

# Business and Travel Impacts of Boston's Downtown Crossing Automobile-Restricted Zone

GLEN WEISBROD

The findings from the downtown Boston automobile-restricted zone project are presented. In contrast to other pedestrian and transit malls, Boston's Downtown Crossing project involved the elimination of all automobile traffic within a zone of 12 blocks, which included 6 different streets, plus improvements to bus service in the area. Travel and business patterns were observed before, during, and after construction of the new pedestrian zone. There were continuing increases in pedestrian volumes following initiation of the automobile restrictions. At the same time, there were major shifts from automobile to transit and walking as the means of traveling to the area, and much of the anticipated increases in traffic volumes on diversion routes did not occur. The historical trend of decreasing retail activity in the downtown area was halted since implementation of the project, although the relation between automobile restriction and long-term economic revitalization is complicated by a variety of other factors that occurred simultaneously.

The Downtown Crossing project was developed with the specific objective of improving the urban environment of Boston's downtown retail district through the implementation of an automobile-restricted zone (ARZ). The project involved much more than simply restructuring traffic patterns to reduce the impacts of the automobile, however; it also included elements to provide better pedestrian facilities and urban design features and to encourage transit use.

During the past two decades, more than 100 U.S. cities of varying sizes have instituted some form of ARZ. The technique most frequently implemented has been the closure of the main downtown shopping street and its conversion to either a pedestrian or a transit mall. The Downtown Crossing project, in the true sense of an automobile-restricted "zone", was an effort to move a step beyond current programs in the United States that have tended to be somewhat piecemeal in nature and address the issues of environmental improvements and traffic restriction in a coordinated and comprehensive way over a major segment of the city center. This paper summarizes the characteristics of the Downtown Crossing project and discusses the changes in travel patterns and business activity that were associated with it.

## OBJECTIVES

The primary goals of the ARZ project were to address three classes of problems:

1. **Travel:** Travel within the central business district (CBD) was characterized by vehicular congestion on the streets, pedestrian congestion on the sidewalks, and a high level of pedestrian and vehicle conflicts. The Downtown Crossing project separated vehicular traffic from the main shopping streets that had high pedestrian volumes and widened sidewalks on other streets to help create a more safe and pleasant walking environment. Transit use was encouraged through the addition of bus service to the ARZ. The automobile traffic pattern, long plagued by a confusing maze of noncontinuous one-way streets, was streamlined into a more direct pattern of primary streets, and traffic flow was further improved through elimination of on-street parking in the area.

2. **Physical environment:** The image of the retail area was unattractive. Much of the area was made unpleasant by crowding, conflict with automobiles, noise, pollution, and a neglected physical environment. The project sought to attract more

people to the area and to encourage those already there to stay longer. To achieve this, there were physical improvements, including the development of mini-parks and bench areas, and programs for improved police enforcement, maintenance of the physical setting, and management of activities in the area.

3. **Economic revitalization:** Together, the transportation system changes and the physical environment improvements were intended to support and expand the market for downtown retail activities and to add impetus to the preservation, enhancement, and revitalization of the downtown area.

## PROJECT OVERVIEW AND HISTORY

The ARZ includes an area of 12 blocks, which affects 6 different streets in the core retail area. Automobile traffic was banned on three blocks of the main retail street, Washington Street. This street section was originally a transit mall, but much of it is now a fully pedestrianized zone. Another major retailing street that intersects Washington Street is Winter Street/Summer Street, which was also closed to automobile traffic and converted to a pedestrian zone. Automobile restrictions were also implemented on sections of four other streets.

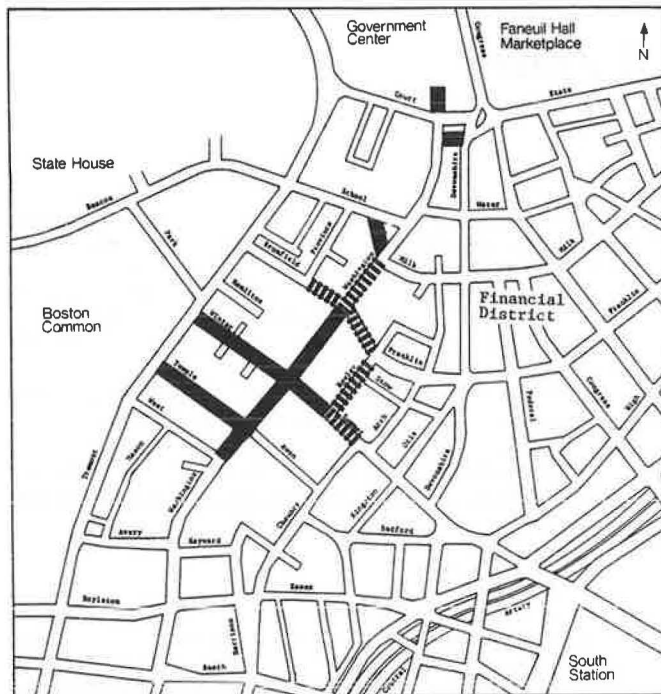
The project was planned and implemented in a relatively short time period. The initial consultant feasibility study and alternatives analysis were conducted as part of the Service and Methods Demonstration (SMD) program of the Urban Mass Transportation Administration (UMTA) and were completed in September 1977. Within a year, the final design plan was developed, an implementation strategy was agreed on, funding was secured, and construction for the special bus lanes was completed. The ARZ and transportation circulation policies were officially implemented in September 1978. Physical improvements, such as bricking of the street surfaces and the placement of benches, new lights, and other pedestrian amenities were essentially completed by September 1979. Total capital costs were \$3 million, of which slightly more than half was funded by the Federal Highway Administration (FHWA) and UMTA and the rest by the City of Boston. An additional \$2 million of UMTA SMD funds paid for noncapital elements including promotion, parking and traffic enforcement, maintenance, and new bus operations.

## KEY PROJECT FEATURES

### Automobile Circulation

As shown in Figure 1, automobile traffic was eliminated from a zone of 10 continuous blocks in the core retail area and segments of 2 other nearby streets. Some of the automobile-restricted blocks (shown by dashed lines on the map), however, remained open for taxis. Two additional blocks were originally closed to automobile traffic but were reopened six months later. The traffic circulation plan also involved the reversal of one-way traffic on several streets and the elimination of all on-street parking in a large area around the ARZ.

Figure 1. Automobile-restricted streets.



- Closed to traffic
- ▨ Closed to general traffic but open to taxis
- Originally closed to general traffic; later re-opened

#### Pedestrian Space

The plan provides increased space for pedestrians on the more congested shopping streets. The pedestrian zones on Winter, Summer, and Washington Streets received new brick paving, lighting, plantings, information kiosks, and bollards. Benches were placed on Summer Street. There were major sidewalk widenings on several other streets, and segments of two streets were converted into park space.

#### Transit Circulation System

For the first two years, six local bus routes and four express bus routes were extended into the Downtown Crossing area, lengthening each of the routes from 0.5 to 1 mile in length. A transit priority route was developed, which used a combination of exclusive transitways and contraflow bus lanes to permit the buses to operate primarily on traffic-free routes and, hence, to serve the heart of the retail core with minimal interference from other traffic.

Originally, Washington Street was a transit mall with limited delivery access. After eight months of operation, the bus loop was modified to eliminate the buses from Washington Street during its reconstruction and bricking. After construction, the bus lane on Washington Street was not reopened due to the earlier experience of pedestrian and bus conflicts there.

#### Service Access

Service vehicles have been allowed on all the pedestrian and bus streets before 11:00 a.m. with the exception of one block of Summer Street where there are no delivery requirements. After 2:00 p.m. the

streets are open only for time-sensitive deliveries such as the U.S. mail, newspapers, etc.

#### Taxi Access

Taxis are allowed access to Temple, Hawley, Bromfield, and Franklin Streets for pickups and drop-offs, and a number of new taxi stands were provided within the area. In the evening, taxis are allowed to proceed up Washington and on Winter.

#### Signing System

A signing system to orient and inform motorists of the new rules was implemented as part of the traffic circulation system. A system of pedestrian signs and information kiosks provides publicity and information and helps orient pedestrians to the whereabouts of retail shops, bus stops, and taxi stands.

#### Ongoing Support Elements

The project plan included special funding for (a) enforcement of parking restrictions and assignment of additional officers at key intersections, (b) upgraded maintenance of the area, (c) programs to promote the area, and (d) a subsidy to cover the operating expenses of 10 bus route extensions into the area.

#### IMPACT EVALUATION EFFORT

Whereas previous evaluations of impacts of ARZs have been limited by a lack of comparable preproject and postproject data, the Downtown Crossing evaluation effort included the collection of information on conditions in the study area before implementation (June 1978), during construction (June 1979), and after project completion (June 1980). The data collection included more than 11 000 surveys in each of the three years, with separate surveys of pedestrians, area employees, bus riders, parking lot users, and merchants. In addition, traffic counts, pedestrian counts, shopper counts, and transit passenger counts were made at 120 locations around the project area. The data-collection effort included measurement of air quality and noise levels; inventories of business establishments, floor space area, and land values; crime and accident reports; and photographic records. Findings from these data are presented elsewhere (1).

Comparison of before and after changes in travel and business patterns are, of course, just one component of a project impact measurement. It is also necessary to make judgments as to what changes in those patterns would have occurred over the same time period without the project. Realistically, that assessment depends on observation of past trends and consideration of other simultaneous local factors that affect travel and business patterns. Inherent in the analysis design is the contention that much can be learned from observing the shifts over time in traffic volumes, modal split, and retail sales associated with implementation of the Downtown Crossing project, even if some of those changes can be attributable, in part, to factors outside the project.

#### EFFECTS ON PEDESTRIAN ACTIVITY

The primary objective of the Downtown Crossing project was to encourage pedestrian activity and ultimately strengthen the retail economy of the area. Following an historical trend of decreasing patronage of the core retail district, the project clearly succeeded in increasing pedestrian activity levels.

Figure 2. Daily volume of visitors in Downtown Crossing area.

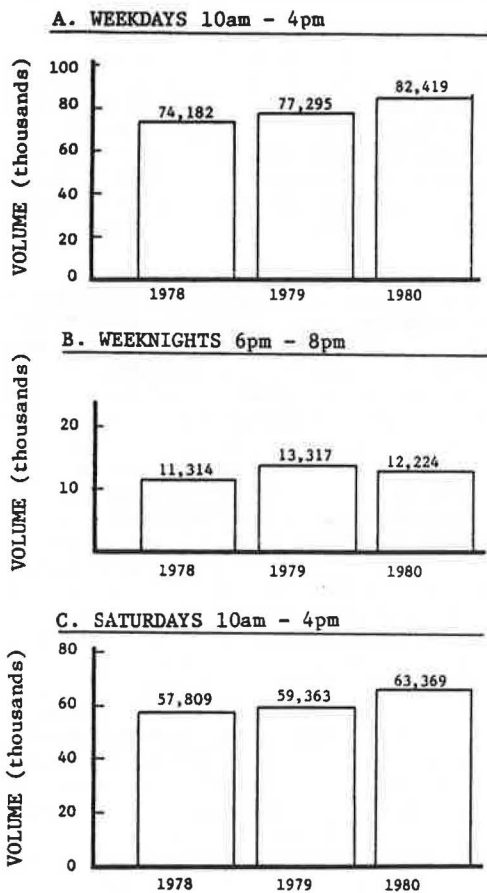
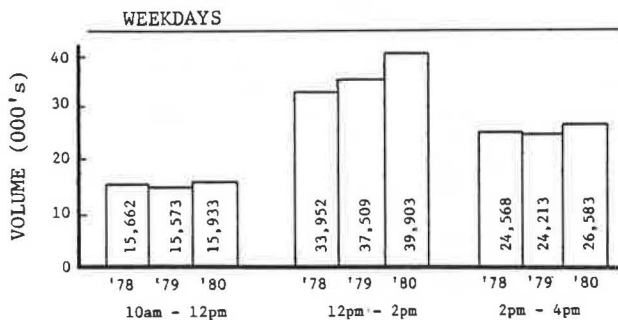


Figure 3. Pedestrian volumes by time of day.



As shown in Figure 2 (data from 1978-1980 pedestrian counts), the number of pedestrians entering the Downtown Crossing area increased following the restriction of automobile traffic (which occurred after the 1978 survey) and continued to increase even more for the daytime periods following the bricking of the street and placement of pedestrian amenities (which occurred after the 1979 survey). Only for the evening shopping period was there no continued increase in pedestrians between 1979 and 1980. Overall, the number of visitors increased 11 percent for weekdays and 10 percent for Saturdays.

The increases in pedestrian volumes were not evenly distributed. The northern blocks, which are located closest to the government and financial office districts, had increases in sidewalk volumes that exceeded 15 percent, while the southernmost blocks actually experienced decreases in pedestrian

volumes. In fact, the largest increase in pedestrian volumes occurred on a block that had sidewalk widening and restricted vehicular access, rather than on the blocks that were fully bricked and totally pedestrianized. This outcome shows that the location of the block relative to activity generators can be as or more important than the form of automobile restriction in determining changes in pedestrian volumes.

In general, the health of the Downtown Crossing area and the observed increases in pedestrian volumes are to a large extent attributable to the presence of a large office work force nearby. About 120 000 persons are employed in office buildings within 0.5 mile of the ARZ, and another 8000 are employed in retail stores. Nearly half of all the pedestrians in Downtown Crossing are downtown employees. The 5 percent growth in downtown office employment during the 1978-1980 period alone would account for a 2 percent increase in weekday pedestrian volumes (compared with the 11 percent increase actually observed).

By comparing shifts in the employment status of all pedestrians over the 1978-1980 period, it is found that while downtown employees accounted for less than half of all weekday visitors, they accounted for nearly two-thirds of the 1978-1980 increase in visitors. The shape of the time-of-day distribution of pedestrian volumes, shown in Figure 3, reflects the substantial contribution of downtown area workers (data from 1978-1980 pedestrian counts). The clear peak between noon and 2:00 p.m. on weekdays can be attributable to the large number of workers entering the area during their lunch period. Much of the total increase in weekday pedestrian volumes between 1978 and 1980 occurred at lunchtime; there was a 17 percent increase in the lunchtime pedestrian volumes between 1978 and 1980 compared with only a 6 percent increase in volume for the rest of the weekday. The lunchtime period overall accounted for nearly three-quarters of the total weekday increase in visitors between 1978 and 1980.

The continued increases in pedestrian volumes are especially significant because they have occurred in the face of new competition nearby. The Faneuil Hall Marketplace opened in stages in 1976-1978 (preceding the Downtown Crossing project) and features 200 restaurants and specialty shops located within a mile of Downtown Crossing and closer to many of the office buildings. Whether Faneuil Hall Marketplace has had a positive or negative impact on shopping activity in the Downtown Crossing area has been the subject of debate. A survey of employees at selected office buildings located near both retail areas showed an increased number of trips to both areas, but a relative decrease in the proportion of midday visits to Downtown Crossing and a relative increase in the proportion of visits to Faneuil Hall Marketplace. This suggests that the increases in employee visits to the ARZ have occurred despite the presence of a nearby competing area.

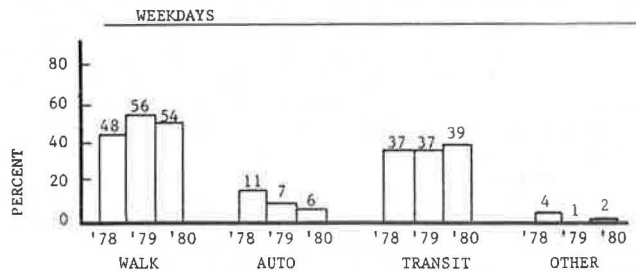
EFFECTS ON TRAVEL CONDITIONS

Changes in Mode of Travel

In the face of extreme traffic congestion and levels of transit ridership to the area that were declining between 1970 and 1977, the Downtown Crossing project was successful in contributing to a substantial shift away from use of the automobile on both weekdays and Saturdays.

There are several reasons why the ARZ and associated policies would be expected to have a substantial impact on mode of access to the area. The ARZ

Figure 4. Mode of access to Downtown Crossing area.



did make traffic access to the immediate area more circuitous. In addition, the elimination of on-street parking and the shift of parking capacity to locations a few blocks away translated into longer walks from parking facilities to the retail district. In addition, there were substantial extensions of local bus service into the area. All of these changes would tend to make automobile travel less attractive and encourage shifts to transit for shopping trips.

Figure 4 (data from 1978-1980 pedestrian interviews) shows a dramatic decrease over time in the proportion of trips coming into the Downtown Crossing area by automobile. Most of the shift occurred between 1978 and 1979 following the closing of the streets and related parking changes. There was, however, also a continued decrease in automobile use between 1979 and 1980. There were corresponding increases in the walk-trip proportion and a slight overall increase in transit use on weekdays. [The proportion of all trips coming directly by Massachusetts Bay Transportation Authority (MBTA) bus without additional use of subway or automobile increased from 2 percent in 1978 to 7 percent in 1980, while the subway share of all trips dropped slightly from 34 to 32 percent.]

The 1978 to 1980 change in the weekday walk and transit modal distributions actually reflects two offsetting trends. For those employed in Boston, there was a continued increase in walk trips relative to other modes of travel, while for those not employed (i.e., housewives, students, out-of-town visitors, etc.), there was a relative increase in transit use. Both groups had substantial decreases in reliance on the automobile.

The observed shift away from automobile travel is clearly attributable to far more than just the ARZ. In fact, there was also a clear shift from automobile to transit among downtown office workers, although that shift was proportionally smaller than the modal shift observed for Downtown Crossing visitors. [The automobile mode proportion decreased from 0.24 to 0.17 for trips to work (a 30 percent drop) while it decreased from 0.11 to 0.06 for Downtown Crossing visitors (a 45 percent drop).] The mode-to-work shift among the office workers occurred even though the exclusion of automobile traffic in the retail district in itself had a minor impact on vehicular access to office buildings elsewhere downtown, and overall capacity of facilities for long-term parking did not appreciably change between 1978 and 1980. There were substantial improvements in local bus circulation, but local buses only accounted for 11 percent of trips to work downtown. The mode-to-work change as well as some of the modal change for Downtown Crossing visitors is attributable to the dramatic increases in fuel prices in 1979 as well as rising parking prices, a freeze on new parking facilities, and the opening of a new rapid transit route extension.

### Traffic Diversion

The downtown Boston street system dates back to the 18th century, and by 1810 the network resembled the pattern that exists today. The maze of narrow, non-continuous one-way streets and the complex intersections downtown contributed to produce traffic congestion throughout much of the day. Much of the congestion problem was attributable to double parking, illegal parking, and illegal use of loading zones, combined with heavy pedestrian volumes and narrow streets.

With or without the ARZ, simplification of the mazelike pattern of traffic circulation, elimination of on-street parking, and improved enforcement within the area were identified as the keys to reducing the extent of automobile congestion in the area. A major concern of those involved in the planning of the ARZ was the impact that traffic limitation on major downtown streets might have on traffic conditions on other already heavily used streets. All on-street parking was eliminated from the expected diversion routes to facilitate greater capacity and smoother traffic flow on those streets.

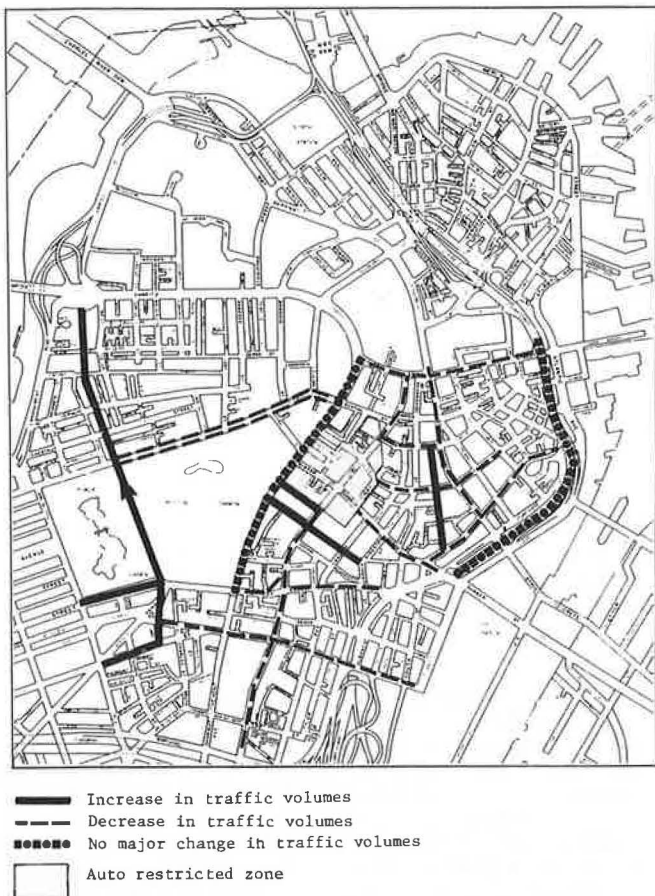
A comparison of the traffic counts taken during the summers of 1978, 1979, and 1980, which covered the periods before and after initiation of the project, indicates that most of the predicted increases on nearby parallel streets did not occur and that there were in fact decreases rather than increases in vehicular traffic on most of the local streets near the ARZ. In most cases, the diverted northbound and westbound traffic can be traced to alternative routes farther away. Figure 5 outlines the major traffic routes as of 1978 and distinguishes between those that experienced increases and those that experienced decreases in traffic volumes in the 1978-1980 period. It clearly shows that many automobile travelers avoided the entire area rather than merely shifting a block or two away from the automobile-restricted streets as was originally expected.

There was a 5 percent overall decrease in area-wide volumes in the 1978-1980 period. In the area shown in Figure 5, total daily traffic on all north-south routes decreased from 62 000 to 59 000, while traffic on all east-west routes decreased from 51 000 to 47 000. There are two explanations for this decrease in areawide traffic volumes. Of this reduction in area traffic volumes of 7000 vehicles daily, up to 6000 can be attributed to observed increases in ridesharing and the modal shift away from automobile travel among Downtown Crossing visitors. At the same time, analysis of traffic counts on diversion routes indicates that several thousand vehicles are avoiding the entire area daily. An increase in traffic on Charles Street on the opposite (west) side of Boston Common accounts for much of the northbound traffic diverted from Washington Street, but there was a substantial diversion of east-west traffic not reflected by increases in volume on other streets in the study area. It is likely that some travelers are now approaching destinations in the government complexes to the north of the Downtown Crossing from the north rather than traveling through the study area.

### Parking Demand

Supporting the finding of an overall decline in automobile trips to downtown in general and the Downtown Crossing area in particular, surveys and counts of parkers at selected on- and off-street facilities in 1978 and 1980 showed a 22 percent decrease in vehicles entering between 10:00 a.m. and 4:00 p.m. The decrease was particularly sharp for

Figure 5. Change in traffic volumes, 1978-1980.



those people who had destinations in Downtown Crossing, among whom the number of vehicles parked at the surveyed sites decreased 37 percent and the number of persons coming by automobile decreased 29 percent. At the same time, automobile occupancy for parkers visiting Downtown Crossing increased among both those traveling to work (from 1.29 to 1.76) and among shoppers (from 1.72 to 1.98).

The particularly sharp decrease in Downtown Crossing parkers can be related to the disproportionate reduction in on- and off-street capacity within two blocks of the ARZ and the significant shift toward transit use and ridesharing among Downtown Crossing visitors. In fact, while there was a decrease in reports of trouble parking for those traveling to work (from 28 to 20 percent), there was an increase for shoppers (from 23 to 38 percent). This latter finding reflects the fact that, while there was little change in total capacity at parking lots and garages, there were major reductions in on-street space and increases in enforcement of no-parking zones, both of which were formerly frequented by parkers for shopping or personal business trips.

Bus Service Changes and Impacts

Although Boston has one of the most extensive systems of public transportation, with subway, bus, and commuter rail services, MBTA relied almost extensively on the subway system to serve the CBD. Local bus routes to the downtown area all terminated at subway stations on the periphery of the central retail and office district. The extension of six

local bus routes and four express bus routes within the ARZ was originally viewed by the merchants and the city as a crucial means of maintaining accessibility to and within the area.

Attitudes toward the bus extension routing changed over time. The high pedestrian volumes on Washington Street led to continuing pedestrian and bus conflicts. Even the merchants came around to feeling that the buses were more of a detriment than a help to their business and asked that they be removed. Eight months after the initiation of the transitway on Washington Street, the downtown bus loop was modified to eliminate all bus service on all but one block of that street. The initial discussion was prompted by the temporary need to remove all vehicles for street reconstruction and bricking, but buses never again traveled on those blocks of Washington Street.

Both counts and surveys indicated that the number of bus riders bound for destinations in Downtown Crossing had increased 26-30 percent following the extension of the bus routes. These increases were substantially greater than the 9 percent increase that had originally been forecasted, but more than half of the new riders represented trips shifted from other transit lines. Those who shifted from other transit lines enjoyed substantial time and cost savings, as most of them were saved a transfer to the subway. In addition, businesses directly beside the bus stops reported significant gains in shopper volumes. Nevertheless, passengers who shifted from other routes meant no additional revenue, and those who saved a transfer to the subway meant a loss of revenue to MBTA. As a result, the total increase in revenue to the MBTA system (net of interroute shifts and transfer losses) amounted to just 5 percent of the cost of the route extensions. On that basis, MBTA eliminated all of the bus route extensions at the end of 1980, 27 months after they were initiated and 15 months after UMTA's demonstration subsidy ended.

ECONOMIC IMPACTS

Retail Expenditures

The Downtown Crossing ARZ covers the major shopping streets that account for most of the sales in the downtown retail district. Although Boston's downtown retail district has fared better than many downtown shopping areas, it was showing signs of decline in the 1970s. Downtown retail sales had been declining in constant dollars (controlling for retail price inflation) since the end of World War II, and over the 1972-1977 period it declined 15 percent (2). While the downtown retail area declined, retail sales over the entire metropolitan area increased 8 percent between 1972 and 1977 (after controlling for price inflation).

Results from the pedestrian interview surveys showed that, in contrast to prior trends, the number of purchases in stores in the Downtown Crossing area increased substantially following initiation of the ARZ and other physical improvements. As a result of both increases in pedestrian volumes and an increase in per-capita purchase rates, the number of total weekday store purchases was up 26 percent in 1980 compared with the level in 1978. There was a slight decline in the total amount spent per pedestrian over 1978-1980, which reflects the disproportionate growth in lunchtime pedestrian activity. Overall, the pedestrian surveys indicated that the increase in retail expenditures over 1978-1980 was nearly the same as the Boston-area price inflation for apparel and upkeep goods over the two-year period (12 percent).

Table 1. Changes in sales by area businesses between 1977 and 1979.

Establishment	Change in Total Sales Volume (%)	No. of Businesses Reporting		
		Decreasing Sales	No Change in Sales	Increasing Sales
Type				
Clothing	7	1	0	12
General merchandise	13	1	0	2
Restaurant or bar	14	1	1	11
Shoes	20	0	0	7
Jewelry	39	0	0	18
Books, records, or cards	48	1	0	11
Hair and beauty	19	3	1	3
Services	46	0	1	6
Sporting goods or cameras	7	3	3	13
Wholesale and manufacturing	19	1	2	10
Miscellaneous	13	5	0	18
Size <sup>a</sup>				
Small	25	12	7	53
Medium	29	6	1	48
Large	13	1	1	9
Ownership				
Independent	28	10	8	84
Chain or subsidiary	26	9	1	31
Location				
On an improved street	33	4	3	37
Near an improved street	24	16	6	78
Total	27	20	9	115

Note: Changes in sales are not adjusted for inflation, which averaged 12 percent for apparel and upkeep goods and ranged up to 16 percent for personal care goods and 21 percent for restaurant meals.

<sup>a</sup>For size of establishment, small = 1-5 employees, medium = 6-25, and large = more than 25.

The observed changes in weekday store visits and retail sales between 1978, 1979, and 1980 indicate a substantial turnaround from the historical trend of accelerating losses. They also support the finding that there was no adverse impact on retail activity during mall construction and that downtown retail activity has in fact continued to strengthen since implementation of the ARZ. Factors such as Boston's tercentennial and the popularity of nearby Faneuil Hall Marketplace may have contributed to the observed retail patterns, but it is generally perceived that the upgrading of the area's physical image and the promotional activities funded under the Downtown Crossing project were major reasons for the strengthened retail activity. The lack of any observed adverse impact from the street reconstruction process can be attributed to both the existence of a substantial market of downtown employees and the completion of construction in a relatively short period of time.

#### Merchant Impacts

On the basis of merchant surveys, Table 1 (data from 1978-1980 business establishment surveys) gives the reported percentage change in area sales by type of store and the number of businesses with increasing and decreasing sales. The total (unadjusted) volume of sales for all stores responding to the survey questions increased by 27 percent from 1977 to 1979. This is significantly higher than the unadjusted sales volume increase computed from the pedestrian surveys, and is partly attributable to the lack of sales-volume data for the two largest department stores in the merchant survey responses. Most categories of stores reported increases in sales exceeding the rate of price inflation. The type of stores showing the greatest increase in total sales were books, records, and cards and services. (There was also a large increase in sales volume for jewelry, which largely reflects the substantial increases in market prices over the period rather than true shifts in the amount of business.) Stores selling more expensive goods such as clothing and sporting goods and cameras reported the smallest increase in sales. In general, sales volumes in-

creased more for the small and medium-sized stores than for large stores. Stores located on the improved streets had a substantially greater increase in sales than those on other nearby streets. The proportion of businesses with decreasing sales was highest among the store categories of hair and beauty, wholesale and manufacturing, general merchandise, and sporting goods and cameras.

Because reported costs and sales figures are subject to inflation and fluctuations independent of the downtown improvements, managers of area businesses were asked to evaluate the impact of the Downtown Crossing project on the profitability of their establishment. Although most of the businesses (72 percent) had a favorable attitude toward the project's impacts on the downtown image, just 39 percent thought that it actually helped their business. Of the remainder, 46 percent concluded that the project had no effect on their establishment and only 15 percent felt that it had hurt their business.

The effect of Downtown Crossing on businesses varied by business size, ownership, and type. According to the perceptions of the merchants (Table 2), larger businesses and chain stores were hurt less and helped more by the project than were smaller and independently owned ones. The finding that smaller stores perceived less benefit from the project than did larger firms is consistent with survey findings from Philadelphia's Chestnut Street Mall. There, 29 percent of the small (less than 24 employees) stores reported increased business and 38 percent reported decreased business, while among larger stores 42 percent reported increased business and only 20 percent reported decreased business (3, p. 192).

#### Business Mix

Changes in the types of businesses operated in the area are another indication of project impacts. Examination of the number of stores entering and leaving the area shows a net increase in the number of restaurants and chain stores. The increase in eating and drinking places largely resulted from the conglomeration of fast food shops within The Corner, a shopping complex within the area, but is nonethe-

Table 2. Perceived effect of Downtown Crossing on individual businesses.

Establishment	Percentage		
	Helped	Unaffected	Hurt
Type			
Clothing	49	32	19
General merchandise	60	10	30
Restaurant or bar	58	24	18
Bank	50	45	5
Shoes	72	12	17
Jewelry	29	57	14
Books, records, or cards	65	31	4
Hair and beauty	32	52	16
Services	28	60	12
Sporting goods or cameras	55	36	9
Wholesale and manufacturing	10	72	18
Miscellaneous	31	51	18
Size <sup>a</sup>			
Small	31	48	21
Medium	53	34	13
Large	50	41	9
Ownership			
Independent	29	55	16
Chain	58	29	13
Location			
On an improved street	41	45	14
Near an improved street	38	46	16
Total	39	46	15

<sup>a</sup>As defined in Table 1.

less consistent with increases in the proportion of such establishments associated with the Chestnut Street Mall in Philadelphia (3, p. 193) and the Mid-America Mall in Memphis (4, p. 28). In general, quick-stop types of businesses particularly benefited from the increase in foot traffic.

Downtown Development Impacts

There has been no major store or building improvement in Downtown Crossing since implementation of the project in fall 1978. Even prior to implementation of the Downtown Crossing project, however, there was little vacant ground floor retail space on Washington Street and there was little need for storefront renovation. Significant vacant retail space did exist, however, on other nearby streets that have been subject to automobile restrictions but have not received physical improvements and that has not been filled since implementation of the Downtown Crossing project. In addition, vacant upper-floor space has remained plentiful in the Downtown Crossing area.

The fact that there were no major store, office, or hotel openings or new development projects initiated in the immediate vicinity of Downtown Crossing over the 1978-1980 study period has two consequences. On the one hand this indicates that short-term impacts of the Downtown Crossing project on private-sector investment were minimal. It also means that the observed changes in pedestrian and retail activity were not directly affected by the openings of any new public or private facilities in the area. Ultimately, however, it must be recognized that the Downtown Crossing project represents just one of a number of independent activities contributing to the growth of the economy of the downtown retail district starting in the late 1970s. Other public and private investments taking place during the two years immediately preceding the project included completion of a sidewalk canopy unifying the storefronts along Washington Street, reconstruction of the Jordan Marsh department store building, and conversion of the former Gilchrist department store building into a 30 store shopping

complex (The Corner). Faneuil Hall Marketplace, located near the downtown retail district, also opened during that period. Construction has since started on two new development projects on Washington Street near the ARZ: a \$30 million high-rise apartment and retail building (the Devonshire) and a \$100 million hotel and retail development (Lafayette Place). The Downtown Crossing project was not, however, directly responsible for either of these private investments, as the decisions to proceed with those projects were made before the Downtown Crossing project was initiated.

CONCLUSIONS

In evaluating the impact of an ARZ or any other downtown improvement project on downtown business investment, it is critical that the distinction between revitalization projects and redevelopment projects be understood. Commercial revitalization projects such as pedestrian and transit malls rely on improvements in the physical amenity and aesthetic image of an area to increase the attraction of existing downtown shopping districts. Depending on the condition of the buildings in the area, a revitalization project may not necessarily call for any immediate corresponding private-sector investment in renovations or new construction. This is in contrast to commercial redevelopment projects, which are based on new construction or conversion of existing buildings to create commercial activity where it did not previously exist; such projects by their very nature require substantial private-sector involvement in developing and promoting the new center.

Downtown Crossing and the nearby Faneuil Hall Marketplace invite comparison in part because both projects involved substantial public funding for the creation of pedestrian streets and were designed to encourage or facilitate new commercial activity. However, the Faneuil Hall Marketplace project involved the redevelopment of warehouse buildings into new commercial uses, while the Downtown Crossing project was merely an improvement to the pedestrian environment to encourage the economic revitalization of an existing commercial center. Even in terms of public funding, the \$21 million of federal urban renewal funds for the Faneuil Hall Marketplace development considerably overshadows the \$5 million of public funding for Downtown Crossing.

It is not reasonable to expect that the pedestrianization of a few blocks and the placement of benches and bushes there will in itself dramatically expand retail sales or spur immediate new private investment in downtown commercial expansion. However, when an ARZ is accompanied by other private investment downtown, it can represent an important contributing factor to an overall program of downtown economic development. In the case of Boston, there were measurable increases in pedestrian volumes and a measurable improvement in the retail sales trend since implementation of the ARZ. The Downtown Crossing project appears to be responsible for much of this change. At the same time, however, it must be recognized that these positive impacts critically depended on the existence of appropriate conditions in downtown Boston, including

1. The existence of a substantial potential market of office workers within easy walking distance to visit the ARZ during midday;
2. The high levels of transit use to downtown, so that the automobile restrictions and parking limitations were not a major concern for most visitors; and
3. The generally positive perception of the downtown area as a place where physical improvements

and substantial new development was already starting to occur.

The success of the Downtown Crossing project is also attributable to the multifaceted nature of the project. The extensive promotional program for Downtown Crossing, the improvements in police presence and traffic enforcement, and the improvements in the physical image of the area were important aspects of the project in addition to the automobile restrictions. The Boston experience shows that, under appropriate conditions, an ARZ project can be an important activity that contributes to the economic well-being of the CBD.

#### ACKNOWLEDGMENT

This paper is based on an evaluation conducted under the SMD program of UMTA and the Transportation Systems Center. The evaluation benefitted from the enthusiastic assistance of the Boston Redevelopment Authority, the Boston Traffic and Parking Depart-

ment, and MBTA. I am indebted to William Loudon and to Carla Heaton for their roles in the evaluation design and analysis process.

#### REFERENCES

1. G. Weisbrod and others. Evaluation of the Downtown Crossing Auto-Restricted Zone in Boston, Final Report. Cambridge Systematics, Inc., Cambridge, MA, 1982.
2. 1977 U.S. Census of Retail Trade. U.S. Department of Commerce, 1977.
3. R. Edminster and D. Koffman. Streets for Pedestrians and Transit: An Evaluation of Three Transit Malls in the United States. UMTA, Rept. UMTA-MA-06-0049-79-1, 1979.
4. Evaluation of the First Year of Operation of the Memphis Auto-Restricted Zone Demonstration. Charles River Associates, Cambridge, MA, 1980.

*Publication of this paper sponsored by Committee on Social, Economic, and Environmental Factors of Transportation.*