Conflict Management in the Design of
the Charles River Crossing

by

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ABSTRACT

This thesis examines the effectiveness of a consensus-building approach to resolving a public dispute surrounding the design and construction of a new roadway. In recent years, such disputes have increased in number and intensity. I reviewed the negotiation process used to revise the design of a river crossing in Boston. A committee, composed of stakeholder representatives, played an important role. Although the committee suggested various alternatives, with the assistance of a neutral facilitator and engineering consultants, it could not reconcile all the differing views. I explain key factors that precluded reaching a consensus.

This case study suggests that a stakeholder committee is useful in identifying problems and generating possible alternatives at the conceptual level. The use of an "open process" encourages diverse perspectives and enhances government's accountability. Independent facilitators and engineering consultants help the members of such committees concentrate on problem-solving rather than on taking sides. However, when a committee faces non-negotiable demands or zero sum bargaining resulting from external constraints, it will have difficulty building consensus. The government, in turn, may be discouraged from pursuing consensus if it finds the committee process inefficient. A formal protocol should be established at the outset indicating how disagreements will be settled if consensus cannot be reached.

Thesis Supervisor: Dr. Lawrence Susskind
Title: Professor of Urban and Environmental Planning

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List of Abbreviations

ABC	Artery Business Committee
BAFG	Boston Artery Focus Group
BATNA	best alternative to a negotiated agreement
BDRC	Bridge Design Review Committee
B/PB	Bechtel/Parsons Brinckerhoff
BTPR	Boston Transportation Planning Review
CA/T	Central Artery/Tunnel
CANA	Central Artery North Area
CIP	Committee Improvement Package
CLF	Conservation Law Foundation
CRT	Committee for Regional Transportation
CRWA	Charles River Watershed Association
CTPS	Central Transportation Planning Staff
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EOEA	Massachusetts Executive Office of Environmental Affairs
EOTC	Massachusetts Executive Office of Transportation and Construction
USEPA	United States Environmental Planning Agency
FHWA	Federal Highway Administration
HOV	high occupancy vehicles
MBTA	Massachusetts Bay Transportation Authority
MDC	Metropolitan District Commission
MDPW	Massachusetts Department of Public Work
MEPA	Massachusetts Environmental Policy Act
NEPA	National Environmental Policy Act
MHD	Massachusetts Highway Department
NRT	Non-River-Tunnel Alternative
ROD	Record of Decision
RRT	Reduced-River-Tunnel Alternative
USACE	United States Army Corps of Engineers

Chapter 1
Introduction

When the government designs and implements a public project, public input is imperative in order to identify and address people's concerns. Although the law mandates that people have a chance to express their concerns at public hearings, citizens still argue against the arbitrariness and inflexibility of government decision making and sometimes resort to lawsuits. There are diverse viewpoints as to what extent people should get involved in the decision-making process. Environmental mediation appears to be a promising approach in resolving environmental disputes. I will review the consensus-building approach to resolving various stakeholding policies and analyze its strength and weakness.

1.1 Citizen involvement versus Consensus Building

Infrastructure improvements are vital to economy development as well as for the environmental improvement. At the same time, building infrastructure could also have negative impacts on surrounding areas and populations. Even if most people support a highway project, its neighbors may contend against the project because they worry about possible negative impacts. Thus, planning infrastructure involves the allocation of benefits and negative impacts. Furthermore, the perception of the impact and the priority of many objectives vary depending on the interest groups. Business groups may appreciate the economic benefits and job opportunities created by a highway project, while environmental advocacy groups may be more worried about the increase of traffic and air pollution.

There are several key elements in the planning of a public project including the decision maker and the evaluation method.[1] The first question is to what extent and how citizens should get involved in the decision making process of the government. The government is supposed to represent the interests of the whole area and population under its jurisdiction and is delegated administrative authority. The government also has professional expertise in terms of engineering constraints as well as cost and duration of the project. However, the government cannot act in isolation in deciding all elements of a project without public input. By responding to peoples' preferences and concerns toward a project, government officials not only improve the project design but also gather support for their decision.

Second is how to assess the benefits and impacts of a project, evaluation process. One of the traditional methods for estimating the benefits of a project is benefit-cost analysis. However, there are many objectives that cannot be measured in terms of money, such as the preservation of the natural environment, aesthetics, and so forth. Tabular display of evaluative factors and the sum of weighted factor scores are developed for considering multiple objectives. This method can take into account the difference of factor weights among areas and population.[2] The unavoidable problem is that however sophisticated a method the government employs for evaluation, value judgment are inevitably involved in the evaluation process; the government selection of an alternative cannot help being made according to someone's set of goals and preferences.

Therefore, public input is necessary for the design of a public project to ensure that value judgments made reflect the interests of more likely to be

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[1] The evaluation method is the way of analyzing a number of alternatives to search out their comparative advantages and disadvantages for subsequent deliberations.

[2] Ortolano (1984) provides a good review of various evaluation methods.

affected. The public should be informed of the impacts of a project and given opportunities to express their concerns. There is now well-developed literature that describes the design of public meetings, advisory groups, and other public involvement techniques.[3] However, there are some problems in the traditional public-participation methods of public hearings, citizens advisory committees, and task forces.

Since citizens are not given enough information prior to a public hearing in most cases, they can only express their specific concerns from uninformed and narrow perspectives. A citizens advisory committee is useful in discussing government proposals from diverse perspectives. However, because a citizens advisory committee is usually closed to the public and its members are carefully selected by the government, the committee does not always represent the realistic views of the publics concerned. Also, since the committee tends to react to government proposals instead of examining alternatives, its members may feel that the government uses the committee only to ensure approval of government decisions. Even if a task force is provided with adequate staff assistance, an inequality in expertise may discourage citizen members from raising questions and challenging governmental value judgments.

The consensus-building approach, which gives more discretionary power to citizens than traditional public involvement methods, is advocated by MIT professor Lawrence Susskind. Susskind was involved as an mediator in numerous cases which dealt with land use and the environment.[4] In particular, as chairman, he led the Alewife Task Force to success in the case of

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[3] *The Public Involvement Manual* by Creighton (1981) and *Effective Citizen Involvement in Transportation Planning*, 2 vols. by US DOT (1976) provide various techniques for public involvement. The following paragraphs are based on the latter manual.

[4] *Breaking the Impasse* by Susskind and Cruikshank (1987) elaborates mediation theories and techniques.

the subway extension from Boston to Cambridge. In this case, he explained that both opening meetings to anyone who wanted to attend and dispensing with votes, enhanced the credibility and visibility of a committee and eliminated the problem of representation. Furthermore, although Susskind admitted that the government had final decision-making power, he stressed that authority should be allocated to those committee participants whose interests were at stake.[5]

Susskind and others also argue that the consensus-building approach is superior to litigation, especially when guided by a professional facilitator.[6] While government officials may think that they are proceeding properly and responding reasonably to public concerns, unsatisfied stakeholder groups or citizens may bring questions to court. It takes a great deal of time and money to settle disputes in court. Judges focus their attention on due process rather than on conflicting points. Since the verdict tends to be unilateral, the risks are high for both sides. Therefore, although lawsuits are important for the politically weaker parties and can be effective leverage in negotiation, they may not be the best way to resolve disputes.[7]

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[5] *Citizen Participation and Consensus Building in Land Use Planning* by Susskind detailed this mediation case.

[6] Susskind and et al. (1990) explains key factors for successful mediation using six public dispute cases.

[7] Talbot (1983) argued that the threat of impending litigation gave the impetus for mediation using six public dispute cases.

1.2 The Purpose and the Framework of This Study

In order to examine the effectiveness of the consensus-building approach with respect to the design of a large-scale public project, I reviewed the negotiation for the design of the Charles River crossing, which is a part of the Central Artery/Tunnel Project in Boston. This case is unique in three ways: an open participatory committee guided by an independent chairman and facilitator reviewed the state-proposed river crossing scheme; the committee members, most of whom were unfamiliar with transportation planning, tackled detailed elements of the design with assistance from technical consultants; the committee not only established criteria for the selection of a scheme but also chose the scheme it preferred.

An advisory committee, called the Bridge Design Review Committee (BDRC), was established after cities, local residents, business groups, and environmental advocacy groups opposed the state-selected design of a number of key bridges. Their opposition revolved around the location of on-ramps and the negative impacts on the river environment, aesthetics, and related land uses. Although the state established the committee as an advisory group, it gave the committee a great deal of authority and flexibility. It also provided funds for a capable independent facilitator and independent consultants as well as state staff assistance. The committee was composed of all stakeholding groups, including a number who were already litigants.

The committee examined all possible options for the river crossing and created various schemes which resolved problems with the original scheme; it narrowed down the options to three committee improvement packages. It could not reach an agreement, however, and after five months of discussion, it made its recommendation by a split vote. The state followed up the

recommended scheme and created an alternative on which all members compromised one year later. Questions regarding the compromise alternative were raised by two federal agencies as well as by some committee members. During this period, a new Secretary of Transportation was appointed, and the new secretary selected an all-viaduct alternative than the alternative recommended by the committee. Some of the environmental advocacy groups then brought the issue to court again. This case is not yet resolved.

In Chapter 2, I describe the negotiation process used during the BDRC meetings and clarifies the arguments of each of the stakeholding groups. I highlight in Chapter 3 several key factors which I found beneficial and detrimental to the negotiations. In Chapter 4, I describe the subsequent BDRC negotiation with the state. In Chapter 5, I explain the gains of each of the stakeholders from this negotiation as well as the key factors that precluded working out a feasible scheme in the subsequent period. In Chapter 6, I examine the entire negotiation process using several criteria, such as representation, openness, neutrality, and efficiency. In addition, I sort out several factors which precluded consensus. These might be of interest for future research.

I gathered information concerning the negotiation process and arguments of each of the stakeholding groups through personal interviews, secondary documents (meeting summaries, members' letters, *Bridge Design Review Committee Report* in 1991, and *Draft and Final Supplemental Environmental Impact Statement/Report* in both 1990 and 1993 as well as testimonies and letters responding to them), as well as other published materials.

This case shows that the consensus-building approach worked well in identifying both the problems with the original design and the issues at stake for each of the groups. By dealing with the engineering issues, this approach also created several superior alternatives to the original "Scheme Z." All the members could understand the trade-offs embedded in the design modifications, even though they were not particularly satisfied with the final scheme. However, this case also shows that the consensus-building approach did not resolve disputes when the members faced trade-offs that forced one group to accept disadvantages in order to satisfy the requirements of another group, especially when there were many engineering and spatial constraints for expanding the size of total benefits divided among stakeholders. The state, which called for the BDRC, reconsidered the benefits of continuing its negotiations with the committee and changed its strategy in mid course.

1.3 Introduction of the Central Artery/Tunnel Project

The Central Artery, which is a part of Interstate Highway I-93, is a key element in the highway network of the Boston metropolitan area. (See Figure 1.1 for the regional highway network). This network is composed of a circumferential highway and radial highways. A circumferential highway, Route 128, rings Boston on the north, west and south approximately eight miles from downtown Boston. This circumferential highway is linked to downtown Boston by the following radial highways:

1) to North Shore --- Route 1

2) to North --- I-93

3) to Northwest --- Route 2 and Storrow Drive

4) to West --- Massachusetts Turnpike (I-90)

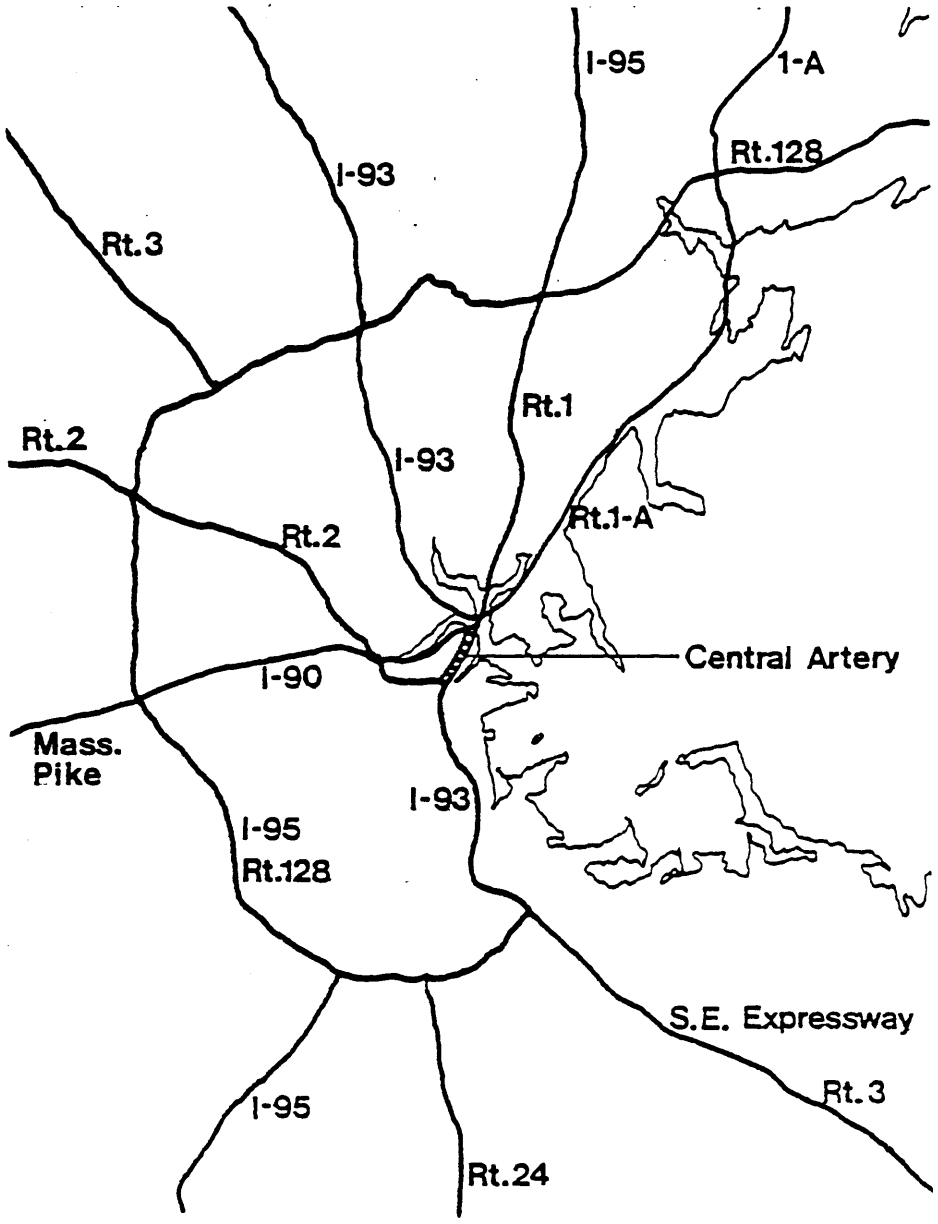
5) to South Shore --- Southeast Expressway (I-93)

The Central Artery traverses downtown Boston connecting it with these radial highways. This is the only direct link east of Route 128 between highways to the north and south of Boston. It stretches in a generally southerly direction from the junction of I-93 and Route 1 (the Tobin Bridge), passing over the Charles River, above downtown Boston, and then to the interchange between Massachusetts Turnpike (I-90) and Southeast Expressway (I-93) near Chinatown. This viaduct section is about three miles long. In the central Boston area, the Central Artery is also connected with Logan Airport and East Boston via two tunnels under Boston Harbor.

When the Central Artery was constructed in the 1950's, it was built without federal assistance and its capacity and design was restricted. At its northern end, five lanes from I-93 and five lanes from Route 1 merge to six lanes over the Charles River. The Central Artery is also inadequate by modern

Figure 1.1 Regional Highway Network in the Boston Metropolitan Area

Source: Massachusetts Department of Public Works. *Central Artery/I-93 Corridor: South Area Planning Study*, 1978.



standards; it has neither extra operational lanes nor sufficient lanes for speed changes to and from ramps. Moreover, it is now forced to accommodate traffic volumes more than double those expected at the time of its design. This has caused chronic traffic congestion and severe safety problems. Traffic volume of the Central Artery is forecasted to increase continuously from 190,000 vehicles per day in 1988 to about 220,000 vehicles per day in 2010.

The Central Artery/Tunnel Project will replace the elevated section, six lanes for most of the stretch and four lanes at its narrowest point, with eight through lanes, mostly underground. This project will also extend I-90 to the east and add four new lanes under Boston Harbor to Logan Airport. The Charles River crossing will be rebuilt to accommodate increasing traffic between I-93 North/Route 1 and the Central Artery/Storrow Drive. This Central Artery/Tunnel Project is the most expensive highway project in U.S. history, and its total cost is now estimated at approximately 7.7 billion dollars.

Chapter 2
The Role and the Performance of the Bridge Design Review Committee

2.1 Scheme Z and the Evolution of Conflicts[1]

Background

The Central Artery is a part of Interstate 93 through downtown Boston to Cambridge and Charlestown, crossing the Charles River. Route 1 branches off from I-93 at the north side of the river to head northeast, and Storrow Drive diverges from I-93 at the south side of the river to head west along the river. (See Figure 2.1 for the location of the Charles River crossing in the whole project and Figure 2.2 for the detailed environment in the Charles River crossing area). Although the existing central artery was built in the 1950's to handle 75,000 cars a day, now nearly 190,000 cars travel through it every day, causing hours of traffic congestion and an accident rate twice as high as the national average. Currently, traffic between Route 1 and Storrow Drive is connected via an existing high level double-deck bridge across the Charles River within a very short 600-foot-long weaving section, causing safety problems and traffic congestion. In particular, for the traffic southbound, six lanes from I-93 and Route 1 merge into three lanes and then narrow to two lanes causing chronic backups. The Charles River crossing is known to be the most dangerous bottleneck in the United States interstate highway system.

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[1] This section is based on a report, *Mega-Project*, by Luberoff, Altshuler, and Baxter (June 1993) and articles in *Boston Globe*.

Figure 2.1 Location of the Charles River Crossing

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Final Supplemental Environmental Impact Statement/Report*, 1994.

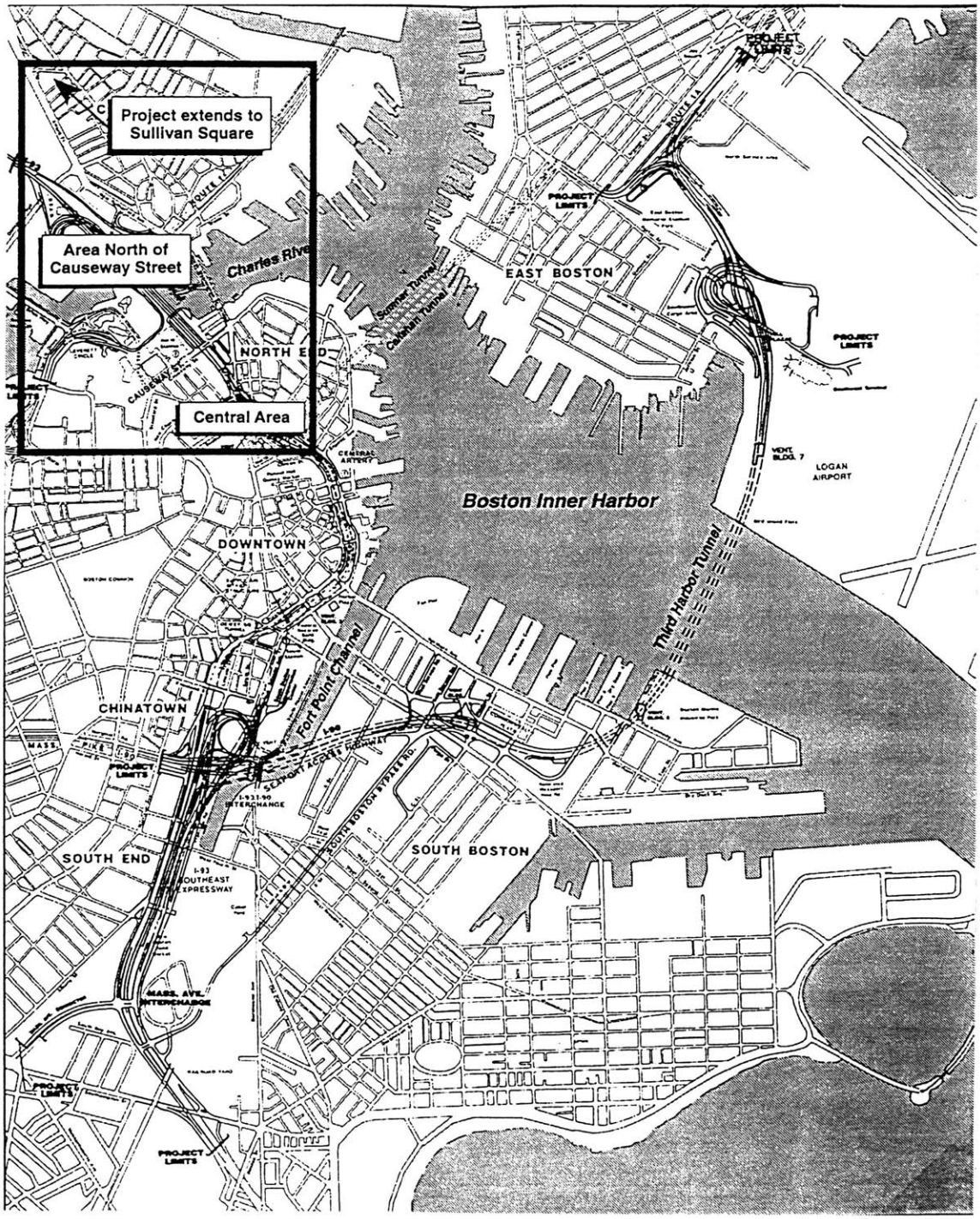
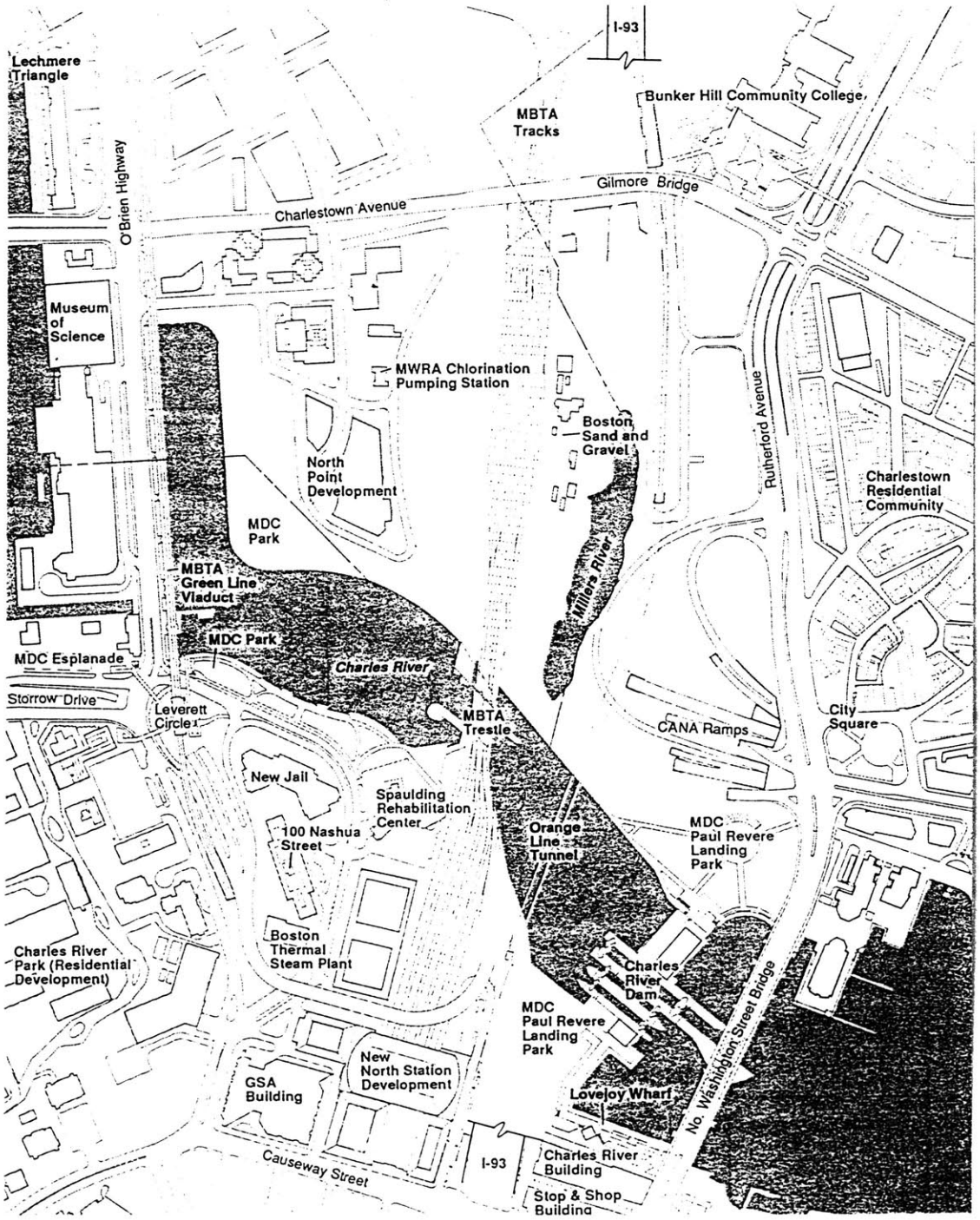


Figure 2.2 Detailed environment in the Charles River Crossing Area

Source: U.S. Department of Transportation, Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Final Supplemental Environmental Impact Report*, 1990.



The Charles River crossing improvement was proposed as part of the Central Artery/Tunnel Project (CA/T Project) in 1983. The Final Environmental Impact Statement and Report (Final EIS/R)[2] selected an alternative called Alternative 5A Modified. The scheme proposed replacing the current double-deck high bridge with two parallel low bridges, five lanes wide, crossing near the top of the Charles River Dam. Traffic moving from Route 1 to Storrow Drive would go under the river through a tunnel, while traffic from Storrow Drive to Route 1 would go on a viaduct. This scheme was designed to fit with the Central Artery North Area Project (CANA)[3] which is now underway in Charlestown. The CANA Project replaces the existing viaduct connections between I-93 and Route 1 with two tunnels under City Square in Charlestown and a long loop on the western side of I-93.

Although the FEIS/R was approved by the Federal Highway Administration (FHWA) and the Massachusetts Executive Office of Environmental Affairs (EOEA) in 1986, it identified fourteen issues, including the fact that the Charles River crossing remained unresolved. Some of the unresolved problems of Alternative 5A Modified were that ramps swung out over the Charles River, low bridges impeded navigation on the river and short weaving distances and tunnel connections between I-93 south of Causeway Street and Storrow Drive along the south bank of the Charles River.

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[2] The EIS conforms to the National Environmental Policy Act (NEPA), and the EIR conforms to the Massachusetts Environmental Policy Act (MEPA).

[3] The state agreed with the FHWA to split the whole project into three sections. The north area included Charlestown and the Charles River crossing. The central area included the elevated sections of I-93. The southern section included a tunnel in the Fort Point Channel and Third Harbor Tunnel to Logan Airport. Although the new Charles River crossing was initially included in the north area planning study, the state later moved the river crossing to the central area. This would enable the north area work to go ahead and facilitate the coordination of the river crossing with the artery depression.

Between 1987 and 1990, the Massachusetts Department of Public Works (MDPW)[4] and Bechtel/Parsons Brinckerhoff (B/PB)[5] engineers considered 32 design alternatives and narrowed them down to three families of design options; the S family provided a tunnel connection between I-93 south of Causeway Street and Storrow Drive and a viaduct connection between the north side of the river and Storrow Drive, the T family put both connections in tunnels, and the Z family put both connections on viaducts. The 1990 Final EIR compared the three family alternatives and Alternative 5A Modified with each other and identified an all-viaduct option, called Scheme Z, as the preferred alternative.

Emergence of Conflict

When a model of Scheme Z was revealed in 1989, people's responses were strongly negative. An Environmental Protection Agency (EPA) official said that if the bridges and viaducts were built as designed, they would constitute "the single ugliest structure in New England." However, the state tried to convince the people that they had already examined many alternatives and that Scheme Z was the only possible option. The City of Boston, the Artery Business Committee, 1,000 Friends of Massachusetts, the Conservation Law Foundation, and other business and environmental groups reluctantly agreed not to oppose Scheme Z. They expected the project to provide jobs, parks, and many other benefits. They were afraid that the whole project would be jeopardized by a design change, which would at the very least involve increased costs and delays, and add many uncertainties to the process.

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[4] The MDPW was later reformed to the Massachusetts Highway Department (MHD).
[5] B/PB was selected as the core management team in the CA/T Project.

However, those worried about negative impacts on the environment and aesthetics started protesting Scheme Z. One of the earliest and most critical constituencies was the Metropolitan District Commission (MDC)[6]. The MDC planners had long dreamed of extending the Charles River Esplanade eastward to the harbor. They feared that Scheme Z, which had 16 lanes on four bridges, would cover the future park on the river bank with noise, polluted air, and shadow. The MDC argued that the river and the riverbanks qualified as parkland protected under Section 4(f)[7] and requested an extensive mitigation package. Fred Salvucci, the Secretary of the EOTC, countered that the area between the Charles River Dam and the Museum of Science was not parkland but a transportation corridor not protected by Section 4(f).

Although the City of Cambridge had not paid much attention to the project passing through the east end of the city boundary, it recognized the threat of Scheme Z and began protesting by the spring of 1990. The Cambridge Conservation Commission expressed concerns toward the obliteration of the Millers River under its jurisdiction, albeit a small and almost stagnant river. The city planners also expressed concerns regarding negative impacts on housing projects in North Point. Then-Cambridge Conservation Commission director, Elizabeth Epstein said "Hugh Russell, a member of the Cambridge Planning Board, made some suggestions about how to modify Scheme Z, very small, very modest, modest things, like loop ramps were so close to the river, and moving back a little bit from the river. The state said 'no, we can't do that.'

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[6] The MDC is responsible for parkland, parkways, and recreation facilities along the Charles River. It was also responsible for the water and sewage system before the establishment of the Massachusetts Water Resources Authority in 1985.

[7] Under Section 4(f) of the Department of the Transportation Act, publicly owned parkland of national, state or local significance may only be used if "there is no prudent and feasible alternative to using the land" (4(f) (1)), and "the program and project includes al possible planning to minimize harm to the park... resulting from the use" (4(f) (2)).

If the state said yes, made some modifications, offered output what now they are trying to built at that point, that might have been the end of it. But everyone in the state were so unresponsive."[8]

The Charlestown community living on the east side of City Square, where the viaduct to the Tobin bridge would soon be depressed as the CANA Project, were satisfied with Scheme Z. The opposition emerged from the New Rutherford Avenue who feared a massive interchange beside their community.

The Committee for Regional Transportation (CRT)[9] established in August, 1990 put many opponents together and campaigned effectively against Scheme Z. Cambridge resident Steve Kaiser, a traffic engineer holding an MIT Ph.D., was an active member of the CRT. He developed several versions of the all-tunnel-alternative by himself and showed the scheme to the opposing groups. Although CA/T officials pointed out many problems in his scheme, such as high costs, contaminated soil excavation, a long period of traffic disruptions, and so forth, the possibility of the all-tunnel-alternative stirred up the controversy of Scheme Z greatly.

State Mediation Effort

Fred Salvucci, Secretary of the Executive Office of Transportation and Construction (EOTC), began discussion with the MDC about the dispute over the river parkland. The MDPW and the MDC, along with some environmental

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[8] Interview, Elizabeth Epstein, the former director of the Cambridge Conservation Commission, February 14, 1994.

[9] Because the CRT was provided much financial and technical assistance by the owner of Park 'N Fly who had been fighting with the state about the acquisition of his parking lot in East Boston, there was a criticism that the CRT was a facade of the owner of the parking lot and its intention was to stop the whole project in order to avoid the acquisition of the land.

advocacy groups, such as 1,000 Friends of Massachusetts, the Conservation Law Foundation, and other organizations, participated in a mediation hosted by the Massachusetts Mediation Service.[10] In November 1990, they reached the following agreement. The MDPW promised to spend from $50 to $75 million to protect the amenities of the river, and the MDC, in return, agreed that the bridge crossing area was a transportation corridor instead of a river park protected under the section 4(f) of the Transportation Act. The agreement was significant for the MDPW. This was because if the area had been identified as a Section 4(f) area, the state would have had to show that Scheme Z was the only prudent and feasible alternative, which apparently was not the case. The Cambridge Conservation Commission and the Charles River Watershed Association argued that the participation of the CLF in the mediation helped legitimize Scheme Z and gave it the appearance of being environmentally acceptable.

In October, 1990, the MDPW unveiled a long-span cable-stay bridge to meet the concerns of the Coast Guard and environmental advocacy groups. The new design would reduce the number of spans from four to three and the number of piers from seventeen to six. However, the design could not accommodate the Traverse Street ramp in downtown Boston in order to secure the spaces for the large piers supporting the cable stays. This removal would result in forcing the northbound traffic from downtown to run through the Washington Street Bridge up to the Rutherford ramp causing traffic congestion both in downtown Boston and Charlestown. Not only did this modification increase the concerns of the residents of Charlestown and the

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[10] The Cambridge Conservation Commission, the Charles River Watershed Association, and other organizations refused to participate in the mediation because the state refused to discuss alternatives to Scheme Z.

North End, but it also enraged the leaders of the Artery Business Committee who had strongly supported the CA/T Project including Scheme Z.

Angry citizens began demonstrating their opposition at city councils and meetings. The City Councils of Boston and Cambridge voted unanimously against Scheme Z. As the opposition spread, 1,000 Friends of Massachusetts changed their position to oppose Scheme Z. Republican William Weld won the gubernatorial election in November 1990 and stated that he would examine Scheme Z and consider new alternatives.

In December 1990, the Conservation Law Foundation (CLF) reached an agreement with the state. The agreement specified mass transit improvements, parking freezes and other measures, which were estimated to cost at least 4.3 billion dollar. The agreement was to be incorporated in the final EIR certificate. Politically, it was seen as a significant development for the state, and the EPA regional director supported it as a model for other states. However, the agreement was widely criticized by planning and environmental groups. The Massachusetts Bay Transportation Authority (MBTA) Advisory Board[11], which was not included in the mediation process but was fiscally responsible for the MBTA budget, criticized the agreement as a back-room deal. Also, environmental advocacy groups, such as the Committee for Regional Transportation and the Charles River Watershed Association, questioned the enforceability of the mass transit plan and the CLF's acceptance of Scheme Z.

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[11] The MBTA is responsible for the management of the subways, buses, and commuter rails in the Boston metropolitan area. The MBTA Advisory Board represents communities that provide a substantial portion of funding and has partial approval power over the budget.

2.2 The Role of the Bridge Design Review Committee and Issues for Each of the Stakeholders

2.2.1 The Position and the Role of the Committee

John DeVillars, Secretary of the EOEA issued a final EIR certificate on his last day in his office, January 2, 1991. Although DeVillars judged that the final EIR[12] was adequate as a matter of law, he strongly recommended a Bridge Design Review Committee (BDRC) in order to make the Charles River crossing more aesthetically pleasing and environmentally harmless as well as to address traffic problems such as the elimination of the Traverse Street ramp in Scheme Z. DeVillars also identified most of the key stakeholders in the EIR certificate who needed to be included in the committee and asked that the committee be convened no later than February 1, 1991.

Richard Taylor was appointed as EOTC Secretary by the newly inaugurated governor. Taylor established the BDRC, composed of 42 members, as an advisory group to him and the MDPW for the design and examination of alternatives for the Charles River crossing on February 1, 1991. Although the previous secretary Salvucci and his subordinates planned to limit the role of the committee to modifications of the bridge design, Taylor gave more authority to the committee as if he wanted to give it his stamp of approval.[13] Taylor appointed Stanley Miller as chairman of the committee. Miller was a general partner of Congress Realty Companies and had worked in both the real-estate business and land-use planning. Jack Wofford was appointed as a facilitator of the committee. Wofford was a senior consultant at Endispute, a

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[12] The state had decided to prepare the EIR, separate from the federal EIS, to get the certificate of EOEA under the Dukakis administration.

[13] Interview, John Wofford, the facilitator of the BDRC, February 8, 1994.

conflict management and dispute resolution firm in Cambridge. He had been involved in transportation planning at state and federal agencies; in particular, he worked for the Boston Transportation Planning Review as director.

2.2.2 Selection of the Committee Members

The committee of 41 members represented a wide range of views about the conflict of the Charles River crossing. It included five litigants (including parties having an intent to file lawsuits): The City of Cambridge, the Charles River Watershed Association, the Conservation Law Foundation, the Committee for Regional Transportation and the Sierra Club. Three of them were focused on the Charles River crossing and two on the whole project. Most of the members were identified in the 1991 final EIR certificate, and the other members were nominated by Secretary Taylor with the assistance of Chairman Miller. Jack Wofford recommended to include all of the contesting parties.[14] However, at least, one stakeholding group was omitted from the original members' list. Dan King, the representative of the Citizens for a Liveable Charlestown, a group which was not invited to the committee, asked for membership just the day before the first meeting.[15]

2.2.3 Problems of Scheme Z

I will summarize four of the most significant problems of Scheme Z (See Figure 2.3 for the diagram of Scheme Z) that the BDRC identified at the initial

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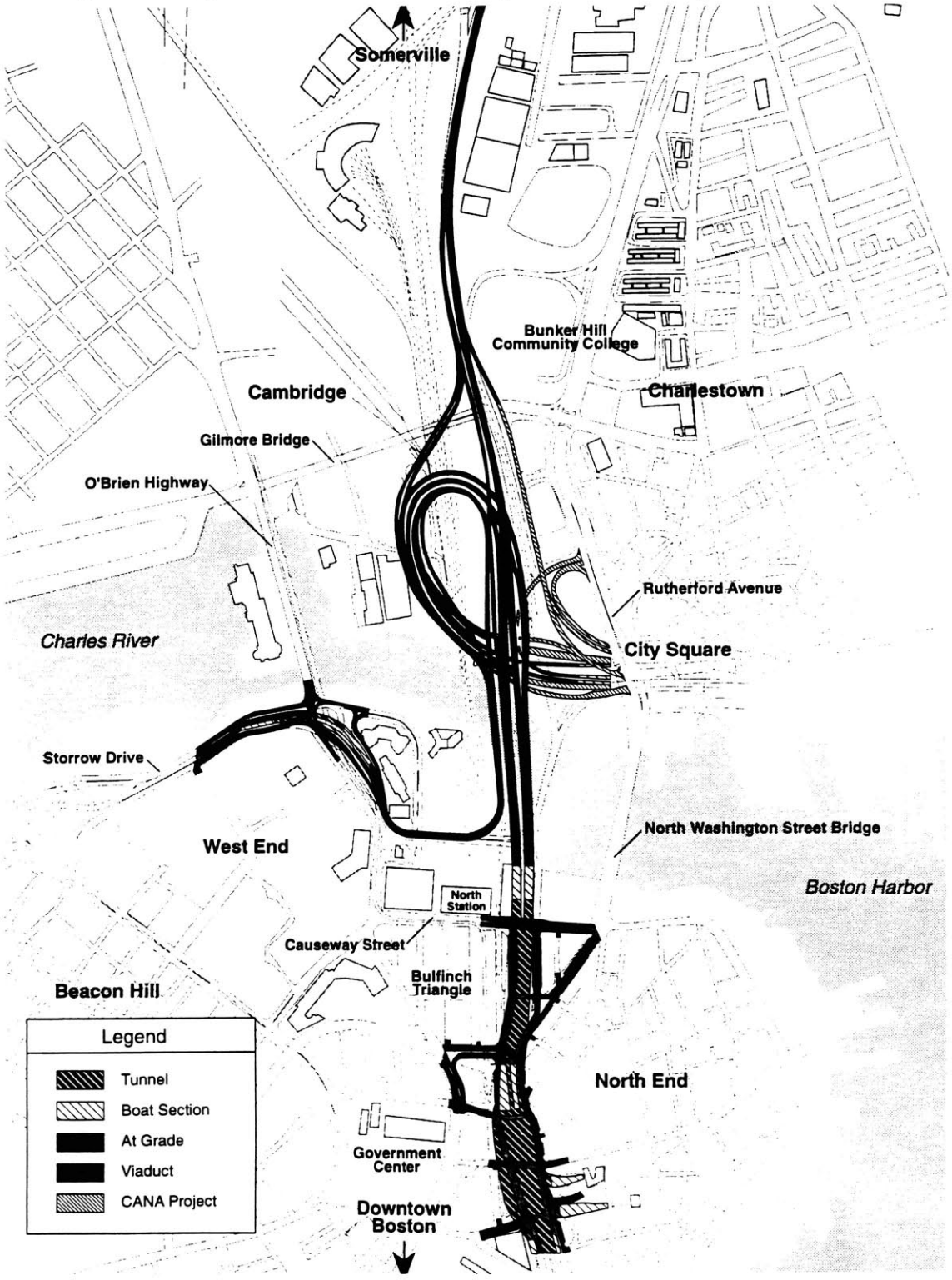
[14] Ibid.
[15] Interview, Dan King, March 1, 1994.

Figure 2.3 Diagram of Scheme Z

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.



stage. In the next section 2.2.4, I will provide more details about the following problems for each of the stakeholders.

(1) Scheme Z included two mainline bridges composed of five lanes each way and a double-deck bridge composed of six lanes connecting I-93 and Storrow Drive. In total, there were 16 lanes crossing the river and 11 bridge foundation piers in the river. This scheme would cover the Charles River and impact negatively on navigation, the parkland along the river, and aesthetics.

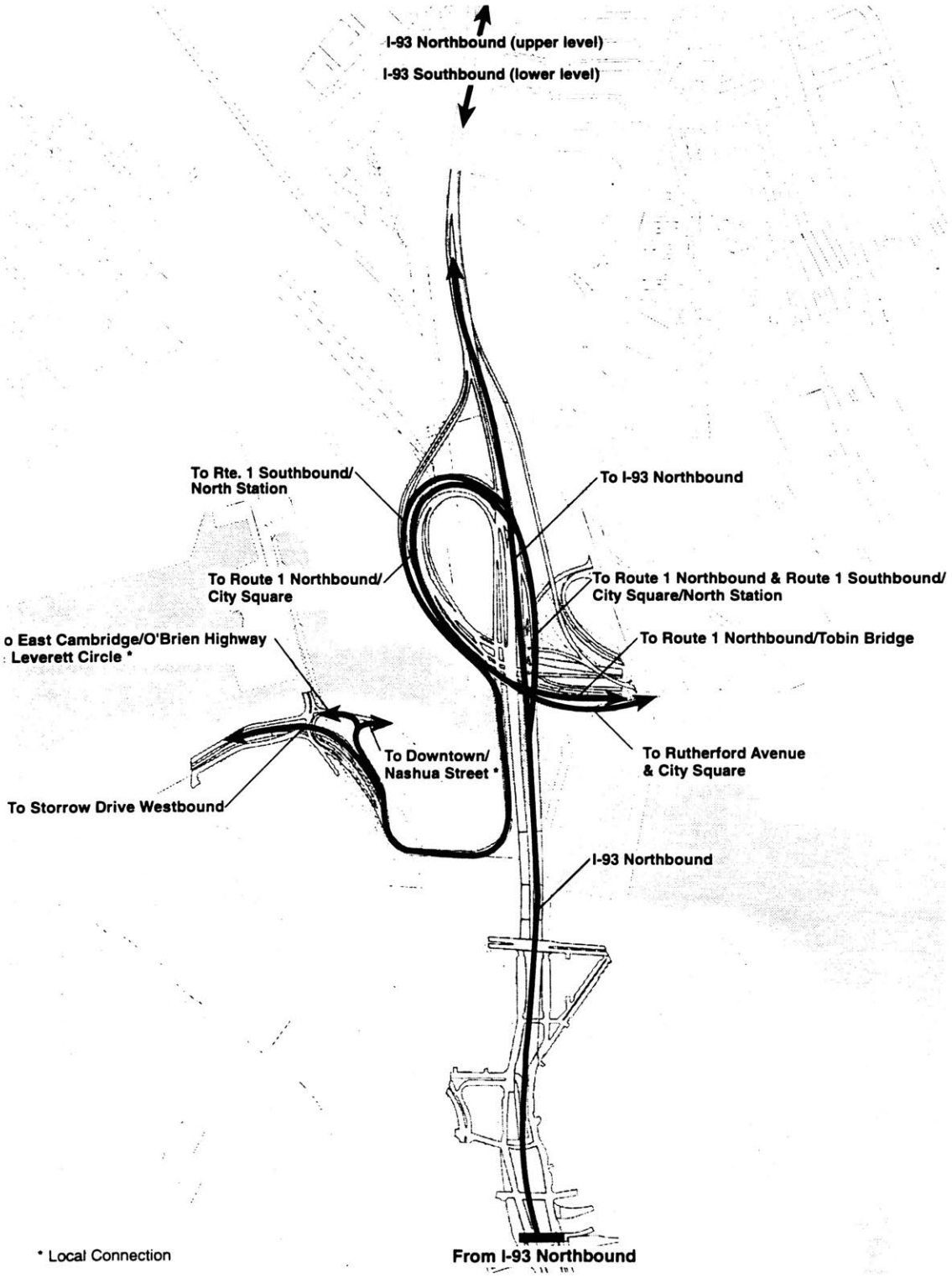
(2) Traffic between Storrow Drive and I-93 south of Causeway Street was designed to cross the river twice in order to avoid inadequate weaving distances. (See Figure 2.4 for the double river crossings of Scheme Z). Since the double river crossing would increase total vehicle miles traveled on the highway, it would worsen air pollution. Moreover, this inconvenient route would discourage drivers from using the highway and thereby increase traffic on local streets.

(3) The interchange had six nested loop ramps 105 feet high in North Point. This massive structure would not only impact negatively on the parkland and aesthetics, but also cause conflicts with the land-use plan for North Point.

(4) The Traverse Street on-ramp, which would require the fourth bridge and increase the total river crossing lanes to 18, was eliminated in the Final EIR. Therefore, the traffic from downtown Boston to I-93 North was routed through Keany and City Squares and up New Rutherford Avenue to the Sullivan Square on-ramp. This traffic movement would have caused congestion as well as noise and air pollution in the North End and Charlestown.

Figure 2.4 Traffic Route of Double River Crossings in Scheme Z

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.



2.2.4 Issues for Each of the Stakeholders

I will cluster members of the committee into the following eight groups and summarize the significant interests and arguments of each.

(1) *The City of Boston and downtown organizations*

The City of Boston and downtown business organizations, such as the Artery Business Committee, 1,000 Friends of Massachusetts, Move Mass 2000, and the Downtown North Association, were the strongest constituencies of the CA/T Project. The City of Boston and business organizations expected a great deal of benefits from the project, such as job opportunities, accompanied development projects, and parks. In particular, the Boston Redevelopment Authority had acquired the planning authority over the air-rights of the depressed artery from the state. Although the City of Boston and business organizations had concerns about the impacts of Scheme Z on the river environment and aesthetics, they agreed not to oppose Scheme Z.

However, the City of Boston and business organizations were distressed by the sudden elimination of the Traverse Street on-ramp in downtown Boston. They were concerned that the elimination of the on-ramp would not only cause local traffic congestion but also make access to northbound I-93 inconvenient.

The City of Boston and business organizations were cautious about the increase of costs and the delay of schedule due to design changes which might delay the whole project and jeopardize funding from the federal government. They were also sensitive about the impacts on buildings and housings in the North End as well as on the Boston Garden development, Green Line

modernization, and MBTA garage construction. I will describe the background and characteristics of the two business organizations in this category as follows:

The Artery Business Committee (ABC)

ABC represented the interests of the downtown real-estate development community supportive of the CA/T Project. ABC was founded in 1987 to ensure that their concerns about the impact of the project would be adequately addressed. ABC had successfully intervened in some of the project-threatening disputes, such as a dump site of excavation materials at Spectacle Island.

1,000 Friends of Massachusetts

1,000 Friends of Massachusetts was convened by former US Senator Paul Tsongas and Thomas Winship, former editor of the *Boston Globe* in response to a request of Secretary Salvucci in 1989. It was formed as an advocacy group for controlled growth and coordination of land use with open spaces and environmental resources.

(2) *Beacon Hill*

The Beacon Hill Civic Association was a politically influential group and had been successful in opposing the "Leverett Connector" between Storrow Drive and Route 1 in the 1970's. Salvucci, who had formerly worked for the City of Boston, backed up the opposition toward the direct connection that was forwarded by Massport Executive Director Edward King. This time, Salvucci was successful in convincing Beacon Hill to accept Scheme Z, arguing that the

connection between Storrow Drive and I-93/Route 1 was routed parallel to the I-93 mainline bridge forcing the traffic between I-93 south of Causeway Street and Storrow Drive to double-cross the river, a routing which would discourage the use of Storrow Drive.

Although Beacon Hill residents had concerns for the aesthetics and impacts on the river, they were most worried about preventing Storrow Drive from being incorporated into the interstate highway system and maintaining its characteristics as a parkway. They were strongly opposed to any modifications of the west side of Leverett Circle that would lead to the increase of traffic on Storrow Drive and give negative impacts on the Esplanade.

It should be remembered that there was another representative from Beacon Hill in the BDRC, Anthony Pangaro, who was an architect living in Beacon Hill and a close friend of Salvucci.

(3) *The City of Cambridge*

The City of Cambridge was one of the strongest opponents of Scheme Z. The mayor and the city councilors all agreed to oppose Scheme Z along with the community advocacy groups in East Cambridge. There were two significant interests: concerns for the environment and the land-use conflict in North Point. First, the Cambridge Conservation Commission had strong concerns about the impacts of bridges and massive loop ramps on parkland along the river and aesthetics as well as negative impacts on the water environment in the Charles River and Millers River. The Commission was especially enthusiastic about promoting the all-tunnel-alternative proposed by Steve Kaiser.

Second was the impact on land use at North Point. North Point is the area of East Cambridge bordered by the O'Brien Highway, the boundary line of the City of Boston, and the north bank of the Charles River. The City of Cambridge had perceived North Point as a potential development area that would yield tax revenues for the city for a long time. The Cambridge Planning Board initiated the process to change the zoning code from industrial use to mixed-use category, which would allow for residential development as well as office and commercial use beginning in the mid-1980s. The city finally adopted a revised land use plan in 1990 coordinating with Alternative Scheme 5A Modified in the 1986 final EIS/R.[16]

(4) *Charlestown*

Charlestown settled in the 17th century is Boston's oldest community. Two sides of it are bordered by I-93 and Route 1 and had been politically neglected for a long time. Recently, however, housing and development projects are taking place along with the CANA Project. Residents living on the east side were satisfied with the CANA Project that would soon depress the viaducts of Route 1 and provide benefits to them, such as easy access to the Boston Harbor, parks and so forth. However, residents living along New Rutherford Avenue strongly opposed Scheme Z because of its visual impact and increasing local traffic. Dan King organized the Citizens for a Liveable Charlestown to address those concerns. Especially after the removal of the Traverse Street on-ramp, the fear of local residents along New Rutherford Avenue increased.

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[16] Hugh Russell claimed that Salvucci had not told Cambridge the intention of the design change of alternative 5A for several years when Cambridge prepared to change the zoning code.

(5) *The Conservation Law Foundation (CLF) and other environmental advocacy groups*

The Conservation Law Foundation, Massachusetts Audubon Society, Save the Harbor/Save the Bay, Boston Greenspace Alliance, and other organizations, had great concerns about the impacts of Scheme Z on the river environment and aesthetics as well as traffic increase. In particular, CLF tried to enhance the mitigation packages, such as the extension of the river park, improvements of mass transportation, and increases of parking freeze areas, rather than to oppose Scheme Z. CLF is an environmental advocacy group that uses litigation and the threat of litigation to pursue desired policies. CLF maintained that the only solution for the traffic congestion and air pollution was to restrict automobile traffic demand by improvements in mass transit and severe restrictions on parking. However, CLF did not make Scheme Z an issue although it was persistent in ensuring the state's promise of comprehensive traffic measures. Douglas Foy, the director of CLF, said, "Our basic policy was that if Scheme Z was going to have to be built, let's make sure we come up with as much mitigation as possible."[17] In December 1990, he reached an agreement with the state about the traffic mitigation packages.[18]

(6) *The Charles River Watershed Association (CRWA)*

The Charles River Watershed Association is composed of nearly 1,250 members supporting the clean-up of and public access to the Charles River.

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[17] *The Boston Globe*, December 5, 1990.

[18] After the FHWA rejected to take responsibility for the agreement, including the state's commitment toward mass transit improvements, the CLF brought this case to court in August 1991. Later, in March 1992, the CLF settled with the state under the aegis of US District Court Judge Robert Keeton. The agreement spelled out lists and deadlines for traffic mitigation packages including new and extended subway and commuter-rail lines.

Since CRWA was formed in 1965, it has greatly contributed to the dramatic clean up of the Charles River. CRWA was one of the most vocal opponents of Scheme Z and expressed strong concerns toward its negative impacts on the river park and aesthetics.

(7) *The Committee for Regional Transportation (CRT)*

The Committee for Regional Transportation was composed of several dozen participants, including environmentalists, neighborhood activists, and mass-transit advocates, such as the members of the Sierra Club, and the National Association of Railroad Passengers. They stressed the importance of a North Station/South Station rail link as a key factor of a balanced transportation system. However, there was some suspicion that CRT was a "front" for Richard Goldberg, the owner of Park 'N Fly in East Boston and was receiving most of its funding from him. Goldberg was fighting with the state to avoid the acquisition of his parking lot by the CA/T project.

(8) *The Sierra Club*

Although they originally supported the CA/T Project, the Sierra Club started opposing the whole project after the state changed the highway design to increase the traffic capacity of the artery and dropped the commitment to the North-South rail link. Since their main concern was air pollution due to the increase of traffic, they stressed the importance of the mass-transit improvements.

2.3 The Deliberation Process and the Recommendations of the Committee

In this section, I will describe deliberation process of the Bridge Design Review Committee based on its final report[19] and meeting summaries. I will also detail the characteristics of the three Committee Improvement Packages (CIPs) in order to show the major elements that the committee members discussed.

2.3.1 The Deliberations of the Committee

The committee started with a site tour of the existing conditions of the Charles River crossing area in February 1991. At the first stage, facilitator Wofford explained the confidentiality of communications between himself and members, and then described a facilitation process such as joint-fact finding, problem-solving, packaging, and negotiation. CA/T Project staff briefed the committee on key technical issues and constraints as well as the design alternatives described in the final EIR. Then, the committee sorted out the concerns of the members and established three subcommittees: traffic and transportation; visual aspects; and parkland and open space. An MDPW staff and a B/PB engineer were assigned to each subcommittee. Subcommittees were comprised of members whose professional backgrounds and experiences fit in the main agenda of each subcommittee.

During the initial subcommittee meetings, brainstorming sessions took place and a broad spectrum of ideas were presented and discussed. The subcommittees also developed detailed objectives addressing the members'

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[19] *Bridge Design Review Committee Report on the Charles River Crossing* (October, 1991).

concerns. Then, the subcommittees disaggregated problems into components in terms of location and function and evaluated these components in a matrix form under the factors, such as traffic, land use, cost, and others. Several options were considered for each of the components.

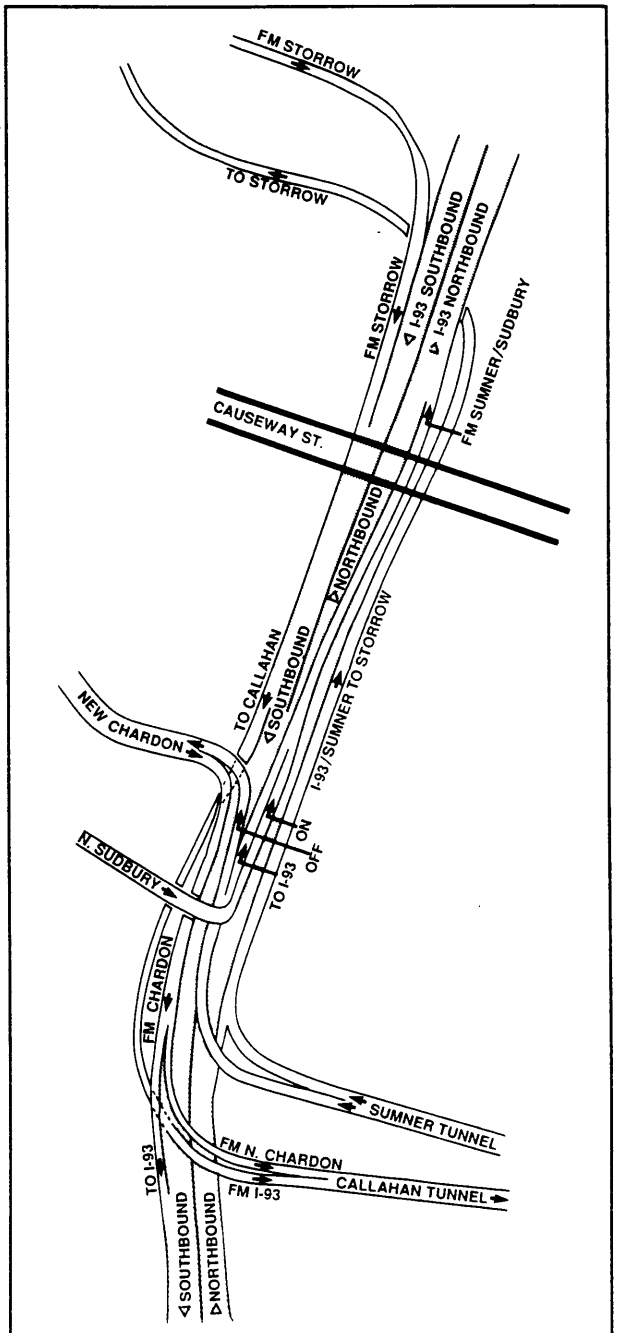
Beginning early in April 1991, packages were assembled from the components and called Committee Improvement Packages (CIPs) from 1 to 13. This process required intensive discussions at the committee and subcommittees as well as dedicated contributions of independent professionals and CA/T staff.

Most of the packages were improved by incorporating bridge and tunnel concepts suggested by independent professionals as well as design refinements developed by the CA/T engineering staff. Most packages were studied in several versions differing in the design of ramp connections north of the river, Leverett Circle access, single versus double deck bridge, and exclusive HOV ramps.

After the first round of the study, all packages had basically the same geometry south of Causeway Street: connections between the main line of I-93 and Leverett Circle via a pair of tunnels behind North Station. This new geometry resolved the issue of the inadequate weaving distances of the alternatives studied with Scheme Z in the Final EIR. (See Figure 2.5 for the diagram of the South of Causeway Street). It not only eliminated double river crossings of Scheme Z, but also accommodated a northbound on-ramp from Sudbury Street without an additional bridge across the Charles River. This south of Causeway Street geometry was the most significant creation of the BDRC. It was a key factor for improving the bridge design and reducing impacts on river park as well as reducing the number of the loop ramps at the north side of the river.

Figure 2.5 Recommended Concept South of Causeway Street

Source: Bridge Design Review Committee. Report on the Charles River Crossing, 1991.



Note on diagram: For clarity, cross streets are not shown in this diagram of multilevel tunnels. The Surface Artery and several local on- and off-ramps are also not shown. The alignments of several connectors are spread out for better visibility.

In the final round, two all-tunnel versions were eliminated because of cost and other problems. Other options were not advanced due to the problem of bridges and river tunnels, traffic operation difficulties, land use impacts and so forth.

The committee selected three CIPs (3, 5, and 8) for final consideration on May 17, 1991. After exploring various versions of three alternatives, CIPs 3.1, 5.3, and 8.1 were advanced to the final selection. CIP 8.1 was selected in a very close vote, 17 - 15, on June 21, 1991 and was recommended to Secretary Taylor.

The committee urged the Secretary to pursue the committee's first choice and not to change alternatives without consultation with the committee. The committee decided to stay in existence in order to play an independent advisory group so that they could follow up the deliberations if some unknown factors, such as engineering and permitting, caused the state to drop the recommended alternative. The executive committee was organized to meet more frequently.

2.3.2 The Recommendations of the Committee

The final three CIPs (3, 5, and 8)[20] shared the following three features: 1) eliminating double river crossings, 2) providing northbound access to I-93 from downtown Boston, and 3) reducing the impacts of loop ramps on the North Point development area to varying degrees. (See Figure 2.6 for the schematic diagrams of CIPs 3, 5, 8 and Table 2.1 for the comparison of the three CIPs). On the other hand, the major difference between the three alternatives was the connection between Storrow Drive and I-93/Route 1 in the north bank

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[20] For the sake of simplicity, I will note CIP 3.1 as CIP 3, CIP 5.3 as CIP 5, CIP 8.1 as CIP 8.

Figure 2.6 Schematic Diagrams of CIPs 3, 5, and 8

Source: Bridge Design Review Committee. *Report on the Charles River Crossing,* 1991.

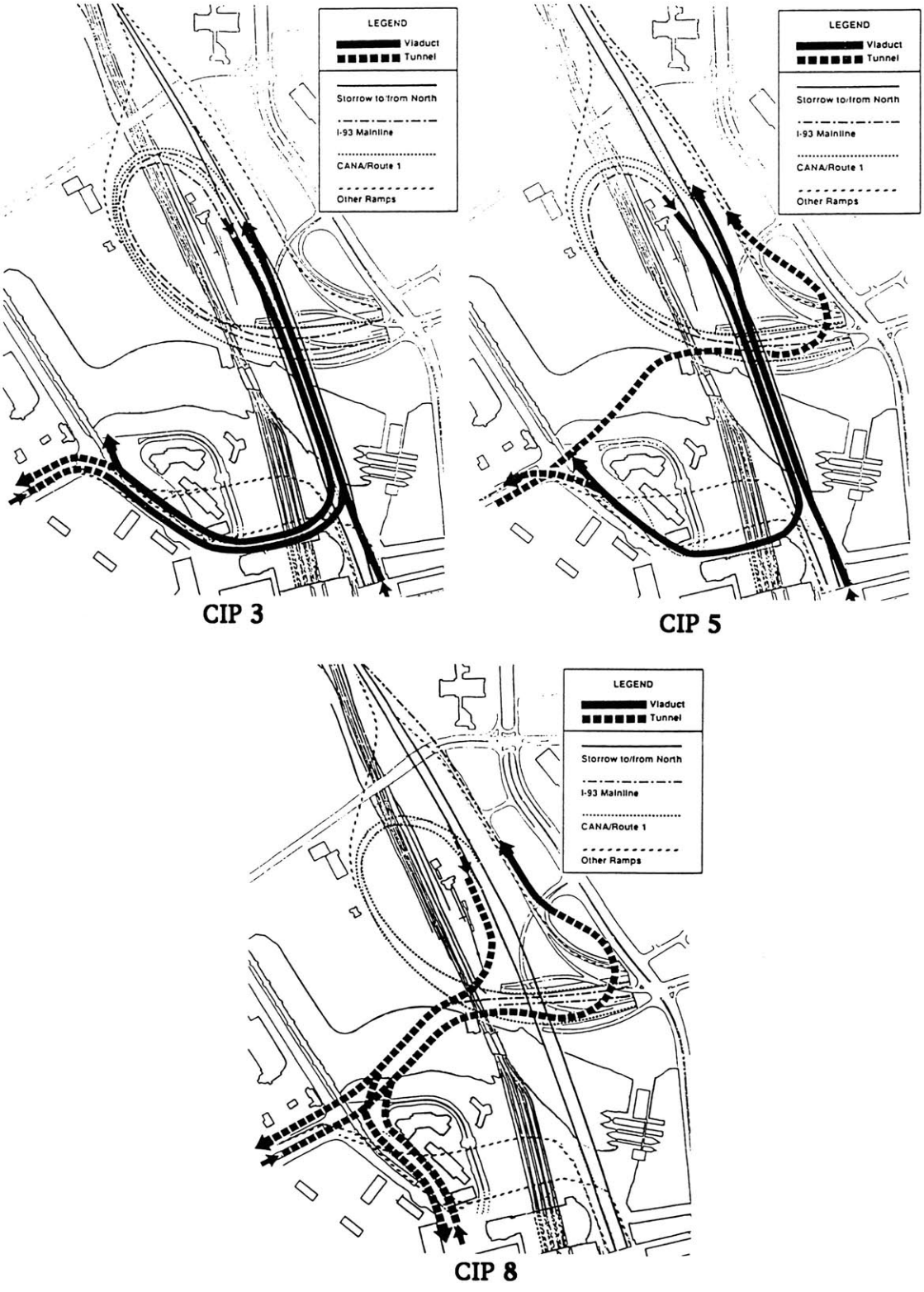

Table 2.1 : Comparison of CIPs 3, 5, and 8

	Scheme Z	CIP 3	CIP 5	CIP 8
River Crossing				
Total Number of travel lanes	16 (*1)	13	13	13
Number of lanes in river tunnel	0	0	4	2
Number of lanes on bridge or viaduct	16 (*1)	13	9	11
Number of bridge or viaduct structures	3 (*2)	1 (*3)	1	1
Overall bridge and viaduct width (feet)	275 (*4)	156-168	156-168	184-196
Number of pier structure in the river	11	6	6	6
Storrow Drive Connections				
Number of lanes to/from the North	4	2	2	2
Number of lanes in tunnel	0	0	2	1
Number of lanes in viaduct	4	2	0	1
Number of lanes to/from the South	2	2	2	2
Number of lanes in tunnel	0	0	2	2
Number of lanes in viaduct	2	2	0	0
North Area Ramp Structures				
Total number of ramps in North Point	6	3	2	2
Overall height of loop ramps at North Point (feet)	105	35	35	35
Proximity of North Point Roadway (feet)	150	70	160	160
Distance from river's edge to elevated ramps (feet	45	120	180	140
Traffic (Year 2010 data)				
Storrow Drive AWDT eastbound (*5)	65200	62900 (- 4%)	57700 (-12%)	58600 (-10%)
Storrow Drive AWDT westbound (*5)	63400	70300 (+11%)	65800 (+ 4%)	69900 (+10%)
Cost and Schedule				
Construction Cost ($ millions, exel. mitigation)	473	757	954	863
Delay in completion (months)	Base	8-10	15-17	11-13

Source: Bridge Design Review Committee Report (October, 1991)
Note: (*1) If the Traverse Street on-ramp were not eliminated, the number of lanes would be 18.
(*2) One is a double-deck bridge. If the Traverse Street on-ramp were not eliminated, the number of bridges would be 4.
(*3) Double-deck bridge.
(*4) Including gaps between bridges.
(*5) AWDT is an abbrebiation of average weekday daily traffic. A percentage of each case means a relative change of traffic volume compared to that of Scheme Z.

of the river. CIP 3 had viaduct connections and CIP 5 had tunnel connections running both ways. CIP 8 had a viaduct connection from I-93 North/Route 1 to Storrow Drive and a tunnel connection running the other way.

By eliminating double river crossings, all the three CIPs reduced vehicle miles traveled and contributed to the improvement of the air environment. The partial river tunnel lanes (CIPs 5 and 8) and the elimination of double crossings decreased the number of lanes crossing the river from 16 in Scheme Z (18 if the Traverse Street on-ramp had not been deleted) to at most 13 in the three CIPs. Instead of Scheme Z's three bridges (four if the Traverse Street on-ramp had not been removed), all the three CIPs had only one single bridge. The width of the bridges was reduced by about 30 percent in the three CIPs; their design was more symmetrical, more level, and more visually pleasing than that of Scheme Z.

The open space along the Charles and Millers Rivers was enlarged by all the three CIPs. The distance to the Charles River from the ramps was at least 120 feet in the three CIPs, as compared to 45 feet in Scheme Z. This better design would make the mitigation of the river park planned by the MDC more effective and appealing.

Scheme Z's six loop ramps in North Point were reduced to at most three in the three CIPs; the heights of the ramps were decreased from 105 feet to 35 feet. These improvements of loop ramps would reduce the conflicts with the North Point development plan.

The northbound on-ramp from New Sudbury Street in downtown Boston was included serving a function similar to the Traverse Street on-ramp that was deleted from the Draft EIR version of Scheme Z. This on-ramp revival in downtown Boston benefited the North End and Charlestown by reducing traffic

on Keany Square, North Washington Street bridge, City Square and New Rutherford Avenue.

As for the potential impacts on the Esplanade, CIP 3 was the most preferable, because it would not change the designs west of Leverett Circle. The construction cost of the three CIPs were more than seven hundred million dollars compared to about five hundred million dollars in Scheme Z; CIP 3 without a river tunnel was the least expensive, and CIP 5 with river tunnels running both ways between Storrow Drive and I-93/Route 1 was the most expensive. As for the impacts on the water environmental due to dredging and excavation, CIP 3 was the best, and CIP 5 was the worst.

Chapter 3
Evaluation of the Bridge Design Review Committee's Work

The Bridge Design Review Committee was successful in identifying both the problems of Scheme Z and the individual interests of its members, in creating various alternatives, and in narrowing down the schemes. Although the committee could not reach a consensus, it recommended CIP 8 to EOTC Secretary in less than 5 months. However, as I will later explain, it took more than one year after the recommendation for the committee members to reach a consensus, and the compromised scheme was later rejected for engineering reasons. I will explain key factors which facilitated the discussions of the committee in section 3.1. I will also explain in section 3.2 the problematic points of procedure that negatively affected the following negotiation after the recommendation.

3.1 Key Factors for Successful Deliberations

I will explain the following four factors that facilitated the discussions of the committee: political support for the committee, effective guidance by the chairman and facilitator, contributions by independent consultants and staff, and the dedication of the committee members.

(1) *Political Support for the Committee*

Governor Weld and his EOTC Secretary Richard Taylor, both of whom had just taken office on January 5 1991, strongly supported the committee. The Scheme Z controversy was one of the major problems remaining at the end of

Dukakis administration. Secretary Richard Taylor was especially supportive of the BDRC and did not constrain the role of the committee. He gave the committee authority to study all the aspects and possibilities concerning the river crossing. Facilitator Jack Wofford said he seemed to put his stamp on this advisory committee, ending the former administration's process. Wofford assured the committee that he could deal with all kinds of schemes rather than the mere design modifications that former Secretary Salvucci had originally intended.[1] Robert O'Brien, the director of the Downtown North Association, said, "I am not sure everyone in the administration was enthusiastic, but Taylor supported the BDRC very actively."[2]

(2) *Effective Guidance by the Chairman and Facilitator*

Chairman Stanley Miller guided the overall deliberations well. He was an old friend of Governor Weld[3] and responsible for a recommendation to the Secretary in three months. At the first meeting, Miller stated that a preliminary report was due by April 30.[4] This deadline was later extended to June 21. While facilitator Wofford attempted to remain neutral, Miller, in chairing the committee, tried to give the discussions direction. He was also concerned about the cost and duration of the project so that the state would not have difficulty in proceeding with a recommended alternative. Elizabeth Epstein said, "I respected Stan Miller, but he directed the thing in the way he

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[1] Interview, Jack Wofford, the facilitator of the BDRC, February 8, 1994.
[2] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.
[3] Interview, Bill Kuttner, a traffic engineer at the CTPS, February 28, 1994.
[4] This schedule was set to give a recommendation to Secretary Taylor prior to the expiration of the 90-day period by which those parties that sued in state court must formally serve their lawsuits.

thought appropriate. He wanted to find the solution. He was not as interested in the process as Jack was."[5]

The facilitator, Jack Wofford, had a key role on this committee, and most of the interviewees praised his performance very highly. He had long experience in transportation planning issues, having once been the director of the Boston Transportation Planning Review, associate commissioner of the MDPW, and deputy general council of the US Department of Transportation. Hugh Russell said, "Jack had enough experience to tell what we could reasonably accomplish, having been involved in transportation planning for twenty years."[6]

Miller and Wofford tried to establish priorities for the study and speed up the decision-making process. In order to focus the committee's discussions on elements of the Charles River crossing, Miller and Wofford set aside other important topics for future studies once they had spent a fair amount on these issues.

For example, when the committee asked Thomas Dyer, an independent railroad consultant, to study the North/South rail link, he reported that a route under Congress Street away from the Central Artery was preferable. The committee then decided to set aside this report for future study.[7] Regional traffic management issues, such as the traffic division from Storrow Drive to the Turnpike, were also set aside for future study. Some of the members were very enthusiastic about the rail link from the viewpoint of a balanced

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[5] Interview, Elizabeth Epstein, the director of the Cambridge Conservation Commission, February 14, 1994.

[6] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

[7] In January 1993, Governor Weld announced that he would like the rail link to be constructed underground as part of the CA/T Project. The state hired Guy Rosmarin to head the Rail Link Task Force of the CA/T Project for a feasibility study. The Task Force proposed a route under the Central Artery, which contradicted with Dyer's report.

transportation system. These regional transportation issues, including mass transit, would have been critically important in predicting the future traffic demand if they had been discussed before the CA/T project was undertaken. However, in the limited context of the Charles River crossing, it may have been appropriate to set aside these issues for future study.

Another important theme that was set aside for future study was the land use in the area north of the Charles River: North Point, the Somerville Industrial Area, and the Sullivan Square South Area. Although this area had a potential for large-scale redevelopment, coordinated redevelopment under a single master plan was difficult, due to the existence of rail facilities, vehicular access constraints, and divided ownership. Tax increment financing was also reviewed to finance the additional costs associated with the all-tunnel scheme. The committee concluded that tax increment financing was not a viable method to generate funding for the improved Charles River crossing due to questions of legislation, jurisdiction, timing and so forth.[8]

Miller and Wofford used some effective techniques to facilitate deliberations and help members focus their attention. Miller proposed his recommendations to the members so that they would hold their discussion to a limited set of options. Although most of the members disagreed with one or more of the recommended items, they agreed that the recommendations would help them to focus their attention.

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[8] Tax increment financing is a technique that uses an increase in property taxes resulting from development to pay for the infrastructure costs, making the project possible. Although this financing method is legislated in the south and west states, it is not in the State of Massachusetts. There is also a jurisdictional question and a timing question. This area lies in three separate cities, and it will take a long time before the project is completed and the tax increment is realized.

At the same time, Wofford handed out a CIP preference form to the members and showed them the aggregated result in different types of matrix sheets. For example, Wofford gave them the preliminary preference poll that showed 65 percent of respondents felt that the all-tunnel option was unacceptable, that CIP 3 and CIP 5 were almost tied for the first choice, and that CIP 8 was the second choice and acceptable to almost all respondents.[9] He also handed out other useful references, in matrix forms, that indicated several criteria for each CIP such as cost, duration, transportation features, and visual and open space characteristics, and other indexes. Miller also used straw-poll votes to get a sense of the preference of the committee.

The preference polls and the Chairman's recommendations were useful in that they focused the members' attention on the critical choices, such as a bridge vs. all-tunnel, the one-level vs. the two- level bridge, the number of loop ramps underground in North Point, and the Leverett Circle connection. The committee members started focusing their discussions on CIP 3, CIP 5, and CIP 8, which were indicated as preferable by the preliminary survey.

(3) *Contributions by Independent Consultants and Engineering Staff*

Miller and Wofford proposed hiring independent consultants in the area of bridge design and tunneling. Since opponents on the committee did not the trust the state and CA/T engineers at all, having neutral experts examine all possibilities was important. The opponents argued that the state did not examine the all/partial tunnel alternatives thoroughly and that it had selected Scheme Z just because it was cheap and expedient. Therefore, subcommittees recommended at least three candidates for each of the areas to

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[9] The BDRC meeting summary, May 10, 1991.

act as independent consultants with the staff assistant at joint ventures, and the committee members interviewed these candidates.[10] Dr. Christian Menn, professor of structural engineering at the Swiss Federal Institute of Technology, was selected as the bridge consultant. He was famous for designing bridges in Switzerland and throughout the world and had authored many papers. Dr. Herbert Einstein, professor of civil engineering at the Massachusetts Institute of Technology, was selected as the tunnel professional. Later, Thomas Dyer was selected as the railroad engineering consultant. Also, both the City of Boston and the City of Cambridge hired their own consultants. These independent consultants for the committee and the two cities worked together with the committee, subcommittees, the MDPW's consultants, and B/PB engineers.

Dr. Menn gave strong guidance to the bridge design improvement. His objective was to establish guidelines for simplifying the design: getting the main line profiles parallel north and south, and reducing the height and the massiveness of the bridge and ramps in North Point. He proposed three concepts, each with a different number of lanes, to correspond with the T family, S family, and Z family in the 1991 EIR. Elizabeth Epstein said, "The first month of discussions were not useful. I was very suspicious, and everyone was defensive. . . . Then, Dr. Menn came in, and that was a big breakthrough."[11]

Dr. Einstein demonstrated a variety of tunnel construction techniques, giving similar examples already constructed throughout the world and confirmed that any of the proposed sites for tunnels would be feasible in terms of constructability. He also presented new construction techniques that would

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[10] Interview, Jack Wofford, the facilitator of the BDRC, February 8, 1994.
[11] Interview, Elizabeth Epstein, the former director of the Cambridge Conservation Commission, February 14, 1994.

save money and time. Although Einstein disagreed with some of the B/PB engineers with respect to cost estimation and tunneling technique, he appreciated their cooperation and speedy responses.[12] Dan King, the representative of the Citizens for a Liveable Charlestown applauded Dr. Einstein saying that "he was a very independent and positive engineer."[13] This cooperation between independent consultants, B/PB engineers, and MDPW staff enhanced the quality and the credibility of the detailed designs and analyses proposed to the committee. This neutrality of the engineering analysis was useful in convincing the members who had argued for the all-tunnel scheme that the scheme was extraordinarily difficult due to its high cost and engineering problems.

(4) *Dedicated Committee Members and Observers*

Since most of the members were representatives of the two cities and existing organizations, it was possible for them to devote many hours to the committee and preparatory work. From February to June in 1991, the full committee was held 15 times, and subcommittees were held more often than that. Most of the members were entirely dedicated to this committee. Robert O'Brien said, "80 percent attended fairly consistently. 50 percent attended faithfully, never missed the meeting. They were very broad, informed, cooperative groups."[14] Hugh Russell said, "I kept track of my time and devoted

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[12] Interview, Herbert Einstein, a professor of MIT in geotechnical engineering, February 28, 1994.
[13] Interview, Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.
[14] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.

thousands of hours during the BDRC process."[15] Some of the members volunteered the rendering drawings and gave useful recommendations and suggestions about the deliberations.

However, a few of the representatives of the citizens groups had difficulty attending all the meetings and keeping up with the deliberations. Dan King said, "Sometimes we had three meetings in a day; the committee, a subcommittee, and our community committee. It was very time-consuming to communicate with the members."[16]

The committee was open to the media and the public. A few enthusiastic "observers," such as Bill Kuttner, Steve Kaiser, Peter Roudebush, and others, attended the committee regularly. Some of the most important suggestions were contributed by these men.

3.2 Questions of Procedure

I will explain two problematic factors that negatively affected the negotiation process which followed throughout the next year: first, the exercise of voting for the selection of a scheme and second, the tight schedule imposed on the committee. The exercise of voting for selecting a scheme was neither appropriate nor useful in hammering out a feasible and reconcilable scheme. The tight schedule of the committee cut off some important possibilities and adequate engineering studies.

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[15] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

[16] Interview, Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.

(1) Voting to Select a Scheme

The committee created various schemes and narrowed down to three CIPs. Since the committee could not reach a consensus on a particular scheme, it used voting to recommend one scheme to EOTC Secretary. The votes for deciding the committee's preferred alternative were very close: on the first vote, 6 members voted for CIP 3, 12 members voted for CIP 8, and 15 members voted for CIP 5. Four members abstained. On the second vote, 17 members voted for CIP 8, 15 members voted for CIP 5, 6 members abstained. They recommended the first choice, CIP 8 to EOTC Secretary.

The exercise of voting to decide the committee's preferred scheme could have been useful in narrowing down the scope of the negotiation if there had not been so many difficulties in the following process, which I will describe in the Chapter 4 and 5. As it turned out though, the voting was not useful in narrowing the gap of the arguments between the stakeholding groups. It was also inappropriate because of the imbalance in the composition of the committee and because of the procedural formality. I will explain these three problems below.

First, there was a wide gap between the groups in support of CIP 5 and CIP 8. It took more than one year before they could compromise on Alternative 8.1D Mod 5, which was later rejected due to inadequate engineering. Since the stakes were high for Beacon Hill and the City of Cambridge, the state had to satisfy both of their requirements when approving of whatever option the committee recommended. Voting was not an effective way to settle a dispute unless the degree of disagreement was very small.

Second, if the committee had been able to reach consensus, the balance of interests groups would not have been so important. However, when the committee, unable to reach a consensus, resorted to voting in order to decide its will, its composition was critically important. There was no guarantee that the balance of interests in the committee was the same as that of the public. The vote might have merely reflected the imbalance in the composition of the committee rather than the will of the public. There seemed to be some problems in the composition of the BDRC such as the overlapping interests, giving the equivalent of a double vote, an imbalance in the number of the members representing the north and the south side of the river, and so forth. Furthermore, people living in areas of the state who would not benefit from the Charles River crossing may have been worried about the increased costs due to the modification, and did not have any representatives on the committee. The BDRC was established as an advisory committee to identify the problems and recommend the ways to solve them. It was not supposed to select an alternative that would be built.

Third, there was not a formal voting procedure. Dan King questioned the method that was used. He said "CIP 5 came in first, and CIP 8 came in second. That was the only vote you need. There were some people who could not attend the meeting. They sent proxies, and nobody who sent a proxy foresaw the second vote. Some of the proxies might have been used incorrectly on the second vote."[17] The committee should have set a more formal procedure. However, when they initiated the committee, no one expected such a close vote, and they saved time avoiding tedious procedural

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[17] Interview, Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.

formalities. Practically, however, since they continued negotiation based on the CIP 8 after the voting, this procedural question may not be an issue.

(2) *Tight Schedule of the Committee*

Setting a deadline for the committee was a key element in order to facilitate negotiation. However, when the BDRC took a vote in June, they had neither explored all the possible schemes nor had the engineers finished checking all the aspects of the design.

In April, the committee started packaging based on the discussions in both the committee and subcommittees and narrowing down their options. By the end of May, engineers had finished the preparation of the key information concerning CIPs 3, 5, and 8. At that time, new versions of the three CIPs were created. The new versions had river tunnels in the area between the MBTA Commuter Rail and the proposed mainline of I-93 instead of the "direct access" tunnels between Leverett Circle and City Square in Charlestown.

The engineers were supposed to bring these new versions up to a level of detail equal to those of CIPs 3, 5 and 8 in three weeks so that the members could discuss and compare these new versions at the same level. However, they did not have enough time to examine the engineering feasibility of those options. Given Beacon Hill's persistent opposition to "direct access" of CIP 8 afterward, the committee should have explored the possibilities of other route tunnels in the new versions.

The tight schedule caused some other engineering problems. For example, the connection between westbound Storrow Drive and southbound I-93/Route 1 had to make a horizontal curve before it passed the end of the

backspin of the stayed cables. The configuration of this connection forced the design of the bridge to be asymmetrical although it was absolutely necessary for the bridge design to be symmetrical due to the requirements of the structural mechanics.[18]

[18] Interview, Anthony DiSarcina, a traffic engineer in Cambridge Systematics working for the CA/T and the BDRC, March 9, 1994.

Chapter 4
The Negotiation Process After Committee Improvement Package 8.1

I will describe the negotiation process after the recommendation of the committee had been made. I will divide this process into the following three periods. First, from September 1991 to March 1992, the state negotiated with the committee concerning its recommendation of CIP 8; eventually the committee agreed on Alternative 8.1D on a conceptual level. Second, from March 1992 to September 1992, the state continued its negotiations and created several versions of Alternative 8.1D; the committee compromised once more on Alternative 8.1D Mod 5. Third, from September 1992 to today, the state created new schemes in response to the concerns of the federal agencies and some of the committee members and finally selected the controversial scheme that does not have river tunnels (the Non-River-Tunnel Alternative).

4.1 Agreement with Alternative 8.1D at the Conceptual Level

After the vote of the committee to recommend CIP 8.1, the committee did not retain its consultants; meetings were held every two or three months to discuss the development of modifications proposed by the state. Thus, the state had the leadership in resolving the remaining problems and in settling lawsuits rather than the BDRC.

The major problems of CIP 8.1 were: 1) the lack of a high-occupancy-vehicles (HOV) system to reduce traffic volume and to promote clean air, 2) the lack of an off-ramp from northbound I-93 to Leverett Circle/Nashua Street, 3) the impact on parkland and historic resources protected by Section 4(f) of the

Transportation Act, 4) the problems associated with the asymmetry of the bridge design. The first modified version of CIP 8.1, Alternative 8.1A did not resolve the HOV problem on the Boston side, and its double-decks posed further design complications. At that time, Alternative 8.1D was designed to include an HOV facility. (See Figure 4.1 for the diagram of Alternative 8.1D).

The most significant feature of Alternative 8.1D that differed from CIP 8.1 was the reconfiguration of the ramp from I-93 northbound to Route 1. It was originally designed so that the traffic would exit the I-93 main line after crossing the Charles River to the left and would proceed to Route 1 via a loop ramp. In Alternative 8.1D, the traffic begins with an underground exit from the mainline in the Haymarket area, moves through the river tunnel between Leverett Circle and City Square in Charlestown, and proceeds directly to the CANA tunnel of Route 1.

The other major element of Alternative 8.1D, which was associated with the change of the CANA Project, was the relocation of the local Charlestown off-ramp located in City Square. The traffic exiting from the City Square off-ramp would exceed the capacity of the intersection and cause severe traffic congestion around the area. Although the City Square off-ramp had been initiated in 1989 as the CANA Project, the design was changed in 1991 in order to resolve the traffic problem. In Alternative 8.1D, the I-93 northbound off-ramp was moved to the north of New Rutherford Avenue, passing through the Bunker Hill Community College athletic field.[1] Further reconfigurations were done to address the traffic and land use problems in North Point and Charlestown.

These modifications reduced the number of loop ramps at North Point to 1 and improved the land use as well as the aesthetics. The change in the CANA

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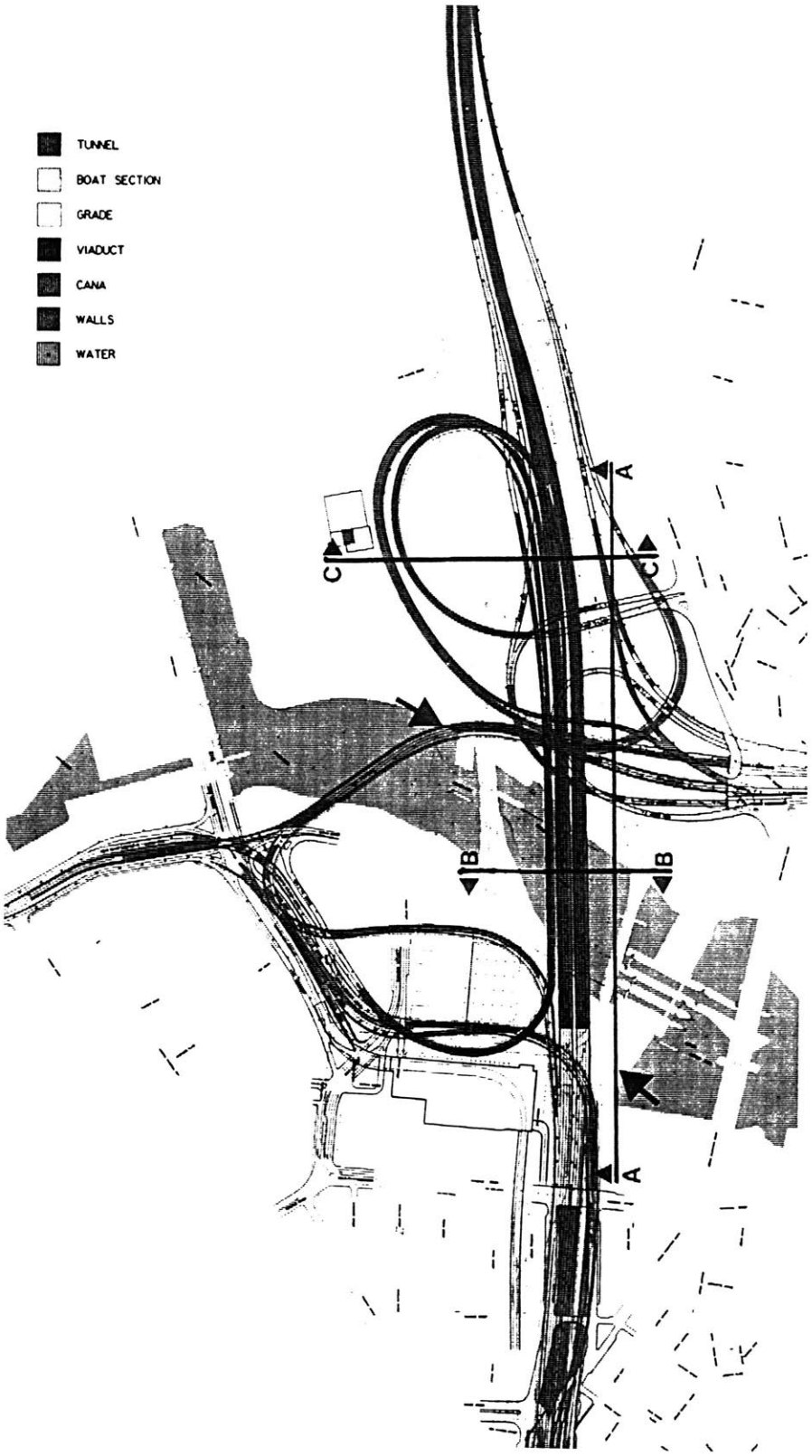
[1] It was finally moved further north to Sullivan Square in the final EIS/R 1994.

Figure 4.1 Diagram of Alternative 8.1D

Source: Bridge Design Review Committee 1992.



design not only reduced the traffic problem in City Square but also separated a viaduct and an off-ramp more effectively from the Charlestown community along New Rutherford Avenue.

Representatives of both the City of Cambridge and the Citizens for a Liveable Charlestown spoke very highly of the dedication of Undersecretary Stanley Durlacher during this process. Hugh Russell said, "Durlacher interpreted the vote correctly, that there should be a tunnel under the river to the extent he could reduce the impact of CIP 8 so that they were similar or even less than CIP 5. He came up with 8.1D, that was clearly superior to either CIP 8 or CIP 5."[2] The City of Cambridge and the state negotiated a settlement for the Cambridge lawsuit. Hugh Russell and Elizabeth Epstein from the City of Cambridge, Stanley Durlacher and Robert Weinberg from the state, and lawyers of both sides had about sixty meetings. Russell said, "The discussions were very short and quick for the engineering issues. Ninety percent of the time was spent for the legal issues."[3] Dan King, the representative of the Citizens for a Liveable Charlestown, said, "We had developed a sense of comfort with Secretary Taylor and Undersecretary Durlacher. Durlacher was very sincere and very clear about what he could and couldn't do."[4]

However, it was not easy for the state to convince the representatives of Beacon Hill to accept Alternative 8.1D because it included "direct access" from Leverett Circle to the north side of the river. The representatives of Beacon Hill did not accept any designs which included "direct access" and reconfiguration of Storrow Drive west of Leverett Circle.

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[2] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.
[3] Ibid.
[4] Interview, Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.

In March, 1992, the BDRC met and voted unanimously that Alternative 8.1D represented "significant progress in achieving the overall stated goals of the BDRC" and that the state should "continue the current process to complete the design for the river crossing."[5] Although it was supposed to approve Alternative 8.1D, the representatives of Beacon Hill were not particularly satisfied with the scheme itself. Dan King and Dun Gifford, the Chairman of the Committee for Regional Transportation, thought the motion was too weak since it just said they were going to continue the process. King said, "Dun came in with a new motion. We were going to put a new motion and to have a split vote. At the last minute, we determined that it was far more important to have a unanimous vote on anything than it was to have a fractured vote on something that we could support. A fractured vote would put Taylor and Durlacher in a difficult position."[6]

4.2 Impasse over Alternative 8.1D Modification 5

During the spring and summer of 1992, design studies were continued by the state in consultation with committee members and the FHWA. Also, the City of Boston and its traffic consultant, Bruce Campbell and Associates, together with the Boston Artery Focus Group[7] had leading roles in creating new alternatives that Beacon Hill could accept. During this period, the City of Cambridge, Charlestown, and environmental groups were not involved with

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5 The BDRC meeting summary, March 12, 1992.

6 Interview, Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.

7 The BAFG, which is comprised of the Downtown North Association, the Beacon Hill Civic Association, the Massachusetts General Hospital, the Museum of Science, the Cambridge Street Community Development Corporation and others, was established to address the concerns of the downtown north and Beacon Hill area after the BDRC meeting in March, 1992.

the process actively, because they thought the modification around Leverett Circle and Storrow Drive was a Boston issue.

Five modifications were developed based on Alternative 8.1D; these were called 8.1D Alternative Modification from 1 to 5. Although Alternative 8.1D Mod 3 was supported by Beacon Hill, it was dropped due to the alignment, which was considered a safety problem by the FHWA. Since Alternative 8.1D Mod 4 provided limited access to the river tunnel to the north bank at Leverett Circle and required extensive tunnel construction along the Esplanade and Leverett Circle, it was rejected by Beacon Hill. Then, in order to get the support of the representatives of Beacon Hill, Alternative 8.1D Mod 5 was created in such a way that it did not reconfigure Storrow Drive to the west of Leverett Circle. (See Figure 4.2 for the diagram of Alternative 8.1D Mod 5). The most significant feature of Alternative 8.1D Mod 5 was that the eastbound traffic from Storrow Drive to I-93 North/Route 1 would move through a grade signalized intersection at Leverett Circle.

In September 1992, Alternative 8.1D Mod 5 was accepted by unanimous vote at the BDRC, and the Notice of Project Change was filed with the EOEA and the FHWA. However, this unanimous support for Mod 5 was a political compromise without adequate engineering study. The potential problems, such as the Leverett Circle intersection design aspects including traffic signalization, and other geometrical features, seemed to be apparent to most of the members.

Stanley Durlacher, former undersecretary of the EOTC, said, "I knew that scheme was not going to get built. But I wanted to get the design to a point acceptable enough to go through the next steps so you could keep refining as you go along. . . . But if I could do it once again, I would take 8.1D."[8] However,

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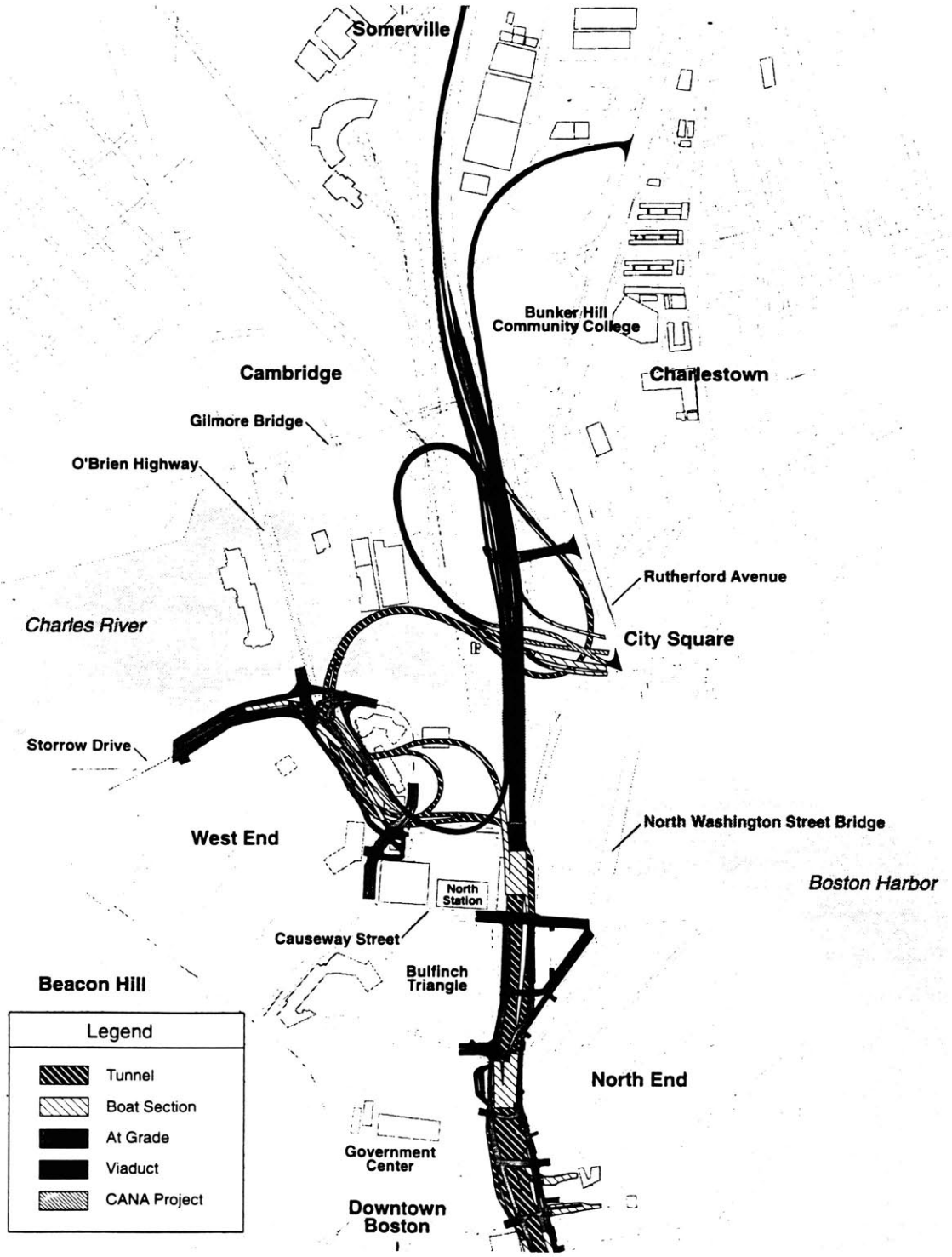
[8] Interview, Stanley Durlacher, the former Undersecretary of the EOTC, March 9, 1994.

Figure 4.2 Diagram of Alternative 8.1D Mod 5

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.



most of the members were more worried about the feasibility of Alternative 8.1D Mod 5. Robert O'Brien, the executive director of the Downtown North Association, said, "Everyone knew it didn't work. We were invited to critique it so that all the deficiencies could be identified and resolved."[9] Hugh Russell, a member of the Cambridge Planning Board, said, "There was not sufficient time to really reflect what was being done. We voted for it, because we did not think there was any other choice. We should have voted against it. We made a mistake."[10] William Kuttner, a traffic engineer in the Central Transportation Planning Staff (CTPS)[11] and a dedicated observer of the BDRC, said "Alternative 8.1D was an engineeringly good plan. It was a fiasco that the process messed up 8.1D and created Mod 5. Mod 5 was dead on the day it was born. Mod 5 had a corkscrew ramp around Leverett Circle, and the signalized grade intersection of Storrow Drive at Leverett Circle would cause long back ups to the Harvard Business School. Nobody bought it, and the FHWA people said 'we would never spend the federal money for the flawed interstate highway.' In addition, it was far more expensive than Alternative 8.1D and would delay the schedule much longer."[12]

The Boston Artery Focus Group as well as some other members sent letters to the FHWA expressing their concerns about traffic management at Leverett Circle. As it turned out, a detailed traffic analysis of the intersection indicated that grade separation from Storrow Drive was needed in both east-bound and west-bound directions at Leverett Circle, and a traffic light in the

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[9] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.
[10] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.
[11] A cooperative transportation planning organization of the EOTC, MBTA, MDPW, Massachusetts Port Authority (MPA), and Metropolitan Area Planning Council (MAPC).
[12] Interview, Bill Kuttner, a traffic engineer of the CTPS, February 28, 1994.

east-bound direction would cause severe backups to Storrow Drive.[13] The BAFG also pointed out many other traffic issues around downtown Boston and Beacon Hill.

Modifications of Alternative 8.1D seemed to be stuck in a deadlock, in which any improvements would only result in a trade off which would force the acceptance of other problems. There were many spatial constraints around Leverett Circle, such as the limited capacity of the local streets, one way streets, parkland and historical buildings protected by Section 4(f), and others. Eventually, Alternative 8.1D Mod 5 was defeated.

4.3 Political Change and Decline of the Bridge Design Review Committee

In October 1992, EOTC Secretary Richard Taylor announced that he would leave his post for private financial reasons. James Kerasiotes, the Massachusetts Highway Commissioner, took the post in November. Robert Zimmerman, the director of the Charles River Watershed Association, hinted at the possibility that Governor Weld might have forced Taylor out.[14] Two months later, Stanley Durlacher, Undersecretary of the EOTC, was fired. Hugh Russell suggested that the relationship between Durlacher and engineers of the B/PB was not good and the engineers might have brought their complaint to Kerasiotes or other aides of Weld.[15] It is difficult to know for sure what was happening behind the scenes.

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[13] As for approach delay from Storrow Drive to Leverett Circle would be 343 second per vehicle in the AM and 491 second per vehicle in the PM. (The Draft EIS/R, July 1993).
[14] Interview, Robert Zimmerman, the director of the Charles River Watershed Association, February 17, 1994.
[15] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

Concerns about Alternative 8.1D Mod 5 were raised by the federal agencies as well as by the members of the BDRC. First, the U.S. Army Corps of Engineers (USACE) requested further study to prove that the impact of Alternative 8.1D Mod 5 on the water environment was the lowest among the practical alternatives.[16] According to the letter from the USACE to the FHWA, "We are concerned that a 'head-to head' comparison of these two alternatives --- Scheme Z and 8.1D MOD 5 --- in the NEPA process may not lead to a choice which we could designate as the Least Environmentally Damaging Practicable Alternative (LEDPA). . . . It may be necessary to formulate and evaluate 'hybrid' alternatives to ensure that all practicable alternatives have been addressed."[17]

Although this letter expressed concerns about the impact of tunneling on the water environment, the main point was to examine more alternatives including hybrid cases so that they could identify the state's preferred alternative as LEDPA. Stanley Durlacher said "It basically says, 'come in and convince us that Mod 5 was the least environmentally damaging practicable alternative. We will talk about it.' I thought it was a pretty good news. . . . I talked with the USACE many times. They seemed to be willing to explore the possibility of water based tunnels. They seemed to be fine."

Furthermore, the state had designed a tunnel in the Fort Point Channel which was in a similar condition to the Charles River, and it did not have problems concerning the permission of the USACE. Also, the state had made a

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[16] The USACE associated with the EPA are the authorities which regulate discharges of dredged or fill material in the waters and wetlands under Section 404 of the Clean Water Act. The USACE cannot give the permission if practicable alternatives exist which have less adverse impact on the aquatic ecosystem and do not have other significant environmental impacts.

[17] A letter from the New England Division of the USACE to the Massachusetts Division of the FHWA, January 5, 1993.

detailed analysis with respect to water environmental impacts due to the dredging and the disposal of materials in 1991. It concluded that these problems proved manageable based on both test borings and the estimation of the type and amount of material to be disposed of, and that the environmental benefits of putting traffic in a river tunnel in the long run would far outweigh the short term construction impacts of the tunneling.[18] Therefore, as far as the water environment issue was concerned, the MHD could have proved Alternative 8.1D MOD 5 as the least environmentally damaging practical alternative (LEDPA) if the MHD had been really committed to it.

Next, the FHWA expressed concerns with respect to traffic problems in Alternative 8.1D Mod 5: driver behavior in the long tunnel and its impact on traffic operations; traffic safety in the tight alignment of the on-ramp from Storrow Drive to I-93 North/Route 1; traffic level of service at the Leverett Circle/Storrow Drive Intersection. The FHWA also mentioned the concerns of the USACE about the aquatic impacts and requested a non-river-tunnel alternative to be included in the EIS.[19]

Durlacher said, "8.1D Mod 5 wasn't perfect, but it was acceptable. I agree with the further study about the human factors in a tunnel and traffic safety issues. But, I never wanted to try to go to the FHWA and say that we want to stretch your 6 percent grade limit to 6.5 percent. . . . The people in charge of the project changed and their philosophy to approaching the problem changed. They wanted the quickest, least costly way. There was not a political will or a champion for the tunnel scheme in the state."[20]

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[18] The BDRC meeting summary, March 12, 1992 and a letter from the BDRC to the Secretary of the EOEA, February 19,1993.

[19] A letter from the FHWA to the MHD, January 26, 1993.

[20] Interview, Stanley Durlacher, former Undersecretary of the EOTC, March 9, 1994.

The state decided to add the Reduced-River-Tunnel Alternative (RRT) to the Draft EIS/R as well as the Non-River-Tunnel Alternative (NRT) in February 1993, responding to the concerns of the USACE and the FHWA. (See Figure 4.3 and 4.4 for the diagram of the RRT and the NRT. Their features are detailed in Chapter 5). The BDRC was no longer involved in the process of developing schemes and was merely notified by the state of the progress.

Elizabeth Epstein, the director of the Cambridge Conservation Commission, said, "Mod 5 wasn't a committee's camel, because the BDRC didn't do the design work. The state made the BDRC a group of idiots. It was so clear that they didn't want to do anything with the committee. They just came in and presented new alternatives."[21]

The BDRC tried to have its recommendation reflected in the Draft EIS/R. It asked the state to compare a version of Alternative 8.1D with the NRT so that both of them had grade separations in both directions at Leverett Circle.[22] Unfortunately, the comparison by the state was made between Alternative 8.1D Mod5 (that had a signalized intersection eastbound at Leverett Circle) and the NRT (that had grade separations at Leverett Circle in both directions), even though it had already proved that an eastbound signalized intersection at Leverett Circle in Alternative 8.1D Mod 5 would not work. Robert Zimmerman, the director of the Charles River Watershed Association, said, "Everybody knew that 8.1D Mod 5 was a 'straw man' and that it didn't work. But Kerasiotes didn't try to correct its problem nor work with the committee members."[23]

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[21] Interview, Elizabeth Epstein, the director of the Cambridge Conservation Commission, February 14, 1994.
[22] A letter from the BDRC to the Secretary of the EOEA, February 19, 1993.
[23] Interview, Robert Zimmerman, the director of the Charles River Watershed Association, February 17, 1994.

Figure 4.3 Diagram of the Reduced-River-Tunnel Alternative

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.

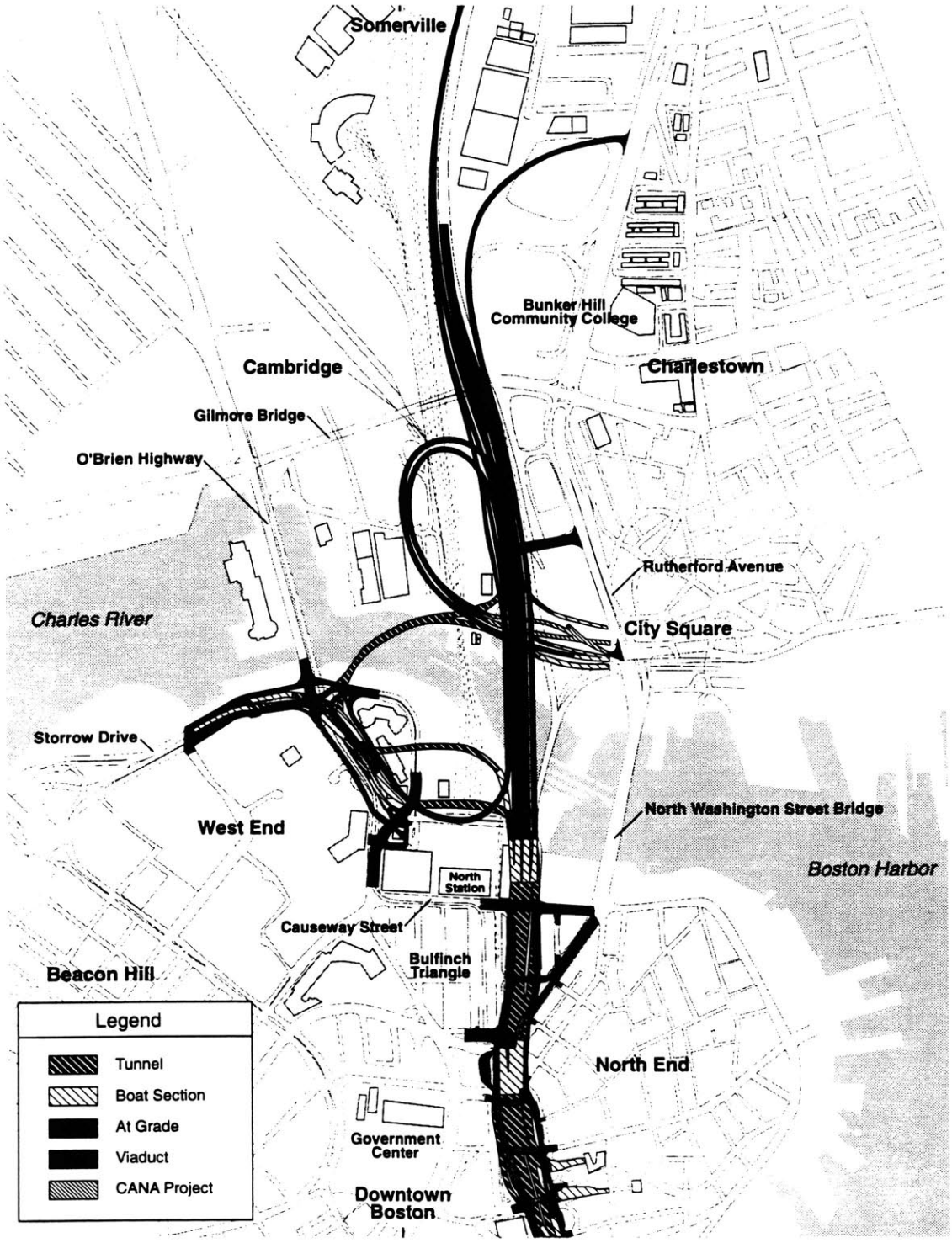
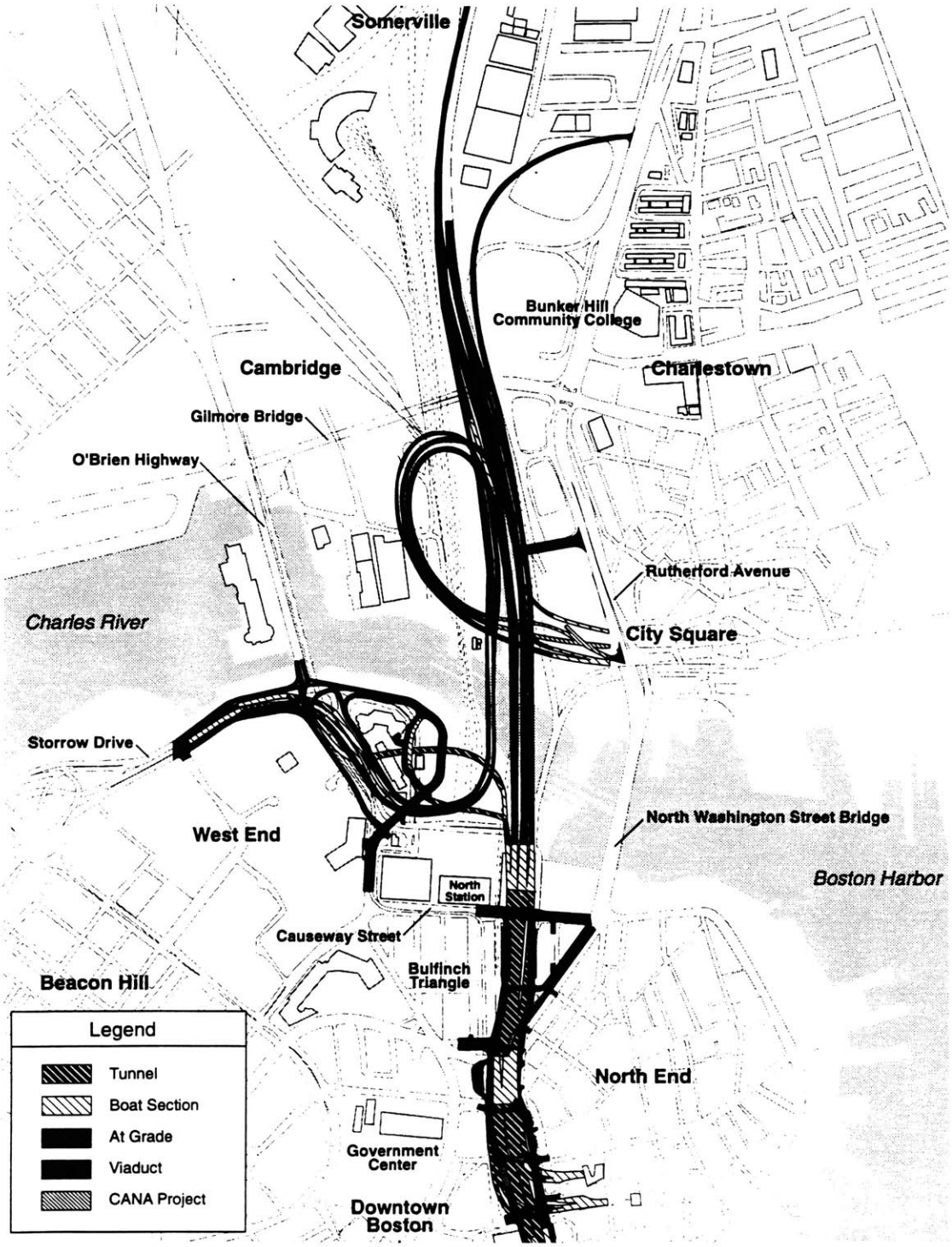


Figure 4.4 Diagram of the Non-River-Tunnel Alternative

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.



The BDRC also expressed the concern that for the state to perceive a river tunnel as environmentally damaging for a highway but not too environmentally damaging for a railroad would be legally vulnerable and unsound, in their response to the state's announcement of the North-South Station rail link.[24]

The FHWA Scope of Work for the Draft EIS was issued in February 1993. The Certificate of the EOEA on the Notice of Project Change, which is the Scope for the Draft EIR, was issued in March 1993. This certificate required the MHD to evaluate three alternatives: Alternative 8.1D Mod 5, the Reduced-River-Tunnel Alternative (RRT), and the Non-River-Tunnel Alternative (NRT).

The Draft EIS/R, published in July 1993, included four alternatives: 8.1D Mod 5, the RRT, the NRT, and Scheme Z. The Draft EIS/R did not identify a preferred alternative of the state but presented the four designs' features and comparisons. Although several possible refinements were considered and summarized, the eastbound grade separation at Leverett Circle was not included in the possible refinements of Alternative 8.1D Mod5.

Following community meetings held in East Cambridge, and in the Charlestown and in the North Station areas of Boston, a public hearing was held at the Museum of Science in September, 1993. Members of the BDRC testified at the public hearing or gave written comments from various perspectives. The BDRC reiterated the basic principles developed through its deliberations and, in particular, asked the state to consider a revised version of the RRT that would build a river tunnel in the present transportation corridor. (See Figure 4.5 for the comparison of the revised Reduced-River-Tunnel Alternative with the non-revised RRT). Robert O'Brien, the executive director

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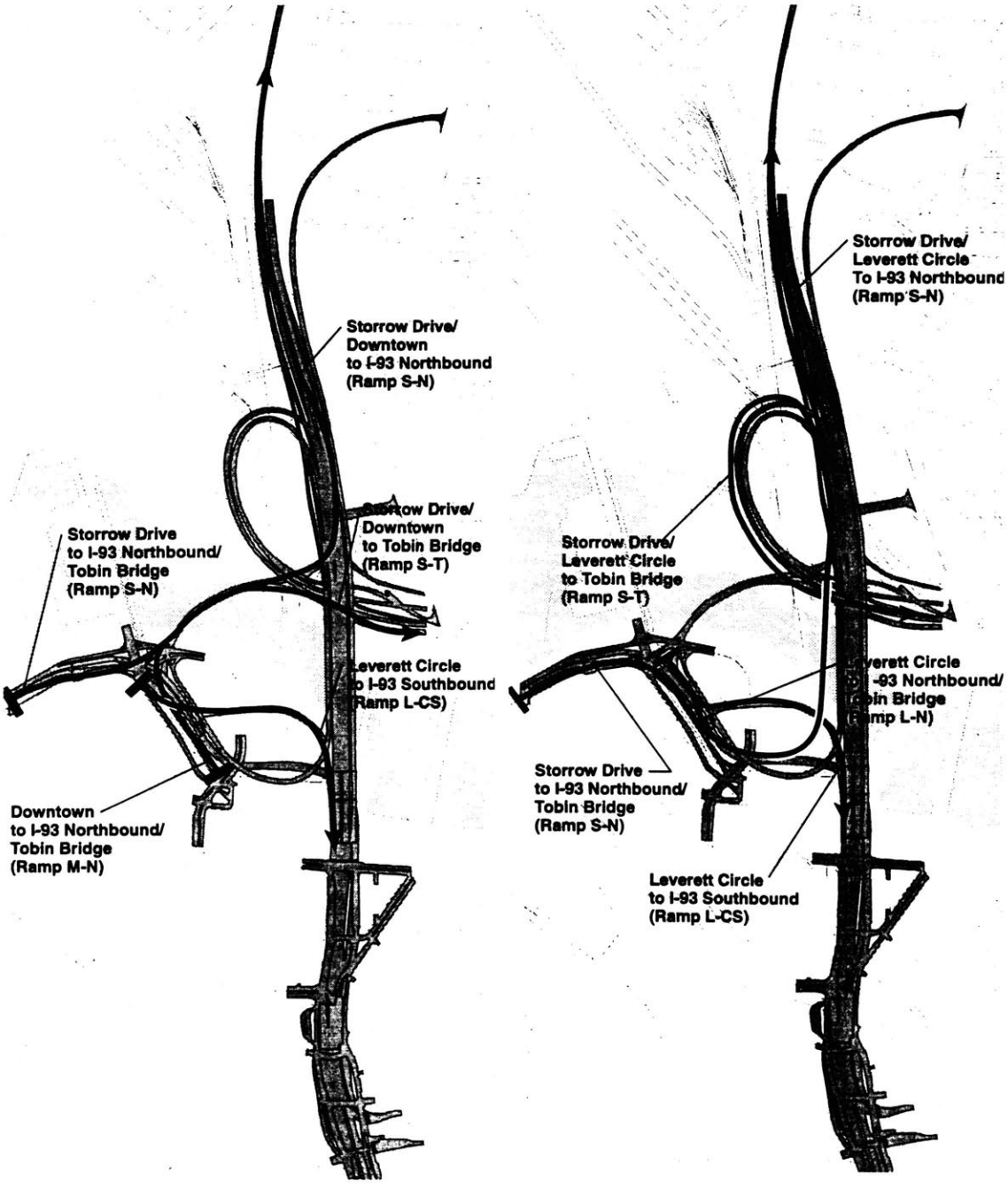
[24] A letter from the BDRC to the Secretary of the EOEA, February 19, 1993.

Figure 4.5 Diagram of the revised Reduced-River-Tunnel Alternative

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Final Supplemental Environmental Impact Statement/Report*, 1994.



Reduced-River-Tunnel Alternative

Revised Reduced-River-Tunnel Alternative

of the Downtown North Association, and Anthony Pangaro, an architect and real-estate developer representing Beacon Hill, who used to be the project manager for the Southwest Corridor Project under Salvucci, enthusiastically tried to get the full support of the committee members with respect to the revised Reduced-River-Tunnel Alternative. O'Brien said, "Most of the constructability issues that they thought would prevail turned out to be solvable. Had the scheme secured support from Cambridge, the Secretary would have chosen the scheme."[25] However, the scheme was not attractive to the City of Cambridge. Russell said, "We didn't support the alternative because it involved three ramps in Cambridge. It would be very expensive and have a similar constructability problem to Mod 5 because of its closeness to the Charles River Dam, the existing highway, and the Orange Line tunnel. It was a trap just like 8.1D Mod 5. We didn't want to make the same mistake."[26]

Kerasiotes, the Secretary of the EOTC announced the Non-River-Tunnel-Alternative as the preferred alternative in November, 1993. Then, the Final EIS/R was published in February 1994, which compared the preferred alternative, i.e. the Non-River-Tunnel Alternative, with Scheme Z. The Final EIS/R also described further realignments of Alternative 8.1D Mod 5 and the Reduced-River-Tunnel Alternative and the reasons for the rejection of the modifications. The revised Reduced-River-Tunnel Alternative was also rejected due to the constructability issues and possible conflicts with the future North-South Station rail link. After thirty days of public comment period, the Certificate of the Secretary of the EOEA on the Final EIR/S was issued in March 1994. Although the certificate acknowledged that the change

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[25] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.

[26] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

of the cable-stayed bridge design could result in significant negative impacts[27] and that the state should reevaluate its traffic forecasts taking into account the effects of traffic mitigation packages,[28] it admitted the Final EIR/S as generally adequate.

After the state had spent three years on improving Scheme Z in cooperation with the BDRC, it seemed to be confident that the selected alternative was not vulnerable to lawsuits. However, in April 1994, four environmental advocacy groups that opposed the selected Non-River-Tunnel Alternative brought this case to court again, claiming violation of environmental regulations. They charged that the Final EIS/R was incomplete because it treated the project as individual segments and did not describe its cumulative impact on the community. These lawsuits might ruin the entire negotiation. The conflict of the Charles River crossing is not yet over.

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[27] In February 1994, the FHWA raised concerns regarding the engineering viability of the non-symmetrical cable-stay bridge design and required the state to conduct a bridge type study. Many commenters expressed concern about the possibility of the design change, and, this certificate noted that such a change would be subject to further MEPA review.

[28] The Conservation Law Foundation, Steve Kaiser, and other commenters argued that the traffic analysis of the MHD do not take into account mitigation measures, such as mass transit projects, parking freeze enlargement, and the North-South Station rail link.

Chapter 5
Evaluation of the Negotiation Process After Committee Improvement Package 8.1

I will explain the major factors that prevented the committee from reaching a consensus on a feasible scheme, following the negotiation process that I described in Chapter 4. At first, I will detail the features of the three alternatives examined in the 1993 Draft EIS/R, because it is necessary to clarify the differences between these schemes in order to understand the arguments of each of the committee members. I will also clarify the gains of each of the members through the design change from Scheme Z to the selected Non-River-Tunnel Alternative. Then, I will explain three factors which may have negatively affected consensus building.

First, the most promising Alternative 8.1D was rejected only by Beacon Hill because of a non-negotiable issue involving the necessity for a Storrow Drive modification along the Esplanade. Second, since the modifications of Alternative 8.1D were constrained spatially in a compact urban area, no alternatives could be found to meet all requirements; the negotiation became a zero sum bargain. Third, the opposition of the representatives seemed to be stronger than the realistic views taken by their constituencies. Also, I will describe the state decision-making process, explaining why it stopped pursuing a consensus and selected the controversial Non-River-Tunnel Alternative. Increasing cost due to schedule delay may have been an important factor for the state.

5.1 Features of the Three Alternatives in the 1993 Draft EIS/R

In the 1993 Draft EIS/R, three alternatives were detailed and compared with each other. These alternatives were a significant improvement over Scheme Z, especially in the following areas:

1. Each alternative included the I-93 northbound on-ramp at New Sudbury Street, which had a traffic function similar to the Traverse Street on-ramp eliminated from Scheme Z.

2. Each alternative included land tunnels behind North Station to connect I-93 south of Causeway Street and Storrow Drive without forcing the traffic to cross the river twice.

3. Each alternative included a southbound HOV lane on I-93.

4. Each alternative greatly reduced the height and number of the bridges. Also, each alternative reduced the number of North Point loop ramps to a maximum of three with heights of about 35 feet. These modifications would not only increase the open space along the river and the development area in North Point but also would improve the aesthetics of the structures.

The Certificate of the Secretary of the EOEA on the 1993 Draft EIS/R said that because the environmental impacts were the same or similar in each of the three alternatives, the environmental impacts would not be the determining factors for selecting a preferred option. Furthermore, it continued by noting that to the extent an alternative would offer a clear advantage in one area, it would increase adverse impacts in another area. It was impossible to point out the best alternative in terms of environmental impacts. The EPA had the same recognition that there were no substantial differences between the three alternatives in the Draft EIS/R.

However, many of the BDRC members regarded the difference dividing the three alternatives as significant in terms of land use and parkland as well as aesthetics, and some of them are still arguing against the state's preferred alternative, i.e. the Non-River-Tunnel Alternative. The differences among the three alternatives are detailed in the following paragraphs. (See Table 5.1 for the comparison of the three alternatives and Figure 4.2, 4.3 and 4.4 for the diagram of the these alternatives).[1]

Alternative 8.1D Mod 5 includes a 10-lane cable-stayed mainline bridge, 170 feet wide, and a three-lane northbound tunnel under the river. I-93 mainline traffic crosses the river on a single bridge with four lanes in each direction. An additional two lanes on the western side of the mainline bridge carry I-93/Route 1 southbound traffic to Storrow Drive. This scheme has a single loop ramp in North Point which is 35 to 40 feet high and 180 feet from the river's edge. The land tunnel behind North Station accommodates traffic between I-93 south of Causeway Street and Storrow Drive, and the river tunnel accommodates northbound traffic between Storrow Drive and I-93 North/Route 1. Since this scheme has the lowest number of lanes over the river and the narrowest width of coverage of the river, most of the environmental advocacy groups still favor this version. However, there are still unresolved problems in this scheme such as the poor service level at Leverett Circle Intersection, the possibility of a high accident rate due to the tight alignment of the ramp around Leverett Circle, and the long total length of the tunnel sections. It would also have great temporary impacts on the water environment and navigation due to tunnel construction. Furthermore, it would cost more than the NRT by about 300 million dollars and take four-and-a-half more years to complete.

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[1] *The Draft Supplemental Environmental Impact Statement/Report* (the MHD, July 1993).

Table 5.1 : Comparison of Three Alternatives

	Scheme Z	8.1D Mod 5	RRT (*1)	NRT (*2)
River Crossing				
Total Number of travel lanes	16 (*3)	13	14	14
Number of lanes in river tunnel	0	3	2	0
Number of lanes on bridge or viaduct	16 (*3)	10	12	14
Number of bridge or viaduct structures	3 (*4)	1	1	2
Overall bridge and viaduct width (feet)	275 (*5)	170	230	330 (*6)
Number of piers in the Charles River	11	1	1	6
Distance from the residential community east of Rutherford Avenue (feet)	390	500	450	450
Storrow Drive Connections				
Number of lanes to/from the North	4	4	4	4
Number of lanes in tunnel	0	2	2	0
Number of lanes in viaduct	4	2	2	4
Number of lanes to/from the South	2	2	2	2
Number of lanes in tunnel	0	2	2	2
Number of lanes in viaduct	2	0	0	0
North Area Ramp Structures				
Total number of ramps in North Point	6	1	2	2 to 3
Overall height of loop ramps at North Point (feet)	105	35 to 40	35 to 40	35 to 40
Distance from development area (feet)	oss of 1 acr	-46	44	24
Distance from river's edge to elevated ramps (feet	45	180	135	135
Traffic				
HOV lane (I-93 southbound)	no	yes	yes	yes
Direct access ramp from downtown Boston	no	yes	yes	yes
Storrow Drive to I-93 move at Leverett Circle	underpass (1-level)	at grade	underpass (2-level)	underpass (1-level)
I-93 to Route 1 move	on viaduct	in tunnel	on viaduct	on viaduct
Storrow Drive eastbound traffic volume	69107 (*7)	49721 (-28%)	54192 (-22%)	56673 (-18%)
Storrow Drive westbound traffic volume	65905 (*7)	67154 (+2%)	68057 (+3%)	67947 (+3%)
Cost and Schedule				
Construction Cost ($ millions, exel. mitigation)	489	1282	1131	995
Delay in completion (years)	Base	4.5	0.5	0.0

Source: Draft Supplemental Environmental Impact Statement/Report (July, 1993)
Note: (*1) Reduced-River-Tunnel-Alternative
(*2) Non-River-Tunnel-Alternative
(*3) If the Traverse Street on-ramp were not eliminated, the number of lanes would be 18.
(*4) One is a double-deck bridge. If the Traverse Street on-ramp were not eliminated, the number of bridges would be 4.
(*5) Including gaps between bridges.
(*6) including a 100-foot gap between the main line bridge and Storrow Connector.
(*7) The traffic volume of Storrow Drive in Scheme Z is a little different from that of Table 2.1 probablely due to change of wither the traffic assignment model or the estimated section.

The Reduced-River-Tunnel Alternative (RRT) is a revised version of Alternative 8.1D Mod 5 addressing the concerns of the FHWA in terms of traffic safety and operations. The ramp accommodating traffic northbound I-93 to Route 1 is taken out of the river tunnel and placed on a viaduct by adding two lanes to the mainline bridge, resulting in a bridge with 12 lanes in total, 230 feet wide, and a river tunnel with two northbound lanes. There are two loop ramps in North Point which are 35 to 40 feet high and 135 feet from the river. Although this option would provide an eastward underpass at Leverett Circle, the Lomasney Way/Nashua Street on-ramp to the river tunnel would cause some access problems. A revised Reduced-River-Tunnel Alternative was then designed in order to address the traffic operation and access issues of downtown Boston. However, this design was not attractive to all the members of the committee and was rejected by the state for construction reasons. Also, the RRT and the revised version would have temporary impacts on aquatic resources due to tunnel construction and cost more than the NRT by about 150 million dollars.

The Non-River-Tunnel Alternative (NRT) takes traffic from Storrow Drive to I-93/Route 1 out of the river tunnel and placed it on a viaduct, resulting in 14 lanes crossing over the river by two bridges. The mainline bridge has a 10-lane cable-stayed structure, and a second bridge carries an additional four lanes to/from Storrow Drive. The width of the two bridges is 330 feet including a 100-foot gap between the bridges. The second bridge would limit the open space between the mainline bridge and the MBTA Commuter Rail bascule bridge and negatively affect the parkland for mitigation planned by the MDC. In North Point, there are three loop ramps merging to two, which are 35 to 40 feet high and 135 feet from the river. The ramps are 24 feet away from the adjacent parcels compared to about 45 feet in

the case of Alternative 8.1D Mod 5 and the RRT, and requires that changes to be made to the planned perimeter road. The NRT is similar to CIP 3, which was rejected by most of the committee members in June 1991, and is called "Son of Scheme Z" by environmental advocacy groups due to its negative impacts on both the open space along the river and aesthetics.

5.2 Gains of Each of the Stakeholders in the Non-River-Tunnel Alternative

I will describe the gains of each of the stakeholders resulting from the design improvement from Scheme Z to the Non-River-Tunnel Alternative. I will highlight their interests and arguments, comparing then with the features of the three alternatives in the 1993 Draft EIS/R. I will also consider their original arguments against Scheme Z as well as their responses to the 1993 EIS/R.

(1) *The City of Boston and downtown business organizations*

These groups gained most of the key elements in the first round of the BDRC, such as the provision of the New Sudbury Street on-ramp to northbound I-93, the elimination of double river crossings between I-93 south of Causeway Street and Storrow Drive, and the improvement of the aesthetics of the bridges and the parkland mitigation along the Charles River. They also gained the Nashua Street off-ramp from northbound I-93. They successfully rejected the signalized intersection at Leverett Circle which would cause traffic congestion on Storrow Drive. Although the Boston Artery Focus Group failed both to get full support for the revised Reduced-River-Tunnel Alternative and to

convince the state to pursue this alternative, they could accept the Non-River-Tunnel Alternative considering their initial support of Scheme Z.

The Artery Business Committee must have been satisfied with the NRT, because it was worried most about the delay of the schedule and funding of the project.[2] Although 1,000 Friends of Massachusetts supported the RRT[3], their preference for it may not have been strong enough to oppose the NRT.

(2) *Beacon Hill*

Beacon Hill successfully rejected any modifications of Storrow Drive west of Leverett Circle as well as encroachments onto the Esplanade. Beacon Hill secured the same connection between Storrow Drive and northbound I-93/Route 1 via a viaduct looping around the Boston Garden combined with the Leverett Circle underpass. This configuration would secure a relatively smooth traffic flow on Storrow Drive as well as entrances from the local streets in Beacon Hill to Storrow Drive.

As a member of the BAFG, Anthony Pangaro was enthusiastic about the revised Reduced-River-Tunnel Alternative which would resolve the access issues to the river tunnel and have a relatively appealing single bridge.[4] It is clear, however, that Beacon Hill was satisfied with the NRT, considering its initial support of Scheme Z.

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[2] A letter from the ABC to the FHWA and the EOEA, October 5, 1993, and an aural testimony at public hearing in September 14, 1993.
[3] A letter from the 1,000 Friends of Mass to the FHWA and the EOEA, October 5, 1993.
[4] An aural testimony at public hearing in September 14, 1993.

(3) *The City of Cambridge*

The City of Cambridge initially advocated an all-tunnel alternative and compromised with the Alternative 8.1D Mod 5. Although the heights of the loop ramps in North Point were the same between the cases of Alternative 8.1D Mod 5 and the NRT, the number of loop ramps increased from one in Alternative 8.1D Mod 5 to three (merging to two) in the NRT. However, in reality, coordination with the housing development plans is almost the same as in the case of Alternative 8.1D Mod 5. (See Figure 5.1 for sections of loop lamps in North Point and Figure 5.2 for views of models from North looking South in the case of Scheme Z, 8,1D Mod 5, and the NRT). Hugh Russell, a member of the Cambridge Planning Board, described three reasons for this argument.[5] First, the City of Cambridge had approved the CANA Project before 1987 including two loop ramps in North Point, and the revised land use plan was based on this configuration. Second, major impacts by loop ramps would be inflicted on the state owned parcel beside the ramps, where housing will not be built. Since the sites for the housing projects are buffered by other state-owned parcels, adding one partial loop ramp to the original CANA scheme would not make much difference to the projects. Third, because the housing projects would have four-story parking, the lowest residential floors would start approximately 40 feet above ground, and loop ramps would be below the residential floors. Since North Point is situated in a tidal river area and filled land materials do not have enough structural ability, building parking below grade would not be allowed. Russell also mentioned that the NRT would be more harmless to the housing project than Alternative 8.1D Mod 5, which needs a graving basin for tunnel construction beside the project. Although

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[5] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

Figure 5.1 Comparisons of Sections of Loop Ramps in North Point

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.

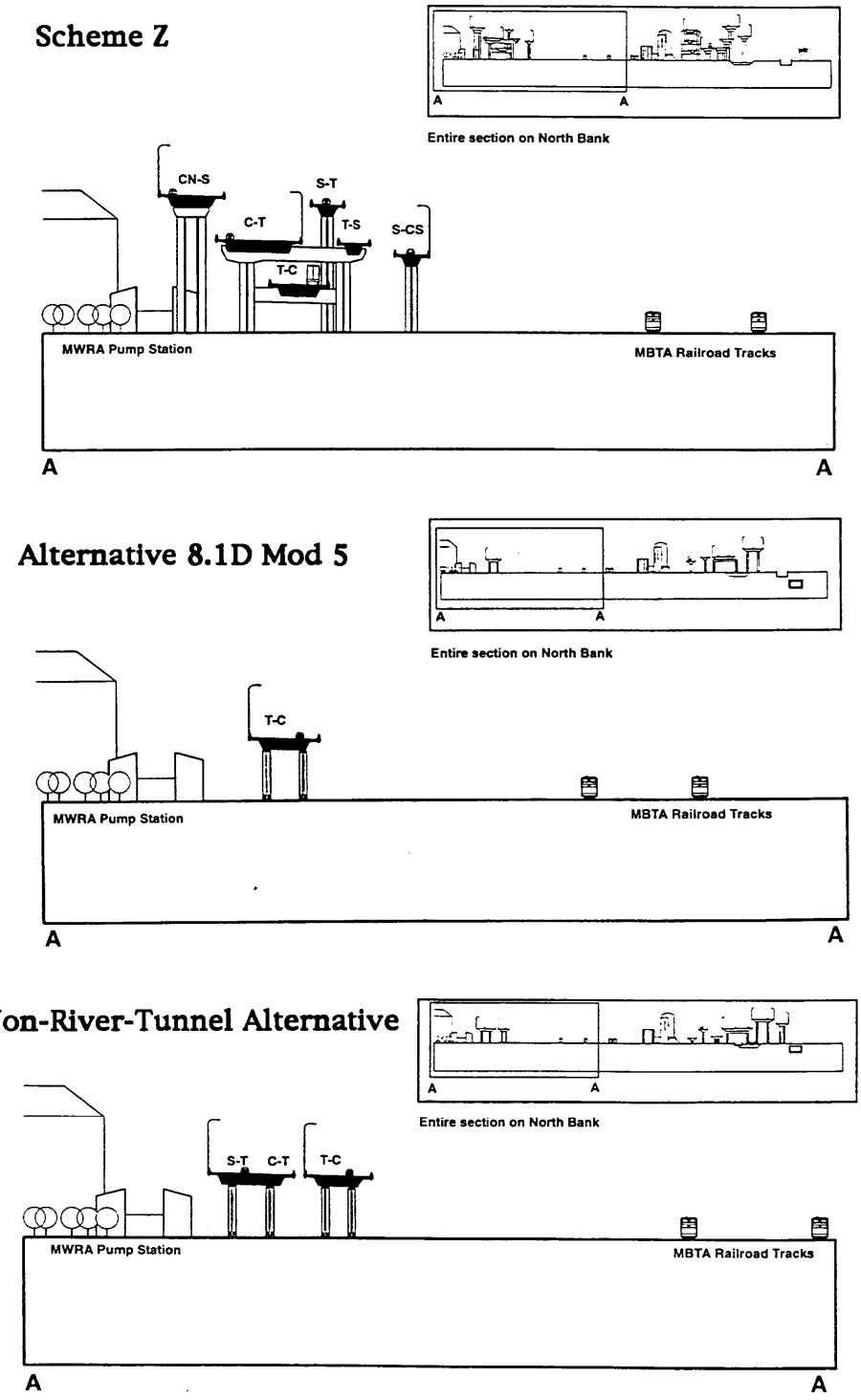
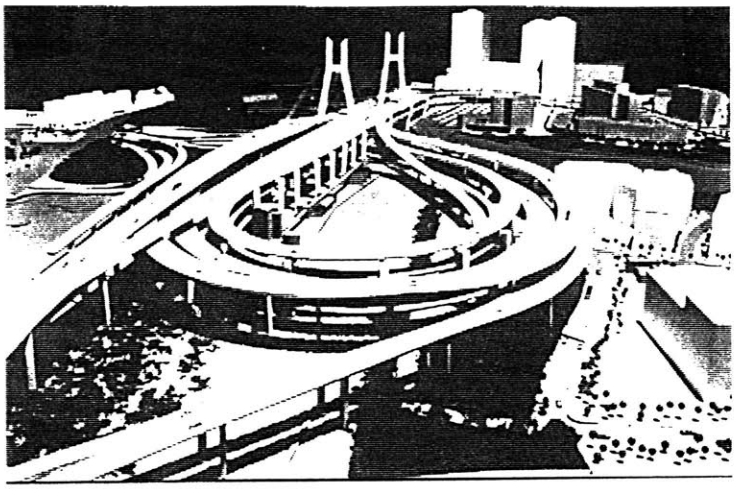


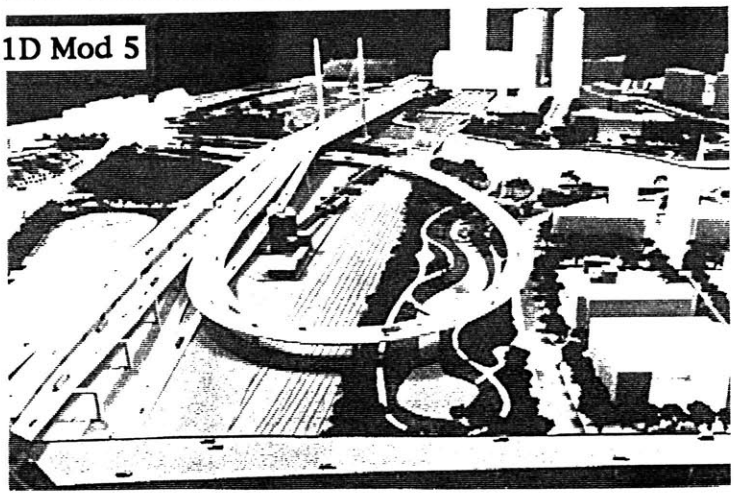
Figure 5.2 Comparisons of Views from North

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.

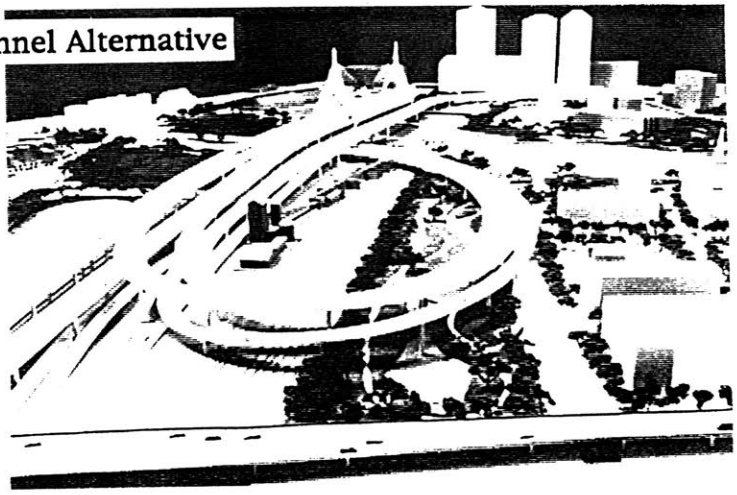
Scheme Z



Alternative 8.1D Mod 5



Non-River-Tunnel Alternative



some of the possibilities were foreclosed, this area will be provided infrastructures such as streets, parks, and so forth by the state so that the city can facilitate housing development.

As for the parkland along the Charles River, the north bank between the mainline bridge and the MBTA Commuter Rail bascule bridge would be covered by the second bridge in the case of the NRT. This second bridge would make the arts park, which was planned in the MDC parkland master plan, unattractive and pedestrian movements from North Point to the lower basin of the Charles River uncomfortable. (See Figure 5.3 for the plan views in the case of Scheme Z, 8.1D Mod 5, and the NRT; and Figure 5,4 for the MDC riverpark master plan). The aesthetics of the bridges from the perspective of the Cambridge side would be worsened by the non-cable-stayed second bridge. The Millers River, which would be relocated in North Point for mitigation, would not be as good in the NRT as in Alternative 8.1D Mod 5. Elizabeth Epstein testified at the public hearing that if resolution of the problems in Alternative 8.1D Mod 5 proved impossible, the state should incorporate the beneficial features of Mod 5 into the RRT.[6] Unfortunately, the revised RRT, which could have gathered the full support, was not good enough for the City of Cambridge.

(4) *Charlestown*

Dan King, the representative of the Citizens for a Liveable Charlestown, strongly contends against the NRT, particularly in terms of the aesthetics of the bridges from the perspective of the Charlestown community.[7] However,

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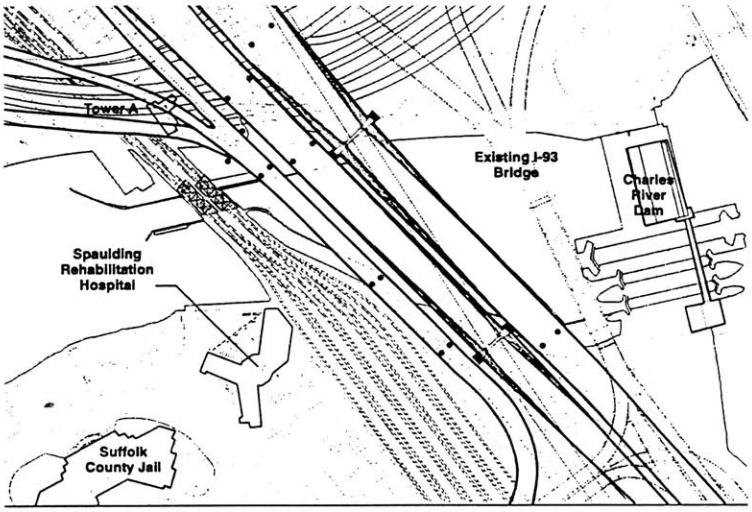
[6] An aural testimony at public hearing in September 14, 1993.

[7] Interview, Dan King, the representative of the Citizens for a liveable Charlestown, March 1, 1994.

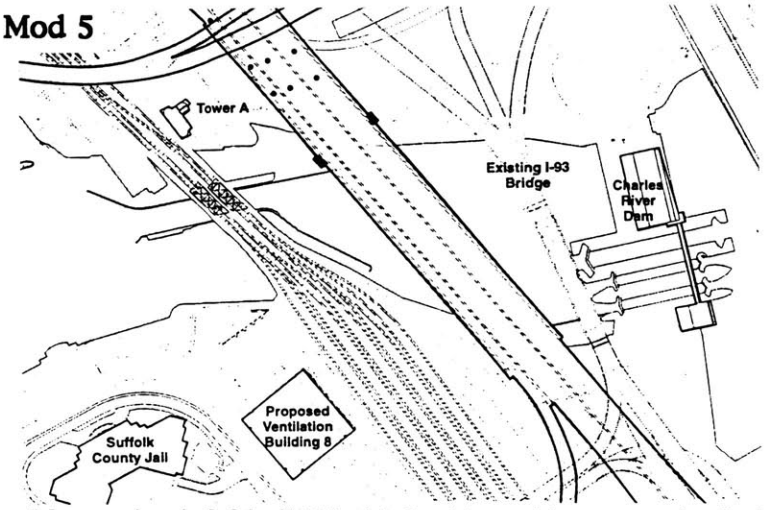
Figure 5.3 Comparisons of Plan Views

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.

Scheme Z



Alternative 8.1D Mod 5



Non-River-Tunnel Alternative

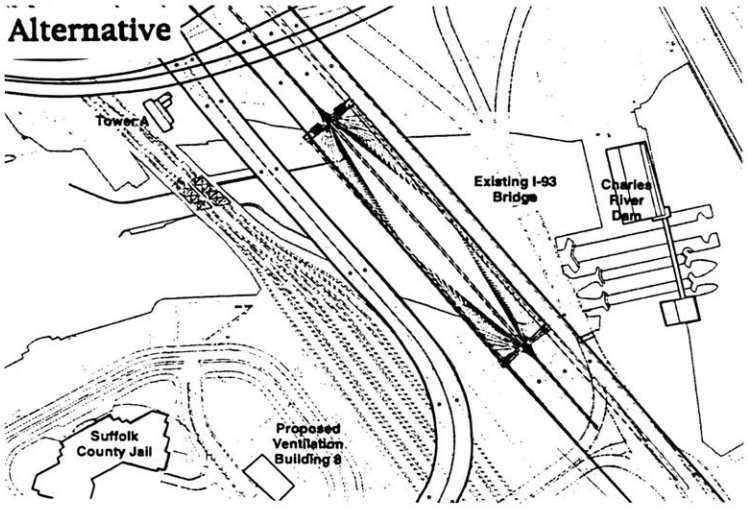
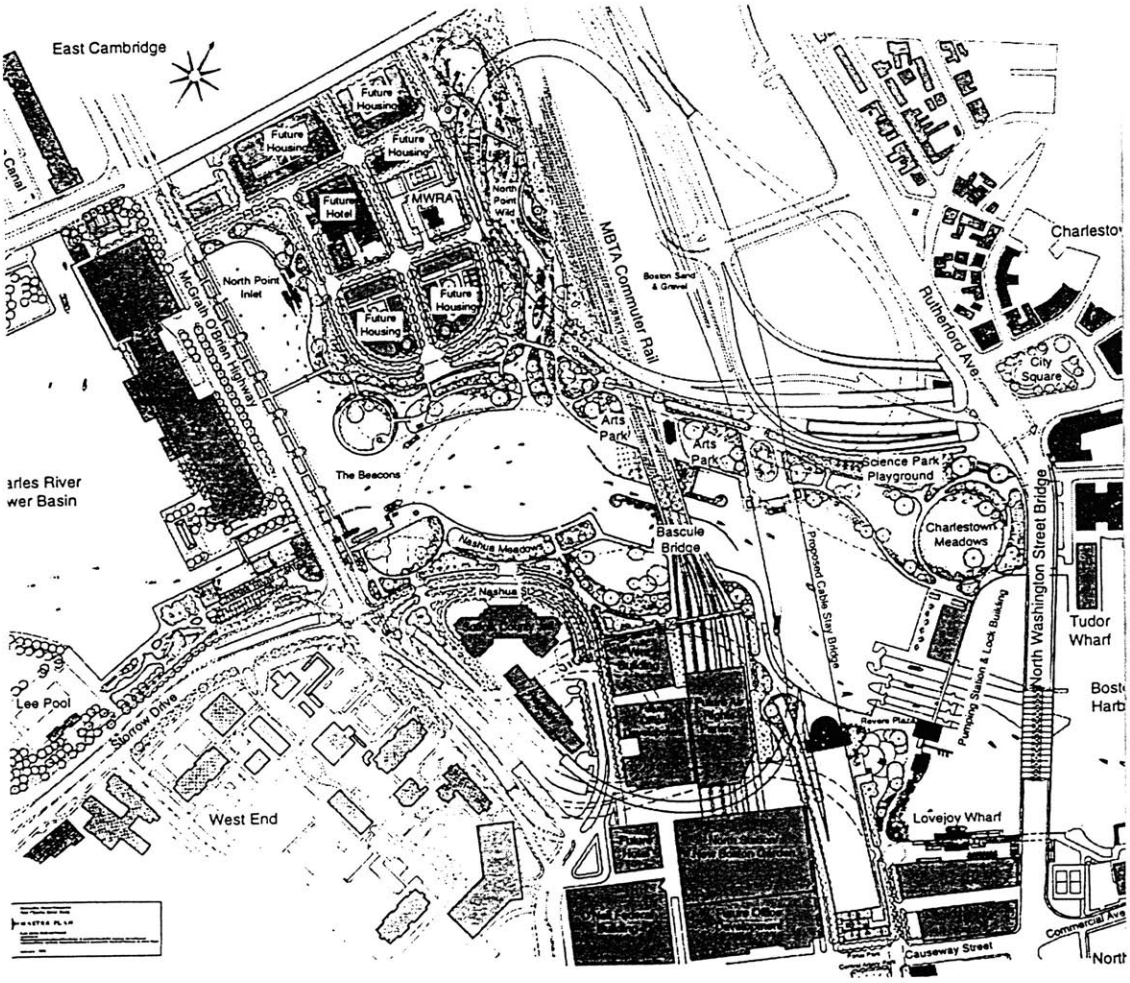


Figure 5,4 The MDC River Park Master Plan

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.



since the second bridge in the NRT would be built on the west side of the main bridge with a consistent profile, there would not be significant differences between it and Alternative 8.1D Mod 5 in terms of aesthetics from Charlestown. (See Figure 5.5 for the side views of bridges in the case of Scheme Z, 8.1D Mod 5, and the NRT). Charlestown resident Bill Kuttner, a traffic engineer at CTPS, said, "Charlestown gained a lot from the design changes. Somehow the way things have changed benefited Charlestown, such as the change of the CANA Project and the relocation of the City Square off-ramp to the north of New Rutherford Avenue."[8]

There were five Charlestown residents in the public hearing on September 14, 1993 who argued for the further relocation of the I-93 off ramp passing through the athletic field of the Bunker Hill Community College on New Rutherford Avenue to Sullivan Square. The state moved the off-ramp to the Sullivan Square area in response to their concerns in the Final EIS/R. However, it is a little strange that this rather minor specific concern had been left unresolved since the off-ramp was relocated from City Square to the Bunker Hill Community College in 1991.

(5) *The Conservation Law Foundation (CLF) and other environmental advocacy groups*

Since CLF and other environmental advocacy groups wanted Alternative 8.1D Mod5, they opposed the selection of the NRT. However, these environmental groups may grudgingly accept the NRT, considering their original acceptance of Scheme Z.

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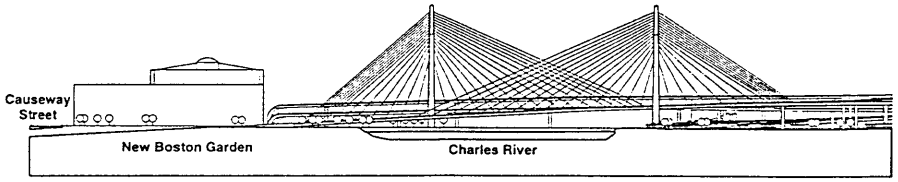
[8] Interview, Bill Kuttner, an engineer of the CTPS, February 28, 1994.

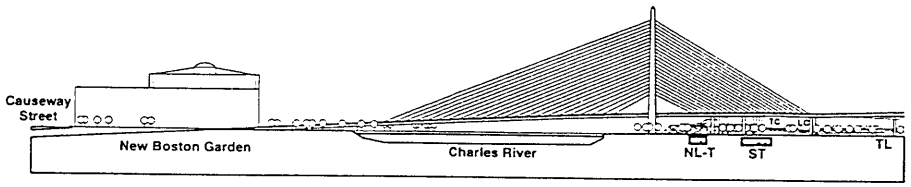
Figure 5.5 Comparisons of Side Views of Bridges

Source: U.S. Department of Transportation, Federal Highway Administration, and Massachusetts Highway Department. *Central Artery/Tunnel Project, Charles River Crossing, Draft Supplemental Environmental Impact Statement/Report*, 1993.

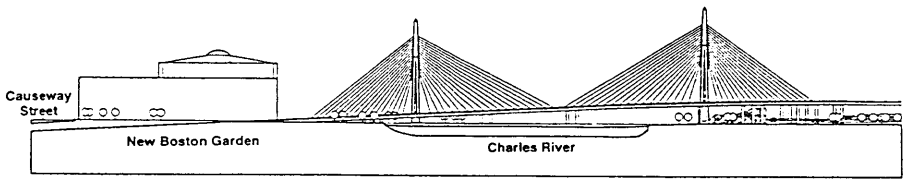
Scheme Z



Alternative 8.1D Mod 5



Non-River-Tunnel Alternative



CLF still advocates Alternative 8.1D Mod 5 arguing that the state failed to revise its traffic modeling to reflect mitigation commitments, such as mass transit improvements, expansion of parking freezes, as well as the North-South Station rail link. CLF contended that if the state were to consider the diversion of automobile traffic to mass transit by the mitigation packages and redesign highway capacity with that diversion in mind, the traffic flow problems around Leverett Circle would be minor enough to accept.[9] However, this capacity change would cause bottlenecks between the Charles River crossing and the ongoing Central Artery, which was designed without considering traffic mitigation packages. Also, CLF reached an agreement with respect to traffic mitigation in exchange for support of Scheme Z in December 1990 and has had no discussions about traffic capacity change since that time.[10]

(6) *The Charles River Watershed Association (CRWA)*

The Charles River Watershed Association opposed the NRT due to the more negative impacts on the parkland and the aesthetics compared to both Alternative 8.1D Mod 5 and the RRT.[11] Both the river and the bank between the mainline bridge and the MBTA Commuter Rail bascule bridge would be covered by the second bridge in the case of the NRT. This second bridge would

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[9] A letter from the CLF to the FHWA and the EOEA, October 4, 1993, and an aural testimony at public hearing in September 14, 1993.

[10] This discussion is important from the perspective of the regional traffic management and would have been appreciated if it had been raised in the beginning of the 1980s. In 1983, two of the major policy changes from earlier commitments in the 1970s were made: widening the artery and dropping the North/South station rail link. Strangely enough, neither change was the subject of public debate or controversy. David Luberoff, Alan Altshuler, and Christie Baxter, *Mega-Project*, (J.F.K. School of Government, Harvard University, 1993).

[11] Interview, Robert Zimmerman, the director of the CRWA, February 17, 1994.

make the MDC parkland mitigation plan less effective. The aesthetics of the structures would also be worsened by this second non-cable-stayed bridge.

(7) *The Committee for Regional Transportation (CRT)*

The Committee for Regional Transportation opposed the NRT due to the lack of the river tunnel and the two bridges which would cover the wide area of the river. Dun Gifford said that he would bring this question to court again.[12] However, since there were no statements at the public hearing and written comments to the FHWA and the EOEA with respect to both the Draft and the Final EIS/R, there seems to be a question about the CRT's intention and commitment against the NRT. The CRT also advocated the North-South Station rail link at the BDRC. Although the BDRC referred the rail link to future studies, the state initiated intensive research and decided to accommodate it under the Central Artery in 1993.

Steve Kaiser, the independent traffic engineer working as a CRT member, argued that the 14 lanes of the Charles River crossing was overdesigned and could increase traffic on Storrow Drive. When Kaiser proposed an all-tunnel-alternative at the BDRC in 1991, he accommodated fewer lanes in a tunnel of his scheme than that of other alternatives. In the hindsight, his argument was not adequately highlighted at the committee.

(8) *The Sierra Club*

Rather than focusing on the traffic issues at Leverett Circle, the Sierra Club argued that traffic issues including the Massachusetts Turnpike should be

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[12] Telephone interview, Dun Gifford, the chairman of the CRT, March 25, 1994.

discussed. It also stressed the importance of mass transportation, especially the North-South Station rail link. Since the Sierra Club was not interested in the design modifications of the Charles River crossing, they could not represent well their interests in the BDRC and the subsequent process. The Sierra Club was the only group who condemned the BDRC as "a flawed process, . . . manipulated and controlled to make Scheme Z palatable."[13] However, the state supported the rail link plan and changed the design specifications of the CA/T to accommodate it under the Central Artery.

5.3 Non-Negotiable Alternative 8.1D

Alternative 8.1D was a far more promising option than Alternative 8.1D Modification 5 in terms of traffic flow and safety. Unfortunately, Beacon Hill never accepted alternatives that included the "direct access" between Leverett Circle and City Square in Charlestown. Two major concerns of Beacon Hill with respect to Alternative 8.1D are detailed in the following section.[14]

First, Alternative 8.1D required an access ramp to the river tunnel connecting between eastbound Storrow Drive and northbound I-93/ Route 1 and the construction of a two-level underpass below Leverett Circle. The ramp to the river tunnel and grade separation of Storrow Drive at Leverett Circle would require a deep cut boat-section on Storrow Drive and encroach onto the Esplanade to some extent. The Esplanade is an important recreational park especially for Beacon Hill residents and is protected by Section 4(f) of the Transportation Act. Also, the construction of a two-level underpass at Leverett Circle would require deep excavation and massive structures, such as deep

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[13] A letter from the Sierra Club to the FHWA and the EOEA, October 5, 1993.
[14] A letter from Shapiro Grace & Haber (attorneys of the Beacon Hill Civic Association) to the Secretary of the EOTC, February 27, 1992.

retaining walls and layers of Jersey barriers, and would affect negatively on the landscape of the area, which is also protected by Section 4(f).

Second, the "direct access" between eastbound Storrow Drive and northbound I-93/Route 1 would increase traffic volume on Storrow Drive. Storrow Drive would be incorporated into the interstate highway system and lose the unique characteristics of a parkway. Furthermore, because there is not enough space on Storrow Drive to accommodate a weaving section between Charles Circle and Leverett Circle, accesses to the river tunnel from Cambridge Street at Charles Circle, Blossom Street, and Fruit Street via Storrow Drive would be blocked. Therefore, traffic from these streets to northbound I-93/Route 1 would enter the river tunnel via a ramp on Merrimac Street/Lomasney Way moving through the Beacon Hill local streets.

However, there are three questions about the uncompromising stance of the representatives of Beacon Hill. First, Beacon Hill representatives consistently opposed the "direct access" of the eastbound traffic of Storrow Drive to I-93 North/Route 1 via the river tunnel between Leverett Circle and City Square in Charlestown. Even the unattractive Scheme Z was acceptable to Beacon Hill representatives just because it connected eastward Storrow Drive with northbound I-93/Route 1 via a viaduct looping around the Boston Garden even though it had an eastward grade separation of Storrow Drive at Leverett Circle. Their argument was that while the eastward Leverett Circle underpass would allow for smooth traffic on Storrow Drive, the circuitous route would discourage drivers from using Storrow Drive moving to I-93 North/Route 1.

However, the distance of the circuitous viaduct between Leverett Circle and City Square in the case of Scheme Z is at most 0.3 of a mile longer than the distance of the "direct" river tunnel in the case of Alternative 8.1D. There

would not be much difference between Scheme Z and Alternative 8.1D in terms of traffic volume of both directions. (See Table 2.1 for the traffic volume on Storrow Drive).

Second, opposition toward blockage of access to the river tunnel from Cambridge Street at Charles Circle, Blossom Street and Fruit Street had strong emotional overtones. The traffic volume from these streets to I-93 North/Route 1 would be small enough to be accommodated in an on-ramp on Merrimac Street/Lomasney Way. It would not be so inconvenient for Beacon Hill residents to use the on-ramp to enter the river tunnel. Bill Kuttner, a traffic engineer in the CTPS, said that he created the design making it possible for the traffic from Cambridge Street at Charles Circle to enter the river tunnel to I-93 North/Route 1 directly via Storrow Drive by extending the Leverett Circle underpass to Charles Circle with an on-ramp from Cambridge Street.[15] However, this design modification did not seem to satisfy the Beacon Hill representatives.[16]

Third, some of the interviewees of the BDRC questioned the representation of Beacon Hill. During the BDRC meetings and subsequent negotiations, Beacon Hill representatives were uncompromising in their opposition to "direct access" via the river tunnel. Hugh Russell, a member of the Cambridge Planning Board, said, "One of the representatives from Beacon Hill was constantly playing strategic games. You always knew what his conclusion was, but you never understood how and why he came to that

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[15] Interview, Bill Kuttner, a traffic engineer at the CTPS, February 28, 1994.

[16] Anthony DiSarcina, a CA/T traffic engineer at Cambridge Systematics, said that the scheme expanding the Leverett underpass to Charles Circle had a constructability problem. However, he also said that because the traffic assignment using the Charles Circle on-ramp would be from 200 to 400 during peak hour and would be accommodated by the on-ramp on Merrimac Street/Lomasney Way, the concerns of Beacon Hill was more emotional than real.

conclusion. He did not tell objective reasons you could understand."[17] Also, some of the interviewees[18] suggested that because of the strong personal and professional relationship between Anthony Pangaro and Fred Salvucci, Pangaro represented the interests of Salvucci, the creator of Scheme Z, rather than the interests of the Beacon Hill community.

On the other hand, there is an argument in support of the representatives of Beacon Hill. In the 1950s, part of the Esplanade was taken for Storrow Drive violating all of the original promises to Beacon Hill; in the 1960s, the state planned a direct connection between Leverett Circle and City Square in Charlestown via a bridge, to be called the "Leverett Connector." Beacon Hill had opposed this plan fearing that the connection would increase traffic on Storrow Drive and encroach onto the Esplanade in the future. Fred Salvucci, working for the BRA at that time, actively opposed the plan, which was backed by Massport Executive Director Edward King, and made it his cause not to build the Leverett Connector. Robert O'Brien said, "The idea was that it would be a parkland, a road runs through a park, and it would not be a highway. Beacon Hill has been fighting to keep this highway from coming. They would like to see traffic lights on Storrow Drive. They would like to see Storrow Drive closed on weekends. They would like to see all of the things that happened on Memorial Drive happen on Storrow Drive."[19]

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[17] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

[18] Telephone interview, Steve Kaiser, a traffic engineer, February 2, 1994. Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994 (He did not mention the name of Pangaro explicitly). Bill Kuttner, a traffic engineer at the CTPS, February 28, 1994. Dan King, the representative of the Citizens for a Liveable Charlestown, March 1, 1994.

[19] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.

Whether or not Beacon Hill representatives' arguments were reasonable, it was clear that they were unwilling to trade the reconfiguration of Storrow Drive west of Leverett Circle for environmental mitigation or traffic management that could reduce traffic volume on Storrow Drive. Beacon Hill could have lived with Scheme Z which had already received the FHWA Record of Decision (ROD) in May, 1991. Jack Wofford, the facilitator of the BDRC, said, "Of all the members in the committee, they were less open to compromise. I think that part of the reason was that they had actually supported Scheme Z as satisfactory although they didn't like double river crossings."[20] Even though the FHWA ROD mentioned its recognition of the ongoing review process by the BDRC and the future modifications of Scheme Z, the fact that Scheme Z had been approved officially must have increased the "best alternative to a negotiated agreement" (BATNA)[21] of Beacon Hill.

Another important factor was that the City of Boston allied itself with Beacon Hill and virtually gave it a veto power.[22] Beacon Hill might have had a greater political influence on the City of Boston than had Charlestown, which preferred Alternative 8.1D. The state could not move Alternative 8.1D forward without the agreement of the City of Boston and Beacon Hill even though the rest of the members wanted it.[23]

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[20] Telephone Interview, Jack Wofford, the facilitator of the BDRC, March 7, 1994.

[21] The term "BATNA" was invented by negotiation researchers. No group would choose to be part of a negotiation if what it can obtain "away from the bargaining table" is better than what it is likely to get by negotiating. On the other hand, if a group sees an opportunity to get more than its BATNA through negotiation, it has ample reason to come to the table. *Breaking the Impasse, Consensual Approaches to Resolving Public Disputes*, Lawrence Susskind, Jeffrey Cruikshank, (Basic Books, 1987).

[22] Interview, Bill Kuttner, a traffic engineer at the CTPS, February 28, 1994.

[23] Interview, Stanley Durlacher, the former Undersecretary of the EOTC, March 9, 1994.

5.4 Zero Sum Game

Although Alternative 8.1D Mod 5 was approved by a unanimous vote of the BDRC, the Boston Artery Focus Group expressed concern regarding back ups on Storrow Drive. In addition, the FHWA pointed out that the safety problems were in the tight alignment of the ramp connection between eastbound Storrow Drive and northbound I-93/Route 1 and in the long tunnel sections connecting northbound I-93 and Route 1.

The state could have gotten through the EIS/R process with the traffic problems in the tight alignment of the ramp and in the long tunnel section if it had been able to get the full support of the members for Alternative 8.1D Mod 5. Stanley Durlacher, the former Undersecretary of the EOTC, said that the FHWA looked at the configuration but did not tell him to stop filing Alternative 8.1D Mod 5 in advance of the Notice of Project Change.[24]

However, neither the members of the Boston Artery Focus Group nor the City of Boston could accept Alternative 8.1D Mod5. This scheme would have a two-phase signalization at Leverett Circle, and some traffic movement would be restricted during peak hours in order to secure a smooth traffic flow at the grade Leverett Circle Intersection on Storrow Drive. For example, left turns from Nashua Street to Lomasney Way and from Storrow Drive to the Charles River Dam were restricted during peak hours. The Charles River Park (housing complexes), the Boston Garden, and the Museum of Science were particularly opposed to the two phase signalization at Leverett Circle. Durlacher said, "There would be back ups at Leverett Circle as there are today. But the signalization would work almost as well as it does today. Their opposition to the signalization is parochial. It is going to have some

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[24] Ibid.

compromises, whether urban impacts, geometry, traffic flow. You just can't do it without irritating some people."[25] It proved to be true that this signalization would cause back ups on Storrow Drive as well as air quality problems. The expressions of concern by the members of the BDRC with respect to the supposedly compromised Alternative 8.1D Mod 5 were fatal to the state's credibility and leadership.

Furthermore, although Durlacher claimed that the configuration of Alternative 8.1D Mod 5 was set within the highway structural standard in terms of weaving length, grade, and radius, the scheme was apparently compromised to some extent with respect to traffic safety. It was estimated that the accident rate of eastbound traffic on Storrow Drive to northbound I-93/Route 1 would be about two and half times higher in the case of Alternative 8.1D Mod 5 that it would be in the case of the Non-River-Tunnel Alternative.[26] Also, Anthony DiSarcina pointed out that traffic from Storrow Drive to I-93 North/Route 1 would have merging problems with traffic from northbound I-93 to Route 1.

While Beacon Hill representatives strongly opposed the reconfiguration of Storrow Drive west of Leverett Circle, there seemed to be no feasible configuration east of Leverett Circle to accommodate both the eastbound underpass of Storrow Drive and the ramp to the river tunnel. There were many large facilities and buildings that were very difficult to relocate or remove, such as the MBTA Commuter Rail bascule bridge and the Orange Line tunnel, the Charles River Dam, the Registry of Motor Vehicles building protected by Section 4(f), and so forth. Robert O'Brien said, "For the first year,

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[25] Ibid.

[26] The accident rate of 8.1D Mod 5 is estimated to be 17.47 accidents of millions of vehicle mile travel while that of the NRT is to be 7.62.

the committee was successful. You can get a general consensus on broad issues. But, after the first year of the committee, technical detailed design issues were too much involved. You will never be able to satisfy everyone in a detailed trade-off. It can't happen."[27]

Later, the revised Reduced-River-Tunnel Alternative failed to get the full support of the members; the City of Cambridge, especially, did not accept the scheme due to its two loop ramps in North Point. Hugh Russell said, "Every river tunnel alternative has a legacy of problems. I realized, having studied every scheme, that there are no alternatives with the river tunnel that did not have problems around Leverett Circle. If the City of Boston had been dealing with Beacon Hill's problems on a more factual level than a political level, it is possible that a different compromise might have been worked out although it would have been much more expensive."[28]

Alternative 8.1D may have been the only good engineering tunnel scheme; however, it could not get the support of both Beacon Hill and the City of Boston. On the other hand, with the support of the City of Cambridge, the revised RRT Alternative could have been another political compromise like Alternative 8.1D Mod 5; however, this scheme may not have been a wise engineering solution.

5.5 Lack of Ties Between Representatives and Constituencies

This case seemed to have no representation problems because no groups were split nor were any representatives rebuked by their constituencies

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[27] Interview, Robert O'Brien, the executive director of the Downtown North Association, February 4, 1994.
[28] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

during the three years of negotiation. Most of the stakeholding groups were identified in the 1991 Certificate of the Secretary of the EOEA, and these groups had no difficulty selecting their representatives. Since this representation issue is one of the key points in successful negotiation, the BDRC was initiated in an ideal way.

However, one could argue that most of the constituencies lost their enthusiasm after the BDRC abandoned Scheme Z and recommended CIP 8.1. In these plans, the Charles River crossing had been set for the east end of the City of Cambridge, where the current I-93 and the MBTA Commuter Rail are built. People usually do not seek access to that area. Also, the planned highway was at least 400 feet away from the Charlestown community. This was not the case in the Inner-Belt-Highway Plan of the 1960s, which involved the acquisition of many local residents' properties.

Thus, this public conflict seemed to have become essentially a political battle among the main participants. As I mentioned in the previous section, some of the interviewees questioned the representation of Beacon Hill. I am not sure whether this representation problem of Beacon Hill really existed; however, I could say that the weak responses to the representatives from the constituencies might have negatively affected productive consensus building.

The other point associated with weak ties between the representatives and their constituencies was the perception gap between them with respect to their interests. It was difficult to tell whether the Non-River-Tunnel Alternative and Alternative 8.1D Mod 5 would be better; because there were no objective criteria for measuring the value of the environment and aesthetics so that we could compare those values with costs and other benefits associated with traffic. It was simply a question of whether the parkland along the

Charles River between the mainline bridge and the MBTA Commuter Rail would be worth $300 million plus traffic disadvantages and 4 years of delay.

Whether to accept the Non-River-Tunnel Alternative may also be a difficult decision for the environment advocacy groups' representatives. It may be more difficult for the representatives if their constituencies do not feel that there are significant differences between the two schemes. As for the City of Cambridge, in a political sense, it is appropriate for the representative to talk with the mayor and council members in decision making. However, there still might be a gap between a dedicated professional official in charge of the environment (i.e., the representative of the group) and ordinary citizens (i.e., constituencies of the group).

5.6 State Decision Making

Before the BDRC was formed, key stakeholders did not trust the state because of its uncompromising attitude and repeated contradictions. These stakeholders could not agree to participate in a committee that played only a passive role. That is why the Secretary of the EOTC gave the committee a more active role so that they could examine engineering possibilities and create better alternatives. Stanley Durlacher, the former Undersecretary of the EOTC, said, "The reason the BDRC was there was because of state's failure to do an adequate job in planning and in communicating in the first instance. . . . If you announce you are going to have open and participatory process, you do it openly, honestly, not constrain the process by your own sense of where the predetermined outcome needs to be. . . . We never intended to please everybody, we intended to give everybody an equal basis of understanding

what the issue was."[29] Given the bitterness of the Scheme Z conflict at the end of 1990, this kind of participatory approach by all the stakeholders was a good way to resolve the issues and to build a consensus. At least, one could say that the establishment of this committee was necessary in order to prevent the project from being stopped.

However, after the major problems of Scheme Z and each of the stakeholders' interests were identified, there were different arguments about the role of the BDRC committee. Anthony DiSarcina, a traffic engineer in Cambridge Systematics working for the CA/T and the BDRC, said that the committee should have been constrained to establish criteria for selection rather than to select an alternative. The committee did not pay enough attention to engineering problems, and their deliberations concentrated mostly on the aesthetics.[30]

Also, the committee was formed as an advisory group for the Secretary of the EOTC and the MDPW. It was not supposed to make a value-judgment on trade-offs between traffic benefits/cost saving and the aesthetics/the environment. That is because the composition of the committee was not proportionate to the size of its members' constituencies, and the representatives' views did not necessarily reflect the average view of their constituencies. Also, because the state is responsible for funding the project and for the allocation of the revenue among many projects, it is supposed to make a final decision concerning the preferred alternative. Even if some of the members care greatly about the funding, they cannot be more responsible than the state.

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[29] Interview, Stanley Durlacher, the former Undersecretary of the EOTC, March 9, 1994.
[30] Interview, Anthony DiSarcina, a traffic engineer in Cambridge Systematics working for the CA/T and the BDRC, March 9, 1994.

Secretary Kerasiotes seems to have simplified the decision-making process and to have broken the impasse in order to move the project forward. He based his decision, not on the committee's recommendations, but on the established goals and later engineering studies made by the state. Hugh Russell said, "What he has done was to try to find the way to simplify the project to the extent possible. Because it is a very difficult project, it is a very important step. A tunnel scheme does not make much difference. It makes a little difference if you walk along the river. It is clearly not worth hundreds of million dollars. That is something we have to recognize. If you build highways for taking traffic off the local streets, and it does not go off, then it does not work and it does not provide relief for the city."[31]

It was unfortunate that the committee members, who dedicated their time and energy for nearly three years, was not given a chance to resolve the problems of Alternative 8.1D Mod 5. If Kerasiotes had been committed to Alternative 8.1D Mod 5 and to the state's cooperation with the BDRC, it is possible that he might have resolved the remaining problems of Alternative 8.1D Mod 5 by getting involved with the committee as did the former Secretary Taylor. However, given the situation in which an improvement for one group resulted in forcing another to accept disadvantages, it seemed to be difficult to build a consensus for a particular scheme on a detailed level.

Other important factors in the state's decision were increasing costs and schedule delays. It would have taken a great deal of time and cost if the state had pursued a consensus. The negotiation involved a detailed engineering design, and it took a long time to develop the preliminary design from the

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[31] Interview, Hugh Russell, a member of the Cambridge Planning Board, February 24, 1994.

concepts and to examine the feasibility of each concept. The state gave the committee two years and about one and half million dollars to hire a facilitator, independent consultants, and staff.[32] This figure did not include the engineering works by the state and its consultants. Moreover, schedule delays increased overhead costs of the project, such as management costs and insurance fees. The state also had to consider foregone benefits that the project would have been able to generate if there had been no delay of schedule. Thus, the increasing time and cost were contributing factors in discouraging the state from continuing the negotiation process.

Although the state could not satisfy all the participants, it had already acknowledged the interests of each of the members. The state had to meet all the requirements of the regulatory agencies as well. Although the members of the committee were not satisfied with the state's preferred alternative, they understood the necessity for trade-offs among the different schemes, i.e. between traffic benefits/cost saving and the aesthetics/the environment. When the understanding of the members came to this level of maturity, it was the time for the state to select its preferred option, balancing the benefits and disadvantages among all stakeholding groups and considering the cost and duration of the possible alternatives.

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[32] Interview, Stanley Durlacher, the former Undersecretary of the EOTC, March 9, 1994.

Chapter 6
Summary Evaluation and Lessons to be Learned

The Charles River crossing is a key element of the Central Artery/Tunnel Project (CA/T Project) which will greatly improve traffic conditions in the Boston metropolitan area. The original Scheme Z had many problems in terms of traffic function and the negative impacts on the river park and on aesthetics. The Bridge Design Review Committee (BDRC) composed of all stakeholding groups was established for discussing these issues from diverse perspectives. The committee created various alternatives, called Committee Improvement Packages (CIPs), and recommended CIP 8.1 to the Secretary of Transportation and Construction. The committee was useful in that it identified the interests of each of the groups and narrowed down various options through intensive discussions. However, it could not hammer out any feasible and reconcilable scheme in almost two years of deliberations. The state gave up consensus building with the committee and selected the Non-River-Tunnel Alternative based on its own subsequent study. Some of the members who wanted a river-tunnel scheme were disappointed with the selection, and four environmental advocacy groups brought this case to court again in April 1994. However, given the state negotiation with the committee for almost three years, in addition to the mandated MEPA and NEPA processes, this project is unlikely to be stopped by a court injunction.

This conflict management case shows both the advantages and disadvantages of the consensus-building approach using this kind of citizens committee. I evaluate the BDRC in terms of its representation and performance and explain three significant factors that precluded consensus

building of the committee. I also describe five lessons to be learned from this case study for future similar public disputes.

6.1 Evaluation of the Representation of the Committee

I evaluate the representation of the committee using the following criteria: the selection of the members and the representativeness of the groups.

The Selection of the Members

The members of the committee were selected by the state based on the 1991 Certificate of the Secretary of Environmental Affairs. The certificate called for the BDRC and identified key stakeholding groups. The offer to participate was not given to all the parties that had interests in this case. The representative of the Citizens for a Liveable Charlestown was not notified of the committee and had to seek its membership on it just before the first meeting. However, since other groups did not protest against being excluded, one could say that no major stakeholders were omitted.

The number of representatives of each stakeholding group was not so well balanced in the committee to justify selecting an option by voting. There were some problems in the composition of the BDRC, such as overlapping interests which gave those interests the equivalent of a double vote. The committee did not include representatives of taxpayers from the rest of the state which would not benefit from the Charles River crossing but would have to pay for it. They complained about the increasing costs due to the recommended modifications. Furthermore, the Federal Highway

Administration (FHWA) and the US Army Corps of Engineers (USACE), which were responsible for traffic functions and the water environment, were not involved in the deliberations of the committee. The Secretary of Transportation and Construction was supposed to make his decision based not only on the committee's recommendation but also on other factors for which the state and federal agencies were responsible but lacked a clear voice at the meetings.

The Representativeness of the Groups

Since most members were the representatives of city governments and existing organizations, they could spend a great deal of their office hours on committee work. However, the representatives of local community organizations, who had their own jobs, had difficulty in dedicating such long hours for discussions at both the committee and community meetings. It would have been preferable to give more support to these community representatives.

The members actively participated in discussions and contributed important ideas and suggestions in order to improve the design rather than to stop the project. This is partly because the CA/T Project had already started in downtown Boston and stopping the Charles River crossing was not a realistic option. This attitude was beneficial and allowed the committee to focus on the main issue of the river crossing by narrowing down the committee improvement packages.

6.2 Evaluation of the Negotiation Process

I will examine the deliberation process of the committee as well as its subsequent negotiation with the state, using the following four criteria: openness of the process, neutrality of the technical examination, clarity of the ground rules, and efficiency of the negotiation.

Openness of the Process

The meetings of the committee were open to anyone, and some of the important ideas were contributed by dedicated observers. This openness of the committee not only added diverse perspectives but also enhanced its credibility. The committee discussed the problems of Scheme Z and create various alternatives fairly.

However, after the recommendation of the committee had been made, meetings were held less frequently. The state negotiated with each of the interest groups individually and created various alternatives to meet the requirements of each of them. The committee did not actively get involved in the process but reacted to new schemes proposed by the state, especially during the modification of Alternative 8.1D.

After federal agencies and some of the committee members raised concerns about Alternative 8.1D Mod 5, the state created the Non-River-Tunnel Alternative and the Reduced-River-Tunnel Alternative based on its study. Although the state kept informing the committee of its progress, it did not involve the committee in the development process of adding new alternatives. This change in the relationship between the state and the committee generated an adversarial environment for consensus building. However,

since trade-offs among alternatives had been clarified and understood by most of the committee members, one could not say that the state distorted the design process.

Neutrality of the Technical Examination

The committee was provided an independent chairman and facilitator as well as consultants in the area of bridge design and tunnel construction. These people helped the committee to address the concerns of all members and to examine all possible alternatives including all-tunnel-options. This neutrality created the trust of the members and facilitated discussions. However, since the traffic and structural engineers did not attend the meetings as members, their concerns carried less weight than the viewpoints of the environment and the aesthetics.

After CIP 8.1 was recommended by the committee, the state created new schemes in order to address the remaining problems. Since the state had to deal with complicated engineering designs in a short time, especially during the modification of Alternative 8.1D, it did not involve committee members or committee's consultants in the design process. The state tried so hard to meet the representatives' requirements in a spatially constrained urban area that it unfortunately compromised the traffic engineering quality of the scheme.

After the federal agencies and some of the committee members raised concerns about Alternative 8.1D Mod 5, the state shifted its focus to the Non-River-Tunnel Alternative. The state left the problems of traffic functions unresolved in Alternative 8.1D Mod 5. The state may have avoided the difficulty of getting through the permission process for dredging and excavation in river-tunnel alternatives. The state seems to have decided that it

was more important to move a feasible option forward than to get the full support of the committee members.

Clarity of the Ground Rule

At the first meeting, a three-month time limit was set for the deliberations of the committee. Although the limit was eventually extended for two more months, it was useful in facilitating discussions and narrowing down options. However, the ground rule concerning the scope of the discussions and voting procedure was not clearly defined at the beginning. Although the chairman and the facilitator did well in guiding the committee to focus on the main issues, voting raised some procedural questions. Considering that the committee and the state could not work out a feasible scheme based on CIP 8.1, selecting CIP 8.1 by a split vote did not set the right direction for subsequent discussions. It took more than one year to compromise on Alternative 8.1D Mod 5. Even worse, it was later rejected due to inadequate engineering. A formal protocol should have been established at the initial stage as to how negotiations would be settled if a consensus could not be reached.

Efficiency of the Negotiation

The committee held fifteen full meetings as well as frequent subcommittee meetings in five months and had intensive discussions using a multidisciplinary approach. During the first four months, the committee resolved the serious problems of Scheme Z, such as the double river crossings and the lack of an on-ramp to I-93 North from downtown Boston. The

committee also established the goals of the river crossing in terms of traffic function, land use, environment, and aesthetics. At the initial stage, the committee effectively enlarged the total benefits of the project so that the requirements of a stakeholder could be met without sacrificing the others' interests.

In nearly two years of discussions, however, the committee could not work out any feasible scheme on a detailed design . The most promising Alternative 8.1D was not accepted by Beacon Hill. The compromised Alternative 8.1D Mod 5 was not a wise engineering scheme. When the committee faced trade-offs among participants due to spatial constrains and engineering difficulties, it could neither negotiate efficiently nor hammer out a sound reconcilable design. The only good thing in this stalemate was that most members could understand the issues and trade-offs, whether or not they accepted the state decision.

Four environmental advocacy groups have recently brought this case to court again and some other groups might follow suit. These lawsuits might ruin more than three year negotiation process. However, there seems to be little possibility that the project will be stopped by these lawsuits. The US Environmental Protection Agency and the Massachusetts Secretary of Environmental Affairs acknowledged the trade-offs among the three alternatives in the 1993 Draft EIS/R and approved the state selection as appropriate. The state decision that it stopped pursuing a consensus with all stakeholders and selected the most feasible Non-River-Tunnel Alternative may have been appropriate rather than continuing negotiations with the committee.

6.3 Limits of Consensus Building

According to many case studies and a theoretical study, the consensus-building approach proved useful in public disputes. The Scheme Z conflict cleared the first hurdles when the BDRC was established. The committee was called by the Certificate of the Secretary of Environmental Affairs at the time when the conflicts were mounting. Since most of the members were identified in the certificate, the state did not have much difficulty in selecting stakeholding groups. The representatives of the committee also did not have much difficulty in keeping their constituencies from arguing against their representation. The committee was provided with a capable facilitator and independent consultants and could discuss the issues effectively from diverse perspectives. However, eventually, the committee could not reach a feasible consensus. I summarize three of the significant factors which inhibited the consensus building at the committee.

Non-Negotiable Elements

Alternative 8.1D, the most promising option, was rejected by Beacon Hill alone. Alternative 8.1D had a direct access from Storrow Drive to I-93 North/Route 1 via a river tunnel. It would require a deep cut boat-section on Storrow Drive and the construction of a two-level underpass below Leverett Circle. Although a significant traffic increase on Storrow Drive is not expected in simulations, direct access may attract more traffic in the long-term future. Also, the reconfiguration of Storrow Drive may have a negative effect on the Esplanade, at least during construction.

The original Scheme Z had a more circuitous viaduct connection between Storrow Drive and I-93 North/Route 1 looping around Boston Garden. Beacon Hill representatives must have felt more secure with the circuitous connection of Scheme Z than with the direct connection of Alternative 8.1D. Also, Scheme Z required only a one-level underpass below Leverett Circle and a shorter, shallower boat section on Storrow Drive.

Furthermore, Scheme Z had been officially approved by the Federal Highway Administration. If the state had not filed another alternative, Scheme Z would have been the final design. Beacon Hill representatives, who could have lived with Scheme Z, were not motivated to trade the reconfiguration of Storrow Drive in Alternative 8.1D with environmental mitigation.

Zero Sum Game

The negotiation concerning the modification of Alternative 8.1D was stuck in a zero sum bargain, in which any improvement for one group resulted in forcing another to accept disadvantages due to various spatial constraints in a compact urban area. Since Beacon Hill representatives rejected reconfigurations of Storrow Drive west of Leverett Circle, the state had to find a possible alignment of an on-ramp connecting the westward portion of Storrow Drive with a river tunnel in the area east of Leverett Circle. Unfortunately, in this east area, there were many facilities, such as the MBTA Commuter Railroad and Orange Line, the Charles River Dam and the current I-93 as well as parkland and a historical building protected by the Transportation Act. Since these facilities constrained possible alignments of

the connection, all modified versions of Alternative 8.1D had problems of design standards and constructability.

The state adopted Alternative 8.1D Mod 5, which did not have grade separations at Leverett Circle, in order to meet the requirements of Beacon Hill representatives and other design conditions. Alternative 8.1D Mod 5 was once acceptable to all the members of the committee. However, the state tried so hard to meet all the requirements of the committee members that it unfortunately compromised engineering quality in terms of traffic safety and flow. Since this design had a two-phase signalization at Leverett Circle, it inconvenienced area organizations due to the restricted turns. Also, the Boston Artery Focus Group and the City of Boston raised concerns about back-ups on Storrow Drive due to the signalization. Furthermore, the FHWA raised concerns about traffic safety in the tight alignment of the ramp as well as other sections.

Changing the Motivation to Negotiate

As the negotiation process proceeded, the possible benefit which would result from continuing the negotiation changed to a varying degree among participants. The state seemed to have realized the necessity of establishing a committee for settling the dispute in 1991, although the establishment of the committee was mandatory by the Certificate of the Secretary of Environmental Affairs. However, after two years of deliberations, the state seemed to have recalculated BATNA (Best Alternative to a Negotiated Agreement) and changed its strategy.

Because the overhead costs of this project were so high, the increasing costs due to schedule delay became serious for the state. The state had to

respond to the concerns of legislators about increasing costs, whose districts would not receive the benefits from this project. The state also had to consider foregone benefits that the project would have been able to generate if there had been no delay of schedule from the viewpoint of the local economy. Thus, increasing costs and time were contributing factors in discouraging the state from continuing the negotiation. Furthermore, the state had become confident that the project would no longer be vulnerable to lawsuits since it had spent more than two years negotiating with the committee in addition to the mandated NEPA and MEPA processes. At that time, the state abandoned the consensus-building approach and decided on the most feasible Non-River-Tunnel Alternative.

The City of Cambridge did not accept the possibly reconcilable option of the revised Reduced-River-Tunnel Alternative. This option was proposed by the Boston Artery Focus Group to meet the requirements of Beacon Hill and northern area in Boston. If this scheme had been accepted by the City of Cambridge, it could have been selected by the state as a reconcilable option. One reason for the city's rejection may have been that the scheme was not superior in design of loop ramps at North Point. However, another possible reason involves the recalculation of BATNA; the city may have tried to make use of this pending conflict as leverage to get more money from the state for infrastructure development in both North Point and other areas. This strategy may have been better for the city than compromising on the revised Reduced-River-Tunnel Alternative.

6.4 Lessons to be Learned

Since the Charles River crossing was a crucial part of the 7.7 billion dollar CA/T Project and involved many complicated design issues, the consensus-building effort by the state and the BDRC was surprisingly challenging. Given the strong opposition and lawsuits against Scheme Z, establishing a committee was unavoidable. However, the consensus-building approach by a citizens committee may not have been the best way to design this large a project. The following five recommendations for similar public disputes may be made from this study:

(1) A citizens committee composed of stakeholders can play an important role in problem finding and solving, even if the consensus-building approach may not be the best way to design such a large project. The BDRC resolved the problems of Scheme Z to some extent with the assistance of consultants and CA/T engineers.

A citizens committee is also better than back-room deals with individual disputants. Before the BDRC was established, the state agreed with the Conservation Law Foundation about a 4.3 billion dollar package for mass-transit improvements in order to reduce the demand of automobile traffic. Neither the effect of this package nor the negotiation process was clear. Also, this deal meant that the state used one important "card" for the subsequent negotiation before the committee started discussions.

(2) Once the government decides to call for this kind of citizens committee, it is important to deal with the committee in an open and neutral way. Otherwise, the committee would get no credibility from its members. A

neutral facilitator and independent consultants are useful in securing neutrality. At the conceptual level, ordinary citizens can do excellent jobs in understanding the problems and creating possible solutions if they are provided with adequate technical assistance.

(3) However, the government should not delegate the final decision-making authority to the committee. The government is delegated authority from the elected governor and has legitimacy in representing all the constituencies of the state. However well balanced the composition of a committee may be, the committee cannot exactly reflect the public view. The committee is not supposed to make value-judgment on delicate trade-offs between traffic functions and aesthetics.

The government is also responsible for project finance, scheduling, and obtaining required permits. The government has to take leadership in designing a fundable and buildable scheme. If the committee can work out a reconcilable option, the government may think much of it. However, if the committee cannot reach a consensus, it should not select an option by voting. The committee does not have enough responsibility to constrain government decision making by voting. The role of the committee is to clarify the main arguments about the issue and propose possible options.

(4) In a detailed design, it is very difficult to get a consensus of all stakeholders. Especially in this kind of a large-scale urban project, which involves many stakeholders and spatial constraints, it is not realistic to expect to find a scheme that will meet the requirements of all the stakeholders.

Even if a reconcilable option is found, it tends to be extremely expensive and may result in opposition from tax-payers. Also, the government may face

difficulties at the implementation stage, even if it agrees with an option at the committee meetings. There are some uncertainties that the state engineers cannot identify at the conceptual level.

In the Charles River crossing case, the state tried hard to stick to the committee recommended option and to resolve the remaining problems within that framework. The state was preoccupied with getting the consensus of the committee. The government has to recognize that its responsibility is to find a feasible option rather than to get a consensus.

(5) The role of a committee in terms of scope, output, and time-limit must be clearly defined by the government before it is established. It is important for the government to have the committee members understand its role and limits. A formal protocol should be established at the initial stage, especially as to how disputes should be settled if the committee cannot reach a consensus. Otherwise, the negotiation process would be dragged on, and some of the members would be frustrated whatever decisions are taken.

6.5 Implications for Future Similar Cases

Because the information I gathered through interviews and written materials is limited, it must be noted that there may have been more factors in this case which prevented consensus building. Additionally, there might have been other ways that the state and the committee could have resolved the non-negotiable elements and zero sum situation. It may be a dangerous leap to conclude that the consensus-building approach does not work in this large a project except in the initial stage of identifying problems and proposing possible options. I will now describe the implications for similar future disputes. This section is beyond the evidence that I found in this case study. I will speculate on what could have been done to build a consensus in this complicated situation. This may be useful for readers who will be involved in similar situations in the future.

Zero Sum Game

When participants in negotiations face a deadlock that seems to be a zero sum bargain, there are three possibilities for overcoming the situation: searching more alternatives, mitigation, and compensation. Even if people have already spent many hours for searching alternatives, they still may find a solution by focusing on the remaining problems. In many cases, even if the negotiation appears to be in a zero sum bargain, there may be other elements that the disputing groups can trade with each other thereby enlarging the benefits for both of them.

In order to break through seeming zero sum situations, all the participants have to focus their attention on their interests and look for

possible tradable elements. There are two important factors in facilitating this process: neutral facilitators and adequate tradable elements. First, a neutral facilitator may be useful in sorting out the combination of tradable elements and in sounding out acceptable compensation for each of the disputing groups. While the disputing groups may be unwilling to express their real interests, concerns, and acceptable conditions, because they do not want to be viewed as weak in regard to their arguments, they may be more open with a neutral facilitator.

Thinking back to the zero sum situation revolving around the on-ramp connecting westward Storrow Drive with I-93 North, there seems to be a possibility that the facilitator could have played a more active role in resolving the trade-offs. Unfortunately, the Bridge Design Review Committee no longer played a central role, and its facilitator could not work effectively in sounding out the concerns and tradable conditions of each of the groups. It seems that the state responded to the concerns of each of the disputing groups piece by piece and lacked a strategy for finding tradable conditions.

Second, the government should think about the tradable elements from broad perspectives, such as alternatives, mitigation, and compensation. If environmental advocacy groups are worried about negative impacts on the environment, the government may create possible alternatives that will avoid using the area or preventive methods to reduce the impacts of the project. These environmental groups may agree with the mitigation that the government proposes. The government may also offer compensation if it cannot satisfy the requirements of these groups by environmental mitigation. For example, if the government cannot effectively mitigate the environment of the surrounding area of the project, it may offer to build a river park or preserve wetland in other areas of the project site. The government may

propose other methods to reduce traffic of the planned highway, such as traffic control of the highway, improvement of alternative routes, subsidies for the use of mass-transit.

In the Charles River crossing case, the state should have expanded its scope to a larger area and additional compensation rather than focus on the alignment of the on-ramp. The state could not find tradable elements because it was preoccupied with searching acceptable alignments. Even worse, the state ended up compromising in terms of the engineering quality by simply seeking consensus. As I will explain in the following paragraph, the state should have had its membership in the committee and clearly stated its responsibility and concerns. The important point for the state is not taking a conciliatory approach to get a consensus but that it is committed to the negotiation process as the most important stakeholding entity. The state should have offered other mitigation or compensation rather than compromise in order to reach a consensus with disputing groups.

Non-Negotiable Element

Sometimes, disputants have strong historical, religious roots or emotional factors in the project area that people living outside cannot understand. In many cases, this seemingly non-negotiable element for a group can be tradable if the government is committed to taking care of its concerns and trying to resolve them. In this situation, it is important to listen carefully to its concerns even if the other members feel they are unreasonable. By continuing a dialogue, the government may identify the real concerns of the disputing group and find possible solutions. The disputants may think about their interests rather than about the surface-level

arguments they made, and hopefully, propose compensation that is compatible with the project. The disputing group may appreciate the fact that the government is committed to talking with them. This trust-relationship may be an important step in lowering their hard stances and in finding a possible solution.

Alternative 8.1D seems to have included a non-negotiable element for Beacon Hill representatives. However, if the committee had retained its authority and recognized problems in modified versions of Alternative 8.1D, it could have returned to the original Alternative 8.1D and renegotiated it with Beacon Hill. Unfortunately, the state and the committee failed to review Alternative 8.1D once they moved to its modified versions. The state and the committee should have discussed traffic function in the modifications of Alternative 8.1D with the FHWA. They also should have talked with the USACE regarding the possibility of river-tunnel alternatives and the conditions of its permits.

My speculation is that the state was talking with the FHWA but tried to overcome its concerns by building up the support of the constituencies of the state. If the state had discussed more seriously with the FHWA, it might have realized the problems in Alternative 8.1D Mod 5 and gone back to the original 8.1D which was superior in design. The intensive work and active role of the committee may have been necessary in order to understand the problems of Mod 5 and to have Beacon Hill agree to negotiate with Alternative 8.1D.

Once they stepped back to Alternative 8.1D, there might have been several possible ways to reduce its impact on the Esplanade, such as landscaping and controlling of traffic on Storrow Drive. It might have been possible even to find an alignment of the on-ramp to I-93 North without encroaching on the Esplanade.

Commitment to the Negotiation

Once the government expressed its will to negotiate with disputing groups, it should commit itself to the negotiation rather than make an arbitrary decision. In order to get a consensus, it may be necessary for the government to get involved in the process as a member rather than merely providing financial and technical support. The government has to have a clear voice in the committee. The responsibility of the government, such as controlling cost, scheduling, and improving traffic function, must be understood by members of the committee. The same is true with other agencies that have jurisdictions under the project. These agencies should get involved in the negotiation process. They have legitimate concerns about the impacts of the project, which must be heard by committee members. The government and these concerned agencies do not have to compromise their responsibility and should not unless they are allowed to do so within the context of the law. However, they should be committed to the process as members of the committee. They should be responsible for the negotiation process as well as for their delegated authority. Even if the political change is made, the process that the previous administration shared must succeed to the next administration.

This may be true with other members in the committee. All the members have to get through the negotiation process together even if their own interests are met at the earlier stage. When some of the disputing members continue negotiations in order to resolve the remaining problems, they may face unexpected difficulties. Sometimes renegotiation is necessary including the members whose problems have been settled. Also, it might be

preferable for litigants to drop their lawsuits even if they are strong leverage for negotiations. The government may be discouraged from committing itself to the negotiation if it finds that some of the members are unwilling to negotiate.

In the Charles River crossing case, the state and the concerned agencies did not attend the BDRC as members. Although the state was committed to getting a consensus, it was not committed to the negotiation process representing its legitimate mandate at the committee meetings. The committee was changed to a place where the state notified the members of its progress rather than negotiate with them. Furthermore, the framework of decision making changed after the secretary was replaced. The state was no longer committed to the negotiation.

Decision-Making Rule

The government clarifies the role and the responsibility of a committee as well as the rules to which all the members have to be obliged. Once the government begin negotiation at the committee, it should not negotiate with a member in a back-room. Otherwise, some of the members may secretly seek favorable treatments from the government and distort the constructive process of the committee.

The government should also clarify the decision-making rule before it starts this kind of consensus-building approach. The government has to explain the legal and administrative frameworks to which it must conform. The government may hold their final decision until a possible option is found by the committee. Although the government is supposed to do so legally, we could naturally expect it to employ the recommended option as long as the

government is committed to the process and its concerns are adequately reflected in the option.

However, we cannot always expect the government and the members of the committee to reach a consensus. Although it is tricky to discuss this point before they start negotiation, it is important to decide how the issues will be settled when the government and the members cannot reach a consensus. For example, they may agree that the government will file several options conforming to the official process if they cannot narrow them down to one. The government can hold the authority for the selection and move the process forward while the disputing groups still have chances to appeal their concerns through the formal process.

Since the interests and arguments of both sides will have been clarified by that time, the official process, such as public hearings and responses, will be more meaningful than usual. The general public can be involved in the official process more effectively. Of course, the members of the committee still have the right to bring the issue to court. However, we could expect the court to focus on the more substantial issue rather than the mere procedural question because the negotiation process is shared by both sides and both sides are talking about the issues at the same level.

After the BDRC recommended an option, it was no longer the central place where the state and its members negotiated. Without clarifying the decision-making rule, the state just started negotiations with each of the major disputing groups. It may have been more difficult for the state to meet the requirements of different interest groups separately than it would have been if they had talked at the committee together. The disputants who had settled their issues were not motivated to reconsider problems that remained for the other disputing groups. When a consensus could not be reached, it was

especially important to follow the clear rule that should have been established at the first in order to prevent some of the members (including the state) from neglecting the process up to that point.

Schedule Delay

The time limit as well as the focus of the study should be clearly defined at the initial stage of a committee. Unfortunately, the disputants tend to delay the process as a tactic from stopping the project. Sometimes, their ultimate goal is permanent continuation of the negotiation process. While they do not suffer at all from scheduling delays, the government is burdened with all costs resulting from such delays. This may be the most serious factor that may fail in consensus building and may discourage the government from committing itself to negotiations with those disputing groups.

There are a couple of strategies that might prevent some of the members from using delay as a tactic. First, the government should clearly establish a time limit for the negotiation. The time limit facilitates discussions and negotiations. This is especially true if the members of the committee recognize that the government is sincerely committed to the negotiation and that an attitude of negotiation is expected only for the limited time period, they are motivated to use this opportunity and compromise. The government may set the rules in such a way that they will extend the time limit after the due date only if all agree to continue the negotiations and can expect a consensus in a limited time; otherwise, the government will make its decision based on the discussions up to that point and its own judgment.

Second, the government and the committee may brief the mass media on the progress of negotiations and disputing points. These reporters will write

articles from diverse viewpoints about the discussions and the arguments of each of the stakeholders. These opinion leaders may contribute suggestions as to how the disputes would be settled and attract more attention from the public. Voices from the public through the mass media may exert meaningful pressure on the disputing members so that they will compromise with each other. The public may also be educated by getting more information about the arguments of the project. The environmental groups may get more sympathy from the public. It is also possible that tax payers can raise questions about the cost of the mitigation and compensation as well as the benefit of the project. The important thing is that the government and the committee members should brief the media together at the same place, not contact reporters alone. Otherwise, some of the members might try to use the media unilaterally to sell their positions.

Third, the government may use an "exploding offer" for encouraging disputing groups to compromise. The government may offer generous extra compensation, which will be valid only for a limited period. If disputing parties will not respond to the special offer within the time limit, they will miss the chance of taking the extra option. This method is a little tricky in terms of timing and substance, and may be the final card of the government at the last moment.

In fact, the cost of the CA/T Project has been increasing dramatically. Although there seem to be many factors in increasing the cost, the state was seriously worried about schedule delay. The time limit of the BDRC was clearly defined at the initial meeting, although it was once extended for about two months. However, the state did not set a clear deadline for the subsequent negotiation. The state probably did not expect that it would take such a long time to resolve the remaining issues after it received the recommendation of

the committee. It was therefore necessary for the state to establish a clear rule concerning the time limit.

The conflict of the Charles River crossing was not settled successfully even though the committee was organized under favorable conditions. Zero sum and non-negotiable elements seemed to have been the dominant factors that precluded consensus building as well as schedule delay. However, there also seem to have been untapped approaches for breaking through these problems. If the state and the committee had used the different approaches stated above, they ultimately might have reached a consensus. The decision making rule, especially, should have been established at the first stage so that all the members, including the state, would have understood the value of the negotiation process even if a consensus was not reached.

Appendix I

The Bridge Design Review Committee Members List

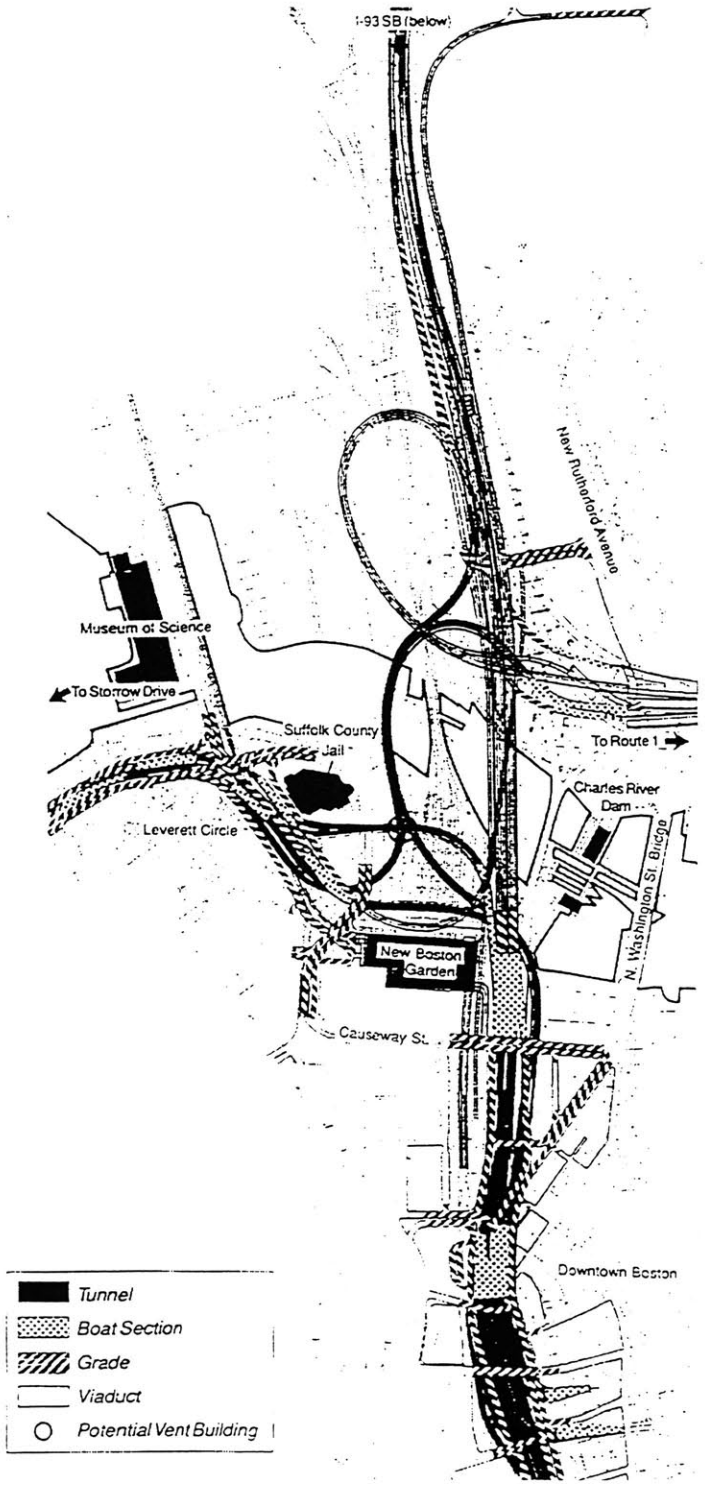
Source: Bridge Design Review Committee. Report on the Charles River Crossing, 1991.

Stanley Miller	Chairman
John Wofford	Facilitator, ENDISPUTE, INC.
City of Boston	
Joseph Beggan/Karen Anderson	Boston Transportation Department
Lorraine Downey/Mike Cannizzo	Boston Environment Department
Judy Evers	Mayor's Office of Neighborhood Affairs
Richard Garver	Boston Redevelopment Authority
Justine Liff	Boston Parks and Recreational Department
City of Cambridge	
Elizabeth Epstein	Director, Cambridge Conservation Commission
Hugh Russell	Architect; Member, Cambridge Planning Board
State and Regional Agencies	
Ilyas Bhatti/Julia O'Brien/Karl Haglund	Metropolitan District Commission
Janet McCabe	Executive Office of Environmental Affairs
Judy McDonough	Executive Director, Mass. Historical Commission
David Soule/Ed Bates	Metropolitan Area Planning Council
Susan Tierney	Secretary, Executive Office of Environmental Affairs
Area Residents and Private Organizations	
Joanne Prevost Anzalone	North End/Waterfront Council
Derek Beckwith	Move Massachusetts 2000
Robert Brannen/Peter Hopkinson	Artery Business Committee
Stephen Burrington	Conservation Law Foundation
Philip Caruso	Boston Chamber of Commerce
William Constable/Maurice Freedman	1000 Friends of Massachusetts
Lee Cooke-Childs	Boston Society of Landscape Architects
Vincent Cucchiara/John Messervy	Massachusetts General Hospital
K. Dun Gifford	Committee for Regional Transportation
Frederick Gleason	Architect, Boston Preservation Alliance
James Grandy	Building Trades Council
Richard Johnston	Charlestown Resident
Dan King	Citizens for a Liveable Charlestown
Louise Lewis	Sierra Club
Robert O'Brien	Downtown North Association
Mark Primack	Boston Greenspace Alliance
Charles Redmon	Boston Society of Architects
Hugo Salemme/Debra McManus	East Cambridge Residents
Vicki Jo Sandstead	National Trust for Historic Preservation
Peter Thomson	Beacon Hill Civic Association
Robert Zimmerman	Charles River Watershed Association
Ernest Zupancic	American Planning Association
Other Professionals	
Joel Bard	Attorney, EOEA Designee
Lee Breckenridge	Attorney & Assoc. Professor of Law, EOEA Designee
Antonio DiMambro	Architect, Comunitas, Inc.
Graham Gund	Architect, EOEA Designee
William Lamb	Architect, Charlestown
Anthony Pangaro	Architect, Macomber Development
William Rawn	Architect; Member, Boston Civic Design Commission

Appendix II

Diagram of Alternative 8.1D Mod 3

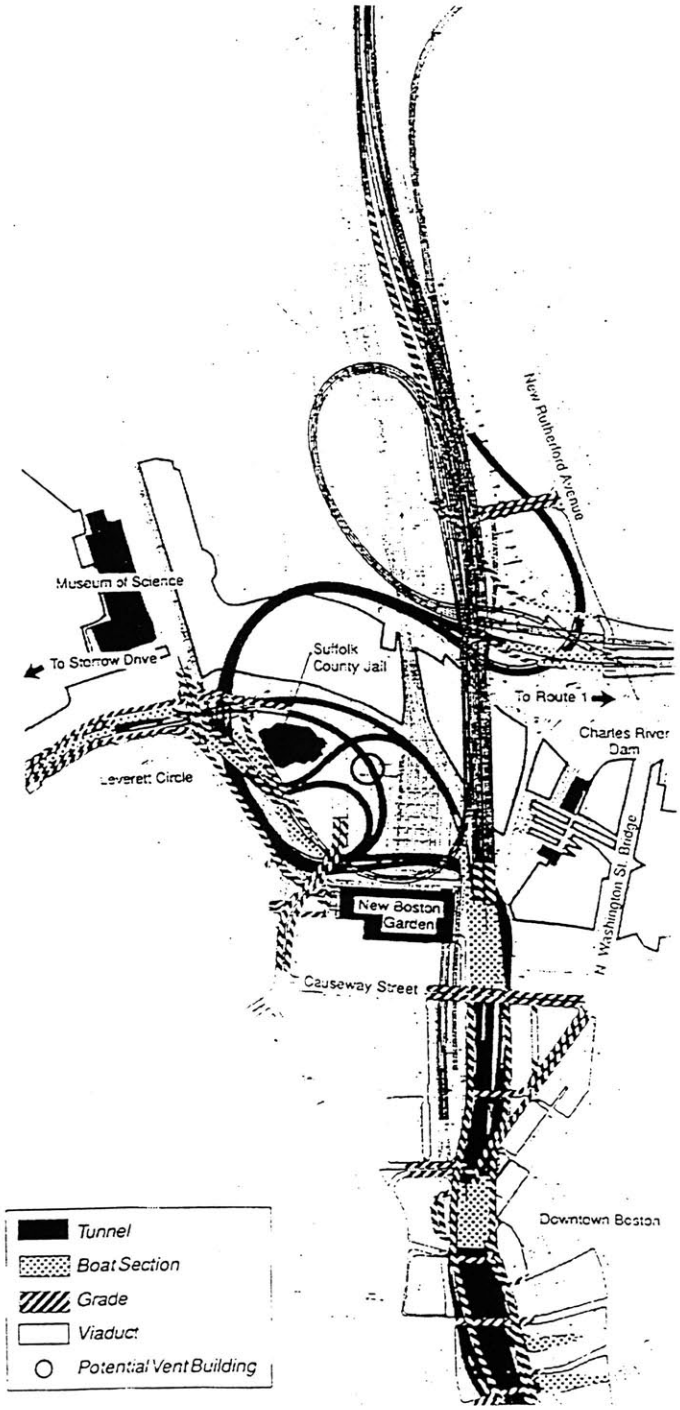
Source: Massachusetts Highway Department. Central Artery/Tunnel Project, Charles River Crossing, Notice of Project Change, 1992.



Appendix III

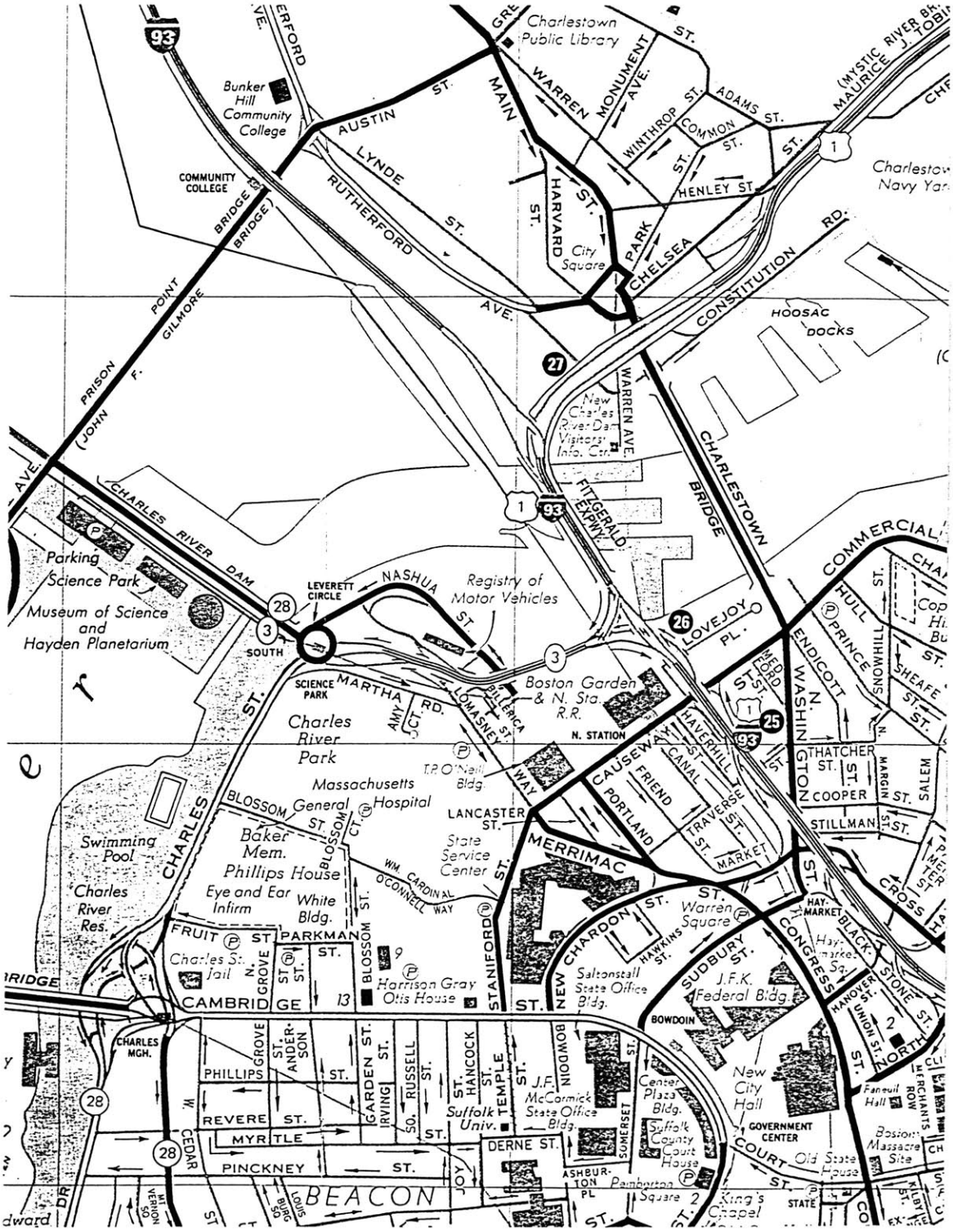
Diagram of Alternative 8.1D Mod 4

Source: Massachusetts Highway Department. Central Artery/Tunnel Project, Charles River Crossing, Notice of Project Change, 1992.



Appendix IV

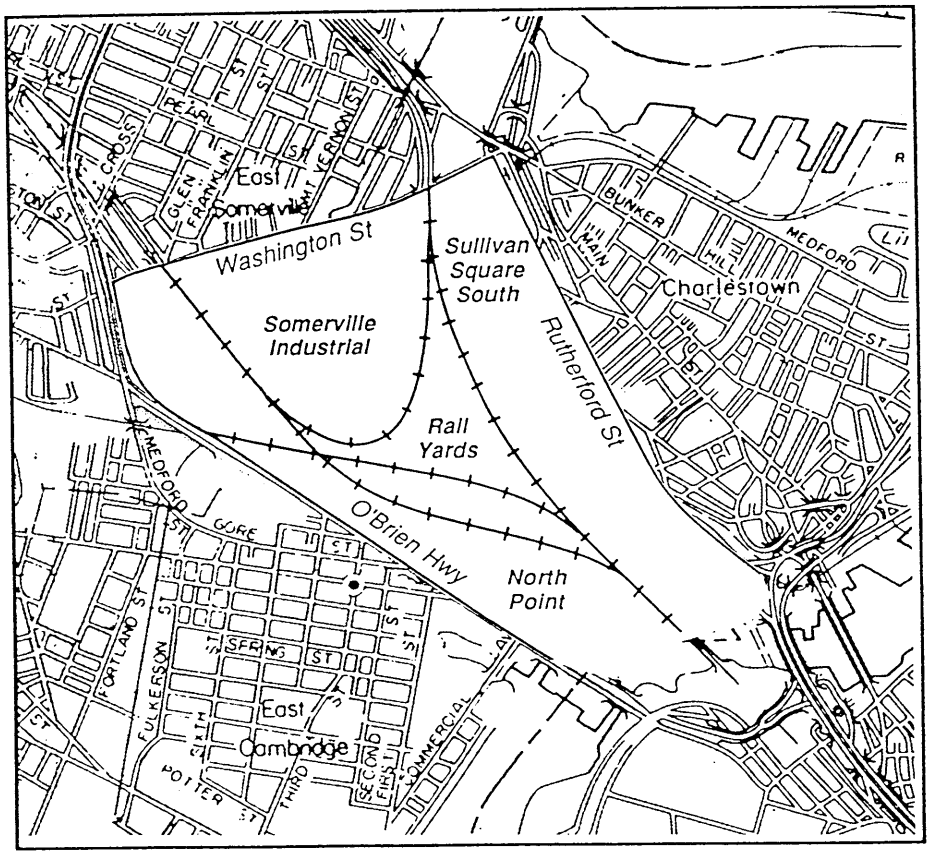
Street Map of the Project Area



Appendix V

Land-Use Study Area of the BDRC

Source: Bridge Design Review Committee. Report on the Charles River Crossing, 1991.



Study Area North of the Charles River

Appendix VI
North-South Station Rail Link

The recent discussions of the North-South Station rail link plan are detailed below. There have been significant developments in the design of the rail link since January 1993. The rail link was also an important issue associated with the CA/T Project, especially for the mass-transit advocacy groups in the BDRC. Dyer's report at the committee concluded that the rail connection was technically feasible in an alignment under the Congress Street and that there was no benefit in using the Central Artery corridor for the rail link. Then, the rail link was separated from the CA/T Project and its planning was referred for the future study at the BDRC in May 1991.

However, in January 1993, Governor Weld announced that he would like the rail link to be constructed underground as part of the CA/T Project. The state hired Guy Rosmarin, a member of the Committee for Regional Transportation with his own previous transportation history, to head the Rail Link Task Force of the CA/T Project for a feasibility study. The Task Force proposed a 2 1/2 mile underground tunnel from east of the Back Bay Station to the South Station, under the Central Artery to the North Station, under the Charles River, and rising out of the ground in Somerville. The study reported that although it would take 15 to 20 years to build and cost about $3 billion, the rail link would reduce the traffic on the Central Artery by 20,000 cars per day in the year 2010.

Then the state changed the specifications of the slurry walls of the newly constructed Central Artery, saying they should be dug 20 feet deeper so

that it would accommodate the four-track rail link underneath the highway. A feasibility study by the Federal Transit Administration also confirmed the advantages of the Central Artery route for the rail link. Although the North-South Station rail link has been dreamed of by many transportation planners, the former Dukakis administration insisted for years that the rail link was technically impossible. Congress has earmarked $4 million for the further study of the rail link.

Interviews

Anthony DiSarcina, civil engineer working for the CA/T Project in Cambridge Systematics, Inc., March 9, 1994.

Stanley Durlacher, former Massachusetts undersecretary of Transportation and Construction, March 9, 1994.

Herbert Einstein, professor, Department of Civil Engineering, MIT; consultant, BDRC, February 28, 1994.

Elizabeth Epstein, former director, Cambridge Conservation Commission; member, BDRC, February 14, 1994.

Dun Gifford, chairman, Committee for Regional Transportation; member, BDRC, March 25, 1994 (by phone).

Stephen Kaiser, activist, Cambridge resident, February 2, 1994 (by phone).

Dan King, activist, Citizens for a Liveable Charlestown; member, BDRC, March 1, 1994.

William Kuttner, traffic engineer, Central Transportation Planning Staff; observer, BDRC, February 28, 1994.

Robert O'Brien, executive director, Downtown North Association; member, BDRC, February 4, 1994 and, by phone, February 23, 1994.

Hugh Russell, architect; member, Cambridge Planning Board; member, BDRC, February 24, 1994.

Hugo Salemme, activist and East Cambridge resident; member, BDRC, February 28, 1994 (by phone).

Veronika Thiebach, staff attorney, Conservation Law Foundation, March 1994 (by phone).

Jack Wofford, former director, Central Transportation Planning Staff; facilitator, BDRC, February 8, 1994 and, by phone, March 7, 1994.

Robert Zimmerman, director, Charles River Watershed Association; member, BDRC, February 17, 1994.

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In addition to the above, materials were drawn from a variety of files, particularly those provided by Massachusetts Environmental Protection Act Unit, Ann Donner, Katina Leodas, and Elizabeth Epstein.