

EASTERN CAMBRIDGE PLANNING STUDY

CITY OF CAMBRIDGE



CAMBRIDGE COMMUNITY DEVELOPMENT DEPARTMENT
EASTERN CAMBRIDGE PLANNING STUDY COMMITTEE

OCTOBER 2001



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Background

RECENT DEVELOPMENT AND THE MORATORIUM

The City of Cambridge has experienced sustained economic growth over the past decade, resulting in significant real estate development pressures throughout the City. The eastern portion of the City in particular has been the subject of numerous large development proposals. In September of 1997, the City embarked upon an historic effort to develop Citywide Growth Management policies and zoning recommendations. This process culminated in the Citywide Rezoning Petition, approved by the City Council in February 2001. The City Council delayed action on the Citywide Rezoning Petition proposals for Eastern Cambridge pending the recommendations of the Eastern Cambridge Planning Study (ECaPS).

Overview

During the Citywide Growth Management process, the rapid pace of development in Eastern Cambridge prompted neighborhood residents to seek immediate action. In November 1999, Cambridge citizens submitted the Larkin Petition requesting the City Council to impose an 18-month moratorium on all new commercial development over 20,000 square feet and new residential development over 20 units within a defined portion of Eastern Cambridge. The primary concerns expressed in the petition were the encroachment of commercial development into residential neighborhoods, increasing traffic congestion, real estate price escalation, and inadequate public open space.

The City Council approved an eighteen-month moratorium beginning in January 2000. The City Manager, Robert W. Healy, appointed an Eastern Cambridge Planning Study Committee and charged the group with the task of using this time “to ascertain what the appropriate zoning and other City policies in the Moratorium Area should be to protect the residents’ quality of life and maintain neighborhood stability.” After a competitive selection process, a multi-disciplinary consultant team led by Goody, Clancy & Associates was selected to assist with the Eastern Cambridge Planning Study. Working closely with the Committee and City staff, the consultant team developed recommendations for land use, zoning, urban design, open space, transportation, and retail. This report documents the findings and recommendations of the Eastern Cambridge Planning Study, developed over the course of a year from June 2000 to June 2001.

EASTERN CAMBRIDGE STUDY AREA

The Eastern Cambridge Study Area is bounded to the west by Windsor Street, to the north by the Cambridge/Somerville boundary, to the east by the Charles River and First Street, and to the south by Main Street. The area is a major gateway from downtown Boston into Cambridge. The Study Area includes portions of four Cambridge neighborhoods: East Cambridge, Wellington-Harrington, Area IV and MIT. To a great extent, the area’s special character is derived from its industrial history and the diversity of its neighborhoods.

ECAPS COMMITTEE

To guide the planning process for Eastern Cambridge, the City Manager appointed an eighteen-member committee including neighborhood residents, representatives of local businesses and institutions, and City staff. The Committee’s recommendations were shaped by a series of four public workshops and more than twenty committee meetings over the course of the project.

CONSULTANT TEAM

A consultant team led by Goody, Clancy and Associates was selected to assist with the planning study. The consultant team included members with expertise in urban design, land use planning, transportation planning and engineering, real estate and housing, economic development, and zoning.

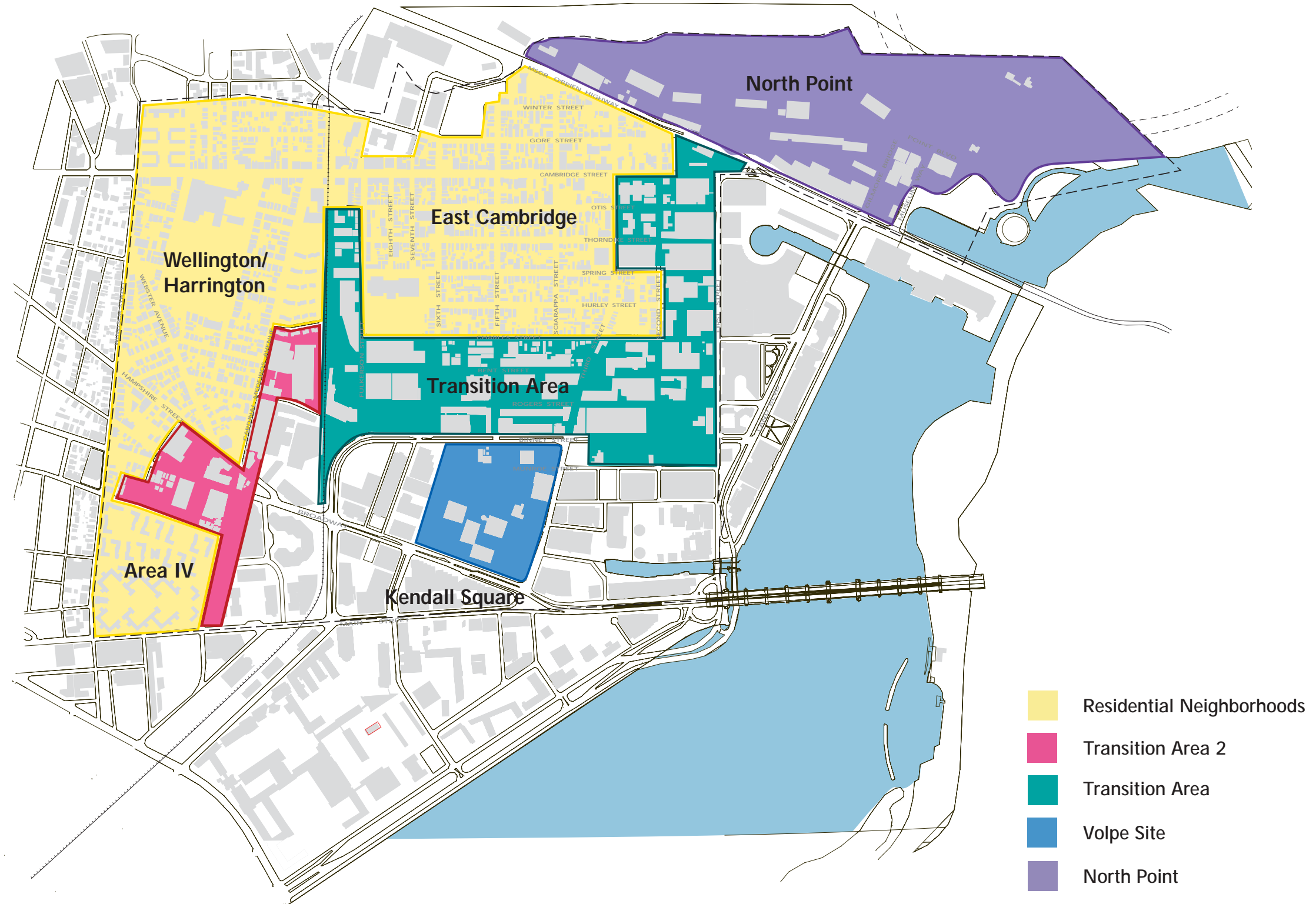
Scope of the Report

This report includes an analysis of existing conditions in Eastern Cambridge –historical context, urban design and open space, land use and zoning, real estate market for housing, office/R&D, and retail, and transportation. A discussion of opportunities and constraints in each area follows.

The report then describes the vision and goals for the study, which were developed by the ECaPS Committee with input received from the public at community workshops.

The study recommends a set of zoning and non-zoning actions, which aim to fulfill the vision for the future of Eastern Cambridge. The ECaPS zoning recommendations were forwarded to the Planning Board in April 2001 and have served as the basis for the Planning Board’s Eastern Cambridge Rezoning Petition filed with the City Council in June 2001. Action on the petition is expected in Fall 2001. Copies of the petition and zoning as finally adopted, can be obtained from the City Clerk. The non-zoning recommendations, which are discussed in this report, include a neighborhood transportation plan, a retail strategy, and ways to address noise impacts from mechanical equipment. A suggested plan for implementation follows the various recommendations.





Historical Context

The history of Eastern Cambridge sets the context for the analysis of current conditions, and serves as a point of reference for understanding community concerns and proposals for the future.

The development history of Eastern Cambridge begins with local businessman and developer Andrew Craigie, who in 1795 bought up the few farms, marshlands, and grazing fields that made up the area. In partnership with Boston businessman Harrison Gray Otis, Craigie formed the Lechmere Point Corporation and built the Canal Bridge across the Charles River in 1809, adjacent to the site of the present Museum of Science. At the time, the Point was virtually an island with only a narrow connection to the mainland. The first two streets through the area were Cambridge Street and Bridge Street (now Monsignor O'Brien Highway).



Courtesy: Cambridge Historical Commission

Analysis

In 1811, the Corporation laid out a street grid aligned with Cambridge Street that covered the peninsula and extended into the surrounding marshlands of the Charles River. The Corporation successfully petitioned for the development of a new county courthouse in East Cambridge, donating the land and \$24,000 for the building's construction. They retained renowned Boston architect Charles Bulfinch to design the building, which still stands today on Cambridge Street.

In 1813, the Lechmere Point Corporation sold its first parcels for industrial purposes along Miller's River (north of Cambridge Street) to the Boston Porcelain & Glass Company.

This ushered in an era of intensive industrialization in Eastern Cambridge. The area's industrial history is evident today in the historic structures that remain in the area, some of which have successfully been renovated for residential and office use.

As the demand for factory sites close to water transportation intensified, land reclamation became a more attractive option.



The upper map shows the first streets platted by the Lechmere Point Corporation in the early 1800s. Canals linked to the Charles, noted on the lower map, helped attract industry to Eastern Cambridge in the middle of the 19th century.
Courtesy: Cambridge Historical Commission

After the Civil War, the vast marshlands south of Charles Street and along the Charles River were filled in to meet the growing demand for industrial sites. Charles Street became the boundary between industrial and residential areas, an historical imprint that marks the changing real estate economics of the nineteenth century. In much the same way, the Wellington/ Harrington and Area IV neighborhoods have retained different development patterns and housing types that derived from the gradual process of land reclamation. These neighborhoods once sat along the water's edge, while much of the area south of Charles Street and north of Monsignor O'Brien Highway (including Kendall Square, MIT, North Point and Lechmere Square) was marshland or water.

A variety of industries such as woodworking, foundries, oilcloth manufacturers, ink producers, publishing companies, and meat packing were attracted to East Cambridge because of its proximity to Boston, large tracts of newly created land, cheap immigrant labor, and excellent transportation links.

A large number of the older houses in the area also demonstrate the typical pattern for worker housing from the early nineteenth century. These early houses were mostly small, single-family worker's cottages. The physical development of the neighborhood closely reflected the prevailing social hierarchy, with workers' housing located closest to the factories and the larger and more prestigious homes built in the center of the present East Cambridge neighborhood, away from both the noxious factories and the marshlands. Managers took up residence along Otis and Thorndike Streets (named after the early shareholders in the Lechmere Point Corporation) with the sites nearest the courthouse holding the highest prestige. A wide variety of these historic housing types contribute to the human scale and rich architectural character of the neighborhood.

While early developers paid little attention to industrial impacts on nearby neighborhoods, public activism in the late 1800s spurred several important changes in public health and open space. Environmental conditions were the most immediate concern, as seen in the public outcry against the smell and disease emanating from polluted local waterways. This resulted in the creation of a system of sewer lines and the infilling of most of the canal system. The most offensive waterway of all, the Millers River, was mostly filled in when the Boston & Albany Railroad purchased the adjoining land to build a vast expanse of rail yards.



A 1925 view, looking south toward the Charles and Boston, shows the heavy concentration of industrial buildings around Kendall Square and the residential areas to the east. The Irving & Casson-A.H. Davenport complex (below) still stands at the corner of First and Cambridge.
Courtesy: Cambridge Historical Commission

In the late 1800s, the Charles River began to be viewed as an important amenity. In 1892, city planners commissioned Frederick Law Olmsted, the designer of New York's Central Park and Boston's Emerald Necklace, to design "The Cambridge Front," a new waterfront park and beach along the Charles River. Unfortunately, the Charles River waterfront was deemed too valuable as industrial land and too polluted for such use. Although it was never built, the plan encapsulated an early desire to give residents a link to the river and open space—a planning goal that survives to this day. One of the first, and most dramatic, results of the shifting perception of the Charles River was the relocation of the Massachusetts Institute of Technology (MIT) from the Back Bay to its present site along the river in 1916.



Courtesy: Cambridge Historical Commission



Historic Patterns in Eastern Cambridge

Like many urban communities across the country, Eastern Cambridge experienced a major decline in manufacturing between 1950 and 1980. The rise of arterial roadways and truck transportation encouraged industrial development on cheaper land close to the burgeoning interstate highway system. Many of East Cambridge's

The evolution from manufacturing center to high-density office district helped create a social and physical divide between the residential neighborhoods and the commercial areas of Eastern Cambridge.

industrial buildings, and even its cherished courthouse, sat vacant and in danger of demolition after the Second World War.

The advent of urban renewal in the 1960s and 1970s dramatically altered the scale and pattern of development in Eastern Cambridge. While the residential neighborhoods remained relatively intact, many of the factories and warehouses around Kendall Square were razed to the ground to make way for new office development, in hopes of spurring new economic growth. In the



Worthington Place (top) is a prominent industrial-to-residential conversion in the area. The CambridgeSide Galleria was part of the City's redevelopment along the Lechmere Canal. (lower photo)

late 1960s, approximately 14 acres in the heart of Kendall Square was designated an Urban Renewal Area. The decline in land values opened the area for light industrial uses, including parking lots, distribution centers and auto repair shops. Over the course of more than twenty years, Kendall Square was gradually rebuilt with a mix of commercial office, hotel, and retail uses, including a major research center for the U.S. Department of Transportation.

In the 1980s, a research-based economic boom began to accelerate the pace of development in Eastern Cambridge. Fueled in part by proximity to

MIT, the area experienced a dramatic increase in construction of office and research buildings. After a brief interruption during the recession of the early 1990s, office and research development was further stimulated by a boom in biotechnology, software development, and a host of supporting services drawn to MIT and Kendall Square. Many of the historic buildings that had been preserved became magnets for new technology-oriented businesses. In addition, some 800 units of housing were built in the Graves Landing, Esplanade, and River Court projects, all on sites formerly used for industry. Furthermore, the Worthington Place redevelopment

and a mix of new development and redevelopment along Fulkerson Street are also successful examples of a conversion from industrial to residential uses in the past decade. In total, about a million square feet of residential use has been constructed on sites formerly in industrial use. Despite this recent residential development, there is still a strong demand for additional housing in the area.

The rapid development of office and research uses in the area has brought an increase in the daily population of workers. Approximately 10,000 people worked in the area in 1990, almost equivalent to the residential population. The redevelopment of Kendall Square as a national center for technology and research has brought significant economic benefits to the city. At the same time, this development has created impacts on surrounding residential neighborhoods, including a significant growth in traffic. Recent concerns over the future of Eastern Cambridge center on the increasingly rapid pace of development, increased housing prices, and the impacts of this development on quality of life for nearby residents.

Recent Planning Initiatives

Eastern Cambridge has been the subject of several major planning and zoning initiatives over the past two decades. A major planning and urban design effort in the late 1970s led to the East Cambridge Riverfront Plan, which involved rezoning the area from First Street to the Charles River as a mixed-use district. With a strong economy in the 1980s, the City was able to manage a public/private venture that resulted in some \$50 million in public money for creating new parks, public parking, and roadway work, leveraging approximately \$800 million in private funds for housing, office, research & development, and retail uses. This area is nearly complete, with only the CambridgeSide hotel remaining to be completed.

In adjoining Kendall Square, the Cambridge Redevelopment Authority established an urban renewal plan in the 1950s. By the 1960s, there was the expectation that National Aeronautics and Space Administration (NASA) would establish its center in Kendall Square. However, in 1969 NASA closed operations in Cambridge and the NASA complex was occupied by the Transportation Systems Center of the Department of Transportation in 1970. The redevelopment plan for the Kendall Square area shifted to office, research & development and hotel uses. At present, biotech uses are increasing their presence in the area, with Biogen expanding and Amgen having located in the One Kendall Square development. As the new Riverfront and Kendall Square developments began to emerge, the neighborhood and the City attempted to revise the zoning for the areas between the two projects and the residential district. A committee led by the City, with representatives of the neighborhood and businesses, met for over a year (1990-1991) and proposed zoning recommendations, which were not ultimately adopted by the City Council. However, draft guidelines were produced by the City, and were used to help review development planned at the 10-acre Commonwealth Energy site east of Third St. These guidelines and the Riverfront planning and design documents were also useful in the review of the numerous proposals reviewed under the city's Interim Planning Overlay Permit (IPOP) project review requirements.

Over the past few decades, the city and community have responded to increasing development pressures with a series of creative planning initiatives. The ECaPS planning process builds on the successful work done to date in growth management, transportation planning and open space enhancements citywide. Specific initiatives within the study area over the past fifteen years include the East Cambridge Development Review Process and Guidelines (1985), East Cambridge Neighborhood Plan (1989), and the North Point Policy Plan and Design Guidelines (1989).

Citywide planning efforts have included the Cambridge Growth Policy Document (1993), the Report of the Green Ribbon Open Space Committee (2000), and the Cambridge Pedestrian Plan (2000). In 1988, the Cambridge Affordable Housing Trust established a fee of \$3.28 per square foot for non-residential development to boost the city's affordable housing supply. In addition, the City's zoning was amended to create an inclusionary ordinance that requires 15 percent of new units in large developments to be affordable.

The City has also developed a series of transportation initiatives, such as the 1992 Vehicle Trip Reduction Ordinance, to reduce new traffic growth and improve access for public transit, pedestrians and cyclists, and the 1998 Parking and Transportation Demand Management Ordinance, which requires commercial developers to facilitate ridesharing, subsidize transit, contribute to employee shuttles, and otherwise encourage non-automobile travel for their employees. In combination, these initiatives have contributed to maintaining and improving quality of life in Eastern Cambridge, and provide a foundation for many of the recommendations in this report.

CITYWIDE REZONING, 2001

In 1997, the Citywide Growth Management Advisory Committee (CGMAC) was formed in response to growing community concerns over the quality and density of new development, traffic growth, and housing affordability. The CGMAC committee included broad representation from Cambridge neighborhoods, businesses, and institutions, as well as City staff. This three-year planning effort culminated in a Citywide Rezoning Petition, submitted by the Planning Board to the City Council in September 2000. The Petition was approved by the City Council in February 2001 after a five-month public review process.

As part of the Citywide Rezoning Petition, seventeen commercial districts were rezoned to residential, while housing became an allowed use everywhere in the city. To reduce new traffic growth, non-residential densities were significantly lowered in many areas, and parking ratios were adjusted. Eastern Cambridge was excluded from some of these changes in anticipation of the ECaPS zoning recommendations contained in this report pending the recommendations of this study.

However, some aspects of the Citywide rezoning adopted in February 2001 apply to the entire city, including the Eastern Cambridge Study Area. These include amendment of the city's density requirements to include above-ground structured parking in the calculations of Floor Area Ratio (FAR) and the citywide project review process. Project review was extended to all new development over 50,000 square feet or in excess of an established traffic threshold.

THE LARKIN PETITION: JANUARY 2000

In spite of the progress made by CGMAC, the rapid pace of development in Eastern Cambridge prompted neighborhood residents to seek immediate action. In September 1999, Cambridge citizens submitted the Larkin Petition requesting the City Council to impose an 18-month moratorium on all new commercial development over 20,000 square feet and new residential development over 20 units within a defined portion of Eastern Cambridge. The primary concerns expressed in the petition were the encroachment of commercial development into residential neighborhoods, increasing traffic congestion, real estate price escalation, and inadequate public open space. The City Council approved the moratorium from January 2000 to July 2001, and the City Manager established the Eastern Cambridge Planning Study Committee to consider appropriate zoning measures and other policies for the moratorium area.

Urban Design and Open Space

I. URBAN DESIGN

The character of Eastern Cambridge is best captured by the word *diversity*. From the intimately scaled residential blocks of East Cambridge to the commercial office towers of Kendall Square, the area reflects a range of development patterns from the 1830s to today. The historic context presented in Chapter Two briefly outlines the forces that shaped the individual form, character, and quality of the neighborhoods and industrial areas. The following overview will describe in greater detail the existing urban design and open space characteristics of sub-districts within the larger Study Area. These sub-districts include: the East Cambridge, Wellington/ Harrington, and

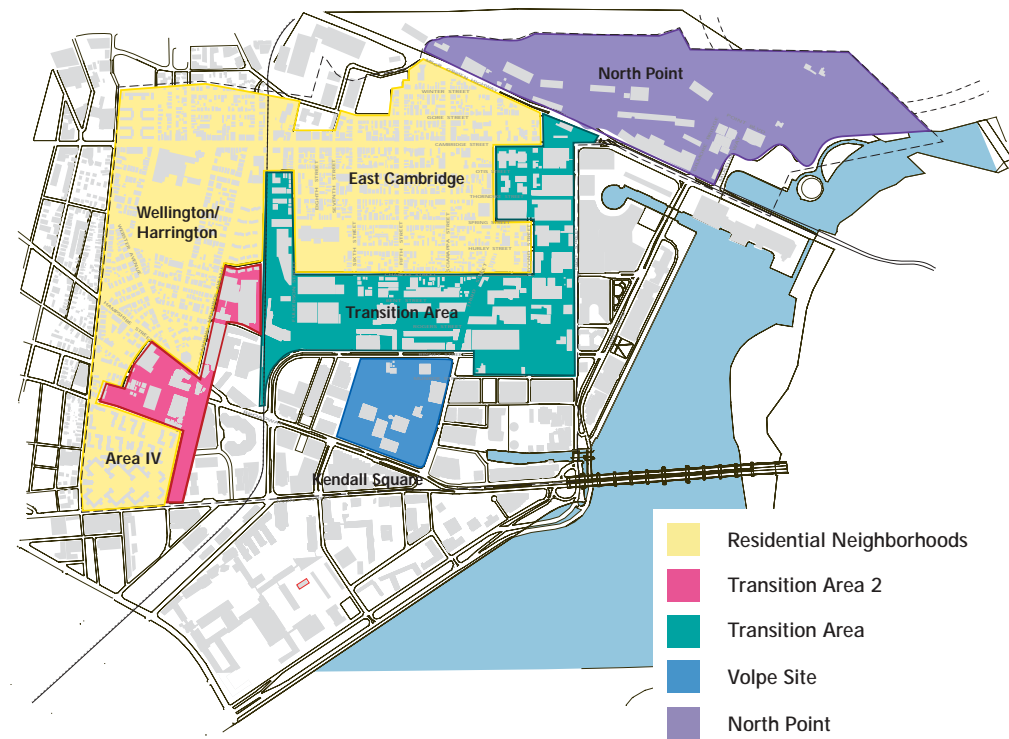
Area IV residential neighborhoods; the Transition Areas between the neighborhoods and commercial districts; Kendall Square; and North Point.

EAST CAMBRIDGE

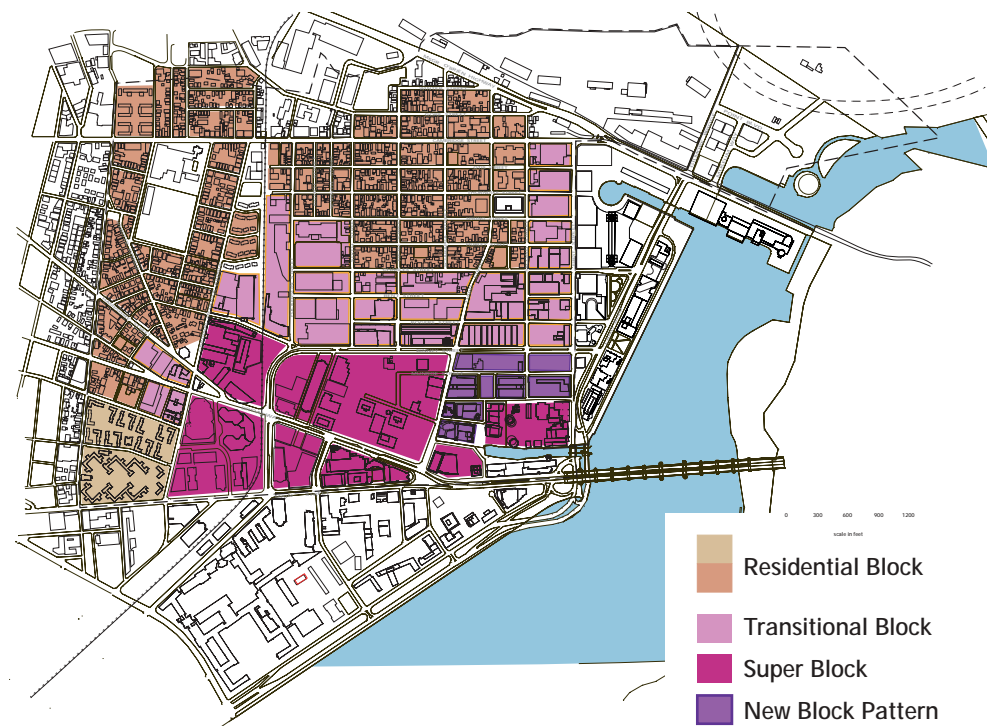
The East Cambridge neighborhood, one of the oldest residential areas in this part of the city, is bounded by the Cambridge/Somerville line to the north, the Charles River to the east, Broadway to the south, and the rail right-of-way to the west. The block pattern reflects the historic grid laid out in the early 1800s, with classically scaled blocks that are approximately 200 feet wide by 400 feet long. The size of these blocks creates a walkable, pedestrian-scale environment. In particular, the size of the blocks affords pedestrians choices of route within a short distance, and the orientation of the blocks creates long south-facing (and north-facing) frontages. The historic Bulfinch Courthouse and adjacent civic buildings are important landmarks anchoring the eastern edge of the neighborhood. The Middlesex County Courthouse, a modern tower located south of the Bulfinch complex, is out of scale with the surrounding context of smaller residential buildings. The Kennedy School and Ahern Field, as well as the skating rink and Gold Star Mothers Park, demonstrate the positive interactions of civic uses adjacent to open space. The commercial spine of Cambridge Street, lined with shops and restaurants, is the primary east-west connector and in many ways the “main street” of the community.

WELLINGTON/ HARRINGTON

The Wellington-Harrington neighborhood is bounded by the Cambridge/Somerville line to the north, the railroad tracks to the east, and Hampshire Street to the south and west. In contrast to the regular street pattern found in East Cambridge, Wellington/Harrington includes a mix of rectangular, square, and triangular blocks of varying sizes. The scale and character of development change dramatically as one moves east towards Kendall Square, with small wood-frame houses giving way to



Focus Areas



Block Pattern

the refurbished brick factory buildings and new offices east of Cardinal Medeiros Avenue. The shops, restaurants and offices at One Kendall, with their interconnected pedestrian spaces and street-level windows, create a vibrant center of activity that draws both residents and visitors. Further north, Cambridge Street forms a continuous retail corridor connecting Wellington/ Harrington with East Cambridge and Inman Square. The Harrington School, Donnelly Field and Frisoli Youth Center create an important place for community activity.

AREA IV

The Area IV neighborhood is bounded by Hampshire Street to the north, the railroad tracks to the east, Massachusetts Avenue to the south, and Prospect Street to the west. North of Harvard Street, Area IV includes traditional one-and two-family houses in close proximity to large-scale office buildings. The large block of office development between Broadway and Main Street limits the number of east-west connections from the neighborhood to Kendall Square. South of Harvard Street are Newtowne Court and Washington Elms, refurbished public housing developments made up of garden-style apartments on two consolidated city blocks. Main Street, running through the lower portion of the neighborhood, serves as the primary connector to both Kendall Square and Central Square. The green space and recreational facilities at Harvard Street Park create a cluster of activity that is reinforced by a row of small shops at the intersection of Broadway and Market Street.

TRANSITION AREAS

The Transition Areas include a broad swath of commercial and industrial development separating the residential neighborhoods from Kendall Square and the Lechmere Canal. Historically, these areas approximately mark the shoreline that was filled to create new land for industrial development in the 1800s. This is an area of transitions, both of use as well as scale. The current proximity of residential and industrial uses raises issues of noise from mechanical equipment, visual and noise impacts

of loading docks, peak-hour traffic headed to and from offices, in addition to the greater bulk of commercial and industrial buildings adjacent to the fine grained triple-decker residential fabric.

For purposes of this study, the blocks that form a U-shape around East Cambridge are referred to as Transition Area A, while the blocks extending south along the eastern edge of Wellington/ Harrington and Area IV are referred to as Transition Area B. The block pattern in Transition Area A is an extension of the East Cambridge grid, though the individual lots are much larger. In contrast, Transition Area B is made up of large blocks with few connecting through streets. The size and scale of buildings in the Transition Areas vary widely, from one-story industrial sheds to massive telecommunications towers. Several historic buildings, including American Twine and Worthington Place, have been preserved and still retain their unique industrial character.

KENDALL SQUARE

Kendall Square is the office/R&D core of Eastern Cambridge, centered on the transit station, Marriott Hotel, and the shops and restaurants along Main Street. The majority of development in Kendall Square dates from the 1970s and 1980s, when vacant factories and warehouses were torn down and replaced with new office buildings. The brick building and clock tower on Main Street, one of the few remaining industrial structures, is a reminder of the massive industrial infrastructure that once existed. Today, Kendall Square may be characterized as composed of large blocks, wide roadways, and large buildings surrounded by green space and parking. The Volpe Center illustrates this urban form, with a series of self-contained buildings, parking lots, and lawns that bear little relationship to their context. The 20-acre site, equivalent in size to eight East Cambridge residential blocks, acts as a barrier to pedestrian movement between the neighborhoods and Kendall Square. In contrast, Main Street offers many of the elements of

a thriving commercial district, including a transit station, pedestrian plaza, and a variety of shops, cafes, and restaurants. The internal food court at Kendall Square draws a significant amount of activity away from the street, however, making the area feel less lively. In addition, the street-fronting retail lacks critical mass, and has only limited continuity along both sides of the street.

NORTH POINT

North Point is a triangular area approximately sixty acres in size, bounded by the Somerville and Boston City lines to the north, the Charles River Basin to the east, and Monsignor O'Brien Highway to the south and west. The site is isolated by high-speed roadways, rail yards, and water, with only one north-south connection at the Gilmore Bridge. At the same time, the sheer amount of land, its proximity to transit and future open space, and excellent views of Boston make it a likely site for development. North Point comprises two distinct areas on either side of the Gilmore Bridge: to the west, rail yards and warehouses predominate, and the area is used for shipping and truck operations. Immediately east of the Gilmore Bridge are Museum Towers (a 435-unit residential development) and the E.F. office building. An MWRA pumping facility is also located east of the bridge, with additional land owned by the state with uses still to be determined. North Point Park, currently under development as part of the New Charles River Basin master plan, will occupy the eastern edge of the site along the water. Additional parkland, the North Point Wilds, is also planned for the area.

Based on the analysis of existing urban design conditions in Eastern Cambridge, several key themes and opportunities emerge for future planning:

- The historic block pattern of East Cambridge creates a walkable, pedestrian-scale environment, and is a useful model for large development sites.
- The creation of pleasant and accessible neighborhoods is closely tied to the continuity of pedestrian connections, emphasizing the importance of connecting to existing street grids and pathways.

- More gradual changes in scale and massing in the Transition Area can help to improve the connections between residential neighborhoods and Kendall Square.
- Well-designed civic buildings such as the Bulfinch Courthouse on Cambridge Street play a key role in the image and identity of existing neighborhoods, and should be established in new development areas, where possible.
- The location of open space adjacent to other community facilities creates a strong interaction of uses that supports community life.
- Well-defined street walls, human-scale buildings, and windows at street level are essential to creating an attractive pedestrian environment.
- A critical mass of street-level retail is important in creating lively commercial districts serving adjacent development, and should be encouraged where appropriate.

OPEN SPACE

The first public open spaces in Eastern Cambridge were created in the residential neighborhoods and along the riverfront. The Charles River is also an important open space resource for adjacent neighborhoods and the larger community. North Point Park will provide a major new public open space, and enhance accessibility to the water's edge. The current open space inventory for Eastern Cambridge includes*:

- Tot lots and playgrounds: Hurley Playground, Kennedy School/Ahern Field, Costa Lopez/Taylor Park, Gannett Warren Pals Park, Gold Star Mothers Park, Harrington School/ Donnelly Field, Harvard Street Playground, Market Street Playground, Charles Park and Silva Park.

- Neighborhood / Community Parks: Gold Star Mothers Park, Harrington School/ Donnelly Field, and Kennedy School/ Ahern Field.

The existing residential neighborhoods offer very few potential sites for new public open space. As a result, major new parks and recreational facilities will likely need to be located outside the existing neighborhoods. Strong pedestrian and bicycle connections will be essential to link these parks with existing residential areas.



Open Space Analysis

North Point and the Volpe Center offer the most viable opportunities for creating significant new open space in Eastern Cambridge. It will be essential to consider broad community open space needs when planning for these areas. The March 2000 Report of the Green Ribbon Open Space Committee identified the following additional needs for public open space in Eastern Cambridge:

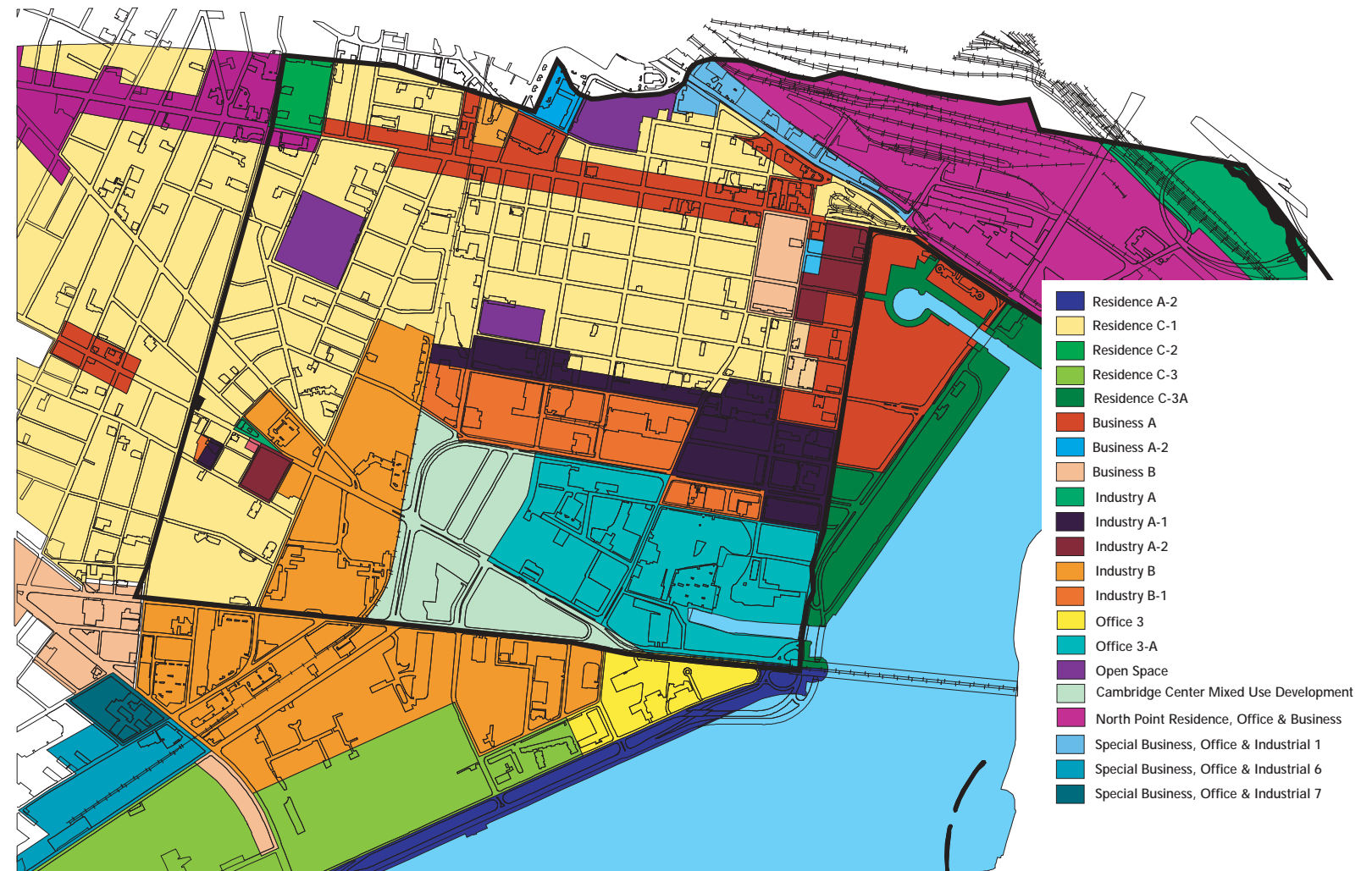
- A neighborhood and community park for Area 4
- A multi-use path along the Grand Junction railway right of way
- Three to four multipurpose fields
- A bike and pedestrian path connection between North Point and the Linear Park through Davis Square
- A tot lot for North Point
- A neighborhood or community park for East Cambridge or North Point

Land Use and Zoning

Historically, Eastern Cambridge has been characterized by tightly-knit residential neighborhoods surrounded by industrial uses. In the last half of the 20th century, a decline in industry produced large parcels of vacant and underused property south of Binney Street. Land clearance for urban renewal after World War II created vast areas of open land around Kendall Square,

EXISTING AND PERMITTED DEVELOPMENT IN EASTERN CAMBRIDGE

LAND USE TYPE	TOTAL GFA (SQ. FT.)	% OF STUDY AREA TOTAL
Office and R&D	7,868,201	40.1%
Residential	4,803,755	24.5%
Industrial	2,304,151	11.8%
Mixed Use	2,261,439	11.5%
Parking	1,307,185	6.7%
Other	730,402	3.7%
Retail, Service & Entertainment	301,936	1.5%
Institutional	26,345	0.1%



in anticipation of future development. Over the past thirty years, Eastern Cambridge has emerged as a nationally prominent center for high-tech business and research, leading to the conversion of numerous industrial sites into office and R&D uses. This has produced a land use pattern of moderate-density residential neighborhoods surrounded by high-density commercial and residential development.

The Eastern Cambridge project area includes 21 different zoning districts, the significant majority of which are commercial or industrial zones. However, the Residence C-1

district is the largest single zone within the study area, and includes most of the old residential neighborhoods in East Cambridge, Wellington/ Harrington, and Area IV. The numerous zoning districts mirror the diversity of land uses within the project area. Residential densities in the Residence C-1 district are fairly uniform, with a Floor Area Ratio (FAR) of approximately 0.7 that reflects the traditional housing stock of one and two-family homes. Office/ R&D densities typically range between FAR 1.0 and 3.0, with the highest densities at Kendall Square approaching FAR 6.0.

Eight major development projects are currently underway in Eastern Cambridge. These projects were permitted prior to the passage of the moratorium in January 2000. In total, these projects comprise 3.2 million square feet of new development and 3,300 additional parking spaces. Approximately three quarters of this new development is office and/or research and development space, one tenth is housing, while the remainder is made up of telecommunications facilities, retail, and hotel space. These projects will significantly shift the overall land use mix in Eastern Cambridge, increasing the proportion of office/R&D uses from 33 percent to 40 percent of total gross floor area (GFA) in the Study Area.

CURRENT DEVELOPMENT PROJECTS IN EASTERN CAMBRIDGE

PROJECT	DEVELOPMENT AREA (SQ. FT)	USE (SQ. FT.)	PARKING SPACES
210 Broadway	70,000	70,000 office	70
Tech Square	599,000	599,000 office	622
Biogen	210,000	210,000 office/R&D	0
Amgen	285,000	285,000 office/R&D	0
286 Third Street	128,000	126,000 office 2,000 retail	1,667
300 Bent Street	61,000	61,000 office	100
Thypin Steel:			
• 170 Fulkerson	135,000	113,000 telecom 22,000 office	N/A
• 157 Sixth	365,000	185,000 telecom 180,000 R&D	N/A
Cambridge Research Park	1,370,000	200 residential units 300 hotel rooms 76,000 retail 850,000 office	2,238
TOTAL	3,223,000	2,403,000 office/R&D 298,000 telecom 78,000 retail 200 residential units 300 hotel rooms	4,697

FUTURE DEVELOPMENT POTENTIAL

In order to better understand the potential for future development in Eastern Cambridge, it is useful to compare projected growth under existing zoning and Citywide Rezoning proposals for Eastern Cambridge. In both scenarios, the existing residential neighborhoods and core commercial areas are unlikely to experience significant new growth in the foreseeable future. The analysis is therefore focused on three areas where major new development is likely to occur: North Point, the Volpe Center, and the Transition Areas between existing neighborhoods and Kendall Square. Under existing zoning regulations, in place during the moratorium, approximately nine million square feet of new residential and commercial development is projected to be built in Eastern Cambridge over the next twenty years. This represents an increase of 45 percent over existing and permitted GFA. New development at North Point alone represents approximately 50 percent of this predicted growth, while the Volpe Center accounts for an additional 30 percent.

20-YEAR BUILD-OUT COMPARISON*

	EXISTING ZONING			CITYWIDE REZONING			PS PROPOSAL		
	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
North Point	851,000sf (19%)	3,574,000sf (81%)	4,425,000sf	851,000sf (19%)	3,574,000sf (81%)	4,425,000sf	992,000sf (27%)	2,695,000sf (74%)	3,687,000sf
Volpe Center	1,127,000sf (62%)	1,804,000sf (38%)	2,931,000sf	564,000sf (19%)	2,367,000sf (81%)	2,931,000sf	675,000sf (26%)	1,873,000sf (74%)	2,548,000sf
Transition Areas	1,283,000sf (85%)	226,000sf (15%)	1,509,000sf	385,000sf (85%)	68,000sf (15%)	453,000sf	113,000sf (11%)	950,000sf (89%)	1,063,000sf
Total	3,261,000sf (37%)	5,604,000sf (63%)	8,865,000sf	1,800,000sf (23%)	6,009,000sf (77%)	7,809,000sf	1,781,000sf (24%)	5,518,000sf (76%)	7,299,000sf

* Based on a market analysis conducted for the Eastern Cambridge Planning Study, 20-year growth potential represents build out of 55% of total growth potential at North Point, 90% of total growth potential at the Volpe Center, and 62% of total growth potential in the Transition Areas.

Under the Citywide Rezoning Petition, approximately eight million square feet of new development was projected to occur in Eastern Cambridge over twenty years. More significant, however, was the shift from commercial to residential use. The proposed Citywide Rezoning would have reduced new commercial development by thirty percent compared to existing zoning, and would have increased residential development by nearly ten percent.

The ECaPS zoning proposal remains consistent with goals of the Citywide proposal to provide strong incentives for residential development and reduce commercial FARs to address peak hour traffic impacts. Under the ECaPS proposal, over seven million square feet of development is expected in the study area over a twenty year period, with over three-quarters being housing and a quarter as office and R&D development. The charts on this page and the following represent projected new development in twenty years for North Point, the Volpe Center Area, and the Transition Areas under existing zoning and under the zoning recommendations of this study and the amount of housing anticipated under these zoning recommendations. See Appendix B for additional details.

20-YEAR HOUSING PROJECTIONS UNDER ECAPS PROPOSAL

AREA	NUMBER OF HOUSING UNITS
North Point	2,160
Volpe Center	1,500
Transition Areas	760
TOTAL	4,420

* Calculation based on an average unit size of 1,250 sq. ft. per unit

* Based on a market analysis conducted for the Eastern Cambridge Planning Study, 20-year growth potential represents build out of 55% of total growth potential at North Point, 90% of total growth potential at the Volpe Center, and 62% of total growth potential in the Transition Areas.

OPPORTUNITIES

Opportunities in Eastern Cambridge that should guide future planning efforts are as follows:

- North Point and the Volpe Center area provide an opportunity for the development of significant amount of residential and new neighborhoods in areas previously dominated by industrial and commercial uses.
- Affordability of housing for a variety of income groups has become an issue in Eastern Cambridge, as in the rest of the City. Development of large amounts of housing offers the opportunity to create a significant amount of affordable housing, as required by the City's inclusionary ordinance.
- Commercial development, particularly retail, will be required to support the new residential development and to create vibrant and lively mixed-use neighborhoods. Areas close to the Lechmere T-station in North Point and along Third Street in the Volpe Center offer particularly attractive areas for development of neighborhood-serving retail.
- The areas of new development and redevelopment of existing areas offer opportunities for creation of appropriate transitions in height and uses between the low-scale residential neighborhoods and the higher scale development in Kendall Square and along the riverfront. The Transition Areas, particularly, offer the potential for creation of more residential uses over time, close to the existing neighborhoods.

Real Estate Market

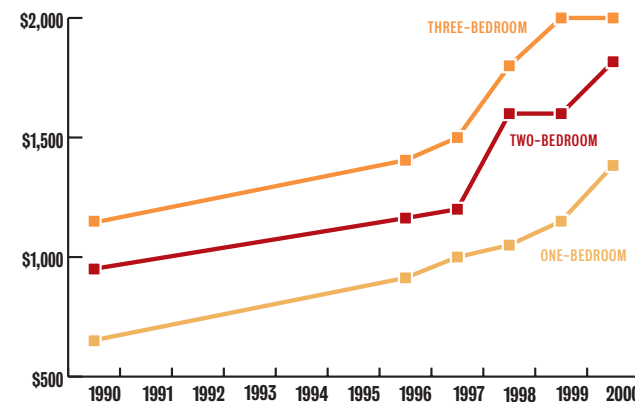
HOUSING

RENTAL HOUSING MARKET CONDITIONS

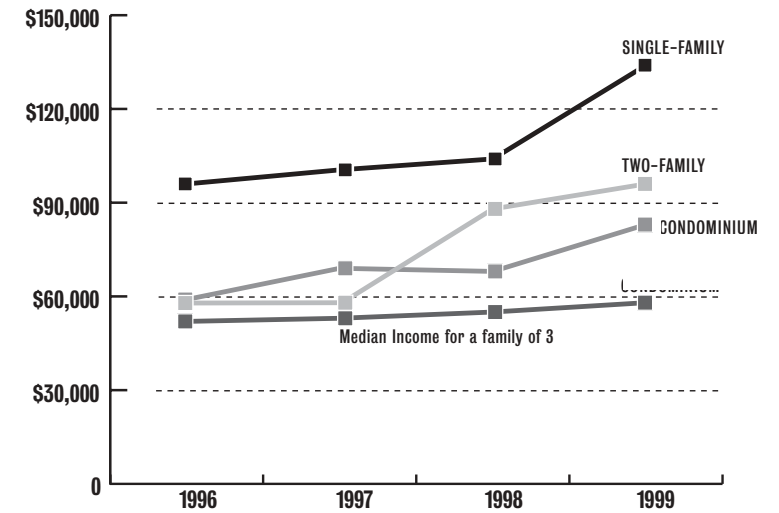
Construction of new rental housing in Cambridge was slow from 1975 through 1995, while rent control was in effect. In the 1980s and early 1990s, most new construction consisted of high-end condominiums. The limited supply of rental housing has created a long-term supply and demand imbalance, with demand greatly exceeding supply. The problem is particularly acute in the moderate and low-income tiers of the rental apartment market.

The 1990 Census found that 70 percent of Cambridge's occupied housing units were renter-occupied. Between 1996 and year-end 1999, 1,325 units were added to the Cambridge housing supply; the vast majority of these (over 80 percent) were rental apartment units. Despite this construction activity, the rental vacancy rate fell from 1.3 percent in 1997 to 0.9 percent in 2000, while median rents continued to rise. The chronic undersupply of rental housing has caused rental rates to increase significantly; between 1996 and 1999, Cambridge rents increased at a compounded annual rate of 6 percent. During the past year, rental rates have risen by 10 to 20 percent. Rental price increases are expected to continue at a slower rate through 2003.

CAMBRIDGE ANNUAL AVERAGE RENTS, 1990-2000



CAMBRIDGE MEDIAN INCOME AND MINIMUM INCOME REQUIRED TO PURCHASE A HOME, 1996-1999



FOR-SALE HOUSING MARKET CONDITIONS

The for-sale housing market is also characterized by high demand and limited additions to supply. This demand is fueled by a series of factors that will continue to put pressure on local markets for the foreseeable future, including:

- Rising prices elsewhere in the metro region
- The presence of a wide range of well-paid employment opportunities
- The attraction of Cambridge as a desirable urban community for those who seek an alternative to the suburbs

On the supply side, the greatest impediments to both market-rate and affordable housing production are the limited availability of sites and the high cost of land and construction. These conditions have led to low vacancy rates (less than 1 percent) and rapidly escalating prices similar to conditions found in several of Boston's near-downtown neighborhoods. Cambridge sale prices have increased dramatically in nearly every housing type and every neighborhood over the past five years.

Given the price of Cambridge land and the lack of availability at any price, condominium development has been the predominant for-sale housing type for new construction over the past thirty years. As a result of recent pricing pressure in

PERCENT CHANGE IN CAMBRIDGE MEDIAN HOUSE PRICES: 1994-1999

CHANGE IN MEDIAN PURCHASE PRICE 1994-1999	SINGLE- FAMILY	TWO- FAMILY	THREE- FAMILY	ALL 1- TO 3- FAMILY	CONDOS
East Cambridge	45%	59%	148%	54%	-1%
Wellington/Harrington	64%	50%	87%	60%	83%
Area 4	100%	65%	120%	109%	50%
Citywide	39%	75%	89%	70%	49%

the for-sale housing market, some types of housing (notably luxury condominiums) in some locations (prime sites near public transportation, educational institutions and other amenities) can compete with office and R&D for land. Expanding the supply of new housing is not likely to reduce price pressures significantly, since the high cost of construction will continue to dictate that new housing is developed at or near the top of the market.

Between 1995 and 2000, housing prices in Eastern Cambridge increased faster than in the rest of the city. In contrast, the area remains among the city's most affordable areas for one to three family homes. Housing affordability in Eastern Cambridge is expected to become a greater challenge over the next several years as median home prices move further beyond the reach of median-income households.

Eastern Cambridge experienced a sharp increase in demand for a wide variety of housing types over the past five years, from single-family to high-rise condominiums. In combination with the high cost and scarcity of land, this has produced a vacancy rate of less than one percent and a dramatic surge in rental rates and median house prices. At the same time, median incomes have not kept pace with rising housing costs, putting more housing out of reach for middle and low-income households. As a consequence of price increases, high-end condominiums in prime locations have become competitive with office and R&D uses for land.

The City's Inclusionary Zoning ordinance requires developers of any new or converted residential development with ten or more units to provide 15% of the total number of units as

affordable housing. It is, therefore, expected that the ECaPS zoning proposals, which strongly encourage residential development throughout the study area, will result in the development of significant new affordable housing in the area.

OFFICE AND R&D

REGIONAL COMMERCIAL MARKET OVERVIEW

The demand for commercial property is a function of employment growth, which under most conditions rises and falls directly with overall economic growth. The City of Boston is the twentieth largest city in the nation, and the seventh largest Consolidated Metropolitan Statistical Area (CMSA). The unemployment rate in the Boston CMSA has been consistently below national averages since 1993. The Cambridge unemployment rate has been below the national average since 1990, dropping to 1.9 percent in 1998 and 1.3 percent in May 2000.

Eastern Cambridge has approximately as many jobs as it has residents. Like the rest of the City and Boston, it provides employment and income for an area that extends well beyond its borders. Projections of employment by industry sector provide an indicator of expected demand for various types of commercial property over the next five years. Service employment in Massachusetts is projected to grow 1.8 percent annually, twice the growth rate of overall employment. Business services, engineering and consulting will lead this sector, with a 3.3 percent growth rate projected through 2004 by the New England Economic Project (May 2000).

The Massachusetts economy as a whole is expected to grow more slowly over the next several years than it did during the 1990s, principally due to a shortage of skilled labor. This shortage is due in part to the accelerated inflation of housing prices. Price inflation is a major risk to the Massachusetts economy, as the accompanying wage inflation is likely to increase the number of firms that will seek less expensive locations.

The regional economy also faces risk from the demand side. The Boston region's specialization in money management, financial services and business investment supply industries makes it particularly vulnerable to either stock market losses or rising interest rates. This risk factor comes with associated costs of greater uncertainty that must be taken into account in both public policy and private sector decision-making.

In sum, the New England Economic Project's employment growth projections through 2003 indicate a continuation of demand for commercial space, albeit at lower levels than experienced in the 1990s.

CAMBRIDGE COMMERCIAL MARKET OVERVIEW

The Second Quarter 2000 Greater Boston office market conditions were very strong, with a direct vacancy rate of 1.7 percent in the Central Business District (CBD). The Cambridge market, which comprises roughly 16 percent of the Boston area non-Central Business District (CBD) office market, had a direct vacancy rate of 0.5 percent. With the decline in the Internet economy, the vacancy rate in Cambridge has increased to 17% in the second quarter 2001 as a number of businesses have downsized.

The Cambridge office market is divided into three sub-markets: Eastern Cambridge, Harvard Square and Alewife. The Eastern Cambridge market includes approximately 8.5 million square feet, representing more than 70 percent of the Cambridge market. The attractiveness of the Eastern Cambridge market stems in large measure from its proximity to MIT, which provides one of the most skilled workforces in the country, as well as access to downtown Boston and the Longwood Medical Area. In combination with constraints on supply, these factors contributed to driving office and R&D vacancy rates very low and establishing rental rates and land prices that were among the highest in the country.

The dramatic growth of the biotech industry over the past ten years has contributed to increasing market pressures for R&D space in Eastern Cambridge. Three leading biotechnology companies are currently located in Eastern Cambridge: Amgen Inc., Biogen Inc., and Genzyme Corporation. Together, these three companies produce five of the industry's ten best-selling products, according to a 1999 Ernst and Young report. Developers are currently investing approximately a billion dollars to build more than three million square feet of new research labs in Cambridge, more than doubling the city's supply of R&D space. Most of this space will be built near Kendall Square, where five new research buildings totaling 1.2 million square feet are under construction or were recently completed. Additionally, as of July 2001, four other projects totaling 2.1 million square feet received approvals in the immediate neighborhood. Even with this new construction, the upward pricing pressure, particularly in the biotech sector is expected to continue.

By the middle of 2000, the Cambridge commercial office/R&D market consisted of 11,907,646 square feet of floor space. From the end of 1999 to the Second Quarter of 2000 the average office rental rate had increased from \$40.50 to \$50.56 per square foot – an increase of nearly 25 percent in six months. Price increases in 1999-2000 precipitated a striking difference between businesses and research facilities that could afford to locate in Eastern Cambridge before 1997 and those that can afford it today. Inexpensive office/R&D locations once offered by warehouse conversions have been filled up, and new start-up companies often have to look for space outside Eastern Cambridge. While this trend has changed subsequently with the slowing of the Internet economy, the biotech sector remains strong and in the long term this area is expected to continue to be attractive to the office and R&D sector.

RETAIL

RETAIL ACTIVITY IN EASTERN CAMBRIDGE

The ECaPS retail analysis surveyed existing retail in the study area and aimed to identify additional retail demand consistent with the study's vision to create a vibrant, mixed-use community. Retail in Eastern Cambridge is predominantly clustered in four areas: the neighborhood shops, services and restaurants along Cambridge Street, which are characterized by low rents and sales volumes; the high-tech center of Kendall Square, characterized by high rents and sales volumes; the region-serving CambridgeSide Galleria mall and nearby shops on First Street; and the mixed-use retail, restaurant and entertainment center at One Kendall Square. In total, these areas comprise approximately 1 million square feet of retail space. A new mixed-use retail and entertainment center is currently under development at Cambridge Research Park, and will add 70,000 square feet of retail/ multifunctional theater space to the existing inventory. The distribution of retail by floor area in Eastern Cambridge is shown below.

EXISTING RETAIL

LOCATION	RETAIL FLOOR AREA (SQUARE FEET)
Cambridge Street	129,950
Neighborhoods	67,175
Kendall Square	100,500
First Street	52,950
One Kendall Square	51,450
Cambridge Research Park (permit granted)	70,000
Galleria	662,000
Total	1,134,025

Excluding the CambridgeSide Galleria mall, retail in Eastern Cambridge primarily consists of professional services, restaurants/cafes, and general retail. These are largely neighborhood-serving uses that draw customers from the local area. The distribution of retail by type of use is represented in the following table:

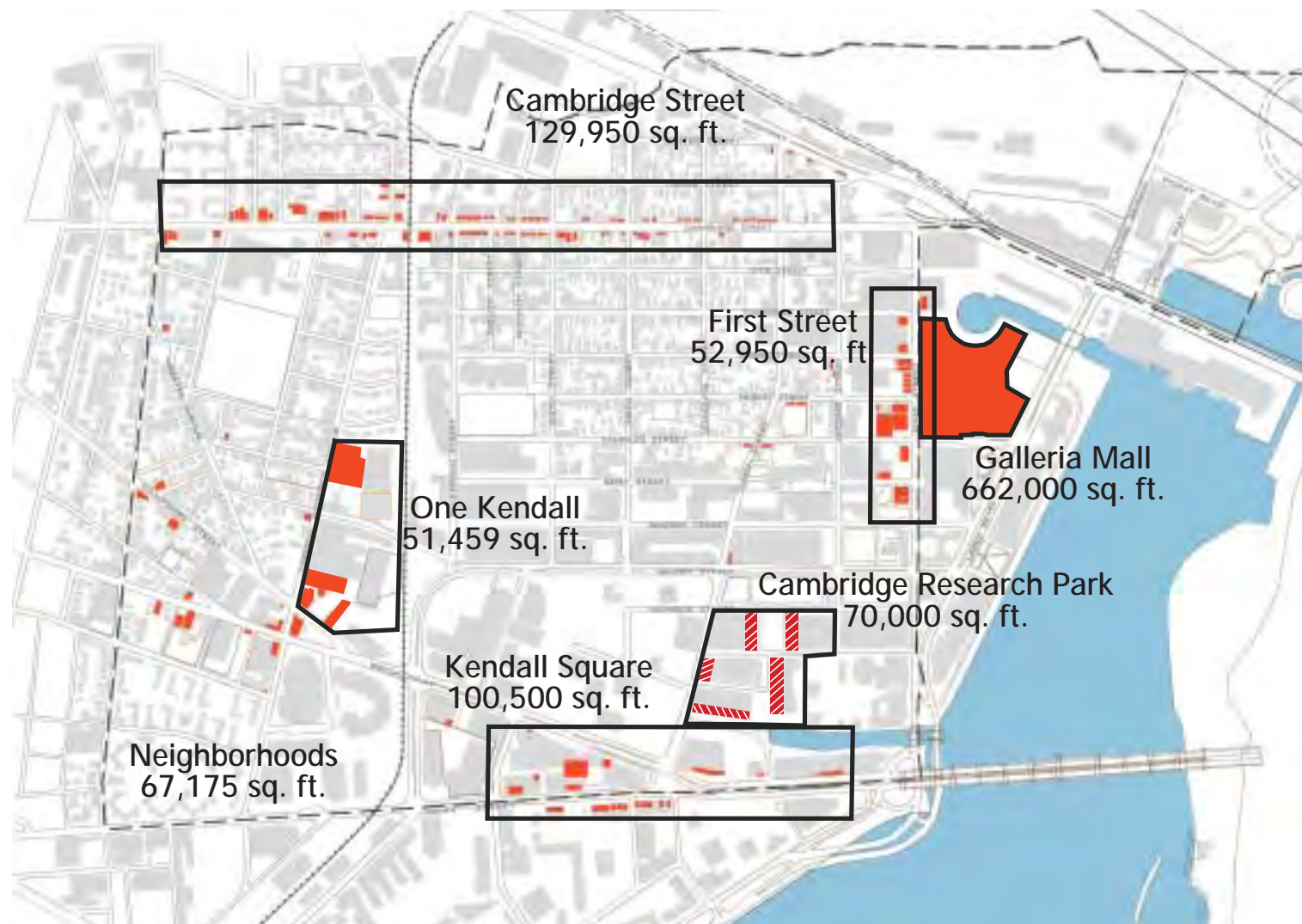
RETAIL IN EASTERN CAMBRIDGE

TYPE OF RETAIL	AREA (SQ. FT.)*	AS PERCENT OF TOTAL
Professional Service	114,150	28%
Restaurant/Café	108,775	27%
General Retail	79,600	20%
Cinema	37,000	9%
Salon	28,000	7%
Auto-Related Use	21,025	5%
Bakery/Market	13,475	3%
Total	402,025	100%

* Excludes CambridgeSide Galleria and Cambridge Research Park

(Source: Byrne McKinney / Goody Clancy & Associates Analysis, Fall 2000)

Retail activity in Eastern Cambridge falls into three general categories, based on the source of demand: regional retail, employment center retail, and neighborhood retail. The CambridgeSide Galleria mall and national chain stores on First Street serve primarily a regional market. Smaller stores and eating establishments on First Street target neighborhood residents, employees, as well as people drawn to the mall. Retail establishments in Kendall Square cater primarily to employees in the immediate area. Kendall Square is essentially a nine-to-five, weekday market. Despite its large employment population, it has not yet achieved the critical mass necessary to support extensive street-level retail. Additional residential development in the area would help provide the clientele for seven-day retail. Cambridge Street and One Kendall Square serve a mix of local residents and employees, as well as visitors from elsewhere in the city. Finally, small shops scattered throughout the neighborhoods provide goods and services to local residents.



Location of existing and proposed retail

While existing retail serves a large number of the residents' needs, there are certain types of retail that are lacking. Additional convenience retail was identified as a need for the study area by the Committee as well as the public at the community workshops. Furthermore, future development at North Point and the Volpe Center area is likely to create additional need for this sector, which includes cafes, dry cleaners, small grocery stores, and similar neighborhood-serving retail. It is projected that the new North Point development

would be able to provide the critical mass of development to attract this new retail to the area, including to Cambridge Street. Initial development is likely to occur in North Point and serve the new neighborhood developed there. Over time, particularly with the moving of the Lechmere Station, this retail is likely to establish a stronger connection to Cambridge Street, strengthening the retail on Cambridge Street in the process.

While retail is allowed elsewhere in the study area, it is felt that North Point and the Volpe Center area would be the most likely locations for new retail to flourish due to significant additional residential and commercial development anticipated here. It is felt that new retail in the area should be in service of the neighborhood, and should not focus on drawing people from outside the neighborhood.

OPPORTUNITIES

Opportunities in Eastern Cambridge that should guide future planning efforts are as follows:

- The parity of land values for residential and commercial development in Eastern Cambridge offers an unusual opportunity to shift to residential use without sharply reducing land values, a prospect that would not have been viable five years ago.
- The continuing strength of the biotech sector suggests an opportunity for use of R&D office space within the Eastern Cambridge area by the biotech companies which are already located in the area.
- A significant increase in housing around Kendall Square, in combination with the proposed multifunctional theater complex at Cambridge Research Park, can be expected to increase the demand for restaurants and related entertainment that will extend the vitality of the area into the evening. With enough additional residential development, the area could gain a market for 18-hours-a-day, seven-days-a-week convenience retail, restaurants and services that benefit both the employee population and current residents.

Transportation

Regional roadway access to the Eastern Cambridge Planning Study area is provided by Monsignor O'Brien Highway and the Gilmore Bridge to I-93 in the north; Binney Street, Land Boulevard, and Memorial Drive to I-90 in the west; and the Longfellow Bridge and Monsignor O'Brien Highway to I-93 in the south. The map below shows the study area in its regional context. More local access is provided by Main Street, Broadway, Hampshire Street, and Cambridge Street.

Transit service is provided by the Red and Green Lines on the southern and northern edges of the study area respectively, also as shown in the map below. The area is also served by several MBTA bus routes. Privately operated shuttle buses serve some major employers, and 'The Wave', a bus provided by the Galleria and serving the public, shuttles between the Kendall T-station and the CambridgeSide Galleria mall.

The City's transportation policies and projects are guided by the Vehicle Trip Reduction Ordinance (VTRO), a municipal



ECaPS study area in regional context.

ordinance passed in 1992. The Parking and Transportation Demand Management (PTDM) ordinance requires programs to reduce single-occupancy vehicle travel for non-residential parking facilities. Both ordinances promote alternatives to single-occupant auto travel to reduce congestion and pollution and maintain the livability of Cambridge.

However, the prospect of considerable new development concentrated in specific parts of the study area – North Point, the Volpe Center site, and the Transition Areas – coupled with the trend towards increased car-ownership, has generated growing concern about cumulative impacts to the transportation system and growth of auto traffic within the neighborhoods. The degree to which non-auto mobility can be enhanced and vehicular access and off-street parking controlled play a significant role in determining the scale of these potential impacts.

TRAFFIC ANALYSIS

Similar to the transportation analysis done in connection with the Citywide Rezoning, two baseline conditions are considered in this study, existing conditions and permitted conditions. "Existing conditions" refers to 1998 (the year for which the most comprehensive and consistent set of transportation data is available), while "permitted conditions" refers to conditions that will prevail when projects for which building permits issued as of July 2001 are operational. It is important to address both of these conditions because there are almost 3.3 million square feet of development that have received permits and are likely to be occupied over the next few years. These developments have been subject to special permit transportation mitigation requirements that address conditions at

several locations in the study area.

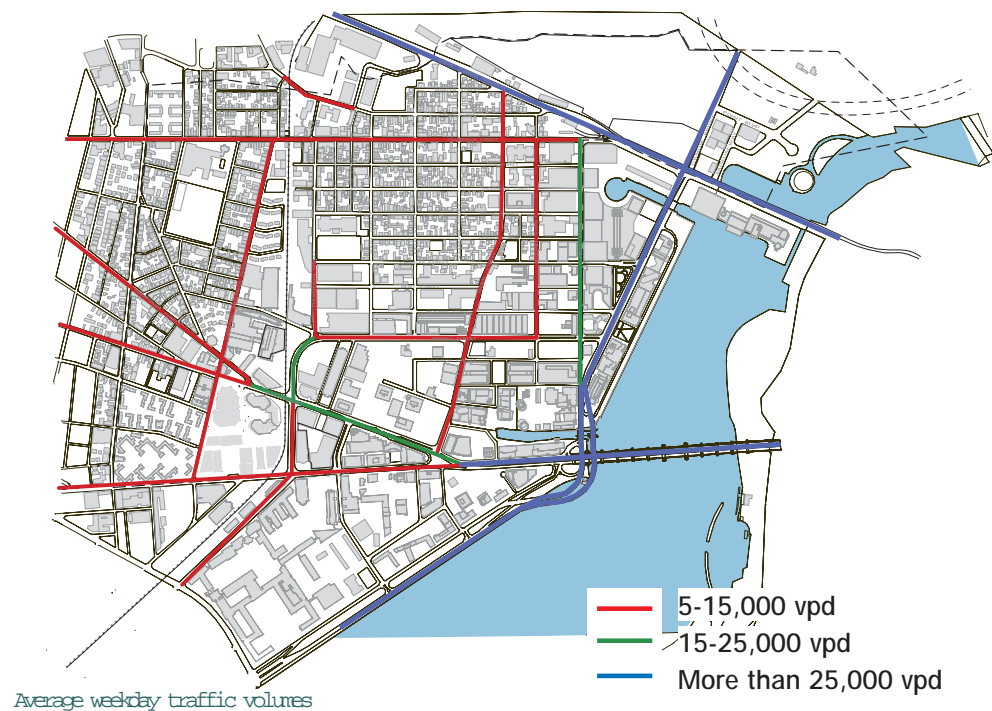
"Future conditions" includes existing conditions, development that is already under way, and ECaPS 20-year projections for development in the study area. Substantial data and analysis are available from other studies to facilitate the transportation analysis.

TRAFFIC VOLUMES AND CIRCULATION

The geography, the configuration of arterial roadways, the presence of the Grand Junction railroad corridor through the heart of the study area, and the distribution of land uses in the study area result in a much higher level of vehicular traffic on corridors running in the north-south direction than in the east-west direction. The lack of continuous east-west connections across parts of the study area protects the neighborhood streets from traffic to some extent, forcing it to use the east-west arterials – Binney Street, Hampshire Street, Broadway and Main Street. The median on Binney Street west of Third Street deters some north-south traffic from percolating through East Cambridge, resulting in heavier volumes on Third Street, First Street, Land Boulevard, and Cardinal Medeiros Avenue.

According to the 1990 US Census, driving alone as a mode of travel to work for commuters living in the study area varied from 34.1% in the Kendall Square area to 45.9% in the North Point area. Also, according to the 1990 Census, the drive-alone share of commuters working in the study area varied from 63.8% near the Twin City Mall to 54% in the Kendall Square area. According to recent data, the drive-alone share of commuters working in the heart of Kendall Square has dropped to 43%*. 2000 US Census update of the Cambridge Journey to Work data is expected to be available in 2003.

*Survey of Kendall Square Urban Renewal Area as reported in Fay, Spofford and Thorndike's Traffic Count Program and Trip Generation Analysis Annual Report, 2000.



Average weekday traffic volumes (AWDT) are presented in the above plan. As can be seen, three streets at the periphery of the study area carry traffic exceeding 25,000 vehicles per day (vpd) and provide regional access: Land Boulevard/Memorial Drive, Monsignor O'Brien Highway, and Main Street/Broadway (as it crosses the Longfellow Bridge into Boston). Only five of the other streets in the study area (Broadway, Cambridge Street, Hampshire Street, Binney Street, Gore Street) carry more than 15,000 vpd. These provide connections to the other neighborhoods in Cambridge and Somerville. Most of the remaining streets in the area that connect to other neighborhoods carry less than 15,000 vpd.

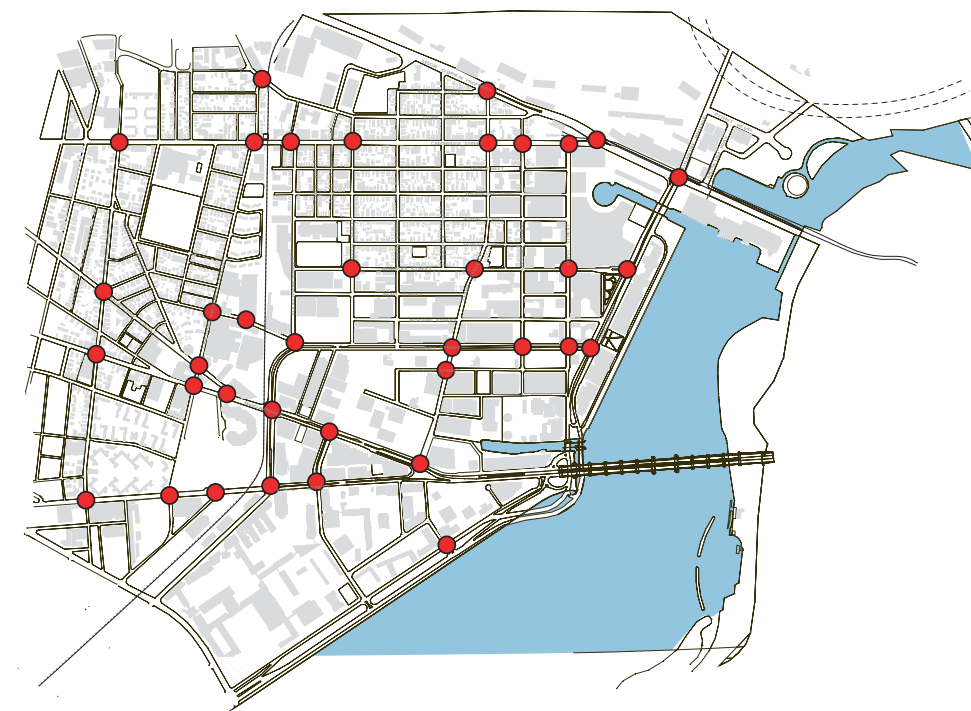
The local streets carry less than 5,000 vpd. Third Street and the southern two-way section of Fulkerson Street are exceptions as they provide north-south connections between Kendall Square and Monsignor O'Brien Highway.

Neither First Street, the City's preferred route for traffic headed from Monsignor O'Brien Highway to the Kendall Square area, nor Second Street, connect directly to Monsignor O'Brien Highway. Third Street, on the other hand, does run directly from Monsignor O'Brien Highway to Broadway. As a result, there are significant turning volumes at the Monsignor O'Brien Highway / Third Street intersection. The dominant directions are the right turn to Third Street in the AM peak hours and the left turn to Monsignor O'Brien in the PM peak. Under year 2005 permitted conditions, the projected peak hour demand for each of these moves would exceed 900 vehicles.

Fulkerson Street is two-way between Charles Street and Binney Street. Currently, the intersection of Fulkerson, Little Binney, and Binney streets provides for all movements between these streets and westbound Binney Street. Observations show that a significant amount of traffic headed to Kendall Square cuts through the Twin City Mall and uses Fulkerson Street to head south. Hence, Fulkerson provides a connection between Monsignor O'Brien Highway and the One Kendall Square Garage on Little Binney as well as westbound Binney Street.

**TRAFFIC OPERATIONS:
LEVEL OF SERVICE AND
CRITICAL MOVEMENTS**

To understand the current performance of intersections in the study area, Level of Service (LOS) information was compiled for intersections in the study area (signalized and unsignalized), for which data are available (see Appendix G). This information was used to develop many of the recommendations in the neighborhood transportation plan (see Appendix F).



Intersections included in Critical Movements Analysis

In addition, Critical Movements analysis (explained in the next section, Future Traffic Operations) of 39 intersections was used to evaluate the impact of various development scenarios on future traffic performance. This analytical method does not provide the same level of detail as the LOS analysis but is a more appropriate tool for comparing long-term traffic impacts. The critical movements analysis is consistent with methodology used in connection with the Citywide Rezoning Petition.

The LOS analysis confirms capacity deficiencies causing motor vehicle delays at Land Boulevard/Msgr. O'Brien Highway, as well as at 6 other signalized locations. Deficiencies are also experienced at 4 un-signalized intersections.

FUTURE TRAFFIC OPERATIONS

While the methods used for analyzing traffic operations are the same as those used in connection with the Citywide Rezoning Petition, the Eastern Cambridge study provides a much more comprehensive analysis as it covers roughly the same number of intersections in a much smaller area. The analysis of future traffic operations includes the following four steps:

- Calculation of estimated cumulative traffic impacts of four development scenarios
- Critical sum analysis of 39 intersections
- Analysis of the impact of reduced parking ratios and a parking cap in North Point
- A neighborhood transportation plan proposing measures to improve future transportation operations, including vehicle circulation, transit accessibility, and pedestrian and bicycle mobility

Similar to the goal of the Citywide Rezoning Petition, the ECaPS goal is to reduce the anticipated number of trips generated by new development by 2020 to approximately half of what would have been allowed by existing zoning.

1. Traffic Impacts of Development Scenarios

Four development scenarios were compared. For each scenario the new floor area that would be expected in 20 years and the resulting AM/PM peak and daily auto trip generation were calculated. The scenarios include:

- Status Quo (existing zoning)
- Citywide Rezoning Petition
- Initial Land Use Scenario
- Initial Land Use Scenario with Auto Trip Reduction

While the Citywide Rezoning scenario accomplishes a reduction from the Status Quo (existing zoning), in Eastern Cambridge it falls short of the goal of a 50% reduction in anticipated growth in new trips generated by development. This is because a large amount of Cambridge's development potential is within the ECaPS study area.

The Initial Land Use scenario is based on the Committee's vision for Eastern Cambridge in terms of desired land use mixes and densities. The auto trip generation resulting from this scenario is lower than the Citywide scenario but again does not achieve a 50% reduction in new trips.

The Auto Trip Reduction scenario, the preferred scenario, uses the land use mix and densities of the Initial Land Use scenario coupled with a reduction in parking ratios. A 20% reduction in parking ratios is proposed, which is estimated to lower the auto mode share by 10 percentage points and overall auto trip generation by 20%. In addition, to ensure that trip generation remains low and does not exceed the parking supply, project proponents would be required to implement significant demand management programs – above and beyond what is currently required under the City's Parking and Transportation Demand Management (PTDM) ordinance – and/or improve transit accessibility to a given area. This scenario meets the study goal of reducing the growth in new peak hour trips by 50%.

The peak hour traffic impact from new development for the four scenarios is as follows:

NEW PM PEAK HOUR AUTO TRIPS	
SCENARIO	NEW PM PEAK HOUR AUTO TRIPS
Status Quo (existing zoning)	4040
Citywide Rezoning	2600
Initial Land Use Plan	2270
Auto Trip Reduction (Preferred Scenario)	1840

The number of daily auto trips generated by new development under the Auto Trip Reduction scenario is approximately 16,690.

2. Critical Movement Analysis

Critical Movement Analysis was used to estimate how the 39 major intersections in the study area would perform under the four build-out scenarios. Critical movement volumes were estimated for the PM peak hour. The critical movement volume at an intersection is the sum of all conflicting traffic movements expressed in vehicles per hour (see Appendix E for an illustration of "conflicting movements"). Intersections with 1,500 or fewer critical movements per hour are considered to operate adequately, i.e. motorists will, on average, wait no more than two light cycles to get through the intersection. Once this threshold is exceeded, intersection operation starts to deteriorate significantly.

Intersection performance for the 4 scenarios was compared, looking at both the number of intersections at which the PM critical movement threshold is exceeded and the sum of critical movements above the threshold.

Currently, the critical movement threshold in the PM peak hour is exceeded at one intersection (Monsignor O'Brien Hwy/Land Blvd). It is estimated that in 20 years traffic from existing development, projects that have received permits prior to July 2001 and due to build out shortly, and traffic increases

from development outside Eastern Cambridge will result in five intersections within the study area exceeding the critical movement threshold.

Under the Status Quo (existing zoning) scenario, which envisions development based on existing zoning, 10 of 39 intersections are expected to exceed the critical movement threshold while the threshold would be exceeded at 9 intersections under the other three scenarios.

There is a significant difference between the land use scenarios in terms of the sum of critical movements above the threshold resulting from new development as illustrated in the table below. The Auto Trip Reduction or Preferred scenario represents a two-thirds reduction in traffic impacts compared with the Status Quo (existing zoning) scenario.

SUMMATION OF CRITICAL MOVEMENTS ABOVE THRESHOLD

SCENARIO	SUMMATION OF CRITICAL MOVEMENTS ABOVE THRESHOLD
Status Quo (existing zoning)	2530
Citywide Rezoning	1650
Initial Land Use Plan	1290
Auto Trip Reduction (Preferred Scenario)	920

TRUCKS

The existing truck route through the study area is along Monsignor O'Brien Highway, a small segment of Cambridge Street, First Street, Binney Street, and Main Street. The analysis indicates that the highest truck volumes in the study area are on Monsignor O'Brien Highway, Cambridge Street, Main Street, Land Boulevard, and Binney Street.

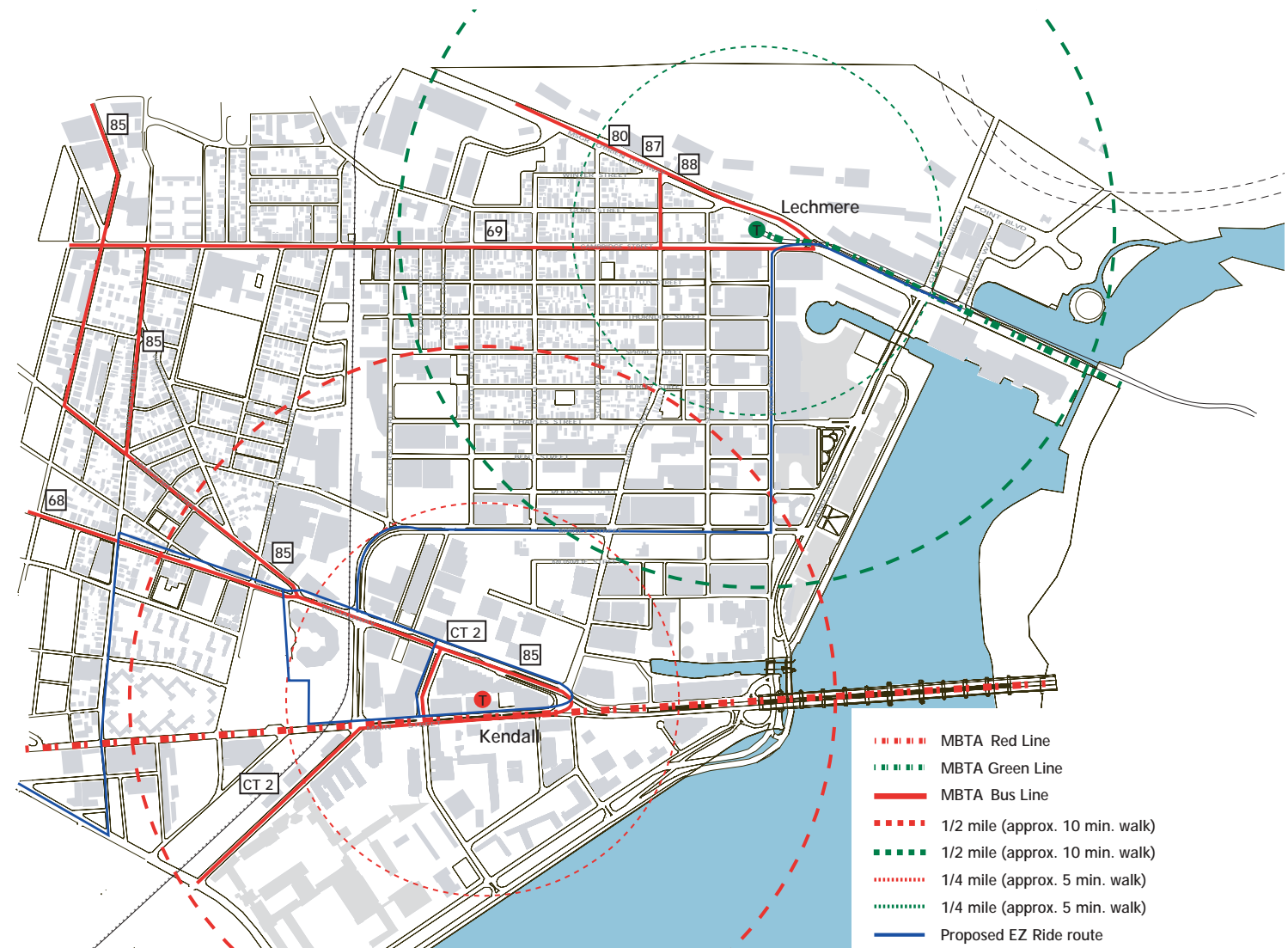
Other streets notably Third Street, Gore Street, Cardinal Medeiros, Warren Street, and Fulkerson Street, some of them with 24-hour truck restrictions, also have significant truck

traffic. It is important to remember that truck restrictions apply only to through trucks and not those making deliveries on the streets in question. Further, the data also shows that some of these streets are used by trucks at night. For example, according to 1998 and 2000 City of Cambridge data, Gore Street and Fulkerson Street had 66 trucks and 42 trucks, respectively, between 11 p.m. and 7 a.m. The high volumes of trucks on these streets affect the residential neighborhoods.

A recent state-funded regional truck study addresses truck issues in metropolitan Boston. The study sought to identify ways to reduce the impacts of truck noise and vibrations on residents, especially at night; ensure the continued delivery of goods and services by maintaining truck access to businesses and residences; and ensure, where feasible, that truck traffic is directed towards appropriate roadways. Key routing recommendations of the truck study are incorporated in the transportation recommendations of this report (see Appendix F).

PUBLIC TRANSPORTATION

While the Massachusetts Bay Transportation Authority (MBTA) Red Line offers excellent connections to downtown Boston and further into Cambridge and Somerville, the Green Line only provides connections to downtown Boston because it terminates at Lechmere. The Red Line serving the Kendall station operates at headways of 4 minutes during the rush hours and 6 minutes at other times of the day. The Green Line operates at a 3.5 minute frequency during the rush hours and 5 minutes at other times of the day.



Transit and Bus Routes within the Study Area

MBTA rapid transit and bus service in the study area are presented on the diagram “Transit and Bus Routes within the Study Area”. Four bus routes (#69, 80, 87 and 88) terminate at Lechmere and four routes (#64, 68, 85 and CT2) connect to or terminate at Kendall station. The study area is also served by The Wave, a public shuttle running between the CambridgeSide Galleria and Kendall Square and primarily employee shuttle services operated by the Charles River Transportation Management Association.

According to the 1990 US Census, transit as a mode of travel to work for commuters living in the study area varied from 16.9% in the Wellington-Harrington neighborhood to 22.7% in the North Point area. The transit share for commuters working in the study area varied from 3.3% near the Twin City Mall to 24.2% in the Lechmere area. According to recent data the transit share of commuters to the heart of Kendall Square is 52%. The 2000 US Census update of the Cambridge Journey to Work data is expected to be available in 2003.

MBTA service and ridership data for trains and buses confirms the importance of the Red line and suggests that the bus system has sufficient capacity to meet current demand, with the exception of the #85 route from Spring Hill via Union Square, and #87 from Arlington Center via Elm Street. Looking at boardings by stop illustrates a much higher dependence on bus rather than rail at Lechmere station compared to Kendall station.

The diagram “Transit and Bus Routes within the Study Area” shows a quarter-mile and half-mile radius, a reasonable walking distance, around the Kendall and Lechmere stations. All of East Cambridge is within half a mile of Lechmere station. Most of Area IV and Kendall Square is within half a mile of Kendall Station. However, much of Wellington- Harrington is further than half a mile from either of the two stations.

North Station, which provides regional service to the north and north-east, is slightly more than a mile away from the center of the Eastern Cambridge residential neighborhoods and is linked to Lechmere by the Green line. The EZRide, a shuttle connecting North Station to additional locations in Eastern Cambridge and Kendall station under planning jointly by the City and the Charles River Transportation Management Association (CRTMA) with an anticipated start in Winter 2001/02.

Although Main Street has ample space to accommodate buses and shuttles close to Kendall station, operations are somewhat restricted at the eastern end by limited access and bus circulation space. The curbside use allocations on Main Street are being revamped to better accommodate buses.

The connection with Broadway is from eastbound Broadway only, and there is no direct connection with Third Street. While this circulation works well for bus routes from the west (MBTA #64, #68, #85) terminating at Kendall, other buses have to go around the block.

The Kendall Square area attracts employees from beyond the I-95 corridor. While there are many express commuter buses serving downtown Boston and Kenmore Square, there are none to Kendall.

Other transit issues include the lack of direct connections between Eastern Cambridge and most nearby communities – Brookline, Chelsea, Everett, Melrose, Somerville, and even parts of Boston, including Logan Airport. A trip to any of these cities often requires going into Boston and transferring to another line. For example, counting the MassPort bus, a trip to Logan Airport from Kendall Square requires three transfers. Crowding on the transit lines in the downtown area further exacerbates the problem.

Three proposed transit improvements will especially affect the study area. These are the Urban Ring, Green Line extension, and the EZ Ride North Station shuttle. The Urban Ring and the Green Line extension are major MBTA projects for which funding has not yet been identified.

(i) Urban Ring

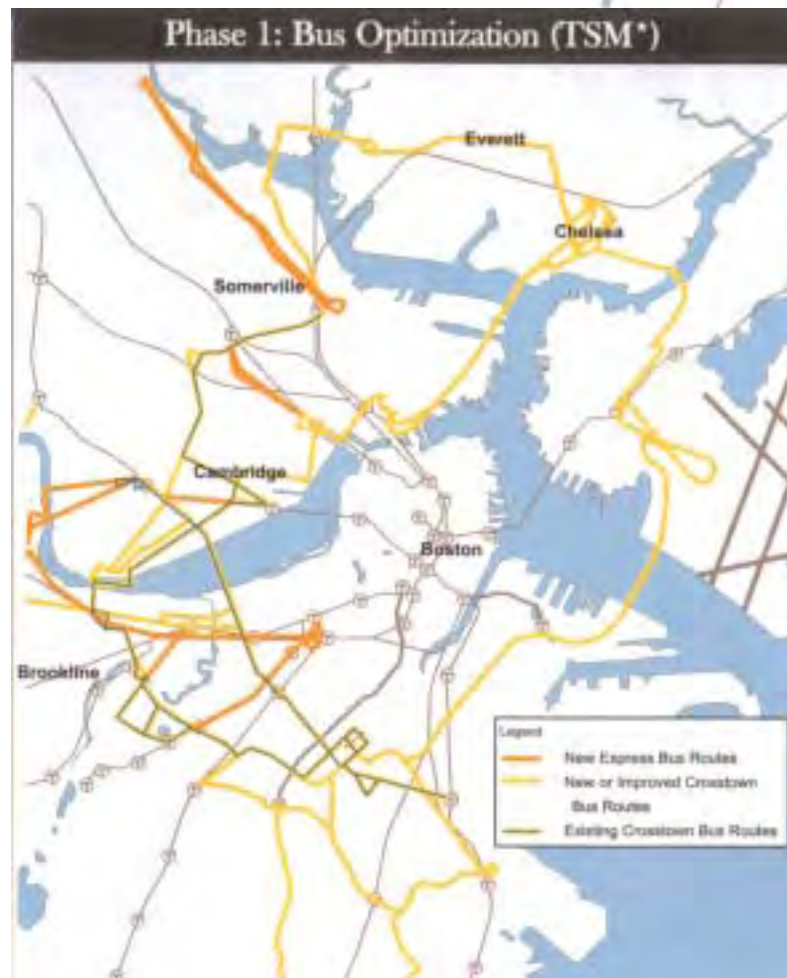
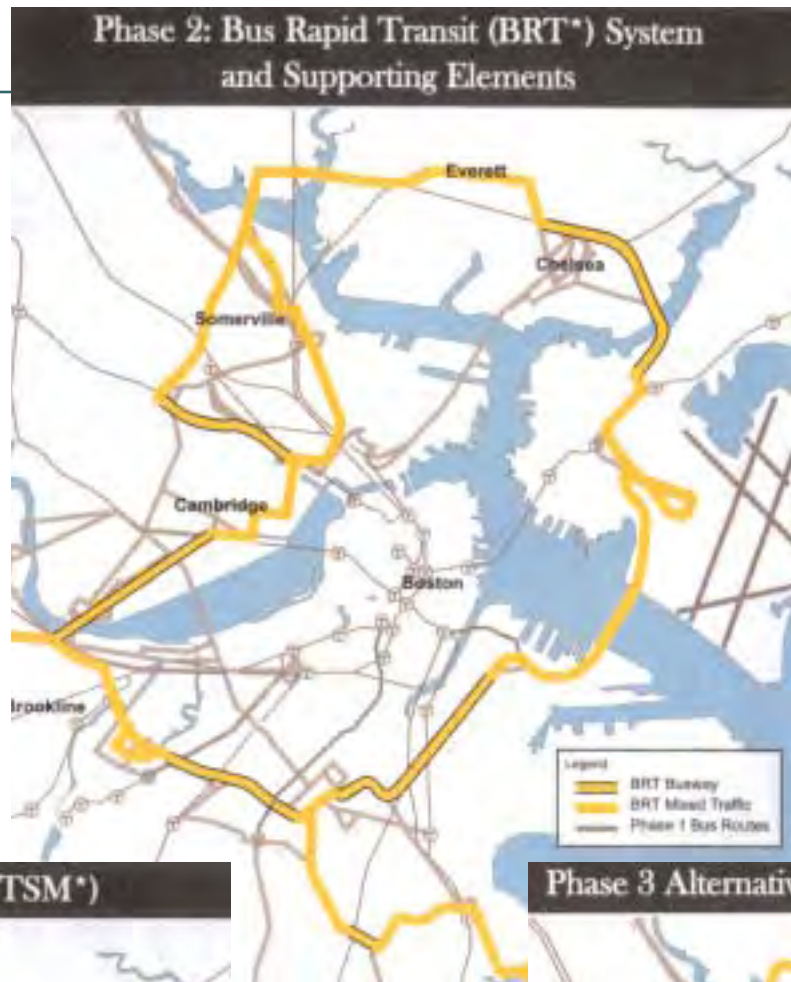
The Urban Ring is proposed as a circumferential transit line that would encircle downtown Boston, connecting the “spokes” of the existing radial transit network in Cambridge, Somerville, Chelsea, Everett, Brookline, and Boston. It would greatly reduce the need for transfers, cutting travel time, and increasing travel options for commuters. The Ring will greatly enhance T service in Cambridge in general and Eastern Cambridge, in particular. It is proposed to be implemented in three phases – transportation system management (TSM), bus rapid transit system (BRT), and light rail in tunnel (LRT).

(ii) Green Line Extension

The MBTA plans to extend the Green Line beyond Lechmere to Tufts University / West Medford via Somerville. This will require relocating the Lechmere Station across Msgr. O’Brien Highway to North Point.

(iii) EZ Ride North Station Shuttle

A shuttle connecting Eastern Cambridge to North Station in Boston is presently being planned jointly by the City and the Charles River Transportation Management Association (CRTMA). This project has funding and is expected to begin in Winter 2001/02.



MBTA Urban Ring Plans
 Courtesy of the Massachusetts Bay Transportation Authority



Pedestrian & Bicycle Curb Locations

PEDESTRIAN ENVIRONMENT

The study area's residential neighborhoods, with narrow streets, low traffic volumes, and small blocks are eminently walkable and bikeable. Furthermore, the transit stations, which are within a half mile from most of the study area, and a high level of existing and permitted entertainment and retail activity within the study area, encourage walking.

Elsewhere, especially near Kendall Square, the blocks are longer and the roads and intersections wider making walking and bicycling less attractive. However, most new development in the Kendall Square area, Tech Square and Cambridge Research Park, for example, is being required to provide pedestrian amenities and break up existing "superblock" sites.

While the Kendall station is easily accessible by pedestrians Lechmere is surrounded by major streets that are difficult to cross.

Pedestrian data is presented graphically in Appendix H for weekday peak hour conditions, AM and PM. As expected, the highest volumes are near the transit stations and where there are concentrations of commercial development. Four of these intersections had more than 500 pedestrians crossing in at least one peak hour.

Most streets in the study area have marked crosswalks and reasonably wide sidewalks. However, Binney Street, which is perceived as unsafe to cross by many residents, presents a barrier

between the Kendall Square area and nearby residential neighborhoods. The limited crossing locations along the length of Binney Street, the high speeds, high volume of traffic, and multi-lane configuration of the street make crossing the street difficult. The City, through the special permit mitigation process, is requiring pedestrian improvements at the intersections of Binney and Fulkerson, Sixth, Third, and Second streets.

Pedestrian safety improvements along Binney, Broadway, and Cambridge Street could include providing neckdowns at intersections, tighter turning radii to slow vehicles, and shorter and protected crosswalks.

Some streets at the edges of the study area also create barriers to pedestrians. Pedestrian access to the river is impeded by Land Boulevard and Memorial Drive. The Grand Junction rail corridor presents an opportunity for north-south pedestrian and bike connection, but limits access between Wellington-Harrington and East Cambridge and the river.

At Lechmere, Monsignor O'Brien Highway is seven lanes wide and carries more than 25,000 vehicles a day and pedestrians currently experience long crossing delays. Improved crossing of the highway will be increasingly important as the North Point area develops, the North Point Park is completed, and the Green Line station is relocated.

BICYCLE ENVIRONMENT

Bicycling is an important mode of transportation in Eastern Cambridge for commuters and residents alike. Currently, there are bicycle facilities along Broadway to the west of Mid-block Connector, and along the Western and Mid-block Connectors.

Bicycle data from intersection counts, presented in Plan G, shows that, as expected, summer volumes are two or three times higher than winter volumes. The analysis identifies four locations where there are over 100 bicycle movements during at least one peak hour in summer: Cardinal Medeiros/Hampshire, Broadway/Hampshire, Harvard /Portland, and Portland /Broadway.

Since most local streets in the study area have low traffic volumes (fewer than 5,000 vpd) and average speeds less than 25mph (Windsor Street at 29 mph is an exception), they do not warrant separate bicycle facilities. The City does have an ongoing traffic calming program to reduce speed and increase safety on streets that are susceptible to speeding or are near schools and playgrounds.

MIT, Kendall Square, and downtown Boston are major destinations for bicyclists in Eastern Cambridge. Currently, many of the major streets and arterials in the vicinity of MIT and Kendall Square do not have bike facilities and many of the intersections in the Kendall Square area are not very bike-friendly. More than 40% of the vehicles entering the intersections of Broadway/Galileo Way or Main Street/Galileo Way are turning vehicles. The City is working to address the problem of wide turning radii at this intersection, which currently means that turning vehicles do not have to reduce speed, making it unsafe for bicyclists going straight through the intersections. In addition, though Boston is a short ride away, the bicycling facilities along the Longfellow Bridge or the Monsignor O'Brien Highway are very poor. As with pedestrians, desired bicycle connections to the river and to North Point Park meet major barriers, either busy streets or the railroad.

OPPORTUNITIES

Major opportunities to improve transportation in Eastern Cambridge that should guide future planning efforts are listed below. Many of the proposed measures will improve conditions for pedestrians and bicyclists. A number of these are being addressed in already committed development mitigation requirements. Appendix F, the complete list of recommended transportation improvements discussed during the ECaPS process notes where this is the case. The remainder will have to be prioritized and implemented through future mitigation requirements or as other funding becomes available.

- The relocation of Lechmere station presents an opportunity to extend First Street to connect directly with Monsignor O'Brien Highway, which would encourage the use of First Street. This will be especially important as development occurs in North Point.
- Measures to ensure safe at-grade pedestrian and bicycle crossings of Memorial Drive and Msgr. O'Brien Highway.
- Improved transit access to the North Point area by the proposed Green Line extension and the proposed Urban Ring would ease congestion on Monsignor O'Brien Highway and greatly enhance non-auto access to and from the study area. While planning is in progress, funding has not yet been secured for these projects.
- Pedestrian and bus links from North Point to the Bunker Hill Community College Station would provide access to the Orange Line from the study area.
- In addition to Lechmere, a number of the new MBTA bus routes proposed in Phase I of the Urban Ring would serve Kendall station. Several of these routes would benefit from a link to Third Street at Broadway/Main streets.
- Truck traffic related improvements would help keep through truck traffic off residential streets.
- Off-road, multi use paths could provide a significant transportation and recreation resource for the study area. Opportunities for such paths lie along the Grand Junction

railroad right-of-way and at North Point, connecting the proposed Somerville regional bike path to the river. The City has committed funds for a feasibility study of the Grand Junction path in the fiscal year 2001-02.

- City policy requires consideration of bike facilities on all streets as they are reconstructed and restriped.

Focus areas

Early in the Eastern Cambridge Planning Study, four focus areas

were identified for detailed study based on the likelihood of change. These include North Point and the Volpe Center area, the parts of the study area with the greatest remaining development potential; the Transition Areas between the residential neighborhoods and the commercial development in Kendall Square; and the Residential Neighborhoods. Existing conditions, development opportunities, and challenges for each of these focus areas are summarized below.

NORTH POINT

As described earlier, North Point is a 56-acre area on the northern edge of the city, characterized by industrial uses and rail yards. Recent development in North Point consists of the

Vision and Goals

high-rise residential Museum Towers and the EF Centre office building. The pattern of development bears little relationship to the traditional, small-scale block pattern of East Cambridge. The construction of the Museum Towers complex in 1998 on a portion of the site reflects an often-used model for redeveloping former industrial areas, in which large-scale buildings seek to create their own privatized environment in the absence of a surrounding context to which the new uses might relate. North Point is one of the last undeveloped areas of its size remaining in Cambridge. Most of the area is owned by two entities, Guilford Transportation Industries and the Cambridge Companies. The rest, located east of the Gilmore Bridge, is owned by MWRA, MDC, and other state agencies.

RECOMMENDATIONS

- Parks
- Housing
- Streets
- Retail & Restaurants
- Mixed Commercial & Residential
- Improve Pedestrian Connections
- Vehicle Access to North Point
- Future Bicycle/Multi-Use Path
- Pedestrian/Cycle Connections
- New Pedestrian Crosswalks
- Future Traffic Pattern

EXISTING

- Existing DOT Building
- Existing Residential Neighborhoods
- Existing Open Space
- Existing Pathway
- Existing Traffic Pattern



Composite Urban Design Goals

Currently, the area contains three zoning districts: North Point Residence, Office & Business, which makes up the bulk of the area; Special Business, Office & Industrial 1 along Monsignor O'Brien Highway; and Industry A in the northern portion abutting Charlestown.

The northern edge of the site, largely occupied by rail yards, abuts Somerville. To the south, Monsignor O'Brien Highway forms a barrier that currently cuts this area off from nearby East Cambridge. Within the district, the Gilmore Bridge creates another barrier. While accessibility presents an obstacle to the development of this site, North Point also presents many opportunities. As one of the largest developable areas remaining in the City, North Point offers the potential for creation of a new residential neighborhood, providing housing opportunities for a variety of residents. To the east, the Charles

River waterfront is being rediscovered and refurbished with the development of a 14-acre park by the Metropolitan District Commission. The park offers the potential to connect Cambridge to Charlestown and Boston. Significant opportunities exist to connect this area to East Cambridge, particularly in conjunction with the relocation of the Lechmere T Station and the development of new pedestrian crossings at the intersections of East Street, First Street, and Water Street with Monsignor O'Brien Highway. As industrial uses are replaced by walkable residential neighborhoods, connections to the Bunker Hill Community College stop on the Orange Line and to the commuter rail at North Station become more important. Since there is presently so little developed land in this area, there is also an opportunity to create a significant amount of public open space for Eastern Cambridge.

VOLPE CENTER AREA

The area surrounding Kendall Square developed much later than the residential neighborhoods of Eastern Cambridge. The industrial nature of early uses in the area is still visible in its large-scale block pattern and warehouse-like buildings, many of which have been replaced with taller office buildings in the past thirty years. The influence of urban renewal is evident in the large-scale block pattern and the design of some of the office buildings in this area.

In the heart of this district is the Volpe Center, one of the U.S. Department of Transportation's major research facilities. It is a 19-acre block consisting primarily of the Volpe office buildings and associated surface parking lots, as well as a couple of defunct industrial buildings. To the west and south of the Volpe Center block is the MXD urban renewal district, now mostly made up of R&D facilities. The Volpe Center is bordered on the north by Binney Street, on the south by Broadway, and on the east by Third Street and the site of the recently-permitted Cambridge Research Park. The bulk of the Volpe Center area is owned by the US General Services Administration, the rest by N-Star.

Currently, almost no roads penetrate the Volpe Center block, though it is accessible by car from Broadway and Third Street. Pedestrian access is also limited to the periphery. The Volpe Center is only a block away from the Kendall station, with access via the public easement through the Marriott Hotel lobby.

The entire Volpe Center block is currently zoned Office 3-A, allowing residential and office use but not retail. The Citywide Rezoning Petition proposed a PUD overlay (PUD 3A), in which residential is allowed; office/R&D is allowed up to a maximum of 25% of gross floor area (GFA); and a maximum of 2,500 square feet of retail is allowed per building.

Its prime location near transit, in the heart of Cambridge's high-tech district, and across the street from the new Cambridge Research Park development put this block in a key position to affect the character of Kendall Square. With an increase in density, particularly through the development of new housing, the site could foster the 18-hour activity that residents desire in Kendall Square. The size of the block provides an opportunity to create a major new public park. There is also an opportunity to significantly improve connections between the adjacent neighborhoods and the Kendall Square transit station, as well as MIT.

TRANSITION AREAS

In the transition areas different development patterns and/or land uses abut each other. Transition Area A forms a perimeter of industrial buildings around three sides of the East Cambridge neighborhood, roughly along First, Binney, and Fulkerson streets. The area shares similar block sizes with East Cambridge, but its nineteenth century industrial buildings are of a much larger scale. Transition Area B is mostly new office development, an extension of Kendall Square's high-tech cluster into Area IV and Wellington-Harrington. These are mostly large, odd-shaped blocks roughly corresponding to the One Kendall Square and Technology Square developments.

Currently, in Transition Area A, Binney and First streets lack street activity. Binney Street is difficult to cross. The industrial development, particularly in Transition Area A, creates an uninviting environment for people walking between the residential neighborhoods and Kendall Square. On First Street, the CambridgeSide Galleria and other large-scale developments cut the neighborhoods off from the river. The Grand Junction railroad tracks are a physical barrier between East Cambridge and Wellington-Harrington.

There are currently several zoning districts in the Transition Areas. They are: Residence C-1; Business A; Business B;

Industry A-1; Industry A-2; Industry B; Industry B-1; Special Business, Office and Industrial; and Cambridge Center Mixed-Use Development.

Transition Area A is predominantly zoned commercial or industrial. The Citywide Rezoning Petition strongly encouraged residential development, rezoning several districts to exclusively residential, and prohibiting Office/R&D, Industrial, and Retail uses in C1-A and C2-A zones. It would also have reduced the maximum height in some districts north of Binney Street.

In Transition Area B, the zoning is predominantly commercial and industrial, but the uses are mostly commercial. The Citywide Rezoning Petition would have reduced commercial FAR in the IB and IA-2 districts from 4.0 to 2.75.

There are numerous pedestrian barriers between the Transition Areas and the neighborhoods. However, there is extensive vehicular access to this area from Binney, First, Broadway, and Hampshire streets. Retail development along First Street faces strong competition from the Galleria Mall. Other challenges in the area include noise from R&D buildings disturbing residents, real estate pressure as new commercial development replaces smaller residential uses, and limited open space.

Yet there are considerable opportunities in these areas, as they are undergoing significant change. Both areas are close to mass transit at Kendall Square and Lechmere, and potentially the Urban Ring. One Kendall Square in Transition Area B is a thriving retail, restaurant, and entertainment destination. Pedestrian improvements in this area and well-designed new development could significantly enhance the connections between East Cambridge and Wellington – Harrington, as well as connecting the neighborhoods to the Sixth Street pedestrian walkway and improving access to Kendall Square. Many of the buildings in Transition Area A have the potential for conversions to housing, creating potential for mixed-use streets.

NEIGHBORHOODS

At the heart of Eastern Cambridge are its residential neighborhoods: Area IV, Wellington-Harrington, and East Cambridge. While there has been some large-scale development including schools, parks, and public housing, for the most part the traditional sense of human scale, variety, and pedestrian-friendly streets remains as a legacy of historical development pattern. The buildings in these neighborhoods typically line the streets, creating a lively and diverse street edge. Cambridge Street, lined with shops and other active pedestrian uses, combines these design characteristics with retail and mixed uses to function as a neighborhood main street and focus for community life.

Vehicular traffic in the neighborhoods is primarily handled by major roads such as Binney Street, Hampshire Street, Broadway, Cambridge Street, First Street, Cardinal Medeiros Avenue, and Monsignor O'Brien Highway. Traffic volumes on Third Street and Fulkerson Street are higher than expected for neighborhood streets because they provide a north-south connection between Kendall Square and Monsignor O'Brien Highway.

All of the neighborhoods are within a 15-minute walk of Lechmere, Kendall Square, or Central Square T stations. However, transit access is weaker within Area IV and Wellington-Harrington. Pedestrian access within the neighborhoods is good, but barriers such as the railroad tracks, Binney Street, and Monsignor O'Brien Highway reduce access between neighborhoods and to areas outside the neighborhoods.

The land use in these areas is predominantly residential, interspersed with neighborhood retail, small businesses, and neighborhood parks. Existing zoning, however, covers a wide range of uses, many of which are evident at the edges of the

neighborhoods around the districts identified as Transition Areas. Zoning districts in the Neighborhoods include: Residence C-1 and C-3; Business A and C; Industry A, A-1, B, and B-1; Cambridge Center Mixed Use Development; Office 3-A; Open Space; and Special Business, Office & Industrial 1. The neighborhoods are dense residential areas with few available lots for new development. Infill development on individual parcels may occur, as well as redevelopment of existing buildings. Protecting and preserving the character of the neighborhoods has been a consistent goal of the Committee and has informed the thinking of both the zoning and non-zoning recommendations in this report.

VISION STATEMENT

Eastern Cambridge is a remarkably diverse community of historic neighborhoods, state-of-the-art research facilities, a world-renowned university, a vibrant traditional main street, arts cinemas, neighborhood parks and Charles River frontage—all within a short walk of each other. The resulting mix, which interweaves housing with research, single family houses with office towers, historic with cutting edge architecture, walking and bicycles with heavy vehicular traffic, and other contrasts of urban life, provides the basis for a uniquely vital community—a quality often sought but rarely achieved in other urban communities. Yet this mix is also the source of tensions and conflicts. The core mission of this study is to preserve and enhance the benefits of Eastern Cambridge’s diversity, while managing and diminishing the accompanying negative impacts. This mission translates into broad goals that govern planning for future change in every part of Eastern Cambridge:

- Promote land use patterns that improve quality of life in residential neighborhoods and foster a vital public realm in mixed-use districts.
- Expand housing opportunities for a wide range of residents, across the community.
- Support economic development policies that address the needs of small and start-up businesses and people in need of jobs and public services.
- Shift transportation patterns toward more walking, transit use, and bicycle use, reducing reliance on automobiles.
- Meet the open space needs of current and future residents.
- Pursue urban design policies that enhance the character of residential neighborhoods, support creation of more lively pedestrian-friendly areas in mixed-use districts, and result in more attractive and convenient pedestrian connections between every part of Eastern Cambridge.

Goals

Building on the vision outlined above, a series of more specific goals were developed that address land use, housing, economic development, transportation, open space, and urban design. These objectives are summarized below.

A set of more detailed goals—reflecting the vision statement—addresses land use, housing, economic development, transportation, open space, and urban design.

A. URBAN DESIGN

- Design streetscapes and public spaces to encourage walking and cycling, and to create a welcoming pedestrian environment through the provision of street trees, seating, and lighting, and other amenities.
- Create better transitions in massing and scale from higher density mixed-use districts to residential neighborhoods.
- Preserve the scale and character of residential neighborhoods.



- Extend the historic scale and pattern of existing blocks into new mixed-use districts.
- Locate new buildings to provide a consistent edge along public streets, and avoid blank walls or parking facilities facing public streets.
- Locate uses such as loading docks to minimize visual impact and impact on pedestrian movement.

B. OPEN SPACE

- Enhance and expand the area's open space resources to serve current and future residents.
- Create new neighborhood parks, playgrounds and recreational facilities that serve a wide range of users.
- Design new open spaces to be convenient and welcoming to residents.
- Create a network of pedestrian and bicycle-friendly connections to the Charles River.





C. LAND USE AND DENSITY

- Ensure that the uses, scale, and density of new development are compatible with respect to the character of streets, parks and public spaces, and the existing residential neighborhoods.
- In mixed-use districts (North Point and Kendall Square), emphasize housing together with a mix of other uses such as office, R&D, and retail to create lively streets, promote walk-to-work opportunities, and limit the increase in traffic.
- Focus street-fronting retail and related pedestrian-friendly uses along streets that offer opportunities to support active commercial districts.



density commercial and housing uses within a short walking distance of public transit stations.

- Coordinate future development with the provision of new transportation access



D. HOUSING

- Encourage the development of new housing throughout Eastern Cambridge.
- Create a variety of affordable, moderate, and market-rate housing opportunities that serve a diverse population.
- Provide a mix of ownership and rental housing at all income levels.
- Encourage the creation of live/work and artists' housing.





E. ECONOMIC DEVELOPMENT

- Promote the creation of a wide range of jobs that match the community's skills, education and interests.
- Strengthen existing neighborhood retail, especially along Cambridge Street, and encourage a limited amount of new retail to serve those who live and work in the area.
- Promote opportunities for start-up and incubator businesses.
- Maintain the city's long-term tax base and ability to fund a relatively high level of public services.



F. TRANSPORTATION

- Protect residential neighborhoods from the impacts of traffic associated with commercial development.
- Promote a walkable community in which residential neighborhoods and mixed-use districts are woven together with a comprehensive system of pedestrian-friendly streets and public spaces.
- Reduce reliance on the automobile by making transit, walking, and bicycling more attractive and convenient and by minimizing new parking.
- Provide a continuous system of bicycle routes, supported by lock-up racks and other facilities.
- Expand transit services by supporting the implementation of the Urban Ring, extension of the Green Line to Somerville, and enhanced bus and local shuttle services.
- Ensure that future development accommodates the Urban Ring.



Zoning Recommendations

The following zoning recommendations for Eastern Cambridge

emerged from the context, analysis and vision described in the previous chapters and were forwarded to the Planning Board in April 2001. Based on these recommendations the Planning Board filed the Eastern Cambridge Rezoning Petition with the City Council in June 2001. At the time of writing, the petition is under consideration by the City Council and the Planning Board and final action is expected in Fall 2001. Interested parties should contact the City Clerk or check the City's website at:

<<http://www.ci.cambridge.ma.us/~CDD/commplan/zoning/zord/index.html>> for the most current zoning for Eastern Cambridge.

Recommendations

NORTH POINT

The North Point area is envisioned as a mixed-use neighborhood with housing as a dominant use – a place to live, work, and enjoy a variety of parks and public spaces. ECaPS PUD zoning would:

- Require at least 65% residential development with a maximum of 35% commercial development and create an overall cap on non-residential parking for the district.
- Reduce automobile traffic generated by the site – by setting an FAR of 2.4 for a mixed-use project, but allowing FAR to increase up to 3.0 as the percent of residential use increases, since residential uses generate less peak hour traffic.
- Reduce the parking required on site by 20 percent from the Citywide Rezoning Proposal and require corresponding auto vehicle trip reduction measures.

...NORTH POINT

- Establish lower heights closer to the East Cambridge residential neighborhood and taller heights farther away.
- Encourage retail uses to support the new neighborhood that will complement, not compete with, existing retail on Cambridge Street.
- Require the creation of a major new public park easily accessible from the relocated Lechmere T station.

In addition, proposed Design Guidelines would encourage:

- Strong pedestrian and bicycle connections to East Cambridge.
- Retail uses at the relocated Lechmere T station to connect North Point and Cambridge Street
- Lower heights around public spaces and close to the existing East Cambridge neighborhood.



Urban Design Principles



Illustrative Redevelopment Conceptual Study

EXISTING



Illustration of new pedestrian friendly mixed-use street through the heart of North Point.

EXISTING



Illustration of possible reconfiguration of the intersection of First and Cambridge Streets to create a more lively and pedestrian-friendly connection to North Point.

EXISTING



1

Illustrative study of new blocks to orient around a new main street.



3

Organizing principles to include strong connections to First Street and Cambridge Street, variety of blocks, and new neighborhood parks.



2

Illustrative study of increasing height towards railyards, away from the Eastern Cambridge neighborhood.



VOLPE CENTER

Zoning recommendations for the Volpe Center area reflect the desire for housing and open space in the Kendall Square area to help enliven the area during all hours of the day. The proposed PUD zoning for this area would:

- Create a transition in land uses from Broadway to the residential neighborhoods – by requiring residential development to the north and mixed-use development to the south.
- Require lower heights closer to the neighborhoods and allow taller heights closer to commercial development on Broadway.
- Establish a minimum required amount of housing and a maximum allowable amount of office and R&D to create a strong residential presence in the area.
- Require a major new public park facing Binney Street and connecting to Third St. and Broadway. The park should be inviting and accessible to the existing residential neighborhoods and transition areas.
- Encourage retail on Third Street and Broadway to create active street life in Kendall Square.

In addition, new proposed Design Guidelines would encourage:

- Open spaces throughout the site to link the community with Kendall Square.
- Strong bicycle and pedestrian connections to the Broad Canal and the Charles River.



Urban Design Principles



Illustrative Redevelopment
Conceptual Study

EXISTING



Illustrative study of mixed-use development along Third Street to create a vibrant pedestrian connection between Kendall Square and the neighborhood.

EXISTING



Illustration of a new park on the Volpe site to serve existing residents as well as those in the proposed residential development adjacent to the park.



Illustrative study shows variety of blocks, transition in height, enlivened Third Street, and large neighborhood park. The park should be inviting and accessible to the existing residential neighborhoods and transition areas.

EXISTING



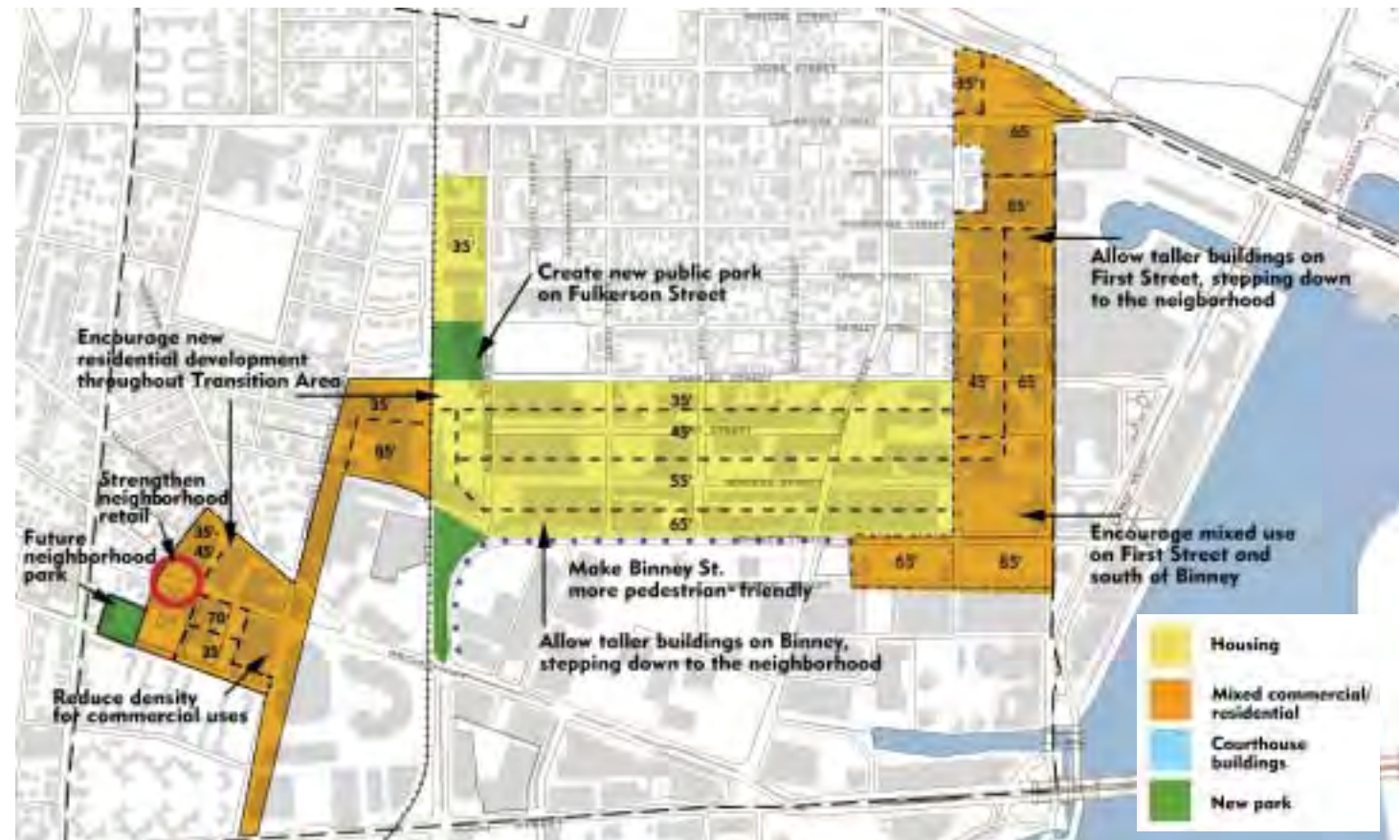
TRANSITION AREAS

The Transition Areas lie between the residential neighborhoods of East Cambridge, Wellington-Harrington, and Area IV and the commercial development in Kendall Square. The primary goals for these areas are to encourage residential uses and create a transition in heights from the neighborhoods to Kendall Square. The ECaPS zoning changes would:

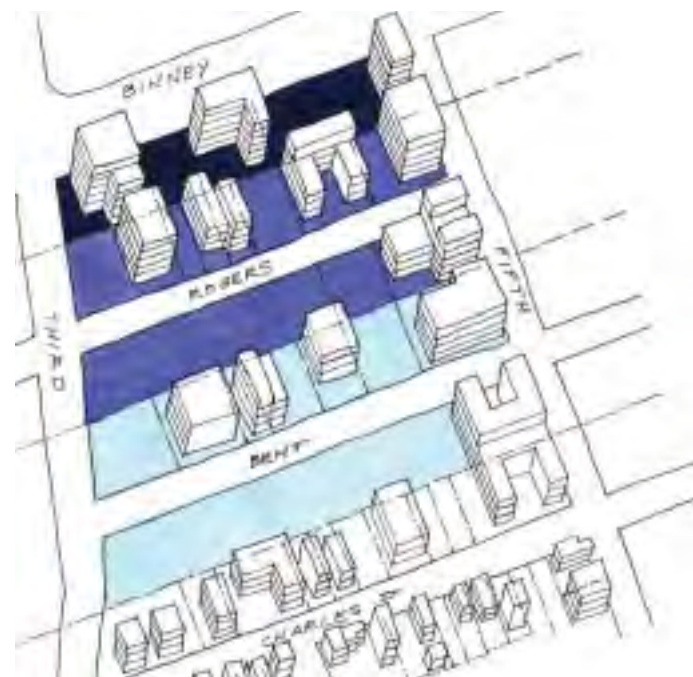
- Encourage new residential development and conversion of existing buildings to residential use; existing commercial uses would be allowed to remain as conforming uses.
- Create a 2:1 differential in residential and commercial Floor Area Ratios (FARs) through the creation of an Eastern Cambridge Housing Overlay (ECHO).
- Apply new, finely graduated height limits.
- Encourage ground floor retail along First Street.
- Allow for Transfers of Development Rights (TDRs) to allow commercial development rights to be transferred to areas south of Binney Street and encourage conversion of areas north of Binney Street to residential.

In addition, new proposed Design Guidelines would encourage:

- New open spaces that connect to existing parks.
- Improved pedestrian crossings at Binney.
- Strong pedestrian and bicycle connections between the neighborhoods and Kendall Square, Central Square and the Charles River.



Urban design principles diagram shows the graduated height towards the neighborhoods as well as the desire for mixed-use development along First Street and along the edge of Area IV.



Illustrative study of height and massing decreasing towards the residential neighborhood to ensure a transition down to a scale similar to what currently exists.

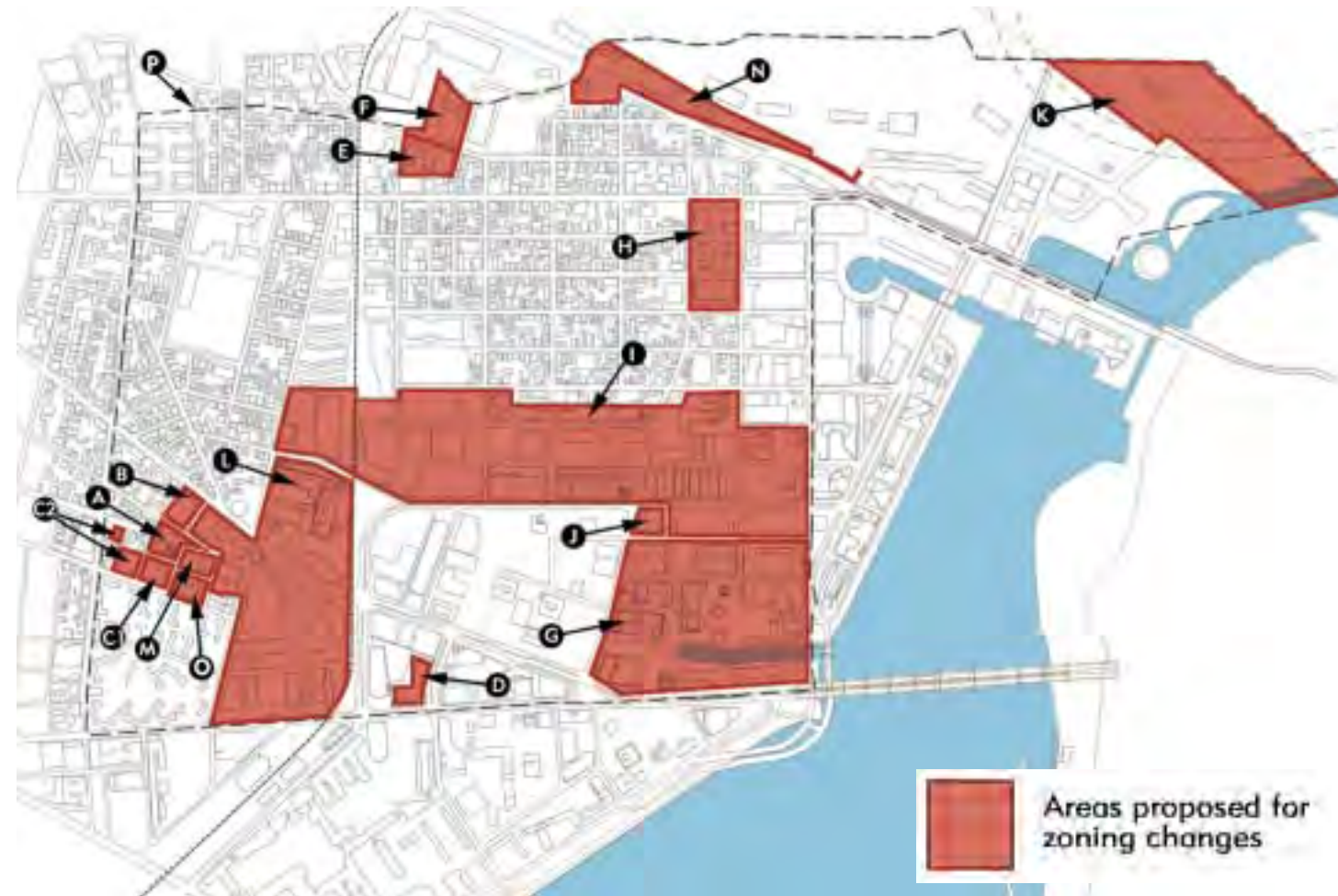


Transfer Donating and Receiving Districts proposed to encourage development where appropriate.

ADDITIONAL ZONING RECOMMENDATIONS

Several other smaller areas recommended for rezoning in the Citywide Rezoning Petition are also included in the ECaPS recommendations. These include industrially and commercially zoned areas in the neighborhoods and in Transition Area B that would undergo reductions in allowed commercial density and height, and several areas that would be rezoned to bring zoning into closer conformance with existing and planned development.

- Area A Industry A, Business C, and Residence C-1 zones at Broadway
- Area B Industry B zone at Clark Street
- Area C1 Residence C-1 zone between Hampshire and Dickinson Streets
- Area C2 Industry A-1, Industry B-1 and Residence C-1 zones between Hampshire Street and Broadway.
- Area D MXD District
- Area E Business A zone between Cambridge Street and Gore Street
- Area F Business A-2 zone at Gore Street
- Area G Office 3A (PUD-3) zone
- Area H Business B zone between Second Street and Third Street
- Area I Industry A-1 zone in the Transition Area
- Area J Industry B-1 zone at Third Street and Binney Street
- Area K Industry A zone in North Point east of the Gilmore Bridge
- Area L Industry B zone west of the railroad tracks
- Area M Industry A-2 zone on Broadway
- Area N Special District 1 along Msgr. O'Brien Highway
- Area O Industry A-2 zone at Harvard Street
- Area P The entire ECaPS area (for application of Eastern Cambridge Design Guidelines)



Additional zoning changes are part of the ECaPS recommendations, many of which would result in lower commercial density and height.

DESIGN GUIDELINES

The Eastern Cambridge Design Guidelines have been developed to inform property owners, business owners, developers, and the general public about the desired form and character of future development in the Study Area. The aim is to create consistently high-quality public environments, and to ensure that development contributes to the character and vitality of the surrounding community. The guidelines are based on the following core principles:

- Manage development to maintain livability in residential neighborhoods and ensure compatibility with existing neighborhood character.
- Provide better transitions between developed/developing areas and residential neighborhoods.
- Create new mixed-use neighborhoods at North Point and the Volpe Center that are integrated with the existing urban fabric.
- Enhance quality of life through the creation of active streets, new public open spaces, and expanded retail opportunities.
- Strengthen pedestrian and bicycle connections throughout Eastern Cambridge, especially between residential neighborhoods, Kendall Square, the Lechmere transit station, and the Charles River.

The guidelines are organized into two sections: Built Form, which addresses the use, scale, and character of buildings; and Public Realm, which addresses connections, streets and sidewalks, open space, and transportation. The detailed guidelines are attached in Appendix D.

These guidelines would be referred to by the Planning Board in their review of special permit applications for projects in the ECaPS Study Area that are before the Board if adopted by the City Council or the Planning Board.

THE DESIGN GUIDELINES ARE ORGANIZED AROUND THE DIFFERENT TYPES OF BLOCKS:

RESIDENTIAL BLOCKS

- **CREATE A CONSISTENT RESIDENTIAL EDGE**
- **INDIVIDUAL UNITS AND FRONT DOORS FACING THE STREET**
- **BLANK WALLS SHOULD BE AVOIDED**

RETAIL BLOCKS

- **AT LEAST 75 PERCENT OF THE STREET FRONTAGE SHOULD BE RETAIL**
- **MAJOR ENTRANCES SHOULD BE LOCATED ON PUBLIC STREETS**
- **BLANK WALLS SHOULD BE AVOIDED**

MIXED-USE BLOCKS

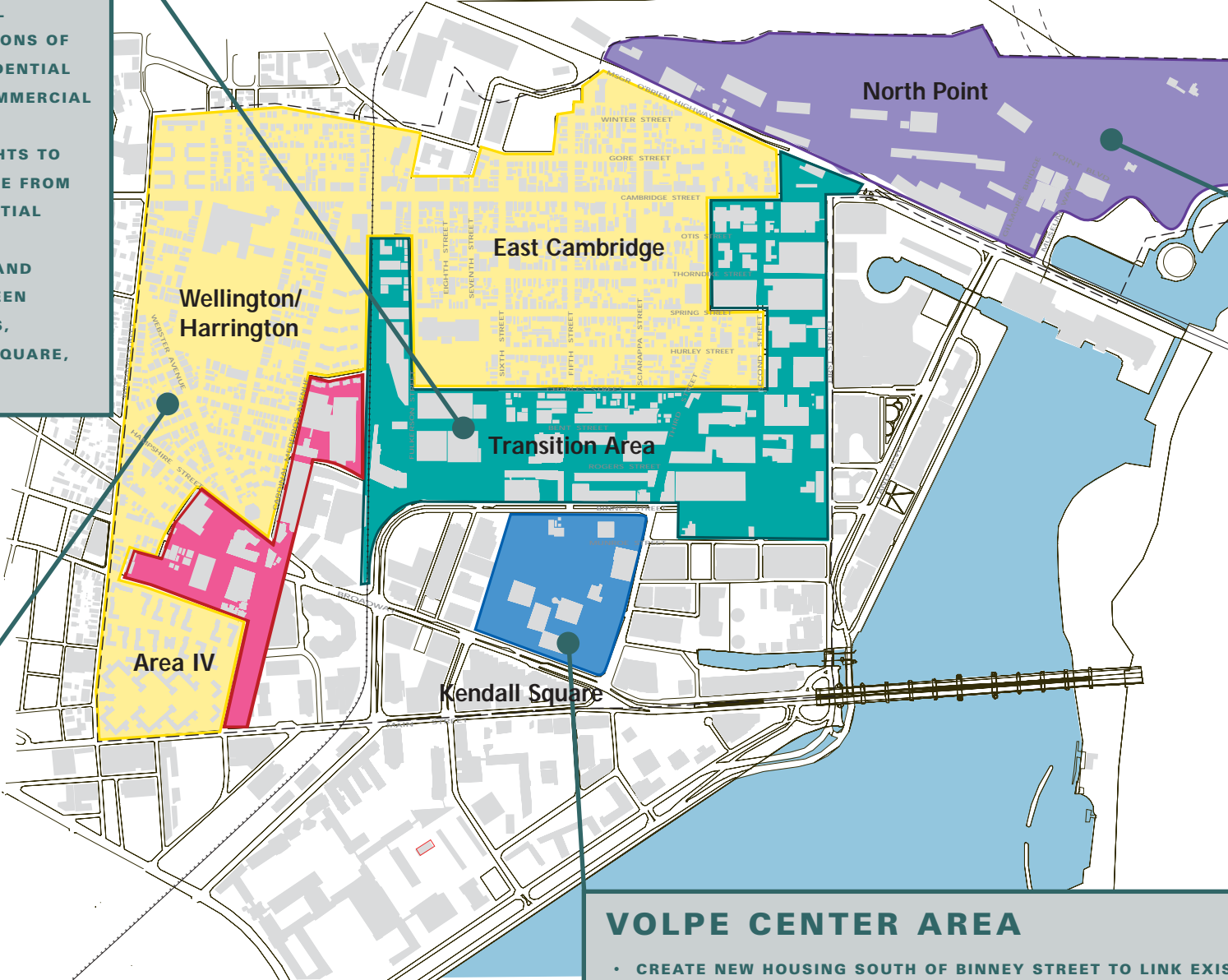
- **STREET-LEVEL FACADES SHOULD INCLUDE:**
 - **RESIDENTIAL**
 - **SHOPS, RESTAURANTS, AND CAFES**
 - **COMMUNITY SPACES**
 - **ART EXHIBITION SPACE**
 - **COMMERCIAL LOBBIES**
- **MAJOR ENTRANCES SHOULD BE LOCATED ON PUBLIC STREETS**
- **BLANK WALLS SHOULD BE AVOIDED**

DESIGN GUIDELINES GOALS:

- North Point
- Transition Area A
- Transition Area B
- Volpe Center
- Residential Neighborhoods

TRANSITION AREAS

- ENCOURAGE NEW RESIDENTIAL DEVELOPMENT AND CONVERSIONS OF EXISTING BUILDINGS TO RESIDENTIAL USE BUT ALLOW EXISTING COMMERCIAL USES TO REMAIN.
- USE FINELY GRADUATED HEIGHTS TO CREATE TRANSITIONS IN SCALE FROM KENDALL SQUARE TO RESIDENTIAL NEIGHBORHOODS.
- CREATE BETTER PEDESTRIAN AND BICYCLE CONNECTIONS BETWEEN RESIDENTIAL NEIGHBORHOODS, KENDALL SQUARE, CENTRAL SQUARE, AND THE CHARLES RIVER.



NORTH POINT

- CREATE A LIVELY NEW MIXED-USE DISTRICT WITH STRONG VISUAL AND PEDESTRIAN CONNECTIONS TO EAST CAMBRIDGE. THE NEW DISTRICT SHOULD BE A PLACE TO LIVE, WORK, AND ENJOY A VARIETY OF PARKS AND PUBLIC SPACES.
- CREATE A NEW EAST-WEST MAIN STREET THROUGH THE CENTER OF NORTH POINT, CONNECTING EAST CAMBRIDGE WITH THE FUTURE MDC PARK
- EXTEND FIRST STREET INTO NORTH POINT TO CONNECT EXISTING AND NEW NEIGHBORHOODS.
- CREATE A MAJOR NEW PUBLIC PARK EASILY ACCESSIBLE FROM THE RELOCATED LECHMERE T STATION, FIRST STREET, AND O'BRIEN HIGHWAY.
- CREATE A NEW RETAIL EDGE AT THE RELOCATED LECHMERE T STATION AND AT THE INTERSECTION OF FIRST STREET, CAMBRIDGE STREET, AND O'BRIEN HIGHWAY THAT WILL COMPLEMENT, NOT COMPETE WITH, EXISTING RETAIL ON CAMBRIDGE STREET.

NEIGHBORHOODS

- PRESERVE AND ENHANCE NEIGHBORHOOD CHARACTER.
- MAINTAIN THE WALKABLE SCALE AND CHARACTER OF RESIDENTIAL BLOCKS.
- SUPPORT AND STRENGTHEN BUSINESSES ON CAMBRIDGE STREET, BROADWAY, AND MAIN STREET.

VOLPE CENTER AREA

- CREATE NEW HOUSING SOUTH OF BINNEY STREET TO LINK EXISTING NEIGHBORHOODS AND KENDALL SQUARE.
- CREATE A MAJOR NEW PUBLIC PARK FACING BINNEY STREET, SURROUNDED BY RESIDENTIAL AND RETAIL USES.
- STRONGLY ENCOURAGE RETAIL ON THIRD STREET AND BROADWAY TO CREATE ACTIVE STREET LIFE IN KENDALL SQUARE AND TO CREATE A LIVELY CONNECTION BETWEEN THE NEIGHBORHOODS AND KENDALL SQUARE.
- CREATE A MIX OF HOUSING AND COMMERCIAL USES ALONG BROADWAY.
- CREATE A TRANSITION IN LAND USES AND HEIGHTS FROM BROADWAY TO THE RESIDENTIAL NEIGHBORHOODS.

NON-ZONING RECOMMENDATIONS

OPEN SPACE

Open space in the study area was a major concern of the Committee and was discussed in detail at the public workshops. Using the priorities identified in the City's Green Ribbon Open Space Committee Report of March 2000 as a basis, the ECaPS Committee identified the following open space recommendations for Eastern Cambridge:

NORTH POINT

Development of a new community at North Point will create significant open space needs. In addition, this area offers the opportunity to create open space accessible to the existing Eastern Cambridge neighborhoods. The North Point Park planned by the MDC will serve as a regional resource. In addition, the design principles developed by the Committee for North Point include the recommendation for a large park as well as a series of smaller green spaces scattered throughout the district, along the major transportation spine. The plan envisions a large park of approximately 2.5 acres to be located to serve both the residents of North Point and of Eastern Cambridge. Proximity to the new Lechmere Station would be important to provide access to the park and make it a public amenity. Plans for the Central Somerville Bike Path are under study. Development of North Point offers the opportunity to create a bike/pedestrian connection between the Somerville Bike Path and the New North Point Park, thus introducing a vital link in a regional connection.

VOLPE CENTER AREA

The Committee felt that the Volpe Center area presented the opportunity for creating a major public park to serve the needs of Eastern Cambridge. This park, visualized as a 7.5 acre park, serving both active and passive recreation needs, is to be located at the north west corner of the Volpe Center block. A park at this location would conveniently serve the existing residential neighborhoods, new housing developed in the Volpe Center area, as well as daytime users from the surrounding commercial areas. Its proximity to the Kendall Square Station would enable a park at this location to be a resource for the larger Cambridge community, too.

TRANSITION AREAS

Ahern Field, adjacent to the Robert F. Kennedy School, is a key active recreation resource for the Transition Areas. It is heavily used for school-related activities and as a playground for the East Cambridge neighborhood. Expansion of Ahern Field would allow current uses to grow in the same location, and may also allow some space for passive use.

The parks proposed at North Point and the Volpe Center offer opportunities to create landmark urban spaces that would define and focus their respective districts, enhancing the commercial and residential areas around them. The Committee is interested in seeing a diversity of uses on these open spaces spanning a range including active sports fields, relaxing contemplative areas, dog parks, tot lots, and open air performance spaces.

NEIGHBORHOOD TRANSPORTATION PLAN

The Neighborhood Transportation Plan includes a series of recommendations that focus on reducing new auto trips, influencing where traffic goes, and enhancing non-auto mobility. The strategies for meeting these objectives are

summarized below and specific measures recommended under each category are listed in Appendix F.

REDUCE NEW AUTO TRIPS

The ECaPS Committee adopted the Citywide objective to achieve a reduction in auto trip generation from new development by 50%. The key strategies to achieve this goal include:

- Incorporate zoning constraints on parking supply for new development.
- Implement demand management measures or infrastructure projects that support alternatives to driving.

INFLUENCE WHERE TRAFFIC GOES

Measures to direct traffic could be used to minimize additional traffic on neighborhood streets and to optimize vehicular, pedestrian and transit accessibility to new development. Ways to accomplish this include:

- Encourage use of First Street to Kendall Square, complementary to Land Boulevard. Key methods to accomplish this are:
 - Make the connection between First Street and Monsignor O'Brien Highway more direct.
 - Make Linskey Way two-way.
- Enhance vehicular, pedestrian, and transit access to North Point and Lechmere Station, when relocated, while minimizing traffic impacts on neighborhoods. Monsignor O'Brien Highway is under the jurisdiction of the Metropolitan District Commission (MDC) and improvements will require their approval. Key measures to enhance connections to North Point include:
 - Optimize North Point access by "intercepting" eastbound traffic at the earliest opportunities on Monsignor O'Brien Highway and by incorporating improved pedestrian and bicycle connections.

- Improve pedestrian crossings of Monsignor O'Brien Highway.
- Increase transit access to North Point.
- Enhance access to new development at the Volpe Center, while minimizing its traffic impacts on the residential neighborhoods through the following measures:
 - Establish principles and guidelines for roadway access.
 - Strengthen pedestrian connections between the residential neighborhoods and the Volpe Center block and Kendall Square.
 - Increase transit access to Volpe site.
- Enhance access to new development in the Transition Areas, while minimizing its traffic impact on the residential neighborhoods. Key ways to accomplish this include:
 - Establish principles and guidelines for roadway access.
 - Focus non-residential traffic to the transition area on Bent Street by providing for two-way traffic.
 - Make Linskey Way two-way.
- Reduce use of neighborhood streets by auto traffic accessing development in Kendall Square.
 - Reduce the use of the Twin City mall parking lot as a through connection between Gore Street and Monsignor O'Brien Highway.
 - Reduce use of Fulkerson and Charles streets by automobiles leaving the parking garage on Little Binney Street without shifting traffic to other residential streets.
- Reduce traffic speed and improve safety within the residential neighborhoods.
 - Pursue traffic calming initiatives in accordance with current City criteria and procedures, which include

traffic speed, location of schools, location of playgrounds, and coordination with other City projects. Traffic calming involves the physical redesign of roadways to reduce traffic speeds and balance the needs of all users through safety enhancements.

- Reduce impact of truck traffic on residential neighborhood streets by restricting truck routes within the study area, in coordination with the recently-concluded regional truck study and the truck plan for the City.

ENHANCE NON-AUTO MOBILITY

To maximize non-auto mobility and reduce the dependence on automobiles the following improvements are proposed within and beyond the ECaPS study area.

- Maximize system-wide transit accessibility in the study area and connections with regional MBTA network by supporting planned public transit infrastructure projects such as the Urban Ring and the Green Line Extension as well as transportation demand management measures.
- Improve pedestrian and bicycle mobility.
 - Develop stronger linkages between the neighborhoods and the Kendall Square area.
 - Enhance pedestrian environment throughout the study area.
 - Improve pedestrian crossings.
 - Provide/facilitate bicycle facilities along all major arterial and collectors in the study area.
 - Maximize opportunities for off-road bicycle and pedestrian pathways between Eastern Cambridge and other parts of the City and region, such as along the Grand Junction corridor and at North Point.
 - Evaluate street network in terms of its impact on bicycle mobility in the neighborhoods and prevent

one-way street patterns from hampering bicycle mobility.

- Maximize opportunities for pedestrian and bicycle connections to the Charles River waterfront.
 - Provide safe crossings of Land Boulevard and Memorial Drive. These streets are under the jurisdiction of the MDC and improvements require their approval.
 - Enhance pedestrian environment on First Street.

Roadway improvements proposed in this report would be implemented either by the City or by developers in conjunction with development projects. Such improvements include laying out new streets and extending existing streets into North Point and the Volpe Center. Developers would be responsible for the creation of these streets.

Some of the recommended improvements are already required as part of special permit approvals. For example, improvements at Broadway and Hampshire are required as part of Tech Square and 7 Cambridge Center special permits and the improvements at the Second and Binney are required through the Beal and Cambridge Research Park special permits.

The City undertakes roadway projects such as traffic calming, intersection improvements, and changes to traffic patterns, contingent on need and the availability of funds. Starting in 2002, the City will reconstruct Cambridge Street. This will involve roadway reconstruction as well as pedestrian and bicycle improvements, including new sidewalks and curb extensions, new street trees and street lighting, and new street furnishings such as trash receptacles, benches, and bicycle parking.

RETAIL STRATEGY

The retail strategy for Eastern Cambridge is intended to strengthen and reinforce existing retail centers, while promoting additional retail opportunities that serve both residents and employees. The recommendations that follow are based on four key objectives:

Encourage retail development where it can make the greatest contribution to the vitality of Eastern Cambridge.

- A key component of the retail strategy is to direct new retail to locations where it can reasonably be expected to succeed. The goal is to create vibrant retail areas that build on existing centers of activity, rather than diluting new retail throughout Eastern Cambridge. More specifically,

the intent is to support and strengthen the existing Cambridge Street corridor, and to concentrate new retail at the First Street/Cambridge Street intersection and along Third Street adjacent to Kendall Square.

Encourage new retail that promotes a lively and active pedestrian environment in Eastern Cambridge.

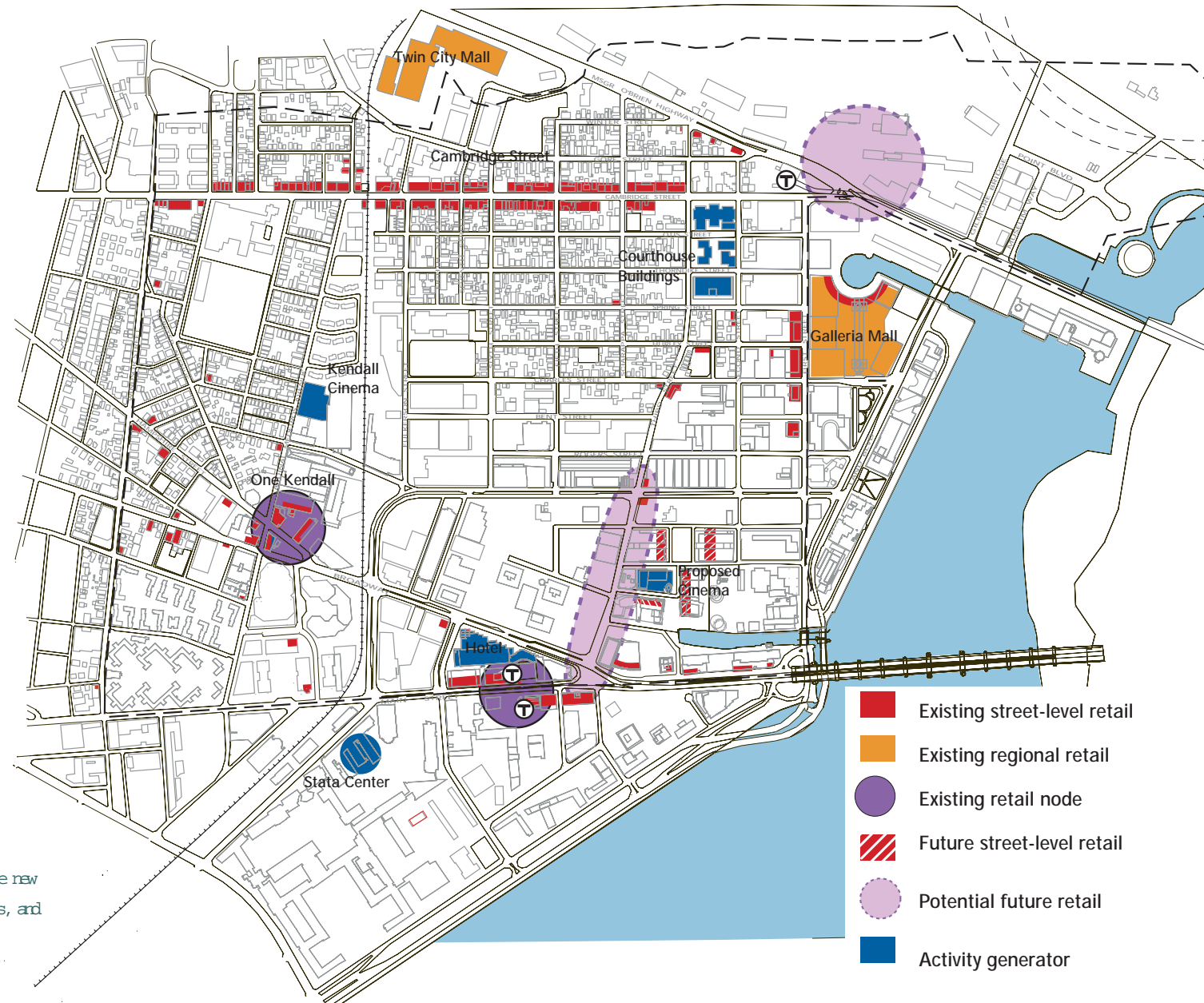
- Street-level retail can play an essential role in supporting active pedestrian environments. Street-level retail also provides additional “eyes on the street” contributing to a greater sense of public safety. New street-level retail in Eastern Cambridge should be designed to support pedestrian activity and create better connections between neighborhoods and commercial areas.

Enhance retail opportunities for residents of the neighborhood.

- Currently, neighborhood residents are served by a mix of retail uses on Cambridge Street, First Street, and within the neighborhoods. As part of the ECaPS planning process, residents expressed a desire to strengthen and improve businesses on Cambridge Street, as well as to enliven Kendall Square and support the development of new neighborhood-serving retail including green grocers, bookstores, and cafes.

Support entrepreneurial growth and investment (including assistance to Cambridge Street businesses and property owners) to preserve and enhance the ability of independent proprietors to succeed.

- Cambridge Street is a unique retail environment, with a diversity of shops and services that reflect the neighborhoods it serves. Most businesses on Cambridge Street are independent proprietorships, characterized by low sales volumes and low rents. New retail initiatives should aim to preserve the unique character of Cambridge Street while supporting entrepreneurial growth and investment.



Focus and concentrate retail to create new walkable streets, establish connections, and reinforce existing retail districts

RECOMMENDATIONS

CAMBRIDGE AND FIRST STREET

The City of Cambridge has several initiatives completed or underway to strengthen the Cambridge Street retail corridor.

The Cambridge Street Streetscape Improvement Plan is an \$11,000,000 project that will involve roadway reconstruction of Cambridge Street as well as pedestrian and bicycle improvements such as new sidewalks and curb extensions, new street trees and street lighting, and new street furnishings such as trash receptacles, benches, and bicycle parking. Parks and plazas along the corridor – the Valente Library Park, Millers River Park, and Vellucci Plaza at Inman Square – will be reconstructed. The Facade Improvement Program offers technical and financial assistance (matching grants of up to \$35,000 for exterior rehabilitation) to property owners or tenants seeking to renovate or restore Cambridge Street building facades of commercial and mixed-use structures. To date, this program had funded the improvement of twelve facades that are complete or in progress.

The City has also been instrumental in helping retailers to organize a business association. The Cambridge Street Business Association could participate in a number of initiatives to strengthen Cambridge Street, including marketing initiatives to create theming and identity; coordinating special events to raise the street's profile; addressing the lack of unity/cohesion perceived by existing proprietors; and identifying specific merchandise types or tenants not currently located in the area.

The intersection of Cambridge Street and First Street is an important gateway to Eastern Cambridge, carrying high volumes of vehicle and pedestrian traffic. The adjacent MBTA Lechmere Station also serves as a major transit link to destinations in Cambridge and throughout the region. This area will become even more important in the future, as North Point is fully developed and transit service to Lechmere is expanded.

As this occurs, the market for convenience retail will grow substantially with the influx of new residents and commuters. This creates an opportunity for new street-level retail that can act as an anchor for Cambridge Street and a bridge to North Point. The potential relocation of Lechmere Station and extension of First Street across Monsignor O'Brien Highway would create a further opportunity to transform this intersection, establishing a welcoming new gateway to the district. New retail at the intersection of Cambridge and First and along the extension of First Street into North Point can create additional support for area businesses, drawing future residents and transit users onto Cambridge Street.

NORTH POINT

As North Point develops, new retail is likely to include a mix of independent proprietorships and regional retailers. New retail should be focused on convenience, including restaurants, convenience grocery, video, dry cleaning, coffee shops, flowers, sundries, and prepared foods. Retail economics in this area are likely to be characterized by mid- to high sales volumes and mid- to high-priced rents. The magnitude of supportable new retail is roughly 35,000 to 50,000 square feet at full build-out of North Point. The zoning recommendations of this study, described in the previous section, are intended to encourage retail that supports, rather than competes with, existing businesses, and that strengthens pedestrian connections to North Point.

Retail is permitted on the street level of any building. The first 50,000 square feet of street-level retail within a 500-foot radius of the intersection of Cambridge and First Street is exempt from the 35 percent commercial gross floor area (GFA) limit.

To prevent big-box development, the maximum floor area for a retail establishment is 10,000 square feet. To encourage pedestrian activity and support transit use, accessory parking is not required for street-level retail.

THIRD STREET

The potential redevelopment of the Volpe Center area offers an opportunity to create street-level retail along Third Street, and to bring new vitality to Kendall Square. The existing shops and restaurants on Main Street can become the core of an expanded commercial district that serves local residents, employees, and visitors. In the great tradition of Cambridge squares, Kendall Square can become a unique retail district that is active throughout the day and evening. New shops and restaurants should draw on the growing employee and resident population, with a mix of uses to serve a variety of needs. The new retail and multifunctional theater venues planned for Cambridge Research Park on the east side of Third Street will create a major new activity center, setting the stage for development of the Volpe Center area. A new retail corridor along Third Street will also help to create a better pedestrian connection from the adjoining neighborhoods to the Kendall Square transit station.

New retail on Third Street is likely to include a mix of independent proprietorships and regional retailers. The focus should be on convenience, including restaurants, convenience grocery, video, dry cleaning, coffee shops, flowers, sundries, prepared foods. Retail economics on Third Street are likely to be characterized by high sales volumes and high-priced rents. The magnitude of supportable new retail is roughly 50,000 to 70,000 square feet at full build out of the Volpe site. The zoning recommendations of this study, described in the previous section, are intended to encourage new retail that will add vitality to Kendall Square, and create better pedestrian connections between adjacent neighborhoods and commercial areas. For further details on recommended zoning, see Chapter 6.

The first 50,000 square feet of street-level retail along Third Street or fronting a public park is exempt from the 750,000 square foot commercial gross floor area (GFA) limit. To prevent big-box development, the maximum floor area for

a retail establishment is 10,000 square feet. To encourage pedestrian activity and support transit use, accessory parking is not required for street-level retail.

NOISE IMPACTS

As part of the Eastern Cambridge Planning Study, concerns were raised about the level of noise emitted by mechanical equipment in R&D buildings in the Kendall Square area. Other uses such as loading docks, construction, and related material delivery activity, other generators of noise were also discussed. Many homes in the study area are located close to commercial and R&D uses, particularly in the Transition Areas. Residents are particularly concerned about the cumulative impact of noise from existing and future office, R&D, and telecommunications development. The noise was identified as a constant presence in the neighborhood, and described as buzzing, humming, or whirring sounds. As more telecom and biotech buildings are constructed, residents are concerned that noise levels will increase.

CURRENT CITY ORDINANCE

Currently, the City of Cambridge Noise Control Ordinance (Chapter 8.16 Noise Control) regulates excessive noise levels based on the predominant use in the area. The ordinance measures noise impacts at the lot line of affected properties. In addition to establishing these limits, the Noise Ordinance controls specific “non-measured noise disturbances,” which include vibration, construction noise, car horns and other street sounds, car and other alarms, and animal noises, among others. These are “declared to be loud, disturbing, and unnecessary noises,” which are illegal, unless a variance has been granted by the License Commission.

RECOMMENDATION

In May 2001, the City Council requested the City Manager and the Community Development Department to convene a task force including residents, business owners, members from the biotech communities and members of the Planning Board to examine standards for rooftop and other building related mechanical equipment. This task force will be charged with examining the noise as well as aesthetic impact of mechanical equipment and will assess the need for additional regulations.

IMPLEMENTATION

ONGOING

- Citywide Project Review, including traffic impact studies.
- Eastern Cambridge Design Guidelines to be used by the Planning Board in their review of PUD and other special permit applications in the study area.
- Neighborhood Transportation Plan – recommendations of the plan to inform City priorities and mitigation requirements for projects that require special permits.

SHORT TERM (0-1 YEAR)

- Action on proposed zoning and design guidelines by City Council.
- City to work with developer and MBTA on planning and development of Urban Ring, and Lechmere Station relocation, and Green Line extension. Continue planning for regional multi-use paths.
- Set up a Task Force to study noise impacts from mechanical equipment.
- Complete planned pedestrian/bicycle improvements in existing areas, and in new areas as development gets underway.

MID TERM (1-5 YEARS)

- Transportation planning efforts continue. City to work with developer and MBTA on planning and development of Urban Ring and Lechmere Station relocation, finalize planning and design for regional multi-use paths.
- Conduct noise impact study and implement recommendations.
- First phase of development at North Point and Volpe likely to occur. Begin pedestrian, bicycle and roadway improvements in these areas.

LONG TERM (5+ YEARS)

- Completion of major infrastructure at North Point as development occurs (Lechmere Station relocation; extension of First Street).
- Continued work with MBTA on planning and development of Urban Ring and Lechmere Station relocation.
- Construction of multi-use paths through Eastern Cambridge.
- New development likely to continue at North Point and the Volpe Center.
- New residential development likely to occur in the Transition Areas.

Appendix A

Demographic Trends

Population trends in Cambridge are similar to those found in other major urban centers within the (MSA). According to the 2000 Census, the population of Eastern Cambridge has shown a gradual increase, similar to the rest of the City, though at a slightly higher rate. The population data is summarized in the table below.

The number of households in Eastern Cambridge has increased at a rate significantly higher than the city as a whole. At the same time, average household size in Eastern Cambridge has declined, dropping from 2.54 in 1980 to 2.24 in 1990. This remains higher than the Cambridge citywide average of 2.03. In spite of the area's proximity to MIT, students comprise a relatively small fraction of the resident population. According to the 1990 Census group-quartered individuals made up only 2% of the Eastern Cambridge population, compared to 15% citywide.

YEAR	POPULATION		HOUSEHOLDS	
	Cambridge	Eastern Cambridge	Cambridge	Eastern Cambridge
1980	95,322	17,518	38,836	6,779
1990	95,802	17,826	39,405	7,259
2000	101,355	19,990	42,615	8,758

Appendix B

Anticipated Development Under Proposed Zoning

Following is a summary of the 20-year build out projections for North Point, Volpe and the Transition Areas. These figures are based on projected market trends for commercial and residential uses, as well as site-specific development opportunities and constraints.

NORTH POINT

ASSUMPTIONS:

- Buildable area = 2,062,971 sq. ft.
- 55% of full build out will be achieved in 20 years
- FAR = 2.5 plus inclusionary bonus for affordable housing
- Commercial development = 35% of total development

NEW DEVELOPMENT

Housing

2,694,800 sq. ft.

2,160 units (at 1250 sq. ft. per unit)

3,240 parking spaces (at 1.5 spaces per unit)

General Office

496,400 sq. ft.

790 parking spaces (at 1 space per 625 SF)

R&D

496,400 sq. ft.

590 parking spaces (at 1 space per 840 SF)

NEW RESIDENTIAL POPULATION

4380 persons (average 2.03 persons per household)¹

VOLPE CENTER AREA

ASSUMPTIONS:

- Buildable area = 835,000 SF
- 90% of full build out will be achieved in 20 years
- FAR = 2.5 plus inclusionary bonus for affordable housing
- Net new commercial development (at full build out) = 750,000 sq. ft.

NEW DEVELOPMENT

Housing

1,872,500 sq. ft.

1,500 units (at 1250 square feet per unit)

2,250 parking spaces (at 1.5 spaces per unit)

General Office

337,500 sq. ft.

540 parking spaces (at 1 space per 625 SF)

R&D

337,500 sq. ft.

400 parking spaces (at 1 space per 840 SF)

New Residential Population

3,045 persons (average 2.03 persons per household)

TRANSITION AREAS

ASSUMPTIONS:

- Approximately twenty percent of all properties in Transition Area A are likely to redevelop in twenty years.
- Significant redevelopment is not likely to occur in Transition Area B.
- For properties likely to redevelop, 62% of full build out will be achieved in 20 years.
- Residential FAR = 2.5 plus inclusionary bonus for affordable housing
- Commercial FAR = 1.25
- New development will be predominantly residential.

NEW DEVELOPMENT

Housing

950,000 sq. ft.

760 units (at 1250 sq. ft. per unit)

1140 parking spaces (at 1.5 spaces per unit)

General Office

56,700 sq. ft.

90 parking spaces

R&D

56,700 sq. ft.

70 parking spaces

Redevelopment of existing properties in the Transition Area will likely result in a net loss of existing industrial and retail space, as shown below:

Industrial: -229,100 sq. ft.

Retail: -29,400 sq. ft.

NEW RESIDENTIAL POPULATION

1,540 persons (average 2.03 persons per household)

** Based on projected average household size for Eastern Cambridge in 2005.*

Appendix C

Retail Stores, Employment & Sales in the Cambridge Market

Category	CAMBRIDGE TOTAL			EASTERN CAMBRIDGE		
	Stores	Employees	Annual Sales (\$M)	Stores	Employees	Annual Sales (\$M)
General Merchandise	16	491	53.30	6	402	44.50
Apparel/Accessories	127	1,218	87.30	51	651	49.50
Radio/TV/Computers	198	3,980	1,070.90	65	1,996	549.20
Household Appliances	7	27	4.80	1	1	\$0.20
Eating/Drinking	347	6,165	300.80	92	1,475	71.20
Misc. Convenience Goods	82	474	67.50	22	100	14.20
Furniture/Furnishings	80	450	57.20	19	102	11.50
Material/Garden	32	378	54.70	5	78	10.80
Misc. Shopping Goods	139	1,369	99.00	30	258	18.50
Drugs Stores	14	190	24.50	2	35	4.50
Other	36	328	33.00	8	45	4.50
Auto Sales/Services	44	311	82.60	9	54	10.10
Food	110	1,545	217.00	28	124	10.20
Liquor Stores	17	113	8.80	1	2	0.20
Total	1251	17,039	2,161.40	339	5,323	798.90

Appendix D

Eastern Cambridge Design Guidelines

The Eastern Cambridge Design Guidelines were developed as part of the Eastern Cambridge Planning Study. The guidelines are intended to inform property owners, business owners, developers, and the general public about the desired form and character of development in the ECaPS Study Area. They will guide development activities in this area, particularly in North Point, the Volpe site, the transition areas between residential neighborhoods and Kendall Square, as well as other areas in Wellington-Harrington, Area IV, and East Cambridge. The aim is to create consistently high-quality public environments, and to ensure that development contributes to the character and vitality of the surrounding community. The guidelines are based on the following core principles:

- Manage development to maintain livability in residential neighborhoods and ensure compatibility with existing neighborhood character.
- Provide better transitions between developed/developing areas and residential neighborhoods.
- Create new mixed-use neighborhoods at North Point and the Volpe Center that are integrated with the existing urban fabric.
- Enhance quality of life through the creation of active streets, new public open spaces, and expanded retail opportunities.
- Strengthen pedestrian and bicycle connections throughout Eastern Cambridge, especially between residential neighborhoods and Kendall Square, the Lechmere transit station, and the Charles River.

The Eastern Cambridge Design Guidelines will be referenced by the Planning Board in their review of special permit applications for projects in the ECaPS Study Area that are before the Board. These guidelines will be specifically referenced in the City's zoning ordinance in the Project Review Special Permit section and in the PUD text where applicable. Therefore, they will serve as a guide to developers for projects in the Eastern Cambridge study area that seek a PUD special permit or a Project Review special permit, among other discretionary permits.

The guidelines are organized into two sections: Built Form, which addresses the use, scale, and character of buildings; and Public Realm, which addresses connections, streets and sidewalks, open space, and transportation. Where additional area-specific guidelines are proposed, they are listed at the end of the appropriate section. The areas are the focus areas as defined for ECaPS.

A. Goals

This section lists the goals that guided the development of these guidelines.

NORTH POINT

- Create a lively new mixed-use district with strong visual and pedestrian connections to East Cambridge. The new district should be a place to live, work, and enjoy a variety of parks and public spaces.
- Create a new east-west main street through the center of North Point, connecting East Cambridge with the future MDC Park
- Extend First Street into North Point to connect existing and new neighborhoods.
- Create a major new public park easily accessible from the relocated Lechmere T station, First Street, and O'Brien Highway.
- Create a new retail edge at the relocated Lechmere T station and at the intersection of First Street, Cambridge Street, and O'Brien Highway that will complement, not compete with, existing retail on Cambridge Street.

VOLPE CENTER AREA

- Create new housing south of Binney Street to link existing neighborhoods and Kendall Square.
- Create a major new public park facing Binney Street, surrounded by residential and retail uses.
- Strongly encourage retail on Third Street and Broadway to create active street life in Kendall Square and to create a lively connection between the neighborhoods and Kendall Square.
- Create a mix of housing and commercial uses along Broadway.
- Create a transition in land uses and heights from Broadway to the residential neighborhoods.

TRANSITION AREAS

- Encourage new residential development and conversions of existing buildings to residential use but allow existing commercial uses to remain.
- Use finely graduated heights to create transitions in scale from Kendall Square to residential neighborhoods.
- Create better pedestrian and bicycle connections between residential neighborhoods, Kendall Square, Central Square, and the Charles River.

NEIGHBORHOODS

- Preserve and enhance neighborhood character.
- Maintain the walkable scale and character of residential blocks.
- Support and strengthen businesses on Cambridge Street, Broadway, and Main Street.

B. Built Form

1. STREET-LEVEL USES AND DESIGN

The following guidelines apply primarily to large-scale development sites. For these larger sites, developers should clearly identify the intended use and size for each block. For infill development, new buildings should contribute to the character of the existing street.

- a. Residential blocks** are blocks that are primarily lined with housing. Corner retail is allowed and even encouraged in some of these blocks, depending on the zoning.

New development on residential blocks should be consistent with the following principles:

- i. Create a consistent residential edge, with small setbacks for stoops, porches, and front gardens.
- ii. Buildings should be designed with individual units and front doors facing the street, including row house units on the lower levels of multi-family buildings. Where residential lobbies face the street, doors should generally be spaced no more than 75 feet apart.
- iii. Blank walls should be avoided along all streets and pedestrian walkways.

- b. Mixed-use blocks** are blocks that include housing and/or commercial uses, with a mix of active uses strongly encouraged on the ground floor.

New development on mixed-use blocks should be consistent with the following principles:

- i. Street-level facades should include active uses such as:
 - Residential entrances
 - Shops, restaurants, and cafes
 - Services for the public or for commercial offices such as fitness centers, cafeterias, daycare centers, etc.
 - Community spaces, such as exhibition or meeting space
 - Art exhibition space/display windows
 - Commercial lobbies and front doors
 - ii. Office/ R&D uses are discouraged from occupying extensive ground-floor frontage. Where these uses do occur, they should occupy no more than 200 to 250 feet of continuous frontage along public streets.
 - iii. Major entrances should be located on public streets, and at or near corners wherever possible. Entrances should relate well to crosswalks and pathways that lead to bus stops and transit stations.
 - iv. Transparent materials and interior lighting should be used to maximize visibility of street level uses. Ground floor facades should be at least 30 to 50 percent transparent surface to permit a clear view from the sidewalk to the interior space of the building.
 - v. Blank walls should be avoided along all streets and pedestrian walkways.
- c. Retail blocks** are blocks that include both commercial and residential uses on upper floors,

with retail strongly encouraged on the ground floor. Retail blocks are intended to have a high volume of pedestrian traffic, and to support public activity throughout the day and evening.

New development on retail blocks should be consistent with the following principles:

- i. At least 75 percent of the street frontage should be occupied by retail uses, including cafes and restaurants.
- ii. Major entrances should be located on public streets, and on corners wherever possible. Entrances should relate to crosswalks and pathways that lead to bus stops and transit stations.
- iii. Transparent materials and interior lighting should be used to maximize visibility of street level uses. Ground floor facades should be at least 50 to 75 percent transparent surface to permit a clear view from the sidewalk to the interior space of the building.
- iv. Blank walls should be avoided along all streets and pedestrian walkways.

2. BUILDING HEIGHT AND ORIENTATION

a. Major public streets

These include a new main street at North Point; O'Brien Highway; Cambridge Street; Broadway; Binney Street; Third Street between Broadway and Binney; First Street (including the extension into North Point), and Main Street.

- i. Set back any portion of the building above 65 feet by at least 10 feet from the principal facade.
- ii. For retail and office uses, build to the lot line or provide small setbacks (5 to 15 feet) from the right-of-way for café seating, benches, or small open spaces. Setbacks used exclusively for ornamental landscaping are not permitted but may be allowed to accommodate street furniture, street trees, or generous sidewalks. Awnings and canopies are encouraged to provide shelter and enliven the ground floor facade.
- iii. For residential uses, provide small setbacks (5 to 10 feet) for stoops, porches, and front gardens.
- iv. Driveway turnaround and vehicle drop-off facilities are strongly discouraged along public streets.
- v. Locate loading docks on side streets or service alleys, and away from residential areas.
- vi. In use, design, and entry, orient buildings towards corners.

b. Neighborhood Streets

These include existing residential streets in East Cambridge, Wellington/ Harrington, Area IV, and the Transition Area, as well as new residential streets at North Point and the Volpe Center.

- i. Set back any portion of the building above 45 feet by at least 10 feet from the principal facade. Where appropriate, design these setbacks to include balconies and rooftop terraces.
- ii. For residential uses, provide small setbacks (5 to 15 feet) for stoops, porches, and front gardens.
- iii. Provide individual entrances to ground floor units along the street.
- iv. Locate courtyards and open spaces to maximize sun exposure.

c. Park Edges

These are streets facing a public park.

- i. The height of the principal façade of buildings surrounding a park should be no greater than 1/3 the width of the park. For additional height above this limit, buildings should be stepped back by at least ten feet from the principal facade. Greater height without setbacks may, however, be appropriate at corners or in specific locations to create architectural variety. The buildings must conform to overall district height limits in the zoning.

- ii. Locate buildings to minimize shadows on the park, especially in the afternoon.
- iii. Surround public parks with uses that create an active environment throughout the day and evening and increase safety for park users, such as:
 - Buildings should be designed with individual units and front doors facing the street, including row house units on the lower levels of multi-family buildings. Where residential lobbies face the street, doors should generally be spaced no more than 75 feet apart.
 - Shops, cafés and other public uses that enliven the street.

d. Other Streets

- i. If the prevailing height of surrounding buildings is 65 feet or less, establish a cornice line that matches the prevailing height of surrounding buildings. For additional height above the cornice line, provide a setback of at least 10 feet from the principal façade.
- ii. For retail and office uses, build to the lot line or provide small setbacks (5 to 15 feet) from the right-of-way for café seating, benches, or small open spaces. Setbacks used exclusively for ornamental landscaping are not permitted.
- iii. For residential uses, provide small setbacks (5 to 10 feet) for stoops, porches, and front gardens.
- iv. Locate loading docks on side streets or service alleys, and away from residential areas.

3. SCALE AND MASSING

- a. For new development sites, the block size should be similar to the existing East Cambridge blocks. An attempt should be made to reduce the distance that pedestrians have to walk to a crosswalk in order to safely cross the street.
- b. Buildings should avoid continuous massing longer than 100 feet facing residential streets and 200 feet facing mixed-use and retail streets. If massing extends beyond this length, it should be made permeable and visibly articulated as several smaller masses using different materials or colors, vertical breaks, bays, or other architectural elements.
- c. In addition to the above limits, buildings should reflect a rhythm and variation appropriate to the urban context. For example, this can be achieved by expressing bay widths of 16 to 25 feet along residential streets and 25 to 50 feet along mixed-use and retail streets.
- d. Buildings should have a clearly expressed base, middle, and top. This may be achieved through changes in material, fenestration, architectural detailing, or other elements.
- e. Use variations in height and architectural elements such as parapets, cornices and other details to create interesting and varied rooflines and to clearly express the tops of buildings.
- f. Emphasize corners using taller elements such as towers, turrets, and bays
- g. Taller buildings should be articulated to avoid a monolithic appearance. Preference is given to point towers over slabs, and to buildings with smaller floor plates.

4. ARCHITECTURAL CHARACTER

- a. Residential
 - i. Create varied architecture and avoid flat facades by using bays, balconies, porches, stoops, and other projecting elements.
 - ii. Maximize the number of windows facing public streets to increase safety.
- b. Commercial
 - i. Create varied architecture and avoid flat facades by using recessed or projected entryways, bays, canopies, awnings, and other architectural elements.
 - ii. Vary the architecture of individual buildings to create architecturally diverse districts.
 - iii. Where buildings are set back at upper stories, lower roofs may be used as balconies, balustrades, and gardens.

5. ENVIRONMENTAL GUIDELINES

- a. Design buildings to use natural resources and energy resources efficiently in construction, maintenance, and long-term operation of the building. Buildings on a lot should be sited to allow construction on adjacent lots to do the same. Compliance with Leadership in Energy and Environmental Design (LEED) certification standards and other evolving environmental efficiency standards is encouraged.

- b. Rooftop mechanical equipment should be sited and shielded to protect neighboring uses from noise impacts.

6. PARKING

- a. While underground parking is preferable everywhere, if above ground parking is to be built it should be designed so as not to be visible from public streets or pathways. Above ground structured parking should be lined with active uses (shops, cafes, etc.) along major public streets, or with housing units along residential streets.
- b. Locate vehicular parking entrances on side streets and alleys and provide safe pedestrian access from public streets.
- c. All parking garages must provide direct pedestrian access to the street.
- d. The primary pedestrian exit/access to all garages serving non-residential uses should be to the street or a public area.
- e. Design and locate lighting fixtures in surface parking lots and garages to enhance safety while minimizing light spillover onto adjacent properties.

C. Public Realm

1. OPEN SPACE

- a. Public open space
 - i. The provision of open space of diverse sizes and use is encouraged to enhance the public environment in the study area.
 - ii. The provision of interconnected series of open spaces is encouraged to provide connections to neighborhoods and to encourage pedestrian movement.
 - iii. Where major new parks are required by zoning, provide programmed, multi-use open space for both recreational and cultural activities.

Area-specific guidelines:

North Point

- The major new park required by the zoning code should be located convenient to the Lechmere T station in order to link East Cambridge and future neighborhoods at North Point.
- In addition to the required public open space, the creation of a series of smaller open spaces such as courtyards, parks, playgrounds and gardens located along the central main street is encouraged.

Volpe Center

- Use open space to create links between Kendall Square and the residential neighborhoods.

Transition Areas and Neighborhoods

Locate new open spaces to create linkages and connect to existing parks and open spaces, where possible.

- b. Semi-private open space
 - i. For residential development, create semi-private open spaces (e.g. front and rear yards, porches, stoops, and patios) that create a transition from public sidewalks and courts to private interior spaces.
 - ii. Design residential courtyards to be visually accessible from streets to enhance safety and activity along the street.

2. STREETS AND SIDEWALKS

- a. Character
 - i. Use streetscape elements such as trees, benches, signage, and lighting to support active pedestrian uses and to reinforce the character and identity of each district.
 - ii. Design streets to encourage pedestrian and cycle activity, and to control vehicle speed in residential areas.
- b. Where appropriate, establish, preserve and highlight views from public streets and spaces to important civic landmarks such as the Charles River cable-stayed bridge and the clock tower in Kendall Square.

- c. In the design of new streets, provide sufficient pavement width to accommodate on-street parking where appropriate in order to provide short-term parking and to serve local retail.
- d. In the design of new streets, pathways, and parks, provide pedestrian-scale lighting to enhance pedestrian safety.
- e. Refer to the Cambridge Pedestrian Plan and the Cambridge Bicycle Plan for additional guidance on creating a safe and pleasant environment for pedestrians and bicyclists and for guidance on sidewalk width and street trees.

3. CONNECTIONS

- a. Provide safe pedestrian and bicycle connections to future regional pathways (Grand Junction railroad, North Point path).
- b. Provide strong pedestrian, bicycle and visual connections to the Charles River and public parks through view corridors, signage, and/or art installations.
- c. Provide safe pedestrian and bicycle connections to existing and new bus stops and to transit stations including Kendall Square, Lechmere, Community College and North Station MBTA stations.

Area-specific guidelines:

North Point

- Provide continuous pedestrian and bicycle access through the area to the MDC New Charles River Basin Park.

- Provide new pedestrian crossings along O'Brien Highway with strong visual connections from existing streets in East Cambridge to new streets at North Point. Ensure that new pedestrian crossings are coordinated with traffic operations on O'Brien Highway.
- Provide an attractive landscaped edge between the future Somerville regional bicycle path and the adjacent rail yards.
- Provide landscaped pedestrian/cycle connections from North Point to the future regional bicycle path.

Volpe Center

- Provide green connections to Broadway and Third Street as extensions of the proposed public park.
- Provide strong pedestrian and bicycle connections to the Broad Canal and the Charles River from the site.

Transition Areas

- Provide safe pedestrian crossings at Binney Street.
- Design the new park on Fulkerson Street to maximize visual connections between neighborhoods on either side of the Grand Junction rail tracks.

Neighborhoods

- Improve pedestrian, and bicycle connections to the Charles River, particularly across First Street.
- Improve visual, pedestrian, and bicycle connections between the residential neighborhoods on either side of the Grand Junction rail tracks.

4. TRANSPORTATION

a. Transit

- Preserve rights of way for future Urban Ring project.
- Integrate retail and other public activities with any new transit stations.

b. Pedestrian

- Provide pedestrian crossings/phases at all major intersections.

c. Bicycle/other non-motorized vehicles

- Provide bicycle lanes on major streets.
- Provide sheltered bicycle racks in all new commercial and multi-family residential buildings and in transit stations.
- Provide bicycle racks along the street in retail areas.

Appendix E

Critical Movements Analysis

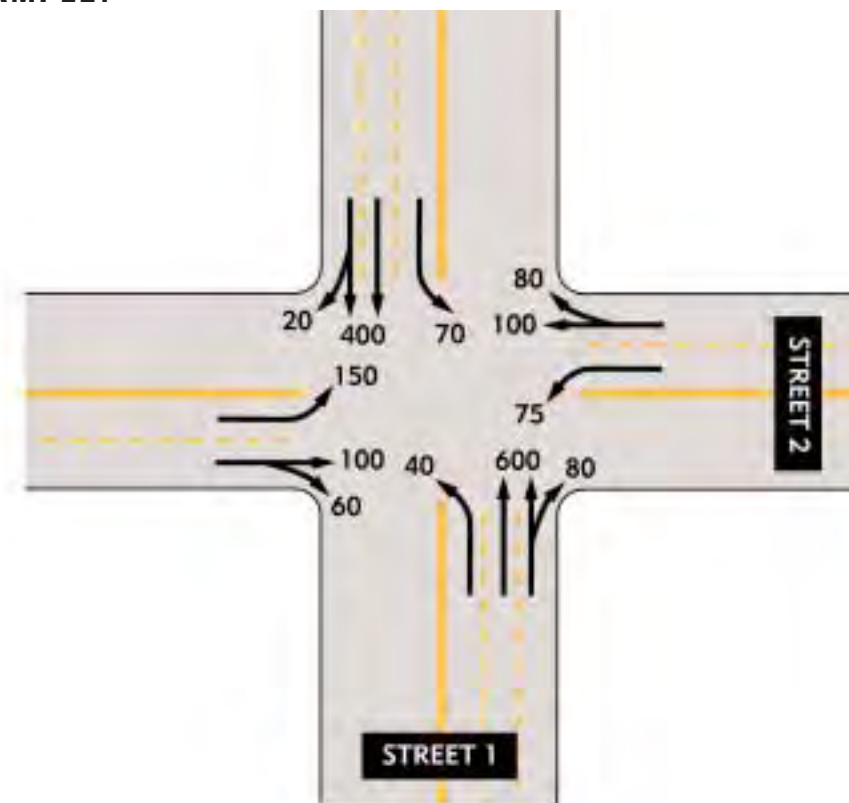


Street 1: $(A \div 2) + D$ or $(C \div 2) + B$, whichever is more

Street 2: $E + H$ or $G + F$, whichever is more

Critical Sum = Result of Street 1 + Street 2

EXAMPLE:



Street 1: $[(400 + 20) / 2] + 40 = 250$ or $[(600 + 80) / 2] + 70 = \boxed{410}$

Street 2: $(100 + 80) + 150 = \boxed{330}$ or $(100 + 60) + 75 = 235$

Critical Sum = $410 + 330 = 740$ vehicles

Intersection		1998		2005		2020		2020 Buildout							
		Existing		Permitted Condition		Permitted Condition		Status Quo		Citywide Proposal		Initial Land use Scenario		Initial Land use Scenario with Auto Trip Reduction	
		Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum
1	Main Street / Windsor Street	No data	No data	140	50	140	50	310	110	300	90	280	90	250	80
2	Main Street/ Portland Street	1,390	750	1,600	870	1,710	930	1,870	1,010	1,850	970	1,840	970	1,810	960
3	Main Street/ Albany	870	610	1,050	710	1,120	760	1,360	950	1,350	930	1,310	910	1,280	880
4	Main Street /Vassar Street	1,610	580	2,220	830	2,350	880	2,870	1,170	2,750	1,130	2,680	1,090	2,620	1,050
5	Main Street/ Ames Street/Mid-block Connector	1,110	490	1,480	670	1,570	710	1,570	710	1,570	710	1,570	710	1,570	710
6	Wadsworth Street / Memorial Drive	1,270	700	1,320	720	1,420	780	1,470	790	1,460	780	1,470	780	1,460	780
7	Broadway/Third Street	2,280	1,110	2,850	1,340	3,030	1,430	3,350	1,710	3,200	1,570	3,160	1,530	3,130	1,510
8	Broadway Avenue/ Ames Street	1,620	660	2,120	940	2,250	1,000	2,310	1,000	2,320	1,000	2,330	1,000	2,310	1,000
9	Broadway Avenue/ Galilei Street	2,800	1,020	3,600	1,330	3,830	1,420	4,880	1,850	4,610	1,790	4,460	1,730	4,330	1,670
10	Broadway Avenue/ Hampshire Street	1,760	780	2,290	990	2,430	1,050	2,960	1,360	2,860	1,290	2,770	1,240	2,700	1,200
11	Broadway Avenue/ Portland Street	1,380	680	1,720	820	1,840	870	1,970	930	2,000	940	1,990	940	1,960	920
12	Broadway Avenue/ Windsor Street	1,330	840	1,470	950	1,580	1,010	1,880	1,210	1,810	1,110	1,770	1,090	1,730	1,070
13	Hampshire Street/ Card. Madeiros	1,620	950	1,840	1,090	1,970	1,170	2,200	1,360	2,160	1,300	2,120	1,260	2,090	1,250
14	Hampshire Street/ Windsor	No data	No data	160	100	160	120	390	290	340	220	310	190	280	170
15	Little Binney/ Card. Madeiros	1,020	780	1,130	850	1,220	920	1,230	930	1,240	940	1,240	940	1,230	930
16	Little Binney/ Kendall Square Garage Driveway	610	380	820	510	870	540	870	540	870	540	870	540	870	540
17	Binney Street/ Fulkerson Street	690	690	940	940	1,000	1,000	1,320	1,320	1,380	1,380	1,340	1,340	1,270	1,270
18	Little Binney/ Fulkerson Street	720	570	780	620	840	670	840	670	840	670	840	670	840	670
19	Little Binney/ Binney Street	360	360	480	480	510	510	700	700	690	690	670	670	640	640
20	Munroe Street/Third Street	1,330	970	1,570	1,170	1,680	1,240	1,960	1,500	1,830	1,360	1,800	1,330	1,770	1,310
21	Binney Street/ Land Boulevard	3,150	1,080	3,960	1,710	4,210	1,790	5,010	2,370	4,670	2,130	4,610	2,060	4,540	2,010
22	Binney Street/ First Street	1,820	820	2,610	1,030	2,760	1,100	3,660	1,300	3,390	1,350	3,220	1,300	3,130	1,260
23	Binney Street/ Second Street	1,280	470	1,930	780	2,030	820	2,890	1,150	2,680	1,040	2,530	970	2,440	940
24	Binney Street /Third Street	2,280	1,200	2,960	1,420	3,150	1,520	4,500	1,960	4,080	1,810	3,880	1,740	3,740	1,690
25	Charles Street/ Land Blvd.	3,320	1,190	3,860	1,420	4,130	1,510	4,920	1,730	4,650	1,670	4,570	1,630	4,490	1,610
26	Charles Street/ First Street	1,330	550	1,490	630	1,590	670	1,760	710	1,880	750	1,820	730	1,770	720
27	Charles Street/ Third Street	No data	No data	190	130	190	130	560	390	430	250	390	220	350	200
28	Charles Street/ Sixth Street	610	400	740	470	790	500	790	500	790	500	790	500	790	500
29	Cambridge Street/ Windsor	No data	No data	20	10	20	10	300	230	190	130	210	140	170	120
30	Cambridge Street/Cardinal Madeiros/Warren Street	1,800	1,080	1,980	1,190	2,120	1,280	2,440	1,540	2,370	1,440	2,370	1,450	2,320	1,420
31	Cambridge Street/Lambert/Fulkerson	1,320	880	1,400	940	1,510	1,010	1,820	1,100	1,760	1,130	1,750	1,110	1,710	1,090
32	Cambridge Street/Sixth Street	1,180	520	1,280	580	1,380	630	1,690	740	1,620	690	1,620	700	1,580	680
33	Cambridge Street/Third Street	1,860	920	2,130	1,060	2,280	1,140	2,970	1,300	2,740	1,230	2,700	1,230	2,620	1,210
34	Cambridge Street/Second Street	1,190	820	1,280	890	1,380	960	1,690	1,040	1,610	1,060	1,600	1,040	1,560	1,020
35	Cambridge Street/First Street	1,670	1,120	1,850	1,280	1,990	1,370	2,480	1,580	2,510	1,700	2,430	1,630	2,350	1,580
36	McGrath O'Brien Highway/ Cambridge Street	3,580	1,040	3,850	1,110	4,130	1,190	5,410	1,780	5,090	1,590	4,980	1,590	4,830	1,520
37	McGrath O'Brien Highway/ Land Boulevard	5,180	1,600	6,060	1,810	6,470	1,940	7,540	2,210	7,160	2,100	7,090	2,080	6,980	2,060
38	McGrath O'Brien Highway/ Third Street	3,270	1,350	3,640	1,510	3,900	1,620	4,010	1,670	4,020	1,670	4,010	1,670	3,990	1,660
39	Gore Street/Warren Street	1,340	860	1,410	910	1,520	980	1,520	980	1,520	980	1,520	980	1,520	980
Total Critical Sum above 1500 threshold		100		530		880		3,410		2,530		0		1,800	
Total Critical Sum above 1500 threshold for NEW Development		N/A		N/A		N/A		2,530		1,650		1,290		920	
Auto Trips Generated for NEW Development		N/A		N/A		N/A		4,040		2,600		2,270		1,840	

Appendix F

Transportation Recommendations

The following is a list of recommendations that were articulated during the ECaPS process and is intended to guide City priorities and mitigation requirements for projects that require special permits. Such improvements would occur over a long period of time and as such, the recommendations should be reevaluated at the time of implementation to ensure that they are the appropriate measures to achieve the desired goals.

Objective	Strategy	Recommendations
A. REDUCE NEW AUTO TRIPS		
Achieve a reduction in auto trip generation consistent with the City-wide objective to reduce new auto-trip generation by 50%.	Incorporate zoning constraints on parking supply for new development.	<ol style="list-style-type: none"> 1. Reduce maximum parking ratios for commercial development by 20% from those proposed under Citywide Growth Management in North Point. 2. Establish a maximum parking ratio for residential development of 1.5 spaces per unit. 3. Establish a non-residential parking “cap” of 2,500 spaces in North Point, consistent with zoning as now proposed under the EcaPS recommendations.
	Implement demand management measures or infrastructure projects that support alternatives to driving.	<ol style="list-style-type: none"> 4. Require new development to support the reduced auto mode-share reflected in the constrained parking supply with a package of measures additional to the level of TDM already required by the City under PTDM initiatives. Examples of measures that might be considered include the following: <ol style="list-style-type: none"> (a) Travel Demand Management Initiatives such as: <ul style="list-style-type: none"> • car sharing organization membership for residents and/or employees to reduce individual car ownership and use • set-aside of parking spaces for car-sharing vehicles • provision of T-pass for households to encourage transit use • residential membership of TMA, with coordinator to enable TMA benefits such as vanpool programs to extend to residential projects

Objective	Strategy	Recommendations
		<p>extend to residential projects</p> <ul style="list-style-type: none"> • option of residential parking leasing versus mandatory ownership to discourage car ownership • graduated parking rates (increased rate for multiple car/space) to discourage multiple car ownership • shuttle service, including residential-to-transit connections to provide attractive alternative to single occupancy vehicle auto travel • allocation of space for transportation information center to promote/encourage non-auto modes • bicycle fleet and support facilities available to residents or employees • allocation of space for daycare facilities to reduce vehicle trips associated with child care drop-off; state-of-the-art public transit stops (e.g. shelters, seats, information etc.) <p>(b) Infrastructure Projects to enhance non-auto mobility such as:</p> <ul style="list-style-type: none"> • relocation of Lechmere station; North Point pedestrian/bicycle connection to Bunker Hill Community College station • pedestrian crossings of Monsignor O'Brien Highway • additional or upgraded pedestrian crossing of Binney Street, First Street, Land Boulevard and Memorial Drive • off-road bicycle/pedestrian path through North Point • off-road bicycle/pedestrian path segment on Grand Junction (the City is currently conducting a feasibility study) • bicycle station (locker facilities, showers, repair shop etc.) • North Point busway connection to Bunker Hill Community College station • Green Line extension beyond Lechmere • Lechmere station bus facility • Urban Ring components including right of way protection • Third Street/Main Street bus link and associated bicycle connections

Objective	Strategy	Recommendations
B. INFLUENCING WHERE TRAFFIC GOES		
Encourage use of the First Street corridor as the preferred north-south route to Kendall Square, complementary to Land Boulevard.	Enhance connection of First Street to Monsignor O'Brien Highway. Facilitate two-way connection between Linskey Way and First Street	<p>5. Plan for the future extension of First Street to Monsignor O'Brien Highway in conjunction with the relocation of Lechmere station.</p> <p>6. Alter circulation on Linskey Way to provide for two-way travel between First Street and the Beal garage driveway on Linskey Way.</p>
Enhance access to new development at North Point while minimizing traffic impacts on residential neighborhoods.	<p>Optimize access connections to North Point by “intercepting” traffic at the earliest opportunities on Monsignor O'Brien Highway, incorporating improved pedestrian and bicycle connections.</p> <p>Improvements along Monsignor O'Brien Highway are under the jurisdiction of the Metropolitan district Commission (MDC) and will require their approval.)</p>	<p>Recommendations for access to North Point:</p> <p>7. Third Street</p> <ul style="list-style-type: none"> - Eliminate westbound left turn from Monsignor O'Brien Highway to Third Street. - Provide widened median by elimination of westbound left turn. - Improve protection for existing crosswalk by elimination of northbound “turn-on-red.” - Provide improvements including curb extension on western corner to shorten Third Street crosswalk and reduce corner radius (to slow turning vehicles), and eliminate “turn on red” provisions. <p>8. Water Street:</p> <ul style="list-style-type: none"> • Provide signal at the intersection. • Provide eastbound left-turn from Monsignor O'Brien Highway to Water Street • Allow right-turns only from Water Street. • Provide crosswalks along all legs of the intersection • Provide signal phasing to include protected walk phase to east of Water Street. <p>9. First St. Extension:</p> <ul style="list-style-type: none"> • Extend First Street across Monsignor O'Brien Highway with traffic signalization. • Prohibit left-turns from Monsignor O'Brien Highway in both directions. • Prohibit left-turns from southbound First Street extension. • Provide crosswalks along all legs of intersection. • Provide signal phasing to include protected walk phase to east of First Street Extension.

Objective	Strategy	Recommendations
		<p>10. East Street:</p> <ul style="list-style-type: none"> • Relocate East Street to align with Cambridge Street. • Prohibit through movements between East Street and Cambridge Street, unless warranted by development in the future. • Provide consolidated/shortened crosswalks in conjunction with relocation of East Street • Provide signal phasing to include protected walk phase to west of East Street. <p>11. Additional right-turns in/right-turns out access from North Point to Monsignor O'Brien street can be incorporated if required, subject to satisfying roadway design considerations.</p> <p>12. Provide a continuous internal roadway connection from Water Street to Museum Way to facilitate flexibility of access.</p>
	<p>Strengthen pedestrian connections between the existing residential neighborhoods, North Point and the Green Line Lechmere station by providing enhanced crossing facilities across Monsignor O'Brien Highway.</p>	<p>13. Incorporate at least 4 new crosswalks across Monsignor O'Brien Highway, spaced no more than 300 feet apart, as included in Rec. 6.</p> <p>14. Traffic progression along Monsignor O'Brien Highway should be maintained through coordination of new traffic signal phasing with maximum 120-second cycle length at existing intersections. However, development proposals should analyze the opportunity of running one or more intersections at a shorter cycle length to reduce pedestrian delay.</p>
	<p>Increase transit accessibility to North Point.</p>	<p>15. Preserve options for on-going and future transit initiatives, including the Urban Ring Phases 1, 2 & 3, and the Green Line extension to West Medford.</p> <p>16. Seek opportunities for the early implementation of sections or parts of such transit projects, as part of new development. Refer to examples under Rec. 4, which include Transportation Demand management measures and infrastructure improvements.</p>

Objective	Strategy	Recommendations
Enhance access to new development at the Volpe Site, while minimizing its traffic impacts to the residential neighborhoods.	Establish principles and guidelines for roadway access.	17. Primary, all-directional access to the Volpe site should be focused on Broadway and the southern section of Third Street.
		18. Maintain the integrity of the median on Binney Street to preclude new openings that might connect with neighborhood streets. This allows only for eastbound right-in/right-out on the Binney Street frontage.
	Strengthen pedestrian connections between the residential neighborhoods and the Volpe site/Kendall Square.	19. Provide a pedestrian crossing across Binney Street at Sixth Street to the multi-use path west of Volpe Site (refer to Rec.40). Experimental improvement is currently being pursued in relation to the Biogen and 300 Bent Street development
		20. The need for a crosswalk on Binney Street at Fifth Street should be investigated as the Volpe site develops.
		21. The revised configuration of the Binney Street/Fulkerson Street intersection (refer to Rec. 27) should include a protected crosswalk on Binney Street.
	Increase transit accessibility to Volpe site.	22. Preserve options for on-going and future transit initiatives, including the Urban Ring Phases 1, 2 & 3.
	23. Seek opportunities for the early implementation of sections or parts of such transit projects, as part of new development. Refer to examples under Rec. 4, which include Transportation Demand management measures and infrastructure improvements.	
Enhance access to new development in the Transition Areas, while minimizing its traffic impact on the residential neighborhoods.	Establish principles and guidelines for roadway access.	24. Focus vehicular access in Transition Areas on First Street and Binney Street corridors.
		25. Locate driveway access for development west of Fulkerson on Little Binney Street, provided it does not conflict with nearby intersection.
	Focus non-residential traffic to the transition area on Bent Street by providing for two-way traffic.	26. Make Bent Street two-way between Third Street and Fulkerson Street. A potential subsequent stage to convert Charles Street to one-way westbound should be considered only when the effects of the initial change have been established.
	Facilitate two-way connection between Linskey Way and First Street.	Refer to Rec. 6 .

Objective	Strategy	Recommendations
<p>Reduce use of neighborhood streets by auto traffic accessing development in Kendall Square and adjacent areas.</p>	<p>Reduce the use of the Twin City mall parking lot as a through connection between Gore Street and Monsignor O'Brien Highway.</p>	<p>27. Eliminate direct connection via Rufo Road. Planned renovation of Twin Cities mall provides opportunity to implement.</p>
	<p>Reduce use of Fulkerson Street and Charles Street as an egress route from the garage on Little Binney Street without shifting traffic to other residential streets.</p>	<p>28. Implement a community process to develop design options and implementation of changes to the Fulkerson Street/Binney Street/Little Binney Street intersection layout and its traffic operation. This process is to be facilitated by Amgen (Refer also to pedestrian needs under Rec. 21).</p>
<p>Reduce traffic speed and improve safety and quality-of-life within the residential neighborhoods.</p>	<p>Traffic calming - the physical redesign of roadways to reduce traffic speeds and balance the needs of all users through safety enhancements.</p>	<p>29. Pursue traffic calming initiatives in accordance with current City criteria and procedures, which include:</p> <ul style="list-style-type: none"> • Traffic speed • Location of schools • Location of playgrounds • Coordination with other City projects <p>Streets that satisfy one or more the above-mentioned criteria for inclusion in the Citywide Traffic Calming program are:</p> <ul style="list-style-type: none"> • Sixth Street • Fulkerson Street • Willow Street • Windsor Street • Gore Street • Spring Street • Charles Street • Card. Medeiros Avenue
<p>Reduce impact of truck traffic on residential neighborhood streets.</p>	<p>Restrict truck routes within study area, in coordination with truck plan for the City.</p>	<p>30. Impose 24-hour ban on truck traffic on Cardinal Medeiros Avenue and Warren Street.</p>
		<p>31. Restrict truck hours to between 11PM and 6AM on other streets.</p>
		<p>32. Sign truck routes in the study area.</p>

Objective	Strategy	Recommendations
C. ENHANCING NON-AUTO MOBILITY		
Maximize system-wide transit accessibility in the study area.	Support planned public transit infrastructure projects.	Refer to Rec. 15, 16, 22 and 23.
Provide additional transit service, routes and connections with regional MBTA network.	Extend additional Green Line branch service to Lechmere.	33. Encourage MBTA to explore improved service through extension of B and C lines from Government Center to Lechmere.
	Enhance mobility through local bus and shuttle service improvements.	34. Encourage MBTA to pursue local bus service improvements in association with and in response to new development. The MBTA Annual Service Plan Review provides a process for public input.
		35. Encourage expansion of private shuttle service in association with new development
		36. The Charles River TMA should continue to expand its role in providing coordinated shuttle services.
Enhance transit service through reduction of circuitous circulation for buses and shuttles.	37. Improve bus stop amenities such as shelters, seats, schedule and stop information.	
Improve pedestrian and bicycle mobility.	Develop stronger linkages between the neighborhoods and the Kendall Square area.	38. Provide a direct, transit-and bicycle only connection from Third Street to Main Street. Pursue design including the feasibility of at least a one-way, and possibly a two-way, connection.
		39. Improve pedestrian facilities at intersections along Binney Street/Galileo Way by providing protected pedestrian phases, shortening crosswalks, or signalizing pedestrian crosswalks. 40. Implement required special permit mitigation projects, which include: <ul style="list-style-type: none"> • Galileo Way/Vassar Street/Main Street (MIT, 2000) • Broadway/Galileo Way (Tech Square, 1999/Cambridge Research Park, 1999) • Broadway/Hampshire Street (Tech Square, 1999) • Sixth Street/Binney Street (Biogen, 1999/300 Bent, 2000). See Rec. 19 • Third Street/Binney Street (Tech Square, 1999 /Amgen, 1999 /Cambridge Research Park, 1999 /Biogen, 1999 / Beal, 1999)

Objective	Strategy	Recommendations
		<ul style="list-style-type: none"> • Second Street/Binney Street (Cambridge Research Park, 1999 / Beal, 1999) • Binney/Fulkerson/Galileo (Amgen, 1999 / 300 Bent, 2000) • Cardinal Mediros Avenue/Little Binney Street (Amgen, 2000)
	District Commission (MDC) and will require their approval.	<p>51. Signalize existing crosswalk at northbound Land Boulevard, and relocate and signalize existing crosswalk across southbound Land Boulevard to align with the proposed Broadway Canal path.</p> <p>52. Investigate the possibility of using bicycle-friendly pathway surfacing materials along the Lechmere Canal. (Improvements along the Lechmere Canal will require coordination with the Lechmere Canal Committee.)</p>
	Provide safe crossings of Memorial Drive	<p>53. Provide additional signalized crosswalk across Memorial Drive at Wadsworth Street. This is currently being planned, and will be implemented by MIT.</p> <p>54. Investigate the possibility of providing better north- and southbound connections at Third/Broadway/Main Street</p>
	Enhance pedestrian environment on First Street.	<p>55. Operate First Street/ Thorndike Street signal to bring up pedestrian phase, when called, at the end of current phase.</p> <p>56. Provide additional crosswalk at Otis Street</p>
	Provide safe and convenient pedestrian and bicycle connections across Monsignor O'Brien highway, to the Future MDC Park.	Enhance pedestrian and bicycle facilities along the Paul Dudley White path to connect to North Point Park.

Objective	Strategy	Recommendations
		<p data-bbox="935 272 1637 445">60. Provide a multi-use path across the mouth of the Lechmere canal. This will provide a seamless connection from the Paul Dudley White Path to North Point Park. This will require coordination with MDC and the Museum of Science</p> <p data-bbox="935 449 1637 558">61. Provide a multi-use connection along the southern edge of the Museum of Science. Plans are currently being explored by the MDC.</p>

Appendix G

Summary of Intersection Operations and Volume Data (1998 Conditions)

Street 1	Street 2	Street 3	Intersection Type	Vehicular Level of Service		Pedestrian Volumes		Bicycle Volumes				Planned Improvements
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour		
								Winter	Summer	Winter	Summer	
SIGNALIZED INTERSECTIONS ¹												
Broadway Street	Galileo Way		S	C	C	529	596	48	-	38	-	Yes
Broadway Street	Mid-Block Connector		S	C	C	505	533	21	-	45	-	Yes
Cambridge Street	First Street		S	C	C	615	711	6	-	10	-	Yes
Cambridge Street	Mon. O'Brien Highway		S	C	D	-	-	-	-	-	-	Yes
Cambridge Street	Second Street		S	C	D	426	323	11		8		Yes
Cambridge Street	Third Street		S	C	D	338	274	10		12		Yes
Cardinal Medeiros Ave.	Hampshire Street		S	C	C	196	232	46	150	53	131	Yes
First Street	Binney Street		S	C	B	126	125	8	-	15	-	Yes
First Street	Cambridgeside Place	Charles Street	S	B	B	85	187	6		8		
Land Boulevard	Binney Street		S	C	C	25	44	8		6		Yes
Land Boulevard	Cambridgeside Place		S	C	C	89	229	8		3		Yes
Land Boulevard	Mon. O'Brien Highway		S	F	F	110	140	79		53		
Main Street	Midblock Connector	Ames Street	S	B	C	194	377	25		24		Yes
Main Street	Portland Street		S	C	B	229	227	44	84	46	90	Yes
Portland Street	Broadway Street		S	C	F	275	196	35	92	25	112	Yes
Third Street	Binney Street		S	B	C	132	176	3	-	10	-	Yes
Third Street	Broadway Street		S	C	F	962	559	11	-	23	-	Yes
Third Street	Mon. O'Brien Highway		S	B	F	-	-	-	-	-	-	Yes
Vassar Street	Main Street	Galileo Way	S	D	D	440	640	39	-	52	-	Yes
Windsor Street	Broadway Street		S	C	C	111	151	-	67	-	96	Yes

Source: City of Cambridge

Street 1	Street 2	Street 3	Intersection Type	Vehicular Level of Service		Pedestrian Volumes		Bicycle Volumes				Planned Improvements
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour		
								Winter	Summer	Winter	Summer	
UNSIGNALIZED INTERSECTIONS ¹												
Binney Street	Kendall Square Cinema/Garage ²		U	-	-	435	600					Yes
Bent Street	Third Street		U	A	A	-	-					
Broadway Street	Hampshire Street		U	F	F	88	75	58	118	48	143	Yes
Cambridge Street	Cardinal Medeiros Ave.	Warren Street	U	F	F	170	138	24	-	33	-	Yes
Cambridge Street	Lambert Street	Fulkerson St.	U	F	F	135	214	26	-	41	-	Yes
Cambridge Street	Sixth Street		U	B	B	134	214	6		4		
Cardinal Medeiros Ave.	Bristol Street	Binney Street	U	C	C	65	100	15		16		Yes
Fulkerson Street	Binney Street		U	C	C	46	82	9		13		Yes
Harvard Street	Moore Street		U	A	A	163	168		61		61	
Harvard Street	Portland Street		U	C	C	69	71		56		133	
Land Boulevard	Main Street		U	A	A	-	-	-	-	-	-	
Main Street	Memorial Drive		U	A	C	-	-	-	-	-	-	
Market Street	Moore Street	Broadway	U	C	C	137	105	-	44	-	68	
Second Street	Binney Street		U	E	E	65	64	5	-	9	-	Yes
Second Street	Linskey Way		U	B	B	150	156	8	-	5	-	
Sixth Street	Bent Street		U	A	A	102	64	23	-	19	-	
Sixth Street	Binney Street		U	A	A	41	35	3	-	3	-	Yes
Sixth Street	Charles Street		U	B	B	53	33	4	-	3	-	
Sixth Street	Rogers Street		U	A	A	134	111	20	-	21	-	
Third Street	Linskey Way	Munroe Street	U	C	C	217	213	16	-	16	-	

Notes: 1. Information presented only for intersections where data are available

2. Mid-block crossing to One Kendall Square - Garage/Cinema

S=signalized, U=unsignalized

Source: City of Cambridge

SUBWAY

Line	Station	Headway (mins.)			Boarding Counts		
		Rush	Day	Night	Daily	AM Peak	PM Peak
Green	Lechmere	3.5	5	5	10,155	461	570
Red	Kendall	4	6	6	22,512	1,056	945

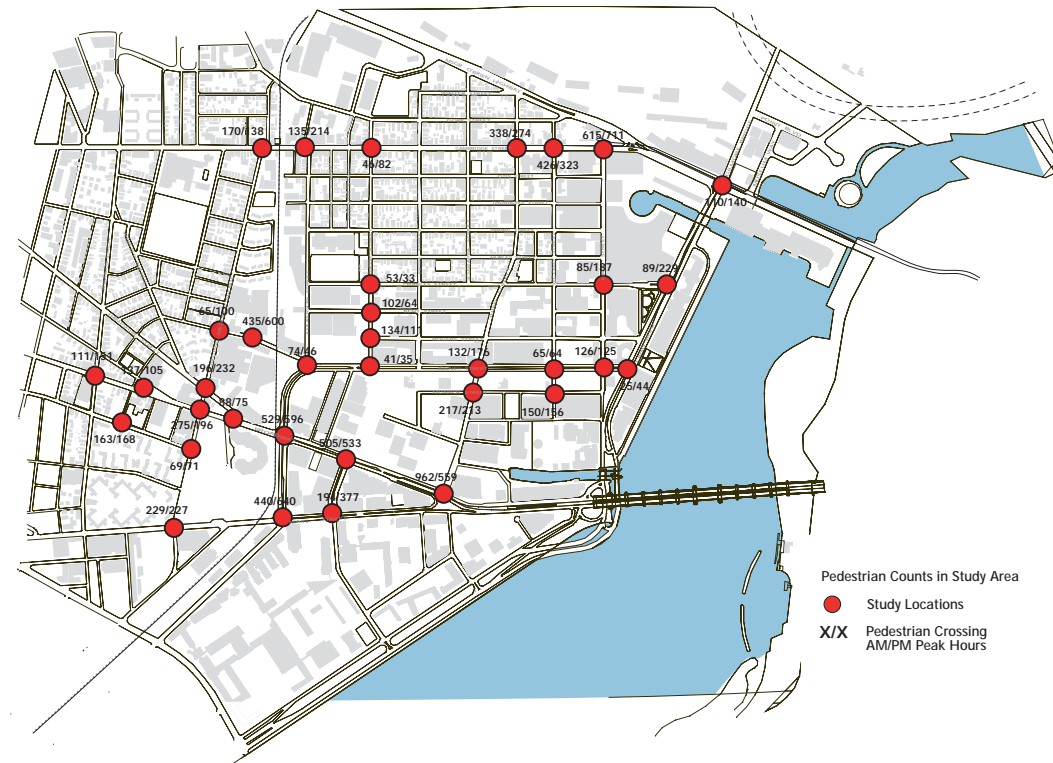
BUSES

Route	Destination	Headway (mins.)					Peak Period Capacity (One-way)	Peak Direction Ridership	
		Rush	Day	Night	Sat	Sun		Morning Peak Hour	Evening Peak Hour
Lechmere Station									
69	Harvard Square via Cambridge Street	17	23	30	20	30	198	116	191
80	Arlington Center via Highland	15	35	60	35	60	224	168	152
87	Arlington Center via Elm	16	30	30	24	30	210	180	288
88	Clarendon Hill via Highland	15	30	30	24	30	224	160	184
Kendall Station									
CT2	Ruggles via Vassar/BU	20	30	-	-	-	168	76	60
64	Oak Square via Central (during rush hours)	18	-	-	-	-	187	114	85
68	Harvard Square via Broadway Street	40	40	-	-	-	84	20	8
85	Spring Hill via Union Square	40	40	-	-	-	84	107	82

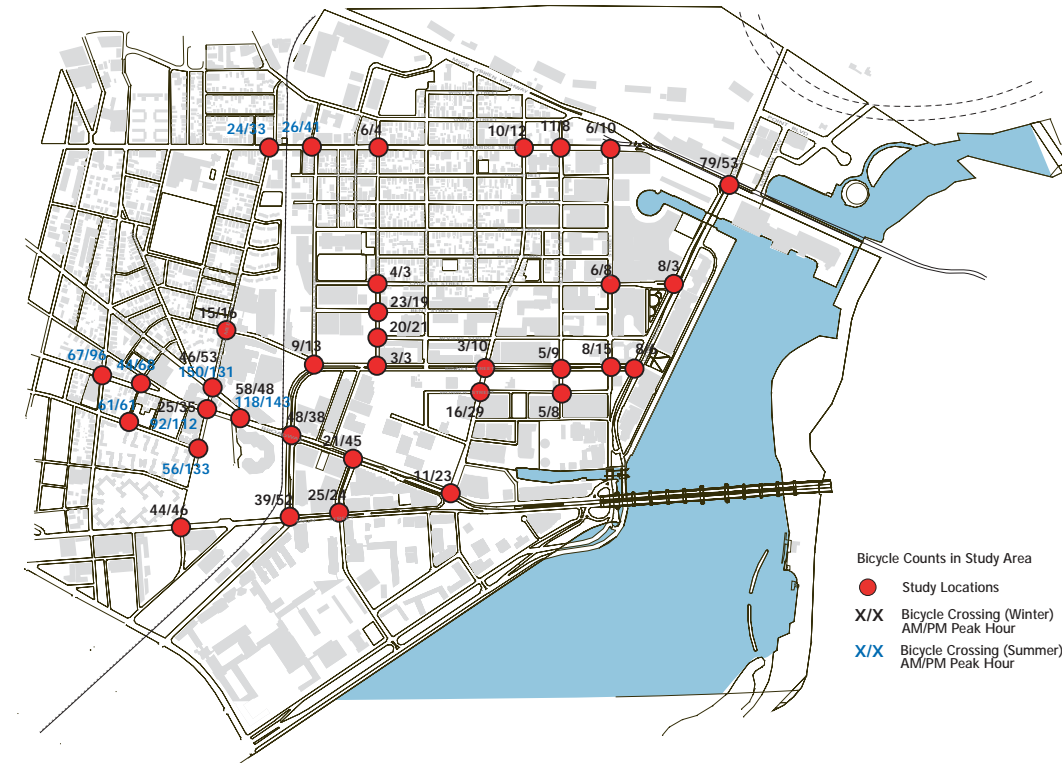
Source: Ridechecks conducted by CTPS for the MBTA, Fall 1997-Fall 98.

Appendix H

Pedestrian and Bicycle Data



Pedestrian Counts in Study Area



Bicycle Counts in Study Area