, water, and sewer, electrical and gas infrastructure is not directly controlled by the City and the City cannot assume the same level of responsibility for the information that is provided by these utilities. As a result, it may be difficult to obtain information from or impose requirements on these utilities because it would necessitate involvement from a third party that is outside the control of both the applicant and the Planning Board. Due to these conditions, a more feasible approach than the current proposal could be requiring the applicant to determine how much electricity and gas service the project will use, since it is more possible to measure usage than it is to measure impact. However, any report presented to the Planning Board should be used constructively to advance and improve the project. The Board’s role may be limited because the Zoning Ordinance regulates land use, not energy, which is subject to other regulations such as the State Building Code.
- As noted above, Section 19.34 already states the objective that “projects should not overburden the City infrastructure services.” The section specifically calls out neighborhood roads, the city water supply system, and the sewer system; it does not reference electrical or gas infrastructure, although it does reference building efficiency. Because the petition references various types of infrastructure, there is significant overlap between the existing language and the proposed new language, which creates the potential for conflicting interpretations. In addition, the proposed new language implies that the Planning Board would look unfavorably upon an expansion of or upgrade to any type of utility infrastructure serving the city; this would include not just electrical and gas utility service, but other utility services, such as sewer and stormwater, as well.

- Improvements to City-managed infrastructure are typically encouraged through new development; it is not uncommon for the Planning Board or other City agencies to require large development projects to build or improve utility infrastructure as mitigation for their impact (see the attached memo from DPW to the Planning Board dated July 30, 2019). The petition does not address mitigation, which is one of the key practical benefits of the Project Review Special Permit process.
- Energy utilities are regulated by the state Department of Public Utilities and the state Energy Facilities Siting Board, which evaluate infrastructure needs from a regional perspective. As a result, energy utilities such as Eversource do not plan system expansions and upgrades based on the needs of an individual project. Due to the role of these state regulatory agencies, the Planning Board would not have the authority to apply certain conditions related to utility infrastructure to the approval of a Project Review Special Permit.
- Finally, the petition uses terms such as “extensive additional infrastructure” and “undue adverse impacts” that are not used elsewhere in the Zoning Ordinance. Terms such as “extensive” and “undue” may require further clarification.



City of Cambridge Department of Public Works

Owen O'Riordan, Commissioner

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July 30, 2019

To: Planning Board

From: Katherine F Watkins
City Engineer

Re: Utility Zoning Petition

In response to the zoning petition to amend Article 19.000 of the Zoning Ordinance to broaden the consideration of utilities during the Project Review Special Permit process, please see comments from DPW below focusing primarily on the impact of the proposed amendment on City utilities.

Through the Project Review Special Permit process, applicants provide a narrative regarding City utilities – sewer, stormwater and water. The emphasis is on determining the utility needs of the project and identifying required improvements to the City infrastructure to meet those utility needs, with the overall goal of ensuring that the project doesn't overly burden the system and in fact benefits the City infrastructure. This is an important aspect of the planning process; ensuring that applicants incorporate utility planning in the early phases of a project and emphasizing that development projects are responsible for their impacts on City infrastructure and have to make necessary improvements to the systems.

The applicants do not have detailed utility designs at the time of Planning Board review but meet with DPW and the Water Department to gain an understanding of the scope of work that will be required and commit to working with DPW and the Water Department throughout the development process to meet all of our requirements relating to stormwater (quality and quantity), sewer service, and water service. A similar process happens for as-of-right developments as well.

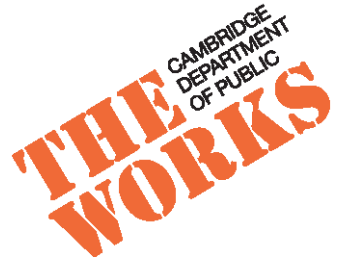
The City infrastructure improvements needed to support the development / redevelopment projects are constructed by the applicant. In addition to supporting the development, these improvements provide significant benefits to the community and to the environment. Development projects replace 100+ year old water mains, remove significant stormwater from the City's sewer and drainage system, improve the quality of the stormwater before it goes to the Charles River or the Alewife Brook, and improve the reliability and level of service of the City utilities. Projects have constructed comprehensive sewer separation and new stormwater outfalls, improving the capacity of our sewer system and reducing the amount of combined sewer overflows to the Charles River, all of which provide significant benefits to the community and to the environment.



The “Utility Impact Findings” of the proposed zoning amendment, as written, is therefore problematic from a DPW perspective. The implication that development projects requiring extensive additional utility infrastructure have undue adverse impacts on the residents and the environment does not account for the long-term benefits to the community and the environment of these infrastructure improvements. For the Planning Board to define and quantify “undue adverse impacts on the residents and the environment” it would also need to weigh the short-term impacts of construction against the long-term benefits to the community and the environment.



CITY OF CAMBRIDGE
Community Development Department



July 22, 2019

To: Louis DePasquale
City Manager

From: Katherine F Watkins
City Engineer

Iram Farooq
Assistant City Manager for Community Development

**Re: Awaiting Report 19-13, dated February 4, 2019
Awaiting Report 19-71, dated June 3, 2019
Awaiting Report 19-78, dated June 10, 2019**

Regarding Eversource electric Substation Expansion, Energy Projections and Overall Update on Process

In response to the above referenced awaiting reports, please see the information below.

UPDATE ON PROCESS

The siting process for a new substation is a long process and while we do not have full answers to all of the questions identified in the Awaiting Reports, we wanted to provide an update on the process and share the currently available information, while we continue the dialogue with Eversource Electric on this critical project.

ELECTRIC LOAD PROJECTIONS – WHY IS EVERSOURCE PROPOSING A NEW SUBSTATION?

According to Eversource, in August 2018, the peak electric load in East Cambridge reached 98% of all-time load. Eversource begins evaluating transmission capacity expansion once peak loads reach approximately 75% of capacity. Operating at a high level of capacity does not provide redundancy in the system, which is problematic in a connected electrical grid. If a transformer overloads during heavy summer loads and there is no available capacity as backup, portable generators would need to be brought in and / or customers would need to be disconnected.

In addition to the existing demand, Eversource has projected future demand through 2029 and describes the need for improved power transmission capacity as follows:

“Eversource has identified an additional 20MW of new electric load in East Cambridge through 2019 and is projecting an additional 100MW during the next decade.”

According to Eversource, in addition to meeting additional growth, “the new substation will enhance the reliability of the electric transmission and distribution system in Cambridge and improve regional connectivity to enable access to renewable energy resources. As the region continues to reduce the use of fossil fuels and increase the amount of renewable energy, investments in the New England power grid, such as the proposed substation, will help ensure that the renewable energy can be delivered to serve the energy needs of Cambridge residents.”

“Access to alternative energy sources – small or large, local or remote – will be restricted without a flexible and reliable transmission and distribution network. Moreover, Massachusetts, and the other New England states, have ambitious goals for carbon reduction that will require increased use of electricity to support electric vehicles and electric building heating systems. Even when combined with dramatically increased adoption of energy efficiency and demand response programs, of which Eversource is a national industry leader, it is projected that demand for electricity in communities like Cambridge will continue to increase.”

KENDALL SQUARE ENERGY ANALYSIS (2016) AND LOW CARBON ENERGY SUPPLY STRATEGY (2018)

As Eversource projects future demand for electricity, it is critical that the projections consider a variety of factors; energy efficiency, anticipated development, and building electrification.

In 2016, Arup analyzed energy demand in Kendall Square through 2035. The study examined anticipated trends in energy use intensity (EUI) and energy codes and concluded that the EUI of future buildings in Kendall would be 50% lower than those constructed at the time of the study. In addition, it incorporated assumptions about efficiency projects underway and anticipated future efficiency upgrades. It found that, as a result of lower EUI in new construction, and energy efficiency projects underway or planned, the total annual energy use is expected to remain about the same. Peak loads, however, were projected to increase. The study also assumed that natural gas would be the primary heating fuel, and that its use would increase.

In 2018, Ramboll built on the Arup study to project energy demand city-wide in the Low Carbon Energy Supply Strategy study. In addition to assumptions about improved energy efficiency in new construction and anticipated energy efficiency upgrades in the existing building stock, the study also took into account climate change projections and the resulting impacts on heating and cooling demand. Total annual energy demand is projected to fall significantly as a result. However, given the importance of electrification in enabling the use of renewable energy sources to achieve Cambridge’s Net Zero Action Plan goals, it is vital that building electrification projections and resulting changes in electricity demand also be incorporated into long-term planning for distribution infrastructure.

FINANCIAL ANALYSIS AND ENVIRONMENTAL ANALYSIS OF THE SUBSTATION

At this early stage in the process, Eversource is indicating that the proposed Fulkerson Street project is still under conceptual engineering review and cost figures and environmental impact reports have not been finalized. If the Project advances, costs and environmental analysis will be developed and included in the required state regulatory filings including EPA, MEPA, DEP, and the Massachusetts Energy Facilities Siting Board (EFSB). These reports, as well as detailed designs of the building, will be shared with Cambridge and made publicly available once completed and available.

SITING OF NEW SUBSTATION

Eversource Electric purchased the 135 Fulkerson Street property in January 2017 after several years of searching for potential properties. Colliers International conducted a search of potential properties and identified fifteen potential locations. Eversource evaluated the parcels and determined that the Fulkerson St parcel was the only viable option considering parcel size, proximity to load and availability.

Given the concerns expressed about siting a substation at the Fulkerson St site, Eversource and Colliers International conducted another search of properties in April and May 2019 but have been unable to find an alternative parcel that meets their requirements.

The City sponsored a meeting in early July with developers and larger property owners in the eastern portion of the city to facilitate additional discussions regarding potential alternative sites. Eversource has indicated that they will be continuing these discussions directly with individual property owners. The City is also working with Eversource to determine if any city properties could be viable alternatives. City staff have evaluated Binney Park Parcel (intersection of Binney St and Fulkerson St) and Triangle Park Parcel (intersection of Land Blvd and Binney St).

The Binney Park Parcel supports critical drainage, steam and telecom utilities and a portion of the future Grand Junction Path. Once these uses are accommodated, approximately 2/3-acre of land could be made available. Eversource is currently evaluating whether this could be a viable site. If the Binney Park Parcel or another city parcel is determined to be a viable site for a substation, the City would then evaluate if using the parcel for a substation is in the City's best interest. The Triangle Park Parcel is about 1/3-acre and appears to be too small a site to be viable for a substation.

NEXT STEPS

City staff have a meeting in early August with Eversource staff responsible for developing peak and base load projections to better understand the basis for the projections and advocate for a robust, well-designed electric infrastructure in Cambridge to address not only immediate needs but also factor in Cambridge's plans for growth and net zero commitments for greenhouse gas emissions reductions. Many of Cambridge's net zero actions and requirements will begin implementation within the 10-year planning horizon of Eversource's infrastructure plan. The City has asked Eversource to present non-wires

alternatives, or distributed energy and conservation measures that can help reduce the need for additional distribution grid capacity, as demonstrated by other Eversource projects in Massachusetts. Eversource has indicated that such alternatives must be presented in a comparative cost-benefit analysis to state regulators as part of the substation application process.

Another Council Hearing is also being scheduled in August to review the projections, better understand the need for the new substation, and evaluate non-wires alternatives including enhanced investment in energy conservation measures and battery storage to reduce base load and demand response strategies to reduce peak load.

Eversource Update

presented to

**City of Cambridge
Transportation and Public Utility Committee**

June 25, 2019

Eversource planners continually evaluate electrical, economic and other data and to project electric needs.

These are confirmed as work orders are submitted by developers.



Review existing equipment and available property.

Can we exchange a transformer to get more capacity (i.e. larger transformer)?

Are there other creative ways to solve the load issue at a utility-scale level?



Seeing growth, system engineers and planning confers to see if a system reconfiguration can address capacity needs?

Can we work with what we have?
Can the system operate safely at peak load with the loss of a piece of equipment or transmission line?

Is there room to enhance or expand an existing substation?

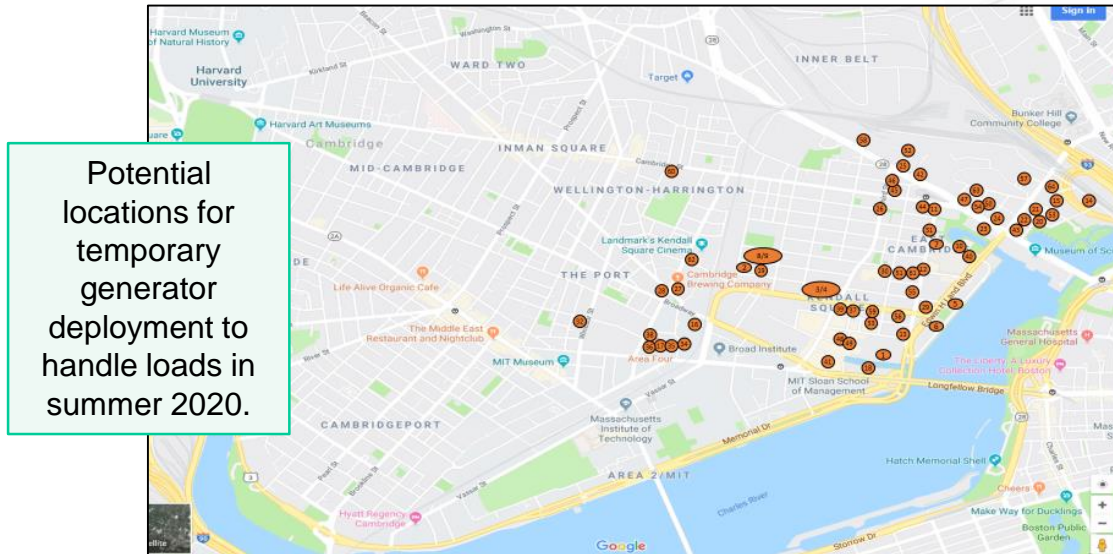
Can we add a transformer at existing property to address load needs?



The anticipated customer demand for electricity in Cambridge can not be solely addressed by solar, energy efficiency or demand response programs.

Proposed Putnam Avenue Project

- ✓ Available space.
- ✓ Adequate Transmission Supply.
- ✓ Near load pocket.
- ✓ Shorter permitting process via local zoning.
- ❖ One additional transformer will not solve the entire load need.
- ❖ Delays in the permitting process are impacting projected in service date. Contingency plans underway to ensure peak load is met.



System Planning - Building a system, not just a substation.

If no way to utilize existing property to solve load need, system planning investigates building new substation.

Routing assessments considered concurrently during parcel review. Routes with obvious flaws are eliminated

System planning and substation engineering determine needs at new facility, calculates parcel size, defines search area.
Real estate search set out to find available parcels.

Initial route engineering and building concepts developed.

Proposed Substation Site - Real Estate Search Historical Timeline and Consideration Criteria

- **November 2014** - System Planning engaged Eversource Real Estate to identify a parcel 40,000 square foot or larger for a future substation in East Cambridge / Technology Square area. Real Estate conducted search of potential properties on the market. Initial efforts found no available properties.
- **March 2015** - Real Estate engaged broker Colliers International to conduct search of potential properties not actively on the market, but where owners may be open to a potential sale. Fifteen (15) potential locations identified, eight (8) of which met some, but not all, of Eversource's criteria. Planning/Engineering evaluated these eight, eventually determining 135 Fulkerson St. to be the only viable option, considering parcel size, proximity to load and availability.
- **June 2016** - Purchase and sale agreement for 135 Fulkerson St. signed with 135 Cambridge LLC.
- **January 17, 2017** - Property purchase closed.
- **April, 2019** - Eversource conducted a refreshed search of properties on the market as a potential alternative to 135 Fulkerson and found no parcels that met our requirements.
- **April-May, 2019** - Eversource reengaged Colliers International to perform another parcel search of potential off-market properties. Despite significant effort, Colliers was unable to identify any other potential alternatives that met the criteria.

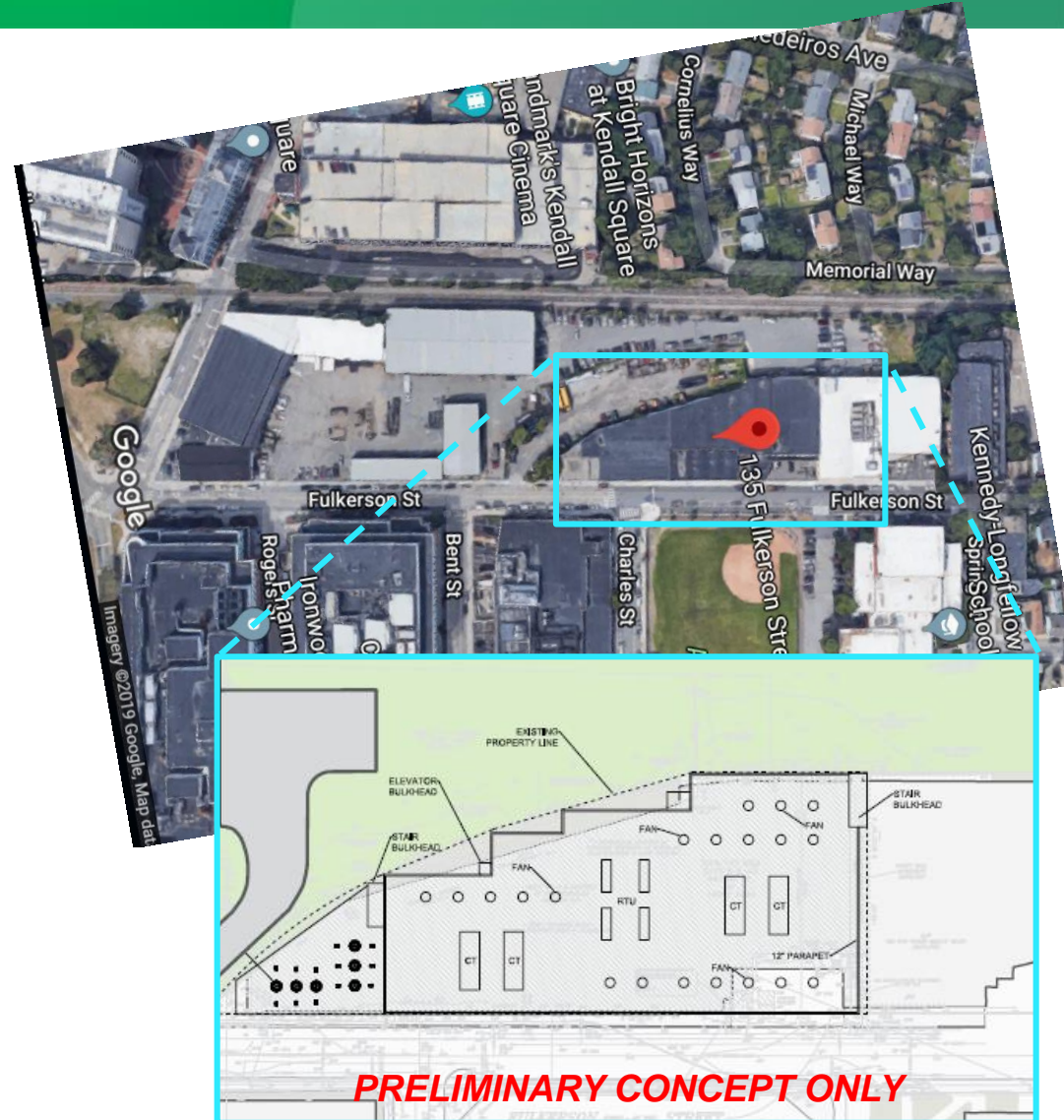
Proposed Substation Requires Circuit Routes Connecting to the Electric System

Proposed substation must connect to the electric system:

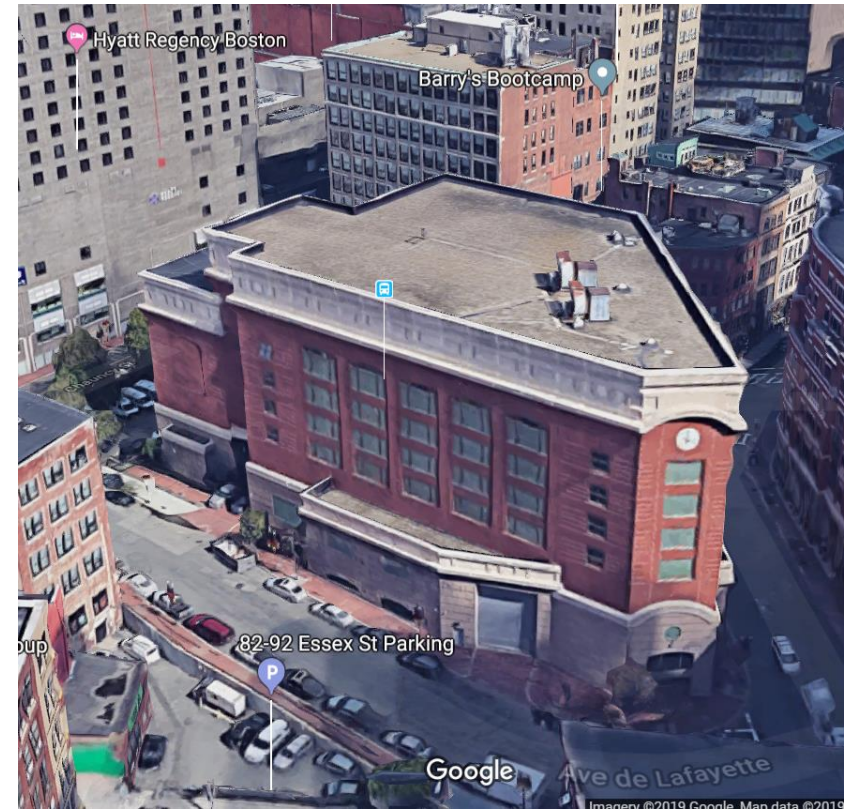
- Interconnected system requires connection points near existing East Cambridge, Putnam and Brighton electric substations.
- Will include transmission and distribution circuits.
- Enhances system reliability and capability.
- Meets forecasted need.

Proposed Fulkerson Street Project

- ✓ Land mass meets size requirements.
- ✓ Willing seller.
- ✓ Near load pocket.
- ✓ New construction so facade can be customized to almost any design.
- ❖ Longer, more involved permitting process.



East Cambridge Substation Size / Scale



Near term solution = one additional transformer at an existing substation or equivalent.

Longer term solution = approximately two Seafood Way substations or equivalent.

Robust / comprehensive solution = Kingston substation equivalent.

Substation façade examples

Flexible Design, Fit the Surroundings

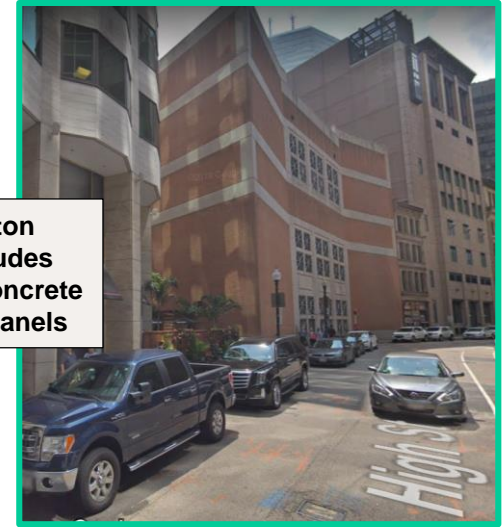
Seafood Way Substation, Boston

- Façade includes perforated metal panels and concrete foundation.



High Street, Boston

- Façade includes brick and concrete facia, vent panels



Kingston Street, Boston

- Façade includes brick facia, simulated windows, clock.



- Safety is of the utmost importance for our employees, our neighbors and the communities where we all live and work.
- Any proposed substation in East Cambridge will be housed in a secure building providing a physical security barrier.
- We incorporate the highest levels of safety features into building designs, including applicable fire suppression systems at key elements of the building.

After designs and routes have been vetted, project to be filed with the EFSB.

After 12-18 months, the EFSB will issue a decision on the proposed project and if approved, any associated conditions.

EFSB will hold public comment hearings on the proposed project.

Begin project construction.

As a regulated utility, Eversource must seek project approval from the Energy Facilities Siting Board and the Department of Public Utilities.

EFSB has a statutory mandate to implement the policies of G.L. c. 164, § § 69J-69Q to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost.

EFSB is required to review alternatives to planned projects, including “other site locations.” Eversource must demonstrate that we have considered a reasonable range of practical project and siting alternatives and that the proposed facilities are sited at locations that minimize costs and environmental impacts while ensuring supply reliability.



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