REQUEST FOR PROPOSALS

JACKSON SQUARE DEVELOPMENT AREA

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF CAPITAL ASSET MANAGEMENT
DAVID B. PERINI, COMMISSIONER

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MICHAEL MULHERN, GENERAL MANAGER

MASSACHUSETTS HIGHWAY DEPARTMENT
JOHN COGLIANO, COMMISSIONER

CITY OF BOSTON
DEPARTMENT OF NEIGHBORHOOD DEVELOPMENT
CHARLOTTE GOLAR-RICHIE, DIRECTOR

BOSTON REDEVELOPMENT AUTHORITY
MARK MALONEY, DIRECTOR

July 2, 2004

TABLE OF CONTENTS

I. INTRODUCTION

In March of 2002, Jane Swift, the former Acting Governor of the Commonwealth of Massachusetts (the "Commonwealth"); David B. Perini, Commissioner of the Massachusetts Division of Capital Asset Management and Maintenance, the Commonwealth'' designee ("DCAM"); Thomas M. Menino, the Mayor of the City of Boston (the "City"); Mark Maloney, Director of the Boston Redevelopment Authority, the City's designee (the "Authority"); Michael Mulhern, the General Manager of the Massachusetts Bay Transportation Authority (the "MBTA"); and Michael Hogan, the Executive Director of the Massachusetts Development Finance Agency (the "MDFA"), negotiated and signed a Memorandum of Agreement (hereinafter referred to as the "MOA", see Appendix A) among the Commonwealth, DCAM, the City, the Authority, the MBTA and the MDFA, to facilitate the development of certain parcels of State surplus land and MBTA surplus land located in the City of Boston, in accordance with an approved Jackson Square Contextual Development Plan (the "CDP"). The MOA establishes the process through which the identified parcels are to be disposed of and designates the Authority as the agency having primary planning and development responsibility for parcels subject to the MOA. The Authority's responsibilities include working with the Commonwealth, DCAM, MBTA and the MDFA to:

- manage a community planning process;
- develop a mutually agreeable joint disposition strategy;
- issue a Request for Proposal;
- jointly evaluate the responses to the RFP; and
- assist with the designation of a qualified Redeveloper.

The aforementioned MOA was drafted within the context of an ongoing community planning process in Jackson Sq. and a separate master community planning process for the Greater Roxbury Neighborhood District. While these community planning processes are distinct, nevertheless, they are mutually supportive and responsive to the collective interests of the City. These two parallel community processes were led respectively, by the Jackson Sq. Coordinating Group (the "JCG") and the Roxbury Master Planning Working Group.

The 6 vacant public parcels of land located within Jackson Square and described in the MOA include Parcels #69, #70, #35, #36, #37, and Parcel C (see Appendix B).

Parcels #69 and #70 (collectively the "Commonwealth Parcels") are currently owned by the Commonwealth, acting through the Massachusetts Highway Department (the "MHD") and DCAM.

The disposition of the Commonwealth Parcels under the care and control of MHD will be consistent with MGL Chapter 7, Section 40F ½ and Chapter 81, Section 7E. The MHD Board of Commissioners voted to surplus the Commonwealth Parcels at a meeting held on February 8, 2002 contingent on the following conditions:

1. If necessary, the successful respondent must prepare, at his/her own expense, a deed description and a highway alteration plan to alter the state highway location line to MHD specifications. Said plan must be prepared and submitted to MHD within one hundred twenty days (120) following acceptance of the successful respondent's proposal by DCAM.

2. If necessary, the plan prepared shall specify the required Massachusetts Highway Bounds (MHBs) to delineate the revised no access layout. The purchaser shall remove and reset the MHBs as required to effect the highway alteration in accordance with instructions from the MHD District Highway Director.

3. If necessary, the transfer of the subject parcels will be subject to the approval of the Federal Highway Administration.

4. The parcel(s) will be sold subject to any and all easements of record and any licenses and permits granted to public or private utilities or cable companies.

   The proponent shall be required to execute and deliver the MEPA Agreement in the form attached as Appendix H to this RFP.

5. Pursuant to Section 40F½ and 40I of Chapter 7 of the Massachusetts General Laws, a public hearing was held on December 22, 2003 to: (1) consider reuse restrictions for the sale of the Commonwealth Parcels being offered in this RFP and, (2) disclose the conditions and reasons for the proposed sale of said parcels.

Notice of this hearing was printed in the Boston Herald on November 26th, December 3rd, December 10th and December 17, 2003. Additional notification appeared in the Central Register and was posted at Boston City Hall, the Massachusetts Executive Office

of Administration and Finance, and the Massachusetts Secretary of State's Office.

No specific reuse restrictions that differed from the community's conceptual vision for the redevelopment of Jackson Square were proposed during this hearing.

Therefore, in order to satisfy the conditions of the MOA and remain in compliance with M.G.L. Chapter 7, Section 40F ½ and Chapter 81, Section 7E, title to the Commonwealth Parcels will be conveyed by DCAM to the final designated redeveloper, subject to and in accordance with the land disposition policies of the Authority.

In addition to the Commonwealth Parcels identified within MOA, the JCG identified two additional parcels, not included within the MOA that are crucial to the comprehensive redevelopment of the Jackson Square area. Consequently, a formal request to add these properties to the original list of parcels to be jointly disposed-of was made to the Massachusetts Bay Transportation Authority (the "MBTA") and the City's Department of Neighborhood Development (the "DND").

As a result of this request, the MBTA agreed to allow MBTA Parcels #35, #36 and #37 (the "MBTA Parcels") to be disposed of through the mechanism of this RFP. The dispositions of these parcels are subject to the provisions described in MGL Chapter 161A.

The MBTA currently owns an adjacent parcel to the Commonwealth Parcels that is restricted for use as a MBTA utility easement. Ownership of said area, comprising an additional area of approximately 108,426-sf, will be retained by the MBTA for the purpose of maintaining various subsurface utilities that are essential to mass-transit operations in the Jackson Square area. However, the MBTA has agreed to pursue release of the non-exclusive surface rights in this parcel, situated along the Orange Line corridor, for purposes of delivering a long-term agreement to the Authority, for uses in connection with the establishment and maintenance of an Alternative Transportation Corridor, i.e. non-motorized public transportation as an amenity to the Jackson Square redevelopment offering herein. The Authority will deliver the rights it acquires in this parcel to the selected developer for fair market value of the parcel after the rezoning of Jackson Square has been completed.

Being in compliance with the terms and obligations of the MOA [Section IV (5)] and the provisions of MGL Chapter 161A, title to the MBTA Parcels will be transferred to the Authority after the final selection of a redeveloper. This transfer of title will allow the Authority to invoke its own disposition policies and procedures enabling it to ensure that both, the community's vision, as interpreted by the redeveloper, will be implemented. Any and all restrictions or obligations, without limitation, imposed on the Authority, in connection with the conveyance of this property to the Authority, shall be assumed by the Redeveloper.

In addition to the aforementioned MOA parcels, the City of Boston has determined that it owns a certain parcel of vacant land (the "City Parcel") in Jackson Square, under the custody of the Department of Neighborhood Development (the "DND"). This parcel of land is also crucial to the community's planning effort and, as is the case with each parcel described in this document, the DND has agreed to seek the redevelopment of this parcel within the context of the approved CDP and shall convey title to their parcel directly to the Authority, who shall simultaneously convey title to the final designated redeveloper, once selected. Any and all restrictions or obligations, without limitation, imposed on the Authority, in connection with the conveyance of this property to the Authority, shall be assumed by the Redeveloper.

Access to the City Parcel-C is from Columbus Avenue, across a portion of land under the care and custody of the DCAM, for the exclusive use by the Trustee's of the Roxbury Community College (the "College"). The College has demonstrated their willingness to facilitate the successful redevelopment of the City Parcel-C and will negotiate an appropriate license agreement or grant easement rights to the final designated redeveloper (see following page).

The City of Boston, the Commonwealth of Massachusetts and the Massachusetts Bay Transportation Authority therefore, offer the City Parcel, the Commonwealth Parcels and the MBTA Parcels, respectively, with no representations or warranties. Prospective redevelopers should undertake their own review and reach their own conclusions concerning zoning, physical conditions, environmental concerns, required approvals, reuse potential, and other developmental considerations.

While all information presented in this RFP is from sources deemed reliable, no representation or warranty is made as to the accuracy or completeness thereof. This RFP (including all attachments) is made subject to errors, omissions, prior lease, sale, withdrawal

without prior notice, and changes in, additional, and different interpretations of laws and regulations.

II. DEVELOPMENT OBJECTIVE

The primary objective of this Request for Proposals (the "RFP") is to identify development teams who are qualified to enter into a Development Agreement with the Authority, the DCAM, the MBTA and/or the DND, for the purpose of providing a mix of uses and related services that reflect financially viable and creative urban design solutions in response to the CDP. The CDP consists of the following elements:

1. The Jackson Sq. Development Priorities;
2. The Jackson Sq. Traffic & Air-Quality Study;
3. The Jackson Sq. Transit-Oriented Improvement Recommendations; and
4. The Jackson Sq. Urban Design Vision and Guidelines.

Summary of the CDP

- The **Jackson Sq. Development Priorities** was agreed upon after an exhaustive community process that culminated in 2001 and described in the planning document entitled "Putting the Pieces Together". The list of preferred land uses agreed upon by the community are as follows:

  1. Youth/Community Center
  2. Affordable Housing
  3. Small Scale Commercial/Retail
  4. Expanded Open Space

- The **Jackson Sq. Traffic & Air-Quality Study** is intended to establish benchmark traffic and environmental data against which the efficacy of future development may be measured. It recognizes that this neighborhood is in transition from being primarily an "industrial" area, to one that is characterized by uses more conducive to an emerging residential neighborhood. As this area transitions from existing industrial uses, this change may necessitate close monitoring to ensure that, as development occurs, ambient noise levels are reduced and improved air-quality monitoring data. By gathering this data, the environmental impact of future development may be evaluated and lead to a better quality-of-life for future residents.

- The **Jackson Sq. Transit-Oriented Improvement Recommendations** encourage alternative modes of transportation, suggest creative ways to improve and maintain public landscaped areas, encourage traffic calming techniques, and suggest streetscape improvements. These recommendations are intended to serve as a guide for negotiations during the community review process after a redeveloper is designated.

- The **Jackson Square Urban Design Vision and Guidelines** were subsequently developed and are intended to serve as a minimalist set of design/development criteria that best reflects the community's collective development vision for Jackson Square. It is expressly intended that this design vision and guidelines referenced to this document will cause respondents to be creative and exceed the goals and criteria established herein.

When Article 80 of the Boston Zoning Code was established, among its main objectives was to establish a clear and predictable set of development review guidelines that a developer could rely upon as they negotiated the zoning review process. The transportation related issues enumerated within that document was intended to identify a generic set of conditions and issues that may be found throughout the City. Consequently, when it comes to Jackson Sq., the Article 80-review process may be better served if a set of transportation access plans were specifically tailored to monitor and/or the conditions found in Jackson Sq.

The "Jackson Sq. Supplemental Transportation Access Plan" was reviewed by, but not approved by the community. However, in order to facilitate responsiveness to this RFP, we have appended this report to the CDP. By so doing the Boston Transportation Department intends to draw early attention to transportation issues that may be unique to Jackson Square.

III. ZONING CONSIDERATION

The underlying zoning for the Commonwealth, MBTA and City Parcels located in Jackson Square are currently classified as an Industrial Development Area (the "IDA"). As such, parcels located within the IDA encourage the development of industrial uses and "artist mixed uses", while forbidding all other residential uses.

The underlying zoning classification for MBTA Parcel #35 located in Jackson Sq. is Open Space-Recreation Center (the "OS-RC"). As

such recreational uses are allowed; however, residential and commercial uses are forbidden.

Clearly, the inconsistency between the underlying zoning regulations for Jackson Sq. and the CDP must be resolved if the RFP disposition process is to succeed. Affirmative steps have been taken to initiate this rezoning process; however the formal re-zoning process will not be completed by the time the RFP is advertised. Consequently, a draft copy of the proposed re-zoning amendments to the Boston Zoning Code, Article 55-The Jamaica Plain Neighborhood District, currently under consideration, is attached (see Appendix C) for review. We expect that the Authority and the Zoning Commission will approve most of these recommendations.

Consequently, Respondents to this RFP are encouraged to proceed with the preparation of their plans "as if" the appropriate land use changes will be approved before the final designated redeveloper is selected.

IV. ENVIRONMENTAL CONSIDERATIONS

The Commonwealth Parcels #69 & #70*:
Prior environmental reports commissioned by the MBTA indicate that oil, hazardous materials and underground storage tanks exist on the Commonwealth Parcels.

Prospective redevelopers should refer to the following documents (See Appendix D):

- "Remedial Action Evaluation and Cost Estimate, Jackson Square Development Project, MBTA Parcels A, 69, 70 and 71", by Haley & Aldrich, Inc. for Bryant Associates, Inc. August 1990;
- "DRAFT Preliminary Assessment Report For The MBTA Parcels, Jackson Square", transmittal letter with attachments, from Deborah Gevalt, Vice President Haley & Aldrich, Inc., February 15, 1990;
- "Report On The Site History Research And Site Conditions Jackson Square Development Project, Boston, MA", by Haley & Aldrich, Inc. for Bryant Associates May 1989;
- "Report On Infrastructure And Site Improvements, Jackson Square Development Project Boston, MA", by Haley & Aldrich, Inc. for Bryant Associates, November 1989.

*** In previous reports, maps and charts, the vacant MHD-DCAM parcels were referred to as Parcels #69, #70 and #71. For purposes of this disposition RFP, parcels #70 and #71 are combined and referred to henceforth as Commonwealth Parcel #70.**

Prospective redevelopers should also review the files of the Massachusetts Department of Environmental Protection ("DEP") regarding the Commonwealth Parcels. Those files may be obtained from the DEP Northeast Region File Facility located in the Department of Transitional Assistance Building, 35 Congress Street, Shetland Office Park, Salem, MA 01970; consult the DEP's website at www.state.ma.us/dep/nero/service/foi.htm for instructions for reviewing DEP files. Use DEP Tracking # 3-3573 to request files for the Commonwealth Parcels. Respondents are responsible for making their own determination of existing conditions and conducting their own environmental investigations of the Commonwealth Parcels and of the surrounding area.

The Authority, in consultation with both DCAM, has successfully secured a "Grant of Services" Award from the DEP to finance a 21E Phases 1 and 2 Site Assessment of the Commonwealth Parcels.

It is anticipated that the Phases 1 & Phase 2 Site Assessments for the Commonwealth Parcels will be available prior to the completion of the Qualifying Phase of the RFP selection process.

The MBTA Parcels #35, #36 and #37:
No environmental information currently exists for MBTA Parcel #35, #36 and #37. Consequently, the Authority has applied, on behalf of the MBTA, to the MDFA-Brownfields Site Assessment Program, seeking to finance a 21E Phase 1 and 2 site assessment for the MBTA Parcel. The cost of this assessment and the corresponding obligation for repayment (at 0% interest) will be passed on to the selected redeveloper.

It is anticipated that the Phases 1 and 2 Site Assessments for the MBTA Parcel #35 will be available prior to the completion of the Qualification Phase One of the RFP selection process.

In the process of preparing this RFP, it became clear that the previously described MBTA utility easement adjacent to the Commonwealth Parcels contained two specific areas that did not impinge on the MBTA's utility easement restriction and consequently, these areas could be included into development area contemplated by this RFP. These specific areas were subsequently identified as MBTA Parcels #36 (approximately 650-sf) and #37 (approximately 5,350-sf).

The City Parcel-C:
Finally, the City of Boston owns two adjacent parcels that for purposes of this disposition plan, are referred to as Parcel C [1540

Columbus Avenue (1100872000) and1540R Columbus Avenue (1100981000)]. Both parcels have a combined land area of approximately 57,086-sf. For the purposes of this RFP, both City parcels are described as one parcel and referred to as the City Parcel-C.

On November 25, 1987, the City of Boston obtained the two parcels at 1540 and 1540R Columbus Avenue, Roxbury, through tax foreclosure.

Between 1994 and 1996, DND retained contractors/consultants to conduct environmental assessments and response actions. During removal of an oil/water separator and a waste oil underground storage tank (UST) adjacent to the building, a reportable release of oil was identified. The DND consultant notified the Department of Environmental Protection (DEP) of the release, and subsequently conducted response actions to clean up the release. Activities included excavation and removal of petroleum-impacted soils from a small area around the oil/water separator and UST. Testing and off-property disposal of the excavated soils allowed “site closure” in accordance with the Massachusetts Contingency Plan (MCP) in January 1996. As remediation of the petroleum release was completed, no further MCP response actions are required.

After completion of these activities in 1996, DND arranged for removal and disposal of the building contents, including abandoned aboveground storage tanks (ASTs) and various containers. When the building was demolished, the foundations were removed and the excavation was back-filled to grade with clean gravel. Both parcels are secured with a locked chain-link fence.

The Commonwealth, the MBTA and the City are willing to work with the selected redeveloper in an attempt to identify alternative funding sources for the remediation of these sites. However, any agreement for the reimbursement of any third party costs shall be subject to appropriation, or availability of funds. Therefore, the selected developer should be prepared to pay for and remediate all environmental conditions on the site, which if designated, a redeveloper accepts in its “as is” condition.

In subsequent phases of review, the Respondent will be required to submit an Environmental Impact Assessment; a Transportation Access Plan, in accordance with Article 80 of the Boston Zoning Code; and be required to execute and deliver the MEPA Agreement in the form attached as Appendix I to this RFP.

V. DEVELOPMENT PLAN

DCAM, the MBTA, the DND and the Authority, in consultation with the JCG, are soliciting responses to redevelop the various publicly owned vacant parcels of land, identified as the subject of this RFP, in a manner that is as consistent with the CDP that was formally approved at a public meeting held on October 2, 2003 and subsequently endorsed by the City, the Commonwealth, the MBTA and the MDFA. The CDP is intended to establish a contextual framework by which community expectations may be evaluated against developer interpretation. **Consequently, the CDP should be treated as guidelines and not an absolute requirement.**

Respondents Site Tour and Briefing

The Authority will conduct a site tour shortly followed thereafter by a briefing for all Respondents to this RFP on July 13, 2004, at 9:00 a.m. Interested Respondents should meet in the BRA Offices in City Hall, at 9:00 a.m.; Departure from City Hall is at 9:30 a.m.

Should anyone not be able to attend the originally scheduled site tour and briefing, a make-up site tour and briefing will be conducted on August 3, 2004 at 9:00 a.m. Interested Respondents should meet in the BRA Offices in City Hall, at 9:00 a.m.; Departure is from City Hall at 9:30 a.m.

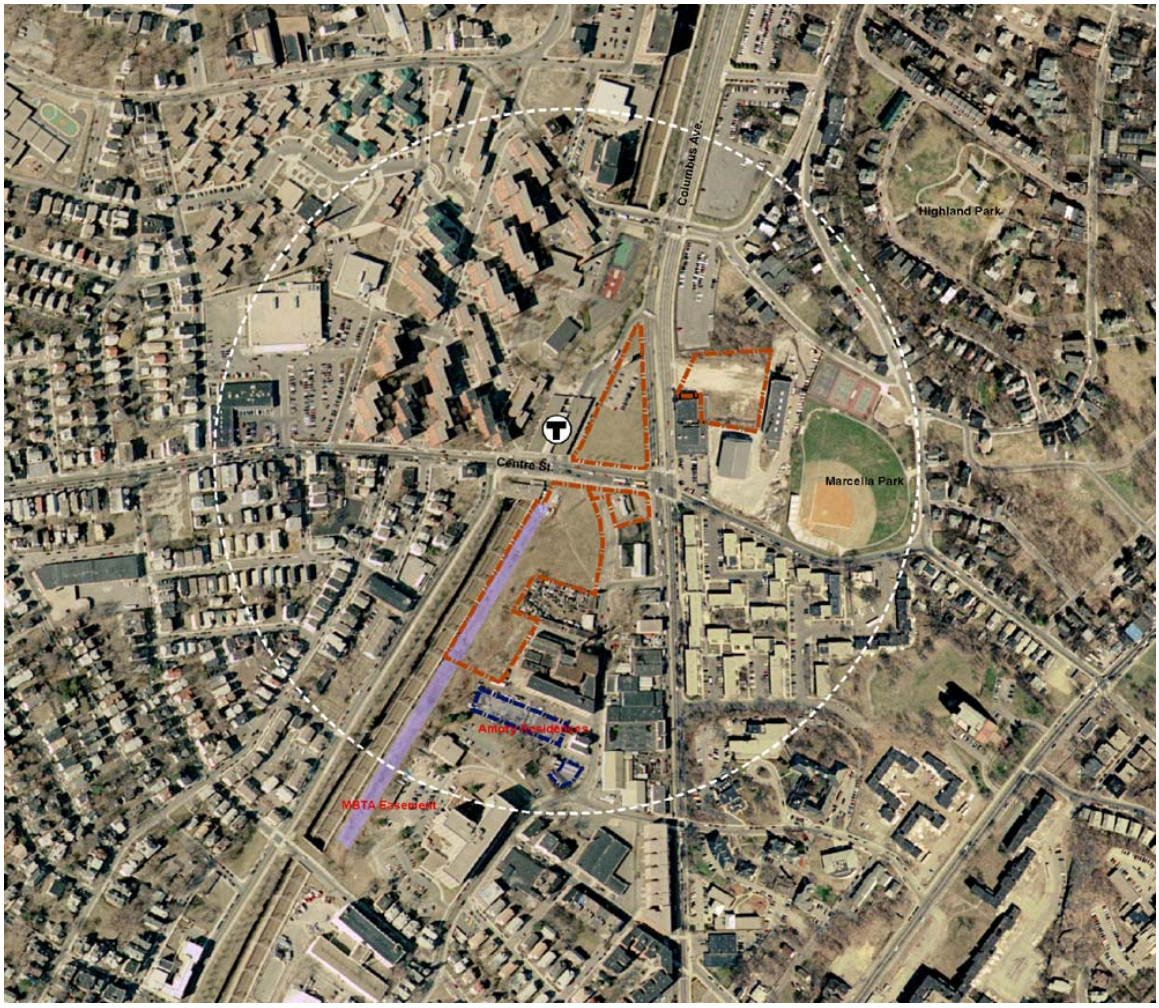
It is imperative that any and all questions arising out of your review of this RFP be transmitted in writing or by electronic mail to the Authority at least three (3) days prior to the scheduled briefing. All questions must be a part of the public record and have to be recorded before they are responded to. Each question and corresponding response will be made available to anyone that might not be able to attend a briefing or who might subsequently request it.

Representatives of the Authority, the DCAM, the MBTA, the MDFA, and the DND shall clarify any and all written questions that have been received by the Authority, no later than 4:45 p.m. on July 9, 2004, or alternatively on July 29, 2004.

Questions must be addressed to:

Boston Redevelopment Authority
One City Hall Sq.
Boston, MA 02201
Attention: Ms. Ines Soto, Planner II
(ines.soto.bra@ci.boston.ma.us).

VI. JACKSON SQ. CONTEXTUAL DEVELOPMENT PLAN



THE JACKSON SQ. DEVELOPMENT PRIORITIES

THE JACKSON SQ. TRAFFIC & AIR QUALITY STUDY

THE JACKSON SQ. TRANSIT-ORIENTED IMPROVEMENT RECOMMENDATIONS

THE JACKSON SQ. URBAN DESIGN VISION AND GUIDELINES

Jackson Square Development Priorities

As developed by the

Jackson Square Coordinating Group (JCG)

September 2003

Jackson Square Development Priorities

September 2003

Table of Contents

Jackson Square - Development Priorities

Jackson Square Coordinating Group (JCG):

The Role of the JCG
The JCG is responsible for making final recommendations on site development, development standards, and land disposition to the government entities holding title to the subject parcels. The JCG has created development priorities and worked with the Boston Redevelopment Authority and other agencies to write the Request for Proposal (RFP).

Since its inception, the Jackson Square Coordinating Group's Site Planning Committee has held more than forty meetings to discuss the Jackson Square Contextual Plan. Following are development goals and objectives for the publicly owned land within a quarter mile radius of Jackson Square, as prioritized by the Jackson Square Coordinating Group after review of the detailed work of the Site Planning Committee.

The Boston Redevelopment Authority (BRA), Massachusetts Bay Transit Authority (MBTA), Massachusetts Division of Capital and Asset Management (DCAM), the City of Boston Department of Neighborhood Development (DND), the community representatives from the Jackson Square Coordinating Group, and the residents of Roxbury and Jamaica Plain are in search of an energetic, dynamic, visionary, community-focused developer to work with the community in the development of vacant, publicly owned land in Jackson Square. This would require the developer to coordinate with any development on private land in the Jackson Square ¼ mile target area.

Development of this long vacant land in partnership with residents and active community groups of Roxbury and Jamaica Plain is vital to the sustainability and ongoing revitalization of these neighborhoods. Thoughtful, innovative development provides an important opportunity to revive these underutilized sites and reweave the fabric of the Roxbury and Jamaica Plain neighborhoods. The fundamental goal is to view these parcels as a coherent unit within the context of Jackson Square.

Principles of development should include elements that maintain the character of the neighborhood as accessible to a culturally and economically diverse population. The public benefits of the land and subsidy should be targeted to benefit people being displaced by gentrification and over 12,000 predominantly minority youth who live in the area. Designs should specifically promote these goals of a diverse, active, livable community that respects and encourages youth participation and leadership with a variety of building types, land uses, and densities, serving a range of household and family sizes, ages, cultures, and incomes.

Development should emphasize creating community focused space that facilitates interaction between residents of all ages while maintaining appropriate individual environments. Community and private spaces should include elements like residences

with private entries in lieu of large open hallways and corridors, private yards and landscaping protecting ground floor townhouses and apartments, and well-placed, appropriate lighting to create nighttime visibility. Housing units, emphasizing individual porches and usable yards, should be grouped around tree-shaded**,** shared open space such as squares or courtyards, with small parks and narrow streets with planting strips. Common green spaces should incorporate gardens for community use. Streets and blocks should be connected with pedestrian walkways and bicycle paths.

It is a priority of the JCG that new development in Jackson Square include one or more facility/ies dedicated to recreational and educational services. The Youth and Families Center should be integrated into the urban environment desired in Jackson Square and present a welcoming face in the streetscape. Thousands of Boston Public High School students pass through the Jackson Square T stop on a daily basis during the school year, and often hundreds of them are "hanging out" in front of the station during after-school hours. The Youth/Community Center should be highly visible and easily accessible for these students. Youth should be involved in planning and designing landscaping in front of this center that should be attractive, promoting the image that youth are valued in the Greater Jackson community.

Automobiles should be seen as a secondary mode of transportation as much as possible without dominating the neighborhood with traffic congestion and parking lots. The goal of a "pedestrian-friendly" environment is to create a positive spirit that prioritizes human interaction while maintaining neighborhood safety by promoting community and controlling traffic.

Of course, design alone, no matter how brilliant, can solve every human problem. Physical transformation must be accompanied by economic and social changes. Development of new programs, services, and facilities to support and enhance this revitalization effort is also important.

Jackson Square Development Priorities:

The vision for development of the publicly owned land in Jackson Square encompasses a broad, and interconnected set of development goals. These goals are intended to respond to current and expanding needs of residents and community groups in the Roxbury and Jamaica Plain neighborhoods. Three of the priority uses for development that emerged from the charrette visioning process, documented in "Putting Together the Pieces" are:

- Develop high-quality, sustainable, permanently affordable housing for families.
- Develop a new multigenerational youth and community center with an emphasis on educational and recreational programming for youth and their families.
- Develop new small and medium scale commercial uses including retail and offices (including affordable space for non-profits) with rent and ownership structures accessible to community members and non-profit organizations

Other general priorities that should be incorporated into any development are:

- Expand and improve green space.

- Carry out the development in ways that do not encourage additional automobile traffic in the area by improving public transit to and within the area, and by developing streetscape changes and site plans that help to calm traffic and ease pedestrian and bicycle access along and across Centre Street, Amory Street and Columbus Avenue.

- Facilitate connection and interaction of the Roxbury and Jamaica Plain neighborhoods now separated by Columbus Avenue.

The Jackson Square Coordinating Group has prioritized the following goals and objectives when developing proposals for the uses above:

Youth and Families Center

As a public venue for all people in and around Jackson Square, the Youth and Families Center is intended to accommodate social, cultural, educational, active recreational programs and a variety of human services. The facility/ies should be accessible and affordable to community members and groups, and made available weekdays, weekends and evenings.

The need for a Youth and Families Center in this area has been well documented. Over 12,000 predominantly minority youth live within walking distance of Jackson Square and over the next ten years the teen population in this area and throughout Boston is expected to increase by 35%. Several hundred youth from the Greater Jackson area participated in community meetings on the need for this Youth and Families Center. The level of youth participation in this development project is unprecedented in recent history.

Developers will be responsible for identifying an operator with ongoing operating funding and long-term resources to support the facility/ies and its program goals. This is to ensure the long-term sustainability and viability of the facility/ies and programs. The following program elements may be accommodated in one or several locations. Plans should be developed with an eye to maximizing efficiency of both the programmatic and physical elements.

Minimum required elements of the new Youth and Families Center should include:

- 40,000 square feet
- Classrooms/meeting rooms for programmed educational activities such as tutoring and mentoring programs, ESOL classes, general adult education classes, art programs, career counseling and training programs, and community development, youth organizing and leadership.
- A state of the art computer center available for training classes as well as for general use and learning opportunities for community residents.

- A multipurpose performance/meeting space that can accommodate dance classes, exercise classes, performances, and community meetings and events.
- A large recreation/gymnasium space for activities, games, recreational activities including indoor soccer, basketball courts, volleyball and batting cages, and social/cultural events with space for at least 250 people.
- Offices for on-site management and maintenance staff.
- A commercial kitchen area for preparing and serving meals and snacks associated with community events and activities, and for leading trainings/classes.
- Dedicated childcare play space for children of people attending events.
- A community-appointed Board of Directors, that includes young people, to oversee and supervise ongoing operations, policies, and management of the facility.
- Energy efficient design, to reduce building operating costs.
- Design for maximum visibility within the center in order to increase safety of all participants, especially children.

Other appropriate elements might include:

- A game room.
- Locker rooms.
- Arts and crafts equipment, such as a pottery kiln or photography studio.
- Other indoor recreational activities, exercise/fitness equipment, a swimming pool, or an ice or roller skating rink.
- Outdoor areas, such as playground equipment, picnic areas, a water play area, a basketball court, or a bike/skating park.

Program Goals:

This new Youth and Families Center is intended to:

- Be affordable, accessible, and welcoming to all.
- Provide programmed educational and recreational activities that maximize uses for all ages.
- Be designed to encourage both social and geographic interaction by a broad spectrum of community members.
- Emphasize cultural and educational programming and events.
- Encourage community service.
- Prioritize community control of the facility operations.
- Be open weekdays, weekends, evenings, and holidays.
- Prioritize local hiring.
- Provide design and access to minimize dependence on automobile traffic to utilize the facility or its programs.
- Not to create needless duplication of services and facilities already available in the neighborhood.

Design
Design should create a building that is physically welcoming and contributes to the urban environment and streetscape in Jackson Square. If a recreational or other component of the facility requires a large space, that space should be creatively designed to avoid presenting a blank or unused face on streetscapes or walkways.

Affordable Housing

A key community goal in the development of the publicly owned land in Jackson Square is to provide critically needed new affordable housing resources. Units should be designed to offer a mix of housing types, with an emphasis on housing for families and a priority for resident control and ownership. Key design features should focus on livability of units, sustainable design, auxiliary spaces to accommodate resident programs and services, and connecting these new housing uses into the neighborhood fabric.

Below are affordability guidelines adopted by the JCG. They are derived from those used by the Boston Tenant Coalition (BTC) in its 10,000 Affordable Homes Campaign. They have been similarly adopted by the Campaign of Conscience in its call for 1,000 affordable homes in Jamaica Plain and Roxbury.

We are seeking a minimum 200 units of permanently affordable housing for families on all of the publicly owned vacant land in the ¼ mile radius target area surrounding the Jackson Square MBTA station. This goal includes the public parcels associated with this disposition, as well as other publicly owned sites within the target area.

This development goal does not include proposals for development on private land or the rehab of existing housing, as valuable as these might be. The estimated number of new units to in predevelopment stages on other public parcels, not included in the RFP, within the ¼-mile radius is estimated at approximately 60.

Definitions:
We define "affordable housing" as 100% targeted to families making less than 80% of median income, with 30% of units targeted to families making less than 30% of median income, and 45% of units targeted to families making between 30% and 60% of median income. We adopt these – Boston Tenant Coalition targeting goals because that is the actual mix of people in our neighborhoods who are threatened with displacement. They are whom public housing investment should serve.

Affordable housing is further defined as permanently deed restricted housing. Units must remain affordable in perpetuity. Housing types may include a mix of rental housing, limited equity condo, limited equity coop, "fee simple" ownership, or other models. Nonetheless, all housing developments must include substantive, meaningful participation and long-term control by building residents in all aspects of ongoing building management and decision-making.

We understand that achieving these goals will require significant subsidy. We intend our plan to become part a multi-neighborhood effort to achieve the affordable housing funding we all desperately need.

We recognize that there might be a need to include some higher-income housing as part of a plan to develop affordable housing. Units targeted at higher income households should be included *only* if it can clearly help accomplish that goal. In all cases, housing targeted to those over 80% of median income should not exceed 30% of the total housing mix on the publicly owned land. Census projections estimate that only about 30% of the residents of Hyde/Jackson have incomes above 80% of median income.

- A mixture of one, two, three, four, and five bedroom units should be included in the development proposal, with an emphasis on family-sized units. Developers should refer to the Boston Housing Authority's public housing and Section 8 waiting lists for guidance on unit mix.

Design Criteria:
Design should support families, encourages residents to interact, provide for a diverse community – young people, elders, ethnic groups, artists, and extended families; - acknowledge and use creative solutions that address barriers that many low-income families face around transportation, childcare, and health/disability issues; and facilitate the development of community (perhaps adapting some co-housing ideas to an affordable setting).

- Buildings should be designed to maximize private entries, encourage ownership of common areas, promote active streetscapes, and integrate new buildings into a fabric for the neighborhood.

- Building design should include creative use of materials that provides for diversity and uniqueness, in both the texture and color of building exteriors.

- Buildings should be pedestrian friendly, and have clear signage and way finding. They should provide resources that support transit oriented development e.g. enhancement or augmentation of public transportation, drop off spaces, cab stands, bike racks, car sharing, shopping buses, delivery services, availability of MBTA schedules, mixed residential and commercial services and/or T-pass incentives.

- Buildings should be designed on a human scale, emphasizing universal design principles to encourage visibility/adaptability.

- Development should incorporate indoor and outdoor spaces for children that are accessible and do not require crossing traffic.

- Unit design should emphasize livability and sustainability. Livability is a function of overall square footage as well as the design and layout of the unit. Circulation should by-pass rather than cut through rooms (particularly the living room) so that rooms can be easily furnished and activities are not disrupted by circulation flow. Design should also maximize furnish ability.

- Apartments should be designed to maximize energy efficiency and use renewable energy. Use of maximum thermal insulation, overhangs to minimize summer time solar gain, recycled materials, and materials that are durable, long lasting, and easily maintained are strongly encouraged.

- Design should include components to achieve optimal indoor air quality including plans for maintenance and cleaning of HVAC systems.

- All buildings in excess of 20 units should have at least one large common area for use by residents for meetings, events, and other building functions and provide indoor and outdoor child-designated space.

- Developers must provide for professional 3rd party property management of all facilities with on-site management offices whenever possible.

Specific unit design criteria:
In addition to adhering to the design guidelines of the Boston Redevelopment Authority and the City of Boston Department of Neighborhood Development, as well as all applicable local, state, and federal codes, Developers shall also utilize the following design guidelines for individual units:

- Entry: Provide a separate entry area/hallway, to separate coming and going traffic from activities within the unit. This area should include a coat closet (minimum 3'-0" for 1 and 2 BR units; 4'0" for 3, 4 and 5 BR units).

- Living Room: Wherever possible, separate living room from unit circulation to provide for more privacy and less circulation disturbance. Minimum size: 150 NSF for a 1-bedroom unit. The area should increase by approximately 10% for each additional bedroom.

- Dining Area: Size and arrangement relative to the kitchen and living area may vary according to the size of the unit, but must be sized sufficiently to accommodate all family members. A combination living room/dining area is acceptable provided it allows sufficient space for furnishing.

- Kitchen: Kitchens should be visually separate from the living room and entry hall. Kitchens in units over 3BR must be able to accommodate at least 2 people working at the same time. Natural light into the kitchen is preferred. The minimum countertop (without stove, refrigerator, or sink) width is 5ft in a 1BR, 8ft in a 2 and 3 BR, 10ft in a 4BR, and 12ft in a 5BR. Dishwashers and disposals are desirable.

- Bathrooms: Provide at least one full bath in a 1BR, 2BR, and 3 BR units; one and a half baths in a 4BR unit; and two full baths in a 5 BR unit.

- Bedrooms: All bedrooms should be designed for double occupancy and have a minimum of 120 square feet. Furnishability with two twin beds and dressers

is the required test for double occupancy. A minimum of 5 linear feet of closet space should be provided in each bedroom; 6 feet is preferred.

- Storage: Provide one secure bulk storage area for seasonal items, suitcases, bicycles, etc.

Small Scale Commercial Development

With its central location adjacent to the Jackson Square MBTA station, a third important development priority in Jackson Square is the development of new small scale commercial uses on the first and second floor levels. These commercial uses are intended to serve the community needs, improve economic opportunity in the neighborhood, link the Jamaica Plain and Roxbury neighborhoods, and provide employment and business opportunity in and around the Jackson Square area while maximizing and expanding the existing usage of public transportation to meet commercial needs.

Any commercial development must reflect the existing cultures in Jackson Square; positively engage the streetscape to create an identifiable commercial node that targets public transportation users and area pedestrians as its primary audience. As stated previously, a goal of the Jackson Square Coordinating Group is to achieve a physical linking of the Roxbury and Jamaica Plain communities that results in greater cultural and commercial exchanges across Columbus Avenue. One tool in achieving this goal is to accentuate the interplay of transaction across Columbus Avenue for the existing community via commercial use on the lower-level developments along and around the corners at the Columbus Avenue/Centre Street intersection to create a core of commerce and essential services for this newly enlarged residential community.

Compatibility with Neighborhood
As rapidly increasing real estate values have affected the neighborhood by pushing out lower income residents, the local commercial districts have also seen increasing rents and the loss of some long-time businesses, many of which have been involved in improving the community. One primary and valued existing characteristic of the adjacent neighborhoods is its many longstanding ties between residents, old and new, and the business owners of its commercial areas. There is a general consensus that in the Jackson Square commercial area this multi-layered connection between the area's business and residential communities of the area must be maintained and strengthened by new development.

A second aspect of the adjacent commercial corridors along Centre Street and Columbus Avenue that must be maintained and strengthened by the commercial development in Jackson Square, is the rich diversity of local business owners and their ability to cater to a broad spectrum of ethnic and cultural traditions. Any commercial development and business recruitment efforts should look to merge and reflect the vibrant local African-American, African, Latino and Caribbean communities.

Development in Jackson Square should result in commercial uses that bring various members of these communities together in one location, including opportunities for both affordable retail, commercial, and non-profit office space, as appropriate.

The developer is to follow the specific design compatibility elements regarding height, street wall continuation, streetscape animation, etc. as outlined in the Jackson Square Urban Design Vision and Guidelines document. Jamaica Plain and Roxbury are unique and beloved commercial districts due to their pedestrian scale and new development must build upon this characteristic.

The existing commercial area within the 1/4 mile radius target area around Jackson Square is also currently characterized at present by its intermingling with residential and even light industrial uses. This mixed-use aspect should also be maintained and strengthened by the new commercial development. All commercial use should be concentrated on the first and second levels of the development to increase the pedestrian access to these services.

Enhance Sector Diversity

A primary focus of commercial development in Jackson Square should be to provide a commercial environment where a diverse collection of businesses can thrive while providing a complementary spectrum of goods and services that meet the needs of the local residents in this newly enlarged residential community.

One way to ensure this sectoral mix is to adopt rent structures that are conducive to attracting and sustaining locally owned and /or start-up businesses and preventing rent from becoming an excessive burden to doing business.

Another aspect of strengthening the business district in Jackson Square is to ensure the sectoral mix of new tenants is compatible with that which already exists. Certain retail sectors benefit when more of the same type of store comes to an area, while other store types are more negatively impacted. For example, shoppers often prefer to patronize and frequent districts where there are multiple stores that sell comparison items like clothing. Additional clothing stores reflecting a variety of ethnic and cultural preferences can increase the extent to which a shopping area is a "destination". On the other hand, stores that sell convenience items, such as bodegas, compete more directly with other nearby stores of the same type.

New stores that fill space in new development in Jackson Square should complement and add value to both the residents and the existing businesses. They should not provide unnecessary competition, or over-saturate the area with particular types of businesses.

The new businesses should provide to local residents and public transit users the convenience, goods, and services that are currently not available in the neighborhood. Attention to sector diversity in commercial development at Jackson Square and its complementary relationship with the adjacent commercial corridors, provides a rich opportunity to create a distinct commercial node where the collection of businesses at Jackson Square and within the ¼ mile radius target area can serve as a one-stop transit

destination where residents, transit riders, and visitors alike can come to meet all their goods-and service needs.

Local/Minority Ownership
The new development must provide secure space that is affordable and accessible in rent for the local business community, entrepreneurs of color, and non-profit organizations. This priority must be balanced with the need for "anchor" or "credit" tenants that can provide the rental income desirable in commercial development. Nonetheless, the project will not be a success if regional or national retailers only fill space and the consensus of the JCG charette design process was explicitly against big box retail. Any plan for commercial development must identify a specific amount of space to be set aside for people of color and women business owners from the local area and beyond, and the rent structure must be set in a manner to allow these businesses to thrive and grow. Business rents should be structured so that some businesses contribute more to the overall rent structure, again providing affordable space for start-up businesses. A business incubator model could be considered in achieving these goals.

In addition to providing rents that are affordable and accessible to small business owners, the developer of the property must have a plan to assist local residents, people of color, and women business owners to finance the build out of their commercial space and to provide technical skills where appropriate. This could be done through setting lease terms that would allow for the repayment of build-out through rent payments, or by guaranteeing loans to the tenants.

Scale/Size of Commercial Space
Retail tenants in the Jackson Square development space should be small in scale, located on the first and second levels of development, and not overwhelm the neighborhood.

As stated by the JCG, there should be no big box retail.

Commercial uses on the lower levels of the Jackson Square development provide an important tool to achieve the Jackson Square Coordinating Group's goal of creating a physical link among the Roxbury and Jamaica Plain communities. Small scale commercial development on the first two lower levels should therefore provide a highly visible and accessible commercial node transforming Jackson Square into a hub of cultural and commercial exchanges for residents from the neighboring communities and visitors utilizing public transportation. The interplay of commercial use across the corners of the Columbus Avenue/Centre Street intersection should also link to the existing Centre Street and Columbus Avenue business districts creating a continuous corridor of essential goods and services to enliven the streets with commercial and pedestrian activity and serve the needs of the newly enlarged residential community at Jackson Square.

Tenant Selection Decision Making Process
Development should provide opportunities to work with micro-enterprises and local entrepreneurs to start up new businesses and to enhance and grow existing businesses.

Developers should demonstrate and identify their commitment to business recruitment efforts that enhance the commercial district's diversity and economic stability.

Developers must demonstrate a commitment to work with the JCG and/or other community groups as partners in the recruitment and selection of appropriate commercial tenants.

Given the community priority for transit-oriented improved development, it is also recommended that upon tenant selection, the developer work, either directly or via technical assistance partners, to encourage businesses to fully consider public transportation marketing tools and strategies for Jackson Square either individually or collectively as businesses.

Ownership of Space
A key goal of the new commercial space is affordability and accessibility by a broad range of businesses and non-profit organizations, and long-term viability and sustainability of these local businesses. Developers must provide innovative financing and ownership structures that promote long term control and stability of commercial properties and support local reinvestment of commercial resources and dollars.

Design
Design of commercial development should incorporate the overall design goals. There are, however, a few important design concepts that are specific to the commercial portion. These include: 1.) Creating a pedestrian and bike friendly environment, providing easy access from the "T" stop and the ability to walk throughout the various sites to the commercial area(s); 2.) clear connections to the existing commercial districts such that the new commercial uses are located, oriented, and sited to encourage people who shop/dine in the new businesses to also patronize the existing businesses along Columbus Avenue and Centre Street; 3.) providing thoughtful, reasonable access for parking and loading that responds to the goals of encouraging pedestrians access, public transportation usage, and minimizing additional vehicle trips; 4.) all commercial uses must provide maximum accessibility for people with disabilities; 5.) design should use every opportunity to integrate commercial, community and residential uses with commercial located on the lower levels.

Jobs/Hiring
New development in Jackson Square has the tremendous capacity to bring meaningful job creation along with on-going training and career advancement opportunities for the residents of this neighborhood. The developer must demonstrate a plan to ensure that commercial tenants at the site access local area technical assistance and workforce development partners to encourage the hiring of Roxbury and Jamaica Plain residents, as well as minorities and women to assist in filling their hiring needs.

Development Issues:

For the purpose of responding to the Request for Proposals, Developers should address the development site issues:

- N-Star Sub-station: Developer will be required to coordinate relocation of the N-Star electrical sub-station to another location on the vacant public parcels to maximize building opportunities.
- MBTA Parking: Developer may relocate the existing spaces of MBTA staff parking on Parcel 35 to an adjacent parcel to accommodate development proposal. Location and scheduling must be coordinated with the MBTA. The cost of relocating this parking shall be borne by the developer.
- Access/location of the Stony Brook conduit and other utility easements.
- Maintenance of the discontinued portion of Amory Street as pedestrian pathway
- Reconfiguration of the DPW Salt Shed (please refer to the addressed to the JCG Site Planning Committee, dated July 7, 2003):

  The current salt shed usage presents a challenge to effective integration of the development priorities. Developments must provide a proposal to screen reconfigure and/or otherwise improve and segregate the facility from potential adjacent uses.

  Reconfiguration or re-use of the DPW site must ensure that the site becomes integrated into the overall development in Jackson Square and facilitates pedestrian access to and from Jackson Square.

  Reconfiguration must include the following:

  - Coordination with any development on the DND lot to provide a buffer to the facility that provides a clear and accessible pedestrian link across Columbus Avenue to Jackson Square.

  - Provision of attractive and safe screening of DPW uses to facilitate pedestrian use, but avoid creating a "blind spot". This could be decorative fencing that allows some visual access to yard or a mural.

  - A plan for more orderly and efficient use of the salt shed and storage facility. This should include, at a minimum, eliminating outdoor storage and loading as well as doors on the building itself.

  - Any development and screening along Ritchie Street and Highland Avenues should employ uses and materials that encourage and serve pedestrian traffic.

  - Additional pedestrian improvements along Ritchie Street including wider sidewalks and limited curb cuts.

Selection Criteria:

- Demonstrated history/commitment to development with an active, participatory community process
- Demonstrated experience developing resident-controlled housing
- Clear, articulated vision of the community goals
- Local participation/partners
- Local hiring plan, including component to ensure long-term compliance
- Demonstration of how design supports residents daily life, including transportation needs
- Demonstrated ability to work in collaboration with and problem solve with community residents
- Demonstrated ability to work in collaboration with other professionals
- Proposals should receive JCG support for any zoning variance or regulatory approvals
- History of working in the neighborhood/Demonstrated long term neighborhood commitment and investment by the owner/operator
- Demonstrated history of transit/pedestrian oriented development

Ongoing Development Process:

Role of the Jackson Square Coordinating Group
The JCG will maintain an active role in overseeing the development of all aspects of the vacant public parcels in Jackson Square.

If selected to lead the revitalization effort, the selected Developer(s) will be required to:

- Meet regularly with the JCG
- In addition to any public meetings required by the BRA's design review process or to meet zoning requirements, the selected developer(s) must hold public meetings (and coordinate those meetings with the JCG, e.g. check with JCG before scheduling so as not to conflict with other meetings, etc) for review and comment of progress at all key design phases for each component of the project, including, but not limited to:
    - Schematic Design
    - Design Development
    - 50% Construction Documents
    - 95% Construction Documents

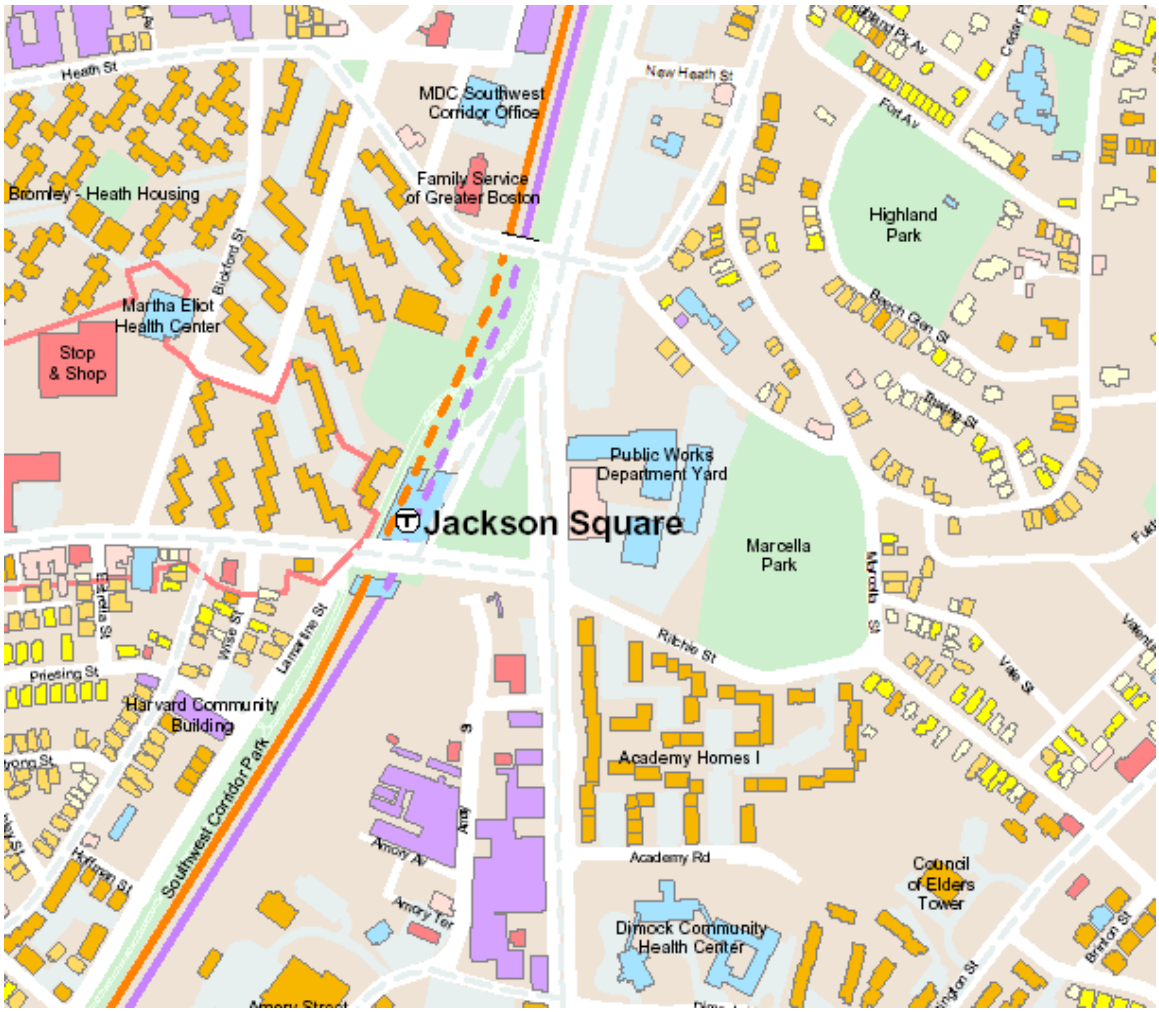
All member organization of the JCG, as well as other key community organizations must be invited in writing, at least 7 calendar days in advance of the meeting. All review meetings must also be publicized in local Jamaica Plain and Roxbury newspapers.

Developer(s) must demonstrate satisfactory review and comment during each phase of planning work, prior to proceeding to any subsequent phases. Review and approval by the JCG shall be required at completion of schematic design, design development, and 50% construction documents for each component and phase of the development work. Review shall include design as well as written policies as needed associated with the particular development phase (i.e. construction mitigation plans, lease-up and marketing plans, leasing policies, transportation demand management plans, affordability restrictions).

Developers will be expected to carefully coordinate with public agencies and private developers on adjacent private parcels to ensure careful coordination of design and construction phasing, and to ensure that the goals and vision can be fully realized.

Traffic Impact on Air Quality in Jackson Square, Boston

A Report



A collaborative project between Harvard School of Public Health, Boston Public Health Commission, Roxbury Community College, Jackson Square Coordinating Group and volunteers

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Table of Contents

1 Introduction:

Jackson Square is a part of the city of Boston. It has high levels of vehicular congestion, pedestrian traffic, and parking demand. The Jackson Square development will increase the travel demand, which is likely to impact the transportation system that is in existence there. This project aims at characterizing air pollution at curb-side/ street levels - act as a baseline study that will help in understanding the implications of development on air quality.

Comparing the various countries, it has been noticed that US is amongst the top users of cars, as compared to public transportation, walking and biking (see table 1). Through years, the relative proportion of car users in the US has increased (see table 2).

Table 1 Modal split for urban passenger travel in Europe and North America, 1995[1]

Country	Modal split as a percentage of trips by travel mode				
	Auto/car	Public Transport	Bicycle	Walking	Other (a)
USA	89	2	1	6	3
Canada	76	10	2	10	2
England	65	14	4	12	5
France	54	12	4	24	6
Italy	52	16	4	24	4
Germany	49	16	12	22	1
Switzerland	46	20	10	24	0
Sweden	46	11	10	29	4
Netherlands	45	7	28	18	2
Austria	45	13	9	28	5
Denmark	42	14	20	21	3

This study is of great relevance today as there is a trend locally in an increase in the dependence on fossil fuels for transportation. The trend in the increasing link between several public health hazards and the deterioration of air quality in cities also warrants this study.

[1] Source: Ministries of transport and departments of transportation in various countries, 1995

Table 2 Trend in increase in autos in USA (data not available post 1995)[2]

Unit: %

Transport mode	1969	1977	1983	1990	1995
Auto	81	84	85	87	89
Public transport	5	3	2	2	2
Walk	10	9	9	7	6
Bicycle	1	1	1	1	1
Other	3	3	3	3	2
Total	100	100	100	100	100

Table 3 clearly indicates an increase in the area and population of Boston, thereby only showing an up-trend in the need to use more cars, because of the sprawl.

Table 3 Adapted from Demographia, International Urbanized Area Analysis and Data Product

City of Boston	1960	1970	1980	1990	2000	Source
Area in sq. miles	516	664	857	891	1,736	US Census
Population (in thousands)	2,413	2,653	2,679	2,775	4,032	US Census
Population Density (persons per sq. mile)	4,676	3,995	3,126	3,114	2,323	US Census

This project was carried out with active involvement from the students of the Roxbury Community College (RCC), who had the opportunity to get hands-on training on documentation of air pollution caused by vehicles in the city. This is their neighborhood and gives them an enormous sense of pride and belonging in being part of this whole endeavor. The students being part of this project also will create awareness in them about air pollution, and would be a source of inspiration for them to delve further in the domains of Public Health and Environmental Engineering.

[2] Source: Federal Highway Administration, Nationwide Personal Transportation Survey (Washington, D.C.: U.S. Department of Transportation, 1973, 1980, 1986, 1992, 1998).

2 Scope of work:

- To inform the public about air pollution in Boston - information about transportation, emissions, emission trends and public health.

- To provide guidance for incorporating air pollution from traffic into decisions on neighborhood development in Boston.

- To provide a baseline study of traffic related air pollution in Jackson Square.

This report will act as a point of reference, along with Article 80, for developers and authorities who are responsible for future development in these neighborhoods. The document provides a reference for measuring traffic and transportation related impacts in future developments.

2.1 Process

- Air pollution measurements were taken at road junctions chosen carefully to represent Jackson Square. They were recommended by the community at large to Boston Public Health Commission (BPHC). The traffic related air pollutants measured in Jackson Square were CO, PM 2.5, Ultrafine particles and Polycyclic Aromatic Hydrocarbons (PAH)

- Vehicular counts were made on selected days during evening rush hour traffic between the months of Jan - May 2003.

- The vehicular counts were used as inputs for a line source dispersion model - CALINE 4. The model has been used only for modeling CO values.

3 Pollution Measurement

3.1 PM 2.5

PM 2.5 concentration was monitored by the TSI Dust Trak (Aerosol Monitor Model 8520) on a height of approximately 80-90cm from the ground near intersections. The TSI Dust Trak is a real-time monitoring device for the determination of aerosol mass concentrations in the range 0.001 to 100 mg/m^3, for particles ranging in size 0.1 - 10μm, with a resolution of 1% or 0.001 mg/m3 whichever is greater. The measurement of PM2.5 concentrations by the Dust Trak is based on a simple photometer using a light scattering where the amount of scattered light is proportional to the volume concentration of the aerosol (Hitchins et al., 2000). The TSI Dust Trak used in this study was calibrated by the manufacturer. It can provide 1 minute average PM2.5 concentrations during measurement hours, 15:30 – 18:30.

Figure 1 presents the cumulative distribution of all 10 minute averaged PM2.5 concentrations, measured across all sampling days in Jackson Square.

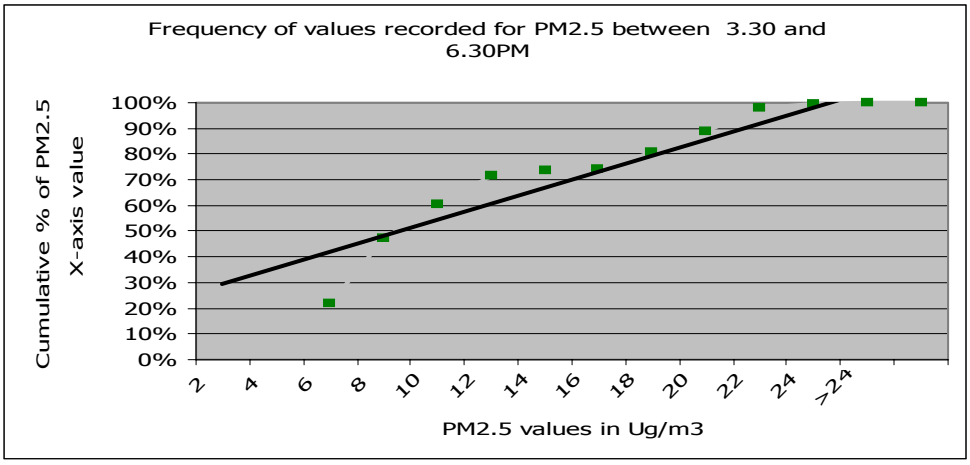
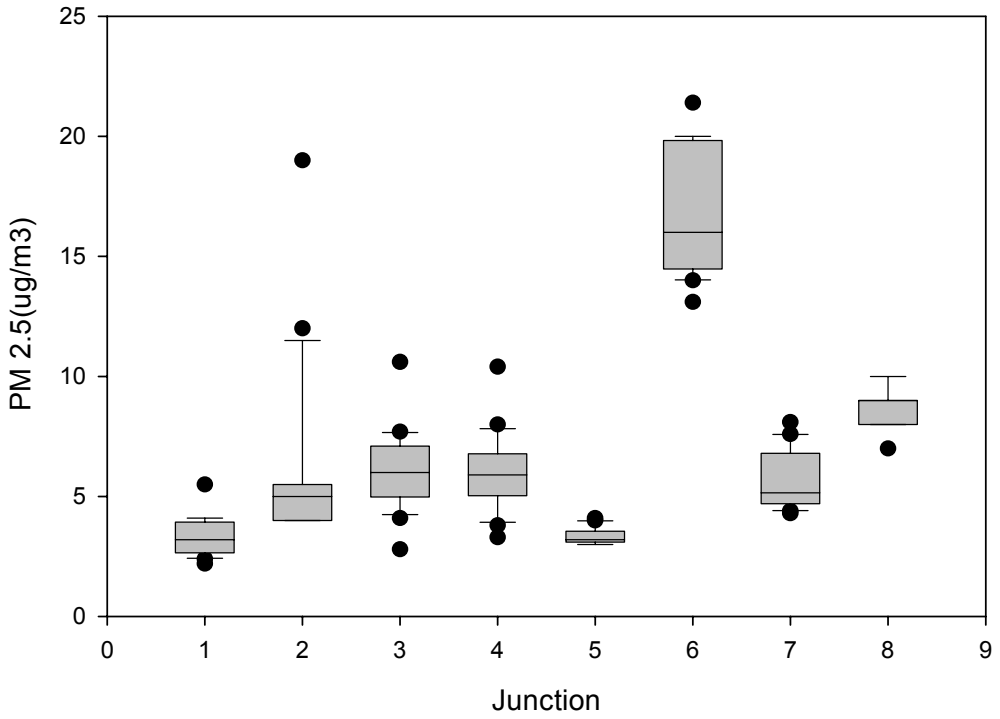


Figure 1 Cumulative Distribution of PM 2.5 in Jackson Square area.

Figure 2 displays the boxplot distributions of PM2.5 concentrations for the eight locations monitored. Clearly, concentrations were high at Center and Bickford Intersection.



1: Marcella and Richie, 2: Columbus and Richie, 3: Amory and Atheron, 4: Highland and Marcella, 5: Center and Larmartine, 6: Center and Bickford, 7: Columbus and Heath, 8: Columbus and Tremont

Figure 2 Concentration Distribution of PM 2.5 in Jackson Square area.

3.2 Ultrafine Particles

Ultrafine particles counts (# of paticles per cc) were made with the P-Trak (TSI 8525 Ultrafine Particle Counter) at the same locations as the PM2.5 measurement.

The TSI P-Trak was designed to detect and count Ultrafine particles in the sub-micron range (0.02 to 1µm) in the concentration range 0 to 5 x 10^5 particles/cm^3. Particles are drawn into the P-Trak by a built-in pump pass through a saturator tube where they mix with an isopropyl alcohol vapor. The mixture of isopropyl alcohol vapor and particles is drawn into a condenser tube where the alcohol vapor condenses on the particles. Then the particles grow into droplets that can be counted more easily than original Ultrafine particles. The grown droplets then pass through a focused laser beam, producing flashes of light. The light flashes are sensed by a photodetector and counted to determine particle concentration (TSI P-Trak, 2003).

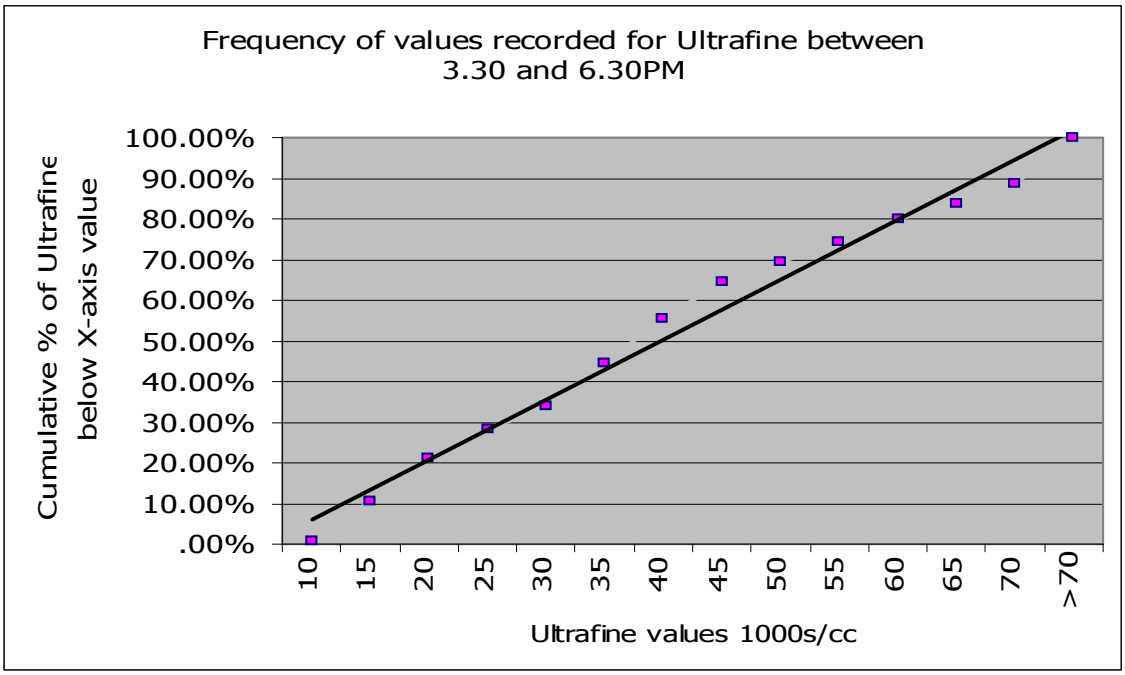


Figure 3 Cumulative Distribution Function of Ultrafine particles in Jackson Square area

Fig. 3 is the Cumulative Frequency Distribution for Ultrafine particle counts. Values range from 10,000 particles per cc. to in excess of 70,000 particles per cc.

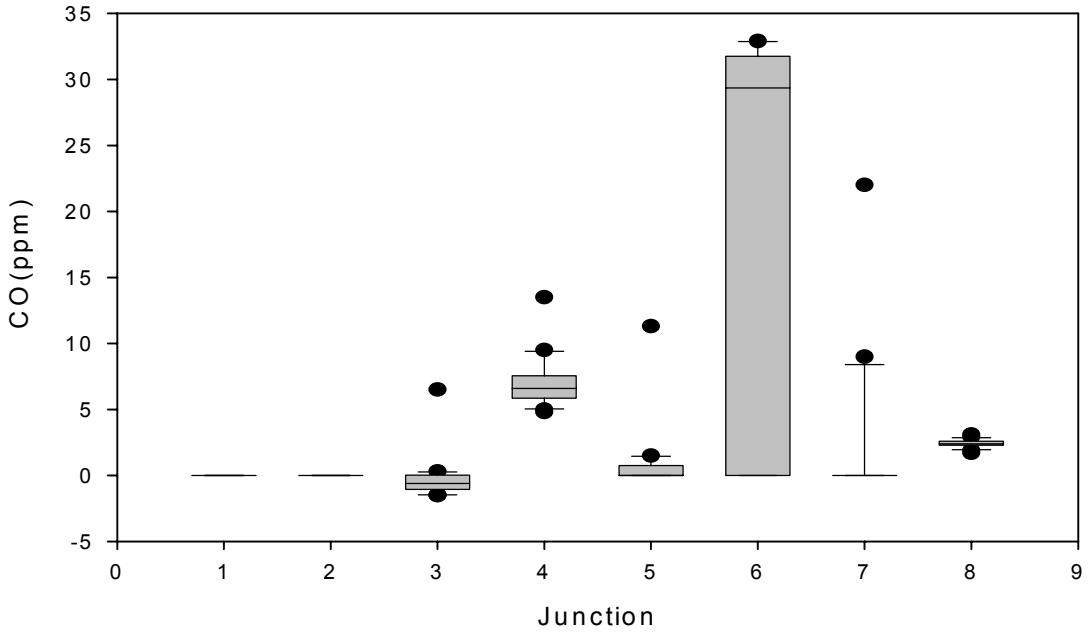


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Figure 4 Concentration Distribution of Ultrafine particle numbers in Jackson Square area.

Figure 4 shows the boxplot distribution by sampling locations. While like PM2.5, the Center and Bickford intersection appears slightly higher, particles count levels are also elevated at the Columbus and Ritchie as well as the Amory and Atherton locations.

3.3 CO

The concurrent measurements of carbon monoxide, carbon dioxide, relative humidity and temperature in the atmosphere near the intersections were conducted using a Q-Trak (TSI Model 8551 IAQ Monitor). Carbon monoxide was analyzed by an electrochemical sensor which can measure a range of range 0-500 ppm. Carbon dioxide was analyzed by a non-dispersive infrared sensor which can measure a range of 0-5000 ppm. Temperature and humidity was measured using a thermistor sensor and a thin-film capacitive sensor, respectively. Only CO is presented as cumulative frequency in Fig 5. Table 4 shows the monthly mean and maximum concentrations for CO and PM2.5.

Table 2 - CO, PM 2.5 measurements recorded in Boston between Nov 02 and Feb 03[3]

Month and year	CO Monthly Mean ppm	CO Monthly Max Ppm	PM 2.5 Monthly Mean µg/m³	PM 2.5 Monthly Max µg/m³
Nov 2002	0.47	2.7	15.48	84.0
Dec 2002	0.47	2.4	15.66	310.0
Jan 2003	0.47	1.5	14.0	60
Feb 2003	0.70	2.4	12.51	53.3

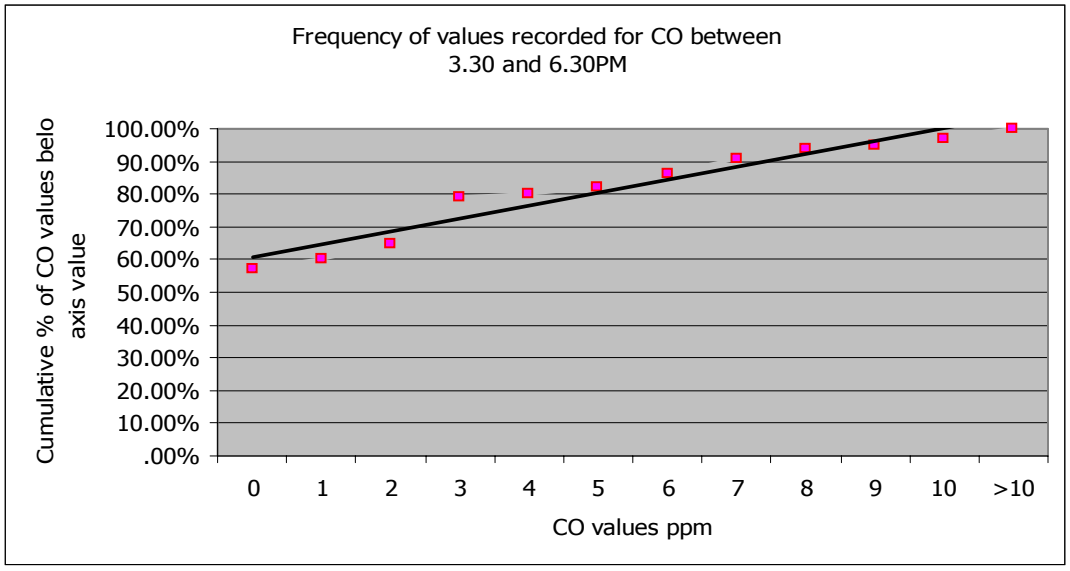

Figure 5 Cumulative Distribution of CO in Jackson Square area.

Figure 6 shows the boxplots for CO. Levels are low everywhere with an occasional short duration higher level, but still within standards.

[3] Source : Collated from Data from EPA

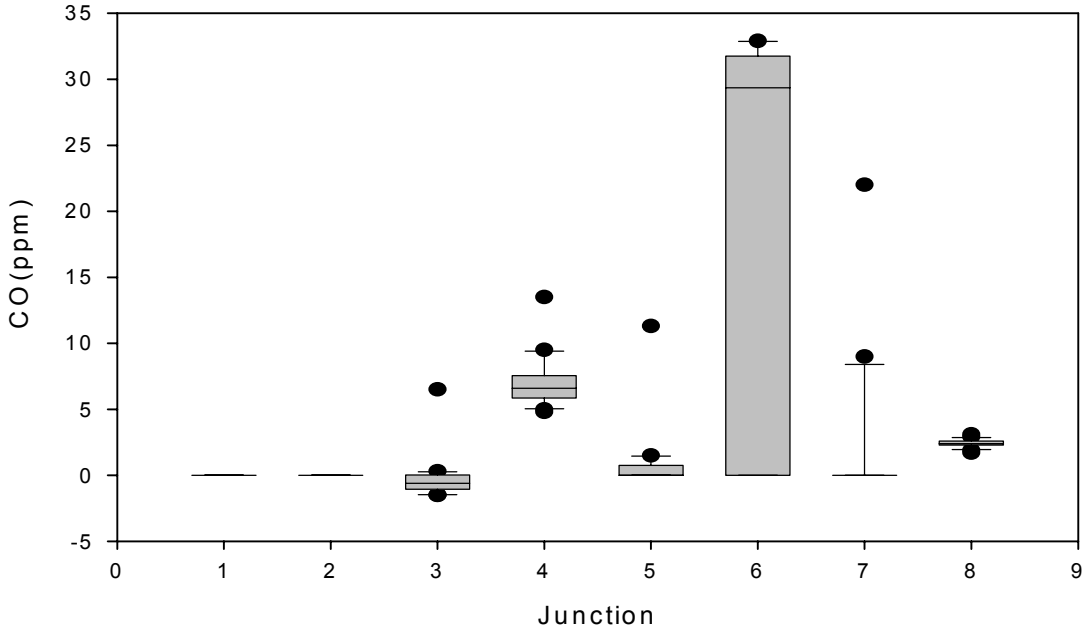

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Figure 6 Concentration Distribution of CO in Jackson Square area.

3.4 PAH

The total concentrations of PAHs in the atmosphere near the intersections were continuously measured in real-time using a PAH monitor (PAS CE 2000). The Photoelectric Aerosol Sensor (PAS) works on the principle of photoionization of particle-bound PAH. The aerosol flow including PAHs is exposed to UV radiation using an excimer lamp. The PAH coated aerosol particles are then ionized, while gas molecules and non carbon aerosols remain neutral. The resulting electric current by positively charged carbon particles establishes a signal which is proportional to the concentration of total particle-bound PAH (Eco Chem Analytics, 2003). The analyzer signal is a measure of total PAH adsorbed on carbon particles and does not specify the chemical type and concentration of each PAH component.

Figure 7 is a Cumulative Frequency distribution for the 10 min averaged PAH data and Figure 8 is the boxplot for each sampling location.

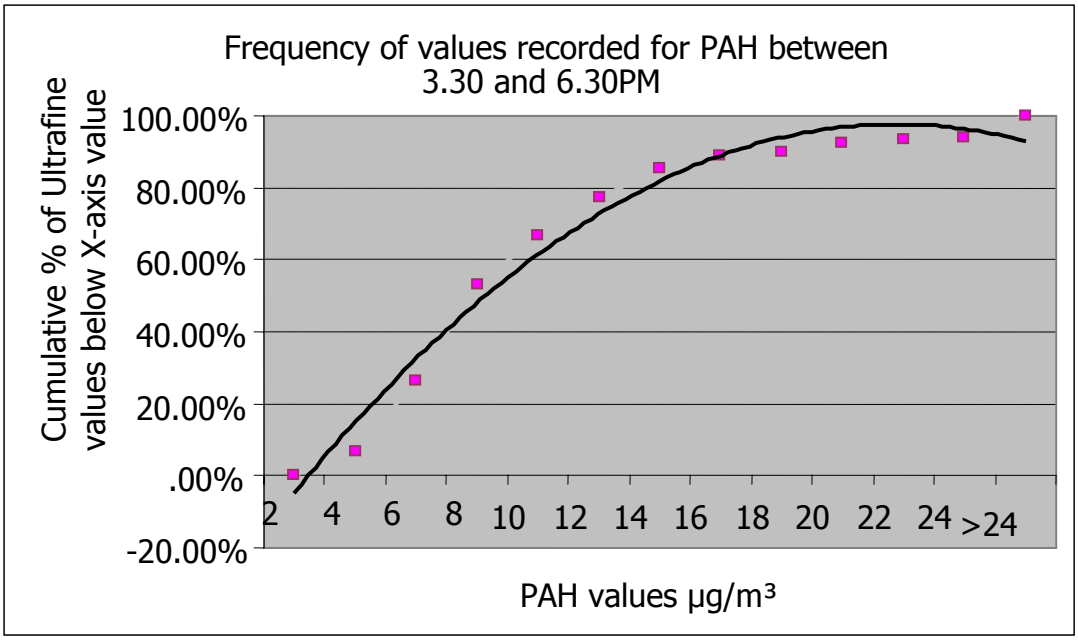

Figure 7 Cumulative Distribution of PAH in Jackson Square area

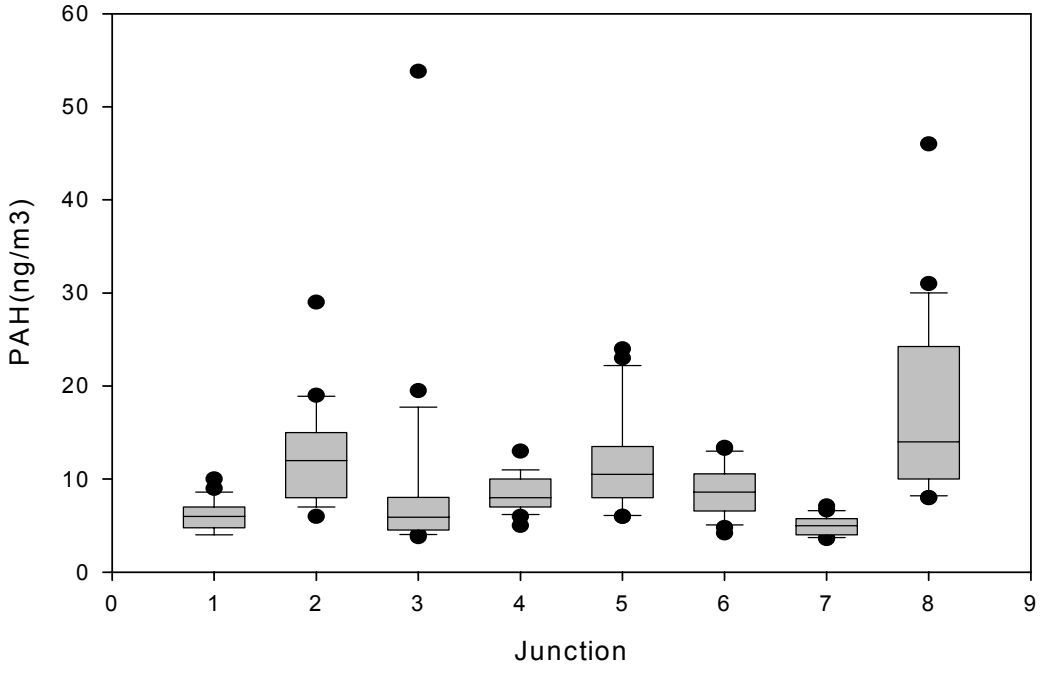

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Figure 8 Concentration Distribution of PAH in Jackson Square area.

3.5 Vehicular Count

Traffic counts were made during each sampling period. Students recorded counts by vehicle type (car, buses and trucks) every ten minutes using a digital watch. Figure 9 represents the cumulative frequency distribution for the 10 minute traffic counts. Except for one high value of greater than 500 vehicles, in the 10 minute interval, the distribution looks like it is flattening out at about 500 vehicles per 10 minute, It appears that at higher traffic loadings, the streets and intersections might be at saturation.

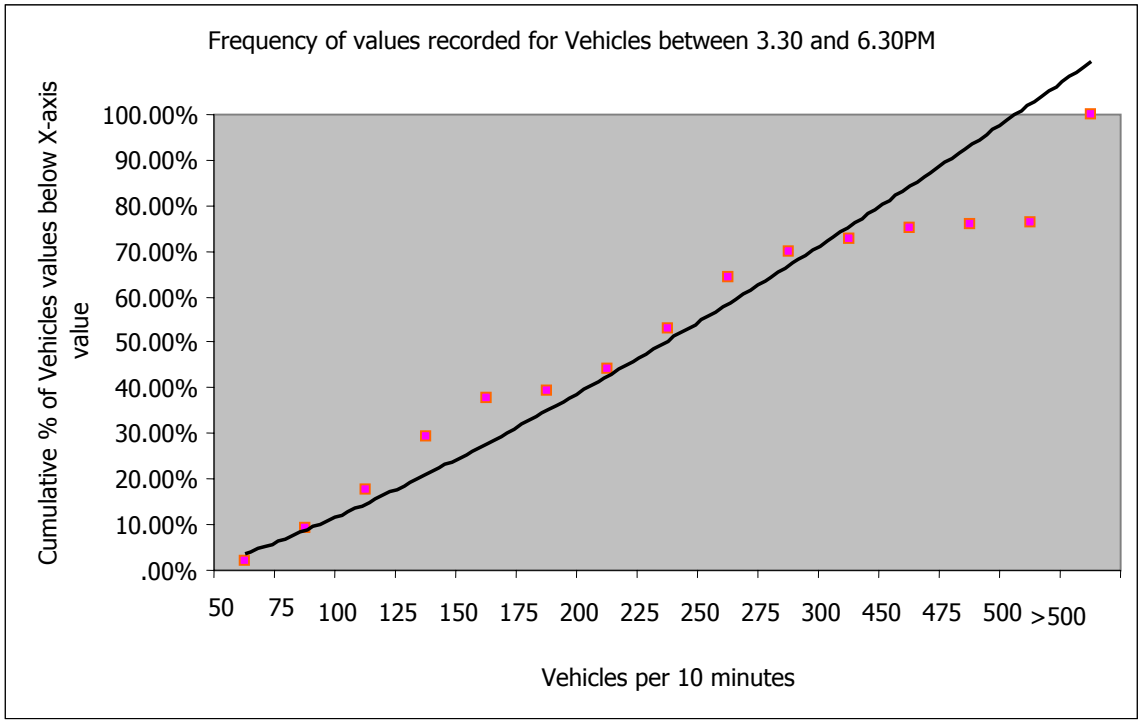


Figure 9 Cumulative Distribution of vehicles counted at peak hours in Jackson Square

- Traffic was counted manually in 10 minute intervals
- Cars, diesel trucks and buses were counted separately.

These values were used to determine the average hourly rates

3.6 Description of Monitoring Locations and observations

Monitoring locations were chosen primarily by the Boston Public Health Commission's toxicologist, as a result of concerns expressed in meetings of the Transportation Subcommittee of the Roxbury Community Groups. Additional locations were chosen to complete the traffic pattern of the primary sampling locations.

Marcella and Ritchie Street Intersection

This location was of primary interest to the JSCG. This intersection is a "Y" intersection with the "stem", or continuation of the east branch, being Marcella Street. The west branch is Ritchie Street. The intersection is in a residential area and is at the southern point of John Connolly Playground.

Figure 10 Marcella Ritchie Intersection

Traffic enters the Y intersection from southbound Ritchie, southbound Marcella or northbound Marcella. Stop signs at northbound Marcella and southbound Ritchie Streets control two of the three directions into the intersection. Near the intersection, on Ritchie Street, is ongoing construction of Academy Homes II public housing with an outlet onto Ritchie Street. Much of the traffic traveling on Washington Street, from both Heath and Center Street, passes through this intersection.

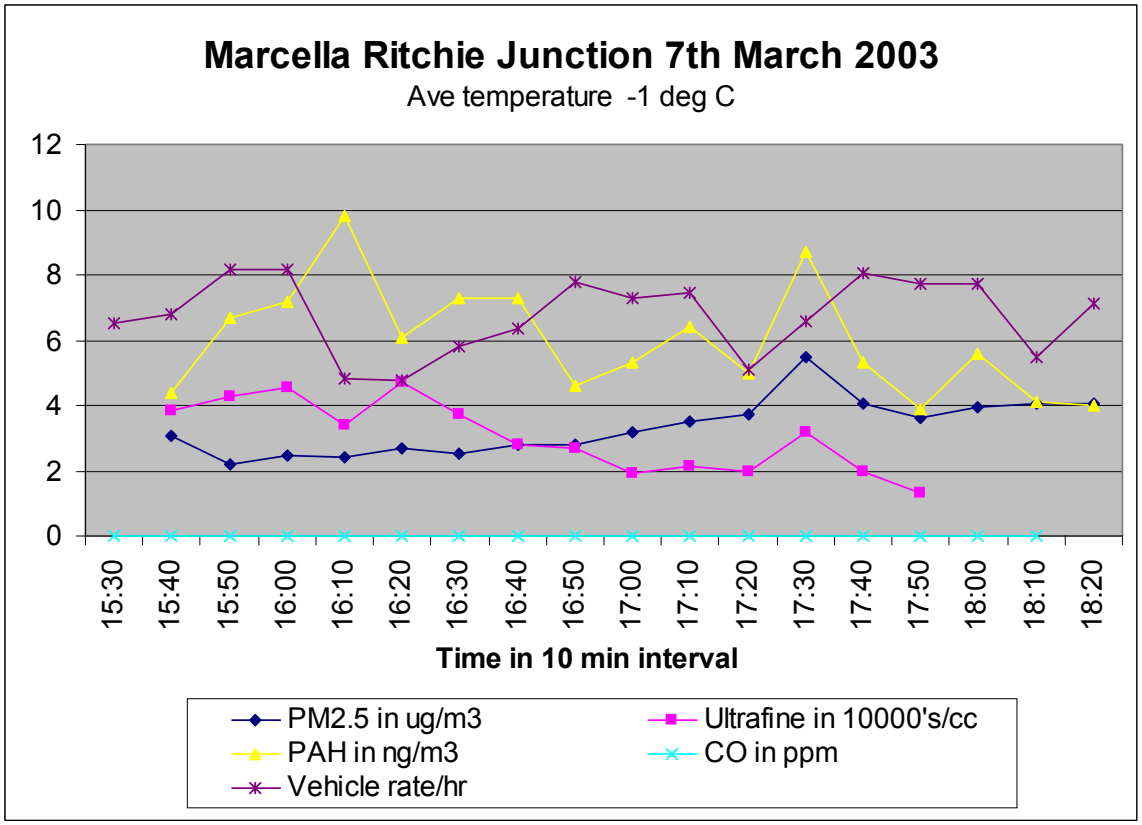


Figure 11 Marcella Ritchie Intersection pollution chart

Observations:

Traffic stalls through this intersection for two primary reasons:

- Backup from the lights at Marcella and Washington Street and
- Discharge of school children by a number of school buses proximate to the intersection.

When traffic backs up, left turns from Marcella to Ritchie Street become difficult, due to southbound through traffic on Marcella blocking the intersection.

Adjusting the traffic light cycle at Marcella and Washington Street to favor Marcella Street would mitigate this situation.

Marcella and Highland Street Intersection

This location was chosen because of its relationship to Marcella and Ritchie Street. This intersection is also a Y intersection, with Marcella being the through street and Highland Street intersecting.

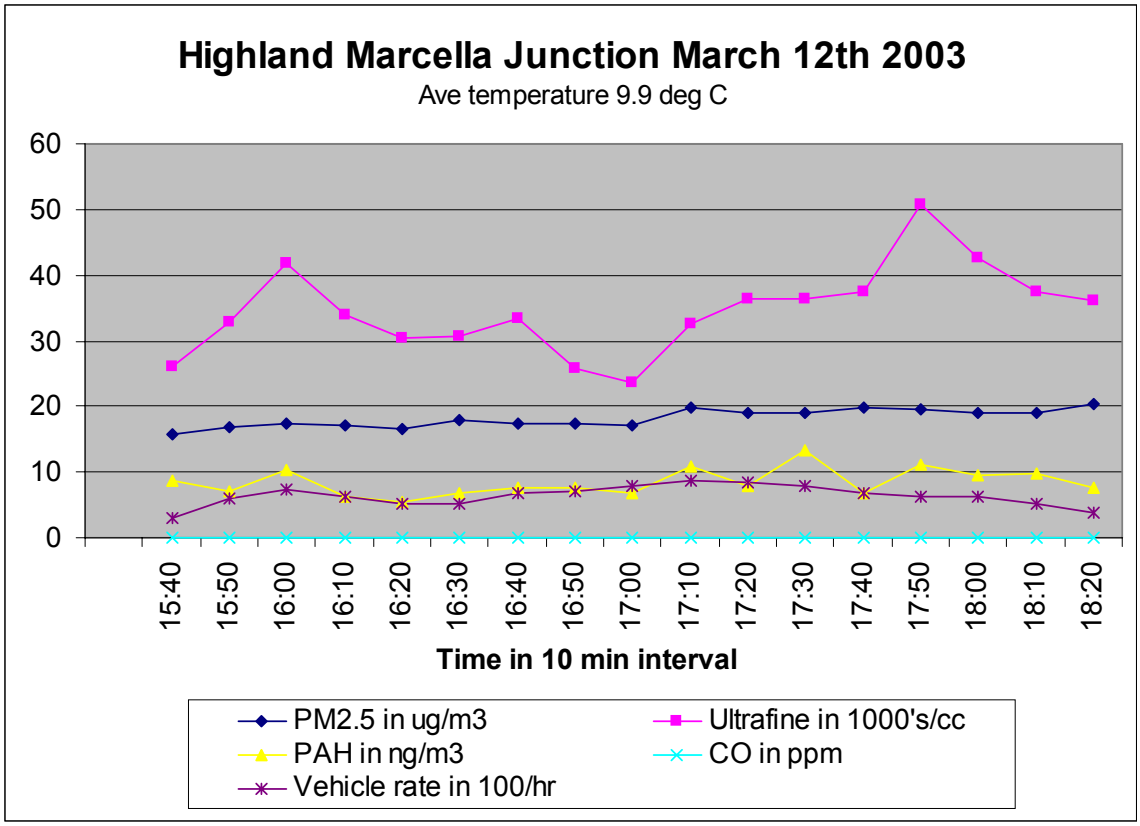


Figure 12 Highland Marcella Intersection pollution chart

Observations:

Very few vehicles traveling on Marcella from Washington continued through the intersection on Marcella. Highland Street appears to carry 'cut-through' traffic from Washington Street to Heath Street. Traffic using this intersection avoids the traffic light at Washington Street and the stop sign at Ritchie. In actuality, Highland Street intersects with Columbus Avenue, bringing traffic to Heath Street, after a short 'jog' on Marcella. Traffic counts at this intersection confirmed this with significant traffic observed to enter the intersection from Highland and make a right onto Marcella with nearly all making a quick left back onto Highland toward the intersection of Columbus and Heath.

Ritchie and Columbus Street Intersection

This intersection was chosen for two reasons:

1. the JSCG had concerns regarding the new development,

2. JSCG wanted information as to whether the traffic traveling through the Marcella and Ritchie intersection proceeds through the Columbus Avenue intersection to Center Street or turns at Columbus.

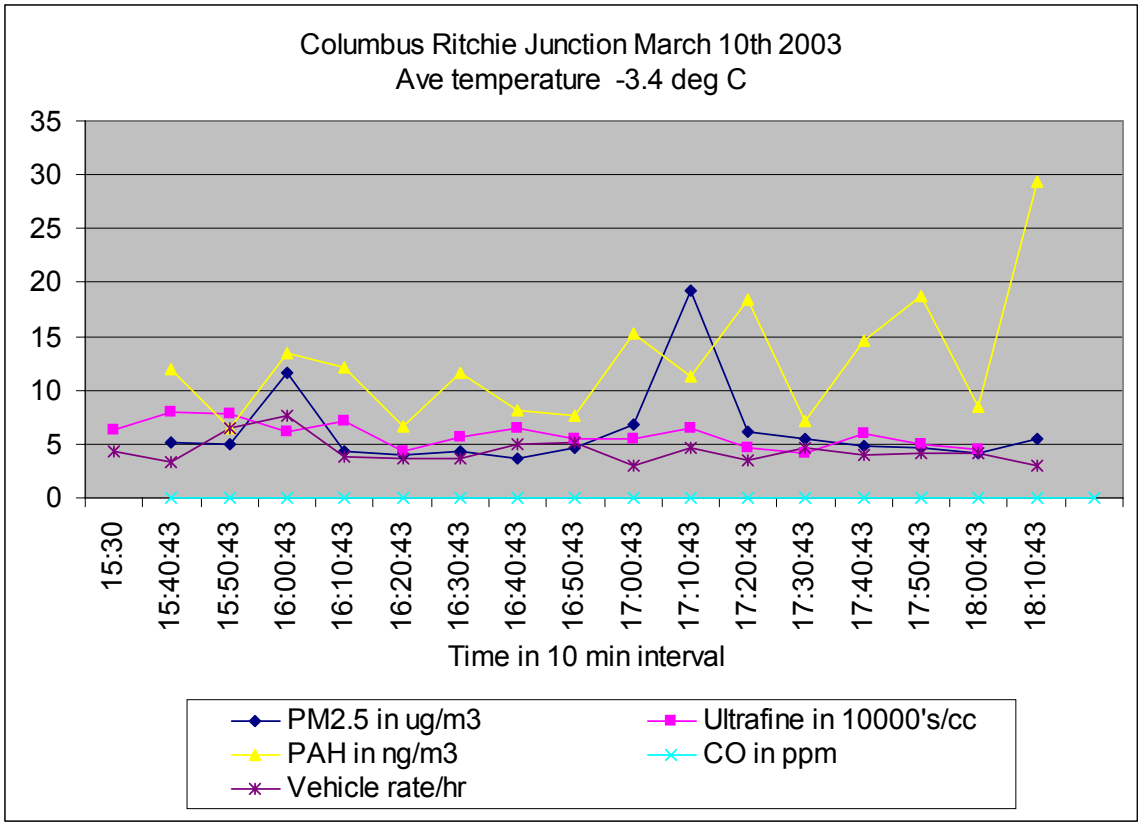


Figure 13 Columbus Ritchie Intersection pollution chart

Observations:

Significant outbound traffic on Columbus makes a right turn onto Center Street. In addition, inbound traffic on Columbus making a left onto Center Street was also counted. Consequently, the make up of traffic traveling on Center Street through the Jackson Square Community could be determined. "Through traffic" on Columbus was not counted, though, due to labor limitations. It can be said that Columbus Avenue is the major source of traffic on Center Street at the subway station. However, much of this traffic appears to take an immediate left onto Lamartine street.

Academy and Columbus Intersection:

Academy Road, located off Columbus Avenue, is parallel to Ritchie Street and is not a through street. It is the main entrance to the Academy Homes housing development, and traffic and pollution were measured because of concerns raised by the JSCG regarding increased traffic from the new housing development. If the traffic from both developments is connected, Academy Road could then be used as a cut-through for traffic traveling from Washington Street to outbound Columbus Avenue, in order to avoid the left turn at Ritchie and Columbus.

This intersection is T-shaped, with Columbus being the main or through road. A break in the median strip on Columbus allows traffic to enter or exit Academy from both directions at Columbus Avenue. Breaks in traffic, due to the light cycles on Columbus at both Center and Dimock Street, provide for relatively safe left turns onto and from Columbus Avenue. No back up of traffic on Academy Road was observed during the rush hour period.

Observations:

A surprising number of U-turns were observed at this intersection. These appeared to be somewhat dangerous, since the U-turns could not be completed in one motion and are better described as three point turns. U turns often disrupted through-traffic on Colmubus Avenue, which travels at significant speed.

Center and Lamartine Street Intersection

This intersection was chosen for two reasons. First, proposed developments on Lamartine Street are of concern to the JSCG. Baseline traffic and pollution measurements would provide information as to the relative impact of new developments on the traffic on Lamartine. Second, Lamartine is a primary outlet from Columbus Avenue through Jackson Square.

Physically, this is a classic T intersection, with Lamartine terminating at Center Street, the main, or through street. This intersection is controlled by traffic lights. The light cycle of this intersection includes a dedicated left turn from Center Street onto Lamartine Street. Virtually all traffic leaving this intersection on Lamartine is left turning traffic from Center. Despite the left turn arrow, not all traffic is able to make a protected left turn, so through traffic in the intersection is limited by the back up of left turning traffic.

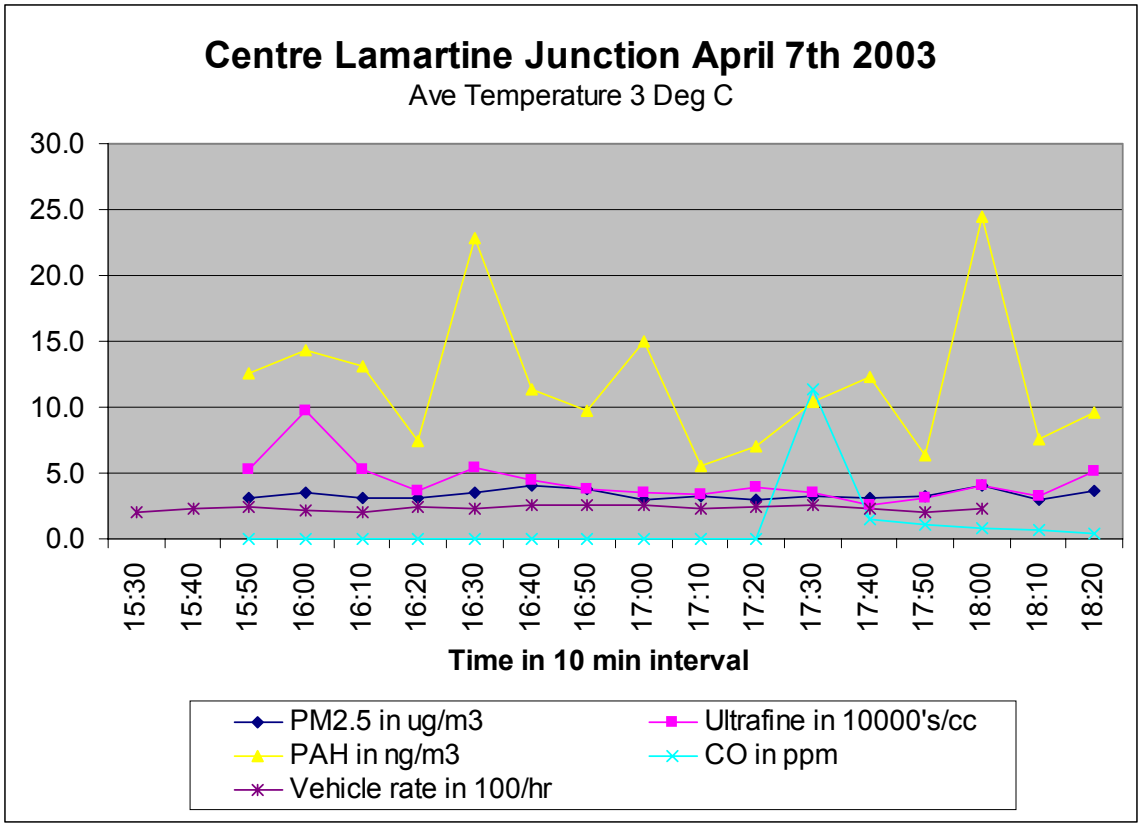


Figure 14 Center Lamartine Intersection pollution chart

Center and Bickford Street Intersection

This classic T intersection is approximately 100 meters up Center Street from Columbus Avenue. Vehicles on Bickford are controlled with a stop sign. Bickford Street is the entrance to a major public housing development and also carries a portion of the traffic exiting the parking lot of the Star Market retail development.

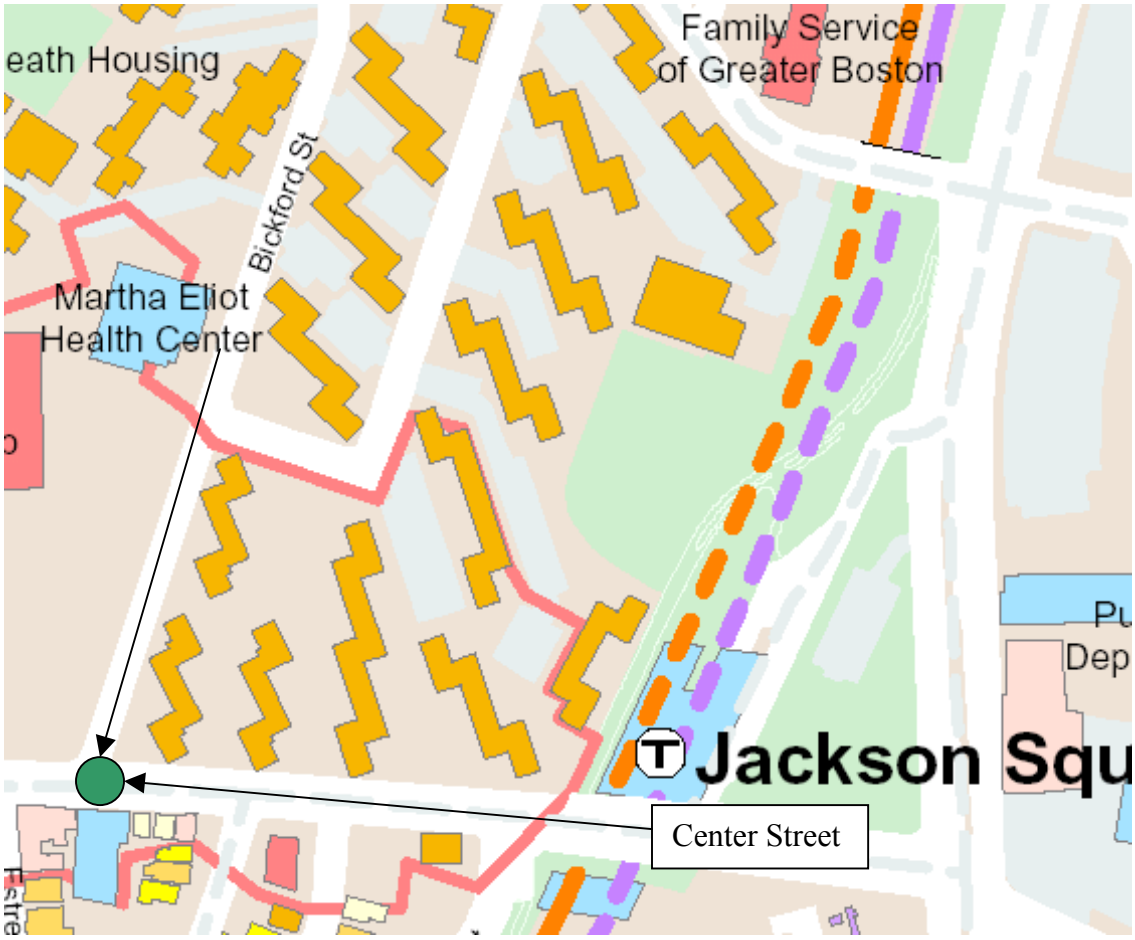


Figure 15 Center Bickford Intersection

Observations:

Due to the heavy traffic on Center Street, left turning traffic from Bickford Street usually must break into the traffic. Fortunately, that traffic speeds are limited due to traffic backup from adjacent light-controlled intersections. Traffic speed was lowest at this sampling location.

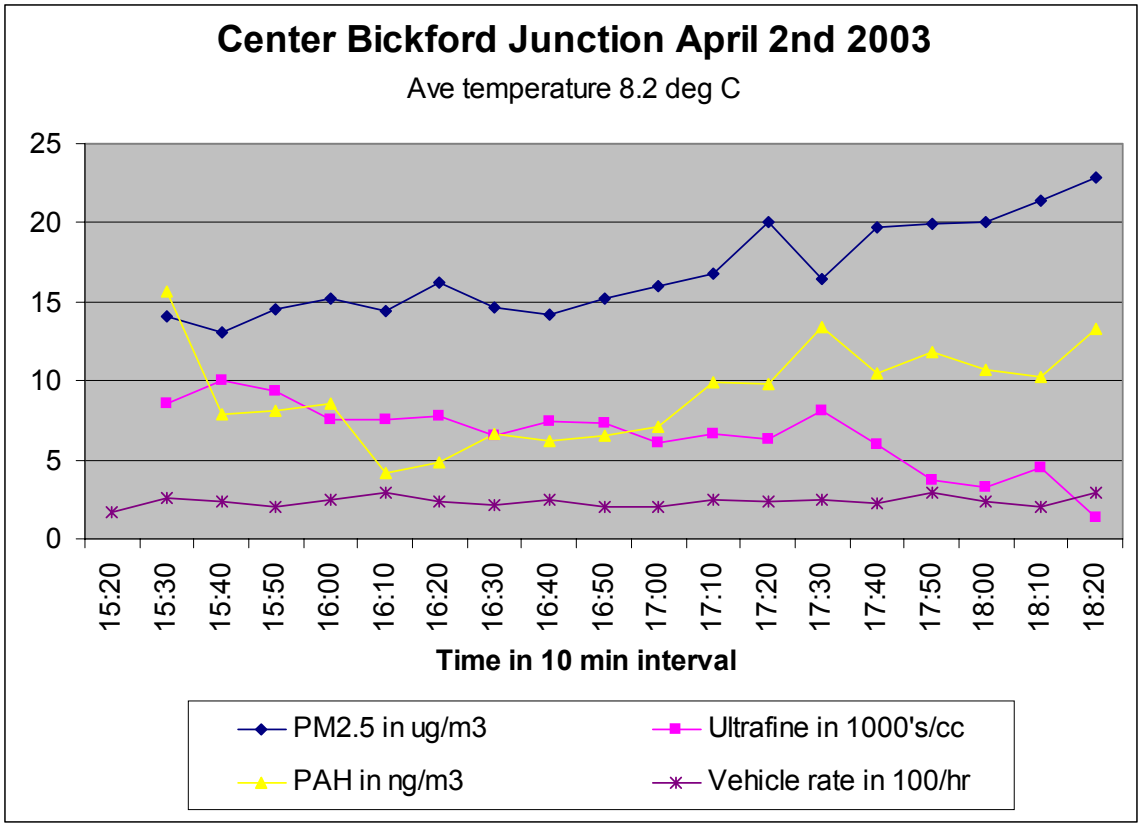


Figure 16 Center Bickford Intersection pollution chart

Amory and Atherton Intersection

This intersection was chosen because of JSCG concerns that proposed developments on Amory would significantly increase traffic on that street and that traffic was bypassing Jackson Square by traveling on Atherton Street. Atherton Street is one way through this intersection. Atherton Street then becomes Mozart Street and terminates at Center Street in a T intersection.

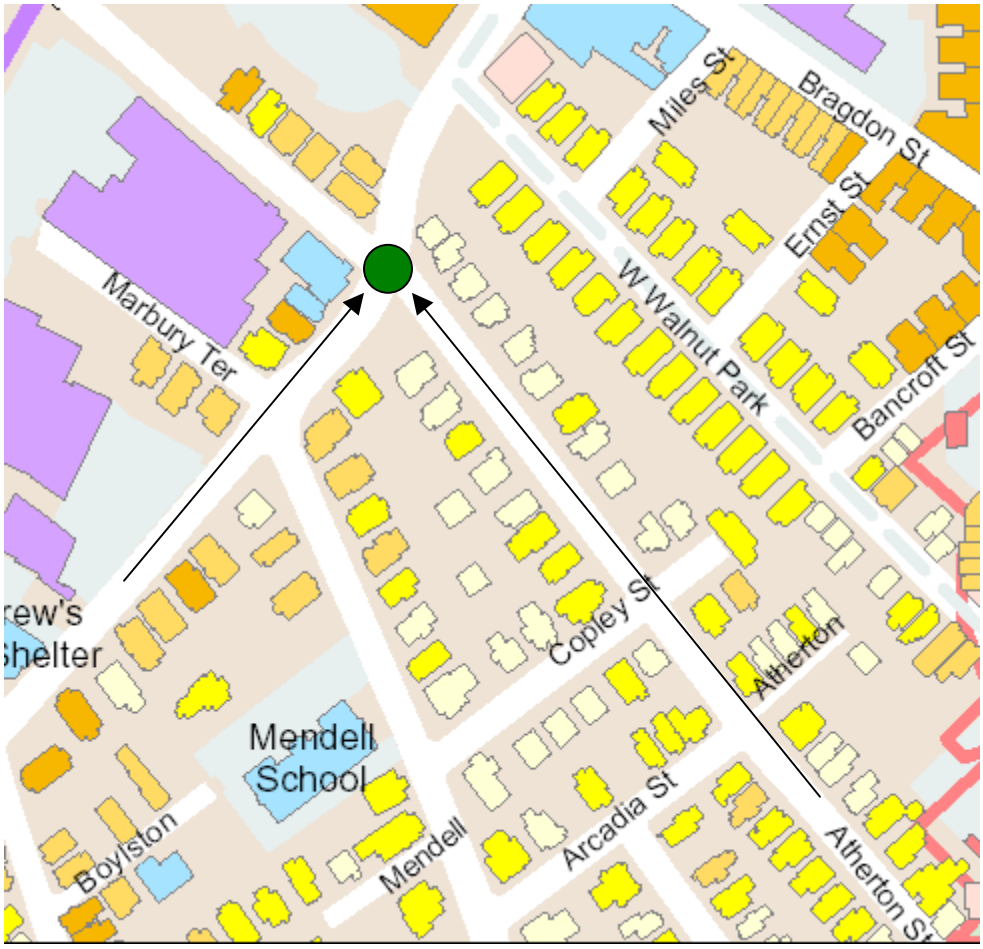


Figure 17 Amory Atherton Intersection

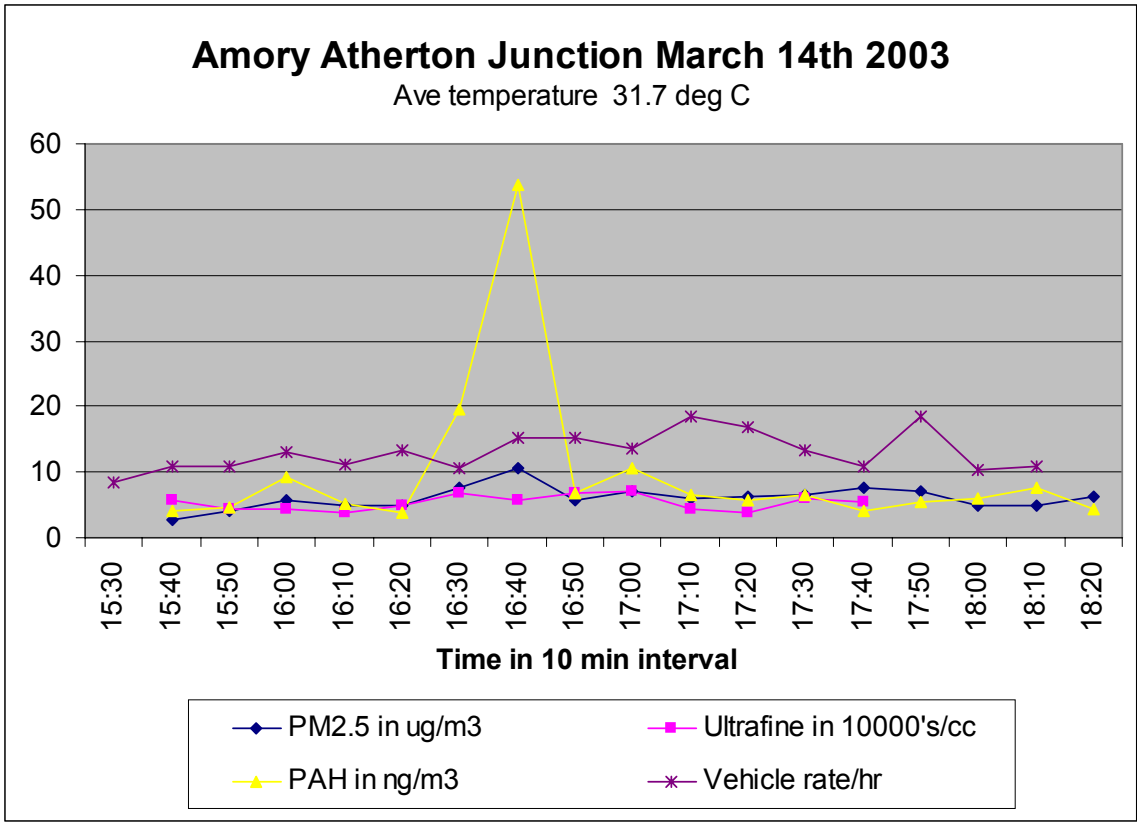


Figure 13 Amory Atherton Intersection pollution chart

Columbus and Heath Street Intersection.

This is a major intersection and was included as one of two attempts at manually measuring through-traffic on Columbus Avenue. Heath Street, one of the few through streets paralleling Center Street, carries substantial traffic. It is both a major source of outbound Columbus Avenue traffic, turning right onto Columbus, and a conduit for traffic that is turning right from Columbus Avenue.

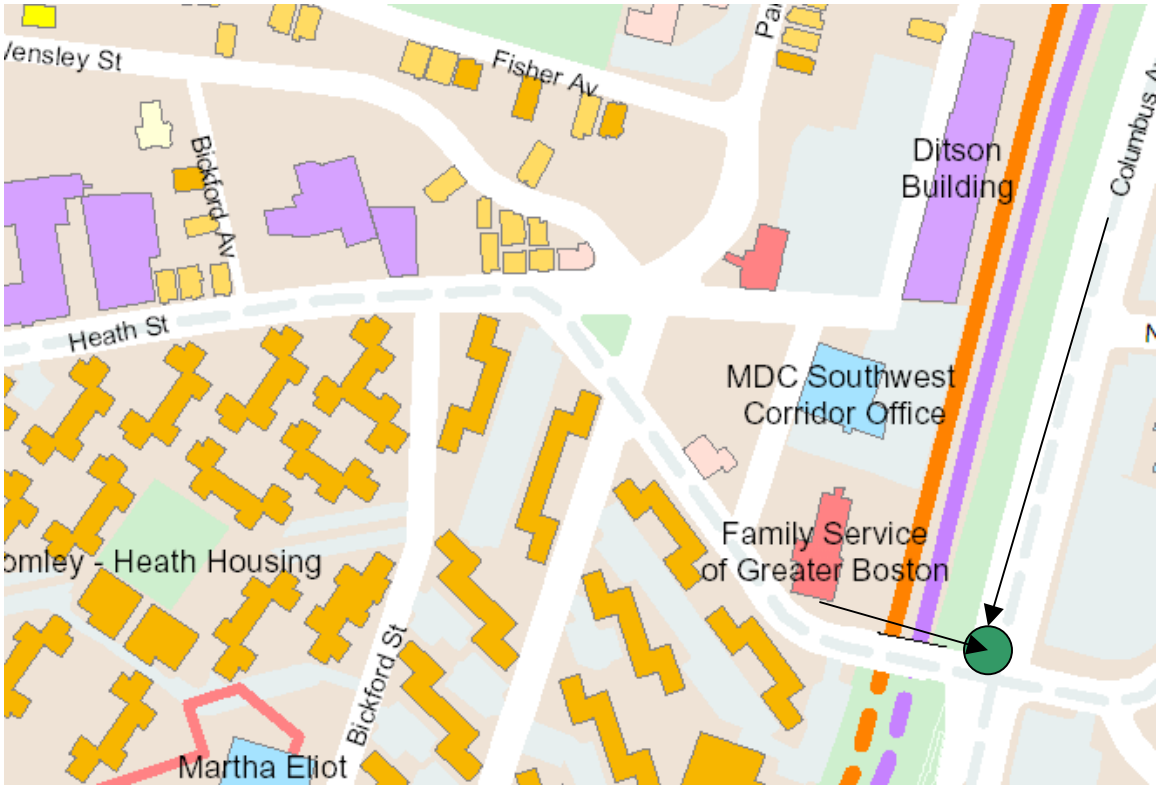


Figure 14 Columbus Heath Intersection

Observations:

Both inbound and outbound left turning traffic is unprotected. That is, there is not a dedicated left turn during the light cycle of this intersection.

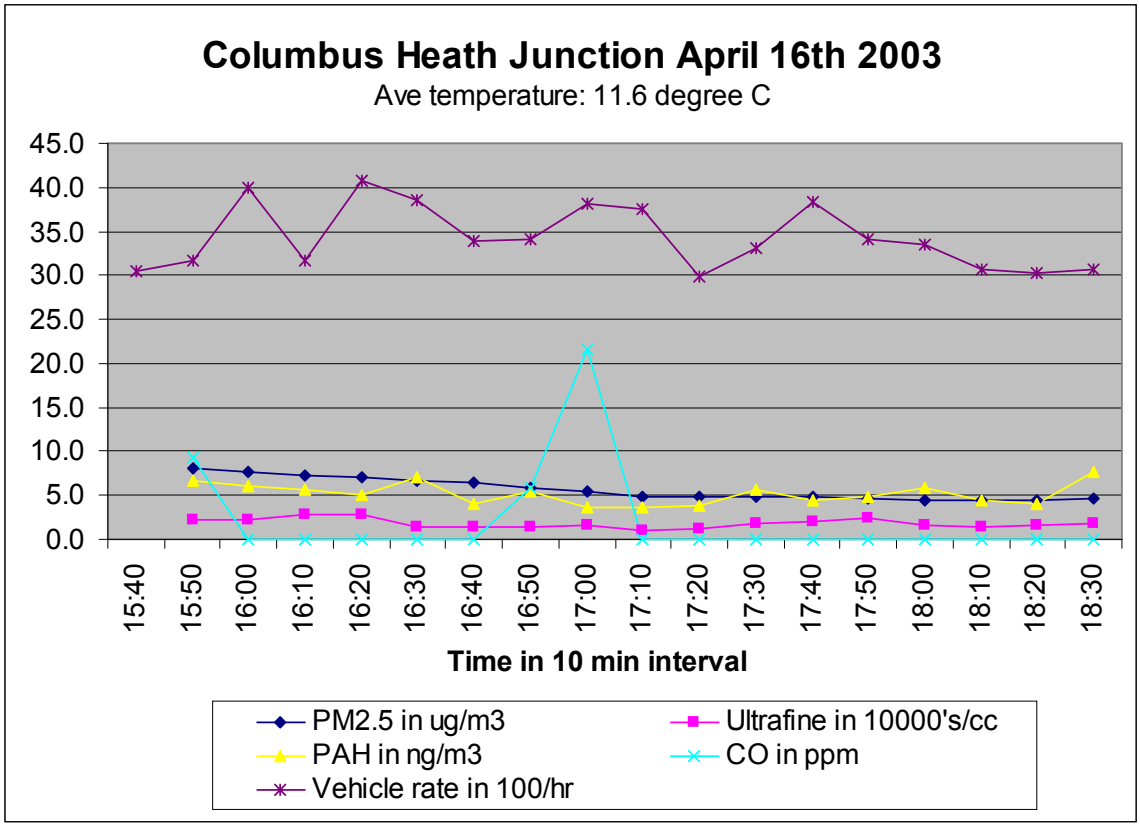


Figure 15 Columbus Health Intersection pollution chart

Columbus and Tremont Street Intersection

This intersection was technically outside the Jackson Square traffic study area, but traffic avoiding this intersection from Center Street impacts intersections such as Heath and Columbus.

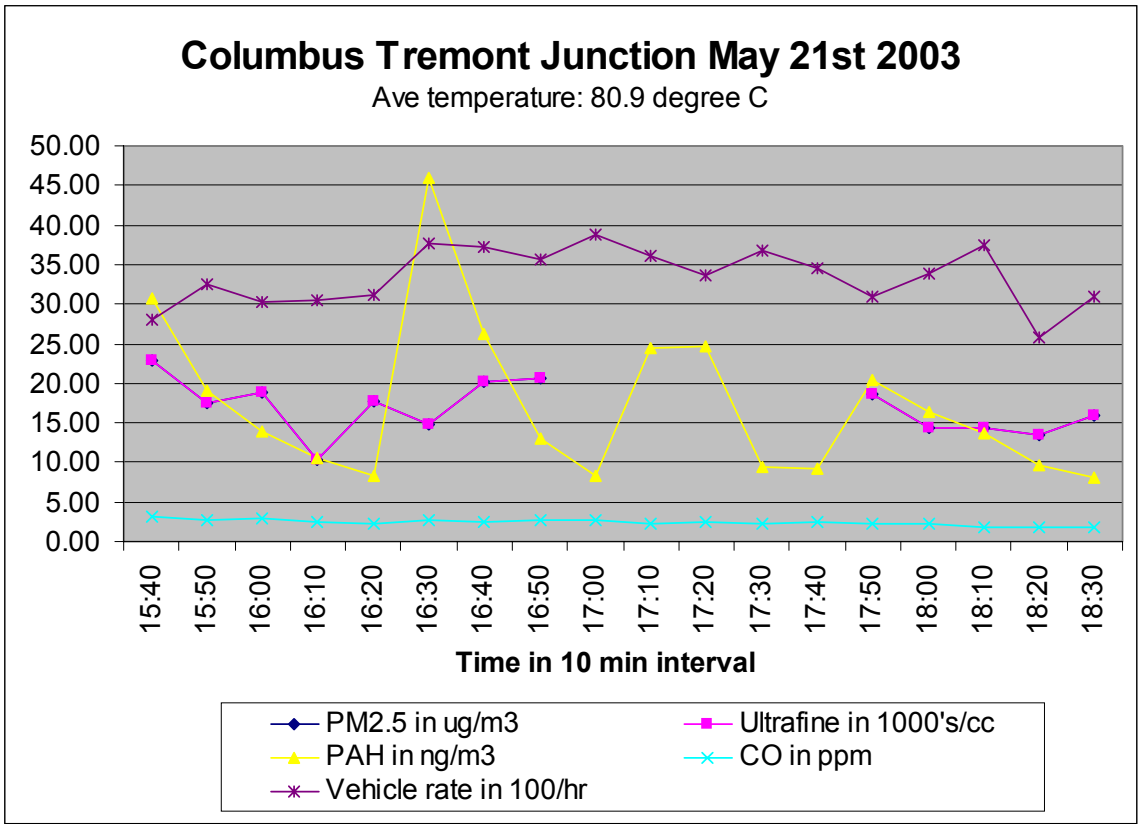


Figure 16 Columbus Tremont Intersection pollution chart

Observations:

The light cycle of this intersection includes protected left turns from Columbus Avenue onto Tremont Street and Malcolm X Boulevard. However, left turning traffic onto Columbus Avenue is not protected.

The light cycle of this intersection favors Columbus Avenue considerably. Even during rush hour, outbound Columbus Avenue traffic backup was less than one light cycle. In contrast, traffic on Tremont Street was often delayed three or more light cycles. This was primarily due to difficulty in left turning traffic clearing the intersection.

Although right turning traffic from Malcolm X onto inbound Columbus Avenue has a dedicated right turn curb cut, traffic turning right from Tremont Street does not. Consequently, even right turning traffic is delayed, with many vehicles avoiding this intersection by going through Mission Hill, particularly on Terrace Street.

4 Modeling CO pollution using CALINE 4

4.1 Introduction:

The vehicular count data collected was used to build a model using CALINE 4. CALINE4 (Caltrans, 1989) is a dispersion model that predicts carbon monoxide (CO) impacts near roadways. Its purpose is to help planners protect public health from the adverse effects of excessive CO exposure. The Caltrans publication, *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol) (Garza et al., 1997), recommends the use of CALINE4 when a proposed transportation project fails an initial screening analysis (described in Appendix A of the CO Protocol), and therefore, requires a more detailed analysis.

CALINE4 is a simple line source Gaussian plume dispersion model. The user defines the proposed roadway geometry, worst-case meteorological parameters, anticipated traffic volumes, and receptor positions. The user must also define CO emission factors for each roadway link. CO emission factors should be generated with the California Air Resources Board's EMFAC7f model or CT-EMFAC[1], which was adapted from EMFAC7f by Caltrans to be easier to use. (Note that CT-EMFAC modeling requires a similar level of user-effort as CL4.)

CL4 is a graphical windows-based user interface, designed to ease data entry and Increase the on-line help capabilities of CALINE4.

CL4 carries a menu bar with the following choices, File, Edit, View, and Help. Menu choices switch views to the corresponding data-entry screens:

- Job Parameters
- Link Geometry
- Link Activity
- Run Conditions
- Receptor Conditions

Software description:

Job Parameters Screen

The Job Parameters Screen contains general information that identifies the job, defines general modeling parameters, and sets the units (feet or meters) that will be used to input data on the Link Geometry and Receptor Positions Screens.

File Name: *Display only, not editable.* Displays the name of the file where the current job is stored.

Job Title: *Optional.* Provides a space for the user to enter a brief job description, up to 40 characters in length.

Run Type: Different choices determine averaging times (for CO concentrations) and how the hourly average wind angle(s) will be determined. (Wind angle is the angle between the roadway link and the wind direction. CALINE4 calculates the angles based on data in the Link Geometry and Run Conditions Screens.) Most users should invoke the "worst-case wind angle" run type and apply a persistence factor of 0.6 to 0.7 in order to estimate an 8-hour average CO concentration.

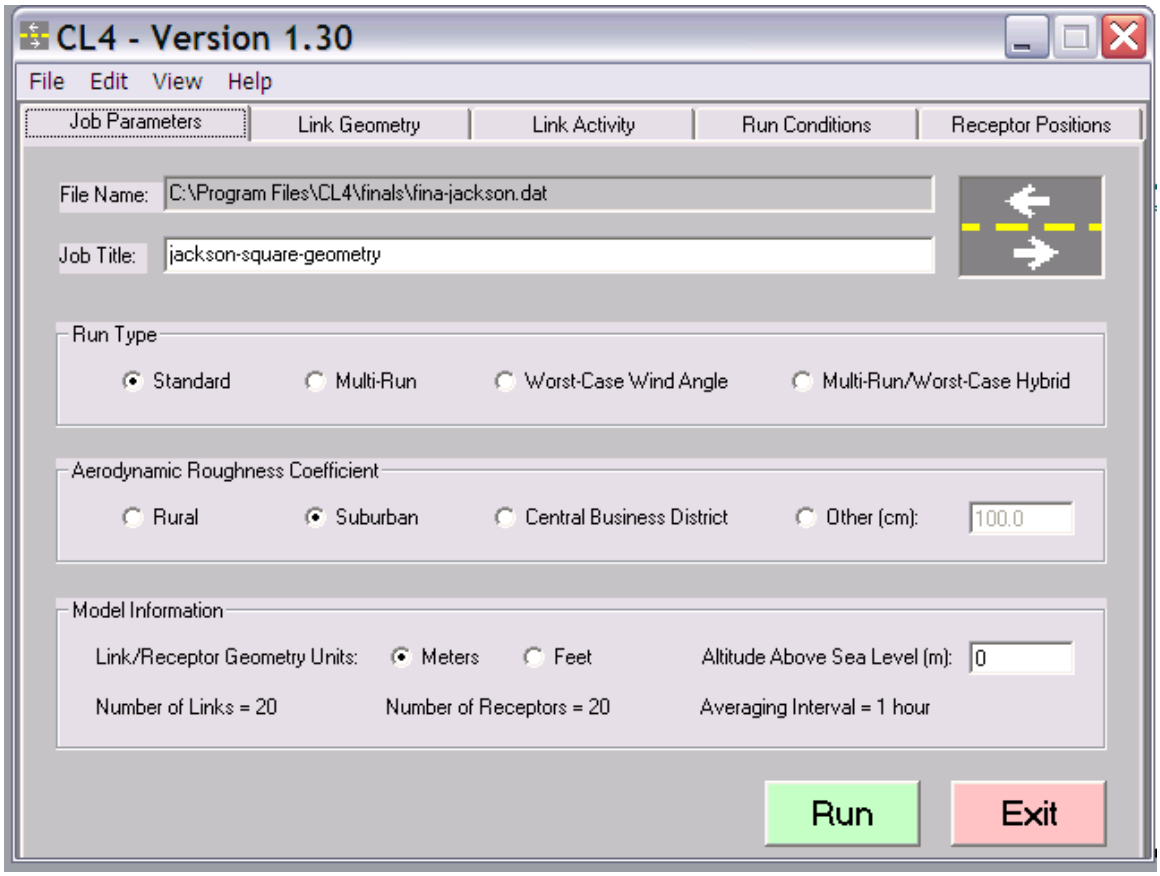


Figure 17 CALINE 4 model interface

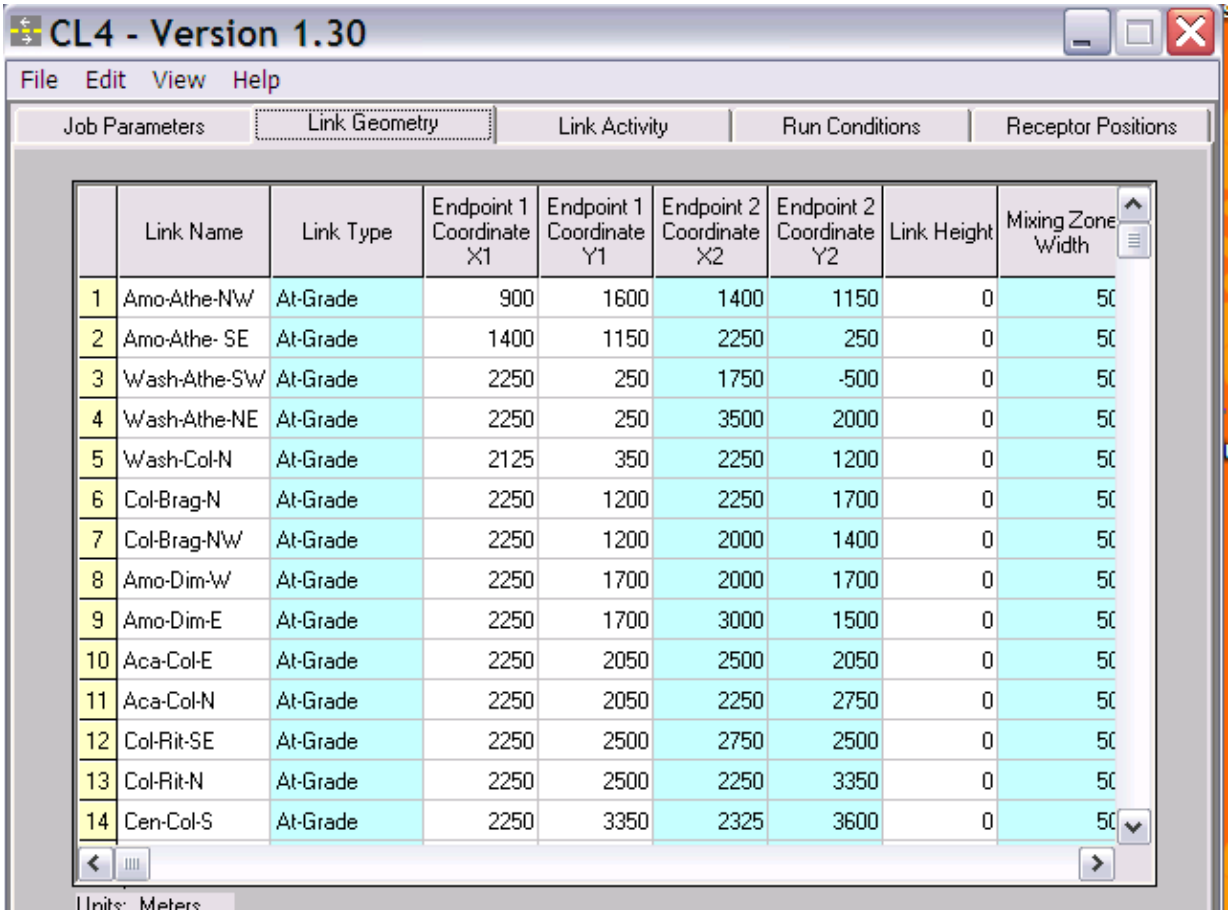
• Standard – Calculates 1-hour average CO concentrations at the receptors. The user must input a wind direction on the Run Conditions Screen.

• Multi-Run – Calculates 8-hour average CO concentrations at the receptors. The user must input wind angles for each hour.

• Worst-case wind angle – Calculates 1-hour average CO concentrations at the receptors. The model selects the wind angles that produce the highest CO concentrations at each of the receptors. This is the most appropriate choice for most users.

• Multi-Run/Worst-Case hybrid – Calculates 8-hour average CO concentrations at the receptors. The model selects the wind angles that produce the highest CO concentrations at each of the receptors.

Link/Receptor Geometry Units: Select whether meters or feet will be used to define the geometry of the roadway links and receptor positions. *This choice only affects the altitude input choice, and the data shown on the Link Geometry and Receptor Positions pages.* Meteorological inputs always require inputs with metric units. Emission factors are always defined in terms of grams per mile. (Note that CALINE4 reports data in metric units, with the exception of the Altitude[2].)



	Link Name	Link Type	Endpoint 1 Coordinate X1	Endpoint 1 Coordinate Y1	Endpoint 2 Coordinate X2	Endpoint 2 Coordinate Y2	Link Height	Mixing Zone Width
1	Amo-Athe-NW	At-Grade	900	1600	1400	1150	0	50
2	Amo-Athe- SE	At-Grade	1400	1150	2250	250	0	50
3	Wash-Athe-SW	At-Grade	2250	250	1750	-500	0	50
4	Wash-Athe-NE	At-Grade	2250	250	3500	2000	0	50
5	Wash-Col-N	At-Grade	2125	350	2250	1200	0	50
6	Col-Brag-N	At-Grade	2250	1200	2250	1700	0	50
7	Col-Brag-NW	At-Grade	2250	1200	2000	1400	0	50
8	Amo-Dim-W	At-Grade	2250	1700	2000	1700	0	50
9	Amo-Dim-E	At-Grade	2250	1700	3000	1500	0	50
10	Aca-Col-E	At-Grade	2250	2050	2500	2050	0	50
11	Aca-Col-N	At-Grade	2250	2050	2250	2750	0	50
12	Col-Rit-SE	At-Grade	2250	2500	2750	2500	0	50
13	Col-Rit-N	At-Grade	2250	2500	2250	3350	0	50
14	Cen-Col-S	At-Grade	2250	3350	2325	3600	0	50

Figure 18 CALINE 4 model interface for entering co-ordinates of various junctions

Aerodynamic Roughness Coefficient: *Also known as the Davenport-Wieringa oughnesslength.*
These choices determine the amount of local air turbulence that affects plume spreading. This subject is usually discussed in elementary meteorology books. CL4 offers the following 4 choices for aerodynamic roughness coefficient:

• Rural: Roughness Coefficient = 10 cm
• Suburban: Roughness Coefficient = 100 cm

• Central Business District: Roughness Coefficient = 400 cm

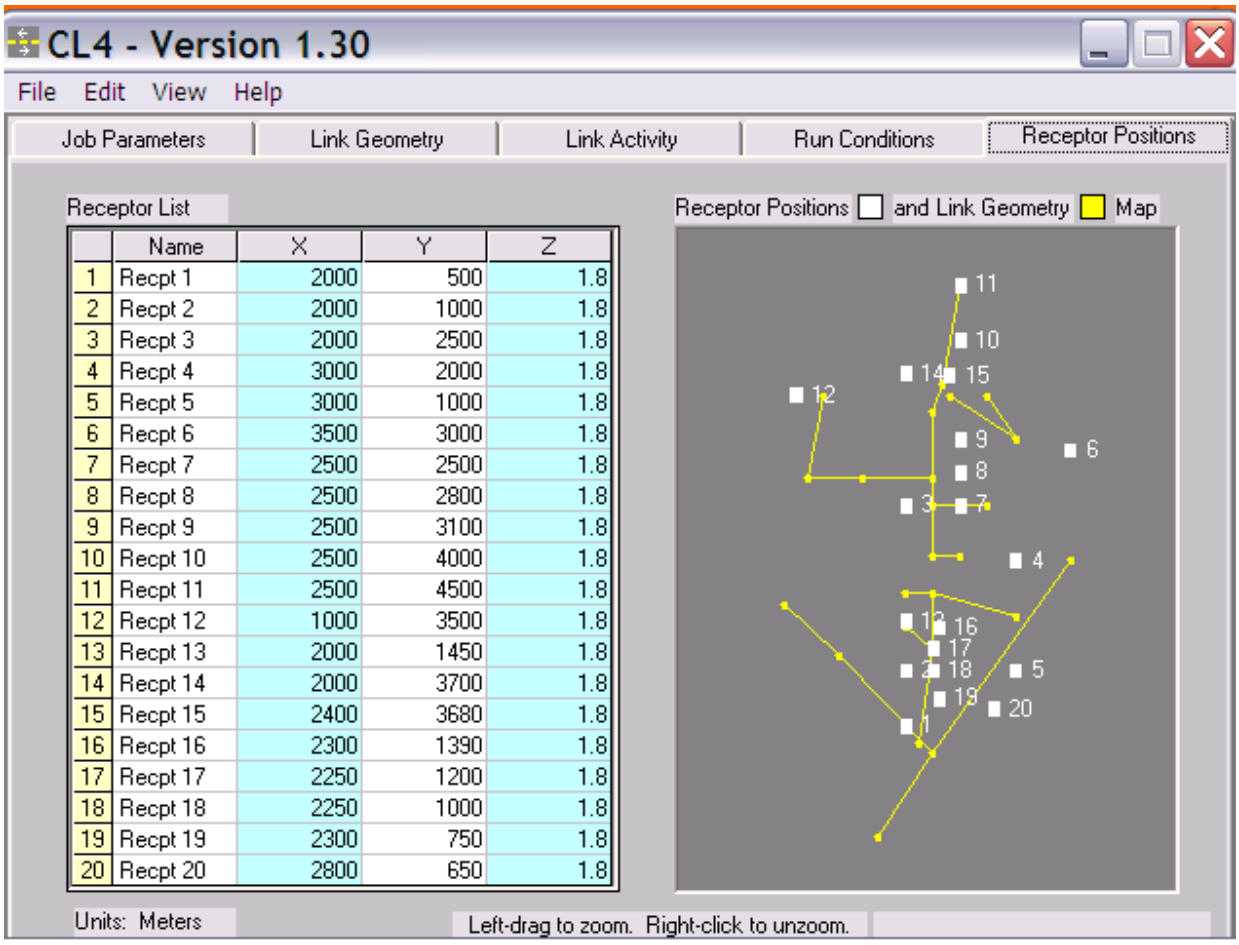
Table 3 Roughness co-effecients used in CALINE-4

Roughness Coefficient (cm)	Landscape Type
.002	Sea, paved areas, snow-covered flat plain, tide flat, smooth desert
.5	Beaches, pack ice, morass, snow-covered fields
3	Grass prairie or farm fields, tundra, airports, heather
10	Cultivated areas with low crops and occasional obstacles (such as bushes)
25	High crops, crops with varied height, scattered obstacles (such as trees or hedgerows), vineyards
50	Mixed far fields and forest clumps, orchards, scattered buildings
100	Regular coverage with large obstacles, open spaces roughly equal to obstacle heights, suburban houses, villages, mature forests
≥ 200	Centers of large towns or cities, irregular forests with scattered clearings.

Source: Stull, R.B. Meteorology Today for Scientists and Engineers. St. Paul, Minnesota: West Publishing Company. 1995.

Altitude above Sea Level: Define the altitude above mean sea level. This input is used to determine the rate of plume spreading. It does not affect the Link Geometry or Receptor Positions. Number of Links: The sum total number of links that the user has defined on the Link Geometry Page.

Number of Receptors: The sum total number of receptors that the user has defined on the Receptor Positions page. Averaging Interval: Indicates whether the user has opted to calculate 1-hour or 8-hour average CO concentrations at the receptors.



	Name	X	Y	Z
1	Recpt 1	2000	500	1.8
2	Recpt 2	2000	1000	1.8
3	Recpt 3	2000	2500	1.8
4	Recpt 4	3000	2000	1.8
5	Recpt 5	3000	1000	1.8
6	Recpt 6	3500	3000	1.8
7	Recpt 7	2500	2500	1.8
8	Recpt 8	2500	2800	1.8
9	Recpt 9	2500	3100	1.8
10	Recpt 10	2500	4000	1.8
11	Recpt 11	2500	4500	1.8
12	Recpt 12	1000	3500	1.8
13	Recpt 13	2000	1450	1.8
14	Recpt 14	2000	3700	1.8
15	Recpt 15	2400	3680	1.8
16	Recpt 16	2300	1390	1.8
17	Recpt 17	2250	1200	1.8
18	Recpt 18	2250	1000	1.8
19	Recpt 19	2300	750	1.8
20	Recpt 20	2800	650	1.8

Figure 19 Building the road network using CALINE4

The receptor points chosen varied - along the roads and away from the roads on various building spots. But there were a total of 20 points chosen, given the limitation of the model itself. However the Model was run for different scenarios and results plotted.

4.2 Model Scenarios and results:

Scenario 1

- The data was input as it was recorded in the field for the Jackson square area road network. No buildings heights were given and the place was assumed as a flat terrain.
- The results were plotted using the software - Grapher.
- The highest value of CO concentration as calculated by the model was 4.5 ppm
- A 20 % correction was applied, making it 5.4 ppm, which is lesser than the NAAQS optimum one hour average value of 35 ppm.

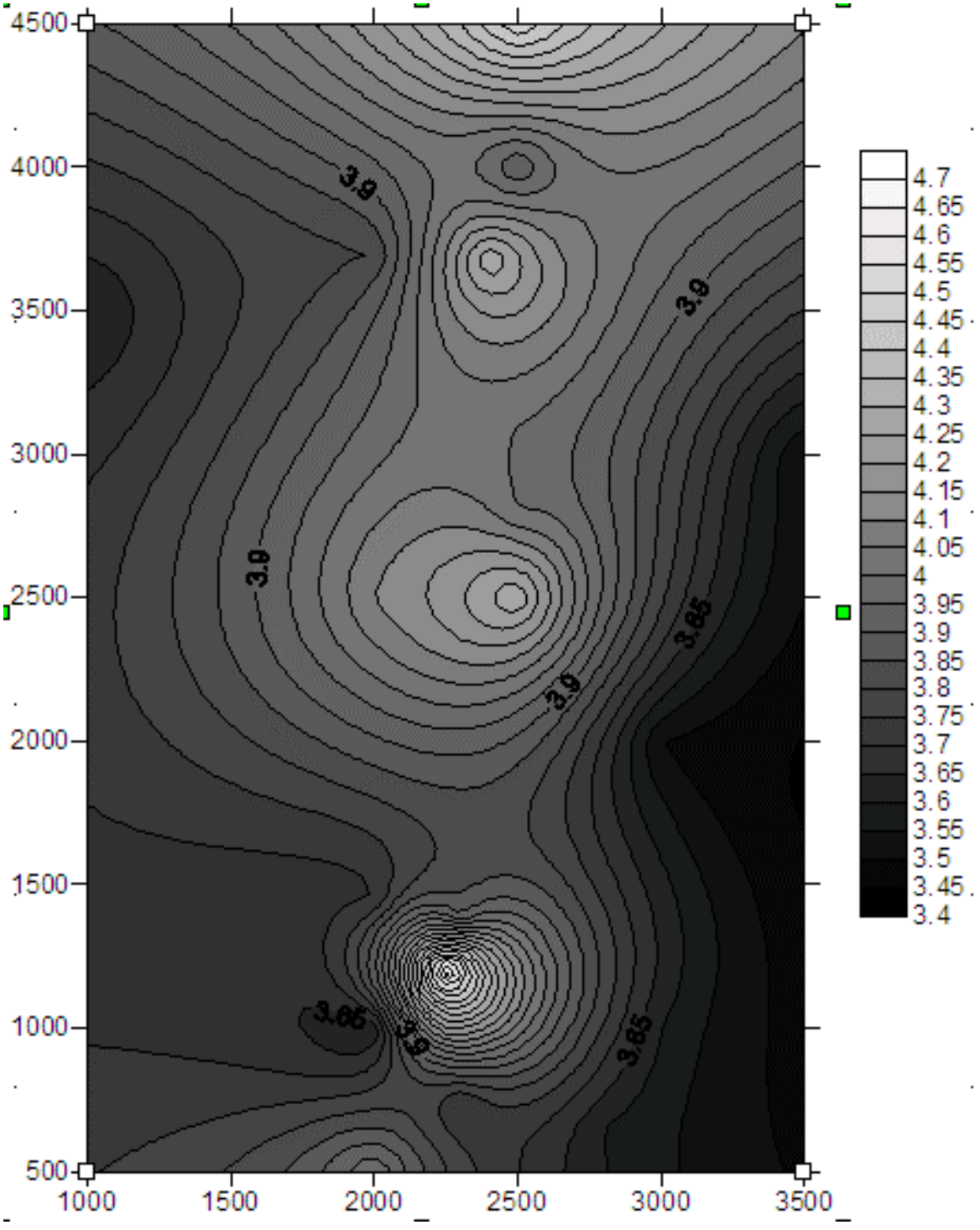


Figure 20 Isopleths showing CO pollution for scenario 1 (without 20% correction)

Scenario 2

- Here, the model incorporates a canyon effect by adding building heights, wherever possible. The results were plotted using Grapher - the software.
- The value of CO increases compared to scenario 1 - the highest CO value, plus correction of 20% gives a value 8.0 ppm.
- This value in reality could be much more, as the model poses several limitations on the position and number of buildings that can be simulated.
- The relative shifting in eye of the isopleths is because of the canyon effect.

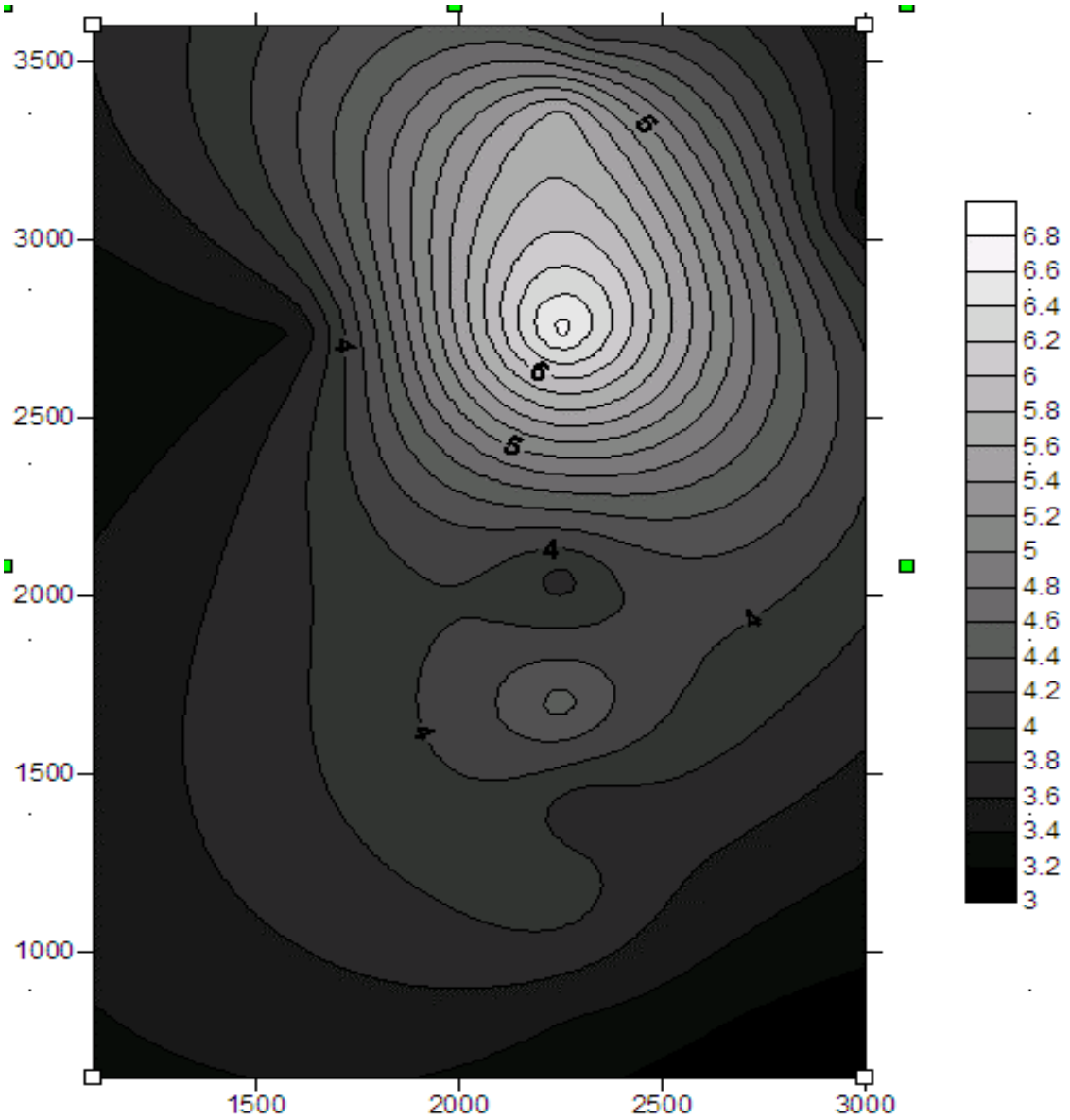


Figure 21 Isopleths showing CO pollution for scenario 2 (without 20% correction)

Scenario 3

- In here it was assumed that the traffic count is tripled
- The value of CO increases substantially - the highest recorded CO value, plus correction of 20% presenting a value of 14.6 ppm.
- This of course is without the building heights and the values could be much higher, if incorporated.

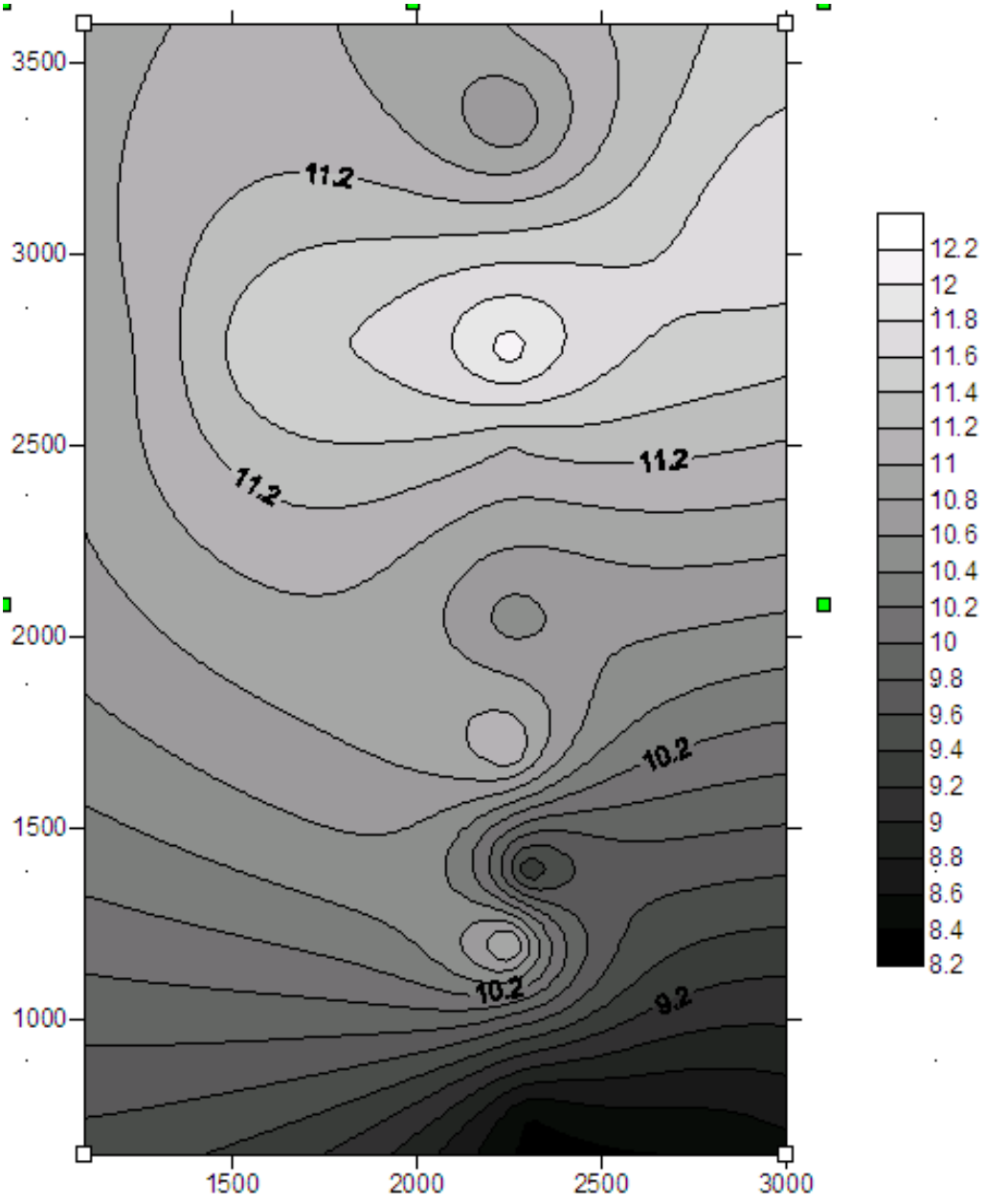


Figure 22 Isopleths showing CO pollution for scenario 3 (without 20% correction)

5 Results- Conclusions and Research Directions

1. Traffic related pollution at times was rather low and did not exceed NAAQS for the time period measured.
2. This does not preclude possibility of higher levels with high traffic loads, slower transit conditions with adverse weather (lower dispersion)
3. Ultrafine particles reflect traffic related emission, in particular diesel truck and bus traffic.
4. PAH also reflects traffic related emission in particular diesel truck and bus traffic.
5. Modeling is useful under open with ventilated configurations. More limited under complex urban infrastructure- e.g. buildings.

6 Appendix

6.1 Significance of Vehicular Air Pollution:

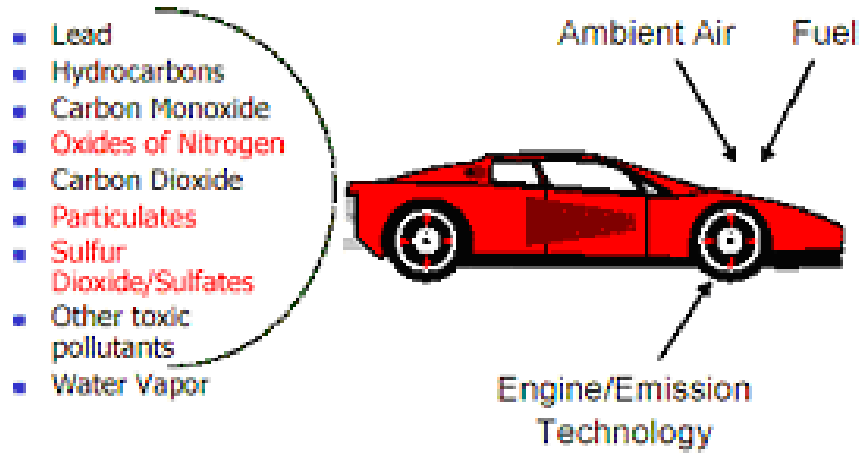


Figure 23 Combustion Emissions

Vehicle emissions are the main source of air pollution in the United States. The number of vehicles on the road and the amount of air pollution are growing every year. Despite significant progress in the development of cleaner gasoline- and diesel-burning vehicles over the last 30 years, the impacts of expanded vehicle use in the US have eclipsed environmental gains. Every three seconds, another new car is sold. Americans account for less than 5% of the world's population, but they drive more than 32% of its vehicles. The average American drove nearly twice as far by auto in l995 than in l970.

Emissions from this expanding population of gasoline- and diesel-fueled vehicles cannot be assimilated by the environment and are a growing threat to public health. Exhaust from the nearly 217 million vehicles used in the US is the single largest source of air pollution in the country. Vehicles account for more than half the emissions of four out of six "criteria pollutants" targeted by the EPA and regulated under the national Clean Air Act. As of 1998, on - and off-road vehicles generated:

- 79% of carbon monoxide emissions in the US.
- 30% of smog-forming pollutants (including nitrogen oxides and hydrocarbons)
- 21% of all 2.5-micron particulates from non-dust sources.
- 51% of the 33 most hazardous air pollutants.

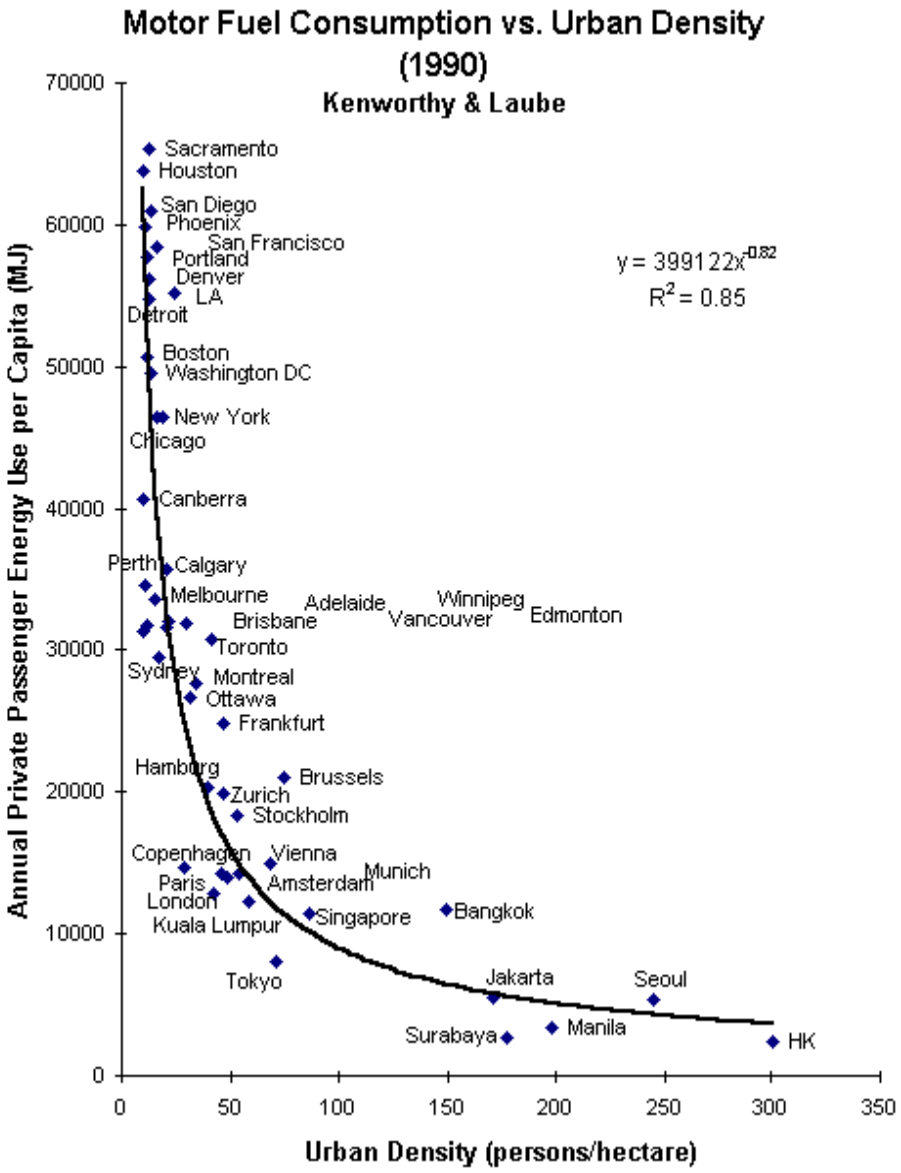


Figure 24 Motor Fuel Consumption (VS) Urban Density [4]

Largely because of vehicle emissions, 121 air quality districts in the US now violate the 1970 Clean Air Act's National Ambient Air Quality Standards - 18 years after the 1982 deadline for compliance. Mainly densely populated cities, these districts are home to almost 40% of US residents - some 102 million people. Vehicle emissions are the source of 60% to 90% of all urban air pollution.[5]

In most communities the amount of developed land is growing faster than the population. This pattern of growth forces us to be overly dependent on automobiles, increasing the pollution and damage they cause. It also destroys open spaces and pollutes extensively.

[4] Kenworthy and Laube ,1990
[5] http://www.informinc.org/fact_needsus.php

At the same time it contributes to a range of serious social problems, particularly for urban populations. In response to these trends, citizens, public interest groups and all levels of government have begun to develop smart-growth solutions to revitalize our cities, promote more compact and transit-oriented development, and conserve our limited, finite resources.

Table 4 Car population[6]

Country	Number of cars (in thousands)	Per capita GDP	Number of vehicles per 1,000 people
US	132,4321	35,600	740
Japan	62,4381	26,100	640
Germany	42,8401	25,900	570
Italy	32,4531	25,100	N A
France	28,0601	24,400	520
UK	25,0291	24,500	410
Spain	17,4491	20,100	NA
Canada	14,9523	27,700	NA
Brazil	13,8273	7,400	190
Russia	13,6393	8,300	NA
Australia	9,9814	24,000	610
Korea	7,9083	4,000	32
China	5,1063	4,300	21
India	4,5653	2,500	30

Air pollution is the contamination of air by the discharge of harmful substances. Air pollution can cause health problems including burning eyes and nose, itchy irritated throat, and breathing problems. Some chemicals found in polluted air can cause cancer, birth defects, brain and nerve damage, and long-term injury to the lungs and breathing passages in certain circumstances. Above certain concentrations and durations, certain air pollutants are extremely dangerous and can cause severe injury or death.

Air pollution can also damage the environment and property. Trees, lakes, and animals have been harmed by air pollution. Air pollution has thinned the protective ozone layer

[6] Source: 1. Anon, Transport Statistics of Great Britain, 2002; 2. Anon, CIA World Factbook, 2002; 3. Anon, Automotive Industry 2001 and beyond, 2001; 4. Anon, Asia Pacific Economic Cooperation, 2003; 5. E A Vasconcellos, Urban Transport, Environment and Equity — the Case for Developing Countries, Earthscam Publications Ltd, London, 2001

above the Earth. It can damage buildings, monuments, statues, and other structures. It could also result in haze, which reduces visibility in national parks and elsewhere, and could sometimes interfere with aviation.

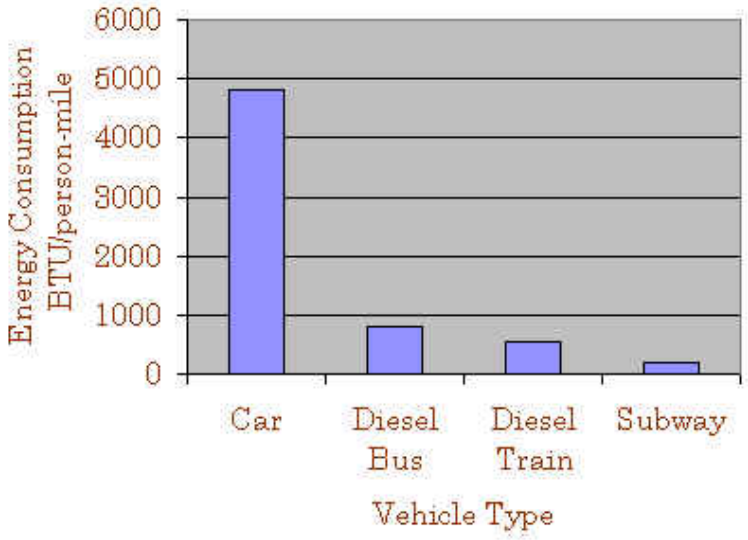


Figure 25 Vehicle Type Vs Energy Consumption[7]

Today, the world is alarmed at the rate at which the automobile use has increased over the last decade seeing the effects of that in our public health. Automobiles have intrinsically grown into our urban system and our new cities are developed with the automobile, and specifically the car as a fundamental necessity. Today as we struggle with developmental issues for the future and the problems from the developments of the last decade, we need to be able to apply those valuable lessons we learned out of developing our cities they way we did. The issue that we are mainly concerned here in the issue of air pollution, specifically that which is a result of the mobile sources - namely automobiles.

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

[7] Source: Environment Canada

Table 5 National Ambient Air Quality Standards (NAAQS)[8]

POLLUTANT	STANDARD VALUE *		STANDARD TYPE
Carbon Monoxide (CO)			
8-hour Average	**9 ppm**	**(10 mg/m3)**	**Primary**
1-hour Average	**35 ppm**	**(40 mg/m3)**	**Primary**
Nitrogen Dioxide (NO2)			
Annual Arithmetic Mean	**0.053 ppm**	**(100 µg/m3)**	**Primary & Secondary**
Ozone (O3)			
1-hour Average	**0.12 ppm**	**(235 µg/m3)**	**Primary & Secondary**
8-hour Average	**0.08 ppm**	**(157 µg/m3)**	**Primary & Secondary**
Lead (Pb)			
Quarterly Average	**1.5 µg/m3**		**Primary & Secondary**
Particulate (PM 10) Particles with diameters of 10 micrometers or less			
Annual Arithmetic Mean	**50 µg/m3**		**Primary & Secondary**
24-hour Average	**150 µg/m3**		**Primary & Secondary**
Particulate (PM 2.5) Particles with diameters of 2.5 micrometers or less			
Annual Arithmetic Mean	**15 µg/m3**		**Primary & Secondary**
24-hour Average	**65 µg/m3**		**Primary & Secondary**
Sulfur Dioxide (SO2)			
Annual Arithmetic Mean	**0.030 ppm**	**(80 µg/m3)**	**Primary**
24-hour Average	**0.14 ppm**	**(365 µg/m3)**	**Primary**
3-hour Average	**0.50 ppm**	**(1300 µg/m3)**	**Secondary**

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are listed above. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m3), and micrograms per cubic meter of air (µg/m3).

Over 50% of the United States population lives in areas which exceed air quality standards for ozone, nitrogen dioxide, sulphur dioxide, and particulates (as monitored by the U.S. Environmental Protection Agency - EPA).

6.2 Global Consequences

Vehicle emissions are major contributors to ozone depletion and climate change.

- The US is the number one generator of carbon dioxide emissions in the world. We produce 25% of the world's total, of which 30% comes from vehicle emissions.

[8] EPA

- Despite urgent calls for global reductions in carbon dioxide emissions made at a series of international conferences since 1992, US emissions continue to rise - increasing 11% from 1990 to 1998.

Oil dependence is an economic and political issue that increasingly threatens national and global security.

- Reliance on oil from politically volatile regions is already having broad national and international security implications. Operation Desert Storm, undertaken in part if not primarily to protect US oil supplies in the Middle East, involved 670,000 Americans and a cost of $60 billion. America's oil addiction continues to influence our relations with oil-producing countries.

- US reliance on foreign oil has soared since 1992 - the year we enacted the Energy Policy Act designed to reduce that dependence. In l992, net petroleum imports for all uses accounted for 40.7% of total consumption; six years later, imports had increased to 51.6%. Assuming petroleum for transportation is imported at the same rate as petroleum for other uses, imports of transportation fuels increased 38% in that six-year period. As more and more fossil-fueled vehicles hit the road worldwide, increasing competition for depleting oil supplies will threaten our continued access to foreign sources.

- Many leaders in the developing world are eager to industrialize and to base their transportation systems on the fossil-fueled internal combustion vehicle. Were China (where only one out of 652 people owns a car, out of a population of 1.2 billion), India, Pakistan, and Indonesia to increase their automobile use to anywhere near US levels, competition for the world's oil supplies would threaten global economic and political stability. And the resulting pollution would have an exponential and perhaps irrevocable impact on the environment for future generations.

As our rate of oil consumption increases, the threat of resource depletion grows.

- Fossil fuels, formed over the course of 65 million years, are now being burned 100,000 times faster than the rate at which they can be regenerated by natural processes.

- While some economists assert that affordable oil will always be available, it is the most limited and rapidly depleting fossil fuel on the planet. More than one-third of the world's oil production, and 67% of all oil consumed in the US, is used for transportation.

- The conventional automobile is only about 12% efficient in delivering the energy released from combustion to the wheels. It is one of the most wasteful, as well as one of the largest, consumers of the world's most limited fossil fuel.

- From l992 to l998, the US transportation sector's consumption of gasoline and diesel rose by 10.8% -- from 139 billion gallons to154 billion gallons. Every second, Americans travel more than 128,000 miles and burn over 150 barrels of

petroleum. At current rates of use, more oil will be burned in the next 20 years than has been burned throughout all of human history.

What is global climate change?

The short wave energy received from the sun is absorbed by the atmosphere, ocean, ice, land and living organisms, whereas the long wave radiation emitted by the warm surface of the earth gets partially absorbed by trace gases in the atmosphere called greenhouse gases (GHGs). The main natural greenhouse gases are water vapour (H2O), carbon dioxide (CO2) and methane (CH4). There is usually a balance between the energy absorbed from solar radiation and the deflected radiation from the earth and atmosphere. Increased levels of these GHGs in the atmosphere are responsible for the increase in the global temperature. Since 1975, average world temperature has increased by approximately 0.5°C and climate change could be due to accumulation of GHGs in the lower atmosphere. This climate change encompasses temperature changes on global, regional and local scales, and also changes in the rainfall, winds, and possibly ocean currents.

Table 8 Projected climate change scenario[9]

Year	Ground level ozone concentration parts per million (ppm)	Carbon dioxide concentration (ppm)	Global temperature change (°C)	Global sea-level rise (cm)
1990	**-**	**354**	**0**	**0**
2000	**40**	**367**	**0.2**	**2**
2050	**-60**	**463-623**	**0.8-2.6**	**5-32**
2100	**>70**	**478-1099**	**1.4-5.8**	**9-88**

Climate change is bad news for global human health. And fossil fuels are the greatest culprits. Studies have shown that the atmospheric accumulation of gases stemming primarily from fossil fuel combustion could increase the global surface temperature by 1.5-4°C. Global warming will expand the range and incidence of vectorborne diseases, increase the incidence of pathogens in freshwater and exacerbate heat-stress related mortality. This might be accompanied by the ill-effects associated with ozone depletion, caused by emissions of chlorofluorocarbon (CFC) gases. Effects would include increased skin cancers and cataracts, as well as possible impacts on the human immune system that may weaken resistance to some infectious diseases.

Projections show that by the year 2100, the global average surface temperature will rise between 1.4°C to 5.8°C. The twentieth century has been witness to unprecedented economic activity — an almost twenty-fold rise over the previous decade — a major cause of climbing temperatures. In addition, there has also been a dramatic increase in the

[9] Source: IPCC- Third Assessment Report 2001, Climate change 2001 impacts, adaptation, and vulnerability, Contribution of working group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change, p 27.

world population that has now exceeded the six billion mark. This is accompanied by a marked depletion in the earth's natural resources, radically changing the global environment.1 By destroying forests, damming rivers, letting wetlands decay and disturbing climate patterns, human actions are undermining ecological safety nets. Climate change results in fluctuations in weather patterns, blurring of seasons, increase in sea-levels, melting of glaciers and depletion in ozone level. Climate change also results in a fall in agricultural productivity, increase in number of infectious diseases, instability in water supply and the dying out of many species of plants, animals and birds.

6.3 What Are the Major Air Pollutants?

Carbon Monoxide (CO)

CO is an odorless, colorless gas. After being inhaled, CO molecules can enter the bloodstream, where they inhibit the delivery of oxygen throughout the body. Low concentrations can cause dizziness, headaches, and fatigue; high concentrations can be fatal.

CO is produced by the incomplete burning of carbon-based fuels, including gasoline, oil, and wood. It is also produced from incomplete combustion of natural and synthetic products, such as cigarette smoke. It can build up in high concentrations in enclosed areas such as garages, poorly ventilated tunnels, and even along roadsides in heavy traffic.

Carbon Dioxide (CO_2)

CO_2 is the principal greenhouse gas emitted as a result of human activity (e.g., burning of coal, oil, and natural gas). CO_2 can cause burns, frostbite, and blindness if an area is exposed to it in solid or liquid form. If inhaled, it can be toxic in high concentrations, causing an increase in the breathing rate, unconsciousness, and death.

Hazardous Air Pollutants (HAPs)

HAPs are chemicals that cause serious health and environmental effects. Health effects include cancer, birth defects, nervous system problems, and death due to massive accidental releases, such as the disaster that occurred at a pesticide plant in Bhopal, India.

Hazardous air pollutants are released by sources such as chemical plants, dry cleaners, printing plants, and motor vehicles including cars, trucks, buses, planes.

Lead

Lead is a highly toxic metal that produces a range of adverse health effects particularly in young children. Lead can cause nervous system damage and digestive problems, and some lead-containing chemicals cause cancer. Lead can also harm wildlife.

Lead has been phased out of gasoline, which has considerably reduced the contamination of air by lead. However, lead can still be inhaled or ingested from other sources. The sources for lead include paint (for houses and cars), smelters, manufacture of lead

batteries, fishing lures, certain parts of bullets, some ceramic ware, miniblinds, water pipes, and a few hair dye products.

Ozone

Ozone is a gas that is a variety of oxygen. Oxygen consists of two oxygen atoms; ozone consists of three. Ozone in the upper atmosphere, where it occurs naturally in what is known as the ozone layer, shields the Earth from the sun's dangerous ultraviolet rays. However, at ground level where it is a pollutant with highly toxic effects, ozone damages human health, the environment, crops, and a wide range of natural and artificial materials. Ground-level ozone can irritate the respiratory tract, cause chest pain, persistent cough, an inability to take a deep breath, and an increased susceptibility to lung infection. Ozone can damage trees and plants and reduce visibility.

Table 9 levels of pollution from various sources[10]

Category	NOx	CO	VOC	SO2	PM10	PM2.5	NH3
Diesel Vehicles	H	M	M	M	M	H	L
Heavy Duty Gas Vehicles	H	M	H	L	L	L	L
Light Duty Gas Trucks	H	H	H	L	M	M	M
Light Duty Gas Vehicles and Motor Cycles	H	H	H	M	M	M	M

Note H-High, M-Medium L -Low designations indicate the level of source of category's emissions to the overall emissions of that pollutant (ie emissions from all sectors)

Ground-level ozone comes from the breakdown (oxidation) of volatile organic compounds found in solvents. It is also a product of reactions between chemicals that are produced by burning coal, gasoline, other fuels, and chemicals found in paints and hair sprays. Oxidation occurs readily during hot weather. Vehicles and industries are major sources of ground-level ozone.

Particulate Matter

[10] Table from Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations Issued By Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency

Particulate matter is any type of solid in the air in the form of smoke, dust, and vapors, which can remain suspended for extended periods. Aside from reducing visibility and soiling clothing, microscopic particles in the air can be breathed into lung tissue becoming lodged and causing increased respiratory disease and lung damage. Particulates are also the main source of haze, which reduces visibility.

Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, fossil fuels, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining, agricultural burning, and operation of fireplaces and woodstoves.

- PM10 (generally defined as all particles equal to and less than 10 microns in aerodynamic diameter; particles larger than this are not generally deposited in the lung);
- PM2.5, also known as fine fraction particles (generally defined as those particles with an aerodynamic diameter of 2.5 microns or less) * PM10-2.5, also known as coarse fraction particles (generally defined as those particles with an aerodynamic diameter greater than 2.5 microns, but equal to or less than a nominal 10 microns); and * Ultrafine particles generally defined as those less than 0.1 microns.

Both on-road and non-road mobile sources emit fine particulate matter. Diesel-powered vehicles and engines contribute more than half the mobile source particulate emissions.

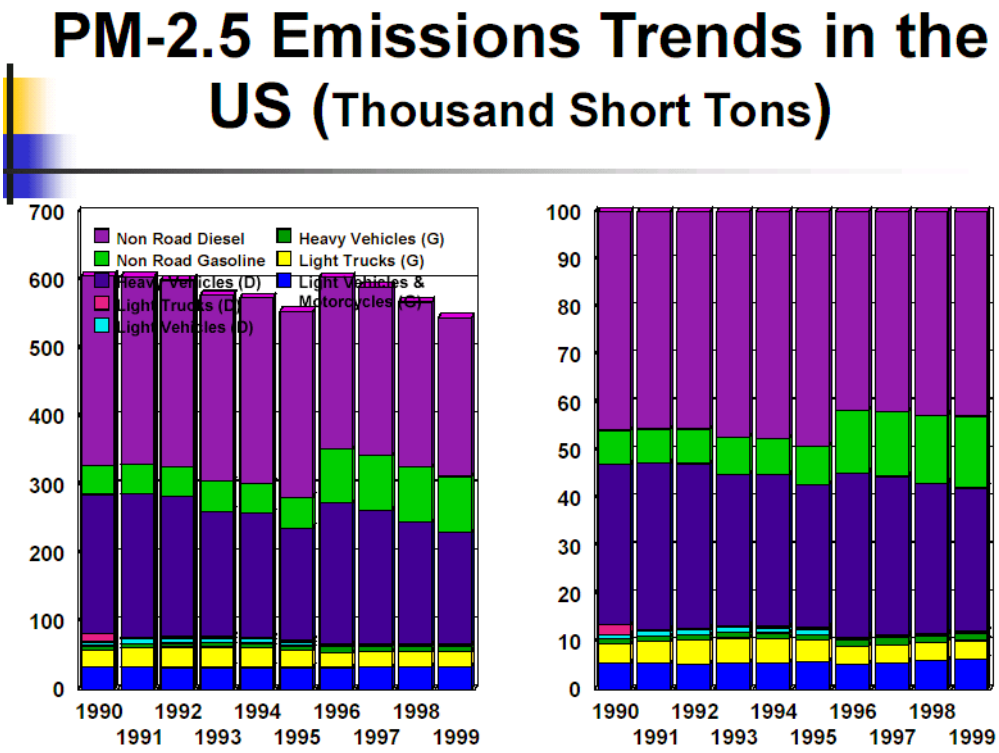


Figure 26 PM2.5 Trends in the US[11]

Health and Environmental Effects of Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (larger than 2.5 micrometers) come from a variety of sources including windblown dust and grinding operations. Fine particles (less than 2.5 micrometers) often come from fuel combustion, power plants, and diesel buses and trucks.

- These fine particles are so small that several thousand of them could fit on the period at the end of this sentence.
- They are of health concern because they easily reach the deepest recesses of the lungs.

Batteries of scientific studies have linked particulate matter, especially fine particles (alone or in combination with other air pollutants), with a series of significant health problems, including:

[11] www.4cleanair.org

- Premature death;
- Respiratory related hospital admissions and emergency room visits;
- Aggravated asthma;
- Acute respiratory symptoms, including aggravated coughing and difficult or painful breathing;
- Chronic bronchitis;
- Decreased lung function that can be experienced as shortness of breath; and
- Work and school absences.

Who is Most at Risk from Exposure to Fine Particles?

The Elderly:

- Studies estimate that tens of thousands of elderly people die prematurely each year from exposure to ambient levels of fine particles.
- Studies also indicate that exposure to fine particles is associated with thousands of hospital admissions each year. Many of these hospital admissions are elderly people suffering from lung or heart disease.

Individuals with Preexisting Heart or Lung Disease:

- Breathing fine particles can also adversely affect individuals with heart disease, emphysema, and chronic bronchitis by causing additional medical treatment. Inhaling fine particulate matter has been attributed to increased hospital admissions, emergency room visits and premature death among sensitive populations.

Children:

- The average adult breathes 13,000 liters of air per day; children breathe 50 percent more air per pound of body weight than adults.
- Because children's respiratory systems are still developing, they are more susceptible to environmental threats than healthy adults.
- Exposure to fine particles is associated with increased frequency of childhood illnesses, which are of concern both in the short run, and for the future development of healthy lungs in the affected children.
- Fine particles are also associated with increased respiratory symptoms and reduced lung function in children, including symptoms such as aggravated coughing and difficulty or pain in breathing. These can result in school absences and limitations in normal childhood activities.

Asthmatics and Asthmatic Children:

- More and more people are being diagnosed with asthma every year. Fourteen Americans die every day from asthma, a rate three times greater than just 20 years ago. Children make up 25 percent of the population, but comprise 40 percent of all asthma cases.

- Breathing fine particles, alone or in combination with other pollutants, can aggravate asthma, causing greater use of medication and resulting in more medical treatment and hospital visits.

Hazardous Air Pollutants (HAP)

HAPs are a broad category of pollutants that include arsenic, mercury, and Persistent Organic Pollutants (POPs) such as PCBs and DDT. Some of the health risks associated with HAPs are cancer and growth retardation. Some research has suggested that POPs can be transferred through breast milk and interfere with development or reproduction. Scientific research suggests that POPs may mimic human hormones, interfering with reproduction and other developmental processes.

PCBs are notorious for travelling large distances over the earth, moving from warmer climates, such as Brazil, to cooler climates, such as the Canadian Artic.

6.4 Public Health

Asthma Facts

There is a virtual asthma epidemic in the US, and diesel trucks and buses are a primary culprit.

- Asthma rates are rising. Research conducted by the Pew Environmental Health Commission found that, between 1980 and l994, asthma rates rose by 75% overall and by 160% among children under age four. The commission predicted that the number of asthma victims would more than double within 20 years, from 14 million in 2000 to 29 million by 2020. Not all the reasons for this epidemic are known, but it is clear that the very fine particles in diesel exhaust and the smog created by diesel emissions irritate the lungs and are a major trigger of asthma attacks.

- Asthma-related hospital emergency room visits are on the rise. In l995, asthma accounted for 1.8 million visits to hospital emergency rooms.

- Asthma is costing our country more and more every year. In 2000, the costs of asthma-related medical care were more than $11 billion.

Vehicle emissions are particularly damaging to the health of children and vulnerable urban populations.

- Asthma-related problems now account for one-third of all pediatric emergency room visits. According to the Centers for Disease Control and Prevention, acute asthma attacks have increased 100% among children in the last 15 years, and asthma is today the most common reason why students miss school. From l980 to l993, rates of asthma-related deaths among children rose 78%.

- Minority and economically underprivileged communities suffer disproportionately. According to the President's Task Force on Environmental Health Risks and Safety Risks to Children, the death rate of African-American children from asthma is over four times that of white children. A ground-breaking study conducted at the Mount Sinai School of Medicine found that asthma hospitalization rates for children from poor, minority neighborhoods in New York City were up to 21 times higher than those for children from affluent neighborhoods. The study concluded that diesel exhaust was a major contributing factor in poor communities, where bus and truck traffic is heavy and the majority of diesel-fueled bus depots are located.

Cancer Facts

Diesel emissions are an increasingly recognized cancer threat.

- According to the US EPA and California's Air Resources Board, diesel exhaust contains more than 40 toxic substances, including known human carcinogens, probable human carcinogens, and reproductive toxins.

- In a 1999 report, the South Coast Air Quality Management District in Los Angeles concluded not only that mobile pollution sources are responsible for about 90% of the total cancer risk in the area, but that diesel particulates, in particular, account for 70% of that risk.

- In a 2000 report, the National Toxicology Program (overseen by the US Department of Health and Human Services) added diesel exhaust particulates to its list of substances "reasonably anticipated" to be human carcinogens. This classification was based on findings of elevated lung cancer rates in occupational groups exposed to diesel exhaust and was corroborated by animal studies.

- 600 children die each year from asthma, and 150,000 are hospitalized.

- From 1980 to 1993, the death rate for childhood asthma in the United States increased by 78%.

- Nearly 5 million American children have asthma.

Each year in the United States, an estimated 8,000 children up to age 14 are diagnosed with cancer. Leukemia and brain tumors are the most common malignancies in childhood. Cancer is the second most common cause of death after injuries in American children.

The death rate from childhood cancer has declined dramatically in recent years in the United States-thanks to the advent of vastly improved approaches to cancer treatment. But the occurrence of new cases of cancer among children- the incidence rate-has been steadily increasing. This upward trend has been most strongly evident for acute lymphoblastic leukemia and brain cancer, the two most common forms of cancer among American children.

These increases in the incidence of childhood cancer have not been explained. However, they are too rapid to reflect genetic changes. Nor is better diagnostic detection a likely explanation. The strong probability exists that environmental factors are playing a role. It is essential that research to identify the specific environmental causes of childhood cancer be undertaken and that the pace of this research be accelerated.

- 8,000 American children are diagnosed each year with cancer.
- Incidence rates for childhood cancer have been increasing steadily for two decades:

  - Acute lymphoblastic leukemia is up 10.7%.
  - Brain cancer (glioma) is up 30%.
  - Osteogenic sarcoma (a form of bone cancer) is up 50%.
  - Testicular cancer (in young men) is up 60%.

Although death rates from childhood cancer are down and survival rates are much higher due to spectacular advances in treatment, the increasing incidence of childhood cancer threatens to undermine those achievements.

Lead Poisoning Facts

Blood lead levels among preschool children in the United States have been reduced by 94% since 1976. The principal cause of this decline is the removal of lead from gasoline.

Despite that decline, 940,000 young children are at an increased likelihood of loss of intelligence, shortened attention span, failure in school, and delinquent and criminal behavior. Lead poisoning in childhood is also suspected to increase the risk of drug abuse later in life.

- 940,000 American preschool children have elevated blood lead levels.
- Lead paint in older housing is the principal source of lead exposure today. Fifty million housing units in the United States contain lead.
- Drinking water is a widespread source of lead exposure.
- Damage to the brains of young children from lead exposure causes lifelong dysfunction.

7 References:

1. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations

2. Caltrans (1989) *CALINE4 – A Dispersion Model for Predicting Air Pollutant ConcentrationsNear Roadways*, Final Report prepared by the Caltrans Division of New Technology and Research (Report No. FHWA/CA/TL-84/15).

3. 27 July 1999, Air Quality Standard For Polycyclic Aromatic Hydrocarbons recommended. http://www.gnn.gov.uk/gnn/national.nsf/0/88336551FC020BCF802567BB003CBA44?opendocument

4. http://www.epa.gov
5. http://www.environmentaldefense.org

Jackson Square Transit-Oriented Improvement Recommendations

Approved by full JCG – August 7, 2003

I. Overview of Transportation in Jackson Square

The Jackson Square Coordinating Group (JCG) is producing planning and development guidelines for an area within a 1/4 mile radius of the Jackson Square MBTA Station. This section provides an overview of transportation issues in this part of the City of Boston.

Jackson Square Coordinating Group Consensus on Transportation

The Jackson Square Coordinating Group (JCG) was formed in June 1999, building on earlier planning work. A series of community meetings and charrettes were held and attended by hundreds of people. A final report, Putting the Pieces Together, was issued in July 2001. That report summarizes the final charrette of February, 2001, and contains the following statements:

"In the spring of 2000, over 800 residents including youth from Roxbury and Jamaica Plain gathered at more than 80 community meetings to discuss Jackson Square… A clear majority … expressed … a preference for development that does not increase car traffic, but instead encourages alternatives such as walking and using public transportation." (p.2-1)

"The current traffic patterns present a barrier between neighborhoods and split the community in half. Charrette participants clearly communicated a strong desire to reduce the traffic load on Columbus Ave., thereby helping to re-knit the urban fabric." (p.3-5)

"The scale of Columbus Avenue generates a physical barrier that can be addressed by new development of the area. Many residents see the potential for creating connections by reducing traffic and creating a pedestrian environment in an area that is currently dominated by vehicular traffic. Many voiced concerns regarding the public hazards that excessive traffic brings to residential communities. These potential hazards include greater danger of asthma attacks due to increased levels of pollution, the cost and injuries resulting from car accidents, and threat of an increase in pedestrian deaths."

The report also highlighted these "key points" with regard to transportation:

- Reduce width of Columbus Ave, by having one lane for parking and slow traffic
- Change texture of street to decrease speed of cars at crossings; add speed signs
- Make Columbus easier to cross in several locations
- Add Green strips along sides of Columbus Ave.
- Develop a traffic management plan
- Change timing on lights for pedestrians to cross more easily.
- Add a bike and pedestrian path along the Eastern side of the train tracks, from Centre St. to Atherton St.
- Maintain pedestrian access from the dead end of Amory St. up to Centre St.

Role of Public Actors

The Boston Redevelopment Authority (BRA) is the City's planning and development agency. The BRA has an agreement with the Massachusetts Department of Capital Asset Management (DCAM) to administer the RFP/RFQ process for several vacant parcels in the area owned by the state. The BRA is coordinating the planning process. The Boston Public Health Commission (BPHC) is responsible for monitoring and improving public health of city residents. In particular, the BPHC is conducting a study of air quality in the planning area, with a focus on pollutants emitted from transportation sources. The Boston Transportation Department (BTD) is responsible for installing and maintaining road markings, traffic signs, bike racks, and parking meters. The BTD planning staff helps produce neighborhood transportation plans and reviews development projects to insure that transportation impacts are minimized and mitigated. The Boston Department of Public Works is responsible for constructing and maintaining roadways, medians, and sidewalks, and other public infrastructure including public footways and bridges. The MBTA operates rail rapid transit service on its Orange Line serving Jackson Square. Several MBTA bus routes also serve the neighborhood, as described below.

Role of Developers

Any proposed development presented to the JCG must reflect the need for transit-oriented development and be sensitive to the existing high rate of respiratory disease in the area. These elements are not add-ons, but should be incorporated into the initial conception of projects and in the design of buildings and streetscapes. The JCG seeks original and inventive solutions to create a healthy, vibrant, affordable, and transit-oriented community. Some of the solutions include: minimizing car use, car dependency, and asphalt, reducing the impact of development on air quality, increasing the use of public transit, walking, and bicycling, and addressing the needs of families with children, elders, and people with asthma. The developer is expected to bring creative solutions to the Jackson Square community.

Existing Modes of Transportation

Transportation data are available for Jamaica Plain (including Mission Hill) and for Roxbury. These data are presented in Table 1. About one-third of all trips, both in Roxbury and Jamaica Plain, start and end within the same neighborhood. About two-thirds of these neighborhood trips are walk trips. Few of the other types of trips are walk trips. Transit has the largest share of trips to the downtown area ("core area") and a significant share to other trips outside the neighborhood but within Boston ("rest of Boston").

Table 1. **Distribution of Trips and Mode Shares**

	Roxbury					Jamaica Plain				
		Mode Share					Mode Share			
Trip Type	% of trips	Auto	Transit	Walk	Total	% of trips	Auto	Transit	Walk	Total
Within Neighborhood	34%	30%	7%	63%	100%	30%	30%	3%	68%	101%
To Core Area	8%	43%	57%	0%	100%	8%	37%	63%	0%	100%
To Rest of Boston	33%	69%	23%	8%	100%	32%	63%	29%	8%	100%
To Inner Communities	17%	85%	15%	0%	100%	19%	81%	18%	1%	100%
To Outer Communities	8%	95%	5%	0%	100%	11%	92%	8%	0%	100%
TOTAL	100%					100%				

Source: Central Transportation Planning Staff (CTPS) data as reported in *Boston Transportation Fact Book and Neighborhood Profiles* (Boston Transportation Department 2002). The "core area" includes downtown and Back Bay. "Rest of Boston" is the city limits not including the previous two categories (the neighborhood itself and the core area).

A separate study examined census tracts that roughly cover the 1/4 mile planning area. These data show that of the 14, 888 workers over the age of 16 who live in the area, 50% use some means other than automobile to get to work. A full 37% took public transportation. Thirteen percent use another means, including 2.2% who bicycled and 7% who walked. Of the working adults in these tracts, 71% work in Boston.

Existing Regional Roadway System

Columbus Avenue is the major arterial passing through Jackson Square. It is designated as part of State Route 28 and is part of the National Highway System. Route 28 enters Boston on Blue Hill Avenue and turns northwest on Seaver Street which becomes Columbus Avenue at Walnut Street at the edge of Franklin Park. Columbus Avenue continues through the Jackson Square planning area and then becomes Tremont Street at Roxbury Crossing. It provides a connection to Interstate 93 via Melnea Cass Boulevard at Ruggles Street. Traffic volumes on Columbus are about 31,000 vehicles per day (2002 counts) on Columbus Avenue near Dimock Street rising to 41,000 vehicles per day (1996 counts) at Roxbury Crossing.

Centre Street connects the Jamaicaway and much of Jamaica Plain to Columbus Avenue. It is also a major commercial street. Lamartine Street is a two-lane collector street that connects Green Street to Centre Street and is used to provide access from Jamaica Plain to Columbus Avenue. Amory Street is a two-lane collector that runs from Williams Street to Columbus Avenue and is also used as a through street to reach Columbus Avenue from Jamaica Plain.

Southwest Corridor Path

The Southwest Corridor is a linear park running the length of the Orange Line from Forest Hills Station to Back Bay Station. It is owned by the MBTA and managed by the MDC. There is a continuous pathway along the corridor that ends at Back Bay. Up to Massachusetts Avenue there is a separate bicycle path that is officially designated the "Pierre Lallement Bicycle Path" after the French immigrant and Roxbury resident

who in the 1860s was one of the first to attach pedals to a two-wheel vehicle. There are two separate paths, one for pedestrians and one for bicyclists; the two paths sometimes cross over each other. The path runs adjacent to Lamartine Street from New Minton Street to Centre Street. The path crosses Centre Street and makes two right-angle turns along the sidewalk before starting again between the Jackson Square MBTA station and Bromley-Heath Housing. This crossing is difficult the path approaching from Bromley-Heath is not aligned with the path on the other side of the intersection. After Ruggles Station, the path becomes more like an urban sidewalk. Many bicyclists continue along Columbus Avenue at that point through the South End. The path is used as a route to central Boston and Cambridge by bicyclists from Jamaica Plain, Roslindale, and points south. From Jackson Square to Ruggles, the road adjacent to the path has three narrow lanes, high-speed traffic, and no shoulders, and as such is considered unsafe by most bicyclists.

Existing Pedestrian Flows

There is significant pedestrian traffic to Jackson Square Station. As noted below, 40% of people entering and 60% of those exiting travel on foot. There is a significant flow of pedestrians from the station to Amory Street via an informal pathway over empty MBTA land and the dead-end portion of Amory Street, which is a City owned right-of-way. There is also a significant flow of pedestrians from Jackson Square station to residential areas on the other side of Columbus Avenue, an intersection that is difficult for pedestrians (see details below).

Existing Public Transit System

There is a Jackson Square rapid transit station on the MBTA's Orange Line that runs from Forest Hills Station to Oak Grove in Malden. The station has no automobile parking available to the public except on-street parking and private lots. There is a drop off area on the side of Centre Street opposite the station. There are bike racks along side and in front of the station. There is a bus loading area adjacent to the train station. There are about 4,800 daily exits or entrances to Jackson Square Station. About 40% of station users arrive on foot and another 40% arrive by bus (see Table 1). Five bus routes serve the station (see Table 2 below). Bus ridership by route is shown in Table 3.

Potential Bus Route Improvements

- Improve the frequency and schedule adherence of bus route 41. This route connects JP Centre and Hyde Square with Jackson Square via Centre Street, and continues to Dudley Square and UMass. This route is frequently behind schedule and also runs infrequently, creating the possibility of very long waiting times.
- Add bus service to the parts of Roxbury & Dorchester that are not served by buses from Jackson Square. This could include adding new routes or altering existing routes.
- Extend bus route 14 from its current terminus at Heath Street to the D branch of the Green Line at Brookline Village. This extension would provide direct access to Brookline Village, a significantly quicker ride to downtown Boston, and access to connections at Kenmore Square to Route 57 and the B and C branches of the Green Line.

Table 1: Characteristics of Jackson Square MBTA System Users, 1994 (source: CTPS survey)

Mode		Access %	Egress %
Walk	959	42.3%	59.4%
Bus		40.9%	33.4%
Park & Ride	246	10.8%	1.1%
Drop off/pick up	116	5.1%	6.3%
Bicycle	12	0.5%	0%
Taxi	9	0.4%	0%
TOTAL	1342	100%	100%

Walk Time	Access	Egress
0-5 min	58%	55%
6-10 min	26%	31%
11-15 min	10%	3%
16-20 min	6%	12%
TOTAL	100%	100%
Mean	7.2 min	8.1 min

Occupation	
Professional	43%
Trades	3%
Clerical	26%
Retail	4%
Homemaker	6%
Student	9%
Retired	4%
Unemployed	1%
Other	4%
Total	54%

Ann. Household Income	
< $20,000	21%
$20 to $30	29%
$30 to $40	20%
$40 to $60	20%
$60 to $80	7%
> $80,000	4%
Total	100%

Age	
17 and under	3%
18-24	17%
25-34	28%
35-44	27%
45-64	20%
65+	4%
Total	100%

Gender	
Male	30%
Female	70%
Total	100%

Auto Available for Trip	
Yes	36%
No	65%
Total	100%

Table 2: Bus Routes Serving Jackson Square Station

#	Name	Via	Hours	Interval	Riders/day
14	Heath St-Roslindale Sq.*	Dudley, Warren, Amer. Legion Highway	M-S, 7 am to 7 pm,	30 min to 45 min	1450
22	Ashmont-Ruggles	Columbus, Seaver, Blue Hill, Talbot	all	8 min to 20 min	8300
29	Jackson Sq-Mattapan	Columbus, Seaver, Blue Hill	M-F, limited Sat	16 min to 60 min	2250
41	Monument-UMass*	Centre, Dudley	all	20 min to 40 min	1000
44	Jackson Sq-Ruggles	Columbus, Humboldt	all	11 min to 45 min	4050
48	Jamaica Plain Loop	Centre, Paul Gore, Lamartine, Amory, Washington, Green	M-S 9 to 5PM	30 to 35 min	200

*Note: Beginning in 2002, route 41 was extended from Dudley to the Monument and route 14 (Roslindale to Heath) was combined with route 46 (Heath to Dudley).

Table 3: Bus activity at Jackson Square Station, typical weekday (1999 to 2002 data)

		Inbound		Outbound	
#	Name	On	Off	On	Off
14	Heath St-Roslindale				
22	Ashmont-Ruggles	125	1164	818	137
29	Jackson Sq-Mattapan				
41	Monument-Umass *	99	57	105	67
44	Jackson Sq-Ruggles	547	0	0	581
48	Jamaica Plain Loop	0	18	14	0

* When data were collected, Rt. 41 went only as far as Dudley

II. On-Site Transportation Guidelines

General Roadway and Sidewalk Design Considerations

Sidewalks on Columbus Avenue and Centre Street should be 12 to 15 feet wide including a landscaping and street furniture strip. The following improvements should be made to roads adjacent to the parcels:

Street trees create a buffer between the walking zone and the roadway.

- Create a buffer from moving traffic using street trees, on-street parking, or both.
- Provide street furniture and amenities (benches, trash cans, public art, bike racks, etc.)
- Provide street trees and other landscaping
- Provide new street lighting of a design to be determined. The design should minimize light pollution.
- Provide new sidewalks adjacent to all parcels to be developed (on Columbus, Centre, and Amory streets and any new streets created), a minimum of 5' wide for residential streets and 10' for commercial/mixed use streets.

Amory Street Cut-Through

The existing cut-through from the Amory Street dead end to Centre Street is a major pedestrian access point to the Jackson Square MBTA station. It should be formalized and maintained as part of the site plan of adjacent developments. An additional possible access point is via the proposed path along the MBTA right-of-way. It must be attractive and open enough to be safe.

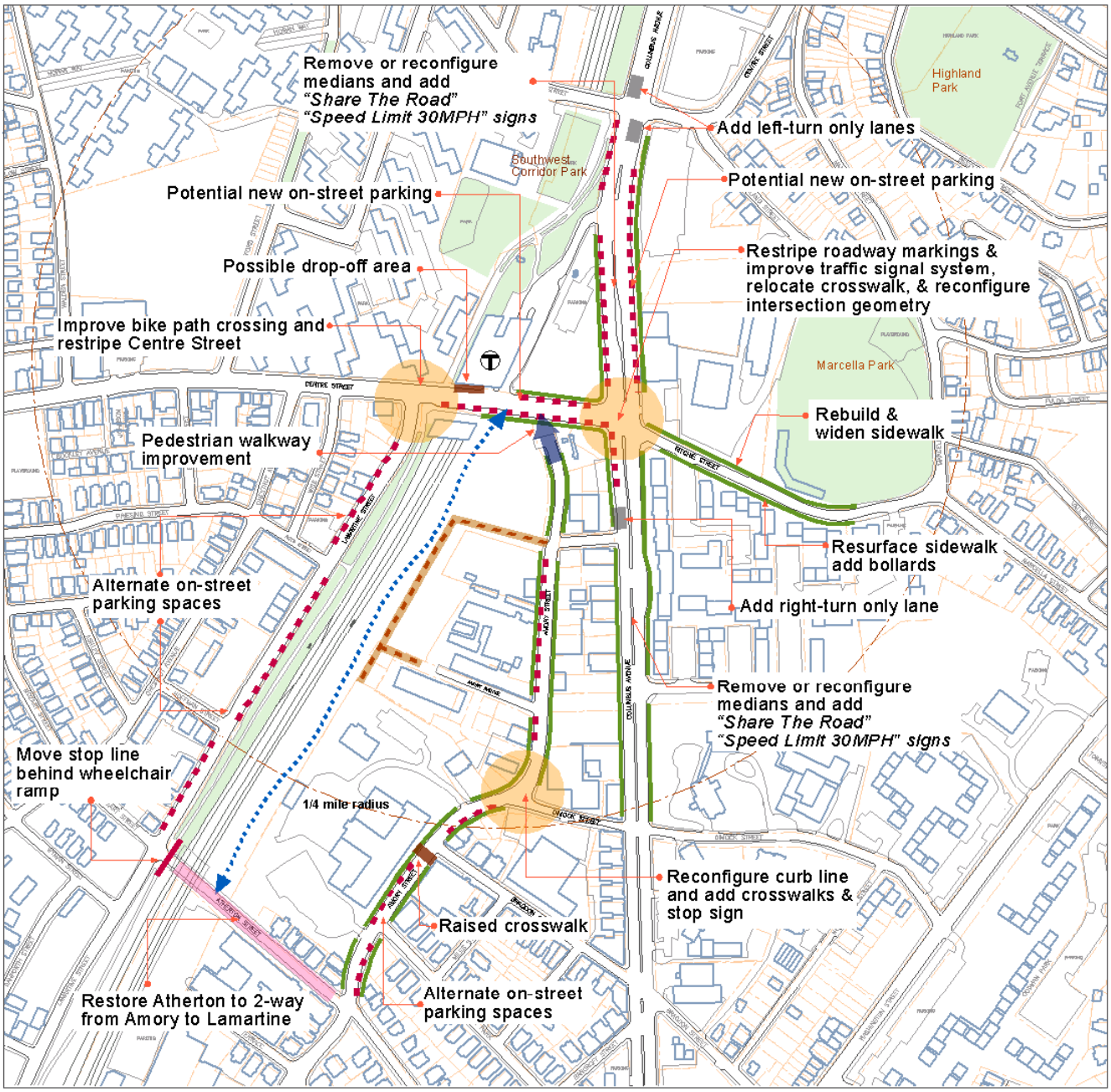
Design of Newly Created Streets

Some new streets are proposed adjacent to parcels F and I. Figure 1 shows proposed locations of these streets. The design goals are to create a pleasant walking environment; safe crossings; bike friendly; and on-street parking wherever possible, in order to maintain an urban character, reduce speeds, and reduce real or perceived

need for surface parking lots. Sidewalks should be 8 feet wide (7 feet minimum). Public Works Department guidelines call for a minimum of 20 feet of clear roadway width for emergency vehicle access, regardless of whether the street functions as a one-way or two-way street. On-street parking should be on both sides of the street if there is sufficient width. Some details to be determined with regard to these new streets are:

- Curb-to-curb width
- One-way or two-way operation
- Regulation of on-street parking
- Location of neck downs (only where there is permanent on-street parking)

These decisions will be made based on the site design proposal and the proposed circulation pattern and parking provision. Resident permit parking should be considered for the on-street parking, given the likelihood of commuter parking to access the MBTA station. The resident-only all-day parking could permit non-resident time-limited parking (such as one-hour or two-hour parking). Back-in angle parking should be considered as a way to increase the number of parking spaces.



Jackson Square
Potential Transportation Improvements

- Potential bike and pedestrian path
- Potential new street
- Streetscape improvement
- On-street parking
- Roadway marking improvement
- Intersection improvement

Bicycle and Pedestrian Path along MBTA Line

A bicycle and pedestrian path has been proposed along the east side of the MBTA right of way between Atherton Street and Centre Street. This will provide a direct connection for bicyclists and pedestrians between Atherton Street and Jackson Square. Returning Atherton St to two-way operation between Amory and Lamartine would then provide a two-way connection at that point to the Southwest Corridor path, and also would provide a means for bicyclists to go to Franklin Park (via School Street) without having to negotiate Egleston Square. The elements to be determined with regard to the proposed new path are:

- width
- paving materials
- landscaping
- connections to Southwest Corridor Path, and to the street network to provide access to the Egleston Sq. commercial district and to Franklin Park
- lighting
- ownership and responsibility for maintenance

Off-Street Parking and Loading

BTD published the following *guidelines* for Jamaica Plain and Roxbury off-street parking for *sites near an MBTA station*:

Non-residential: 0.75 to 1.25 spaces per 1000 sf
Residential: 0.75 to 1.25 spaces per unit

Landscaping can make parking lots much more attractive.

The JCG planning process clearly calls for creative measures to insure no increased automobile traffic in the area. Therefore fewer spaces per unit should be built, taking into account an inventory of on-street parking (including existing spaces, and planned additional spaces on existing or new streets), the proximity of transit, and the Transportation Demand Management plans that will be required of developers. For residential units new on-street parking within a three minute walk of a residence should be counted to make up a ratio of up to 0.67 spaces per unit. For commercial units, on-street parking within a five minute walk should be considered, along with the type of business/activity at the site to determine parking need (e.g. a furniture store that provides free delivery will need little parking).

Parking Lot Guidelines

- Locate curb cuts to minimize conflict with pedestrians and vehicular traffic flow.
- Do not place lots between the building front and the roadway.
- Create multiple small lots in preference to one large lot.
- Provide adequate dimensions for safe pedestrian access as well as auto access and circulation.
- Provide sidewalks for pedestrians within parking lots.
- Provide landscaping to improve aesthetics.
- Provide in lot sidewalks.

The drop-off area across from the MBTA station could be used for on-street parking.

- Provide adequate lighting for night time security.
- Provide alleys for loading and dumpster access.
- Providing drop-off areas and taxi stands at the front of buildings (see photo to be added).

III. Off-Site Transportation Guidelines

On-Street Parking

In addition to new on-street parking on some of the proposed new streets, on-street parking could potentially be added to Centre Street between Lamartine and Columbus Avenue, and on Columbus Avenue between Centre Street and Heath Street. The table below shows that approximately XX on-street parking spaces could be added. This number of spaces includes the existing drop-off area on the south side of Centre Street. These spaces could be unrestricted, time-limited (2 hr, 1 hr, 30 min., 15 min) or metered. For example, 15 min. parking could be used both for MBTA drop-off and for short shopping visits to the new retail uses.

Table 1: Additional on-street parking spaces possible on existing streets

Centre Street	miles	feet	corners + driveways	right turn lane	available ft	spaces (20 ft/space)
North side: Columbus to Busway	0.050	264	40	0	224	11
South side: Columbus, to Lamartine *	0.098	517	40	0	327	16
Columbus Avenue						
West side: Busway to Centre	0.092	486	40	0	296	14
West side: Busway to Heath	0.047	248	0**	0	248	12
West side: Centre to Muffler Mart Driveway	0.034	178	0	0	178	9
East side: Ritchie to Heath	0.147	778	40	0	588	29
East & West Sides, Heath to Cedar		Still to be counted				
TOTAL POSSIBLE SPACES					**At least**	91
* Assumes moving existing neck downs and MBTA drop-off area. ** Doesn't include current entrance to MBTA employee parking.						

Amory Street Conditions

Amory Street runs north-south for 1.2 miles from Williams Street to Columbus Avenue. Amory Street connected to Centre Street until the reconfiguration of Jackson Square in the 1980s as part of the Southwest Corridor Project. The street width varies considerably. There is one lane in each direction and parking generally is permitted only on one side of the street. The center yellow line is mostly faded.

Amory Street is used as an alternative through route to Washington Street, which is typically congested between Montebello and Columbus, and to Centre St, with traffic going up Green St. to Centre. Vehicles headed northbound turn right on Dimock Street, and then left on Columbus

Avenue, since only a right turn is permitted at the Amory and Columbus intersection (a left turn is not currently possible because there is no break in the median at Amory Street). In 2002, there were approximately 5,000 vehicles per day (two way) on Amory Street north of Dimock Street. However, the volume is certainly much greater south of Dimock, since most of the northbound traffic uses Dimock Street.

Atherton Street runs one-way westbound and has one wide lane and meets Amory Street at a signalized intersection. (The one-way restriction between Amory and Lamartine went into effect on July 1, 1987.) Atherton is the only street between Centre and Boylston that crosses over the Southwest Corridor and railroad tracks to Lamartine Street. As a result, it gets a significant amount of traffic. Cars parked too close to the intersection on Atherton make the left turn from Amory northbound on to Atherton westbound difficult at times. The loop detectors on Atherton do not detect bicycles. There is a BHA elderly housing project at 125 Amory; residents of this project have difficulty crossing Amory Street. There is a handicapped vehicle parking area directly in front of the building with a wheelchair ramp. The nearest crosswalk is at Bragdon Street.

Amory Street looking north towards School Street and Marbury Terrace. Note faded double yellow line. The recently marked diagonal crosswalk lengthens the crossing distance. There are no wheelchair ramps.

At the unsignalized intersection with West Walnut Park, there is no wheelchair ramp meeting the crosswalk on the east side of Amory Street. Between West Walnut Park and Bragdon Street, parking is prohibited on the west side 8 am to 6 pm and on the east side at all times.

From Bragdon Street to Columbus Ave

Bragdon Street is a one lane, one-way street westbound. The three-legged intersection of Bragdon and Amory Street is unsignalized. Because Amory Street curves and there is a building very close to the roadway, drivers exiting Bragdon may have difficulty seeing traffic on Amory, especially southbound traffic on Amory (for drivers turning from Bragdon to Amory). It is also difficult for drivers southbound on Amory (towards Green Street) to see traffic existing Bragdon Street.

The Amory Street and Dimock Street intersection is Y-shaped and unsignalized. There is a stop sign facing drivers on Dimock Street entering Amory. There are no marked crosswalks. There is a very large amount of paved area. The sight lines are poor for drivers on Dimock approaching Amory.

The Amory Street and Dimock Street Intersection. The red car facing the camera has a stop sign. There are no visible pavement markings. The intersection is difficult for pedestrians to cross safely.

Between Dimock Street and Columbus Avenue there are many curb cuts for driveways and loading docks along the east side of Amory Street. The sidewalks on Amory Avenue do not meet minimum width standards.

Amory Street makes a 90 degree turn to connect with Columbus Avenue. There are no warning signs about this sharp turn. There are no reflectors on the swing gate blocking the dead end continuation of Amory Street. There is an illegal driveway leading up a steep slope at this sharp turn.

The walk from the Amory Street deadend to the Jackson Square T Station.

Pedestrian Connection from Amory to Jackson Square Station

Amory Street was dead ends just before Centre Street. There is a swing gate blocking vehicular access for the last block approaching Centre Street. Pedestrians continue to use this last block as the most direct route to Jackson Square Station.

The final 50 feet from the Amory Street dead end to the Centre Street sidewalk is a steep walk through dirt and grass. There is little street lighting. There is a push-button activated pedestrian signal a short distance away permitting pedestrians to cross to Jackson Square station. Cyclists also use the path and the light to get from Amory Street onto the Southwest Corridor bike path (heading north) while avoiding the difficult crossing of Columbus at Centre. The pedestrian green is illuminated only upon request, and in coordination with the other signals, which means that the wait for a pedestrian green can be significant. The wheelchair ramps at this crosswalk are damaged. The crosswalk markings are faded.

Changing on-street parking from one side of the street to the other can help reduce excessive speeds on straight residential streets. (Photo: Columbia Street in Cambridge).

Potential Amory Street Improvements

In addition to the issues mentioned above, general improvements include: roadway resurfacing, new sidewalks, new street lighting, and repainting lane markings and crosswalks. In order to make the road more pedestrian friendly, on-street parking could alternate between different sides of street. Neckdowns should be added at intersections and where parking lanes begin and end. The neckdowns could be landscaped, possibly with trees, if subsurface conditions permit. Speed humps should be

Columbus Avenue approaching Centre Street: three travel lanes and no buffer between the sidewalk and the roadway – and no pedestrians!

considered to slow traffic in front of the BHA elderly and disabled housing at 125 Amory. Sidewalks should be widened where they are below the 5 ft. minimum standard and should have clear space of at least 4 ft. to permit wheelchair access. New development should minimize the number of driveway curbcuts intruding on sidewalks. Atherton Street between Amory and Lamartine Street should be returned to two-way operation as it was before 1987.

Potential Columbus Avenue Improvements

From Heath Street to Centre/Ritchie

Between Heath Street and Centre/Ritchie, Columbus Avenue has three 10 ft. travel lanes and a raised median that varies considerably in width. There are left turn lanes at the Center/Ritchie intersection, but not at Heath Street. Because of the number of lanes and the distance between intersections, motorists regularly go faster than the 30 mph statutory speed limit (there is no posted limit). An off-peak speed study is needed at this section of Columbus Avenue.

Improvements are needed to improve safety and the pedestrian environment. The most important safety improvement for drivers is to create left turn lanes for the left turns from Columbus to Heath Street, as recommended in the *Lower Roxbury Transportation Strategies Study*. Between intersections, the traffic volume could be handled with two through lanes instead of three, as is the case on Columbus between Egleston and Centre/Ritchie and also between Ruggles and Prentiss southbound. The right lane could be used for on-street parking. It would be become a straight or right lane at Heath Street. This change would tend to slow the excessive speeds, especially at off peak hours, provide a buffer for pedestrians on the sidewalk, improve the comfort of bicyclists using the roadway, and provide parking for the new development planned in the area without taking up excessive land for surface parking. If the parking lane is permanent, neckdowns can be added on the corner of Centre/Ritchie Street and of Heath Street (southbound). Parking in the sidewalk is common in front of the buildings owned by Urban Edge on Columbus opposite the T station, and must be stopped.

There is a planting strip between the roadway and the sidewalk on the east side of Columbus. This could be improved with additional landscaping. On the west side, a planting strip with street trees and street furniture should be added to create a buffer between the walking zone and the roadway. The median is excessively wide in some places in this stretch. Most of Columbus Avenue north of Heath Street does not have a raised median. Removing or narrowing the median would provide space to allow bicyclists to share the right lane safely, rather than taking up an entire travel lane. It would also reduce the overall street width and provide additional real estate for sidewalks. The median could remain in place at the Centre/Ritchie intersection with a split in the double yellow line to lead drivers around it. Keeping a median or median island at the intersection provides a place for traffic signals. Speed limit (30 mph) and Share the Road (with bicycles) signs are needed, one in each direction.

Intersection with a median nose and opening the full width of the crosswalk.

Columbus Ave./Centre St./Ritchie St. Intersection

The signal equipment at this intersection is old and does not have the functionality required. New signal hardware and a new controller are needed. Currently the signal is timed so that pedestrians crossing lawfully must wait in the median for up to two minutes before they are permitted to finish crossing. The pedestrian signal timing should be adjusted to minimize pedestrian delay. Concurrent pedestrian green with a leading pedestrian interval should be used and the walk signal should be automatic (no push button).

A redesign of the intersection should carefully consider altering the geometry to align approach lanes with receiving lanes and to shorten the crossing distance for pedestrians and reduce the speed of turning traffic. The existing right-turn lane from Centre to Columbus should be converted into permanent on-street parking with a neckdown added at the corner. On-street parking should also be added on Centre Street. There is sufficient width for on-street parking on both sides, one travel lane west bound, and a left turn lane and a left, straight, or right lane east bound. Clear lane markings are needed on Centre Street. Depending on the geometry, it may be appropriate to carry the crosswalk through the median, creating a *median nose*. If so, the cut in the crosswalk should be the same width as the crosswalk (see photo). Distinctive pavement materials for the crosswalks should be used, bordered by white thermoplastic stripes (see photo). Although white is the most visible, thermoplastic does not last that long given the very high traffic volumes passing through this intersection. A crosswalk paved with inlaid stone will be visible even as the thermoplastic starts to wear.

From Centre/Ritchie to Dimock Street

Distinctive paving material can make crosswalks more visible and attractive.

Between Centre/Ritchie and Dimock Street, Columbus Avenue has two lanes in each direction, on-street parking, and a raised median. The exception is the short block between Centre and the Amory Street Connector, where the stretch of the curb lane between the Muffler Mart driveway and Amory St. Connector functions as a right-turn only lane. It should be marked as such. This stretch of roadway is very awkward for bicyclists, especially heading southbound. There is not enough room in the right lane for a motorist to pass a bicyclist who is keeping a safe distance from parked cars and their opening doors. Because it is uphill in that direction, bicyclists may be traveling at only 10 mph or less. At a minimum, Share the Road signs should be installed (showing images of a bicycle and a motor vehicle). Additional width for lane sharing could be obtained by removing the median, leaving it in place at the Centre/Ritchie and Dimock Street intersections as a crossing island and to hold traffic signal posts. Pedestrian conditions could be improved by adding more street trees and street furniture. One possibility is to remove the median but keep crossing islands at intersections. Widen the parking and travel lane on the southbound (uphill) side would provide lane-sharing width for bicyclists (if this is not possible, Share the Road signs could be added). Speed limit (30 mph) signs are also needed, one in each direction. The pedestrian signals should be retimed at Dimock Street to minimize pedestrian delay.

Centre Street

From Lamartine to Columbus

The drop-off area for the Jackson Square MBTA station is across the street from the station. Many people use the travel lane (marked No Standing Any Time) opposite the station because transit riders will not then have to cross the street, which involves significant delay.

Centre Street is wide enough to be narrowed, with on-street parking and perhaps a bike lane. There should be a planting strip between the sidewalk and the roadway.

On-street parking should be added. As on Columbus Avenue, this would provide parking places for those accessing the proposed new commercial and residential uses, and would help to reduce traffic speed and provide a buffer for pedestrians. The drop-off area could be relocated from the south side of Centre to the north side, adjacent to the station. Alternatively, spaces on both sides of the street could be marked for 15 min. parking to accommodate both transit drop-off and short-term parkers. Street trees and street furniture such as benches, trash baskets, bike racks, and historic street lighting should be provided between the walking zone and the roadway.

The crosswalk at the busway is well used by pedestrians but is faded. It should be marked with distinctive pavers highlighted by white thermoplastic. The location of the crosswalk could be reconsidered in order to reduce crossing distance. The pushbutton-activated signal should be adjusted so that it starts a clearance interval from crossing traffic immediately upon activation, provided that the pedestrian phase has not been recently granted.

Centre and Lamartine St. intersection

Although the lane markings have faded, Centre Street westbound approaching Lamartine Street is designed to be two lanes, a left turn lane and a straight through lane. In practice, because of illegal parking, it typically functions as a single left or straight lane. If the drop-off area is moved in front of the station, the center line could be shifted over to accommodate two travel lanes (left only and straight only) and a parking lane westbound. The loop detector in left lane should be adjusted to be sensitive to bicycles, and the sensitive location should be marked. New signal and controller equipment is also needed. The intersection geometry should be studied to facilitate the left turn on to Lamartine and to improve the alignment of the bike path crossing. A diagonal bike crossing should be used to have cyclists crossing the sidewalk at as close to a right angle as possible, as opposed to the current situation in which cyclists must ride along the sidewalk with pedestrians, contrary to city traffic regulations. This improvement consists of two parts: a) move the path to a portion of Bromley-Heath land where it can cut across diagonally; b) move back the stop line and curb cut on the north side of Centre Street so that the crosswalk can line up with the relocated path crossing (see photo to be added).

Curb extension with trees and landscaping.

Centre Street and Chestnut Street

A public way is used at this location for off-street parking. The area should be redesigned to prevent parking on the sidewalk adjacent to the Tropical Market.

Lamartine Street

The surface of Lamartine is currently in poor condition due in part to sewer work in 2002. The Boston Water and Sewer Commission is scheduled to repave Lamartine Street in the first half of 2003. Parking is permitted only on the side opposite the Southwest Corridor Park. Because the roadway is wide (for two travel lanes) and straight, travel speeds can be high. A speed study is needed. One potential method of reducing speeds is to create a chicane effect by alternating the side of street with on-street parking. The transition areas should be marked with curb extensions (neckdowns), which can be landscaped, even with trees, if subsurface conditions permit. To reduce cost, this work should be done in conjunction with the repaving scheduled by the Boston Water and Sewer Commission.

Ritchie Street

Ritchie Street has a single travel lane in each direction and no on-street parking permitted on the north side. The north sidewalk is in poor condition and is substandard width, and is partially obstructed by a telephone switch box and light poles. The south sidewalk is often used for parking, illegally. The north sidewalk should be widened to meet City standards. It may be desirable to widen the right of way to provide wider sidewalks and possibly sufficient room for on-street parking on one side. Bollards could be installed on the sidewalk to prevent illegal parking on the sidewalk.

Transportation Demand Management

- Any transportation studies should document necessary improvements to public transit. For example, this could include studies by the developer documenting necessary MBTA improvements to bring more people to the area along current or proposed transit routes. The developer is expected to take a meaningful role in advocating for any such changes in conjunction with existing MBTA advocacy groups, the JCG, and other local neighborhood organizations.
- Developers/management of larger rental housing going in should provide (low-cost) shopping shuttles to take local residents to discount stores such as CostCo and BJ's.
- Secure bike parking should be provided inside multi-residence buildings (such as a locked bike room in a basement).
- Limited parking should be provided in order "level the playing field" for walking, riding, and taking transit.
- Where possible, apartments should be designed so as to facilitate licensing for home-day providers.
- Large residential buildings should have some dedicated space for childcare/youth service providers.
- Parking management should always be fully exploited before additional parking is added to the neighborhood.

Additional Site Design Concepts

- Greenspace and greenery needs to be integrated throughout the streetscape.
- Parks and open spaces should designed to attract both males and females and from a range of ages (e.g. basketball courts and a tot lot, a bike park and chess tables, etc.).

- People watching opportunities should be provided (e.g. alignment/location of benches, varied setbacks along sidewalk to provide places to stand and talk, etc.) in order to attract pedestrians and foster a vibrant street life.
- Jackson Sq. should have as many of the attributes as possible as the types of places around Boston where we currently take our out-of-town guests.
- There should be no blank walls (of buildings or free standing) along sidewalks – these say "danger, keep out," provide no escape form moving traffic, and are hot in the summer.
- Landscaping plants should have leafy growth either below knee height or above 10', to facilitate visibility and traffic & personal safety.
- Parking lots should never be between the building and the street.

Additional Roadway Design Concepts

- Use bike lanes to effectively increase turning radii (to permit street usage by large trucks and buses) without increasing travel lane width and thus encouraging high speeds.
- Do not create double left turn or right turn lanes, which makes it much more dangerous for pedestrians to cross.
- Use mid-block crosswalks, both to provide safer crossings (away from turning vehicles) and in areas of likely jay-walking/high demand (e.g. in front of Stop & Shop or the Youth Center).
- Consider back-in angle parking along some streets where width is adequate, to provide more on-street parking. Back-in is preferable to head-in angle parking because drivers do not have to back into moving traffic to leave.

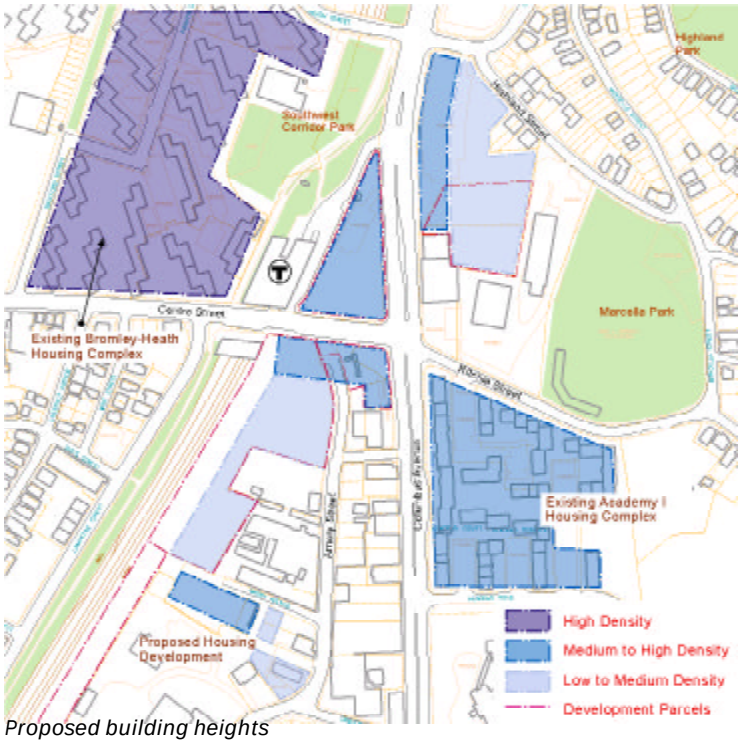
JACKSON SQUARE URBAN DESIGN VISION AND GUIDELINES

URBAN DESIGN GUIDELINES

The Urban Design guidelines are established for the purpose of controlling the physical character of development proposals, and guiding and informing their ensuing design review to make sure the physical qualities of Jackson Square are improved and enhanced and the goals, where stated, of the community visioning process are attained.

DENSITY

The density generated by future developments should be at a level that results in a physically healthy and economically viable environment for the Jackson Square area. The level of density should nevertheless be *compatible with* the existing density in and around the area without any adverse impacts on the quality of life. In general, high density is desired around the T station



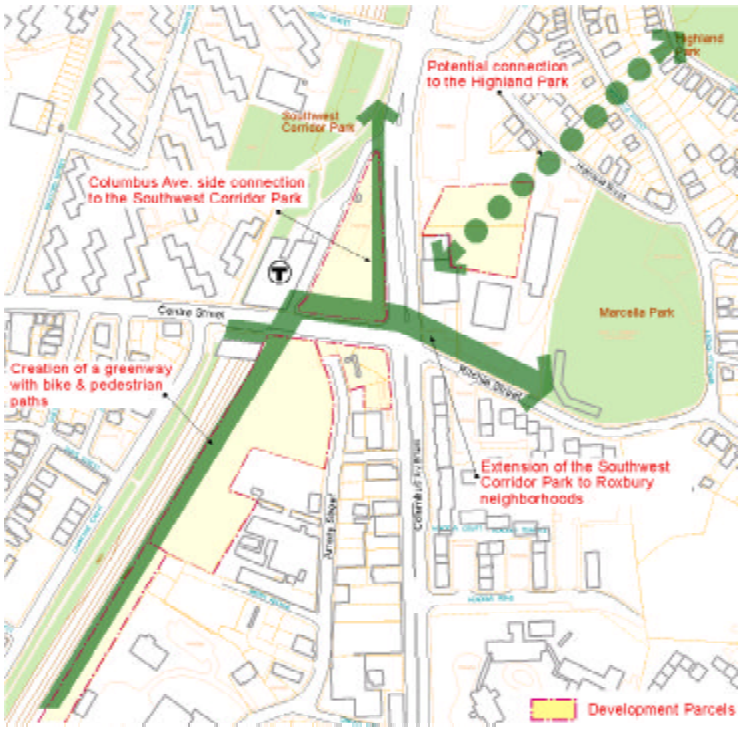
Proposed building heights

and the intersection of Centre & Columbus and Ritchie, with densities decreasing gradually as you move away from these focus points. The current and projected capacity of the public infrastructures serving the area should be taken into account as well in determining the level of density. The final density, mix of uses, building designs, child centered areas and quality of pedestrian environment must contribute to the creation of a new image for Jackson Square as a vibrant, affordable, transit-oriented urban center of activity that brings residents of the neighborhood together.

LANDSCAPE

Acknowledging the need and the strong demands by the communities for more green spaces and playgrounds, each development is required to make a contribution to improving the existing parks and/or creating and maintaining more green spaces.

The new parks and green spaces should be integrated with the existing parks and playgrounds in and around Jackson Square and Roxbury, such as Southwest Corridor Park, Marcella Park, and Highland Park and designed to create a mix of passive parks, playing fields and playground, as well as integrated into the design of all public spaces (e.g. street trees, window boxes, etc.) The new parks and/or green or open spaces should also be designed to create further integration of, and connections to, the existing parks to increase the social and physical connections between the communities and neighborhoods.



Integrated parks system

Southwest Corridor Park

Marcella Park

Highland Park

LAND USE

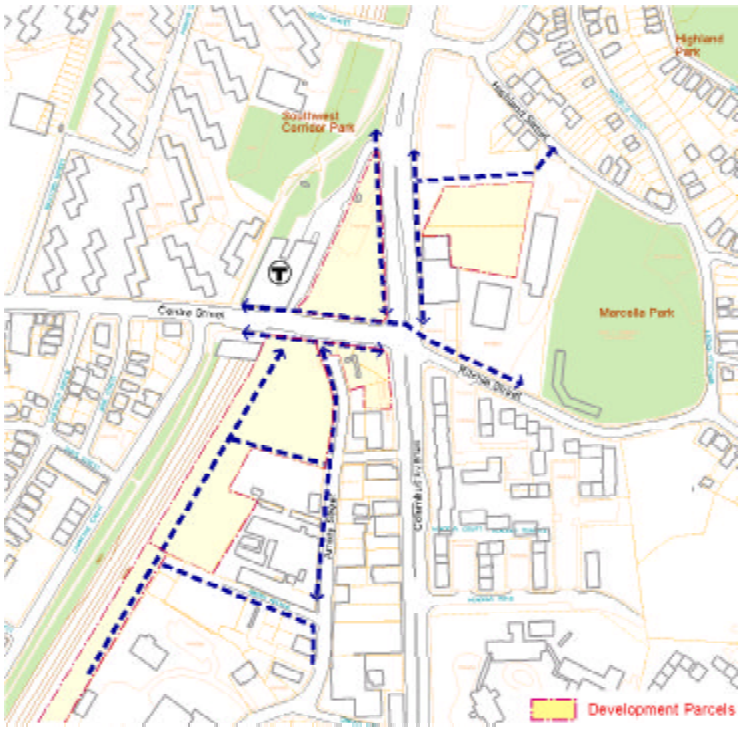
The uses on the developable Jackson Square parcels should be allocated to maximize economic, social, and cultural benefits not only for the Jackson Square area but also for Jamaica Plain, Roxbury, Mission Hill. However, the uses must first serve the largely low-income population that has characterized the neighborhoods surrounding Jackson Square over the last several decades, and should not contribute to their displacement from the neighborhood. Use disposition should conform to the general uses consistently planned throughout the 30-year process which ensued from the original Southwest Corridor planning effort and to the array of uses which were specified by the community through the JCG's efforts.

Key land use guidelines should be;

- Enhancement of the overall identity of Jackson Square area in regards to traffic and personal safety, lighting and architectural/landscape design.;
- Physical and social integration of new developments into the surrounding neighborhoods;
- Optimum use of available land for addressing the identified needs in the community and with minimum environmental impact (specifically including the creation of a vibrant and healthy environment for pedestrians, transit users and cyclists).

STREETSCAPE DESIGN

Streets should be designed to establish a pedestrian-friendly environment that encourages interaction between people and a pleasant walking experience. Efficient connectivity to both the local street network and open spaces and improvement of local public transit service are also critical in encouraging walking. Additional traffic should be focused on public transit users, pedestrian, bicycles and other forms of car alternative transportation, providing efficient and safe vehicular flows which help to reduce congestion at the major intersections of arterials (e.g. Amory Street) and adding to pedestrian safety, is another key in improving the pedestrian and vehicular circulation. New developments should therefore contribute to creating and



Improved pedestrian connectivity

Pedestrian friendly streetscape

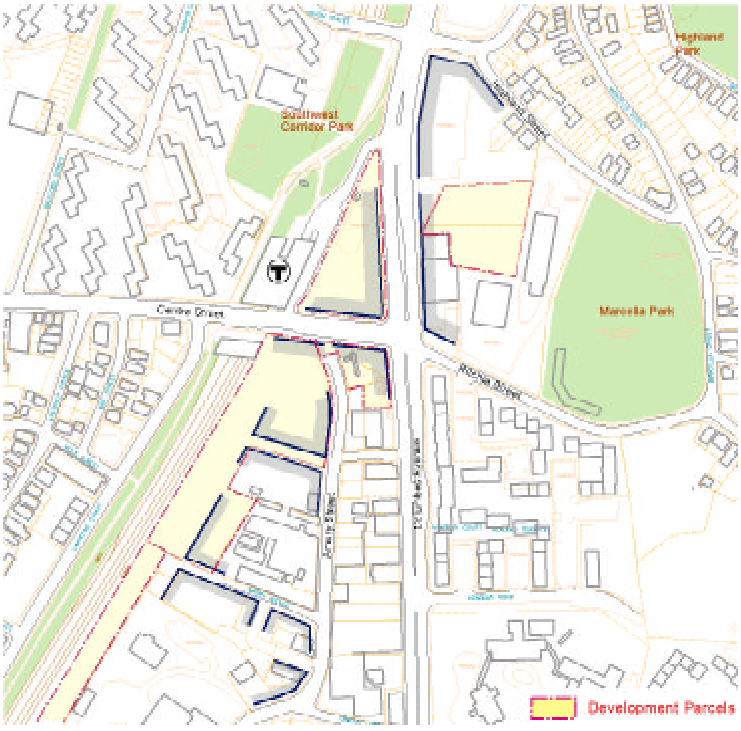
maintaining a pedestrian-friendly environment, a network of circulation options, and safe vehicular access both on-site and connecting to the Jackson Square area immediately around the parcels.

Key streetscape guidelines should be:

- Orientation of new buildings and building entries to the primary streets;
- Creation of easy pedestrian access to Jackson Square and the MBTA transit system;
- Provision of efficient and safe vehicular flows that minimizes contributions to congestion at the major intersections of arterials while improving pedestrian and bicycle safety;
- Streets designed for handicapped accessibility - compliance with ADA standard
- Coordinated compliance with City's design, construction and review policies by proper city agencies such as Boston Transportation Department, Boston Public Works Department, Boston Parks & Recreation Department, the Public Improvement Commission and Environment Department and the Jackson Square Transportation Guidelines;
- Attractive and varied selection of streetscape elements, such as paving materials, trees, street light fixtures and street furniture, for a distinctive and pleasant walking environment and efficient maintenance;
- Maintenance of non-standard streetscape items will be the responsibility of the project proponents;
- Consistency of any proposed parks and open spaces with existing plans such as the Southwest Corridor Park plan or other park or trail plans; and,
- Promotion of bicycle use through the provision of signage, bike lanes, off-road bike paths and bike racks, the locations of which should not compromise pedestrians' safety.

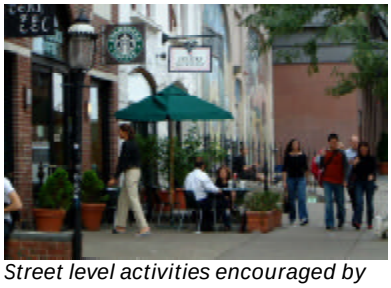
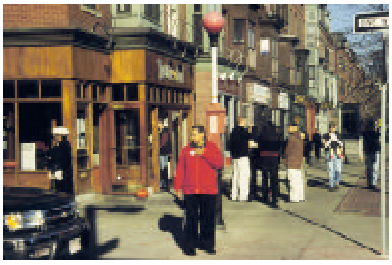
BUILDING DESIGN

The proposed development(s) should be physically compatible with the surrounding environment and contribute to developing a transit and walking destination. The mass and bulk of each



Street wall continuity to define street

Continuing residendential buildings with attractive front designs

Street level activities encouraged by ground floor uses & building setback

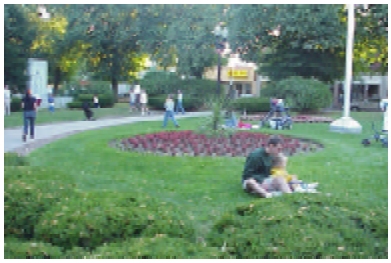
development should be designed to a human scale which ensures interaction between people and buildings in an environmentally desirable manner. New buildings should be oriented to front primary streets, to clearly define streets, and to encourage street activities. Buildings should help to create a unique sense of place while allowing orientation cues for connections to and from other destinations.

Key guidelines for building designs should be:

- Creation of architecturally attractive building fronts and programmatically diverse street level uses to engage pedestrians with the buildings and promote street level activities;
- Determination of a prevailing property line setback for street wall continuity to create a strong urban image and physically consistent walking experience;
- Creating such a setback wide enough to accommodate easy pedestrian flows, linear street tree plantings, street lights, and street furniture; and,
- Application of the 'Green' Design concept to meet at least the minimum LEEDS design standards for each development parcel.

OPEN SPACE

Open space - a place for people to pause, meet, interact, rest, contemplate, and play in the dense urban environment - is one of the major urban elements that can help to define the public realm.




Various types of neighborhood parks

Key open space design guidelines should be:

- Create open spaces that contribute to improving the physical character of Jackson Square, rather than detract from its potential identity;
- Integrate new public spaces with the local street and pathway network to improve their usability;
- Provide adequate lighting that clearly lights sidewalks at night, without contributing to excessive street lighting entering buildings;
- Select landscape elements and furniture such as paving materials, benches, water features or artwork, murals, trees, and lighting fixtures that contribute to the overall pedestrian-oriented scale and image and are easily maintained; and,
- Provide age-differentiated play areas, while encouraging use of open spaces by people of all ages.

TRANSPORTATION PARKING AND SERVICE VEHICLE ACCESS *(Please also refer to Jackson Square Transit-Oriented Improvement Guidelines)*

As an urban area, there will be a reduced parking ratio to encourage the use of public transit. To be effective the development must also provide drop-off areas, bus stops, taxi stands, shopping shuttles and delivery services so that regardless of physical ability, people can accomplish daily tasks. The parking ratio or the number of parking spaces should be determined taking into account the type of development, the proposed mix of uses, financial viability, the social, economic and cultural pattern of users or occupants for each development, and proximity to the MBTA station and bicycle paths.



Well landscaped and screened parking lot

The current zoning and Boston Transportation Department requirements specify that the parking space ratio for residential development can be 0.75-1.25 space per dwelling unit, including street spaces with time limited and residential parking and for non-residential use 0.75-1.25 space per gross 1000 SF, given the public transit systems available in the Jackson Square area. However the developer is encouraged to seek variances to allow lower ratios where possible, in order to increase possible density and affordability, increase land available for open space and encourage use of transportation alternatives. The number of parking spaces for the youth/community center should be determined by its final location, size, and proposed programs. The availability of existing and new on-street parking near developments should be a factor in determining the parking ratio.

An optimum and balanced number of parking spaces should be sought. Shared parking spaces or automobiles, and encouraging the use of alternative transportation modes (i.e. 'ZipCars', bicycles, etc) can be some of the ways to achieve efficient parking levels. Refer to the Transportation Guidelines for additional information.

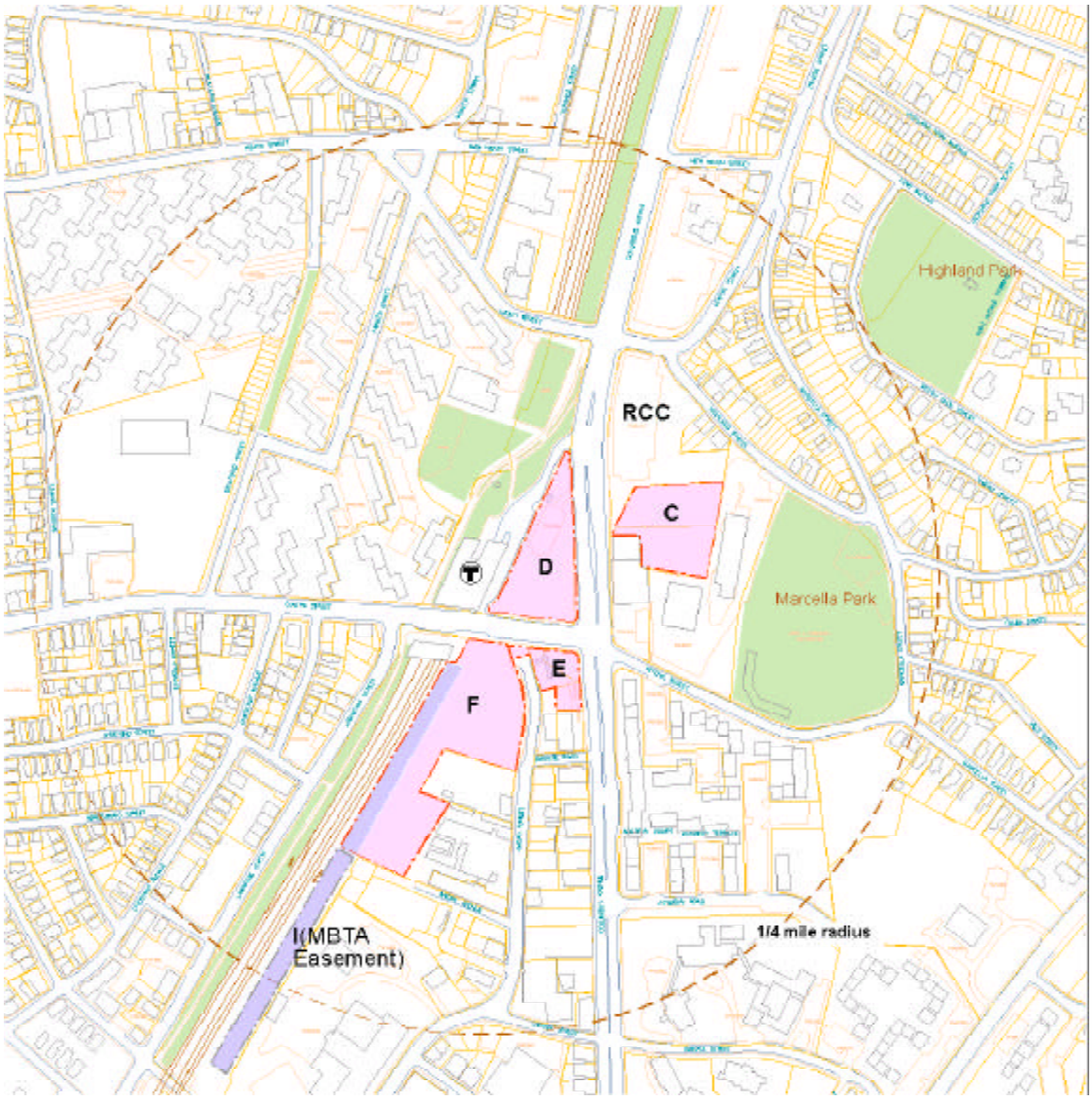
Key guidelines for designing parking lots, when parking cannot be feasibly placed out of sight within or below a structure, should be as follows:

- Minimize the impacts of parking lots on the pedestrian experience by appropriate location, design and the use of fencing and planted buffering;
- Minimize the number of curb cuts
- Locate curb cuts to minimize conflicts with pedestrians and general traffic flows;
- Locate the parking lot behind the building to keep the building streetwall continuity and to improve the pedestrian experience;
- Create multiple smaller size parking lots rather than one large parking lot;
- Provide sidewalks within parking lots;
- Provide landscaped medians or planters between parking spaces to reduce visual and environmental impacts; and

Service vehicle access, necessary for daily building and business operations, should be considered and designed to minimize any interruption to pedestrian activities and traffic flows. Service vehicle access should be off major streets. Service vehicle circulation and location should be determined in association with the type, use, and function of the development. The service vehicle access and circulation (and garbage pick-up, etc.) should comply with the Jackson Square Transportation Guidelines and the City's applicable traffic regulations.

DEVELOPMENT GUIDELINES

The development guidelines are intended to set the framework for how development on each parcel should be implemented in conformance with the overall image and character the community has envisioned for the Jackson Square area.



Development parcels

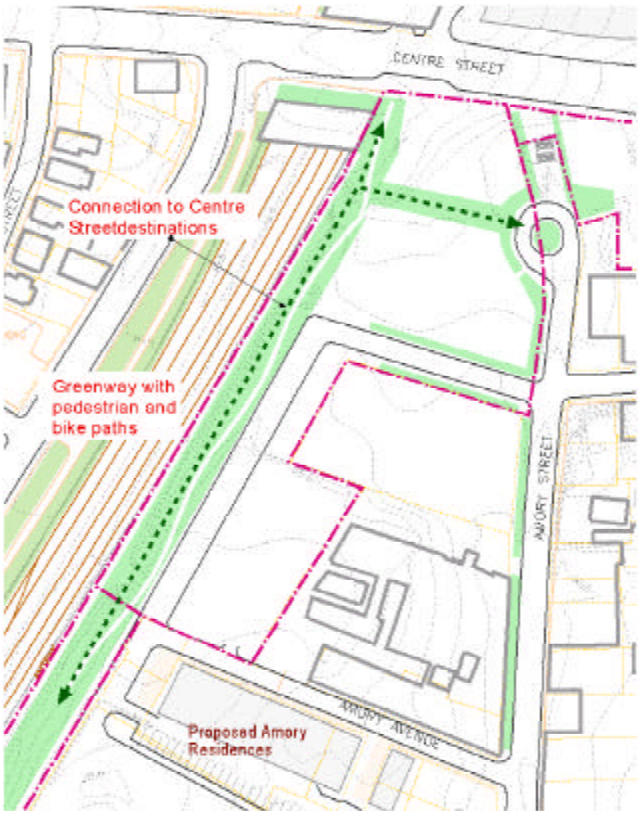
1. PARCELS F, E, AND I (MBTA Easement)

The JCG has recommended that the primary uses for these contiguous parcels are a youth/ community center, affordable housing, low scale retail and commercial uses in a mixed-use development, and open spaces and parks.

MIXED-USE DEVELOPMENT

A mixed-use development is comprised of small to medium scale retail/commercial including youth, community and non-profit office space uses on lower floors and residential units above. Mixed-use development is recommended on both Centre Street, including Parcel D and Columbus Avenue. The expressed community preference is that the low-scale retail/commercial uses on lower floors should be located along Centre Street to reinforce it as the major retail street in the neighborhood. Retail/commercial uses on lower floors should also be located along Columbus Avenue, leading around the corners from Centre Street in order to help create connections between Roxbury and Jamaica Plain.

Any mixed-use development should be designed to integrate the residential components by clearly distinguishing residents' entrances from retail/commercial, and separating commercial and service vehicles' activities from residential use. Development should encourage street level commercial activities with attractive store fronts and pedestrian friendly streetscapes.

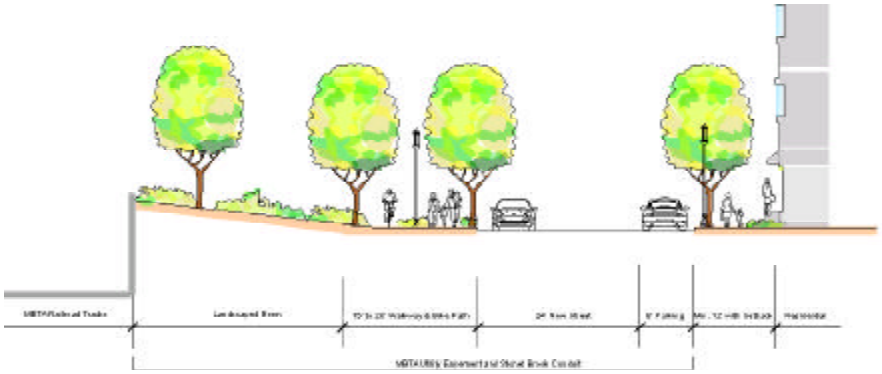


The Greenway

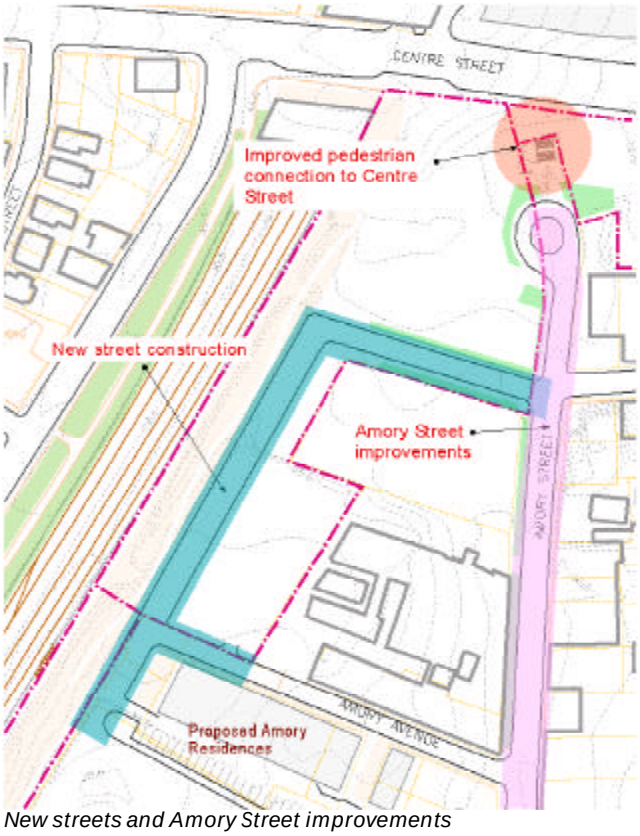
THE GREENWAY ON THE MBTA EASEMENT

The stretch of land along the train tracks, consisting of Parcel I and the portion of Parcel F adjacent to the track boatwall structure, should be developed as a green space with pedestrian and bike paths between Centre Street and Atherton Street. MBTA and BWSC easements run the length of this corridor and access to their infrastructure is required. This greenway can be complementary to the Southwest Corridor Park and, at the same time, it can function as a buffer for the potential housing development close to the tracks. It can also provide a secondary choice for pedestrians or bicyclists between Centre Street destinations and the neighborhoods to the south of Centre Street. Enhancement of this corridor makes the housing sites more attractive, and in turn the housing sites provide use and eyes on the corridor.

Incorporation of this land into any development plan is subject to the approval of the MBTA and the JCG.



Greenway Cross Section



New streets and Amory Street improvements

NEW STREETS

The creation of new connections is encouraged to provide better access to and through the parcels for both pedestrians and vehicles. New streets can be created by extending connecting drives toward the Orange Line track and an 'Amory Street Connector' running parallel to the tracks and connecting Amory Avenue and the various development sites. The new street connections would thus form a loop with the existing streets, which would improve the traffic circulation in this subarea. The new streets provide improved accessibility for the potential housing developments and the greenway as well as new on-street parking. The greenway along the train track boatwall structure will enjoy increased safety and security with the new street and new developments drawing both activity and people to watch over the greenway.

AMORY STREET IMPROVEMENTS

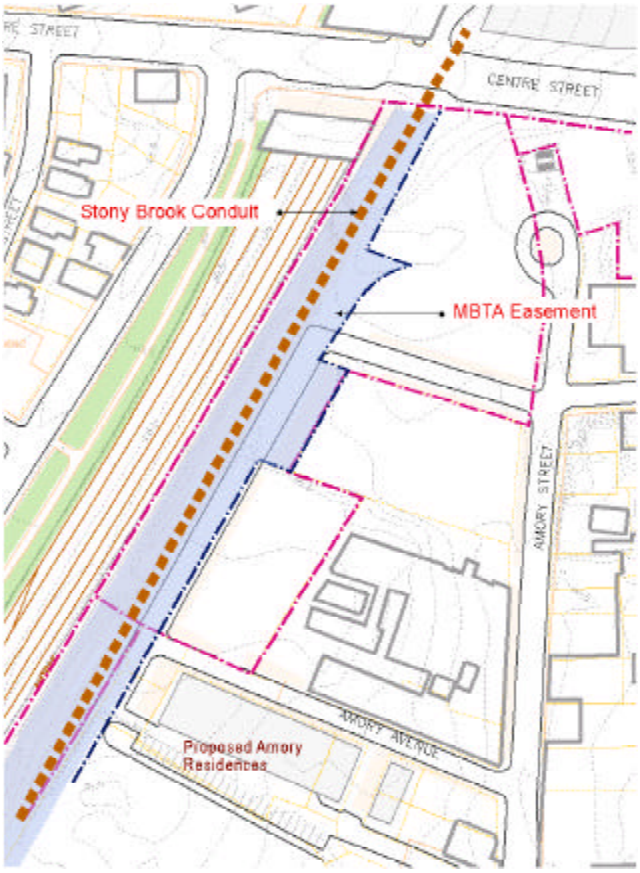
The community vision also endorses the discontinuance of Amory Street as a potential vehicular connection to Centre Street. The Amory Street pedestrian walkway to Centre Street will remain essentially where it is. The pedestrian connection will be permanently improved by the new developments fronting on Centre Street. Vehicular access from the new formal end of Amory Street to the developments on Centre Street and Columbus Avenue should not compromise the quality of the pedestrian connection at the end of Amory Street.

Amory Street pedestrian use should be further enhanced through streetscape improvements such as widened sidewalks, improved paving, street trees, benches, trashcans and streetlights. Building facades along Amory Street should be designed to augment the pedestrian-friendly walking experience. Amory Street should be considered a major pedestrian route from Centre Street to the neighborhoods to the south.

BUILDING HEIGHT & DEVELOPMENT CAPACITY

The height of development on Centre Street and Columbus Avenue should not exceed 6 stories or 70 feet. The height of the residential development along Amory Street and Parcel F should not exceed 5 stories.

The number of off-street parking spaces for the residential developments may fall short of the 0.75-1.25/unit ratio recommended by the Boston Transportation Department as a standard for Transit Oriented Developments. The appropriate number of off-street parking spaces may be determined by various measurements, such as the socioeconomic aspect of housing developments, new and existing on-street parking spaces, proximity of the T station, improvements to local bus service and availability of shuttle services or conveniences such as 'ZipCar.' The youth/community center could have a strong occasional parking demand, given probable hosting of large events. However, the goal is to design a center that serves a local neighborhood and to create a neighborhood where people are comfortable walking, bicycling or taking public transit to events, even at night. The parking should be generally designed to minimize physical, visual, and economic impacts to both the Center and the adjacent developments. A balance between the development volume and the number of parking spaces should be sought that does not compromise the development goals set forth by the community.

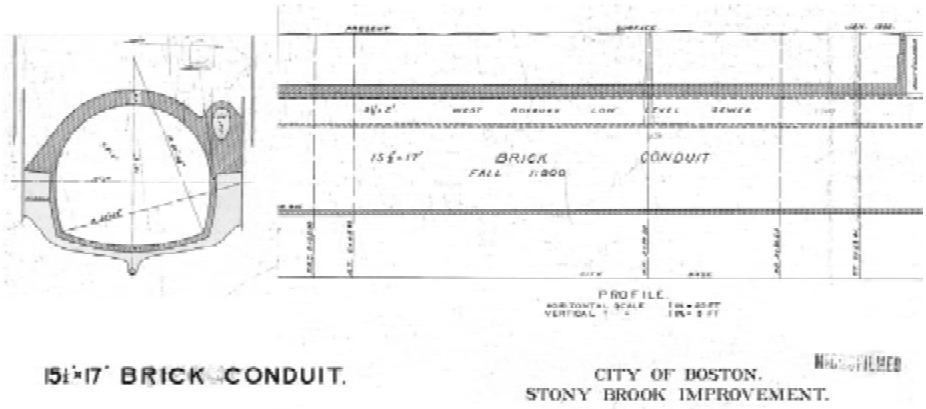


THE STONY BROOK CONDUIT

The Stony Brook Conduit runs parallel to the MBTA utility easement for most of both Parcel I and Parcel F and is buried approximately 7 to 12 feet underground. Any development permitted over it must be designed to provide both structural protection and unimpeded access by the Boston Water and Sewer Commission (BWSC).

The MBTA has identified and will continue to own its utility easement along the Orange Line track (Parcel I and portion of Parcel F). Any development proposed on or over the easement must be agreed by the MBTA.

Stony Brook Conduit & MBTA Easement
The Stony Brook Conduit Location is Based on BWSC Plan:Existing Conditions, Plan of Land prepared by BSC Group in 2001
The MBTA Easement is based on the Southwest Corridor Project, Parcel Development Plan by PRC Engineering in 1987

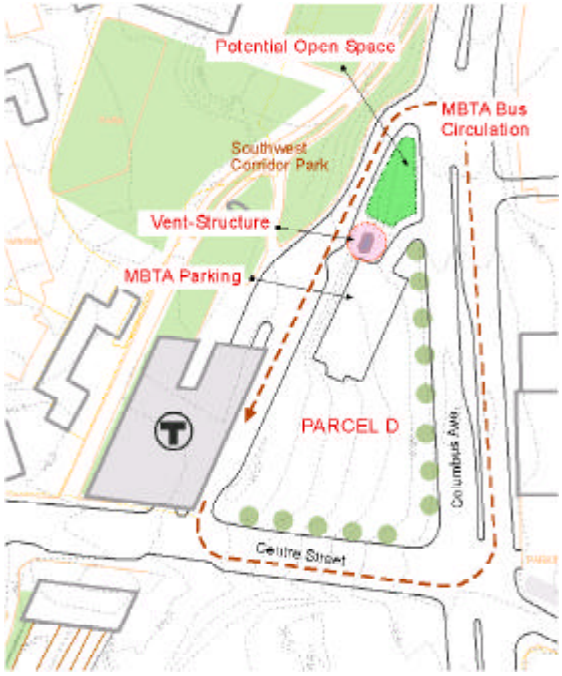


Typical Section of the Conduit
Courtesy of the BWSC

The Relocation of the NSTAR sub-station

The NSTAR sub-station is currently located at the corner of Centre Street and Columbus Avenue on Parcel E, which has been identified as perhaps the most prominent location in Jackson Square. The relocation of the facility somewhat to the south is called for to create an opportunity to develop the corner as a Jackson Square 'gateway' building.

NSTAR sub-station



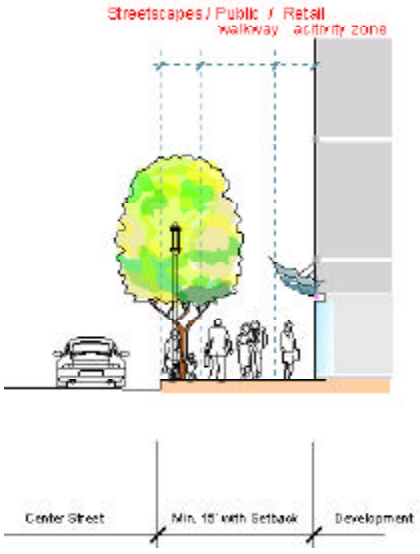
2. PARCEL D

THE SITE PLAN

Any building should be oriented to front both Centre Street and Columbus Avenue Any parking scenario must include the number of dedicated MBTA parking spaces affected by site plan. This will create a building streetwall which both defines the streets and encourages street level activities. The MBTA bus circulation around the site should be acknowledged in the site plan, with improvements offered, if possible, and the building(s) designed to minimize impacts from noise, air pollution, and traffic. Pedestrian access from mid-block on Columbus Avenue up to the MBTA Station should be maintained and could serve as a stream of potential customers for retail businesses on this parcel.

The ventilation structure for the MBTA Station must be incorporated into the site plan. Since the relocation of the structure is not possible, it will limit the development along Columbus Avenue and the number of parking spaces behind the building. The constraint of the ventilation structure could result in the creation of a significant open space at the northern end of the Parcel D site on Columbus Avenue.

Vehicular access should be made from Columbus Avenue to the 'back' of the development. The current curb cut on Columbus Avenue, just south of the MBTA accessway, could be maintained for continuing use by future development. Added on-street parking on Centre Street should be considered in the parking ratio for the uses on this parcel.



Centre Street Edge

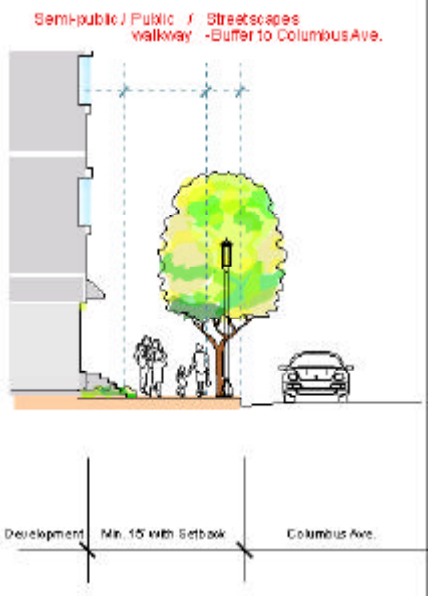
THE CENTRE STREET EDGE

The neighborhood-scaled retail/commercial uses should be located along all sides; this location is recommended by the community because it will draw more foot-traffic via adjacency to the MBTA transit station and slow down traffic on the Columbus Avenue "highway". It would also continue the neighborhood shopping activities found further up Centre Street. The building should be set back from the property line to increase the walkway (see Transportation Guidelines) and maximize pedestrian-friendly street amenities; it should be designed with attractive storefronts to encourage street level activities. The MBTA station should be taken into account when the building is designed to clarify its status as a transportation destination and to enhance the physical character of Jackson Square. The topography of the site should be well accommodated by the storefront designs to provide a continuous walking and shopping experience without awkward transitions into shops or cafes.

Good streetscapes and attractive storefronts to encourage diverse street activities

THE COLUMBUS AVENUE EDGE

Assuming sufficient demand, the Columbus Avenue edge should also have retail/commercial uses on lower floors, in order to lead pedestrians around the corner from Centre Street onto Columbus Avenue and help create connections between Roxbury and Jamaica Plain.The building front should be designed not only to assure the quality of living spaces, but also to enhance the character of the sidewalk along (and recognize the scale of) Columbus Avenue. The corner of Centre Street and Columbus Avenue could be accentuated to emphasize the prominent location



Columbus Avenue Edge

within Jackson Square and likewise, the other corner of the building might also be emphasized due to the absence of other building structures on Columbus Avenue as one travels from Roxbury Crossing toward the site. Added on-street parking on Columbus Avenue should be considered in the parking ratio for the uses on this parcel.

A building with the emphasized corner

THE BUILDING HEIGHT & DEVELOPMENT CAPACITY

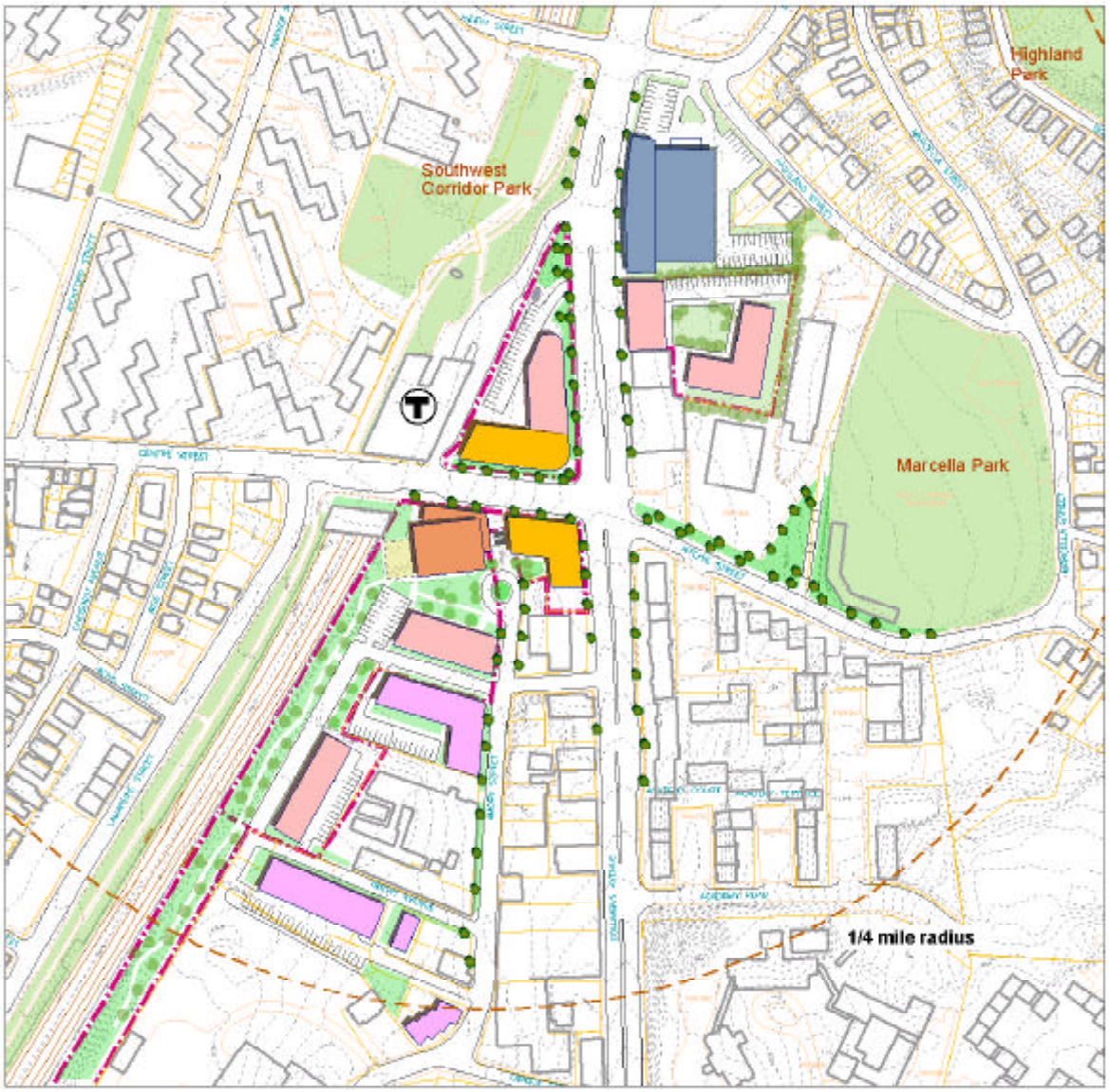
The development height on Centre Street and Columbus Avenue should not exceed 6 stories or 70 feet.

THE STONY BROOK CONDUIT

The BWSC's Stony Brook Conduit runs along the western side of the site and is buried approximately 7 to 12 feet deep underground. Any development permitted over it must be designed to be structurally independent and will have to provide BWSC access for its maintenance.

Location of the Stony Brook Conduit
Based on the BWSC Plan:Existing Conditions, Plan of Land prepared by BSC Group in 2001

3. CONCEPTUAL SITE PLANS

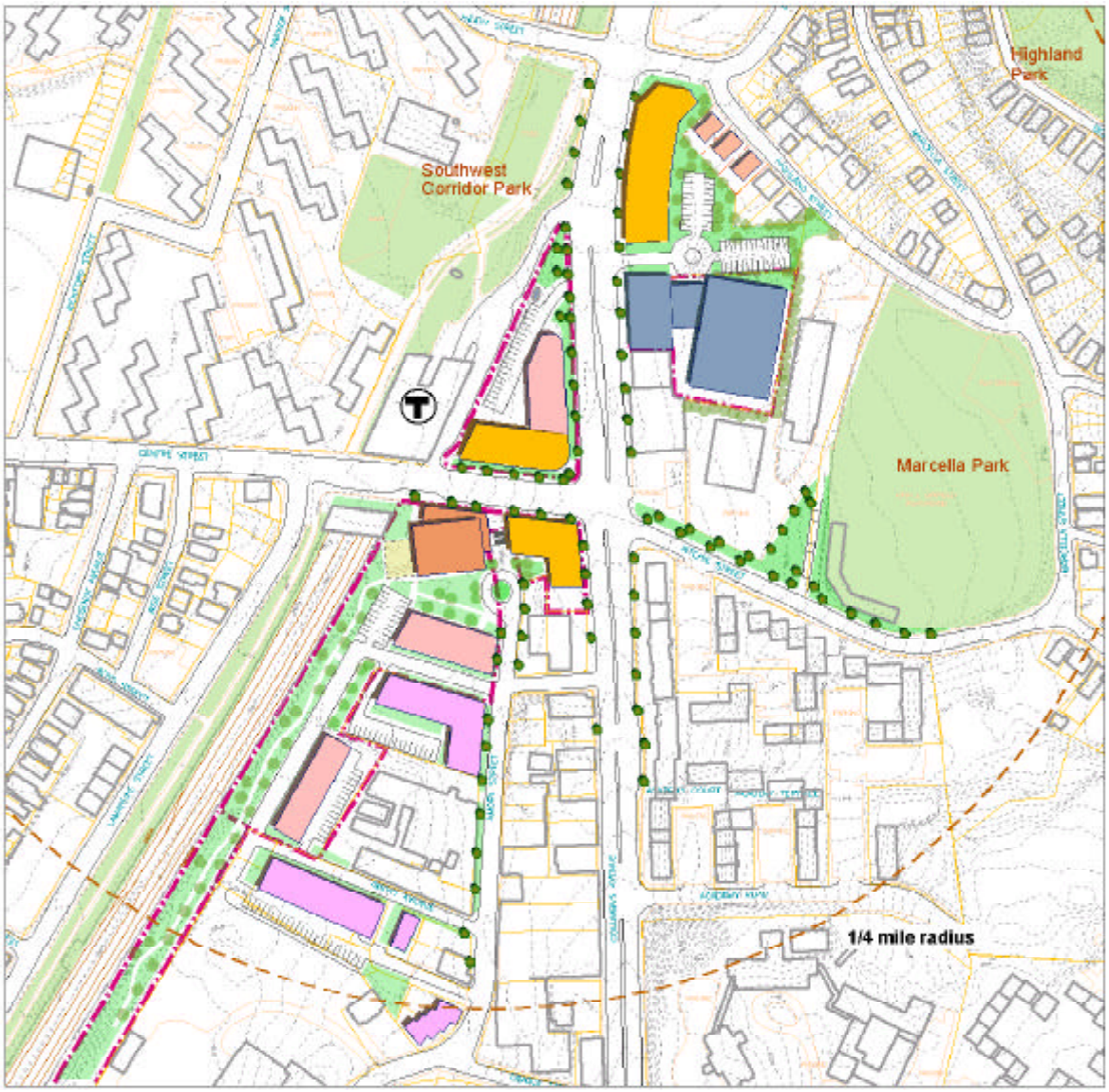


Development Scenario
Conceptual Site Plan-I

- Residential Use-Public
- Mixed Use
- Youth/Community Center
- RCC Natatorium
- Residential Use-Private
- Green Space

Total Build-out
200 residential units
110 residential units from private developments
22,500 sf commercial space
40,000 sf Youth/Community Center
60,000 sf RCC Natatorium
100 off-street parking spaces
30 on-street parking spaces

The purpose of these conceptual plans are to guide discussion on location of uses



Development Scenario
Conceptual Site Plan-II

- Residential Use-Public
- Mixed Use
- Youth/Community Center
- RCC Natatorium
- Residential Use-Private
- Green Space

Total Build-out
210 residential units
110 residential units from private developments
22,500 sf commercial space
40,000 sf Youth/Community Center
60,000 sf RCC Natatorium
79,000 sf Institutional use
115 off-street parking space
30 on-street parking spaces

The purpose of these conceptual plans are to guide discussion on location of uses

APPENDIX
TO
JACKSON SQUARE CONTEXTUAL DEVELOPMENT PLAN

BOSTON TRANSPORTATION DEPARTMENT JACKSON SQUARE SUPPLEMENTAL TRANSPORTATION ACCESS PLAN GUIDELINES

BOSTON TRANSPORTATION DEPARTMENT

JACKSON SQUARE SUPPLEMENTAL

TRANSPORTATION ACCESS PLAN GUIDELINES

The Jackson Square area has high levels of vehicular congestion, pedestrian traffic, and parking demand. The Jackson square Development will increase travel demand, and will have transportation impacts that require analysis, review, and mitigation. Through the City of Boston's Article 80 development review process, the Boston Transportation Department (BTD) will work with the Jackson Square Development Team (the "project proponent") to ensure that they thoroughly evaluate the transportation impacts associated with the Jackson Square Development (the "proposed project"), propose and analyze ways to mitigate these transportation impacts, and implement appropriate mitigation measures.

The project proponent is responsible for assessing and mitigating the short-term and long-term impacts of the proposed project and submitting the following documentation to BTD:

1. Transportation Access Plan: The Transportation Access Plan shall fully describe all transportation-related issues surrounding the proposed project. It should include the following principal components:
   - Description of Existing Transportation Conditions - A summary of existing traffic, public transit, pedestrian, bicycle, and parking conditions in the study area.
   - Evaluation of the Proposed Project's Long-Term Transportation Impacts - A detailed description of the proposed project and a detailed analysis of the proposed project's long-term impacts on traffic, public transit, pedestrian, bicycle, and parking conditions.
   - Mitigation of the Proposed Project's Long-Term Transportation Impacts - Identification of appropriate measures to mitigate the proposed project impacts, including physical and operational improvements, transportation demand management (TDM), and long-term proposed project impact monitoring.
   - Description of the Proposed Project's Short-Term Construction Impacts and Proposed Mitigation - General overview of the proposed project's construction impacts, construction schedule and phasing, and measures to mitigate the short-term impacts. This will be a summary of the more detailed Construction Management Plan (CMP) to be submitted to BTD under separate cover.

   The Access Plan will comprise the transportation components of the proposed project's various environment filings, such as the Draft Project Impact Report (DPIR) or the Final Project Impact Report (FPIR). The Access Plan may be a separate document. In any case, the Access Plan should adhere to the guidelines and scope of work set forth in the following pages.

2. Construction Management Plan: The Construction Management Plan (CMP) shall include a detailed proposal for the proposed project's construction schedule, phasing, occupancy of the public right-of-way, access and delivery requirements, transportation impacts, and mitigation. The project proponent shall submit the CMP to BTD, under separate cover from the Access Plan. The proposed project's general contractor typically prepares the CMP. Guidelines for preparation of the CMP are available from BTD. The CMP shall be completed prior to the issuance of a Building Permit from the City of Boston's Inspectional Services Department (ISD).

3. Transportation Access Plan Agreement: The Transportation Access Plan Agreement (TAPA) is a formal legal agreement between the project proponent and BTD. The TAPA formalizes the findings of the Access Plan, the mitigation commitments, elements of access and physical design, and any other responsibilities of the developer and BTD. Since the TAPA must incorporate the results of the technical analysis, physical design, and assessment of mitigation requirements, it must be executed after these processes have been completed. However, the TAPA must be executed prior to approval of the proposed project design through the City of Boston's Public Improvements Commission (PIC). An electronic copy of the basic TAPA form is available from BTD. It is the project proponent's responsibility to complete the TAPA so that it reflects the specific findings and commitments for the proposed project, and to get BTD review and approval of the document.

STUDY AREA

The Access Plan shall consist of a thorough analysis of the proposed project's transportation impacts throughout the relevant study area. The study area shall comprise the public right-of-way and important transportation elements of the area described by the following list of intersections:

Centre St./Bickford St.
Centre St./Lamartine St.
Centre St./Ritchie St./Columbus Ave.
Columbus Ave./Heath St./Centre St.
Highland St./Marcella St.
Ritchie St./Marcella St.
Dimock St./Amory St.
Columbus St./Dimock St.
Amory St./Proposed Project Site

The project proponent shall review all relevant proposed project proposals and planning studies that would affect the study area, and incorporate these into the transportation analysis, as appropriate.

DEFINITION OF TASKS

Task 1. Description of Existing Transportation Conditions

The Existing Conditions component shall summarize the current status of the transportation system within the study area. It shall focus on the issues listed below, and shall identify any existing problems or deficiencies in the transportation system. The Existing Conditions analysis will form the basis for projecting future conditions, and enable comprehensive assessment of the proposed project's transportation impacts.

1.1 Project Site Conditions. Describe general conditions in the vicinity of the proposed project site, including:

- Existing land use, including existing site square footage, building square footage, number of employees or residents, zoning provisions, and other applicable information
- Physical condition of the site, existing access and egress
- Major streets and intersections in the vicinity of the site
- On-street regulations

Include a survey of existing conditions.

1.2 Traffic. The Access Plan shall include traffic volume counts at the study area intersections for weekday morning and evening peak periods under existing conditions. In addition, mid-afternoon counts are required the Columbus/Richie/Centre intersection because of the high volume of school buses at this intersection. Additional traffic counts are also required for the Saturday afternoon peak.

Existing capacity analyses shall be performed to determine level of service at all study area intersections. Analyses shall reflect realistic peak period characteristics, including pedestrian volumes, requirements for pedestrian phases, curb operations (bus and

school bus stops, pick-up / drop-off), usable lanes, grade, and percentage of heavy vehicles. Appropriate traffic models will be discussed below.

1.3 Parking. The Access Plan shall summarize the parking supply within ¼ mile of the proposed project site. The parking inventory shall focus on publicly available spaces, but shall also include private resident or employee spaces as well, if the information is available. The parking inventory shall include:

a. Location (block face for on-street spaces, facility for off-street spaces). Include a graphic representation of the parking supply locations with respect to the proposed project.
b. Type of Space
   - On-street (metered, resident parking, unregulated, etc.)
   - Off-street (surface lot or garage, user type: resident, employee, commercially available, customer, etc.)
c. Parking Fees, by Type of Space
d. Percentage Utilization During Parking Peak (assume 12 noon)

1.4 Transit. The Access Plan shall describe the study area's mass transit system:

a. Transit Supply
   - Massachusetts Bay Transportation Authority (MBTA) services, proximity to site
     - Service (mode of transit, line, closest station stop)
     - Service characteristics (frequency during peak periods, geographic connections)
     - Physical characteristics (station conditions, rolling stock)
   - Private transit services (summarize characteristics above)
   - Other transit and high-occupancy vehicle (HOV) services

b. System Utilization
   - Capacity by line during peak periods
   - Current ridership and percentage capacity utilization by line during peak periods

1.5 Pedestrians. The Access Plan shall include a description of pedestrian conditions on sidewalks and intersections adjacent to the site, including major pedestrian routes and desire lines in and around the site, volumes of pedestrians on these routes, and the conditions of these corridors, including any deficiencies or barriers.

Pedestrian volumes shall be counted and pedestrian level of service shall be calculated at the following intersection crossings and sidewalk locations:

Centre St./Bickford St.
Centre St./Lamartine St.
Centre St./Ritchie St./Columbus Ave.
Columbus Ave./Heath St./Centre St.
Highland St./Marcella St.
Ritchie St./Marcella St.
Dimock St./Amory St.
Columbus Ave./Dimock St.
Amory St./Proposed Development Site
Centre St./MBTA

Describe pedestrian accommodation at signalized intersections in the study area (i.e. exclusive vs. concurrent, crossing time provided).

1.6 Bicycles. The Access Plan shall describe existing bicycle usage, primary bicycle routes, accommodation of bicycles in the public right-of-way, and the current supply and location of any existing bicycle racks on or adjacent to the project site. On a day with good weather (record date and weather conditions), survey bicycle rack utilization by location. Document storage of bicycles in locations without bicycle racks. Include bicycle volume counts at the following intersections and bike routes:

Heath St./Columbus Ave./Bikeway
Centre St./Lamartine St.
Centre St./Ritchie St./Columbus Ave.

1.7 Loading and Service. The Access Plan shall describe any existing loading and service uses on the site, as well as any special conditions relative to loading and service in the surrounding area.

Task 2. Evaluation of Proposed Project's Long-Term Transportation Impacts

The central component of the Access Plan is the evaluation of the proposed project's long-term transportation impacts. The Access Plan must evaluate these impacts in detail for all the transportation modes and aspects that will be affected, including traffic, parking, public transit, pedestrians, bicycles, and service and loading. Future developments in the study area and future developments outside the study area that have an impact on the study area shall be included in the Access Plan. These impacts must be compared to the appropriate baseline condition and the Future No-Build Condition. The following are the principal issues, modes, and conditions that must be analyzed.

2.1 Project Description. The Access Plan shall include a summary of the key proposed project characteristics that are relevant to the proposed project's transportation impacts. These include:

- Proposed Project name and street address
- Study area, including critical intersections
- Anticipated construction start and completion dates
- Relevant zoning regulations with respect to use, parking and other characteristics
- Required permits, variances, and licenses
- Site area
- Proposed Project's gross square footage and floor-area ratio (FAR)
- Gross square footage by use
- Other relevant variables (e.g. number of dwelling units, number of employees)
- Number of parking spaces, specified by use type
- Number of loading bays, dimensions of bays, design loading vehicle

2.2 Trip Generation Analysis. The Access Plan shall include a clear and detailed trip generation analysis for the proposed uses of the site. This analysis shall include:

a. Person-Trip Generation. The Access Plan shall summarize the proposed project's person-trip generation, for daily, AM peak, and PM peak trips. In addition, person-trips shall also be calculated for Saturday afternoon peak hour (e.g. cultural, recreational, sport, or entertainment use).

The person-trip calculations shall be based on appropriate trip generation rates, typically the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 6th Edition*. The ITE manual includes comprehensive vehicle-trip generation rates based on surveys in suburban locations throughout the United States. Because Boston benefits from an excellent public transit system and pedestrian access, ITE vehicle-trip generation rates are not directly applicable to resulting vehicle trips. ITE rates shall be used to generate total person-trips by correcting for vehicle occupancy rate (VOR). The person-trip generation analysis shall be summarized in a clear table, in the body of the Access Plan, including all of the following information:

- Land use type
- Square footage, by land use type
- Vehicle-occupancy rate (VOR) assumption, by land use type (for translation of vehicle-trip rates to person-trip rates)
- Daily person-trip generation (by land use and overall)
    - Daily person-trip generation rate (per 1,000 square feet, or per unit)

- Resulting daily person-trip ends
- AM peak hour person-trip generation (by land use and overall)
  - AM peak hour person-trip generation rate
  - AM peak hour person-trips, entering
  - AM peak hour person-trips, exiting
- PM Peak Hour person-trip generation (by land use and overall)
  - PM peak hour person-trip generation rate
  - PM peak hour person-trips, entering
  - PM peak hour person-trips, exiting
- Source for trip generation rates

b. Mode Split and Vehicle Occupancy Rate. Person-trips shall be apportioned among the various principal modes (automobile, public transit, walking, bicycling) using an appropriate mode split. The mode split shall be presented as percentages of automobile, public transit, and walk / bicycle travel. Working with BTD, the Central Transportation Planning Staff (CTPS) has compiled appropriate mode split assumptions for various sections of Boston, according to trip type. These mode splits, along with VOR for automobile trips, are available from BTD. The Access Plan shall include a clear, easily understood table that summarizes the assumptions and the resulting trips by land use type, by trip purpose, and by mode.

c. Trip Distribution. The trip distribution shall identify the directional split (i.e. north, south, east, west) of person-trips and vehicle-trips for the specific location and trip types of the proposed project.

d. Trip Assignment. The distributed trips shall be assigned to the appropriate means of accessing the proposed project: highway routes, surface streets, surface intersections, sidewalks, crosswalks, site access / egress points, and public transit lines. If the proposed project expects to rely upon an off-site parking supply, trips shall be assigned appropriately to these locations. Drop-off, pick-up, and valet trips shall also be assigned appropriately, i.e. both entering and exiting the site access, and entering or exiting an off-site parking area.

2.3 Future No-Build Condition. The analysis of the proposed project's transportation impacts must be based on a comparison with an appropriate baseline condition. The proposed project's impacts would be felt fully during some future "horizon year" when the proposed project is expected to be complete, occupied, and operating. The effects of the proposed project (under the "Future Build Condition") are most appropriately demonstrated in comparison to projected transportation conditions during the horizon year without the effects of the proposed project.

- The horizon year shall be five years in the future, unless specific circumstances require that a different time frame be used.
- The Future No-Build Condition shall be based on the Existing Conditions assessment, with the addition of development and infrastructure projects that have been proposed and are expected to be complete and operational by the horizon year (per BTD and BRA instructions).
- The Future No-Build Condition traffic, transit, and pedestrian volumes shall also include a background growth rate of 1 – 1 ½ % per year (depending upon local

conditions) added to existing traffic volume counts, transit ridership, and pedestrian counts, unless otherwise specified by BTD.

2.4 Future Build Condition. The central component of the Access Plan is the assessment of the proposed project's long-term impacts. This shall include evaluations of the proposed project effects on all transportation modes and aspects, throughout the study area.

a. Traffic Impacts.

i) Traffic Volumes. The traffic analysis shall include diagrams of turning movement volumes generated by the proposed project at all study area intersections, and total turning movement volumes for the Future Build Condition. Therefore, the Access Plan shall include turning movement volume diagrams for AM peak volumes, PM peak volumes, mid-afternoon volumes at Columbus/Richie/Centre and Saturday afternoon peaks of each of the following:
   a) Existing Conditions (based on current traffic counts)
   b) Future No-Build Conditions (Existing Conditions, plus appropriate future changes and growth factor)
   c) Project-Generated Traffic Volumes (based on trip generation)
   d) Future Build Conditions (Future No-Build Conditions, plus Project-Generated Traffic Volumes)
   e) Future Build Conditions with Mitigation (if the project proponent plans to undertake any roadway or signalization changes in order to mitigate traffic impacts of the proposed project)

ii) Traffic Capacity Analysis Software. The Access Plan shall include traffic capacity analyses for Existing Conditions, Future No-Build Conditions, and Future Build Conditions. The capacity analysis shall be performed using an approved and appropriate capacity analysis software program.
   - For closely spaced intersections with long queues that create interaction between intersections, the project proponent shall use the computer model Synchro to calibrate field conditions that can accurately model these effects. In such cases, the project proponent shall model all of the intersections that would interact.

   The computer model output shall be attached to the Access Plan as an appendix. Provide BTD with an electronic copy of the Traffic Capacity Analysis.

iii) Traffic Capacity Analysis Results Summary. The Access Plan shall include a tabular summary of the traffic capacity analysis, for all conditions (Existing, No-Build, and Build) for each intersection as a whole and for each approach of every intersection. The summary shall include the volume-to-capacity ratio (v/c), level of service (LOS), delay, and estimated queue lengths for each study intersection, and for each approach of every intersection. The summary table shall also highlight changes to intersection and individual approach LOS that result from site-generated traffic. Provide BTD with an electronic copy of the Traffic Capacity Analysis.

iv) Traffic Counts. The project proponent shall submit, under separate cover, turning movement count summary sheets for each intersection in the study area.

b. Parking Impacts. The Access Plan shall include an analysis of projected parking demand and proposed parking supply.

i) Parking Demand Analysis. The Access Plan shall include an analysis of total parking demand in the horizon year, broken down by land use and user type. The parking demand analysis shall include:
- Daily vehicle-trip generation by land use and user type (consistent with mode split and VOR)
- Parking turnover by land use and user type (cite source)
- Parking demand peaks by land use and user type
- Overall parking demand and peak parking demand, based on shared parking among all land uses and user types included in the proposed project

ii) Proposed Parking Supply. The Access Plan shall include a summary of the proposed project's proposal for off-street parking supply. Parking supply, and parking costs, play a central role in determining mode split and vehicular traffic impact. In general, parking shall be limited to a minimum supply that is appropriate to the neighborhood, the proposed project transit access, and the proposed project mode split. The proposed project parking ratios are to be in accordance with the Parking in Boston Guidelines, December 2001. The information below shall be summarized in a clear table.
- Total Spaces
  - Existing
  - Future No-Build (if applicable)
  - Future Build Parking Conditions
- Parking Allocation
  - Space allocation among various land uses
  - Parking ratios: spaces per thousand square feet or per unit, by land use
  - Specially-designated parking spaces, e.g. vanpools, livery vehicles, rental cars, car-sharing
  - Treatment of existing parking spaces, including displacement of existing parking spaces and how the parking demand for these spaces would be met in the Future Build Condition
- Comparison of Parking Supply and Demand
  - Projected shortfall or surplus of parking spaces, by land use
  - Proposed management of shortfall or surplus
- Provide a plan of all parking facilities, including layout, access, and size of spaces.

iii) Off-Site Parking Supply. Describe any anticipated utilization of off-site parking supply (as described in the Existing Conditions section, amended to reflect Future No-Build Conditions) required to satisfy project-generated parking demand.
- On-Street Parking Supply
- Off-Street Parking Supply
  - Number and type of spaces required (i.e. publicly-available, employee, residential)
  - Resulting parking utilization at 12 noon on a weekday (additional parking survey times may be required, depending upon the nature of the project)

iv) Proposed Parking Management Plan
- Description of Proposed Parking Operations
  - Access control
  - Pass or payment medium
  - Management of operations to prevent illegal parking, violation of 5-minute idling law
- Parking Fees
- Management of Specially-Designated Parking Spaces (e.g. vanpool, carpools, rental cars, car-sharing)
  - Location
  - Parking fees
  - Accommodation of increased supply if demand warrants

c. Transit Impacts. Describe the anticipated impacts of the proposed project on the mass transit system, based on the information about Existing Conditions and the projected transit person-trips (based on trip generation – trip distribution – mode split calculations). Future transit conditions shall be based on transit supply and capacity that is expected to be available in the horizon year; if there is some doubt, the project proponent shall consult with BTD and/or the MBTA. The project proponent may use generally available MBTA ridership data as a basis for this analysis. The Access Plan shall include the following information:

i) Transit Trip Distribution
- Distribution of project-generated transit trips by zone
- Distribution of project-generated transit trips by transit line / route

ii) System Utilization
- Existing Conditions: Capacity and utilization by line
- No-Build Conditions: Capacity and utilization by line
- Build Conditions: Capacity and utilization by line

d. Pedestrian Impacts. Describe future pedestrian conditions in the study area:
- Pedestrian access to and from the proposed project, pedestrian circulation routes
- Pedestrian accommodation in the proposed project's public spaces (e.g. sidewalk, adjacent intersections, plaza spaces, benches, etc.)
- Pedestrian level of service (LOS) at all surveyed crosswalks, sidewalks and other locations
  - Existing Conditions
  - Future No-Build Conditions
  - Future Build Conditions

NOTE: The traffic capacity analyses must also assume appropriate accommodation of pedestrians in all signalization assumptions. The pedestrian impacts analysis shall describe the assumptions regarding accommodation of pedestrians in the traffic analysis, i.e. pedestrian walk rate and percentage of cycles in which pedestrian phase is called (verify with BTD).

e. Bicycles. Describe bicycle access to, from, and within the proposed project site. Describe bicycle storage and other amenities (e.g. shower and changing facilities) to be provided. BTD will provide guidelines on bicycle storage requirements based on project type and size.

f. Loading and Service. The proposed project must accommodate loading and service facilities in an off-street location. The loading and service plan shall not rely upon loading facilities and truck back-up maneuvers in the public right-of-way. Describe service and loading requirements:
   - Number of loading bays
   - Services to be provided (e.g. garbage compactor, garbage collection, restaurant service, move-in / move-out, etc.)
   - Level of loading and service activity (number of trucks per day or per week)
   - Loading and service schedule, schedule restrictions (the project proponent shall prohibit or strictly limit loading and service activities during peak periods)
   - Design vehicle(s)
   - Required truck turning movements (show design vehicle turning movements on site plan)
   - Major loading and service vehicle routes for site access and egress
   - Access for emergency vehicles

2.5 Site Plan. Provide an engineered site plan showing Build Conditions (contrast with existing conditions):
- Public right-of-way layout
  - Roadways
  - Sidewalks
- Vehicular access and circulation
- Service and loading
- Parking
- Bicycle storage
- Proposed on-street regulations

Task 3. Mitigation of the Project's Long-Term Transportation Impacts

The Jackson Square Development offers benefits, but also consumes public services and create impacts on public resources. Chief among these impacts is the proposed project's effect on the transportation system. The project proponent is required to quantify and analyze these impacts through the Access Plan. It is then the responsibility of the project proponent, working with BTD, to develop strategies for reducing and mitigating these impacts. These strategies will include travel demand management (TDM) measures and improvements to Boston's transportation system.

These transportation system improvements and mitigation measures have associated costs. The project proponent should view these costs as an integral component of the overall project cost, necessary to enable the transportation system to accommodate the proposed project's impacts. The mitigation measures benefit the users of the transportation system, in particular the new users associated with the proposed project. The project proponent shall allocate appropriate funding for the mitigation. The mitigation measures associated with the proposed project will be specified in the project's Transportation Access Plan Agreement (TAPA) between the project proponent and BTD.

3.1 Travel Demand Management (TDM). Travel demand management comprises a variety of strategies designed to reduce single-occupancy vehicle (SOV) travel and encourage "alternate modes" of transportation (public transit, walking, bicycling). TDM programs are critical due to the disproportionate impacts of SOV travel on congestion, parking demand, air quality, and quality of life.

In the TAPA, the proponent will be required to implement the following TDM measures:

a. Transportation Coordinator. Designate a full-time, on-site employee as the development's transportation coordinator. The transportation coordinator shall oversee all transportation issues. This includes managing vehicular operations, service and loading, parking, and TDM programs. In addition, the transportation coordinator will be responsible for the monitoring program and will serve as the contact and liaison for BTD, the MBTA and the Transportation Management Association (TMA).
b. Ridesharing / Carpooling. Facilitate ridesharing through geographic matching, parking fee discounts, and preferential parking for carpools / vanpools.
c. Guaranteed Ride Home Program. Offer a "guaranteed ride home" in order to remove an obstacle to transit use and ridesharing
d. Transit Pass Programs. Encourage employees to use transit through the following measures:
    - Offer on-site transit pass sales or participate in the MBTA Corporate T-Pass Program
    - Offer federal "Commuter Choice" programs, including pre-tax deductions for transit passes and subsidized transit passes
e. Information and Promotion of Travel Alternatives
    - Provide employees and visitors with public transit system maps and other system information
    - Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options

- Sponsor an annual (or more frequent) “Transportation Day” at which employees and residents may obtain information on travel alternatives and register to participate in ridesharing programs
- Provide information on travel alternatives for employees and visitors via the Internet
- Provide information on travel alternatives to new employees and residents

f. Transportation Management Association (TMA) Membership. Investigate joining a Transportation Management Association. Encourage tenants to join the TMA as well. If no TMA is established in the project area, investigate starting a new TMA or becoming affiliated with an existing TMA. A TMA can provide many of these TDM measures, including ridematching, guaranteed ride home, and transit information and promotional materials.

g. Bicycle Facilities and Promotion
   - Provide secure bicycle storage (number of spaces will be specified depending upon size of development and type of land use)
   - Provide additional publicly-accessible bicycle storage (number of spaces will be specified)
   - Promote bicycles as an alternative to SOV travel, provide promotional material on bicycle commuting and bicycle safety, and provide incentives for bicycle use

h. Parking Management
   - Offer preferential parking to carpools and vanpools
   - Offer preferential parking space for car-sharing
   - Offer parking space, charging facilities for electric vehicles
   - Enforce a 5-minute limit on vehicle idling for all users of the proposed project, in accordance with Massachusetts state law

i. Trip Reduction Strategies. To the degree possible, the project proponent shall implement the following strategies for its own on-site employees and encourage tenants to implement these strategies as well.
   - Telecommuting. Reduce overall trip demand by enabling employees to telecommute.
   - Flexible Work Schedules. Reduce peak hour and overall trip demand by enabling employees to telecommute, work a compressed workweek, or work hours that enable off-peak commuting.
   - Local Hiring. Recruit and hire employees from the local area. Such local employees can more easily use alternatives to SOV travel, including walking, bicycling, and transit.

3.2 Transportation System Improvements. In order to meet Boston’s mobility needs as its population, density, and land development increase, Boston’s transportation system requires improvements. These improvements will offset the transportation impacts of the proposed project. In addition, these improvements can make the traveling experience easier in the vicinity of the proposed project, which accrues, to the benefit of the project proponent and the proposed project users.

a. Geometric Changes and Improvements to the Public Right-of-Way - The project proponent may be required to make geometric changes and improvements to the roadways, sidewalks, and other elements in the vicinity of the proposed project. These changes and improvements may be necessary in order to enable new circulation patterns resulting from the proposed project and mitigate impacts of new vehicle or pedestrian trips. The project proponent’s consultant in consultation with

BTD shall design changes and improvements. The project proponent will be required to directly fund and implement all changes and improvements to the public right-of-way, and to obtain any required permits. The project proponent shall obtain the approval of the City of Boston's Public Improvements Commission (PIC) for any changes to the public right-of-way. These improvements shall be made with input from BTD, per specifications provided by BTD, by a contractor approved by BTD, and subject to final BTD inspection and approval.

b. Traffic Signal Improvements - Improvements to traffic signals in the vicinity of the proposed project may be necessary to manage the increased travel demands placed on the intersections. Improving the operations of these signals can reduce congestion and improve conditions for pedestrians, bicycles, transit vehicles, and general traffic. Typical traffic signal improvements that BTD may require include:
   i) Traffic signal equipment
      - Signal controller
      - Signal heads and pedestrian heads
      - Signal poles and mastarms
   ii) Traffic monitoring equipment
      - System detectors
      - Video monitoring cameras
   iii) Traffic signal communications equipment
      - Communications conduit (4" PVC)
      - Signal interconnect cable

   The project proponent will be required to directly fund and implement all traffic signal improvements, and to obtain any required permits. These improvements shall be made with input from BTD, per specifications provided by BTD, by a contractor approved by BTD, and subject to final BTD inspection and approval.

Task 4. Description of the Proposed Project's Short-Term Construction Impacts and Proposed Mitigation

The Access Plan shall include an overview of construction period transportation impacts and proposed short-term mitigation. This shall be a summary of the more detailed Construction Management Plan (CMP) that must be submitted to BTD under separate cover. The construction management summary in the Access Plan shall provide an appropriate level of information regarding the analysis and proposed management of the impacts of the proposed project during the construction period, including:

- The need for full or partial street closures, street occupancy, sidewalk closures, and/or sidewalk occupancy during construction
- Frequency and schedule for truck movements and construction materials deliveries, including designated and prohibited delivery times
- Designated truck routes
- Plans for maintaining pedestrian and vehicle access during each phase of construction
- Parking provisions for construction workers
- Mode of transportation for construction workers, initiatives for reducing driving and parking demands
- Coordination with other construction projects in the area
- Distribution of information regarding construction conditions and impact mitigation to abutters

VII. LOCATION AND DESCRIPTION OF THE PARCELS

The information provided herein was obtained from various public sources.

The surplus vacant Commonwealth Parcels were originally under the care and control of the Massachusetts Department of Public Works, the predecessor to the MHD. The Commonwealth Parcels were transferred to the MBTA for the purpose of constructing the Southwest Corridor and the relocated Orange Line Subway Service. By agreement, any land not used for transportation related purposes by 1995, was to revert back to the care and control of MHD. In order to facilitate the redevelopment of Jackson Square, the MHD Board of Directors voted to declare the Commonwealth Parcels as "surplus" to their current and future use. Upon this declaration, DCAM undertook the process for disposition of the Commonwealth Parcels pursuant to Chapter 81 Section 7E and Section Sections 40E through 40J of Chapter 7 of the Massachusetts General Laws. The chart below identifies these two [2] parcels as they appear on the MBTA survey included in Appendix B. (This acreage has not yet been confirmed. The exact acreage will need to be confirmed by a field survey prior to conveyance to the selected redeveloper.)

As mentioned previously, additional parcels requested of the MBTA and the City are also an integral part of this RFP. The description of these parcels was estimated by examination of City of Boston Assessing Data Maps and after consultation with the City, the MBTA and the DCAM. These individual parcels are identified as parcels #35, #36, #37 and #C.

Jackson Sq. Development Parcels*

Parcel ID	Area [sq.ft.]	Current Owner
# 69	32,556	DCAM
# 70	56,525	DCAM
# 35	60,106	MBTA
#36	650	MBTA
#37	5,350	MBTA
# C	57,086	DND

*See aerial photo of location map on following page.

The MBTA currently owns a parcel of land adjacent to the Commonwealth Parcels and it is restricted for use as a MBTA utility easement. Ownership of said area, comprising an additional area of

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approximately 108,426-sf, will be retained by the MBTA for the purpose of maintaining various subsurface utilities that are essential to mass-transit operations in the Jackson Square area. However, the MBTA has agreed to pursue release of the non-exclusive surface rights in this parcel, situated along the Orange Line corridor, for purposes of delivering a long-term agreement to the Authority, for uses in connection with the establishment and maintenance of an Alternative Transportation Corridor, i.e. non-motorized public transportation as an amenity to the Jackson Square redevelopment offering herein. The Authority will deliver the rights it acquires in this parcel to the selected developer for fair market value of the parcel after the rezoning of Jackson Square has been completed.

Respondents to this RFP shall submit proposals for the development of the Commonwealth Parcels and the MBTA Parcels as a single development area. Additionally, respondents have the option of including or not including the City Parcel-C within their overall development plan.

VIII. SUBMISSION REQUIREMENTS

1. SELECTION CRITERIA

All submissions from persons and/or firms in response to this RFP (hereinafter referred to as the "Respondents") will be evaluated based upon their ability to creatively respond to the CDP and other general concerns as articulated below:

- the Respondent acknowledges that any and all costs incurred by any Respondent in responding to this RFP or in otherwise developing submissions are entirely the responsibility of such Respondent and shall not be reimbursed in any manner by the Commonwealth, the City of Boston, the Boston Redevelopment Authority, the Massachusetts Bay Transportation Authority or the Mass Development Finance Agency;

- the Respondent tendering a purchase price consistent with the fair market value of the property as determined by an independent appraisal as commissioned by the Commonwealth, the City, or the MBTA;

- the Respondent's understanding that the properties will be conveyed "as is";

- the Respondent's ability to assume all costs related to the assessment and remediation of all unknown and known environmental conditions that exist on the site/s;

- the Respondent's creative response to the contextual urban design vision for Jackson Sq.

- the Respondent's ability to incorporate within their plan other uses that are appropriate and consistent with the Jackson Square urban design vision

- the Respondent's ability to work within the framework of a community driven development review process;

- the Respondent's (and it's team members) prior experience in real estate development;

- the Respondent's ability to respond creatively to the affordability goals for residential dwellings established by the Jackson Sq. Coordinating Group;

- the Respondent's ability to contribute equity to the project;

- the Respondent's development schedule including key milestones and anticipated completion and occupancy;

- the Respondent's ability to assemble a development team (including, but not necessarily limited to architects, engineers, contractors, environmental consultants, etc.); and

- the Respondent's financial qualifications and the corresponding financial viability of the project proposed.

2. SELECTION PROCESS

The Jackson Square Selection Committee (the "Selection Committee") shall be made up of representatives from the JCG, the DCAM, the MBTA, the DND, the MDFA and the Authority. (See following page, "RFP Activity Flow Chart").

The Selection Committee will review all proposals submitted in accordance with this RFP. All proposals will be reviewed in accordance with and be subjected to the criteria, procedures,

RFP Activity Flow Chart

The Jackson Square Selection Committee (the "Selection Committee") shall be made up of representatives from the Jackson Square Coordinating Group (the "JCG"), the DCAM, the MBTA, the DND and the Authority.

The Selection Committee will review all proposals submitted in accordance with this RFP. All proposals will be reviewed in accordance with and be subjected to the criteria, procedures, submission requirements, and other requirements outlined in this RFP.

The Selection Process shall be conducted in two phases; a Qualifying Phase One and the Designation Phase Two.

In the Qualifying Phase One, developers will have 90 days to draft their responses. The goal of this effort is to demonstrate that they understand the community review process and have the requisite experience and resources to successfully compete for a designation. Following the submission of the required information, the Selection Committee will interview the Respondents, during which time Respondents will have the opportunity to more fully present their qualifications.

All Qualifying Phase One responses will be available for public review at the BRA and summaries may be published at the appropriate time in neighborhood newspapers.

Immediately following the Selection Committee's initial review process, a public meeting will be scheduled for the respondents to present their qualifications to the community for further input, comment and suggestions.

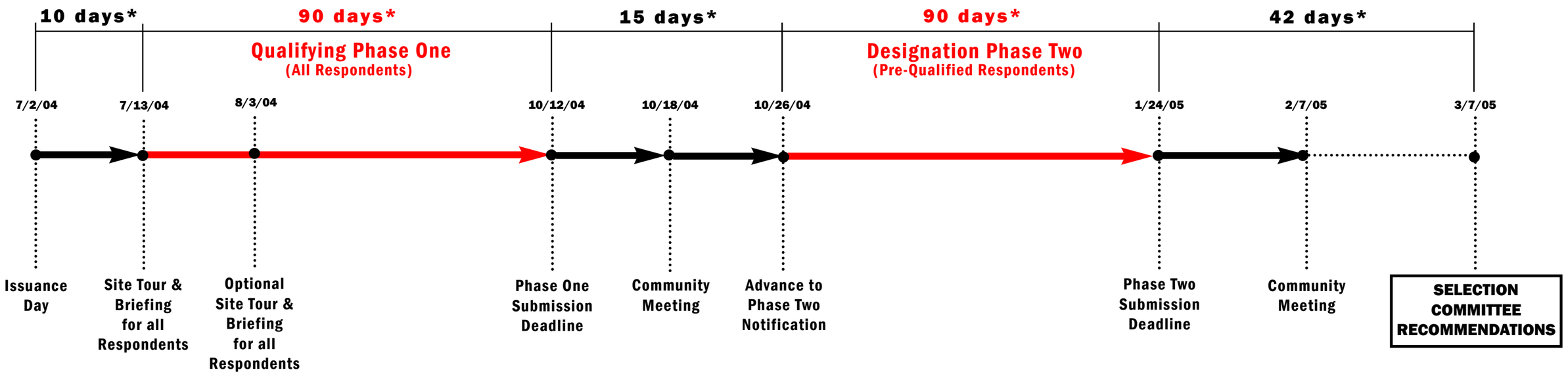
Two weeks after the above-mentioned public meeting, the Selection Committee will recommend a short-list of Respondents to proceed to the Designation Phase Two of the Selection process. (Respondents on said short-list are referred to as "Pre-qualified Respondents")

Pre-qualified Respondents will have another 90 days, from the date of official notification from the Authority, to prepare responses according to the criteria described in the Submission Format, Section B- Designation Phase of this RFP.

At the end of this 90 days period, Pre-qualified Respondents will submit their presentation materials to the BRA, who shall distribute them to the Selection Committee. The Selection Committee will then deliberate among themselves and take appropriate steps to seek clarification from Respondents regarding any pertinent matter under their consideration.

Shortly after receiving the Phase Two responses from the Pre-qualified Respondent, the Selection Committee shall schedule a public meeting, at which time each Phase Two Pre-qualifier shall make their presentation and respond to questions from the audience.

After the aforementioned public meeting, the Selection Committee shall begin its deliberations to recommend the Winner/s.



* calendar days

submission requirements, and other requirements outlined in this RFP.

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Immediately following the Selection Committee's initial review process, a public meeting will be scheduled for the respondents to present their qualifications to the community and give them an opportunity for public comment.

Two weeks after the above-mentioned public meeting, the Selection Committee will recommend a short-list of Respondents to proceed to the Designation Phase Two of the Selection process. (Respondents on said short-list are referred to as "Pre-qualified Respondents")

Pre-qualified Respondents will have another 90 days, from the date of official notification from the Authority, to prepare responses according to the criteria described in the Submission Format, Designation Phase Two of this RFP.

At the end of this 90 days period, Pre-qualified Respondents will submit their presentation materials to the BRA, who shall distribute them to the Selection Committee. The Selection Committee will then deliberate among themselves and take appropriate steps to seek clarification from Respondents regarding any pertinent matter under their consideration.

Shortly after receiving the Phase Two responses from the Pre-qualified Respondent, the Selection Committee shall schedule a public meeting, at which time each Phase Two Pre-qualifier shall

make their presentation and respond to questions from the audience.

After the aforementioned public meeting, the Selection Committee shall begin its deliberations to recommend the Winner/s.

Final designation of the redeveloper for the Commonwealth Parcels is subject to the approval of the Commissioner of DCAM.

Final designation for the MBTA owned parcel is subject to the approval of the MBTA Advisory Board, upon recommendation of the General Manager.

Final designation for the City owned parcel is subject to the approval of the Public Facilities Commission, upon recommendation of the Director of the DND.

In addition, the Authority, the DCAM, the MBTA and DND reserve the right, individually and collectively, to reject any and all proposals, if it deems such action to be in the best interests of the Commonwealth, the MBTA and/or the City of Boston.

2. SUBMISSION FORMAT

All submissions must contain the following information:

A. Qualifying Phase One

i. Respondent's Name and Organizational Structure. Set forth the name, address, telephone number of the Respondent and the name of principals of the Respondent. Specify as to whether the Respondent is a corporation, partnership, joint venture, individual or otherwise.

ii. Corporate Data (if applicable). Provide the incorporation date and where the Respondent is incorporated. If not incorporated in the Commonwealth of Massachusetts, specify whether the Respondent is licensed/authorized to do business in the Commonwealth of Massachusetts. Provide names of all officers, staff members and respective titles.

iii. Partnership Data (if applicable). Provide the date the partnership was organized. Provide the name and

address of each partner and whether such partner is a general, limited, special or other kind of partner.

iv. Joint Venture Data (if applicable). Provide the date the Joint venture was organized. Provide the name and address of each partner and the percentage of ownership and participation of each partner in the joint venture. Also provide the names and addresses of all the parties who have a direct or indirect interest in the joint venture.

v. Description of Respondent's Business (if applicable). Briefly describe the principal business that the Respondent is engaged in and the number of employees employed by the Respondent by professional discipline, number and location of offices.

vi. Key Personnel. Specify the name/s of the member/s of the Respondent's staff that will have primary responsibility for developing and managing the project. Provide copies of the resumes of such personnel and a list of similar projects developed or managed by such personnel. In addition, specify name/s of any professional consultants (e.g., architects, engineers, attorneys) that the Respondent intends to employ in connection with the development of the project.

vii. Financial Information. Provide any relevant documentation and information regarding the Respondent's financial status and ability to finance the project.

viii. Contact Person. Provide the name, address, telephone number and facsimile of the primary contact person who will be responsible for responding to questions regarding the Respondent's proposal.

ix. Describe generally any relevant experience that the Respondent and its principals have had in connection with the development of affordable housing, commercial/retail, mixed use, recreational facilities or any other relevant activities.

x. Describe specifically any recent project/s that the Respondent has completed that would evidence its ability to achieve the objective of this RFP.

xi. Describe specifically any relevant project/s that the Respondent has been involved in and where community participation was required, and the results of such involvement.

xii. Provide any other information about the Respondent's experience or qualifications to develop the Project that the Respondent believes is relevant to this RFP. Please provide descriptions of other similar projects that have been successfully undertaken by the Respondent and provide project references. Please provide bank references. Also provide the names, titles, addresses, and telephone numbers of at least three [3] references for the Respondent.

xiii. History of Tax arrears on property owned in Boston by the principles of the development team.

xiv. Legal judgments or actions pending against the principles of the development team.

xv. Legal judgements or actions pending against the principles of the development team.

xvi. Completed Disclosure of Beneficial Interest Statement in the form attached to this RFP as Appendix F.

B. **Designation Phase Two** submission information must provide a comprehensive description of the Respondent's intention and ability to finance, design, obtain all of the necessary permits and approvals the redevelopment of the Project, including the following:

i. Sources and Uses of Funds statement, including an estimated predevelopment and construction budget itemizing specific costs.

ii. A detailed description of proposed equity investment and sources or construction financing, together with any letters of interest from lenders.

iii. A pro-forma for the Project which demonstrates the Respondent's plan as to its own cash contributions and its method of responding to construction deficits.

iv. A detailed Project Development schedule, including proposed time lines for design of the Proposed Project, obtaining all necessary approvals and Permits for the development of the Project, obtaining the necessary financing for the Project, marketing, occupancy strategy, and construction of the Project.

v. For the Commonwealth, MBTA and City Parcels: A detailed description of the proposed purchase price and business terms. Escalators should not be proposed, nor should equity participation by the Commonwealth, the MBTA or the City be proposed. Transfer of title to the Commonwealth Parcels for full consideration at the time of closing will be required.

vi. Project Schematics consisting of the following requirements:

- Written description of program elements and space allocation for each element.
- Neighborhood plan and sections at appropriate scale (1"=100') showing relationships of Proposed Project to the neighborhoods:
  - Massing
  - building heights
  - scaling elements
  - open space
  - major topographic features
  - pedestrian and vehicular circulation
  - land use
- Color or Black & White 8"x10" photographs of the Site and neighborhood.
- Sketches and diagrams to clarify design issues and massing options.
- Eye level perspective showing the proposal in the context of the surrounding area. Views should display a particular emphasis on important viewing areas such as key intersections or public parks/open space. At least one bird's eye view perspective should be included.
- Site plan(s) at an appropriate scale (1"=20') showing:

- general relationships of proposed and existing buildings and open spaces
- general location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
- pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
- phasing possibilities of the proposed project

- Drawings at an appropriate scale (1":8'0",1":16"0") describing architectural massing, facade design and proposed building materials including:
    a. building and site improvement plans
    b. neighborhood elevations, sections, and/or plans showing the development in the context of the surrounding area
    c. sections showing organization of functions and spaces, and relationships to adjacent spaces and structures
    d. preliminary building plans showing ground floor and typical upper floor(s)
- A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns

IX. PROJECT SUBMISSION FORMS/AGREEMENTS

In order to proceed with this competition, all Respondents shall be required to complete and submit the following forms:

A. Developers Statement of Qualifications and Financial Responsibility
B. Disclosure Statement of Persons Having Beneficial Interest in Real Property
C. HUD Form 6004: Redevelopers Statement for Public Disclosure
D. Non-Discrimination, Boston Jobs Policy and Minority and Business Requirements
E. MEPA Agreement

In compliance with the terms and obligations of the MOA [Section IV (5)], title to the MBTA Parcels and the City Parcel will be transferred to the Authority after the final selection of a designated redeveloper. The transfer of the Commonwealth Parcels will be

conveyed directly to the designated redeveloper, through a release deed subject to the provisions of an eventual Land Disposition Agreement (LDA). This transfer of title will allow the Authority to coordinate the respective disposition policies and procedures enabling it to ensure that the community's vision, as interpreted by the Redeveloper, will be implemented.

Please be advised that any and all restrictions or obligations, without limitation, imposed on the Authority, in connection with the conveyance of the property to the Authority, shall be assumed by the Redeveloper.

Additionally, Redeveloper access to the City Parcel is from Columbus Avenue, over a portion of land under the care and custody of the DCAM, for the exclusive use by the Trustee's of the Roxbury Community College (the "College"). The College has indicated a willingness to facilitate the successful implementation of the community vision by negotiating an appropriate license agreement with the final designated redeveloper.

In compliance with M.G.L. Chapter 7, Section 40F ½ and Chapter 81, Section 7E, title to the Commonwealth Parcels will be conveyed to the final designated Pre-Qualified Respondent, subject to and in accordance with the land disposition policies of the Authority.

Prior to closing, the following agreements, where applicable, may be requested of the Designated Developer(s):

1. Land Disposition Agreement
2. Cooperation Agreement
3. Affirmative Marketing Materials, etc. for Residential Development
4. Affordable Housing Agreement
5. Boston Residents Construction Employment Plan
6. First Source Agreement and Memorandum of Understanding (with the Office of Jobs and Community Services)
7. Transportation Access Plan (with BTD)
8. Construction Management Plans (with BTD)

X. SUBMISSION DEADLINES

For the **Qualifying Phase One** submission, each Respondent must submit five (5) original sealed submissions and fifteen (15) copies of its Qualifying Phase One submission by no later than 12:00 noon on October 12, 2004. Thirty minutes after the submission deadline, at 12:30 p.m., the Secretary will open all submissions.

Any submissions received after that date and time will be rejected. Qualifying Phase One submissions should be addressed as follows:

TO: BOSTON REDEVELOPMENT AUTHORITY
Mr. Harry R. Collings, Secretary
Boston Redevelopment Authority
One City Hall Sq., Room 910
Boston, MA 02201

For the **Designation Phase Two** submission, each Pre-Qualified Respondent must submit one (1) complete set of appropriately mounted site plans, perspectives and architectural renderings mounted onto white foam-core boards and fifteen (15) copies of the descriptive and financial narrative portion of their submission.

This submission must be received no later than 12:00 noon on January 24, 2005. Any submissions received after that date and time would be rejected. Thirty minutes after the submission deadline, at 12:30 p.m., all submissions will be opened.

Designation Phase Two submissions should be addressed as follows:

TO: BOSTON REDEVELOPMENT AUTHORITY
Mr. Harry R. Collings, Secretary
Boston Redevelopment Authority
One City Hall Sq., Room 910
Boston, MA 02201

XI. APPENDICES TO REQUEST FOR PROPOSALS

JACKSON SQUARE DEVELOPMENT AREA

A. The Partnership Memorandum of Agreement
B. Site Plans
C. Proposed Jackson Sq. Re-zoning Amendment
D. Environmental Reports
E. Developers Statement of Qualifications and Financial Responsibility
F. Disclosure Statement of Persons Having Beneficial Interest in Real Property
G. HUD Form 6004: Redeveloper's Statement for Public Disclosure
H. Boston Jobs Policy and Minority and Business Requirements
I. MEPA Agreement