



Kendall Square  
Central Square  
Planning Study

# KENDALL SQUARE

## FINAL REPORT 2013

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# EXECUTIVE SUMMARY KENDALL SQUARE PLAN

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The Kendall Square (K2) Plan is the result of an extensive community-based planning and design process conducted in Cambridge. The Plan knits together a vision for how many actors can work towards an ever more active and successful place while building upon the successes of recent years in making this area a world class innovation center with new housing, retail, and open space uses. The K2 Committee, comprising a wide range of stakeholders, took into account a variety of positions and interests in envisioning the future of Kendall Square, and this report shows how future changes can be guided to respond to the Committee's goals.

A spirit of partnership among the Massachusetts Institute of Technology (MIT), other property owners, the City, and the surrounding neighborhoods will nurture an era of shared benefit, as well as connect the community socially and physically. It will be important to continue working as a community to support the goals expressed in this report, including issues ranging from workforce-readiness programs and education to housing for low and middle income families.

# CHAPTER 1

# BACKGROUND





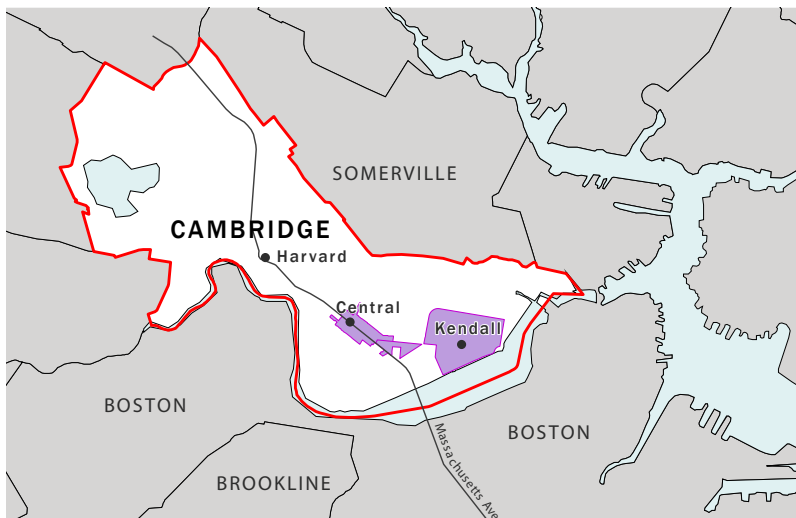
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## K2C2 OVERVIEW

Kendall Square (K2) and Central Square (C2), situated less than a mile apart and having very different characteristics and development histories, are vital mixed-use districts crucial to the future of Cambridge. The Osborn Triangle, located south of Main Street connecting Kendall and Central Squares, is a hybrid area encompassing some of the characteristics of each of the squares, while retaining an industrial character of its own. The City began a coordinated planning study of the entire K2C2 area in early 2011 in response to interest in increased development capacity in Kendall Square and the Osborn Triangle, as well as an ongoing Red Ribbon Commission effort to reframe a vision for Central Square. The overarching goal is to articulate visions for each area that acknowledge the interconnected qualities and dynamic future outlooks of the two. Kendall Square should continue to be a world center for biotech, entrepreneurship, high tech, and the knowledge economy, with the addition of liveliness through more housing and retail. Central Square, as suggested in the work of the Central Square Red Ribbon Committee which immediately preceded the K2C2 process, should continue to expand its rich cultural vitality while participating in the extraordinary economic benefits of the rest of Cambridge.

Committees for K2 and for C2 were appointed by the City Manager to help guide the planning process led by City staff and a consultant team headed by Goody Clancy & Associates. While each committee focused on its square, City staff and the consultants took on the role of coordinating the two efforts so that at the end of the process the visions could be assembled into companion reports, and could be reflected in a wide variety of follow-through actions, including both zoning and non-zoning work, to occur now and in coming years.

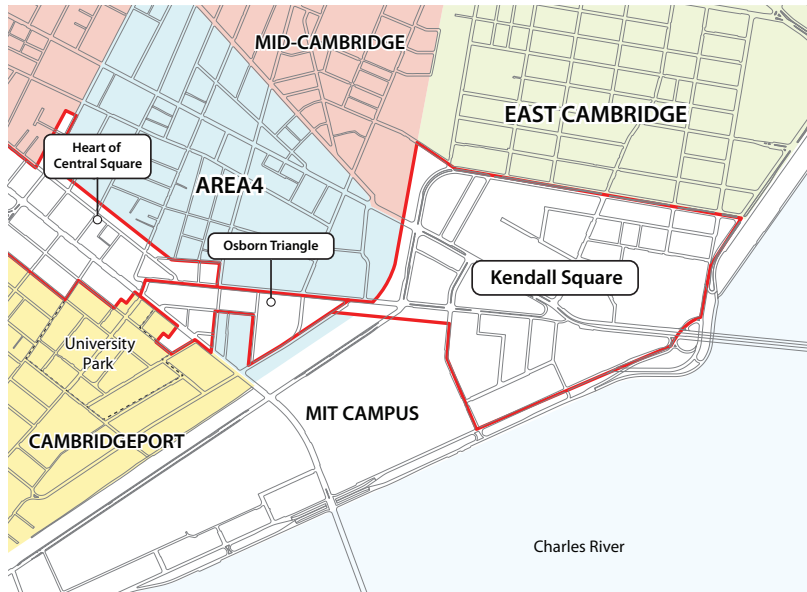
The two squares have in common good access to public transportation, nearby student and residential neighborhoods, and proximity to MIT. These assets should continue to support future growth in each area. With significant growth potential, each square could benefit from better connections to the other. The area where Main Street intersects with Massachusetts Avenue, known as Lafayette Square/Jill Brown-Rhone Park, and its urban context including the area along Main Street east of Lafayette Square, is referred to as the Osborn Triangle Area. The development



of the Osborn Triangle Area can not only help make the flow from one square to the other easier for users, but also provide an interesting and active urban streetscape and retail environment. Several new and proposed projects have the potential to help activate this area, including the growing presence of Novartis and the planned new building by Forest City Enterprises for Millennium Pharmaceuticals.

## HISTORICAL BACKGROUND

Despite having various types of new developments in recent years—including several research and academic facilities on the MIT campus, improved access to the Charles River, and new nodes of retail activity—Kendall Square has no defined center. However, Kendall Square does have a large daytime population and an emerging residential population that is supported by a cluster of biotech and high-tech businesses, along with a number of large property owners who are willing to come together to develop a common vision. It also has the capacity to absorb new development without



the constraints associated with having a large inventory of historic buildings. Kendall Square infrastructure improvements have occurred in some, but not all, areas over the past twenty years.

### Before the 1960s: Kendall Square as an industrial landscape

Kendall Square started out as an industrial district. The 1868 opening of the Grand Junction branch of the Boston & Albany Railroad and the 1912 opening of the first subway line made the area attractive for manufacturing. In 1916, the Massachusetts Institute of Technology moved to its current location in Cambridge from Boston's Back Bay. However, after World War II, industrial development in Cambridge came to a halt and Kendall Square went through a major shift.



### 1960s-2000s: Kendall Square as an office park district

From the 1960s, Kendall Square became the subject of a postwar urban renewal movement that drastically changed the landscape of the area. In 1955 the Cambridge Redevelopment Authority (CRA) was established to spearhead the redevelopment and renewal responsibilities. One of the most significant CRA projects was the grand scheme to locate NASA's Electronics Research Center in Kendall Square. The CRA cleared 29 acres of land to accommodate NASA. However, as the federal government's priorities shifted, the



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plan to locate NASA was canceled, leaving 29 acres empty in the middle of the Square. The vacant land was later partially occupied by the Department of Transportation's National Transportation System Center (the Volpe Center) and Cambridge Center, a primarily office/R&D development by Boston Properties.

**2000s-2012: Kendall Square evolving into a livelier, more mixed-use district**

The East Cambridge Riverfront Plan's implementation (1978-2002) and the 2001 Citywide Rezoning began the process of moving away from the urban renewal approach, by emphasizing the importance of the pedestrian realm and creating open space at the level of the sidewalk. Several notable mixed-use real estate developments, such as Cambridge Research Park (1999) and 303 Third Street (2003), have started to activate the pedestrian realm of Kendall Square. Recent newspaper articles and blogs have praised the new variety of food and drinking options, night life choices, recreational facilities, and other amenities in the Kendall Square area.

**Kendall Square Today: Kendall Square as a thriving innovation community**

The current expectation is that Kendall Square will continue its transformation into an ever more active and fruitful center for living, working, and playing, as described in this report .

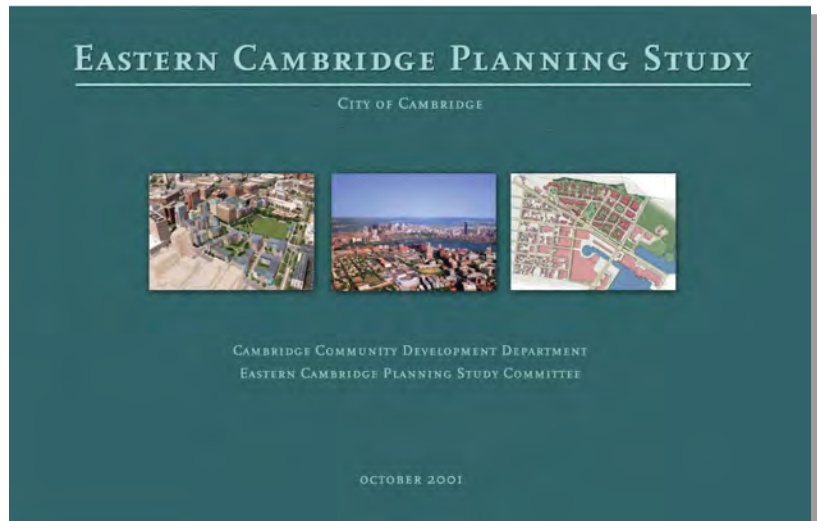


*Kendall Square is transforming into a vibrant community layering housing, recreation, retail, and dining options over the strong backdrop of commercial development driven by the knowledge economy.*



The **Eastern Cambridge Planning Study (ECaPS, 2001)** followed directly after the Citywide Rezoning and went into much more detail about the future of the study area. With regard to Kendall Square, ECaPS:

- Suggested that housing and ground floor retail would be beneficial along Third Street and created zoning incentives for these desired uses. This goal is being realized at 303 Third Street and in the Cambridge Research Park project.
- Directly addressed desired outcomes for the Department of Transportation (DOT) site in Kendall Square and for protecting adjacent neighborhoods. Future development on the DOT site remains a major unknown in the future of Kendall Square. The City has continued discussions with Volpe Center and DOT officials with hopes that the site can be better connected to the transformation that is happening all around it.



*(top) Added ground floor retail space at Tech Square enabled through the 1999 Special Permit.*

*(bottom) Cover page of the ECaPS Plan (2001).*

The **Cambridge Research Park/Kendall Square PUD (1999)** master plan helped expand the biotech emphasis, created a successful ice skating rink/summertime plaza and canoe access, created the Watermark housing complex, and is bringing new ground floor retail (Aceituna, Segway, Bubble Tea Shop, Za, EVOO). A second building at the Watermark is bringing additional housing and continues to link ground floor retail between Third Street and the Broad Canal with retail such as Commonwealth and Cambridge Spirits. A small office building that is also part of the PUD has its approval from the Planning Board, and when completed, will bring ground floor retail all the way to the Canal. This building, which will abut the power plant to the east and the Genzyme building to the north, is in a pivotal location that will link northwards towards the ice skating rink/summer plaza. All of these developments help activate the Broad Canal walkway that was initiated in the 1980s and completed by the expansion of the power plant, a cooperative effort with the Cambridge Research Park in the 2000s.

The **303 Third Street PUD (2003)** led to construction of new housing across the street from the Watermark housing at Cambridge Research Park. This project added more ground floor retail, and helped create a successful “critical mass” of housing and retail activity that is a model in some ways for the whole Kendall Square plan.



The **Alexandria Rezoning (2009)** adjacent to Kendall Square allowed for higher density research and development with ground floor retail, complemented by neighborhood-serving open space. A PUD Special Permit issued in 2010 allows 1.5 million square feet of commercial use, 220,000 square feet of residential use, and 20,000 square feet of retail use. The first building for Biogen has just completed construction at 225 Binney St, between Fifth and Sixth Streets.



(top) Third Street housing with ground floor retail.  
(bottom) Site plan of the Alexandria development project for Biogen along Binney St.

One of the key features of the PUD master plan is the provision of a major new open space to benefit the abutting neighborhood. This site has been cleared in anticipation of a community planning and design process. The next Alexandria buildings under construction are at 75 and 125 Binney St, which are being constructed between Binney St and the new park.

The **650 Main Street Project (2009)** was approved by the Planning Board and ultimately will include about 400,000 square feet of office/research & development use with ground floor retail, in the Osborn Triangle. The first phase is now under construction for a building of 230,000 square feet, with Pfizer as the tenant.

Over the last decade, a number of **MIT Academic Projects** have made positive additions to the urban environment. The Stata Center (2000) was created by replacing an unattractive parking garage with the dynamic Frank Gehry building. The landscaping associated with the Stata Center is also notable for its welcoming urban plaza and its innovative stormwater management scheme. Along Vassar Street, the City and MIT created Cambridge’s first cycle track (with the bicycles at the level of the sidewalk instead of at the level of the automobile) as an important test of this new urban design concept.

The Sloan School Project (2010) has created an attractive new pedestrian way and adjacent green space coming from the river that has greatly improved the entry into Kendall Square. The MIT Cancer Research Center (2010) has improved the sidewalk experience along Main Street by providing new shade trees, lighting, and seating areas. A walkway through the building (paralleling the exterior sidewalk) features displays that describe

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the work of the center. While there is a café interior to the building, it is hoped that a more active character can be brought to the walkway, perhaps with the use of kiosks that are serviced by the café.

The **Boston Properties Rezoning for Broad Institute (2010)** increased by 300,000 square feet the amount of non-residential development allowed in the MXD District to help retain and expand the Broad Institute, and retain the potential for desired additional housing. The Broad expansion on the west side of Ames Street is now nearing completion, as is the expansion for Biogen into a new building at the southern corner of Binney and Fulkerson Streets. In addition, Boston Properties has proposed the creation of a 200,000 square foot housing tower across the street from the Broad expansion.



*Expansion of the Broad Institute along Ames St shown in the middle. The existing Broad building is to the left of the new building.*

**City Plans for Improving Broadway, Binney St, Main St, and Ames St (ongoing)** are intended to upgrade streets and sidewalks, with an emphasis on making better provisions for pedestrians and bicycles, improving street scale, and enhancing the public realm. In addition,

Boston Properties completed renovations to Kendall Square Plaza last year, and replaced walking surfaces, addressed longstanding drainage problems, and improved landscape features and programming.

### **Ongoing Development Projects**

There are several different sectors of Kendall Square that have been treated as separate districts, because the area is so large, and has been subject to different ownership and development dynamics throughout the last 3 years. First, the Novartis site on Massachusetts Avenue across the street from their company's existing facilities was rezoned in 2011, early in the K2C2 process, with input from the K2 Committee. The former All-Asia block on Massachusetts Ave was rezoned in accordance with the C2 recommendations through a petition by



*Novartis Expansion PUD (2011) is in the Osborn Triangle area, and thus relates both to C2 and K2 plans. Its ground floor retail and large landscaped courtyard will provide connections to both areas, and will help activate the streets on which it sits, especially Massachusetts Avenue.*

Forest City for Millennium Pharmaceuticals in February 2013. The MIT area was rezoned, also in accordance with K2 Committee recommendations, in April 2013. The other sectors (for Cambridge Center, Volpe / DOT, and Cambridge Research Park / One Main Street area) will be considered in the coming months.

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## Other Initiatives

Many City initiatives—from zoning, to master plans, to design review, to public works projects—are helping to manage the course of development throughout the City, including Central and Kendall Squares. Taken together, these initiatives have guided, and will continue to guide, the overall evolution of the eastern portion of Cambridge. The following summarizes some of the most relevant City policies and actions for each area.

The City's Master Plan, called **Toward a Sustainable Future/Growth Policy Document (1993 with update 2007)**, includes policies that are particularly relevant to growth in Kendall Square:

- Existing retail districts should be strengthened; new retail activity should be directed toward the city's existing retail squares and corridors.
- Trend to cluster related uses should be strengthened.
- Retail districts should be recognized for their unique assets, opportunities, and functions to maintain their economic viability.

**Citywide Rezoning (2001)** addressed concerns relevant to both K2 and C2:

- Manage density and traffic.
- Address the need for housing.
- Incentivize desired uses.
- Encourage good urban design and district vitality through public review of development.



*Throughout the K2C2 area, strengthening the availability and convenience of non-auto modes of travel continues to be a fundamental goal.*

**Environmental Initiatives** As the city continues to evolve in coming years, there are a number of important environmental initiatives that will help guide growth in sustainable ways. For example, the Parking and Transportation Demand Management (PTDM) program requires all major projects that create new parking to undertake a number of measures to reduce reliance upon drive-alone automobile commuting. To reduce the impact of new buildings on greenhouse gas emissions, the City requires compliance with LEED standards, and has a new set of guidelines to encourage green buildings through zoning. The community is now undertaking a study of how to move closer to the ideal of net zero energy consumption and an effort is underway to create an EcoDistrict in eastern Cambridge to address the impacts of significant new developments anticipated there in coming years through district-scale solutions. A major new initiative, the Cambridge Sustainability Compact, is aimed at leveraging the intellectual and entrepreneurial capacity of the business, non-profit, education, and municipal sectors in Cambridge to address the significant challenges we face as the world's environmental crisis escalates.



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## CHAPTER 2

# ANALYSIS: ISSUES AND OPPORTUNITIES

*This aerial photo shows Kendall Square in its urban context, with MIT on the lower right, downtown Boston on the upper right, and the East Cambridge neighborhood and North Point on the upper left. A close inspection of the photo reveals that there are several areas that have on-grade parking very near the transit station—some of these have subsequently been built upon, but others provide the opportunity for more growth and change in the Square.*

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The K2 Committee, working with the City and consultants, studied a wide range of issues concerning future growth as well as the opportunities for improvement that appear to be desirable. The overarching opportunity is to build upon the recent successes associated with the innovation economy, while addressing issues such as housing affordability, the need for better open space, environmental and transportation management, and setting economic development priorities.

### **Land Use**

The land use planning approach for the future of Kendall Square has been to take into account the last three decades of development which have created an increasingly varied and lively mix of uses. At the same time, there are many challenges to address if the Square's full potential is to be realized.

### **Kendall Square Subdistricts**

The K2 Committee also looked at how these issues and opportunities may be addressed in the subdistricts of Kendall Square that have different development histories, ownership, and development potential.

### **Open Space**

Existing and future public open spaces in and around Kendall Square need to be designed and programmed systematically. The Eastern Cambridge Kendall Square Open Space committee will pursue an integrated vision for the whole open space system.

### **Housing**

While progress has been made in getting housing built in Kendall Square, the high cost of housing is a major concern, and more housing is needed generally. The housing issue was seen by the K2 Committee as one of the foremost challenges to achieving a well-rounded urban environment.

### **Economic Development**

Innovation space for startups is in great demand, but the issue is how to ensure its affordability. Ground floor retail has increased, and more seems likely. The question is what kind does the community want, and where will it be feasible?

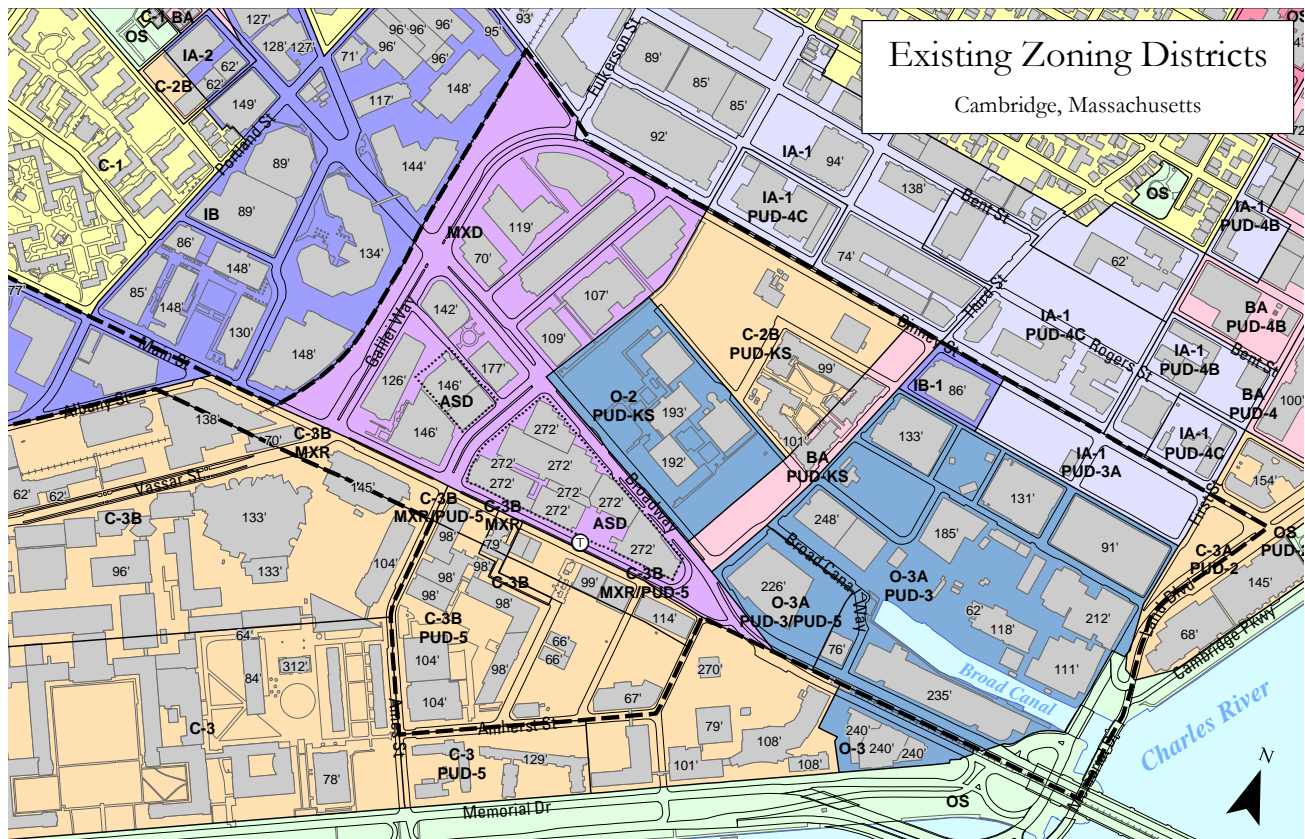
### **Environment & Stormwater**

In Kendall Square, there are opportunities to build upon the urban pattern that now exists, utilizing an array of tools to promote green building design and sustainable transportation practices. The issue of proper stormwater management is also critical, given rising water levels. All of these issues are being addressed in efforts to create a K2 EcoDistrict.

### **Transportation & Infrastructure**

Managing growth in a way that minimizes traffic impacts is essential. Enhanced transportation demand management programs that encourage employees to walk, bike or take transit are required. Streets need to be designed with excellent facilities for pedestrians, cyclists and transit users. Parking must be designed to meet lower rates of driving and optimized to allow sharing of parking among residents, employees and retail customers. Ensuring that there is sufficient transit capacity to meet future needs is a critical regional challenge.

## LAND USE



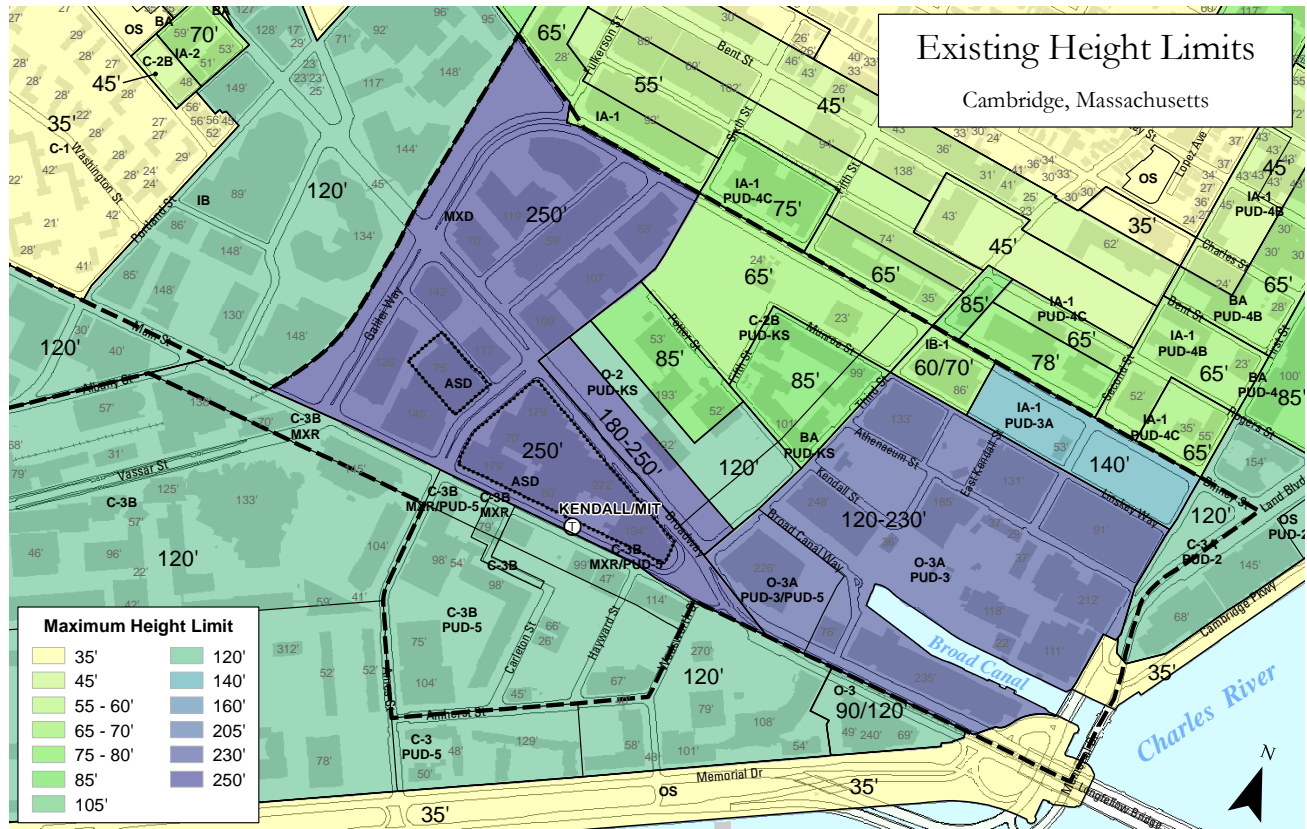
The zoning map for the Kendall Square area shows how the various elements of the urban structure relate to one another. The Charles River is at the bottom of the image, with the MIT campus adjacent to Memorial Drive. At the heart of the Square is the MBTA station that is embedded in the urban renewal development. Towards the top of the map are the lower density portions of the East Cambridge and Area 4 residential neighborhoods. The dashed line shows the study area for the K2C2 planning effort.

### Mix of Uses

Despite the presence of hotels and the nearby institutional presence of MIT, Kendall Square has had the character of an office park rather than a vital mixed-use center as it has redeveloped since the 1960s. That has been changing in the last few years, as several hundred units of mixed-income housing have been built along Third Street, along with an increasing number of cafés and restaurants throughout the area. The innovation culture has made the commercial nature of the Square more dynamic. The K2 Committee looked for ways to keep this positive momentum.

### Urban Design Character

The 1960s urban renewal plan for Kendall Square created a series of superblocks, overly wide streets, and paid little attention to the need for active ground floor uses. Recent additions to the Square have been designed with a more contemporary awareness of the importance of the ground floors of buildings.



This map of the existing pattern of height limits indicates the highest area in the darkest color (up to 250 feet near the MBTA station), with the intermediate heights in the middle tone (up to 120 feet near the river, lower heights near neighborhoods—45 feet to 80 feet in some locations), and the lowest heights in the lightest tones (mostly 35 feet in the residential areas).

## Density

Given the presence of Kendall Station at the heart of the Square, it has been a good strategy to allow for density close to transit, as is most noticeable around the plaza at the station. On the other hand, there are many sites that could be much more productively used near the heart of the square, particularly at MIT and on the Volpe Center property, which have acres of on-grade parking a short walk from the station.

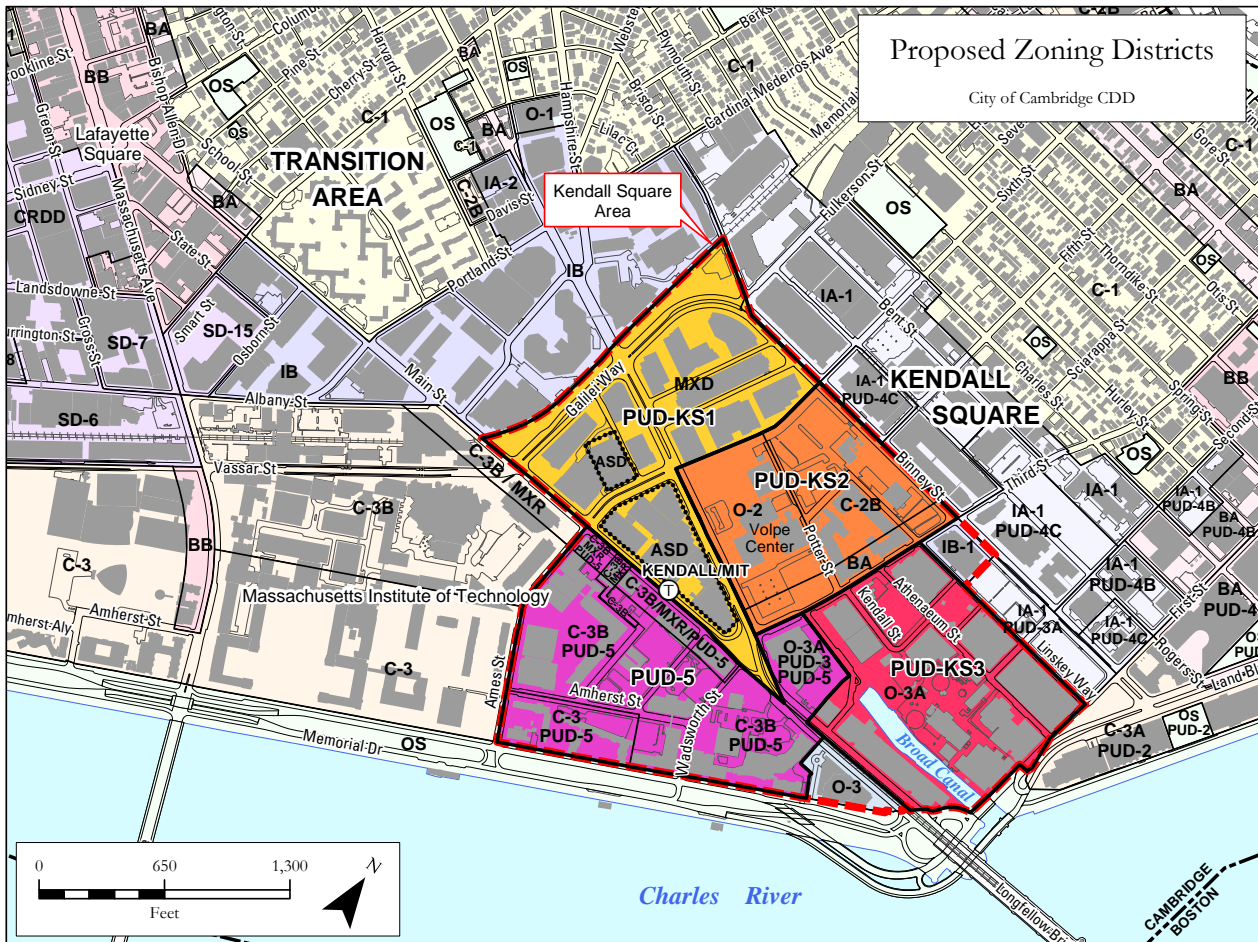
## Public space

Public spaces in Kendall Square need much more design attention. The plaza at the station has recently been improved, and is activated by its proximity to the hotel, the station, and the food court. The rooftop space atop one of the parking garages provides a contrasting quiet, garden-like space. While its area has been reduced by the addition of office space for Google, the public space is becoming more known as a pleasant place to visit, and the passageway from the sidewalk up 4 floors is being made more visible and attractive, lined by shops, and given a more urbane character.

# KENDALL SQUARE SUBDISTRICTS

Much of the K2 discussion was structured around the proposed new Planned Unit Development (PUD) designations shown on the map below. This nomenclature reflects the evolution from a series of rather unrelated developments into the more interconnected Kendall Square desired by the K2 Committee.

- **PUD KS1:** currently zoned as Mixed-Use District (MXD), under the control of the Cambridge Redevelopment Authority with its designated developer, Boston Properties.
- **PUD KS2:** the area largely controlled by the US DOT, with the separate 303 Third Street housing project
- **PUD KS3:** mostly built-out, includes the Cambridge Research Park (Lyme) PUD with Watermark housing, Genzyme HQ, etc.
- **PUD-4:** Alexandria area recently rezoned in 2009, not suggested to be changed.
- **PUD-5:** MIT campus area, recently rezoned in 2013 based on the K2 zoning recommendations.



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### **PUD-KS1: MXD/Cambridge Center Area**

The allocation of square footages per use in the Zoning Ordinance has been guiding the development of the Cambridge Redevelopment Authority's projects for the last several decades. As such development capacity was built out a few years ago, the City Council has subsequently made additional allocations:

1. for the 250,000 square feet expansion of the Broad Institute on Ames St (on the site that had been approved for 200 units of housing),
2. for housing elsewhere in the district to replace the original Ames Street housing, and
3. for the 30,000 square feet Google connector project on part of the garden on the roof of the parking garage accessed via Ames Street and along the passageway from Main St to the elevator to the garden.

At present, the CRA and Boston Properties are working with the City to obtain a portion of the Ames St right-of-way to facilitate the construction of housing.

In addition to the land disposition by the City, some rezoning will be needed to allow the housing to fit onto the very tight site. Once this housing project has been initiated, the CRA is interested in additional possibilities for infill and densification on other sites in the district, as suggested in the zoning recommendations section of this report. This will also require additional rezoning.



*The Google expansion is transforming the former open air passageway from Main Street to the rooftop garden into a small shopping arcade.*

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### **PUD-KS2: US-DOT Volpe Center**

There is significant unrealized development potential on the Volpe site, which is now mainly characterized by one office tower and a very large area of on-grade parking—less than a block from the transit station. The Volpe Center is a part of the federal government (Department of Transportation), which is not bound by local controls such as zoning. However, should DOT decide to respond to the community’s request to allow private development on this important site, that would be subject to zoning, and should meet the goals of this plan.



The Eastern Cambridge Planning Study (ECaPS) of 2001 set a number of goals for the Volpe site: creation of a mix of uses, including residential and retail, and six acres of open space.





## A range of options for the Volpe site

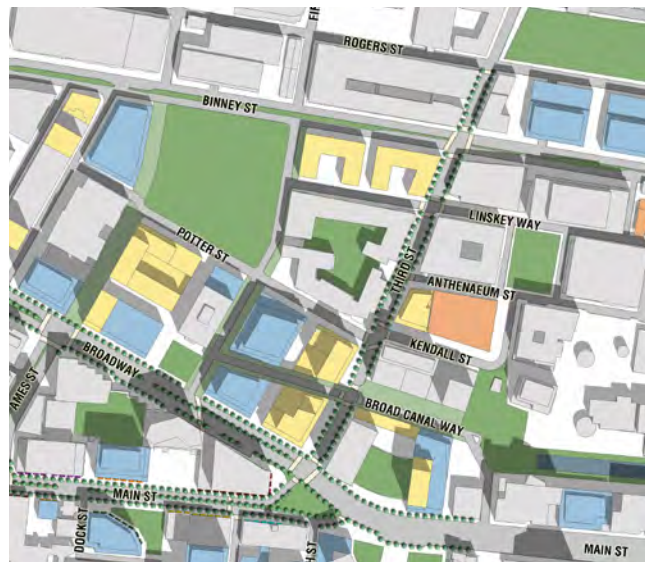
These sketches suggest a range of options for how the Volpe site could be arranged while meeting the K2 goals of a mix of residential, commercial, and public open space on the site. The City hopes that the federal government will work with the community to meet the goals of this plan, in whatever urban design scheme is developed for the future of the site. This is likely to be a rather complex undertaking, in that the Volpe Center needs must be recognized, including how to maintain security. Some flexibility on the part of all concerned will help ensure that the goal of vibrant mixed-use development can be achieved while recognizing the important role of the Volpe Center in the Cambridge community.

To simplify the range of options, in each of these schemes, a tower is shown on the site of the existing Volpe office tower, even though that tower may be redeveloped eventually. Yellow indicates housing, blue indicates commercial, and the orange site is the proposed Constellation Center across Third St on the PUD-KS3 site.

**Option 1: Large park on Binney St.** This plan consolidates most of the open space requirement into one large park along Binney St, with housing south of the park.

**Option 2: Park space with housing to west.** Here, the park space has been dispersed between Binney St and Broadway, and housing comes up to Binney St.

**Option 3: Park space with housing to east.** Here, the park space has been stretched to connect Binney St directly to Broadway, and housing is on the east side, next to 303 Third St housing.



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### **PUD-KS3: Cambridge Research Park (PB Special Permit #141 of 1999) / One Main Street (PB Special Permit #1 of 1979)**

The planning and implementation of these two projects span more than two decades; each has been productive, and each has potentially more to offer. The two red brick towers at One Main Street began making Broad Canal accessible to the public, as required in the special permit for the project. There is a small amount of ground floor retail that opens onto the canal from this site. However, the retail faces the difficulty of being on a one-sided street, since the MBTA tunnel blocks connections to the other side of Main Street. Allowing some additional floor area could serve as a catalyst for improving ground floor retail, reworking the garage, and making a more substantial connection to the canal, which now has so much more activity than twenty years ago.

The PUD on the north side of the canal has been known by several names—Lyme Properties was the original proponent, and the original plan set the tone for development of the PUD over the years since 1999.



The rendering done for the housing and retail team led by Twining Properties shows the original Watermark housing tower on the far left, the new phase two housing tower just left of center, the canal and its plazas and walkways right of center, and the One Main Street project on the right. In the near middle of the image is a green addition to the plaza with a small office building that has been permitted but not yet built. This housing, ground floor retail, and the open space connection to the Broad Canal are all very important and successful additions to Kendall Square.

There is one site at the heart of the PUD-KS3 that has not yet achieved its potential—that is the site set aside for the Constellation performance center. A realistic development plan is needed to transform this bleak space into a vibrant part of this district. The K2 Committee expressed its hope that something positive will soon happen here, including the possibility of giving incentives for additional housing.

**Constellation site in PUD-KS3.** *The orange building in the center of this sketch represents the Constellation Center—it is now an empty site in an important location, across Third St from 303 Third Street apartments and just below the Watermark housing project. Adjacent to the site is a plaza that becomes an ice skating rink in winter represented as a green square in the image. Towards the left of the image is the Broad Canal. Activation of this site in the middle of so much positive change is needed to fulfill the promise of the overall master plan.*



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## PUD-5: MIT-Kendall Area

### Potentials for MIT Properties in Kendall Square

MIT began its “Kendall Square Initiative” planning before the K2 Committee was formed, and fully participated in the work of the Committee. Like the rest of the community, MIT seeks a more vibrant urban setting to help maximize the potential for a successful square. MIT plans to make a number of investments in developing its properties, and the Committee hopes that these actions could help meet community goals. MIT owns several surface parking lots near the heart of the Square that could support much more positive development, including space for high tech and innovation companies, retail, and housing. In buildings owned by MIT, there is now a limited amount of retail, but given the proximity of MIT holdings to Kendall Station, there is a strong potential to make a much more active urban place that is centered on the presence of the station.

MIT’s three historic buildings on Main Street near the station help give Kendall Square its special identity; there has been debate on how to maintain this historic sense in new MIT development, especially with regard to the MIT Press Building. MIT will continue to discuss options with the community, and especially with the Cambridge Historical Commission.

At present, the MIT campus features many attractive open spaces that are open to the public, even though that may not be obvious due to the lack of coordinated wayfinding. The Committee hopes that the MIT developments will be coordinated with a community-wide wayfinding system that will make it easier to find the campus, the river, and the neighborhoods from the center of the square.



**Subsets of the MIT Plan.** The areas noted in red are subsets of the MIT plan that have differing emphases. The Main Street District is where new MIT projects will interact most directly with the Cambridge Center across the street, and where the connection to Kendall Station will be strengthened. Broad Canal Way is where the first project most likely will occur—an expansion of the Innovation Center, with a housing tower, and ground floor retail complementing the other recent developments along Broad Canal Way. The Infinite Corridor refers to the Institute’s plan to continue the pathway connections elsewhere on campus to link up to the Sloan School. And, Point Park Riverwalk is eventually meant to fix the missing link between Kendall Square and the Charles River (This image is from “Reimagining Kendall Square,” MITIMCo’s presentation to the Cambridge Planning Board in May 1, 2012)

# OPEN SPACE

Reflecting a longstanding concern in the community, the Committee emphasized the need to improve and expand the set of open space choices in Kendall Square. The ownership pattern is diverse. On the map below, properties 1 through 9 are controlled by the CRA or Boston Properties, 10 and 11 are controlled by the Cambridge Research Park PUD owners, and 12 and 13 are controlled by Alexandria Real Estate Equities. The total amount of land is about 490,000 square feet or about 11.2 acres.

The significant public spaces in and around Kendall Square are highlighted on the map. Parcels colored in green are existing green space, parcels colored in yellow are plazas, and hatched parcels are anticipated open spaces in the near future. The green asterisk denotes open space on the Volpe block, not yet planned, but required by zoning.

1	104,500 sf	6	26,000 sf	11	34,500 sf
2	9,1000 sf	7	15,250 sf	12	87,000 sf
3	15,000 sf	8	21,915 sf	13	35,000 sf
4	12,100 sf	9	10,900 sf		
5	39,500 sf	10	89,600 sf		



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The following are examples of some of the key existing open spaces in Kendall Square.

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**Kendall Square Plaza (See 7 on adjacent plan)**

The Kendall Square Plaza was built by Boston Properties under the auspices of the Cambridge Redevelopment Authority in the 1980s, and has recently been reconfigured to deal with wear and tear issues, as well as drainage problems that needed addressing. The new arrangement is a needed refreshing of the plaza, and provides a pleasant green center ringed by seating. Another welcome addition is outdoor seating for the café next to the Marriott entry. However, the plaza could be livelier, and might benefit from some additional layers of usefulness.



**Point Park (See 8 on adjacent plan)**

The fountain and the plaza at Point Park have been a rather inward-looking refuge at the intersection of Main St and Broadway for many years. The park needs renovation and reincorporation into the broader open space vision for the newly bustling Kendall Square, which looks to connect all the spaces into a more welcoming and useable open space system.



**Community Ice Skating @ Kendall Square (See 11 on adjacent plan)**

The North Plaza in PUD-KS3 was developed as part of the Cambridge Research Park development (Special Permit #144) by Lyme Properties. The plaza's original intention, which was to become a community benefit for residents and workers in and around Kendall Square, has been slowly coming into fruition in the past couple of years. The plaza turns into an ice skating rink in the winter season and is heavily used by the workers around the neighborhood as a place to enjoy lunch outside during other seasons.



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## HOUSING

Over the twenty years since the initial 1992 publication of **Cambridge Growth Policy: Toward a Sustainable Future**, the City and the Community Development Department have pursued a two-pronged housing strategy: encourage expansion of the housing supply while working to preserve the range of existing housing opportunities available to residents. This strategy, reconfirmed in the **Cambridge Growth Policy Update 2007**, has informed a set of goals that are central to Cambridge's planning efforts, including the following:

- Construct a variety of housing types and models to meet the needs of residents, catering to both a range of incomes and family sizes;
- Preserve existing affordable housing and create new affordable housing consistent with neighborhood scale and character;
- Meet the needs of the workforce attracted to Cambridge by the technology based economy of the 21st century and by the amenities offered by the rich urban fabric of the city;
- Place housing in close proximity to jobs to better manage the capacity of our transportation networks.

**Cambridge Growth Policy** also recognized the impact of university populations within the housing market, and set a policy of encouraging universities to provide housing for their students, faculty and staff. This policy was also supported by the 1991 report of the Mayor's Committee on University-Community Relationships.

The record of development starting in 2001 provides evidence for the success of the City's efforts. About 5,900 net new housing units were built in the years since 2001. Among them are more than 700 permanently affordable units completed or now under construction, all of which are affordable under the requirements of the Inclusionary Housing Ordinance and related measures.

Increasing the supply of housing on the market helps to mitigate the effects of increasing market demand and upward pressure on housing costs. However, supply alone will not make housing affordable for all residents. For this reason the City has for many years employed a vast array of tools to preserve and expand housing affordability for low, moderate, and middle-income residents in efforts to preserve the socio-economic diversity of the community. The effort and resources that Cambridge has committed to affordable housing are unmatched among Massachusetts communities and are among the strongest municipal commitments to housing in the nation.

Despite the positive outcomes of the City's efforts, rents for market-rate housing have continued to rise over the past ten years as the demand for housing remains strong. According to the City surveys, median advertised asking rents for one, two and three bedroom apartments were \$2,300, \$2,800 and \$3,175 respectively in 2012. The housing sales market is similar. Condominiums represent 79% of market rate housing sales, and their median price in 2012 reached \$445,500, a 5% increase from the prior year. Prices such as these are not affordable to low or moderate income households. Families with children, graduate students, single persons with limited incomes and others have found limited housing options in Cambridge within the past few years. Middle income households have found that their opportunities to own housing are also limited and rapidly shrinking.

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## **Current Housing Challenges in Cambridge**

While the fundamental challenge remains to preserve affordability and diversity in a city that is an increasingly desirable place to live, and to preserve the character of Cambridge's traditional neighborhoods, the current time period brings its own unique set of challenges:

- Preserving housing affordability, as restrictions for more than 650 rental units are set to expire before 2020;
- Declining federal support for affordable housing programs;
- Escalating housing market costs which continue to far outpace the incomes of low and moderate income residents and which are now impacting middle-income households, especially families in need of larger units;
- Changing characteristics of the population, in particular the aging of the Baby Boomer generation and the newfound interest in urban living among younger generations;
- Evolving composition and housing needs of the workforce; and
- Recognizing the role of housing in supporting the City's transportation and environmental goals.

The 1997 to 2000 Growth Management Advisory Committee rezoning effort explicitly sought to increase the housing supply in the City by rebalancing commercial and residential density across Cambridge. The 2001 Eastern Cambridge Planning Study and the 2007 Concord-Alewife Planning Study both sought to accomplish the same goals within the specific context of each study area. The K2C2 plan also shares these goals. The Committee believes that orderly growth and continued prosperity in and around Kendall and Central Squares will rely on the expansion of housing opportunities integrated with commercial development.

The K2C2 Planning Study process revealed some core challenges and opportunities for Kendall Square. A very important challenge is how to increase the housing stock in and around Kendall Square. The existing amount of housing is limited, and the price range is very high. Newly created housing in recent years has been designed as luxury housing which has been affordable only to the high income households. Making new housing affordable to a range of incomes including moderate- and middle-income households has proven to be a significant challenge. The costs of land and development have made the development of moderately priced market housing difficult, while the demand from high income households has led many developers to design high-end units and buildings with high-end features and conveniences. Furthermore, the prospect for creating new housing is a concern because some of the major land owners in the area prefer building research lab and office space rather than housing, partly because rents from lab and office spaces are much higher than what can be generated even from high-end housing.

Throughout the study process, the need for additional MIT housing was also discussed, because there is a perception that the availability of MIT affiliated graduate housing is inadequate to meet the demand. In an attempt to address the serious concerns of the K2 Committee, the MIT community, and the Cambridge community at large, MIT has formed a new committee to focus on this issue.



*The arrival of housing on Third Street, a short walk from the Kendall MBTA station, is very welcome as it begins to meet the longstanding expectation that housing would be an integral part of the mix of uses needed to make the area a success. The Watermark project on the right in this photo is part of the Lyme PUD from 1999; the second phase of this housing came on line in 2013. Across the street is 303 Third Street which received its PUD permit in 2003. Both of these projects, with their required affordable components, have successfully incorporated ground floor retail, which makes them good models for more such projects in the area.*

## **K2 Committee Housing Concerns**

The K2 Committee discussed the need for additional new housing in the Kendall Square area as well as the need to ensure that new housing will include units affordable to low-, moderate- and middle-income households. The Committee recommended that new zoning include strong incentives for developers to create affordable housing for middle-income households and that new housing continue to comply with the City's Inclusionary Housing Ordinance which requires the inclusion of units that are affordable to low- and moderate-income households. Increased housing is a necessary component of Kendall Square to support round-the-clock activities, and especially to provide customers for the desired increase in ground floor retail. Therefore, primary goals of this plan are to emphasize the importance of housing, to provide mechanisms to increase the housing stock in and around Kendall Square, and to create new incentives to spur the creation of housing that will be affordable to households, including middle-income households, who would not be able to afford newly created units at market prices. New housing would ideally include a mix of incomes and unit sizes to ensure the diversity of the broader community is reflected in new residential developments in the Kendall Square area.



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Over the last few decades, Cambridge has been pursuing many goals for housing, including a variety of housing types for a diverse population, preserving and creating affordable housing, meeting the needs of the workforce employed in the city's technology-based economy, and placing housing near jobs to lessen auto dependence. Since the urban renewal era began in Kendall Square in the 1950s and 60s, there has been an expectation that there would be housing in or near the heart of the square, but that goal has only recently begun to be realized.

Now that there is a successful record on which to build, more housing will be coming to Kendall Square. The 2013 MIT rezoning includes a requirement for a minimum of 240,000 square feet of housing, which is likely to be part of a building near the Innovation Center and the Broad Canal, and which will include affordable units for low-, moderate-, and middle-income households. Boston Properties has committed to building another 200,000 square feet of residential use, likely to be on Ames Street across from the Broad expansion now under construction. From North Point to Alewife, new housing projects throughout Cambridge are moving forward, and the demand in Kendall Square is especially strong.

In order to create a better balance of jobs and housing, the K2 Committee looked at how much housing might be reasonable to expect in Kendall Square. While the market always goes up and down, another 2,000-3,500 units could be expected to be built in Kendall Square or within walking distance (Central Sq, Main St., North Point, Eastern Cambridge) over the next several years.

The Committee was concerned about finding appropriate building envelopes that would work for housing, i.e., sites that are a good size for housing but too small for office/R&D uses or research/office. In any case, larger sites would be too expensive for housing, and would not be able to compete with office/R&D uses that rely upon being able to create larger footprints.

# ECONOMIC DEVELOPMENT

## Office

According to the C. B. Richard Ellis (CBRE) third quarterly report of 2013, the average asking rent for office space in East Cambridge is \$48.83 per square feet, which has continuously increased since 2009. The vacancy rate has gone up slightly to 5.9 % compared to below 5.0 % in the previous year. As shown in the graph below, the divergence between vacancy rate and average asking rent continues to be significant.

East Cambridge, as defined for the purpose of the CBRE market review, encompasses Kendall Square, Osborn Triangle, MIT campus, East Cambridge neighborhood, and Cambridgeport neighborhood, up to Brookline Street, including University Park.

Over the past few years, there have been many reports from the start-up community that firms are either being priced out or sized out of the crowded Kendall Square marketplace. As the area has become more attractive to marquee companies, these large corporations are willing to pay top rents to locate or expand their presence in the area. Leading tech companies such as Amazon, Twitter, Oracle, Google, Microsoft Corp, and Akamai Technologies and biotech and pharmaceutical corporations such as Biogen, Amgen, Genzyme, and Pfizer that can pay high prices occupy much of the Class A office space.

A related recent phenomenon is that more users are looking for office space rather than biotech space, to the extent that some owners are considering changing the fit-out to encourage office. This is the reverse of what was happening recently, when office buildings, such as at Tech Square, were retrofitted to allow for biotech use.

## East Cambridge office market trend

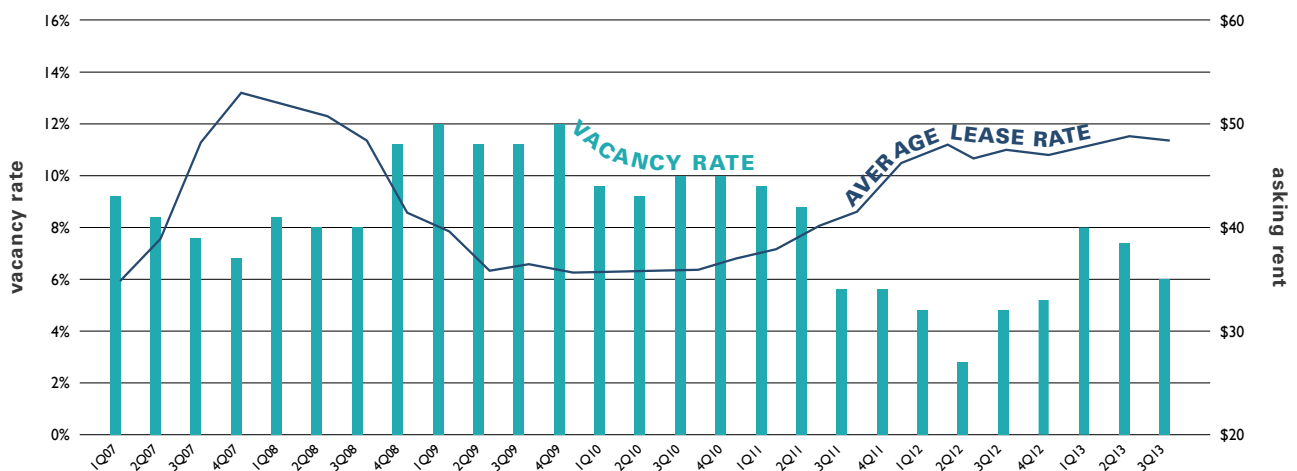


Diagram reproduced from CBRE Cambridge Office/Lab MarketView reports.

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## Innovation Space

Historically, Kendall Square has been known for its entrepreneurial activities, and spinoff startups from MIT occupying inexpensive and underutilized warehouses within the area. The Boston Consulting Group (BCG) study called “**Protecting and Strengthening Kendall Square,**” authored by Ranch Kimball (2010), stated that Kendall Square has the highest number of biotech and information technology firms per square mile in the world. However, as the area gets built out, low-rent warehouses are getting redeveloped into modern buildings that are too expensive for start-ups. As a result, such companies are often priced out, and may move to other parts of the region. Because the innovation spirit of entrepreneurs is an essential component of the identity of Kendall Square, another major challenge of this plan is to retain and increase space for start-ups.

Kendall Square’s success as the most innovative square mile in the world is due in large part to the Square’s ability to offer space for a mix of industries and company sizes. The current and growing array of innovation industries (clean tech, high tech and biotechnology) in the Square help strengthen Cambridge’s economy and allow it to not rely solely on one sector (or one large company) for job creation and growth. Innovation is further enhanced by the increasing number of startups wanting to grow in Kendall Square. In August 2013, the New Engine/Kauffman Foundation report, “**Tech Starts: High-Technology Business Formation and Job Creation in the United States,**” showed that high tech startups are a key driver in job creation and are replacing many of the job losses from other private-sector businesses. As the startup community continues to grow, it is key that Kendall Square, and Cambridge, provide a robust community and office environment for all types of industries.

## number of **biotech + IT firms** per square mile

Research Triangle Park, NC

1

Berkeley Area, CA

2

Austin, TX

8

South San Francisco, CA

11

Harvard Sq & Longwood Area, MA

21

Palo Alto, CA

36

Kendall Sq, MA

163

*Diagram reproduced from BCG’s 2010 study of Kendall Square. Original data source: Capital IQ Database, US Census Bureau, BCG Analysis (as stated in the presentation).*

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## Retail

Since the beginning of urban renewal process in the 70s and 80s, there has been a desire to bring retail to the Square, with a sort of touchstone in the memories of the beloved F&T Diner that was lost in the process. Early attempts in the 80s and 90s fell short of creating a very lively pattern or mix of retail. Nevertheless, it was important to have at least the offerings that did materialize, such as the food court at the Kendall Station (although too internalized to activate the exterior public realm) and small retail shops on the MIT frontage of Main Street (although not enough to create a critical mass). This tenuous situation for retailing was partly inherent in taking many steps over decades to move from the desolate urban wasteland of 1970 towards the more bustling environment that now exists. It is also essential that developers have come to recognize the importance of retail, and the ECaPS strategy for encouraging retail by not having it count as floor area has also helped bring new uses.

The list of new establishments is truly impressive: EVOO, Za, Kika Tapas, Tatte Bakery, Abigail's, Voltage, Meadhall, and others right in the heart of Kendall Square, with not too far away West Bridge joining the more established retail at One Kendall Square, and Area 4 and Catalyst heading up the new set of retail at Tech Square. Not so long ago, Kendall Square was not seen as a place people wanted to linger, but that is changing. The questions for the coming years are whether these successes can continue, how much retail is likely or needed, and what kinds might be expected.



*(top) Tatte Bakery & Café on Third St, which opened in 2012, has become a great neighborhood amenity both to nearby residents and office workers. (bottom) Voltage Coffee & Art on Third St has become an extremely popular gathering place for the entrepreneurship community of the Greater Boston area.*

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There are several important commitments to provide new retail in Kendall Square that should help build upon recent successes in upgrading the retail environment. For example, the expansion of the Broad Institute onto the west side of Ames Street includes a complement to the prominent Sebastian’s café at the base of the original Broad facility at the corner of Main and Ames. This will literally turn the corner for retail, leading down to the Starbucks at the base of the hotel on Broadway and Ames. Similarly, across the street on the east side of Ames, the site proposed for housing by Boston Properties will also include ground floor retail, building on the presence of the adjacent Legal Seafoods and Meadhall.

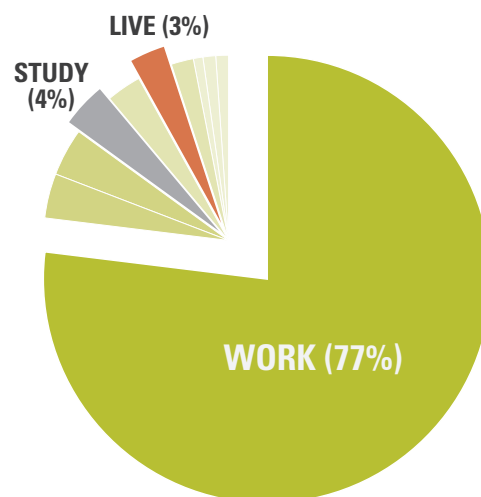
Along the neighborhood edge of Kendall Square, the Alexandria project is committed to as much retail as possible, and at least to creating a retail node at the important corner of Binney and Third St. The PUD permit for this project includes a requirement for annual reporting to the Planning Board on the status of retail marketing. The MIT rezoning of 2013 has a similar requirement, and the MIT proposal is strongly based upon making a livelier urban environment that fundamentally needs the expanding of retail presence.

### Retail Demand Projection

At present, there is about 100,000 square feet of retail in Kendall Square. Among the existing retail establishments in the Square, bookstores, coffee shops, farmers markets, and food trucks were rated as highly desirable by the community, according to the **Customer Intercept Survey** done by the Community Development Department in 2011. Not surprisingly, the results also revealed that “work” was the primary purpose for respondents being in Kendall Square. This indicates that the area has a larger daytime population and a relatively smaller nighttime population.

When planning for new retail spaces, Kendall Square needs to operate within the broader context of the regional retail “ecology.” Accordingly, Kendall Square needs to carefully position its retail identity, while keeping in mind the offerings of nearby districts, such as Central Square, CambridgeSide Galleria, and the Back Bay.

In very rough numbers, the K2 retail consultants estimate that approximately 120,000 square feet of new retail space should be supportable in the near future, and would be best located to support the activation of Main, Broadway, and Third Streets. Additional amounts of retail would certainly help to enliven the other streets in the area but should be considered as more appropriate in the longer term.



*Primary Purpose for Being  
in Kendall Square*

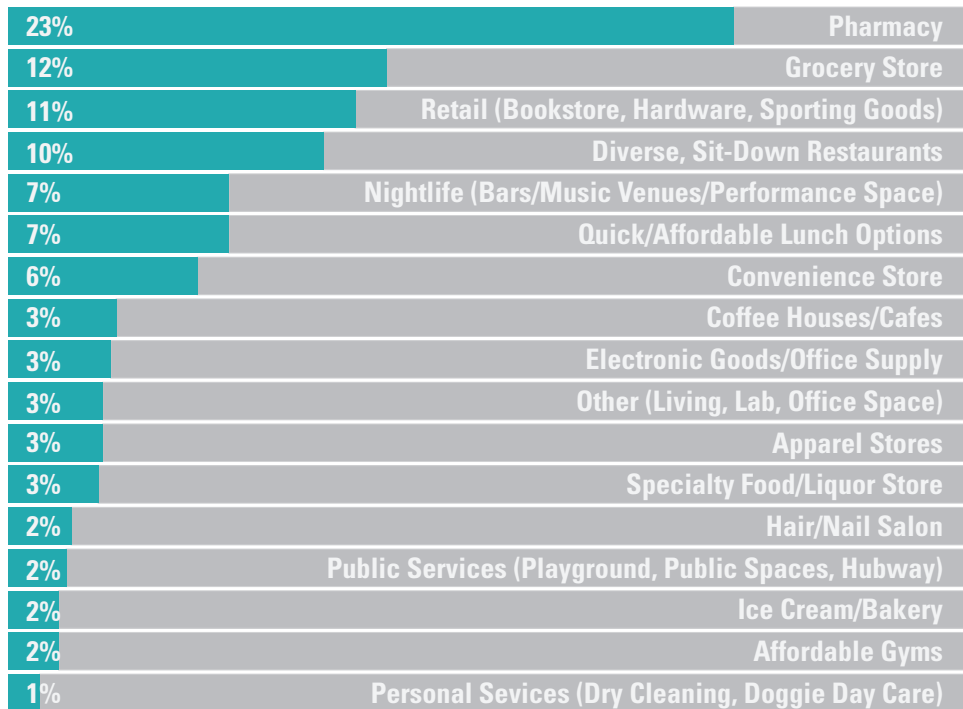
Rules of thumb used by K2C2 consultants		
1,000 SF of housing (1 unit)	supports	20-40 SF of retail
1,000 SF of research/office		16-24 SF of retail

New developments anticipated under the K2C2 Plan could create approximately 7,500 new jobs. These could support approximately half of the 120,000 SF of retail that is desired to activate the key locations, with the other half being supported by future residential development. (For reference, the CambridgeSide Galleria has roughly 1 million square feet of retail.)

A drugstore was the most desired retail according to the Customer Intercept Survey. The large daytime population of the area would supply the number of customers needed to support such a business. A possibly feasible location for a drugstore would be on Main St, near the T station. The retail floorplate should be at least 10,000 SF to appeal to national drug store companies.

The second most-desired retail was a grocery store, which is a key amenity to create a more complete neighborhood. There is insufficient demand for a traditional supermarket due to the presence of competitors nearby. However, a small-format grocery stores (approximately 10,000 to 12,000 SF) would be feasible in Kendall Square. It is recommended that such stores serve deli/hot food buffet and “grab-and-go” meals to meet the quick-service dining needs of people in the area.

Kendall Square is a traffic hub. Given the size of its daytime population, the Square should be able to support more sit-down restaurants. Such restaurants are much desired as they draw people from outside the district and also activate the streets after work hours. In order for restaurants to survive in Kendall Square, it is desir-



List of Desired Businesses  
in Kendall Square

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able that developers work with experienced operators with diverse concepts that could complement other adjacent restaurants. Some of the missing types are bars and large-scale entertainment anchors.

Given the close proximity to CambridgeSide Galleria and Back Bay, both featuring the sale of comparison goods, the retail market for items such as clothing and furniture is weak in Kendall Square.

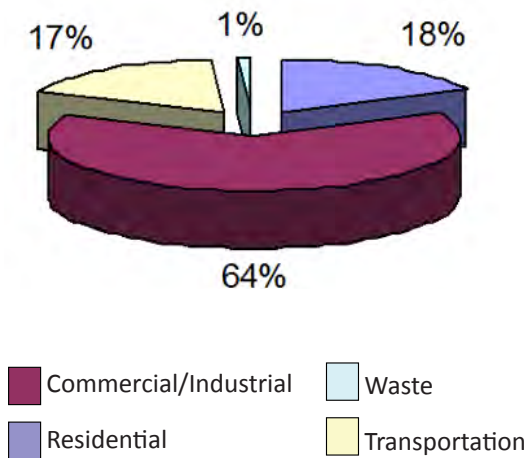
Two categories of national chain stores—large-format drug store and fast-casual food purveyors—would be interested in locating in the Square. The market might not be able to support smaller local and regional chains. However, there is a strong expressed preference for local retail. Therefore, cooperation with property owners to subsidize local stores will be critical in maintaining the diversity of retail choice.

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## ENVIRONMENT & STORMWATER

The topic of environmental sustainability interfaces with several other topics discussed in this chapter, such as transit oriented development density, fostering a mix of land uses to meet the multiple needs of people who live within walking or biking distance, and transportation demand management to discourage driving and encourage sustainable modes of transportation.

About 80% of Cambridge greenhouse gas emissions come from building energy consumption in existing buildings and 66% of that is from the commercial and institutional sectors. Lab and research buildings prevalent in Kendall Square generally have a high energy use intensity per square foot as compared to other uses. It therefore makes it more important that future development in this area reduce consumption of non-renewable energy and target greater energy efficiency.



Over the last few years Cambridge has been tackling the issue of building energy use by adopting a green building requirement for large new construction and the Stretch Energy Code. However, given that a large component of the City's energy use and greenhouse gas emissions originate from Kendall Square, it is important to consider strengthening energy performance in this district for both existing and new construction.

In recent years, the City's efforts to encourage and require green building development has been assisted by the market demand for sustainable construction, especially in the commercial sector. Businesses are competing to attract the best and brightest talent to their

companies and demonstrating leadership as a sustainable, cost-efficient place to do business could connect environmental and economic sustainability of Kendall Square. The Deloitte Report on green buildings states that "More than 90 percent of respondents reported a greater ability to attract talent, and more than 80 percent reported greater employee retention (81 percent) or improved worker productivity (87 percent). Seventy-five percent saw improved employee health, and 73 percent reported operational cost reductions." Source: CoStar Group Newsletter 2008

Kendall Square currently has some existing energy assets that may be further leveraged as the district evolves. MIT has a cogeneration plant and many of the MIT buildings are served by steam; the MIT system is currently serving at capacity. Biogen also has a cogeneration plant, which was expanded to serve the new Biogen buildings under construction. Additionally, Kendall Square is served by a commercial steam network run by Veolia Energy.



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## Stormwater Management

Filled swampland in parts of Kendall Square and the Osborn Triangle are flat and prone to flooding, since there is little provision for stormwater management. Three important considerations are the quality of the runoff, the quantity of water to be handled, and the rate at which it is discharged. Key priorities include peak runoff management, flood storage, groundwater recharge management, phosphorus management, and suspended solids management. Parts of the storm sewer infrastructure date from the late 1800s. Kendall Square was developed as an industrial hub for the city and from its inception has had a lot of hardscape with limited permeable surfaces where water may infiltrate. The high water table complicates the potential for infiltration.

While major storm events are infrequent, they can have significant impacts on above ground roadway infrastructure, basements, and first floors of buildings. Cambridge is improving the functioning of its sewer system citywide by separating sanitary and stormwater sewers. The Department of Public Works is engaged in systemwide improvements to enhance flood protection, combined-sewer overflow control, and water-supply protection, including a plan to build subgrade retention facilities close to the Osborn Triangle/Central Square area beneath municipal parking lots. The City is also working to implement Massachusetts DEP's approach to "pollutants of concern."

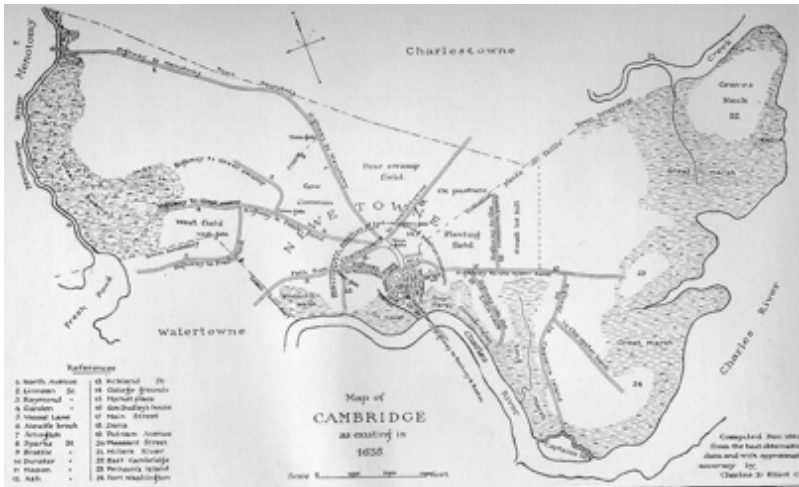
Sustainable practices to control stormwater quality and quantity is the surest way of improving the area's stormwater handling and must be prioritized. While recent development in the area has been subject to the Department of Public Works requirements, future redevelopments of surface parking lots within the area offer good opportunities to address stormwater management goals using a combination of structural controls and low impact development (LID) principles such as green-roof systems, retention basins, rain gardens, and bioswales to control and treat stormwater.



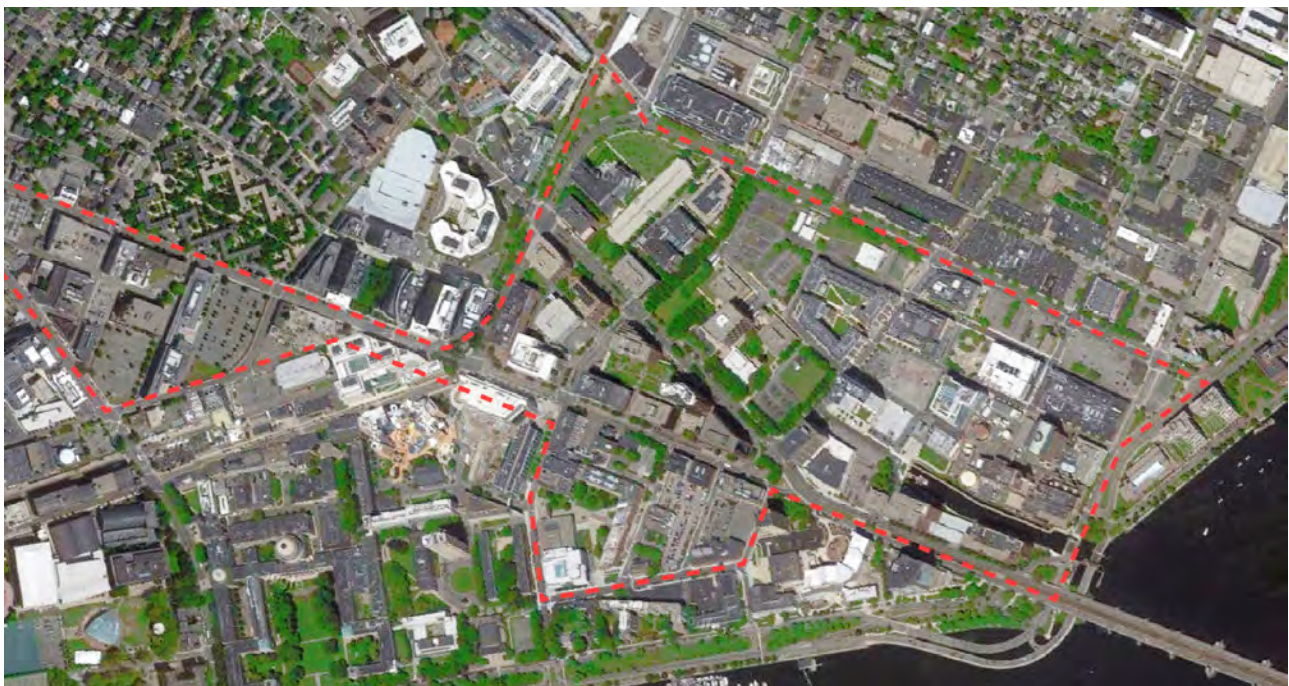
*(top) Broadway: July 10, 2010.*

*(middle) Constructed wetland, North Point*

*(bottom) Green Roof at the Robert W. Healy Public Safety Facility in East Cambridge.*



(left) Much of Kendall Square is built on the Great Marsh, City of Cambridge, 1635. (bottom) Permeable surfaces in Kendall Square and Osborn Triangle area.



## EcoDistrict Potential

The property ownership pattern in Kendall Square, with a few large property owners responsible for the majority of land area, means that a district-based strategy can be more efficiently implemented. The K2 Committee discussed approaches that would engage this potential for efficiency of scale by crafting district/multi-building solutions to environmental goals. One model is the EcoDistrict approach, a comprehensive strategy to accelerate sustainable development at the neighborhood scale by integrating building and infrastructure projects with community and individual action. EcoDistricts can improve building energy performance, reduce storm water runoff quantity, and improve water quality. A district-based strategy would also allow the opportunity to address increased use of renewable energy and/or district steam, to reduce reliance on automobiles, to increase use of alternative fuel vehicles, to mitigate urban heat island, to conserve water, and to minimize waste generation. All of these benefits would be complemented by efforts to make the sustainability initiatives visible to the public.

# TRANSPORTATION

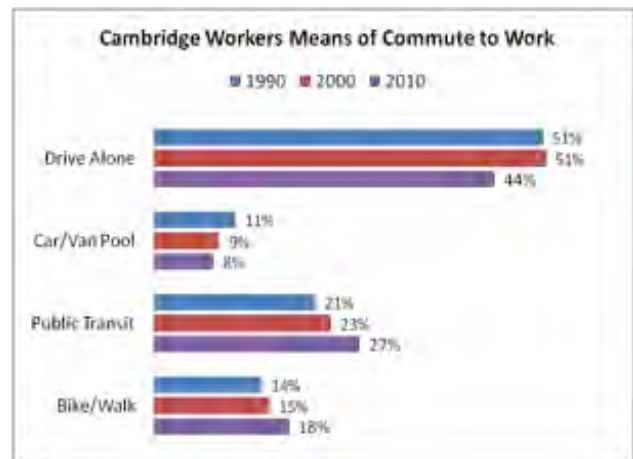
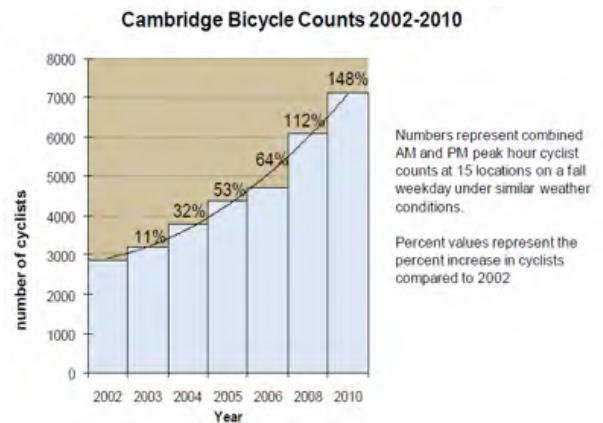
The plan for K2 proposes density near transit nodes and includes a mix of residential, commercial, and retail land uses. This mix of uses, combined with transit availability and robust walking and biking infrastructure, enables people to live, work, learn, and play in the same area and reduces traffic generated by new development.

## Travel Trends

Travel trends show that transportation management in Cambridge is benefitting from positive changes, across the modes. Auto ownership is declining: households without a vehicle grew from 29% to 31% from 2000 to 2010-12, according to the American Community Survey. In addition, according to City research, 50% of Cambridge households within ¼ mile of an MBTA station have no car.

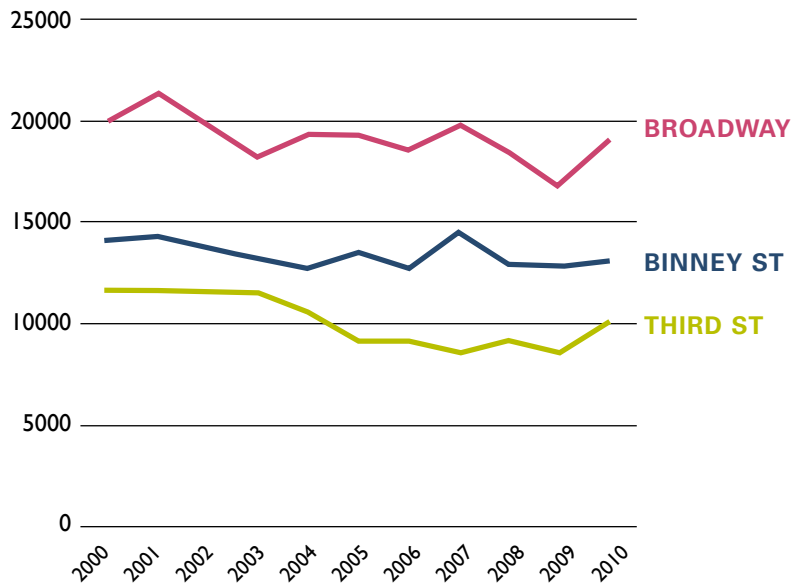
Bicycle growth is strong: the number of bicycles on the road during rush hour tripled between 2002 and 2012. Cambridge has received the highest score in the nation for its bike facilities and the popularity of walking here has been broadly recognized, including being twice named “America’s most walkable city” by Prevention Magazine, receiving the highest Bikescore in the nation and being the only city east of the Mississippi granted a Gold rating by the American League of Bicyclists. The launch in Cambridge of Hubway, the highly successful regional bikeshare system, further increases the potential for growing the percentage of trips taken by bike.

Additional positive trends include mode shifts away from people driving alone in “single occupant vehicles” (SOVs). The percentage of SOV users overall in Cambridge reduced from 51% to 45% at the same time an additional four million square feet of development was built in the decade between 2000 and 2010. Also, public transit use grew from 23% to 25% and the percentage of bicycling and walking commuters is now up, from 15 to 18%.



(top and middle) City of Cambridge CDD and TPT Departments  
(bottom) US Census 2000 and 2010-2012 American Community Survey

## Kendall Square Average Daily Traffic Trend Lines



Source: Cambridge Redevelopment Authority

Importantly, daily traffic volumes remained consistent or have been reduced in this decade of new growth. Although Kendall Square had the most significant development in the city between 2009 and 2010, traffic levels in the Square remained stable during that period.

The City's Parking and Transportation Demand Management ordinance, which is triggered by construction of new parking spaces and requires employers to implement comprehensive demand management programs, has played a significant role in reducing single-occupant vehicle trips from new construction. The ordinance requires measures to encourage walking, biking and transit use and includes a provision for annual monitoring of effectiveness of the program. In addition, more people seek to live, work and play in the same area, significantly reducing the need and desire for automobile ownership. Cambridge has benefitted from this change in preferred lifestyle.

### Parking

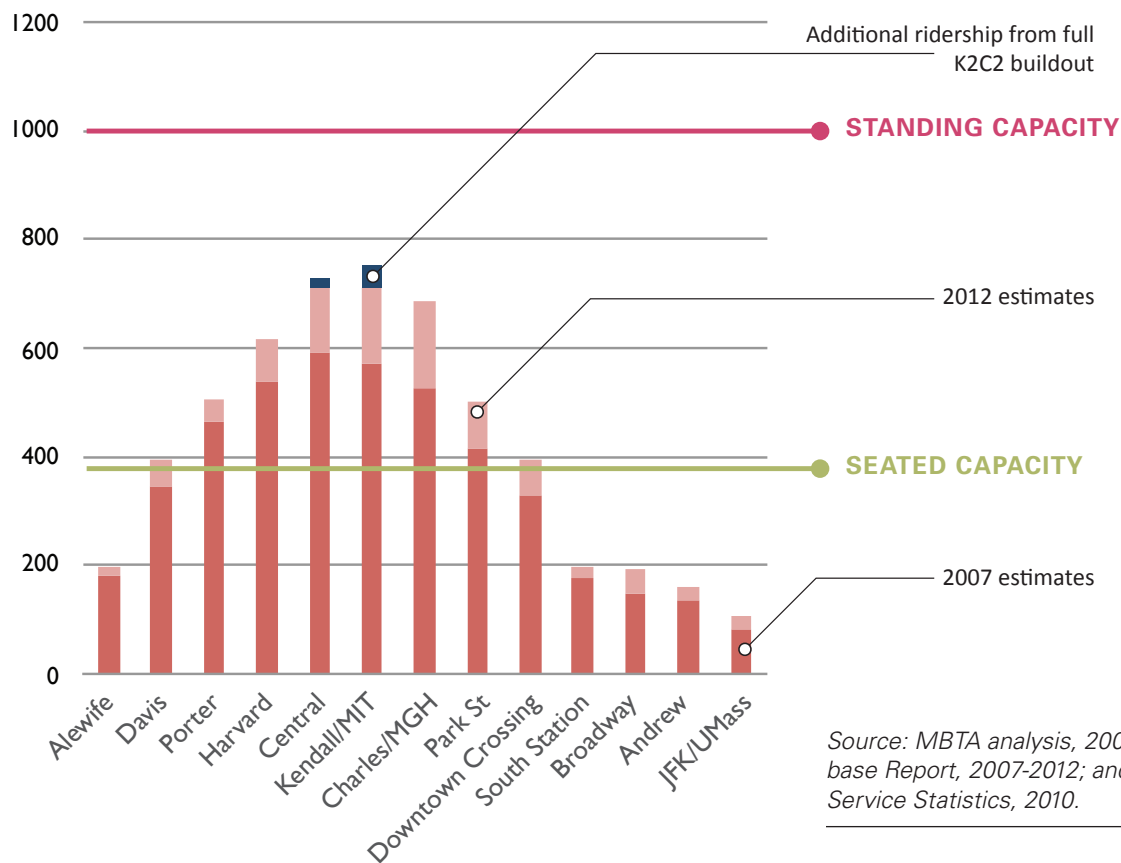
While parking ratios have gradually decreased over time, parking has tended to be overbuilt in Kendall Square and in Cambridge in general. Both parking minimums and maximums have been too high and there has been little incentive to engage in efforts to share parking between uses whose peak demand occurs at different times. Parking ratios could be lowered to meet the lower demand from parking resulting from an increased emphasis on parking demand management and taking advantage of shared parking wherever possible.

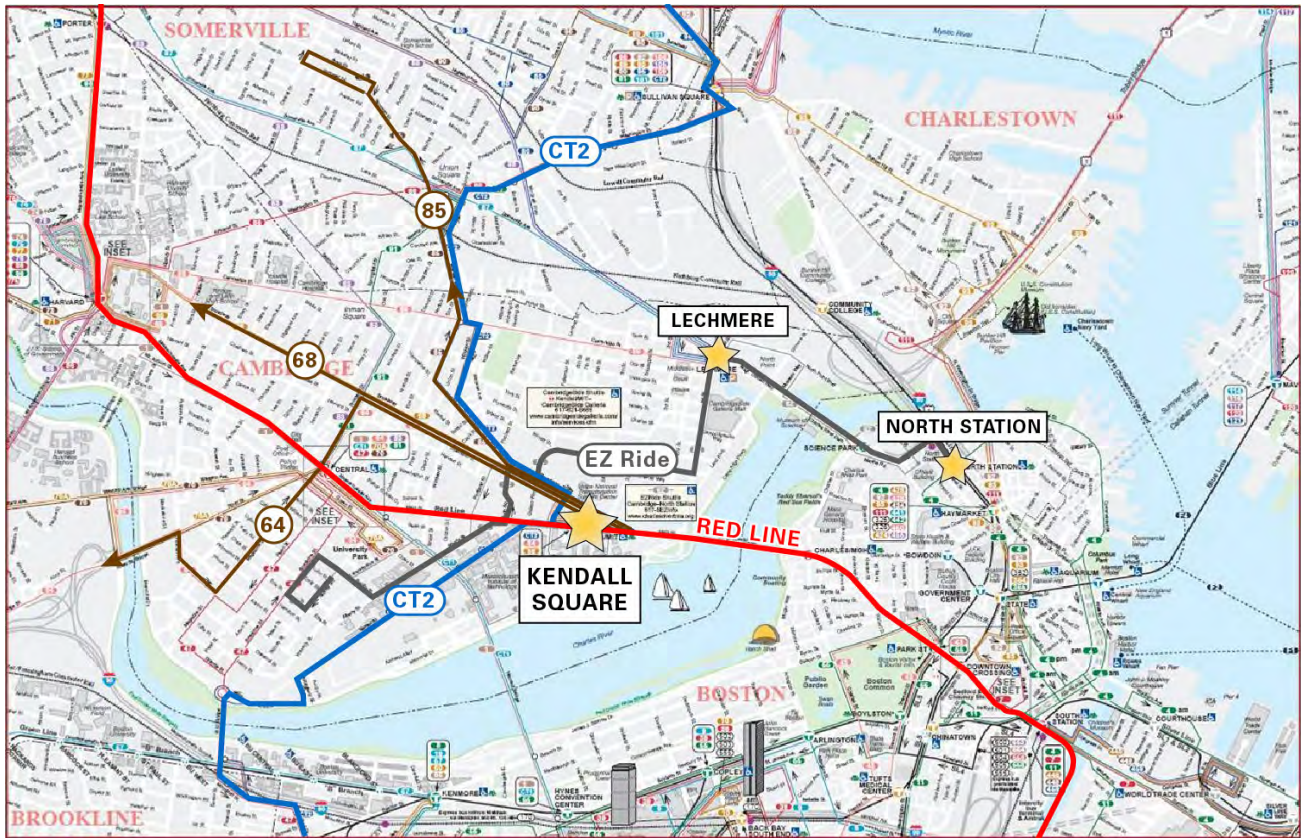
## Transit

A high percentage of employees commute to Kendall Square by transit. That percentage is expected to increase from 38% in 2010 to 42% for office and R&D uses. Detailed analysis was undertaken as part of the Kendall Square study to understand the relationship between current transit capacity and current and future transit demand on both buses and the Red Line.

Current daily boardings at Kendall Station, the 4th busiest Red Line Station, represent 7.3% of Red Line total (MBTA Ridership Statistics, 2010). Development at Kendall Square will add to congestion on the Red Line, which currently has excess peak hour capacity. Of much greater concern to congestion is total growth in the region which is expected to double by 2030 compared to 2008 levels. The extension of the Green Line from Lechmere to various points in Somerville and Medford will have some positive impact by shifting some demand from the Red Line but will serve only 8% of Kendall trip origin market.

## Average train load - AM peak toward Boston





Kendall Square has the least bus service and capacity of nearby transit hubs (including Lechmere, Central, and Sullivan Squares) and significantly less service than similar employment districts (such as the Financial District and Longwood Medical Area in Boston). Service is augmented by the EZRide which operates high-frequency service during weekday peak hours and is funded by participating business and the City of Cambridge. EZRide ridership has been growing at 4% each year since its start in 2002. Bus service between Sullivan and Kendall is a significant missing link.

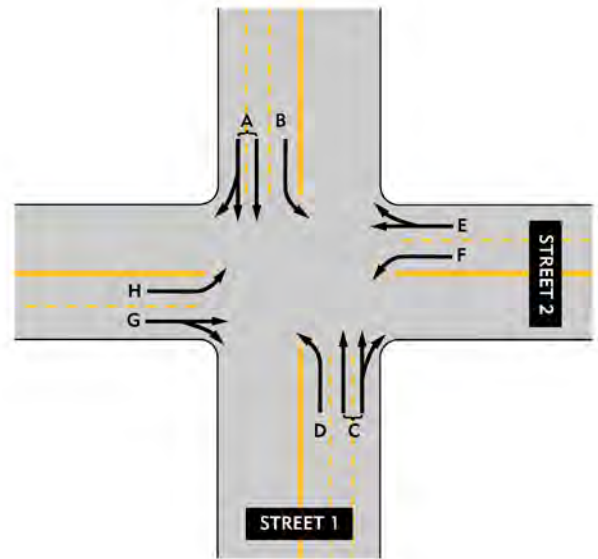
The Urban Ring project, a circumferential bus rapid transit line envisioned to connect Cambridge with Somerville, Everett and Chelsea to the north and Boston to the south, remains the transit expansion project that could benefit Kendall Square the most. While in planning for almost two decades, the project has been put on hold by MassDOT.

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## Analysis of Traffic Impacts

The K2 Study included detailed analysis of future roadway traffic volumes including daily and peak hour traffic and an analysis of anticipated impacts at the intersection level, also known as Critical Sums Analysis, to assess the impact new development would have on existing road capacity. Critical Sums Analysis is a planning tool used to evaluate build-out scenarios by comparing how different levels of build-out impact specific intersections in a general way. The process is based on methodology previously used by the City of Cambridge for 2001 ECaPS, 2001 Citywide Rezoning, and 2005 Concord-Alewife Plan.

“Critical movement volume” at an intersection is defined as the sum of all conflicting traffic movements, expressed in vehicles per hour. For a north-south street, the conflicting movements are the combination of either the northbound left-turn and the southbound through/right-turn volume per lane or the southbound left-turn and the northbound through/right-turn volume per lane, whichever is greater. Similarly, for an east-west street, the conflicting movements are the combination of either eastbound left turn and the westbound through/right-turn volume per lane or the westbound left-turn and the eastbound through/right-turn volume per lane, whichever is greater.



Thresholds for performance are based on total intersection capacity. The 1994 Highway Capacity Manual recognized that the maximum operating volume had increased from 1,800 to 1,900 per hour. This higher volume indicates that an appropriate threshold for intersection performance would be 1,500 or fewer vehicles per hour. An intersection at or below this threshold is considered to operate adequately, i.e., motorists will wait no more than two light cycles to get through the intersection. Once these thresholds are exceeded, drivers start to experience exponentially longer wait times.

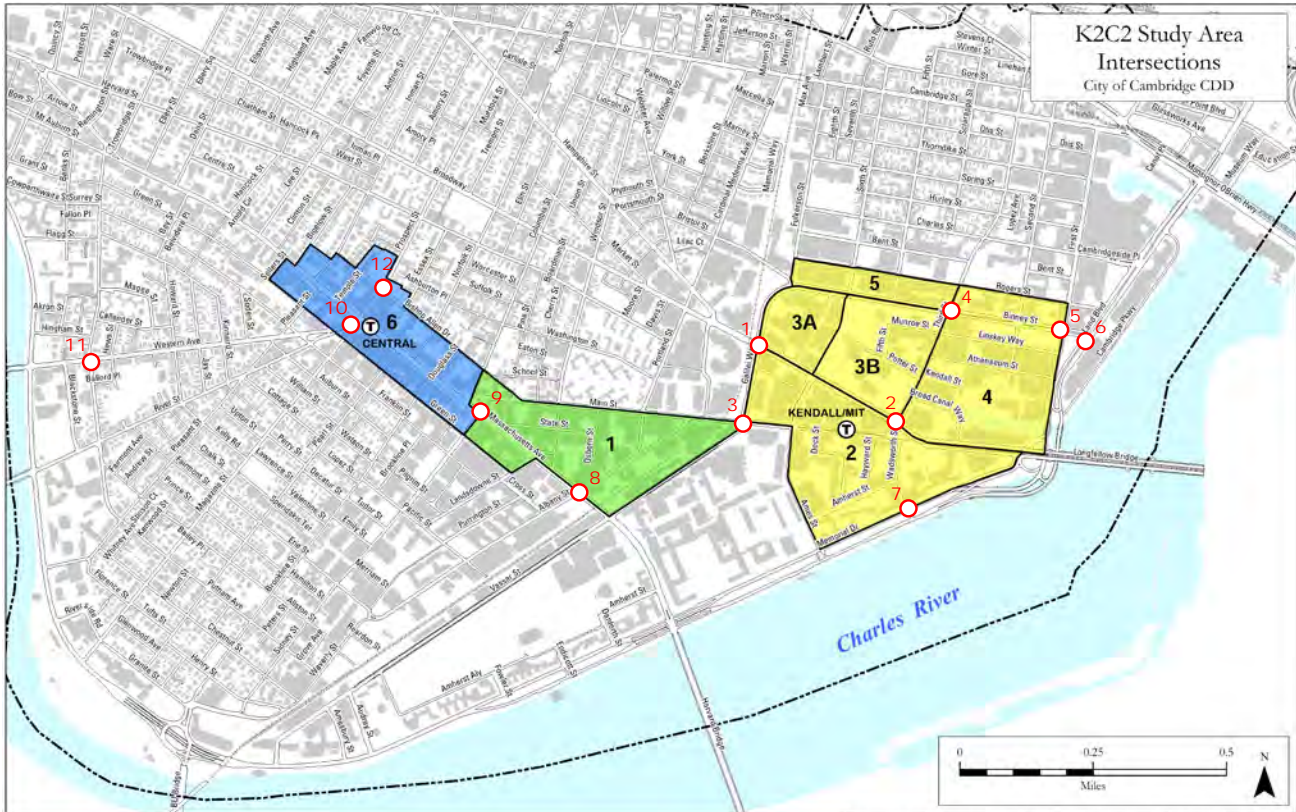
Street 1:  $(A / 2) + D$  or  $(C / 2) + B$ , whichever is more  
Street 2:  $E + H$  or  $G + F$ , whichever is more

Critical Sum = Result of Street 1 + Street 2

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The analysis drew the following conclusions:

- Total intersection volume increase ranged from 19-51%;
- Broadway/Third slightly exceeded the established threshold for impact with 1,510 vehicles per hour; however, the hourly vehicle volume can be reduced to 1440 vehicles per hour with enhanced transportation demand management requirements;
- Volumes generally decrease from 1998 traffic levels; and
- Critical Sums Analysis done by the ECaPS planning study projected that 4 intersections would exceed 1,500 Critical Movements threshold in 2020. Despite development in the area, none of the intersections are even close to that threshold today.



	2010		2030 Buildout		2030 Buildout		2030 Buildout	
	Existing Conditions		Existing Zoning		K2C2		K2C2 with TDM	
	Total Volume	Critical Sum	Total Volume	Critical Sum	Total Volume	Critical Sum	Total Volume	Critical Sum
1. Broadway / Galilei	2292	768	2732	897	3022	1045	2906	999
2. Broadway / Third	1964	1111	2437	1333	2787	1510	2641	1440
3. Main/Galilei / Vassar	1764	711	2183	986	2389	1069	2285	1007
4. Binney / Third	2007	742	2597	982	2929	1112	2768	1044
5. Binney / First	1311	590	1983	682	2182	749	2024	722
6. Binney / Land	2382	654	3019	917	3162	967	3018	903
7. Memorial Drive / Wadsworth	1361	680	1638	802	1677	812	1615	785
8. Mass Ave / Albany	1850	807	2210	1026	2159	1013	2110	978
9. Main / Mass / Columbia / Sidney (Lafayette Sq)	1460	762	2053	1098	2180	1145	2063	1082
10. Mass / Prospect / River / Western (Central Sq)	1912	825	2285	1017	2385	1069	2309	1027
11. Putnam / Western	1737	1004	1801	1068	1812	1079	1800	1067
12. Bishop Allen Dr / Prospect	1488	1008	1594	1114	1571	1091	1558	1078



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# TRANSPORTATION - INFRASTRUCTURE

During the course of the K2 discussions, Broadway, Main Street, Ames Street, and Binney Street were being considered for redesign and reconstruction in the near to mid-term. An area that garnered much discussion was the intersection of Main Street and Broadway. Several options to create a connection through from Third Street to Main Street were discussed. This connection is particularly significant as it would facilitate increased transit, bicycle and vehicular connection. It would also improve urban design by connecting Main Street to the broader Kendall Square area. Enhanced pedestrian facilities would facilitate a much more direct southbound connection to buses than currently exists. When designing above-grade public space and roadway infrastructure, below-grade infrastructure can play a defining role. For example, sidewalk and public space design along Main Street is influenced by the Red Line tunnel. There is also a proliferation of existing water, sewer, telecom, electrical, and plumbing lines below Point Park that any redesign would need to respond to.

A number of alternatives were evaluated as shown in the diagrams below. Option 1B was the preferred option and is being implemented as part of the reconstruction of Main Street, planned for 2014.

## Existing

2010 Vehicular LOS (Level of Service) – C  
2030 Enhanced TDM LOS - D



## Option 1B

2010 Vehicular LOS – D  
2030 Enhanced TDM LOS – D  
Add Longfellow to Main Left Turn LOS - F



## Option 2

2010 Vehicular LOS – D  
2030 Enhanced TDM LOS - F



## Option 3

2010 Vehicular LOS – F  
2030 Enhanced TDM LOS - F

