

# Real Estate Impacts of the Massachusetts Turnpike Authority and the Central Artery/Third Harbor Tunnel Project

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After



Before

IFC



# Economic Impact of the Massachusetts Turnpike Authority & Related Projects

Volume II:

The Metropolitan Highway System &  
Urban Transformation

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# Table of Contents

Preface .....	i
Summary of Volume II Findings.....	i
<b>Introduction.....</b>	<b>4</b>
1.1 Role of the Turnpike Authority in the Big Dig.....	4
1.2 Analysis Methodology .....	4
1.3 Organization of the Report.....	5
<b>Timeline of Highway and Related Land Development.....</b>	<b>6</b>
2.1 Listing of Major Highway and Land Developments .....	6
<b>History: Impacts of Turnpike Extension to Boston .....</b>	<b>9</b>
3.1 History of the Turnpike Extension and Back Bay Development.....	9
3.2 Development and Land Value Impacts on the Back Bay and South End.....	11
<b>Present and Future: Central Artery /Tunnel Project Impacts .....</b>	<b>13</b>
4.1 Profile of I-90 / I-93 Projects .....	13
4.1.1 Turnpike Air Rights Development.....	15
4.1.2 Central Artery Surface Parcels.....	17
4.1.3 Private Development Sites Adjacent to Highway Corridors .....	20
4.2 Development Potential at the South Boston Seaport District and Along the Rose Kennedy Greenway.....	20
4.2.1 South Boston Seaport District Development .....	21
4.2.2 Development Along Rose Kennedy Greenway .....	25
4.2.3 Surface Parks And Open Space .....	28
4.2.4 Planning Issues.....	28
<b>Impact on Broadband Network Development .....</b>	<b>30</b>
5.1 Fiber Optic Network .....	30
<b>Appendix.....</b>	<b>34</b>
<b>Acknowledgements .....</b>	<b>36</b>

## List of Tables

Table 2-1 Listing of Major Highway and Property Developments in Central Boston .....	6
Table 3-1. Growth of Building Values and Property Tax Bills in Boston.....	11
Table 4-1. Development Generated by Turnpike and Central Artery Since 1990.....	14
Table 4-2. Status & Impacts of Development Generated by Turnpike & Central Artery	15
Table 4-3. Turnpike Air Rights and Central Artery Surface Development.....	18
Table 4-4. Expected South Boston Seaport Development and Property Tax Impacts .....	23
Table 5-1. Fiber Optic Connections Under the Massachusetts Turnpike .....	30
Appendix Table 1. County Business Patterns: Suffolk County Jobs by Industry, 1956- 2003.....	34
Appendix Table 2. Boston City Records, Jobs by Industry, 1955-2000.....	35

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## List of Figures

Figure 4-1. Map of Central Artery Parcel Land Use .....	19
Figure 5-1 Comparative Projections of US Broadband Subscribers, 2002-2007 .....	32
Figure 5-2. Purchases of Telecommunications Services by Massachusetts Companies ..	33

# PREFACE

The Massachusetts Turnpike Authority was created by 1952 legislation in order to oversee the construction, operation and maintenance of an express toll highway running east-west between the New York state line and the Boston area. The original Turnpike opened in 1957, consisting of a 123-mile toll way between the New York state line and the Route 128 beltway. It was designated as I-90 in the Interstate Highway System. The Turnpike's 12-mile "Boston Extension" continued the route from Route 128 (now also known as I-95) to downtown Boston. That extension was opened in two stages -- to the Allston-Brighton toll plaza in 1964, and to I-93 downtown in 1965. A final 3 mile continuation of the Turnpike's Boston Extension across Boston Harbor (via the Ted Williams Tunnel) to Logan Airport and Route 1A opened in 2003.

In 1958, the Authority was authorized to acquire the Sumner Tunnel (constructed in 1934) from the City of Boston as well as to construct and operate a parallel Callahan Tunnel. The twin tunnels began joint operation in 1962.

In 1997, the Metropolitan Highway System (MHS) law gave the Massachusetts Turnpike Authority a new set of responsibilities. The MHS was defined to include major highway facilities within the Route 128 belt – including the 15-mile Boston Extension of I-90 between Route 128/I-95 and Route 1A in East Boston (including the Ted Williams Tunnel and Fort Point Channel Tunnel), the Sumner and Callahan Tunnels, the I-93 Central Artery project (including the Leonard P. Zakim Bunker Hill Bridge and Storrow Drive Connector Bridge), the Central Artery North Area (City Square Tunnel) and other connecting Central Artery facilities. The law divided the Turnpike Authority into two parts: the original 123-mile Turnpike (referred to as the "Western Turnpike" and the MHS. Today, the Turnpike Authority operates the Western Turnpike and the MHS as two independent and financially self-sustaining road systems. Once completed, all facilities completed as part of the Central Artery Project will officially become part of the Massachusetts Turnpike Authority's MHS.

A year earlier, in 1996, the Turnpike Authority (MTA) issued a study authored by the Donahue Institute and University of Massachusetts Transportation Center that analyzed the economic impact of the agency and its highway facilities. Many changes have occurred in the nine years since that report, including extension of the I-90 Turnpike across Boston Harbor to Logan Airport, near completion of the I-93 Central Artery Project (that is now operated by the MTA), and a wide variety of safety improvements made to the Turnpike and to Boston highways under the jurisdiction of the MTA. Given the nature of these changes, the Authority commissioned Economic Development Research Group, Inc. of Boston to assess the magnitude of economic impacts associated with the Turnpike and these projects.

This report has two volumes. Volume I describes the economic impact of the MTA as a transportation provider. This analysis includes the economic impacts of the Turnpike west of Boston and the impacts due to new transportation infrastructure and services in the city from the Central Artery/Third Harbor Tunnel Project, known collectively as the “Big Dig,” and ensuing changes of traffic volumes, traffic patterns and travel efficiencies. In addition, Volume I considers the contribution to the Massachusetts’ economy of Turnpike Authority as a business enterprise.

Volume II describes the physical transformation of Boston as a result of transportation improvements, beginning with the 10-mile extension of the Turnpike from Route 128 into Boston’s Back Bay and ending with the “Big Dig.” The original Turnpike extension was built in the early 1960s and was intertwined with air rights development of the Prudential Center, which later led to the development of Copley Place and Back Bay as a high end shopping, hotel, dining and office district. Volume II reviews this history and discusses parallels to the present time. Today, the removal of the elevated Central Artery has opened up the long suppressed development potential of the Boston waterfront. In addition, development of the Rose Fitzgerald Kennedy Greenway above the depressed highway is creating demand for office and residential development with waterfront views.

The facilities that are the subject of this analysis were funded by federal transportation funds, the Commonwealth of Massachusetts, as well as by users of the Turnpike and related facilities through tolls. The Turnpike Authority is the final custodian of the Central Artery/Third Harbor Tunnel projects.

# SUMMARY OF VOLUME II FINDINGS

Improvements and enhancements to the Central Artery, Third Harbor Tunnel and the Massachusetts Turnpike are affecting investment and development opportunities in the city. This is important because the future of Boston, like all mature cities, requires continued investment to maintain the city's urban character and identity. Lack of sites for new development makes new growth impossible.

The Massachusetts Turnpike Authority (MTA) has taken on a wide range of responsibilities over time. The MTA was created by 1952 legislation to oversee construction and operation of a 123-mile tollway (I-90) between the New York state line and the Boston area. Subsequently, the state legislature designated the MTA to take over operation of the Sumner and Callahan Tunnels under Boston Harbor, extension of I-90 between Route 128/I-95 and East Boston (including the new Ted Williams Tunnel and the I-90 Connector to the Tunnel), the Central Artery Project (including the Leonard P. Zakim Bunker Hill Bridge and Storrow Drive Connector), the Central Artery North Area (City Square Tunnel) and other connecting Central Artery facilities. Over time, the Turnpike Authority has also taken on responsibilities for development of emergency response stations, tourism information facilities, fiber optic trunk lines, parks development and urban development projects on parcels and corridors that it controls. In addition, improvements in transportation access and the removal of elevated Central Artery have led private, non-profit and public sector developers to reinvigorate Boston's waterfront from Atlantic Avenue to the South Boston Seaport.

This report documents how new transportation improvements are leading to a major injection of development activity and energy into Boston, similar to the spark provided by the Turnpike extension in the early 1960s. Key findings include:

**1. Development activity in the modern Back Bay- Copley Square area began with the Turnpike extension to Boston from Route 128 and the development of the Prudential Center and Copley Place on Turnpike Authority air rights.**

- Development continues to evolve, more than 40 years after the Turnpike extension and the Prudential Center development opened.
- The area marked by the Back Bay, Prudential Center, Copley Square and Copley Place is the fulcrum of metropolitan Boston's high-end service and retail economy, including restaurants, hip bars and coffee shops, upmarket shopping, hotels and Class A offices, and has become a destination for international and other out-of-state visitors as well as those from within the state.

**2. Turnpike Authority efforts to redevelop property continue to transform adjacent and surrounding neighborhoods.**

- The Central Artery Tunnel Project has created locations for new development in some areas where the elevated highway structure formerly stood. In addition, the

MTA has also created locations for new development on air rights above the Turnpike. Together, these projects have created opportunities to help knit together neighborhoods formerly split by highway corridors. The additional housing, office, retail and hotel development is projected to attract over \$7 billion in private investment, providing a location for more than 43,000 jobs.

- Much of the new development will also have a residential character. More than 7,700 new housing units are proposed or have been built, and more than 1,000 of them will be affordable to lower and moderate income households.
- By removing the unsightly elevated Central Artery structure, the project is also creating new park and open space, as well as enhancing the value of parcels near the old Artery's footprint. However, the economic value of that impact is yet to be established.

**3. The development and property value impacts in the Back Bay that derived from the Turnpike extension project are clearly being repeated in South Boston and along the Greenway as a result of the Central Artery/Third Harbor Tunnel Project. Conditions present in both locations that helped spur development include:**

- Major highway infrastructure projects that created opportunities for air rights development;
- Access improvements created by both new highways and new transit service,
- Removal of real and psychological barriers created by existing transportation infrastructure;
- Reconnection of Boston neighborhoods that had been isolated by the these barriers;
- Creation of large redevelopment parcels as a result of the removal of old transportation infrastructure;
- Significant public investment in the form of either financial incentives or the building of new public buildings and parks, and;
- Abilities of developers to target development to new or unmet market niches.

While these commonalities help explain the parallels between development trends in the two study areas, several factors account for the more accelerated development impacts apparent in the Seaport District and along the Greenway. In the early 1960s, Boston had not yet established itself as a location able to compete for businesses and developers in a national or global market. Today, Boston is a premier, desirable address, and a shortage of land in the central city has constrained opportunities to attract businesses that seek a high profile Boston address.

When the Turnpike extension was built, the national economy had not yet shifted to the financial and service sector, a shift that would subsequently play to Boston's strengths and add to its attractiveness as a business location. In addition, changing demographics resulting from the aging of the baby boomers and decisions by younger adults to postpone or forego having children have created a new market for high-end, urban condominium development. The CA/T Project also immediately followed the

\$3.9 billion<sup>1</sup> Boston Harbor cleanup project, which restored the waterfront as an attractive urban amenity.<sup>2</sup>

The Central Artery/Third Harbor Tunnel Project opened up substantially more land for development than did the Turnpike extension. The Rose Fitzgerald Kennedy Greenway itself comprises as much land as the entire Turnpike project created in the Back Bay. And much of the land “created” or newly accessed by the CA/T Project is located either along the waterfront or with water or park views, elements that generally increase the development potential and value of properties.

The magnitude of the Central Artery/Third Harbor Tunnel Project, in price and scope, and in the access it provides, exceeds that provided by the Turnpike extension project. The combination of these factors will continue to fuel development in the areas impacted by the CA/T Project. Over time, the resulting development patterns will transform the city by concentrating new activity in the Seaport District, revitalizing the waterfront, expanding the economic center of the City, and strengthening existing neighborhoods.

**4. The Turnpike Authority has also developed an underground corridor across Massachusetts for inter-state “fiber optic” trunk lines, used for high speed telecommunications.**

- The MTA collects \$3.5 million annually for leasing its corridor to four telecom companies. These lines are expected to become increasingly important in the future to support the growth of technology industries in Massachusetts.

Altogether, these findings indicate that by providing transportation services, Authority operations and project investments have been an important factor in transitioning Boston’s economy over the past 40 years. They also show that the full contribution of the Turnpike, now intertwined with the Central Artery/Third Harbor Tunnel Project, is still unfolding.

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<sup>1</sup> Bell, Tom, “Boston Harbor Cleanup: A World-Class Environmental Feat”, in *Environment News*, December 1, 2000 <http://www.heartland.org/Article.cfm?artId=9577>

<sup>2</sup> <http://www.savetheharbor.org/downloads/leadingedge.pdf>, “The Leading Edge: Boston Harbor’s Role in the City Economy”

# 1 INTRODUCTION

## 1.1 Role of the Turnpike Authority in the Big Dig

In the 1997 Metropolitan Highway System (MHS) Act, the Massachusetts Legislature assigned the Turnpike Authority responsibility for supervising the completion of the entire Central Artery/Tunnel Project. Under the MHS legislation, the Turnpike was also directed to assume ownership and operate the new roadway facilities upon completion. The MHS currently includes the Boston Extension from Route 128/I-95 to the terminus of I-90 in East Boston, the Sumner, Callahan and Ted Williams Tunnels and all other roadways built as part of the CA/T. Projects considered part of the “Big Dig” include:

- ***I-93 Central Artery Projects***
  - The replacement of the deteriorating elevated Central Artery (I-93) with an underground expressway (new eight to 10-lane underground I-93 in downtown Boston);
  - Leonard P. Zakim Bunker Hill Bridge;
  - The Storrow Drive Connector Bridge; and
  - A surface restoration and beautification program.
- ***I-90 Turnpike Extension to Logan Airport***
  - A new connector tunnel under Fort Point Channel in South Boston, extending I-90 past the interchange with I-93 to a mostly underground interchange near the South Boston waterfront area, continuing to the Ted Williams Tunnel
  - The Ted Williams Tunnel, which goes under Boston Harbor, continuing the I-90 route to Logan Airport and US Route 1A (McClellan Highway).

Each of the Big Dig projects listed above is described more fully in Volume I of this study.

## 1.2 Analysis Methodology

This volume examines the real estate and subsequent economic development impacts that are related to the Metropolitan Highway System, which is owned, operated and has been substantially developed by the Massachusetts Turnpike Authority.

The Turnpike Authority has been implementing a program to promote commercial and residential development projects on surplus property adjacent to the Turnpike and on air

rights above it. The Authority is also working with the City of Boston to provide commercial and residential development areas as well as parks on land made available by the Central Artery Project. The various private development projects will provide places for new businesses and residences, and will also generate additional local property taxes. The study team conducted a series of interviews with public and private officials to develop a profile of these projects and to calculate the likely magnitude of their tax revenue impacts.

### **1.3 Organization of the Report**

This volume is organized into five chapters and an Appendix. Chapter One provides an introduction concerning the motivation for this study and recent changes in jurisdiction of the Massachusetts Turnpike Authority.

Chapter Two illustrates the timeline of the Turnpike/Central Artery/Central Artery Tunnel development along with related real estate development.

Chapter Three describes the Central Artery/Tunnel Project and extension of the Massachusetts Turnpike to Boston and demonstrates how the projects influenced development in the Back Bay and South End.

Chapter Four details the actual and potential impacts of the Central Artery/Tunnel Project, focusing on air rights and central artery land developments as well as potential developments in the Seaport District.

Finally, Chapter Five demonstrates how the inclusion of broadband fiber optic telecommunications capacity as part of the Big Dig further reinforced communications connectivity within Boston, and further connected the region with the growing knowledge based economy.

# 2 TIMELINE OF HIGHWAY AND RELATED LAND DEVELOPMENT

## 2.1 Listing of Major Highway and Land Developments

The table below shows how private development projects have followed completion of the Turnpike Boston Extension in the 1960's and are now following the Central Artery/Third Harbor Tunnel Project. The Boston extension project led to air rights development in the Back Bay area (BB), while the Central Artery/Tunnel Project is now leading to new development in the South Boston Seaport District (SBS) and along the former elevated highway route -- now becoming the Rose Fitzgerald Kennedy Greenway (RKG).

Table 2-1 Listing of Major Highway and Property Developments in Central Boston

Copley/Back Bay and South Boston Seaport District Development Timeline		
Years	Place	Project & Size
1880s	BB	Trinity Church and Boston Public Library define area.
1947	BB	John Hancock Building opens.
1956-7	BB	Prudential Insurance Company announces plans to purchase 128-acre Back Bay rail yards for new office and residential complex.
<b>1957</b>		<b>Mass Turnpike opens from New York State border to Route 128 in Newton.</b>
1957	BB	Prudential Insurance Company and Turnpike Authority reach deal to allow development on air rights above Turnpike extension.
1960	BB	Prudential Insurance Company announces that the Turnpike extension is critical to success of their development.
<b>1962</b>		<b>Groundbreaking for Turnpike Extension from Newton to Boston.</b>
1963	BB	\$200 million Prudential Center Tower opens with mix of office, residential and retail uses, with 1,182,000 square feet.
1963	BB	Municipal Auditorium (later Hynes Convention Center) opens with 450,000 square feet.
1964	BB	Sheraton Boston opens with 1,250 rooms.
<b>1965</b>		<b>Turnpike Extension opens from Newton to Boston.</b>
1967	BB	Boylston Apartment Tower, Fairfield Apartment Tower, and Gloucester Apartment Tower open as part of the Prudential Center with 781 units.
1969	BB	John Hancock parking garage built over Turnpike.
1972	BB	101 Huntington Avenue, part of Prudential Center, opens with 550,000 square feet.
1975	BB	John Hancock Tower opens with 1.6 million square feet.
1982	SBS	Boston Marine Industrial Park Opens.

<b>1982</b>	<b>Planning begins for Central Artery/Third Harbor Tunnel project.</b>	
1983	BB	\$500 million Copley Place mixed use project opens with 3.4 million square feet.
1985	BB	Ingalls Building at 855 Boylston St. opens across from Prudential with 46,404 square feet.
1986	BB	New Back Bay Station opens with Amtrak and Orange Line service.
1986	BB	500 Boylston opens with 715,000 square feet.
1986	SBS	World Trade Center Meeting and Conference Center opens (rehab of 1914 Commonwealth Pier Bldg), with 850,000 square feet of meeting/exhibit/conference space.
1988	BB	Tent City housing development opens at Dartmouth and Columbus across from Copley Place, with 203 low income units and 66 market rate units, all rental units.
1988	BB	Heritage on the Garden retail and residential complex opens at Boylston and Arlington Streets, with 87 condos, 118,000 square feet of office space and 40,000 square feet of retail space.
<b>1991</b>	<b>Construction begins for Central Artery/Third Harbor Tunnel Project.</b>	
1993	BB	Phase I of Prudential Redevelopment opens, with a 70-store retail arcade. When complete, this increases Prudential Center to 7 million square feet (all uses).
1995	SBS	Ted Williams Tunnel opens to commercial traffic.
1998	SBS	John Joseph Moakley United States Courthouse opens on Fan Pier. (In 2001, the Courthouse was officially dedicated to honor Congressman Moakley.)
1998	SBS	Seaport Hotel opens with 427 rooms.
2000	SBS	World Trade Center East office building opens with 490,000 square feet of Class A office space and 12,000 square feet of retail space.
2001	BB	111 Huntington Avenue, Phase II of the Prudential redevelopment opens with 840,000 square feet of Class A office space plus 70,000 square feet of retail.
2002	BB	The Belvedere at Prudential opens with 65 condominiums.
2002	SBS	Boston Convention and Exhibition Center (BCEC) opens with 1.7 million square feet, including 600,000 square feet of exhibition space.
2002	BB	131 Dartmouth opens with 369,000 square feet of office space.
<b>2002</b>	<b>I-90 Ted Williams Tunnel is connected to I-90 Massachusetts Turnpike and opened to all traffic.</b>	
<b>2003</b>	<b>I-93 Central Artery opens initial underground northbound and southbound lanes</b>	
2003	SBS	World Trade Center West office building opens with 517,000 square feet of Class A office space and 34,000 square feet of retail space.
2004	SBS	Developers selected for 12-acre "Core Parcel" Waterside Place with 1.2 million square feet, including 600,000 square feet of retail space, 276 condos, and a 457 room hotel.
2004	SBS	ManuLife Headquarters opens with 420,000 square feet of office space.
2004	SBS	Westin Hotel under construction with 790 rooms.
<b>2005</b>	<b>I-93 Central Artery opens full use of all northbound &amp; southbound lanes</b>	
<b>2005</b>	<b>Silver Line Transit opens service in South Boston Seaport District.</b>	
2005	RKG	Greenway Place at 199 State Street opens with 12 condos with view of Rose Fitzgerald Kennedy Greenway.
2005	RKG	Boston Harbor Residences on Northern Avenue under construction with 465 residential units in two phases.
2005	SBS	Channel Center Phase I opens. Phase II to include retail, office, and housing with 76 housing units.
2005	SBS	21-acre Fan Pier site sold. New mixed use development plan under review with 3 million square feet of built space proposed.
2006	RKG	Inter-Continental Boston and the Residences at the Inter-Continental to open. Project built around Artery Vent Building with 424 hotel rooms and 130 condos.
<b>2007</b>	<b>Rose Fitzgerald Kennedy Greenway scheduled to open with 30 acres.</b>	

<b>2007</b>	<b>Construction of the Allston Turn-Around serving Copley/Prudential, South Boston Seaport District and Logan International Airport Exits.</b>	
2007	BB	Residences at Mandarin Oriental expected to open with 50 condominiums.
Planned	BB	Columbus Center groundbreaking. 500 condos, 199 hotel rooms, with 1.3 million square feet. First air rights development since Copley Square is approved.
Planned	SBS	Pier 4 site with 200 housing units, 225 hotel rooms, 385 Class A office space, and 35,000 square feet of retail.
Planned	RKG	Russia Wharf adaptive reuse and new development with 50 loft housing units, 300 room hotel, 500,000 square feet of Class A office space, 22,000 square feet retail.
Planned	BB	776 Boylston East building (part of Prudential Center) is approved.
Planned	BB	888 Boylston Street (part of Prudential Center) is proposed.
Planned	BB	Millennium Tower, a proposed condominium development over the Turnpike is proposed.
Planned	BB	The Clarendon is approved with 350 rental and homeownership housing units.

*Places: BB = Back Bay, SBS = South Boston Seaport, RKG = Rose Fitzgerald Kennedy Greenway*

# 3 HISTORY: IMPACTS OF TURNPIKE EXTENSION TO BOSTON

## 3.1 History of the Turnpike Extension and Back Bay Development

Many factors contributed to the rejuvenation of Boston during the past 40 years, including the aggressive urban renewal programs of the 1960s and 1970s, strong public sector leadership and commitment to the City, and the national economic shift from a manufacturing base to a financial and service-based economy. However, the Turnpike extension project, which included the clearing of the rail yards in the Back Bay and innovative development projects using air rights over the Turnpike infrastructure, proved to be a significant component of and catalyst for the transformation of Boston from a second-tier city to a true world-class city that now commands the third highest Class A office rents in the country.<sup>3</sup>

In 1957, the Massachusetts Turnpike Authority completed the Turnpike between the state's western boarder with New York and Route 128 in Newton. The Turnpike Authority eventually planned to extend the road into downtown Boston along the New York Central Railroad's Boston and Albany line, but delayed the extension due to the expected complexity and high cost of the project.

At this time, manufacturing and wholesale trade dominated the economy of Boston<sup>4</sup> (see appendix) and many in the business and development world considered the City a "backwater." Almost no new construction had occurred in the City since 1930, and Boston was desperate for new investment. Then, in 1957, the Prudential Insurance Company announced its plans to build a \$200 million mixed-use redevelopment project on the 28-acre site of the Back Bay yards of the New York Central's Boston and Albany line. The City needed this project, but, as proposed, it would have prevented the planned Turnpike extension. The Turnpike Authority and Prudential agreed on a new plan that would allow both projects to go forward, with Prudential building on air rights over a Turnpike exit ramp.<sup>5</sup> This alliance, combined with new redevelopment powers given to the Boston Redevelopment Authority (BRA) and the BRA's use of new federal urban

<sup>3</sup> Ford, Beverly, "Boston Remains One of the Most Expensive Office Markets in the Country" in *Commercial Real Estate News*, August 16, 2005.

<sup>4</sup> Boston Redevelopment Authority, Boston Redevelopment Authority, *History of Boston's Economy: Growth and Transition, 1970-1998*. Lewis, Avault and Vrabel. November 1999; and County Business Patterns.

<sup>5</sup> Tsipis, Yanni K., *Images of America Building the Mass Pike*, Arcadia Publishing, 2002, p. 47-48.

renewal tools, would foster a steady stream of new development in the Back Bay and downtown.

The Prudential project proved to be “the first of 15 urban renewal projects undertaken between 1960 and 1968, which were to turn the face of Boston around and prepare the city for the service and office boom which was to come.”<sup>6</sup> Between 1960 and 1983, the office stock in central Boston increased by 65 percent, from 22 million square feet to 39 million square feet, in large part as a result of the vast urban renewal program of the BRA and the dramatic growth in the finance and service sectors.<sup>7</sup> The 750-foot Prudential “complex lent Boston renewed credibility as a viable market for high-rise commercial development”<sup>8</sup> and became a symbol for a new, revitalized Boston.

Construction of the Prudential complex occurred over several years, with the Prudential Tower opening in 1963, the Sheraton Boston Hotel (still the largest hotel in the City with 1,250 rooms) in 1964, several apartment buildings in 1967, and offices at 101 Huntington Avenue in 1972. Complementing this private development was the development of the Hynes Convention Center, which opened adjacent to the Prudential Center in 1964.

The Prudential Center development represented a major first step in knitting together the South End and the Back Bay, two neighborhoods that had been isolated from each other by the rail lines and storage facilities comprising the Back Bay rail yards, and, later, by Turnpike ramps. The Turnpike Authority continued to work with developers to eliminate barriers created by the Turnpike with new air rights developments. In 1969, the Hancock garage was constructed on air rights over the Turnpike, and in 1983, the ambitious 3.4-million-square-foot, \$500 million Copley Place mixed-use development opened on a 9.5-acre site over the Huntington Avenue Turnpike interchange.

Copley Place, which included 850,000 square feet of Class A office space, a 1,400-parking-space garage, two large hotels, mixed-income apartments, and 385,000 square feet of retail space, is the largest mixed-use development ever built in Boston. This joint venture between the Turnpike Authority and a private developer finalized the link between the Back Bay and South End neighborhoods. Not long after project completion, its influence on the market place became evident. Realtors marketing properties in the South End began advertising them as “blocks from Copley Place.”<sup>9</sup> Further, while some feared Copley Place would attract shoppers from Downtown Crossing, thereby crippling the City’s central retail district, the Copley Place retail space was tenanted with very high-end shops targeted to an unfilled market niche. Instead of drawing customers from downtown, Copley Place is credited with attracting new, upscale chains to other locations in the Back Bay, including Newbury Street and the Heritage on the Garden development

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<sup>6</sup> Schachter, Gustav, Alessandro Busca, Daryl Hellman, and Alberto Ziparo, ed., *Boston in the 1990s: Territorial Planning and Economic Development in the Boston Area to the End of the Century*, Gangemi Editore, 1994.

<sup>7</sup> Boston Redevelopment Authority, *Boston Tomorrow: Issues of Development*, 1983, p.9.

<sup>8</sup> Op. cit., Tsipis, p. 126.

<sup>9</sup> Kaufmann, Jonathan, “Of Two Malls, Only One has Fulfilled its Promise”, in *The Boston Globe*, June 21, 1987, Metro Section p. 1.

at Boylston and Arlington.<sup>10</sup> At this time, the retail space at Copley Place outstrips the performance of other suburban and urban retail centers, taking in \$800 per square foot in annual sales in 2004<sup>11</sup> compared to a national retail mall average in that year of \$356.<sup>12</sup>

Another important public investment that supported the transformation of the Back Bay and South End was the new Back Bay transit station, which opened in 1986 as part of the Southwest Corridor project. This station accommodates both Amtrak and heavy rail service, and brings more than 10,000 people a day into the area.

### 3.2 Development & Land Value Impacts on the Back Bay & South End

The development and property value impacts of the Turnpike-facilitated Prudential Center, Back Bay and Copley Place projects continue to unfold. Table 1 shows property tax revenues generated by key neighborhoods and the City as a whole for 1986 and 2005. The table shows that property tax revenues increased substantially faster in the Copley Square (+307%) and Back Bay (+211) areas, than in downtown (+181%) or the City as a whole (+123%). Much of the increase in the Copley Square and Back Bay areas can be attributed to the millions of dollars invested in the Prudential Center, Copley Place, and the surrounding neighborhoods as a result of the land and air rights made available by the Turnpike extension project.

Table 3-1. Growth of Building Values and Property Tax Bills in Boston

Area by City Ward	Land and Building Value (\$ 000's)			Gross Tax Bill (\$ 000's)		
	1986	2005	% Change	1986	2005	% Change
Copley Square Area (Ward 4)	\$1,628,528	\$6,505,561	299%	\$35,368	\$144,076	307%
Back Bay (Ward 5)	\$2,649,181	\$9,568,138	261%	\$47,071	\$146,199	211%
Boston Total	\$18,568,069	\$65,937,361	255%	\$514,896	\$1,133,185	120%

Source: Fiscal Year 1986 Tax and Exempt Real Estate and Personal Property; and Fiscal Year 1986 Tax and Exempt Real Estate and Personal Property. Boston Assessors Department. Report dates refer to values and tax bills of the preceding calendar year. Totals represent commercial and residential properties.

Note: 1986 data are the earliest available under 100% valuation introduced in 1983.

<sup>10</sup> Golden, Daniel, "Surviving a Recession: Stores with International Cachet and Capital are Betting on Newbury Street in these Economic Hard Times The Fashionable Avenue has Become a Virtual Colony Where Foreign Retailers Pay Rent to Foreign Landlords and Cater to Foreign Customers" in *The Boston Globe Magazine*, March 8, 1992, p. 13

<sup>11</sup> [http://www.simon.com/mall/event\\_details.aspx?ID=784&EID=29121](http://www.simon.com/mall/event_details.aspx?ID=784&EID=29121)

<sup>12</sup> Bodamer, David, "The Mall is Dead", in *Retail Traffic Magazine*, April 1, 2005. [http://retailtrafficmag.com/mag/retail\\_mall\\_dead/](http://retailtrafficmag.com/mag/retail_mall_dead/)

Several new office and residential projects have opened along both the Back Bay and South End streets adjacent to the Prudential Center and Copley Place. In addition, the ongoing redevelopment of the Prudential Center complex is more than doubling its size, adding additional offices, retail and residential space. The offices at 111 Huntington Avenue have commanded top rents and have attracted premier tenants such as the renowned Boston law firm of Palmer and Dodge, the financial consulting firm of Bain Capital, and Boston Properties. The five star Mandarin Oriental Hotel and Residences at the Oriental Mandarin Hotel are now under construction and expected to open in 2007. The residences will be among the most expensive condominium units in Boston, ranging in price from \$2 million to \$12 million.<sup>13</sup> Additional components of the ongoing Prudential Center redevelopment will include offices and residences along Boylston Street.

Design issues that arose from the first urban air rights development undertaken by the Turnpike Authority provide important lessons for similar projects in the future. Given that the Prudential Center was built on air rights over the Turnpike, its entrance sits well above street level. The project was designed with a large concrete plaza and steps leading from Boylston Street to the entrance of the Prudential Tower, which sits well back from the street. This design isolated the development from the street, and many complained that it created an uninviting addition to the streetscape. Additions to the Prudential Center complex have been designed to mitigate the drawbacks of the original development. The redevelopment of the Prudential Center aims to improve the interface of the development with activity on Boylston Street, both by creating a retail arcade that stretches from Boylston Street to Huntington Avenue, and by bringing several of the components of the expanded Prudential Center complex to the sidewalk.

Although there is virtually no vacant land now available in the Back Bay, developer interest remains strong, and air rights development remains a popular vehicle for accommodating additional projects in this strong market. A condominium tower has been proposed on Turnpike air rights at the corner of Massachusetts Avenue and Boylston Street, within a block of the Prudential Center development. Further, legislators charged with determining the future of the Hynes Convention Center are studying the feasibility of building condominiums over the Hynes, or completely replacing the facility with a new housing development.

Many factors converged to support development in the Back Bay and South End during the past half century. Public investments, urban renewal programs, and national economic trends that favored Boston's cultural and academic institutions all contributed to the transformation of the City into a national business center. However, the Turnpike extension project opened up large tracts of land to accommodate development, and the Authority's willingness and ability to negotiate innovative development deals proved to be a real catalyst for fueling this transformation.

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<sup>13</sup> Blanton, Kimberly, "The Lure of Luxury Leads to Boylston Street – Many Await Mandarin Oriental Condos", in *The Boston Globe*, May 18, 2005.

# 4 PRESENT & FUTURE: CENTRAL ARTERY /TUNNEL IMPACTS

This chapter describes recent, ongoing and planned land development projects associated with sales and leases of Massachusetts Turnpike land, air rights and reuse of land made available by Boston's Central Artery/Tunnel Project.

## 4.1 Profile of I-90 / I-93 Projects

The deconstruction of the elevated Central Artery structure and its replacement underground has enabled Boston to knit together neighborhoods previously separated by the old highway. Boston's Central Artery Tunnel Project has enabled planners and developers to build, design and envision housing opportunities and commercial infill, as well as parkways, to bring the city's streets together. These projects represent a creative approach to managing capturing the value of underused space in ways that will contribute to the amenity and vitality of the city.

The I-93 (Central Artery) and I-90 (Massachusetts Turnpike) projects have generated development opportunities by creating new parcels and air rights for new development projects, as well as improving traffic access to downtown Boston and Logan International Airport. By removing the unsightly elevated Central Artery structure, these projects also enhance the value of parcels near the old Artery's footprint. Neighborhoods in which these impacts are seen include Downtown, South Boston, Chinatown and the North End for privately owned land, and Charlestown, Haymarket, the South End, and Kenmore for development on parcels owned by the Authority or air rights over the Turnpike. Development by type, investment and neighborhood is shown on Table 4-1. The Table accounts for projects initiated after 1996, including those completed and others in initial planning stages.<sup>14</sup>

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<sup>14</sup> The projects represented in Table 5-1 were/are subject to A-80 reviews (Article 80 of the Boston zoning code) by the Boston Redevelopment Authority.

**Table 4-1. Development Generated by Turnpike and Central Artery Project Since 1990**  
*(Square Footage of Development Completed, Underway & Planned)*

Site	Expected Investment (millions of '004 dollar)	Condos/ Apt. Units	Hotel (Sq.Ft.)	Office (Sq.Ft.)	Retail (Sq.Ft.)	Other (Sq.Ft.)
Charlestown	\$101.4	141	0	213,000	3,000	0
Chinatown/Leather District	\$1,991.5	3,695	951,000	1,405,000	136,000	147,000
Downtown/ Albany Street	\$2,182.2	1,075	1,600,000	4,086,000	254,000	256,000
Kenmore	\$200.0	375	250,000	0	0	0
North End/ Haymarket	\$304.3	683	33,000	105,000	48,000	202,000
Seaport (S. Boston)	\$2,671.3	1,721	3,884,000	3,403,000	249,000	75,000
<b>Totals</b>	<b>\$7,450.7</b>	<b>7,690</b>	<b>6,718,000</b>	<b>9,212,000</b>	<b>690,000</b>	<b>680,000</b>

*Source: Boston Redevelopment Authority, Massachusetts Turnpike Authority. Calculations by Economic Development Research Group.*

The combined value of private investment at the Turnpike and privately-owned sites is expected to total over \$7.4 billion. Of the total, just 5% has been completed within the past 12 months and another 10% is under construction. Most of the projects are still in the development pipeline and will be completed within the next two to seven years. (See Table 4-2.)

The majority of the projects have a residential component. Nearly 7,700 new housing units are being proposed or have been built. More than 1,000 of these units will be affordable to lower and moderate-income households, providing a solution to what is perhaps the city's most pressing problem. Although the large majority of these residents will probably relocate from other homes in Massachusetts, they will mostly be from communities outside of Boston. This housing development will add to spending in the City. Residents of these projects will have a combined income of some \$1.2 billion, supporting the expansion of stores and restaurants downtown which is expected to add another 1,600 new jobs. In addition, development of 13 new hotel properties downtown will increase the number of tourists who will further support the new retail space. We estimate that 4,200 new jobs will be created in hotels.

The development of a total of 9.2-million-square-feet of office space will support expansion of the service industry Downtown with an estimated 35,800 new white-collar jobs. Jobs in management and administration of new residential buildings downtown are expected to add an additional 1,580 new jobs, for a total of 43,425 new jobs that are expected to be created in the Central Artery Corridor and on Turnpike air rights sites.

Table 4-2. Status & Impacts of Development Generated by Turnpike & Central Artery

<b>Category</b>	<b>Turnpike Sites</b>	<b>Private Sites</b>	<b>Total</b>
<b>Total Investment</b>	<b>\$2.136 billion</b>	<b>\$5.315 billion</b>	<b>\$ 7.451 billion</b>
<b>Project Status</b>			
Complete	4%	14%	5%
Under Construction	3%	28%	10%
Approved	15%	32%	20%
Under Review	11%	26%	15%
Planned	<u>67%</u>	<u>0%</u>	<u>50%</u>
<b>Totals</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Residential Development (assumes total proposed development)</b>			
Condominium Units	2,797	2,073	4,870
Apartment Units	722	2,098	2,820
Affordable Units	<u>465</u>	<u>600</u>	<u>1,065</u>
<b>Total Units</b>	<b>3,519</b>	<b>4,171</b>	<b>7,690</b>
<b>Non-Residential Development (square feet – totals rounded to thousands)</b>			
Offices	1,650,000	7,562,000	9,212,000
Hotels	850,000	5,868,000	6,718,000
Retail	251,000	439,000	690,000
Other	<u>352,000</u>	<u>328,000</u>	<u>680,000</u>
<b>Total Floor Area</b>	<b>3,103,000</b>	<b>14,197,000</b>	<b>17,300,000</b>
<b>Expected Jobs (assumes total development)</b>			
Jobs in Residential Projects	750	830	1,580
Office Jobs	6,000	29,800	35,800
Retail Jobs	550	1,030	1,580
Hotel Jobs	500	3,715	4,215
Other Jobs	<u>125</u>	<u>125</u>	<u>250</u>
<b>Total Jobs</b>	<b>7,925</b>	<b>35,500</b>	<b>43,425</b>

*Source: Boston Redevelopment Authority, Massachusetts Turnpike Authority. Calculations by Economic Development Research Group. Jobs per square feet are a blend of actual jobs, developer estimates and Urban Land Institute ratios. For this study, average square feet per job are for office – 257, hotel – 4,250, retail – 164, and one job per five housing units.*

#### **4.1.1 Turnpike Air Rights Development**

As cities have confronted rising real estate values in central business districts and diminishing sites, the concept of a three-dimensional approach to development has taken root. Some of the most valuable properties in central areas are occupied by highways, railways, and their supporting operations. Rights-of-way for transportation infrastructure slice through available land, acting as barriers and as obstacles to growth. Given Boston’s chronic shortage of developable land, it is not surprising that the concept

of air rights development was pioneered here. The Massachusetts Turnpike Authority was the first public transportation authority to use air rights with the development of the Prudential Center in Boston and Star Market in Newton in 1963. Over the next 40 years, a stream of high-profile projects were developed under air-rights leases from the Authority. These include:

- The Newton Sheraton project, built in 1968
- The Hancock Garage in 1971
- Copley Place in 1980.

These projects have put the Turnpike Authority at the vanguard of air rights development. By taking advantage of modern construction technology and spiraling land values, the Authority has enabled the use of air rights above the Turnpike with new ownership agreements and legal definitions. Past projects began to achieve a three-dimensional transformation of the city, re-seaming city neighborhoods and bringing life to areas that can support higher densities.

**Air Rights Development Can Connect Communities**

Do you find it uncomfortable to walk to Super 88, Ming's Market, or Wollaston's Market from Bay Village and Chinatown? Have you had difficulty finding housing in Chinatown and the South End? Do your children need more space to play outdoors? Would you like to start your own business but have not found the necessary space to do so? Many residents of the Bay Village, Chinatown and South End neighborhoods answer these questions with a resounding "YES!" There is a solution to these problems and many others that face our community.

The solution to these very real issues can be found, ironically, in thin air - over the Massachusetts Turnpike (I-90) highway that cuts through Bay Village, Chinatown and the South End. The solution is to build more land - in essence, the canyon formed by the Turnpike can be filled in with housing, shops, parks, schools - whatever it is we feel the neighborhood and community needs, wants and deserves.

***Making Something Out of Nothing, Report by Chinatown CDC***

The future of Boston, like all mature cities, depends on the quality of the existing urban fabric. Cities stagnate without continued new growth and investment. Continued revitalization is necessary to maintain the city's urban character and identity. Lack of sites for new development makes new growth impossible. The development of Turnpike air right sites and Central Artery surface parcels provide a means to move beyond this barrier and allows for real estate investment. By leasing air rights, the Turnpike Authority creates a critical supply of sites needed to meet the demand for residential and commercial development downtown, and air rights development also serves to minimize noise and sight issues from the highway.

The air rights parcels are envisioned as grouped "districts" along the Turnpike Corridor with guidelines focusing on the unique characteristics and needs of each community along the corridor. Guidelines were created from the vision that responded to certain opportunities and challenges common to all parcels:

1. Filling the gaps between neighborhoods and along major public streets by lining these streets with shops (emphasizing local businesses, not national franchises), cafes, exhibit spaces, and other lively uses, creating a variety of new pedestrian links, public spaces and parks, and paying special attention to the ways in which buildings and public spaces can enrich the public realm.
2. Promoting use of public transportation by reducing parking provisions below levels prevailing at the time of this report and improving public transportation.
3. Creating architecture that combines respect for Boston's unique historic character and expression of the vitality and character of our era.

Developing “property” on air-rights is an expensive and painstakingly slow process. It is expensive due to the engineering and construction costs of the platforms that are the “foundations” in the air for any building. To make up for the deck costs, air rights developments generally must be designed for high densities to create the potential for a viable return on investment. Often, this also requires targeting the development for “high-end” use. As an added complication, the Turnpike Authority’s first responsibility is to keep traffic flowing, which stretched out construction time (adding further to cost of development). Finally, planning for the air rights process is exceptionally intensive. Design issues are extensive, and tall buildings that support high densities are not always welcomed in communities where they appear out of local scale when proposed.

#### **4.1.2 Central Artery Surface Parcels**

In addition to planning for the future of 23 Air Rights parcels, the Turnpike Authority is taking a leading role in managing development of the surface parcels that are being created by the tunneling of the Central Artery. (See Figure 5-1 on the next page.) The Central Artery Corridor Master Plan (2001) provides a frame-work for surface design of the 1.3 mile corridor, designating eight acres for open space and identifying 14 parcels in the Bullfinch Triangle, Haymarket, the North End, and Chinatown. The plan stipulates that development of Artery parcels should focus on reconnecting districts with a seam of open space and design elements that look to the future of the City, while embracing history and knitting severed neighborhoods back together.

The South Bay Planning Study is currently underway to guide the development of the Chinatown Artery parcels, which have a total of 20 acres. The vision underlying the South Bay concept is to develop a new mixed-use, gateway district to downtown Boston that responds to both city and neighborhood needs. This development should take advantage of the multi-modal transportation options here.

**Future of Turnpike Air Rights and Central Artery Parcels.** Table 4-3 lists Turnpike and Central Artery parcels that have been the focus of planning and development effort to date and are being managed by the MTA. In total, 14 major development projects have been built or are planned on these parcels, representing a total investment of over \$2.1 billion. Of this, less than 5% has been built within the last three years. Three percent is

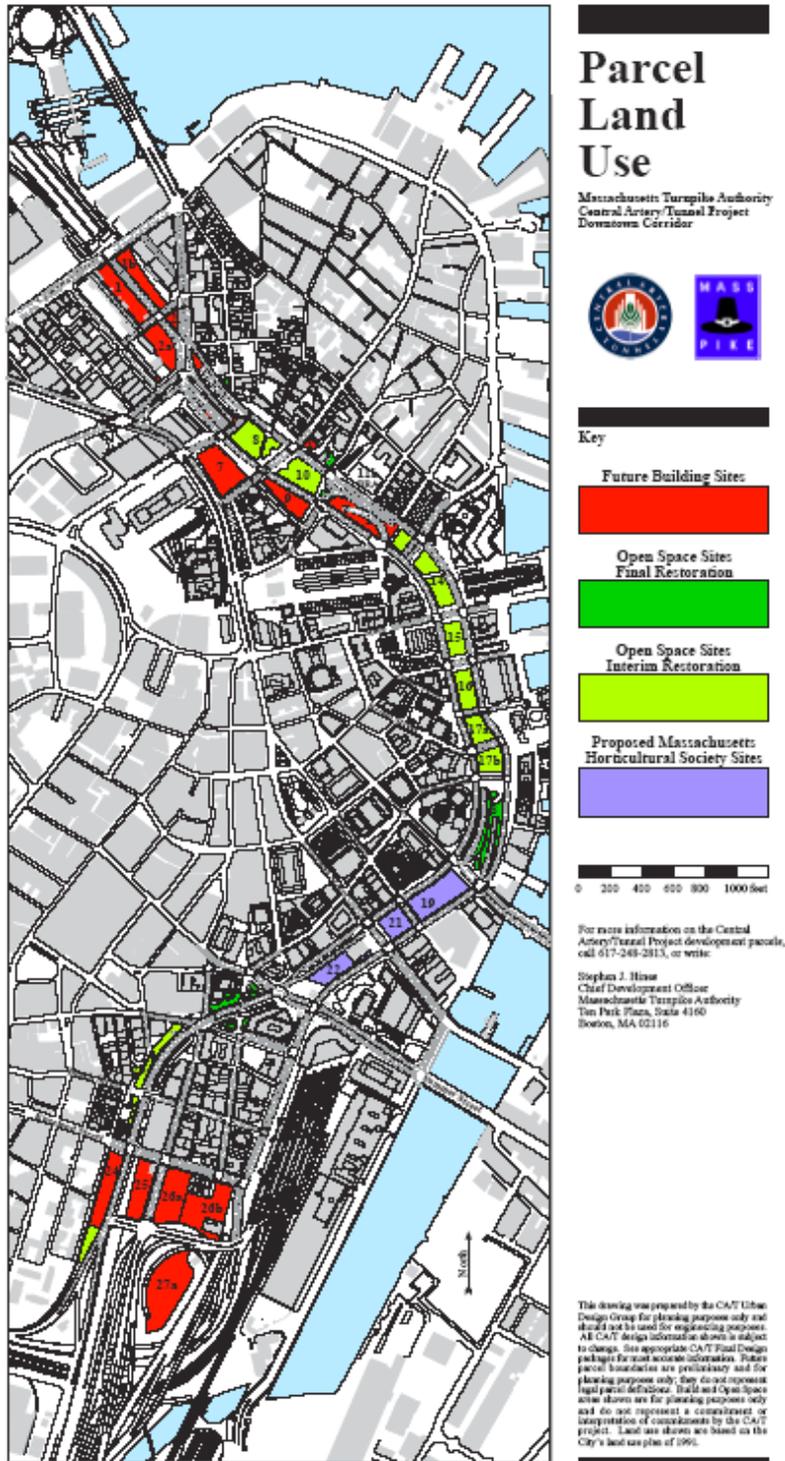
now under construction. Twenty-five percent is under review and over two-thirds are still in the preliminary planning phases.

**Table 4-3. Turnpike Air Rights and Central Artery Surface Development**

Area	Use	Build-out	Status
<b>Charlestown</b>			
CANA Parcel 1	117 Condos	165,632	Completed
CANA Parcels 2 & 4	Office	213,000	Completed
	Retail	3,000	
CANA Parcel 3	18 Condos	26,000	Planned
CANA Parcel 6	6 Condos	14,000	Planned
<b>Downtown</b>			
CA/T Bullfinch Triangle	Retail	100,000	Planned
	Office	100,000	
	400 Condos	560,878	
	147 Apts	206,122	
CA/T Parcel 18 Financial District	Museum	150,000	Review
<b>Haymarket</b>			
CA/T Parcel 6	YMCA	75,000	Planned
	Offices	50,000	
CA/T Parcel 7	Retail	37,500	Construction
	Offices	54,900	
	Unknown spec	127,400	
CA/T Parcel 9	Retail	10,000	Planned
	77 Condos	110,000	
CA/T Parcel 12	86 Condos	120,000	Planned
<b>Chinatown</b>			
South Bay Parcels	Retail	100,000	Planned
	Office	1,232,000	
	1000 Condos	1,500,000	
	500 Apartments	500,000	
Parcel 24	225 Condos	225,000	
	75 Apartments	75,000	
Air Rights Parcels 16, 17, 18, & 19	Hotel	600,000	Approved
	493 Condos	700,000	
<b>Kenmore</b>			
Air Rights Parcels 8, 9, & 10	Hotel	250,000	Review
	375 Condos	550,000	

CANA=Central Artery North Area; CA/T = Central Artery/Tunnel Area  
 Sources: Massachusetts Turnpike Authority, Boston Redevelopment Authority.

Figure 4-1. Map of Central Artery Parcel Land Use



More than half of the development on Turnpike and Artery sites will be residential, with more than 3,500 new units being eyed for these sites. More than three-quarters of the units are expected to be condominiums, while the rest will be occupied by renters. The Turnpike and Central Artery sites can accommodate an additional 1.6 million square feet of new office space, the value of which is estimated at \$400 million in current value. This space will house 6,000 new white-collar jobs downtown, which will in turn strengthen the demand for housing downtown. An additional 500 jobs will be created in two hotel projects that are planned for the Central Artery parcels.

#### **4.1.3 Private Development Sites Adjacent to Highway Corridors**

In addition to the projected benefits from the sites that will be created by the Central Artery and Turnpike projects, the massive public expenditure on the Central Artery/Tunnel Project has attracted an unprecedented level of private investment in new development projects downtown. At present, there are 42 projects within the Central Artery Corridor, which we define as the area within five minutes walking distance of the project. These developments have been timed to come onto the market at the project's completion with an estimated total construction cost of \$5.3 billion (current value).

Of the total private development sites in the Central Artery Corridor, 14% have been recently completed. Another 30% are currently under construction and will begin to stream onto the market within the next two years. One-third has been approved, and 25% are still under review.

Thirty-five percent of the total investment is in residential projects in which the 4,200 new constructed and anticipated units are divided almost evenly into rental apartments and condominiums, with nearly 600 units designated to be affordable by lower and moderate income households. The 30 planned residential projects are expected to generate more than 1,000 jobs in building administration, marketing, security, and maintenance.

Together, these privately owned parcels will include roughly 440,000 square feet of retail space and 7.7 million square feet of new office space, space for more than 1,000 retail jobs and nearly 30,000 office jobs. Moreover, construction is planned or completed for 11 new hotels on the privately owned development sites, which will support an additional 3,700 jobs.

## **4.2 Development Potential at the South Boston Seaport District and Along the Rose Fitzgerald Kennedy Greenway**

Removing the elevated Central Artery has reconnected the neighborhoods of the North End and South Boston to downtown and the rest of the City. With the completion of the "Big Dig" projects, new development opportunities have emerged along the waterfront, in South Boston and the Seaport District, and in neighborhoods such as the North End and Chinatown. Recent and planned development activity along the Rose Fitzgerald

Kennedy Greenway and in the South Boston Seaport District provide a strong indication that the CA/T Project will have a long-lasting impact on development trends in Boston, and will be a catalyst for transforming the landscape and economy of the city over the next 25 to 50 years. It is difficult to predict precisely how the CA/T Project will change the developed landscape in the City. However, the development impacts of an earlier major Turnpike construction project – the extension of the Turnpike east from its original terminus at Route 128 to downtown Boston – provide some insights into the potential impacts of the CA/T Project.

Additional projects in the Seaport District and along the Greenway, both new construction and redevelopment, are underway, many of them outwardly touting the location near the Greenway and the views provided by the removal of the elevated Artery as primary reasons for moving forward. For example, a developer has proposed an adaptive reuse project for Russia Wharf involving several buildings along Congress Street and Fort Point Channel. The project as proposed includes condominiums, office, retail, and hotel space. The developer refers to the area as “the last great address in the Financial District” because of its proximity to the Greenway, South Station, and Fort Point Channel.<sup>15</sup>

#### **4.2.1 South Boston Seaport District Development**

The demolition of the elevated Artery has removed a physical, visual and psychological barrier between Boston’s built-out Financial District and the 1,000 acre Seaport District<sup>16</sup> of South Boston. The South Boston Seaport District offers several strategically located large parcels of vacant, developable land, and numerous opportunities for redevelopment of architecturally interesting buildings, all within a short distance of major new public facilities such as the Boston Convention and Exhibition Center (BCEC) and the Moakley Federal Courthouse. Several studies have projected the build-out potential of the Seaport District to be between 16.2 and 24 million square feet of mixed-use development<sup>17</sup>, leading to the creation of up to 58,500 new jobs, personal and business income of \$2.2 billion per year (exclusive of the BCEC), and new hotel tax revenue of \$1 billion annually.<sup>18</sup> If new development occurs at predicted levels, the South Boston Seaport District will support worker earnings of \$2.2 million and will yield roughly \$172 million annually in Massachusetts income tax and sales tax revenues, and property taxes accruing

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<sup>15</sup> <http://www.savetheharbor.org/downloads/leadingedge.pdf>, “The Leading Edge: Boston Harbor’s Role in the City Economy”

<sup>16</sup> According to the *Seaport Public Realm Plan* prepared by the Boston Redevelopment Authority, the Seaport District is defined as a 1,000 acre portion of South Boston bounded by Fort Point Channel to the west, the Inner Harbor to the north and east, and (roughly) East and West Second Streets on the south (the edge of the South Boston residential neighborhood.)

<sup>17</sup> <http://www.agimmobilier.com/resource-center/Boston.htm>

<sup>18</sup> [http://www.hotel-online.com/News/PressRelease1998/BostonWaterfrontStudy\\_March98.html](http://www.hotel-online.com/News/PressRelease1998/BostonWaterfrontStudy_March98.html)

to communities of the Commonwealth (in 2005 dollars at current tax rates).<sup>19</sup> This new development is expected to serve both new and relocated businesses, but have the overall net effect of facilitating more business expansion and attraction than would otherwise occur in the city. To the extent that this occurs, this expected employment will be growth for the city and potentially also the state.

As shown in Table 4-4, increased property tax revenues based on build out development costs, excluding increases in land values, could exceed \$100 million annually.<sup>20</sup> At buildout, the estimated property tax revenues realized at the South Boston Seaport will be equivalent to 9% - 11% of Boston's 2005 tax base.<sup>21</sup> Moreover, wages paid to construction workers will yield an estimated \$5 million - \$6 million per year in state income tax and sales tax revenue, if a 20 year buildout is assumed.<sup>22</sup>

The scale of the major development projects already completed, under construction, or in the planning stages in the Seaport District (described in Chapter 3) speaks to the already-emerging impact of the Central Artery/Third Harbor Tunnel Project on development activity. Developers and well-established Boston businesses view this area as the next prestigious business and residential address in Boston. The timing of development activity, as well as comments from business leaders and language used to advertise new developments, make clear that the improved access provided by the CA/T Project (including the Silver Line) and the aesthetic improvements associated with removal of the elevated artery have made a significant difference in the marketability and attractiveness of this area.

Prior to the removal of the elevated Central Artery, few development sites remained in the downtown Boston Financial District, severely limiting opportunities for new development. While the South Boston Seaport District is a short walk from the well-established Financial District and hosts numerous sites for development, private investment in the Seaport District was very limited in recent decades. Among reasons that development was inhibited were the barrier created by the highway infrastructure, poor access, and increased project costs associated with permitting required for development near the waterfront, which discouraged investment in the Seaport District.

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<sup>19</sup> Calculated by applying IMPLAN tax module to the \$2.2 billion annual income estimated by the buildout numbers found in the BRA's *Seaport Public Realm Plan*

<sup>20</sup> This estimate uses build-out numbers provided by the BRA, which are somewhat lower than build-out estimates from other sources.

<sup>21</sup> The FY 2005 Real Estate Taxable Recapitulation published by city's Assessing Department reports a gross real estate tax of \$1,133,185,122.

<sup>22</sup> Based on calculations through IMPLAN.

**Table 4-4. Expected South Boston Seaport Development and Property Tax Impacts**

<b>A. Potential Build-out by Square Feet</b>		
	<b>Low Estimate</b>	<b>High Estimate</b>
Office	4,200,000	5,400,000
Hotel	6,000,000	6,000,000
Residential	5,000,000	8,000,000
Retail	500,000	750,000
Industrial	500,000	1,250,000
<b>Totals</b>	<b>16,200,000</b>	<b>21,400,000</b>
<b>B. Potential Build-out Construction Costs</b>		
	<b>Low Estimate</b>	<b>High Estimate</b>
Office	\$1,033,200,000	\$1,328,400,000
Hotel	\$1,500,000,000	\$1,500,000,000
Residential	\$1,180,000,000	\$1,888,000,000
Retail	\$123,000,000	\$184,500,000
Industrial	\$125,000,000	\$312,500,000
<b>Totals</b>	<b>\$3,961,200,000</b>	<b>\$5,213,400,000</b>
<b>C. Potential Property Tax Revenues at Build-out (based on 2005 values)</b>		
	<b>Low Estimate</b>	<b>High Estimate</b>
Office	\$33,764,976	\$43,412,112
Hotel	\$49,020,000	\$49,020,000
Residential	\$8,532,580	\$13,652,128
Retail	\$4,019,640	\$6,029,460
Industrial	\$4,085,000	\$10,212,500
<b>Totals</b>	<b>\$99,422,196</b>	<b>\$122,326,200</b>

Sources: Boston Redevelopment Authority, Seaport Public Realm Plan and interviews.

Methods and assumptions: Expected scale of development is taken from the Seaport Public Realm Plan. Interviews with four Boston developers placed hard and soft costs in a range of \$250-\$300 per square foot. Construction costs were calculated using \$250, except for residential and office. For these types of development, averages of actual or projected costs of recently completed or proposed projects at the Seaport were used (\$236 for residential and \$246 for office). Commercial and residential tax rates are for FY 2005 and account for a 30% residential exemption for each unit. Tax revenues include value of buildings only and do not include value of land. Construction value is used as the assessed value.

For many years, the city and the development community discussed several development concepts for 21 acres at Fan Pier, sites along the Fort Point Channel, and the 11-acre “core block” adjacent to the new BCEC. Despite much reporting of potential projects, little activity, either in terms of land transactions or actual development, materialized.

In the past eight years, as construction of the new underground artery and tunnel progressed and the removal of the elevated structure approached, activity in the Seaport District has been initiated and accelerated. The public sector provided much of the initial investment and development, with the Federal Courthouse and the Boston Convention and Exhibition Center, as well as the opening of the new Silver Line service to South

Boston. These public investments parallel similar investments made in the Back Bay, including the Turnpike extension, the public incentives provided for the Prudential Center Development, the building of the Hynes Convention Center, and the transit improvements created by the Southwest Corridor project.

As with the Copley Square/Back Bay area, private developments are also taking shape in the Seaport District as developers anticipate the improved market created by the public investments. Projects completed within the past eight years include the 427-room Seaport Hotel (1998), the World Trade Center East (2000) and West (2003) office buildings, and the Manulife headquarters building (2004.) The market competitiveness of these new office buildings, and the new prestige emerging for addresses in the Seaport District, are demonstrated by the tenants that have committed to space in these buildings, including Cabot Corporation; the law firms of Foley, Hoag and Eliot, Nutter, McLennan & Fish, Seyforth Shaw, Cetrulo and Capone, and Donovan Hatem; Fidelity Investments; AEW Capital Management; and ManuLife.

New proposals for Seaport District development also speak to the importance of the access and aesthetic changes resulting from the Central Artery/Tunnel Project in fostering new development and improved real estate values. First, after two decades of development discussions and proposals, the 21-acre Fan Pier development site, which reaches from the Federal Courthouse to Pier 4, has been resold for \$115 million dollars to a new developer who is moving forward at this writing. Long ago, the city identified this parcel as a key component to any successful redevelopment of the Seaport District. Four years ago the city permitted the site for 3 million square feet of office, retail and hotel development, as well as some civic and cultural space including the new Institute for Contemporary Art.

Second, the Massachusetts Port Authority selected Urban Retail Properties Co. and the Drew Co. to develop the “Core Block”, an 11.3-acre parcel across the street from the BCEC. The development team is the same group that built Copley Place in the 1980s. The proposed 1.2-million-square-foot Waterside Place project, which will cover 8.3 acres, will be the largest mixed-use development in Boston since Copley Place was built, and it will sit on top of air rights over Interstate 90.<sup>23</sup> The 600,000 square feet of retail space at the site will be targeted to mid-to-high end shoppers, not the very high-end shoppers attracted to Copley Place. A 276-unit condominium complex and a 457-room hotel are also part of the project. On two adjacent sites totaling four acres, the developer will build a supermarket and a visitors’ center. This project will take several years to move through state and local permitting and approval processes before construction can begin.

Third, Channel Place is a mixed use project that combines adaptive reuse and new construction along Fort Point Channel. Phase I, which includes 76 housing units, is completed. The 790-room Westin Hotel is nearing completion adjacent to the BCEC.

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<sup>23</sup> [www.california.construction.com/features/archives/0403\\_National\\_Feature.asp](http://www.california.construction.com/features/archives/0403_National_Feature.asp), “Partnership to Develop One of Boston’s Largest Properties” March 2004

The Boston Harbor Residences, a 465 unit residential complex on Northern Avenue near the BCEC represent the largest rental residential development built in Boston since the 781-unit Prudential Towers was built in 1968.”<sup>24</sup>

Other projects already announced for the Seaport District include redevelopment of the Anthony’s Pier 4 site into a mixed-use development that includes high-end condos, a 225 room hotel, 385,000 square feet of Class A office space, and some retail.

#### **4.2.2 Development Along Rose Fitzgerald Kennedy Greenway**

Prior to the Central Artery/Third Harbor Tunnel (CA/T) Project, few vacant development parcels remained in the Financial District and Downtown. Removing the old Central Artery structure created 30 acres of “new” land along the edge of the central business district, providing opportunities for new private and public developments, as well as acres of new parklands on the former highway corridor that is now the Greenway itself. Along the Greenway, 20 parcels of “new” land have been identified for future development or preservation as open space, and the Turnpike Authority is already soliciting development proposals for some of this land. Commercial, residential, civic, and cultural uses are expected on these parcels, including plans for a new museum and a botanical garden.

Beyond new development on the Greenway, the impact of the Central Artery/Tunnel Project is apparent in the reinvestment activities of existing property owners and businesses, and the increasing rents that properties along the Greenway are commanding. In June 2004, the *Boston Globe* published an extensive report on the impact of the Greenway on property values even a year prior to the then-expected opening of the Greenway. The report found that “in the fifteen years since the Central Artery/Tunnel project began, the value of commercial properties along the mile-long strip that... will become the Rose Fitzgerald Kennedy Greenway increased by \$2.3 billion, up 79 percent... almost double the citywide 41 percent increase in assessed commercial property values in the same period.”<sup>25</sup> The properties showing dramatic increases in value ranged from high-rise office buildings to pastry shops and bakeries adjacent to the Greenway in Chinatown and the North End.

As in the Seaport District and the Back Bay, the new attractiveness of office buildings adjacent to the Greenway is reflected by the flagship firms that are choosing to relocate to space along the corridor. For example, the premier Boston law firm of Choate, Hall & Stewart recently relocated to Two International Place, and noted the panoramic views of Logan Airport, the harbor, the city, and the Greenway as a factor in selecting the space. One of the firm’s employees noted that from the offices “You’re looking out onto the next 20 years of Boston.”<sup>26</sup>

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<sup>24</sup> <http://www.cityofboston.gov/bra/press/PressDisplay.asp?pressID=215>

<sup>25</sup> Palmer, Thomas C., Jr., “For Property Owners, Parks Mean Profits: Property Values Soar On Mile-Long Swath” in *The Boston Globe*, June 14, 2004, p. A1.

<sup>26</sup> Shartin, Emily, “‘Fresh Beginning’ Starts with a Great View: 106-Year-Old Law Firm Choate, Hall & Stewart Moves into New Digs – Where Much of Boston is at its Feet” in *The Boston Globe*, August

While commercial properties have benefited from the anticipated Greenway project, many experts are more surprised by the already realized impacts of the project on the residential market. One reason given for the focus on residential development is that office lease-up activity has been weak and several owners of commercial buildings are converting them to residential uses. William Wheaton, an economist and Director of MIT's Center for Real Estate stated, "People looking for residential condos are willing to pay an arm and a leg more to have a park as a neighbor."<sup>27</sup> An example cited in the *Globe* article is 80 Broad Street, where the developer has incorporated an historic Charles Bullfinch-designed office building into a new 96-unit condominium project. An advertisement for the project states, "From its upper floors the project will feature spectacular views of the Boston Harbor and Customs House tower. Situated two blocks from the waterfront, this project will also benefit from the new parkland that will be created upon completion of the Central Artery."<sup>28</sup>

The Boston *Globe* analysis focused on commercial buildings directly on the new park corridor. But the impact on real estate goes beyond it. A former Stop & Shop bakery on Causeway Street, two blocks from the North End section of the Greenway, was turned into an office building with high-end apartments on the top six floors. Those apartments were quickly sold to a developer who converted them to condos and renamed them Strada234. The assessed value of the commercial property in the Greenway area jumped 577 percent, from \$5 million in 1988 to almost \$34 million."<sup>29</sup> These price increases occurred despite the recession of recent years and the fact that the Greenway doesn't yet exist. The price increases anticipate the expected views and the reconnection to downtown Boston that will occur when the Greenway is created.

In an October 2004 *Boston Globe* article, Boston broker Kevin Ahearn, part-owner of the real estate firm of Otis & Ahearn, was quoted as saying, "The impact of the Greenway is beyond what people can really understand yet...But there is going to be a huge open space, and open space is a residential feature. Along the waterfront, there's a tremendous amount of interest that's real, tangible, and dramatic."<sup>30</sup> The property managers of the Harbor Towers, a condominium development that has not performed as well as expected, anticipate that the Greenway will connect their project to the City, and result in higher rents. This impact is already apparent, as the gap between the price of units facing the Harbor and units facing the soon-to-be-created Greenway have narrowed.<sup>31</sup> And one of Ahearn's top agents "sold a very expensive home in Harbor Towers to people from out of town simply because they were attracted to the words 'Rose Fitzgerald Kennedy

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8 2005, p. E28.

<sup>27</sup> Ibid.

<sup>28</sup> [http://www.colliers.com/Markets/Boston/CaseStudies/Local/folio\\_boston](http://www.colliers.com/Markets/Boston/CaseStudies/Local/folio_boston)

<sup>29</sup> Ibid.

<sup>30</sup> Collins, Monica, "Green with Envy: Nobody is Selling the Hottest Real Estate Market in Boston Harder than Carmella Laurella, which is Why She's Making Just as Many Friends as Enemies", in *The Boston Globe Magazine*, October 17, 2004, p.7.

<sup>31</sup> Op.Cit., Palmer, p. A1.

Greenway.”<sup>32</sup> Between 2003 and 2004, prices for single bedroom units at Harbor Towers increased by more than 130 percent,<sup>33</sup> a substantial increase that some realtors attribute to the location of these projects near the Greenway.<sup>34</sup>

In addition to major redevelopment projects along the Greenway, some property owners and businesses are expressing their confidence in the economic benefit of the Greenway by reinvesting in their properties. For example, the owner of the Grain Exchange Building at 177 Milk Street hired an architectural firm to reorient his building toward the Greenway.<sup>35</sup> Martignetti Liquors in the North End is considering a “facelift.” Two North End restaurants, Mother Anna’s and the Belvedere, may add sidewalk cafés along sidewalks that once faced the Artery infrastructure.<sup>36</sup>

Two additional projects currently under construction illustrate the impact of the removal of the elevated Artery and its replacement with the Greenway on the development market and real estate values. Greenway Place is comprised of 12 new loft condominiums in an old office building at 199 State Street, adjacent to the Greenway. The developer reoriented the building to face the Greenway, with views also encompassing the Harbor. The project is advertised as “located directly on the Rose Fitzgerald Kennedy Greenway...with 16-foot glass curtain walls that will overlook the lush parks and streetscapes...Greenway Place: The New Point of View.”<sup>37</sup>

A second project, the 20-story InterContinental Boston and the Residences at the InterContinental, will open in 2006. The InterContinental is a five-star hotel chain that caters to international travelers. This will be its first project in Boston. The Residences at the InterContinental will be built on the top eight floors of the project and will include 130 units, which will have views of the Greenway or the Harbor. The most interesting component of this project is that it is being built on four acres of land that surround the Artery tunnel vent building at 500 Atlantic Avenue. The building completely surrounds the vent building, and will incorporate special construction to mitigate any vibration from the vent. The project will ask top prices for units and hotel rooms despite this unusual feature, and its location near the Greenway, waterfront, and new convention facilities are some of the significant reason for these high prices.

Altogether, actual and planned residential and commercial projects identified outside of the South Boston Seaport District will generate \$100 million annually in city property tax revenues,<sup>38</sup> and total revenues will exceed \$200 million after the buildout of the Seaport

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<sup>32</sup> Op. cit., Collins, p. 7

<sup>33</sup> Reidy, Chris, “High Hopes at Towers Harbor Towers Looks to the New Greenway as the Road to its own Rebirth” in *The Boston Globe*, March 14, 2004, p. K1.

<sup>34</sup> Op. cit., Collins, p. 7

<sup>35</sup> Op. cit., Palmer, A1.

<sup>36</sup> Reidy, Chris, “North Enders Determined to Shape Their Future” in *The Boston Globe*, June 15, 2004, p. 27.

<sup>37</sup> *The Boston Sunday Globe*, August 21, 2005.

<sup>38</sup> Calculations based on FY commercial rates of \$32.68/\$1000 and residential rates of \$10.73/\$1000. All condos assume a 30% residential deduction.

(as shown in Table 4.4, above). These revenues can potentially be used to help all neighborhoods in the city.

### **4.2.3 Surface Parks and Open Space**

In addition to the 30-acre surface of the Central Artery through downtown Boston, of which 14.5 acres is designated as parkland, the MTA will construct roughly 285 acres of parks and landscaped spaces throughout the city, from Charlestown to South Bay to East Boston, at a cost of \$300 million. Some 42 acres of new parkland are planned for either side of the Charles River between the dam in the area of the Museum of Science and the east side of the Leonard P. Zakim Bunker Hill Bridge. The following is a detailed list on the current status of parks, and Figure 4.1 shows a map of Central Artery open space and parks:

- The Paul Revere Park in Charlestown near the Charles River Dam opened in July 1999.
- The 2.5-acre Nashua Street Park along the Charles River near Leverett Circle and the Spaulding Rehabilitation Hospital has opened.
- Construction of the North Point Park along the New Charles River Basin began in June 2002.
- The Bremen Street Park in East Boston encompasses nearly 18 acres, running for four blocks along Bremen Street next to the Paris Flats neighborhood between Route 1A and Bremen, Porter and Prescott streets. Completion is expected in 2006.
- Additional parks are currently in the planning stage. (See Chapter 5, specifically Figure 5-1 and Section 5.4.)

### **4.2.4 Planning Issues**

The development opportunities created by the CA/T Project have the potential to transform Boston in a substantial and lasting manner. While the level of interest in development projects along the Greenway and in the Seaport District is viewed as positive, and the increase in property values, leading to more than \$200 million in property tax revenues, is helpful to the financial future of the City, there are potential pitfalls that come with such development that must be managed.

Gentrification is one concern voiced by the residents of neighborhoods adjacent to the CA/T Project. Residents of the North End, Chinatown, and South Boston have expressed fears that the new developments in their neighborhoods will raise property values, leading to an increase in property taxes that residents cannot afford. Residents view the gentrification of the South End after construction of Copley Place and the redevelopment of the Leather District into trendy, expensive lofts and shops as examples of what may happen to their neighborhoods. It is expected that city agencies, neighborhoods and developers will continue to work together to address these issues.

Related to the concern of being priced out of the neighborhood is the temptation some land owners may feel to sell their land for large profits. Ken Greenburg, the Toronto urban design consultant hired by the City to visualize the future of the Greenway, noted the importance of keeping existing businesses in the North End to retain the Italian ambience and help create a 24-hour environment.<sup>39</sup>

Another consideration is the pace of development. Regional and national market fluctuations and economic cycles will influence the rate at which development occurs in the area. The recent experience with the Prudential redevelopment project illustrates this point. Completion of that project has extended beyond the original target date in response to the sluggish economy in the early 2000s. Further, the development program was altered, with creation of new retail space preceding office space, due to the soft office market in Boston in recent years. In combination, the developments currently proposed for the Seaport and Greenway would provide considerably more space in all use categories than could possibly be absorbed in the near term. These development will need to be spread out over time in response to market conditions to allow demand to keep pace with supply. If the private market does not adjust to the pace of demand, there could be a glut of space, with buildings sitting empty and detracting from the success of the area.

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<sup>39</sup> *The Boston Sunday Globe*, August 21, 2005

# 5 IMPACT ON BROADBAND NETWORK DEVELOPMENT

## 5.1 Fiber Optic Network

Economic development in Massachusetts is served by an extensive network of broadband fiber optic lines that lie underneath the Massachusetts Turnpike, as well as by traffic that flows on its surface.<sup>40</sup> In the late 1990s, the MTA leased space under the Turnpike for four companies to lay broadband cable. (See Table 5-1.)

Table 5-1. Fiber Optic Connections Under the Massachusetts Turnpike

Telecommunications Company	Number Fiber Optic Strands	Year Agreement Executed
AT&T Corp.	264	1998
Level 3 Communications	3,456	1999
MCI-WorldCom	48	1995
Williams Communications	<u>1,728</u>	1999
Total:	5,496	

Source: Massachusetts Turnpike Authority

The Turnpike is now the route for inter-state fiber optic trunk lines, providing connections with capacity for approximately 5,500 underground fibers. The MTA collects nearly \$3.5 million annually for leasing its underground corridor to these telecommunications companies.

Currently the Turnpike houses significantly more fiber strands than is needed to meet business and household demand, and as a consequence many of the strands are still inactive, even after allowing for redundant capacity. However, the spine of Massachusetts, including its core Metro-Boston region, is now fully wired for any foreseeable demand for broadband service.

As seen in Figure 5-2, fiber optic demand is forecast to triple between 2002 and 2007. Based on the average of three firms that specialize in telecommunications, the number of broadband subscribers in the United States will grow from about 19 million to 57 million from 2002 to 2007. The importance of these fiber optic lines may be even more important for Massachusetts in the future. Economist and economic development

<sup>40</sup> In addition to broadband, utility relocations under the Turnpike include 29 gas, electric, sewer and water lines, along with 200,000 miles of copper telephone cable.

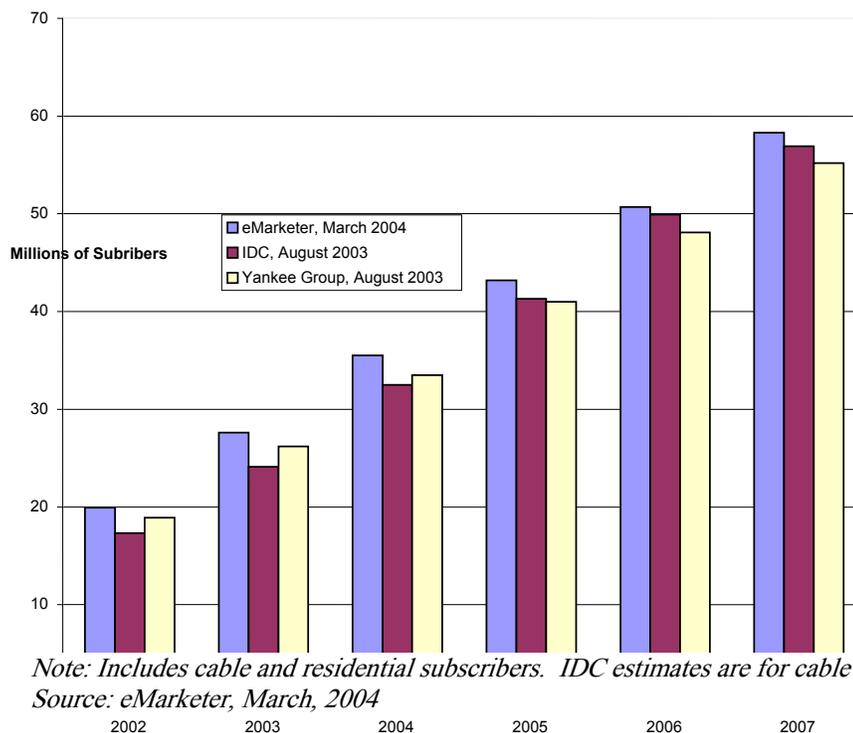
commentators have long believed that the Massachusetts economy is driven by innovation and is “knowledge based.” Within the Commonwealth, companies within the top 6 percentile of telecommunication service users account for 70% of Massachusetts’ employment and 78% of its business sales (Dun and Bradstreet, 2004).

Using national data, EDR Group constructed an index of industries to track reliance on information. The index tracks the intensity of internet connections, online business trading (selling, buying, making and receiving payments), the web as a tool to integrate business processes (with suppliers and customers, to enhance external marketing and internal operations) and to facilitate production processes and services.

Core industries to the Massachusetts economy, including financial services and computing and business services are heavily reliant on the internet. Leading sectors, in order are shown to be:

- Computing and business services
- Financial/Insurance
- Telecommunications
- Other Services
- Manufacturing/utilities and construction
- Wholesale/Retail/Catering/Travel

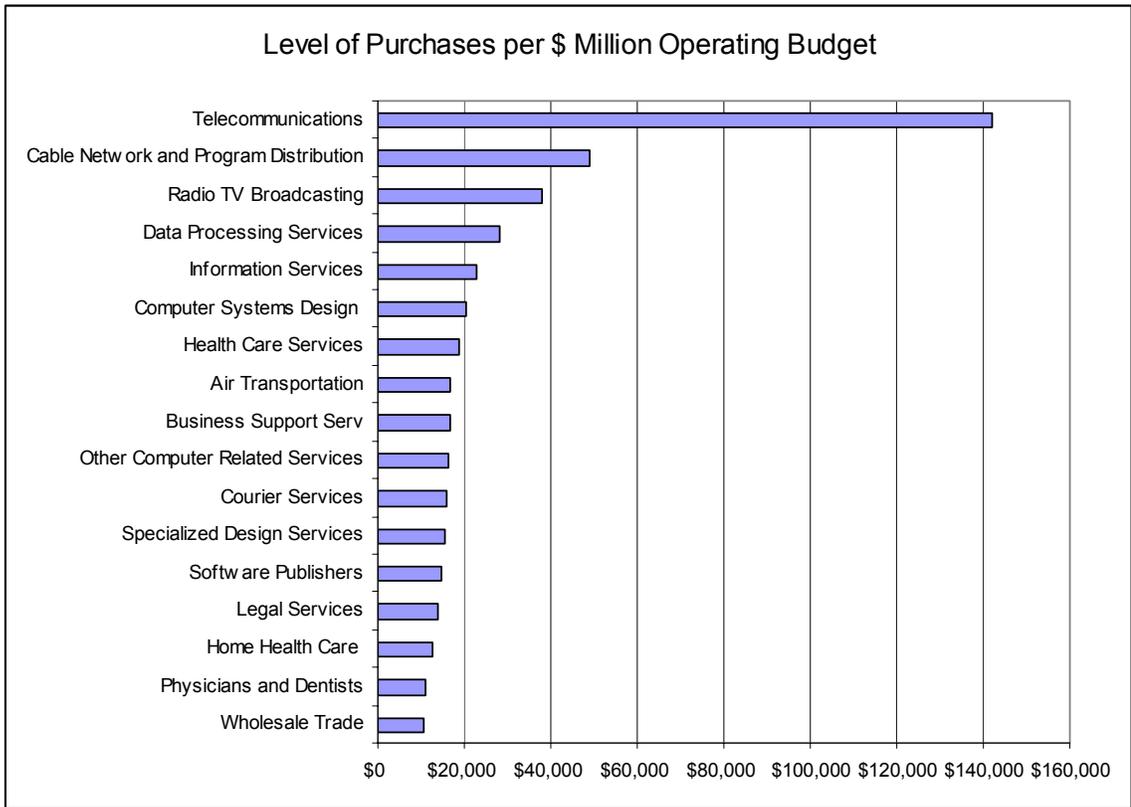
**Figure 5-1 Comparative Projections of US Broadband Subscribers, 2002-2007**



In Massachusetts, we can gauge industries that will benefit from the fiber optic cable running beneath the Turnpike by examining how much each industry spends for telecommunications services as a percent of total operating expenditures. Overall, Massachusetts companies spend \$4.3 billion per year for telecommunications services.<sup>41</sup> Below in Table 5-2 are selected industries in Massachusetts and how much each industry spends for telecommunications services per million dollars of operating budget. The telecommunications industry, along with cable television and radio, are leading purchasers of telecommunications service. Other industries shown below, however, are critical sectors to the modern Massachusetts' economy, such as health care, business and legal services, aviation, software publishers and information services

<sup>41</sup> Source: IMPLAN, Commodity Balance Sheet, which is derived from U.S. Department of Commerce data.

**Figure 5-2. Purchases of Telecommunications Services by Massachusetts Companies**



*Source: calculations by Economic Development Research Group, based on data from the IMPLAN model for Massachusetts.*

*Note, we chose these industries to illustrate how the broadband under the Massachusetts Turnpike supports key business sector in the Commonwealth. While these sectors are among the leading consumers of telecommunications services, other industries also account for more than \$10,000 per million dollars of operating budget (1%).*

# APPENDIX

Appendix Table 1 compares the Suffolk County (Boston) economy from 1956 - the time before opening of the Massachusetts Turnpike, to the present (2003 data). While the source for both years was County Business Patterns, there were significant differences in the industry classification systems used during those two times. Nevertheless, the tables show a dramatic drop in manufacturing jobs and an equally dramatic rise in services.

**Appendix Table 1. County Business Patterns: Suffolk County Jobs by Industry, 1956-2003**

1956 County Business Patterns			2003 County Business Patterns		
Industry Description	Major Sector	Sub-sectors	Industry Description	Major Sector	Sub-sectors
Agric. Services, Forestry, Fishing	1,373		Forestry, Fishing, Agric. Support	34	
Mining	156		Mining	50	
Construction	15,609		Construction	13,361	
Manufacturing	102,985		Manufacturing	15,306	
<i>Food &amp; Kindred Products</i>		14,106	<i>Food Manufacturing</i>		3,355
<i>Apparel &amp; Fabric Products</i>		21,396	<i>Apparel</i>		902
<i>Printing, Publishing Industries</i>		16,218	<i>Printing</i>		1,482
<i>Machinery (except electrical)</i>		7,193	<i>Machinery Manufacturing</i>		327
<i>Electrical Machinery &amp; Equip</i>		8,625	<i>Electronic &amp; Electrical</i>		2,895
			Information	20,880	
Public Utilities, incl. Transport	43,023		Utilities, Transport, Warehousing	20,823	
Wholesale Trade	49,489		Wholesale Trade	12,842	
Retail Trade	78,362		Retail Trade	66,184	
<i>Eating &amp; Drinking Places</i>		18,360	<i>Eating &amp; Drinking Places</i>		35,338
Finance, Insurance & Real Estate	50,524		Finance & Insurance; Real Estate	101,043	
Services	54,437		Services	300,360	
<i>Hotels, Boarding Houses</i>		6,207	<i>Accommodation</i>		9,686
			<i>Prof. Scientific, Tech Services</i>		56,840
			<i>Management of Companies</i>		15,468
			<i>Admin, Support, Waste Mgt</i>		34,369
			<i>Educational Services</i>		46,444
			<i>Health Care, Social Assistance</i>		106,471
			<i>Arts, Entertainment, Recreation</i>		9,337
			<i>Other Services</i>		21,745
Non-classifiable and Unclassified	932		Unclassified	892	
<b>Total Employment</b>	<b>396,890</b>		<b>Total Employment</b>	<b>551,775</b>	

Sources: 1956 and 2003 County Business Patterns for Suffolk County, MA. Bureau of Census, U.S. Department of Commerce. Industry definitions vary over time. Therefore, this comparison should be read as defining orders of magnitude. 2003 data are based on two and three digit NAICS codes sorted by EDR Group.

Appendix Table 2 utilizes an alternative source -- city reports issued by the Boston Development Authority – to compare the city’s economy over the 1955 to 2000 period. The 1955 table is reported as major sectors only. As discussed above, changes in industry classification systems over this 45 year time span requires that this comparison be considered as an order of magnitude, and not as exact counts by sector.

**Appendix Table 2. Boston City Records, Jobs by Industry, 1955-2000**

Sector	1955		2000	
	Jobs	Percent	Jobs	Percent
Agriculture/mining	1,700	0.3%	1,697	0.2%
Construction	16,851	3.0%	19,809	2.9%
Manufacturing	95,785	17.1%	27,978	4.1%
Trans/Comm./Pub. Util.	40,673	7.3%	38,298	5.6%
Wholesale & Retail Trade	140,163	25.0%	83,462	12.1%
Finance, Insurance & Real Estate.	55,755	9.9%	109,087	15.9%
Services	94,595	16.9%	314,441	45.7%
Proprietors	16,178	2.9%	n/a	n/a
Government	98,890	17.6%	93,306	13.6%
<b>Total</b>	<b>560,590</b>	<b>100.0%</b>	<b>688,078</b>	<b>100.0%</b>

Sources: Boston Redevelopment Authority, History of Boston's Economy: Growth and Transition, 1970-1998. Lewis, Avault and Vrabel. November 1999; Boston Redevelopment Authority, The Boston Economy 2004 - Turning the Corner, Leonard, Modicamore and Perkins. September 2004

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