

IMPACT OF PEDESTRIAN MALLS ON TRANSPORTATION ACTIVITIES

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(The opinions, findings, and conclusions expressed in this report are those of the authors and not necessarily those of the sponsoring agencies.)

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ABSTRACT

Pedestrian malls — streets that have been dedicated to pedestrian use only — are a popular urban renewal tactic for stimulating economic growth in deteriorating central business districts by attracting commercial retail business. Because of benefits they bring to the downtown road system, pedestrian malls have been included as a means of route diversion in many lists of transportation system management tactics. Because there has been little documentation of the effects of pedestrian malls on transportation activities, the study reported here was undertaken. Officials of selected cities in other states, all of which have pedestrian malls, and merchants and shoppers on three malls in Virginia were surveyed to measure changes resulting from the construction of malls and identify specific problems relating to transportation in the areas of the malls. It was found that the construction of pedestrian malls had provided an impetus for improvements to the downtown transportation system. Problems with goods delivery were found to have increased, but most merchants had been able to adjust delivery operations to alleviate the problems. It was believed that access for users of the mall could be improved, but the methodology utilized in the study was unable to quantify the degree to which methods of improvement had been effective.

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INTRODUCTION

The automobile has been blamed for the decline of the central city by making it possible for people to live away from the central city and commute there for work.^(1,2) As people moved, businesses followed, and suburban shopping centers appeared. The centers offered convenient and easy access, safe and attractive pedestrian areas free from vehicular traffic, and less congestion and pollution than plagued the downtown, and they generally attracted people in the middle and upper income groups. The impacts upon the downtown area became devastating and in an attempt to revitalize it, many American cities, including three in Virginia, closed the main shopping streets to traffic and constructed malls with trees, benches, shelters, and other pedestrian amenities. It has been reported that pedestrian malls can revive deteriorated shopping areas, provide an environment with reduced traffic, noise, and air pollution, and attract new businesses and shopping activity.⁽³⁾ They are likely to attract large numbers of regular downtown users as well as some new shoppers and visitors.

More recently, the transit mall concept has been introduced. Transit malls are downtown streets that have been closed to automobile traffic and rebuilt for the exclusive use of surface transit vehicles and pedestrians.⁽⁴⁾ Transit buses, trolleys, and light rail vehicles can be operated on a transit mall. Transit malls can improve transit operations by removing conflicting automobile traffic and, therefore, should improve access to the downtown shopping district.

Federal agencies have supported the establishment of pedestrian malls by making funds available for their construction. The Department of Housing and Urban Development (HUD) has provided funds through its urban renewal and community development block grant programs. These funds generally are used to support pedestrian-only malls. Other available federal funds include those from the Urban Mass Transportation Administration (UMTA) and those provided for the federal-aid urban transportation system. Some of the transit malls have been financed as transit related capital improvements by the UMTA.⁽⁵⁾

PROBLEM

The pedestrian malls in Charlottesville, Norfolk, and Winchester were constructed mainly in an attempt to revitalize the downtown areas, and consequently the Virginia Department of Highways and Transportation did not play an active role in the planning and development of them. The city of Hampton had a pedestrian mall under construction while this study was in progress; however information from Hampton was not used since data for a post-construction period were not available. Several cities now have an interest in the transit mall concept and, since the Department has supported transit services by constructing exclusive bus lanes, fringe parking lots, bus shelters, etc., it has been requested to participate in the funding and construction of transit malls. Unfortunately, impact studies have not been conducted and only limited information is available on the effects that malls in Virginia have had upon the transportation system in the downtown area. The Virginia Highway and Transportation Research Council was requested to investigate and document the effects of pedestrian malls on transportation activities such as traffic circulation, public transit, parking, and the movement of goods. To provide Department officials insight into the development of malls, a limited investigation was made of the objectives, benefits, and methods of financing the three malls in Virginia.

PURPOSE AND SCOPE

The purpose of this study was to identify the transportation issues and problems encountered by each of the three above named cities during the development of its mall from the conception of the project, through planning and construction, to the post-completion stage. Emphasis was placed on the effects of the malls upon traffic circulation and operations, parking, public transit, pedestrian activity, and the movement of goods. The specific objectives follow.

1. Identify the objectives of the malls and the sources of funds used for the development of the malls.
2. Document the transportation considerations that were planned for during the development of malls in Virginia.
3. Evaluate the impacts of the mall on transportation activities during and after its construction and identify how transportation was hampered or enhanced by the mall.

The study was limited to the effects of the malls on transportation. Impacts upon the economic and social activities of the community were not addressed.

METHODOLOGY

The research was designed to secure and report information on the effects of pedestrian malls. The work program was organized into the tasks outlined in the following paragraphs.

Literature Review

A search of available current literature was made through the facilities of the Highway Research Information Service. From the abstracts produced by the literature search, articles were selected and obtained. The results of the literature review are presented throughout the report, rather than in a separate section, to promote readability.

Questionnaires

The primary instruments used to collect data were three questionnaires (included as Appendix A) which surveyed city officials in selected cities across the nation, merchants in residence on the Charlottesville, Norfolk, and Winchester malls, and pedestrians on each mall in Virginia.

Although, "before and after" types of studies which measure the impacts in a systematic manner are desired, this study was initiated after the three cited malls were completed; therefore, a subjective type of methodology was selected. The opinions of those who were active in the planning and construction of the malls were recorded.

There are dangers in subjective data. Persons' memories about pre-mall conditions fade, and persons whose attitudes have changed do not want to "go on record" as having changed. One problem encountered was that overall attitudes about the malls seemed to influence responses to specific questions.

City Official Survey

Questionnaires were sent to the persons identified as mall contacts in selected cities across the nation.⁽⁶⁾ Cities were selected on the basis of population and similarity of economic

characteristics.⁽⁷⁾ The population categories correspond to the populations of the three Virginia cities studied. Thirty-one questionnaires were mailed and 22 were returned, for a response rate of 71%. The cities responding to the questionnaire are listed in Table 1.

Table 1

Cities Responding to City Officials' Survey
by Population Groups

<u>10,000 - 25,000 (8)*</u>	<u>25,000 - 100,000 (13)</u>
Atchison, Kansas Helena, Montana Monroe, North Carolina Parsons, Kansas Redding, California Salisbury, Maryland Winchester, Virginia	Charlottesville, Virginia East Lansing, Michigan Eugene, Oregon Greenville, South Carolina New London, Connecticut Portland, Maine Poughkeepsie, New York Springfield, Illinois
<u>100,000 - 500,000 (10)</u>	
Fresno, California Hampton, Virginia Honolulu, Hawaii Norfolk, Virginia Tacoma, Washington Tampa, Florida	

*The total number of questionnaires mailed to cities in each population group is shown in parentheses.

Merchant Survey

Lists of the merchants in residence on the three malls in Virginia were obtained from the agencies responsible for each mall. All of the merchants on Charlottesville's mall were mailed questionnaires and a comparable number were sent for the other two malls. The response rates are shown in Table 2.

Table 2

Response Rates for Merchants' Survey

City	Mailed	Returned	Response Rate
Charlottesville	57	33	58%
Norfolk	58	30	52%
Winchester	55	30	55%

Pedestrian Survey

Pedestrians were interviewed on each mall for a four-hour period, from 10:00 a.m. until 2:00 p.m. These hours are generally regarded as the hours of peak mall usage. Information concerning the responses is shown in Table 3. The low frequencies of youth (< 16 years) encountered probably result from schools being in session.

Table 3

Characteristics of Pedestrian Survey and Respondents

City	Date of Survey	Number of Respondents	Sex		Age				
			M	F	<16	16-25	26-40	41-55	>56
Charlottesville	6- 2-78	122	70	49	0	35	30	34	20
Norfolk	6- 1-78	140	97	42	0	38	39	31	31
Winchester	6-12-78	118	64	51	3	30	30	30	23

Telephone Follow-Up

Because of the limited information provided by the merchant questionnaires and the biased manner in which they were responded to, telephone follow-ups were conducted to identify specific complaints that merchants had concerning access to the malls. Merchants who had indicated worsening of specific problems were called, and the conversations are presented in this text. City officials were also contacted to solicit solutions to problems identified by merchants.

Additional Data

Traffic counts at stations of the Virginia Department of Highways and Transportation's annual 24-hour volume count program around the three malls were utilized to measure changes in vehicular activity around the malls before and after construction.

Although accident reports were also solicited from the three cities, they were not available; therefore, changes in type or frequency of accidents could not be determined.

MALL OBJECTIVES AND SOURCES OF FUNDS

The city officials were asked specific questions about who had initiated the proposal for the construction of the mall and the objectives of the mall. Of the 22 cities responding to the questionnaire, the majority reported that the initiation of the project had been a joint endeavor among merchant groups and city governments. The specific objectives are shown in Table 4.

Table 4

Objectives of Malls

<u>Objective</u>	<u>Primary Objective</u>	<u>Secondary Objective</u>
a. Compete with suburban shopping centers	8	5
b. Attract new businesses downtown	14	5
c. Increase retail sales	14	5
d. Increase property values	10	6
e. Reduce pedestrian/vehicle conflicts	9	10
f. Reduce traffic congestion	7	7
g. Reduce air or noise pollution	1	10
h. Improve cultural environment	8	10
i. Make downtown aesthetically attractive	17	4
j. Develop central activity center	13	5
k. Other (Please specify)	3	1

The majority of the objectives related to the revitalization of the business community, while less emphases had been placed upon improving traffic flow and reducing accidents. The principal objectives had been to make the downtown aesthetically attractive, to attract new business and thus increase retail sales, and to develop the downtown area as a central activity center. However, when asked

how successful the malls had been in accomplishing the objectives, the majority of the city officials were of the opinion that they had been very successful in reducing traffic congestion and accidents and making the downtown area aesthetically attractive (Table 5). Objectives such as to increase retail sales, attract new business, and develop a central activity center had been only moderately accomplished.

Table 5

Success of Mall in Meeting Objectives

<u>Objective</u>	<u>Very Successful</u>	<u>Moderately Successful</u>	<u>No Change</u>	<u>Detrimental</u>	<u>No Response</u>
a. Compete with suburban shopping centers	0	9	8	0	5
b. Attract new businesses	5	11	4	0	2
c. Increase retail sales	6	8	6	0	2
d. Increase downtown property values	9	8	2	0	3
e. Increase downtown employment	4	11	2	0	5
f. Reduce traffic congestion	12	3	4	0	3
g. Reduce pedestrian/vehicle conflicts	12	5	3	0	2
h. Improve cultural environment	3	6	4	0	3
i. Reduce air or noise pollution	5	4	9	0	4
j. Make downtown aesthetically attractive	13	5	2	0	2
k. Develop central activity center	6	11	3	0	2
l. Other (please specify)	2	0	0	0	20

Of the three cities with malls in Virginia, Charlottesville and Norfolk were found to have held the national objectives of attracting new business, increasing retail sales, and developing a central activity center in the establishment of their malls. In Winchester, it was reported that one of the primary objectives had been to reduce traffic congestion and the other to maintain the downtown area as a central activity center. The officials in Winchester reported that the mall had been very successful in reducing traffic congestion, in addition to attracting new business and increasing retail sales in the downtown area. In Charlottesville, it was reported that the construction of the mall had been very successful in reducing traffic congestion, reducing pedestrian-vehicle conflicts and making the downtown area aesthetically attractive. To a lesser degree, the mall had been successful in attracting new business, increasing retail sales, and increasing downtown property values and employment. The officials from Norfolk reported that the construction of the mall had not increased activity in the downtown area as much as they had originally anticipated it would. It was noted that although no immediate change had been observed, the developing trend indicated that the mall would be a moderate success.

As noted earlier, most of the merchant groups had supported the mall projects. Table 6 shows the responses from the merchants in Virginia to a question about the effect they had thought the mall would have upon their business and the actual impact it had had during and after construction.

Table 6
Effect Upon Businesses

Effect	Before Construction	During Construction	After Construction
Beneficial	46	4	53
No Effect	16	34	19
Detrimental	18	36	17
Not Located on Mall	12	14	--
No Response	1	5	4

The majority of merchants had felt that the construction of the malls would benefit business and, fortunately, they had surmised correctly. Table 6 shows that many of the merchants had been adversely affected during construction; however, the malls appeared to be attracting new business establishments as many new merchants were included in the survey. Approximately two-thirds of the merchants located in the downtown area prior to construction of the mall reported that the number of customers had increased or remained constant.

Most of the cities responding to the questionnaire reported that city funds and financial contributions from merchant groups had been used to finance the developmental studies pertaining to the mall (Table 7). A variety of funds had been used for the construction of the malls and these are shown in Table 8.

The three malls in Virginia were constructed with local funds. For the Winchester Mall, state legislation was obtained in 1972 to allow the city to tax abutting property owners on the mall site. These property owners are paying half the cost over a ten-year period, while the city has financed the balance from merchants business license taxes. Prior attempts to raise money from volunteer contributions had been unsuccessful.

The mall in Charlottesville cost approximately \$2.4 million, and the City Council voted a \$1.5 million municipal contribution for the project. From a special assessment of land on the mall, a total of \$500,000 was raised. The city further agreed to contribute up to \$200,000 in public funds for the mall, if the business community would match the contribution.

Table 7

Sources of Funds for Developmental Studies

<u>Type Study</u>	<u>No Study Made</u>	<u>City Agency</u>	<u>Merchant Group</u>	<u>Civil Group</u>	<u>Private Firm</u>	<u>Other (Specify)</u>	<u>Combo. of Grps.</u>
a. Mall feasibility	2	9	4	0	0	1	4
b. Transportation/parking	1	14	0	0	0	1	3
c. Environmental impact	7	7	0	0	0	0	2
d. Economic impact	6	8	1	0	0	0	3
e. Mall design	0	14	1	0	0	1	4
f. Other (specify)	5	-	-	-	-	-	-

Table 8

Sources of Construction Funds

<u>Source</u>	<u>No. of Malls</u>
a. Federal agencies	14
b. State agencies	2
c. City agencies	19
d. Merchant groups	8
e. Private companies	3
f. Civic groups	1
g. Individual donations	1
h. Other	5

TRANSPORTATION CONSIDERATIONS AND EFFECTS

The economic success of a pedestrian mall depends upon the ability of mall-users to get to the mall conveniently. Stiff competition is given the mall by suburban shopping centers which can provide acres of parking for automobiles. By itself, convenient transportation to the mall cannot guarantee success, but without it failure is guaranteed.⁽⁸⁾

As previously mentioned, the original purpose of pedestrian malls was to bring about economic revitalization, but more recently they have been incorporated into downtown transportation plans because of the beneficial influence they can have on traffic operations. Columbus, Ohio, incorporated two pedestrian malls in a traffic control plan on the premise that they would improve traffic flow and reduce pedestrian-vehicle conflicts. The intent of the plan was to allow the pedestrian to move anywhere within the core of the central business district (CBD) without coming into conflict with an auto. A system of one-way streets and prohibitions on turns was designed to discourage through traffic and "cruising parkers" from entering the CBD, and thus to encourage use of the two streets by pedestrians.

In providing access to pedestrian malls, emphasis is placed on using as many modes of transportation as possible, not just catering to one. Land is not available to provide much parking downtown, so the mall must depend on alternative modes of transport as well as the auto. The degree to which other modes of access are used is, of course, dependent upon their availability.

Three principal modes of access to the malls studied were identified in Virginia by the pedestrian survey. They were automobile, bus transit, and walking (Table 9). The "other" category in Table 9 included access by bicycle and taxi.

Table 9

Mall Access Modal Shares

City	Auto	Bus	Walk	Other
Charlottesville	56.6%	3.3%	38.5%	1.6%
Norfolk	44.3%	27.9%	24.3%	3.6%
Winchester	56.8%	0.8%	39.8%	2.5%

Virginia's pedestrian malls depend heavily upon automobiles to bring shoppers downtown from the suburbs. Many urban renewal projects are being undertaken to encourage people to return downtown to live, but it will be many years before malls can subsist on a downtown-dwelling clientele. Although malls are partially an effort to divert traffic away from the automobile, at this stage in their development it is incorrect not to provide access by automobiles.

The automobile trip to the mall requires quick, easy access to the immediate vicinity of the mall and a space to park the vehicle upon arrival.

This section of the report identifies typical improvements made to the street network to accommodate access by automobiles and the movement of goods. Parking facilities near the malls were evaluated and traffic volume counts were used to detect changes in traffic activity. In conjunction with these, improvements in public transit were reviewed and changes in pedestrian activity were noted. Opinions were obtained from merchants and mall users to determine the effectiveness of the changes that had been made in the transportation system.

Traffic Circulation

Simple, direct routing of traffic can reduce travel time by shortening travel routes and eliminating confusion in locating destinations. The literature is fairly unanimous in stating that this should be done by diverting through traffic around the core area as far from the mall as possible. Streets parallel to the mall should be operated as one-way pairs, and streets crossing or abutting the ends of the mall should be used as two-way links.^(8,9,10) Thus, the loop around the mall provides access and motorists wishing to bypass the mall are also accommodated.

In Charlottesville, before the mall was built, traffic could enter the CBD from the southwest by Water St. After construction the direction of flow on Water St. was changed to one-way westbound, and CBD bound traffic from the north on McIntire Road was given access by Market and High Sts. (see Figure 1). Before the mall was built, traffic entering from the east could travel on Main, Market, or High Sts., but is now limited to High and Water Sts. Water and Market Sts. are the major access roads to parking lots and alleys spaces for delivery vehicles.

One merchant complained that traffic patterns had been changed too drastically, while others suggested that signing be provided to clearly indicate the one-way loop around the mall. At the time of the survey, there were no clear visual cues to signal which roads abutted the ends of the mall and vehicles were driving excessive distances around the mall. Access to parking lots was also criticized. Vehicles accessing the mall from the northeast had no direct route to the parking garage on Market St. and, because of this difficulty, they were using surface lots on the south side of the mall on Water St. This use required vehicles to travel farther than if easy access to the garage had been provided.

Charlottesville had been limited in providing a peripheral "through route" on the south side of the mall by a railroad line. Through traffic in both directions was being handled to the north on High Street. No adverse comments regarding High St. were received, so it appeared that the one through route was satisfactory.

The city of Norfolk may have given transportation concerns the most attention of the three cities. Private automobile traffic had been removed from Granby St. a year before any construction was begun in order to experiment with traffic circulation patterns. However, due to the approaching Christmas shopping season, merchants had asked that the traffic be restored soon thereafter. Traffic had been removed permanently two weeks before construction began.

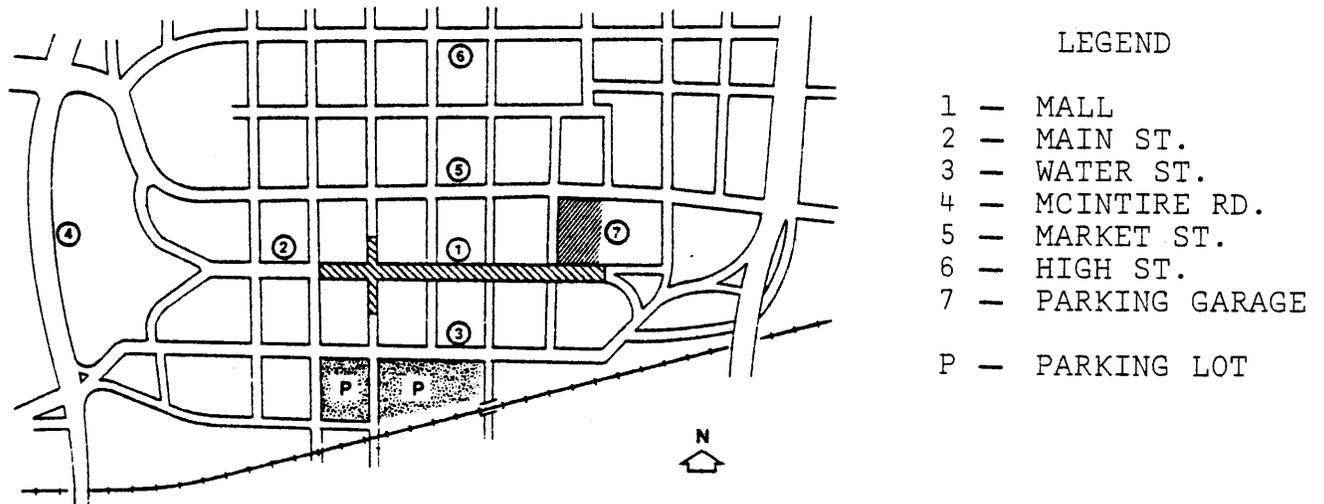


Figure 1. Charlottesville Mall Environs.

The streets parallel to the mall were not being operated as a one-way pair, as recommended in the literature. Monticello Avenue on the east was carrying two-way traffic and Bousch St. on the west was carrying two-way traffic for a block, then became one-way (Figure 2). No comments about the circulation patterns were received, so it appeared that no major problems had occurred.

No modifications had been made to traffic circulation routes in Winchester to accommodate the mall. The streets paralleling Loudoun St. already had been functioning as a one-way pair carrying a U. S. highway through the town (Figure 3). In many smaller cities the main shopping street is usually a major thoroughfare, such as a state or U. S. highway, and in order to ban vehicles from the street an alternate roadway of equal or greater capacity must be available. This change can pose serious problems in the development of malls.

The judicious location and design of parking lots had shortened travel routes in Winchester. The lot on Cameron St., which was serving vehicles accessing from the south, had a rear entrance so vehicles could exit there and return south instead of leaving the front entrance and being forced to travel north. The parking garage on Braddock St. had been located opposite Amherst St., to allow vehicles to exit the garage and proceed to their next destination without being constrained to travel in the direction of the one-way Braddock St.

LEGEND

- 1 — MALL
- 2 — GRANBY ST.
- 3 — MONTICELLO AVE.
- 4 — BOUSCH ST.
- 5 — CHARLOTTE ST.
- 6 — CITY HALL AVE.
- 7 — PARKING RAMP
- P — PARKING LOT

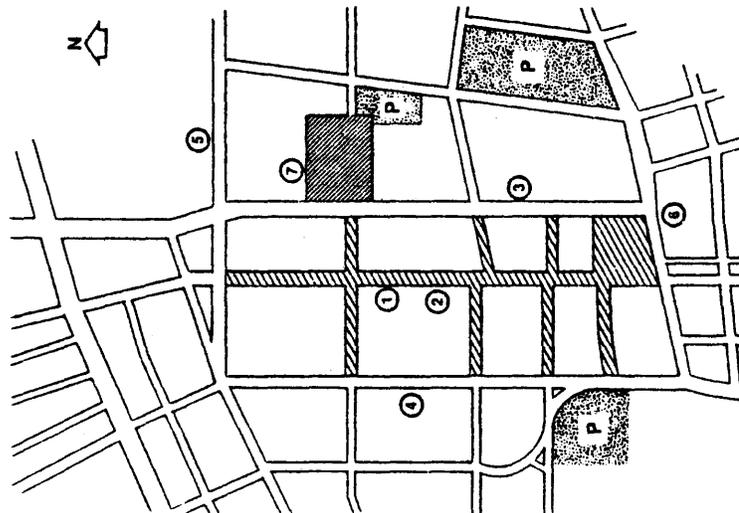


Figure 2. Norfolk Mall Environ.

LEGEND

- 1 — MALL
- 2 — LOUDOUN ST.
- 3 — CAMERON ST.
- 4 — BRADDOCK ST.
- 5 — AMHERST ST.
- 6 — PARKING GARAGE
- 7 — PICCADILLY ST.
- 8 — CORK ST.
- P — PARKING LOT

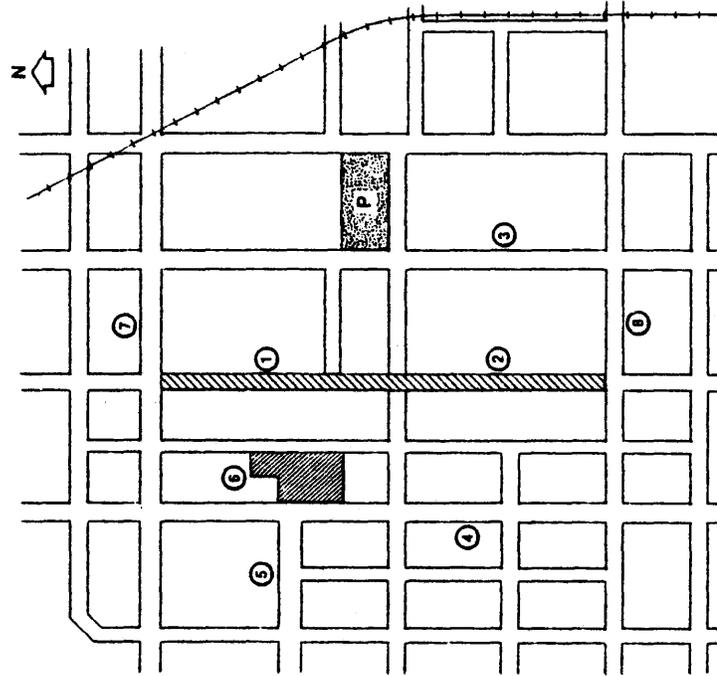


Figure 3. Winchester Mall Environ.

The existing network of streets and physical constraints will have a great effect on traffic routing around a mall. Although the literature is unanimous about desired routing strategies, two cities which could not provide "textbook" circulation did not seem to be encountering major problems. Routing patterns must be adapted to the existing street networks. When traffic is rerouted to accommodate the mall, clear indications of the access loop may be desirable, as had been requested in Charlottesville. Parking lots can be designed and located to shorten distances travelled in the CBD.

Along with shortened travel routes, improvements to roads and intersections are sometimes necessary to handle expected traffic volumes. After construction of the mall the capacity of adjacent roadways can be increased by reducing the number of turning movements at intersections, providing off-street parking facilities so on-street parking can be removed, and establishing one-way streets.⁽¹¹⁾ Table 10 summarizes the improvements that had been made in the 22 cities that participated in the survey, and the frequency at which each had been made. As a result of the improvements, 15 of the 22 cities reported an easing of traffic congestion, but half of the respondents felt that problems still existed (Table 11). No city reported a worsening of congestion. The merchants at the three malls in Virginia also indicated that opinions about congestion around the mall had improved (Table 12).

Merchants in Charlottesville seemed more pessimistic about congestion than those in Norfolk and Winchester, but no specific comments about congestion were received on the questionnaires. The city official questionnaire from Charlottesville indicated an improvement (from "considerable problem" to "minor problem") in the congestion situation, and mall-users who were getting to the mall by automobile in Charlottesville reported encountering congestion less than did their counterparts in either Norfolk or Winchester (Table 13). The telephone follow-up indicated that some of the problem lay in traffic routing and guidance, which were discussed previously.

The degree to which a pedestrian mall can reduce vehicle travel time will vary from city to city. Two aspects of reducing travel time — reducing CBD trip length and reducing congestion — were examined. Three variables were identified which can affect trip length: geometric constraints on circulation patterns, available alternative roadways and modes, and the types of guidance provided. The importance of these variables will vary from city to city and no generalization can be made concerning the role of each one.

Table 10

Modifications Made to Improve Traffic Flow

	Major Artery	Minor Streets
New Street Constructed	6	3
Street Widened	8	5
One-Way Flow Implemented	9	6
Direction of One-Way Flow Changed	6	3
Grade Separation Provided	3	0
Parking Prohibited	8	7
Loading/Unloading Areas Provided	4	11
Traffic Signal Equipment Provided	18	11
Traffic Signal Phasing or Timing Changed	15	11
Other	1	1

Number of Participants in Survey: 22

Table 11

City Officials' Appraisal of Traffic Congestion

After \ Before	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
No Problem	3	0	0	0	0
Minor Problem	5	2	0	0	0
Problem	2	1	1	0	0
Major Problem	1	2	0	1	0

Table 12

Merchants' Opinions of Traffic Congestion

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Before	18	21	19	9	9
After	49	17	15	3	3

Table 13

Do Drivers Encounter Traffic Congestion?

City	Yes	No	Sometimes
Charlottesville	12	53	4
Norfolk	21	30	10
Winchester	17	41	7

According to the city officials and merchants surveyed, traffic congestion had been reduced upon construction of the malls, presumably because roadway improvements had been implemented in the CBD and its approaches to accommodate access to the mall. No specific problems relative to traffic congestion were identified in the surveys.

The involvement of vehicles in accidents within the area framing the mall was chosen as a measure of safety. Conflicts with pedestrians, other vehicles, and stationary objects in the roadway not only contribute to congestion, they also can result in property damage and loss of life or time. Data were not available for a "before and after" analysis of accidents, nor were data available for a comparison of accidents between cities. Pedestrian-vehicle conflicts will be addressed further in the Walk Access section of this report.

Vehicle miles of travel (VMT) is a commonly used measure of vehicular activity in a given area. Three sources of change in VMT have been identified:(12)

1. Changes in route,
2. changes in origin or destination, and
3. changes in modal split.

Pedestrian malls can effect changes in all three categories.

Route changes are effected by closing streets and modifying the flow of traffic and both actions can either increase or decrease VMT. The mall can effect changes in origin or destination on a long-term, regional basis by attracting shopping and service trips from other areas to the CBD. Thus, the attraction of new trips to the CBD will add to the CBD VMT but may reduce or increase the regional VMT, depending on the origins of the trips involved. Changes in the modal split can be effected by encouraging short trips within the CBD to be made on foot rather than by automobile, and by encouraging the use of transit, bicycle, or pedestrian access to the mall. (11,12)

VMT data were not available from the three cities, so traffic volume counts were used to compute estimates. Counts from streets adjacent to the mall were obtained from the Department of Highways and Transportation's annual 24-hour volume count program and the VMT was estimated by multiplying the volume count on a link by the length of the link. The results of these estimations are shown in Figure 4.

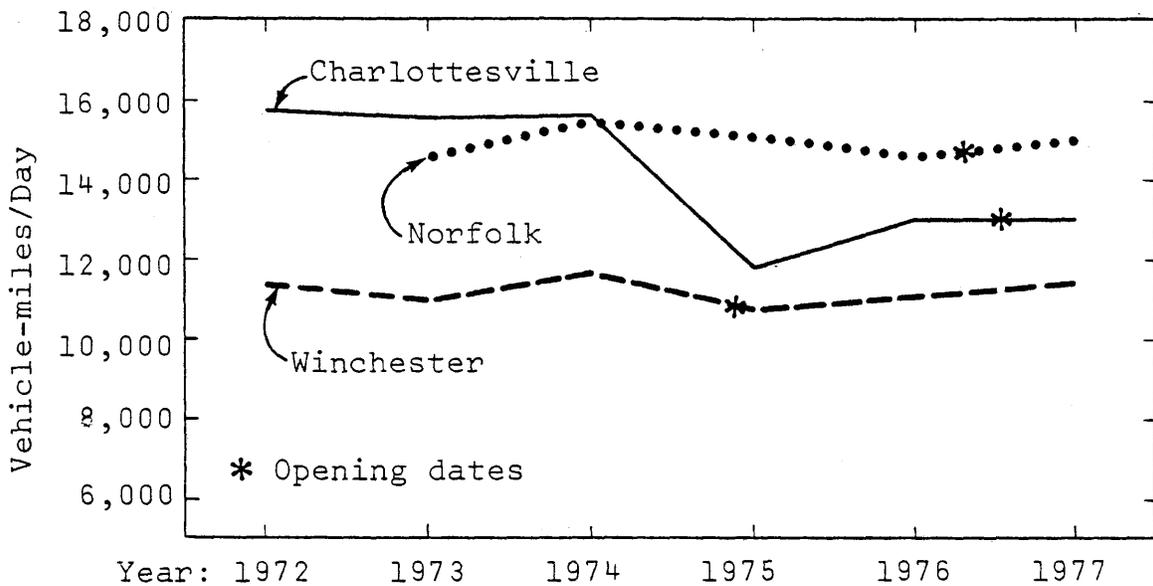


Figure 4. Estimated VMT in Mall Vicinity in Vehicle-Miles/Day. Conversion factor: 1 mile = 1.6 km.

Charlottesville was the only city that showed any fluctuation in the VMT. From the pedestrian survey it was found that no major shift in the mode of access to the downtown area had occurred (Table 14), and most merchants reported an increase in customers after the mall was constructed. If it is assumed that auto occupancy had not increased, then the logical conclusion is that travel routes downtown had been shortened. This conclusion is contrary to the comments received from merchants about poor routing; and rather than draw a conclusion, the authors recommend that a more systematic study methodology than was used be applied to this topic.

One method of evaluating the effect of a pedestrian mall on VMT on a street network is to use computer simulation. By modeling the street network in a CBD and the characteristics of travel to pedestrian malls, the effect of a mall on vehicular activity can be synthesized by removing the links which compose the mall streets. No studies dealing specifically with this topic were found in the review of literature.

The data available from Norfolk were not sufficient to allow conclusions to be drawn, and in Winchester no major changes in routing, modal split, or origin and destination were recorded. The estimated VMT had remained constant in both of these cities.

From an examination of the VMT estimated from traffic volume counts, it appears that VMT data alone cannot be used to measure the impact of a pedestrian mall upon automobile usage. Additional supportive data, such as concise route-change information, changes in modal-split, and measurements of new trips attracted to the mall are necessary.

Table 14

Change in Mode of Access for Charlottesville

	Auto	Walk	Other	No. Respondents
Before	67%	30%	3%	97
After	57%	38%	5%	122

Parking

The literature emphasizes that enough parking spaces should be provided to replace those eliminated by street closings and parking prohibitions and to provide for future mall and other CBD needs.^(8,9) Also, the need to provide parking within walking distance of major mall destinations is stressed.⁽¹⁰⁾

Parking spaces are frequently created in CBDs by converting unused land to parking lots or making spaces on lots with buildings. If surface lots will not meet the forecasted demand, one alternative is to construct multilevel parking decks. This had been done in 15 of the 22 cities surveyed (Table 15). Garages are more expensive than surface lots, but make more efficient use of land. The trend is to build multiuse facilities with office space or shops in the lower levels.⁽¹³⁾ Some concern is expressed in the literature about the long-term effects of building garages, as they can limit expansion of the pedestrian precinct.⁽³⁾ Surface lots are easier to convert to other uses and may not necessarily be restrictive.

Table 15

Modifications Made to Improve Parking

On-Street Parking Increased	4
Off-Street Parking Increased	16
Additional Lots Provided	15
Parking Garage Constructed	15
Preferential Parking Rates Implemented	6
Merchant Validation Stamp Implemented	8
Other Improvements	1

Number of participants in survey: 22

Lots should be located from 300 to 600 ft. (93 to 186 m) from the mall, as pedestrian trips in the business district are usually less than three blocks.^(8,13) The implication is that many small lots should be provided at numerous locations around the mall rather than a few large facilities. Strong visual

linkages from parking facilities to the mall should be provided to make the distance seem short.

Within the parking facilities, pricing policy can be used to reserve desirable spaces for shoppers.

The parking system's pricing mechanism should be utilized to separate the long-term auto commuter from the short-term shopper. The goal of such policies is to preserve the most convenient parking spaces for the shopper, who is susceptible to excessive walking distances, while relegating the less desirable parking spaces to the downtown employee, who will tolerate longer walking distances if this burden is accompanied by economic incentives such as lower all-day parking charges. (13)

In the pedestrian survey, automobile drivers were asked if they were having trouble finding a parking space and if they felt they were having to walk too far from the parking space to the mall. The responses to those questions are shown in Tables 16 and 17.

Table 16

Did Drivers Have Trouble Finding a Parking Space?

City	Yes	No
Charlottesville	13	51
Norfolk	9	47
Winchester	11	52

Table 17

Did Driver Park Too Far From the Mall?

City	Yes	No
Charlottesville	7	56
Norfolk	12	46
Winchester	7	57

$$\chi^2 = 3.08, \alpha = 0.21$$

If the distribution of responses from Winchester are assumed to be from an "ideal" parking condition*, then, at a significance level of 21%, the parking facilities at Granby Mall in Norfolk may be located too far from the mall. This condition was affirmed by Norfolk merchants, as will be seen below.

Prior to opening its pedestrian mall, each of the three cities in Virginia had conducted parking studies and taken measures to meet its parking needs. All three cities had built parking garages and increased the number of surface lots. Table 18 is a compilation of the responses to the question about the availability of parking from the merchants survey. A significant change in their opinions for the better was recorded; however, many merchants felt some serious problems existed.

In Charlottesville and Norfolk, the issue of free parking for the mall was commented upon in the returned questionnaires. There, it was felt that without free parking, the malls could not compete with suburban shopping centers. Free parking was not reported to be an issue in Winchester because the mall was, and still is, the major shopping center in the region and some merchants provide free parking for customers on their property.

Table 18

Merchants' Opinions of Parking Availability

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Before	15	16	23	13	13
After	32	29	13	4	9

Telephone contact with the city officials who participated in the survey brought to light several methods of dealing with parking. Parking is not free anywhere, not even at shopping centers. Users of the shopping centers pay for parking as a hidden cost in their purchases. Therefore, methods of hiding the extra "out of pocket" parking cost at a mall should be used. Parking ticket validation programs seem to be most popular, based on the telephone interviews.

*An "ideal" situation may be assumed because of the extensive parking program initiated at Loudoun St. Mall. Parking conditions there received no criticism from merchants.

Shoppers stamp their parking ticket with a merchant's name, and one or two hours of parking are assessed against the merchant rather than the shopper. This practice had been implemented in both Charlottesville and Norfolk. Some cities assess a parking tax against merchants to help defray parking expenses and keep parking rates low.

Charlottesville's parking garage was being shared by CBD employees who were parking from 8:00 a.m. until 5:00 p.m. and shoppers, who were short-term parkers. The employees were supposed to be using the upper levels of the garage, leaving the lower levels for shoppers. But, several merchants complained that in actuality this was not happening and shoppers were being inconvenienced. Their complaint was valid, and the telephone interviews showed that Charlottesville was not alone with this problem.

Economic incentives can be used to encourage parking on upper levels. Discounted rates on monthly permits for upper levels were said to have encouraged use of the top levels in Helena, Montana; Salisbury, Maryland; and other cities. In Salisbury, economic incentives were being provided not only in parking garages but on surface lots as well. Lots farther from the CBD were offering lower monthly rates, and the rates were higher as one approached the mall. Also, to encourage high turnover rates at meters, the nearer to the mall one parked, the shorter was the maximum interval on the meter.

Besides commenting upon the issue of free parking, merchants in Norfolk criticized the parking facilities. The main complaint was the long distance from lots to the mall. Handicapped and elderly drivers were said to be experiencing hardships in accessing the mall because of the distances. Possibly as a result of merchant outcry on parking issues, a mall "revitalization" study had been undertaken to examine the parking problem in the area.⁽¹⁴⁾ Among other things, the report on the study recommended that several small parking garages be built on the back sides of several blocks on the mall. If this recommendation is implemented, the parking problems should be relieved considerably.

Prior to constructing its mall, the city of Winchester had undertaken an extensive program to provide parking in the CBD area in preparation for closing Loudoun St. to traffic. The program had increased the number of parking spaces and placed them near the mall. Many of the comments received from merchants credited the program for the success of the mall.

The provision of an adequate number of parking spaces around the three pedestrian malls did not appear to have posed a problem, but, in general, locating parking close to the mall and preserving the nearby spaces for shoppers can be. Various methods of parking management can help to increase vehicle turnover and preserve parking spaces near the mall for shoppers. Pedestrian malls can provide impetus to improvements in the availability of parking spaces downtown by making it necessary to provide more parking facilities. Proper management of the facilities can enhance the accommodation of long- and short-term parkers in the CBD.

Public Transit Access

People cannot be diverted from using the automobile unless there is an alternate mode of travel that provides an equivalent, if not higher, level of service. In many American cities, bus transit is the only viable alternative to automobile travel. Unfortunately, transit is seldom able to compete with the automobile; therefore, it caters to captive riders and must be heavily subsidized.

Locating bus stops on streets adjacent to or abutting on the mall is an accepted practice in inducing the mall user to use the transit service. A higher level of competition can be offered by providing a traffic lane for transit only down the mall. In this way, direct access to the mall is provided, as well as on-mall transportation.

If the street being closed to vehicular traffic is a major thoroughfare for transit vehicles, as is often the case, routes and stop locations have to be changed. Transit is usually rerouted along streets parallel to the mall and on streets abutting the ends of the mall to make a loop. If the people managing the mall allow it, vehicles may cross the mall so that passengers can alight directly onto the mall.

Commonly stated objectives of transit services to pedestrian malls are similar to those of regional transit:

1. To encourage transit ridership,⁽⁹⁾
2. to reduce dependence on the auto for local access,⁽⁹⁾ and
3. to provide persons without autos access to the mall.

The following subsection of the report discusses the success reportedly being achieved in attaining these objectives.

Encourage Transit Ridership

Transit operators will sometimes take advantage of a downtown revitalization project such as a mall to justify improvements to service in the area. Of the 22 cities surveyed, 20 provided public transit service. Five of these had made no improvements, while the remaining 15 had made improvements as summarized in Table 19. Several of the respondents stated that improvements had not been made specifically to improve access to the mall but to upgrade the entire transit system.

Ten cities reported that these improvements had led to increases in ridership, and five reported no change (Table 20). No cases of declining ridership were reported, which seems to indicate that inclusion of a mall on bus routes will not detract from ridership. Thus it appeared from the reported increases that the first objective, to encourage transit ridership, was being accomplished.

Table 19

Improvements Made to Transit Systems

Stop Location Changed	9
Shelters Provided	8
Routes Changed	7
New Equipment Purchased	5
Fares Changed	4
Priority Lanes Provided	3
Headways Reduced	2
Other	2

Number of participants in survey: 20

Table 20

Changes in Transit Ridership

Response	Frequency
Increase	10
No Change	5
Decrease	0
No Response	5

Reduce Dependence on Automobile

Success in achieving the second objective, reducing dependence on the auto for local access, was evaluated by interviewing pedestrians on the mall; however, the number of transit riders included in the interviews in Charlottesville (4), and Winchester (1) were not enough to allow any conclusive statements. In Norfolk, 35 respondents said they had come to the mall by bus. Six of these had been diverted from the use of autos prior to the construction of the mall, and 2 formerly had gotten to the downtown area by walking. On the other hand, it was found that one person who formerly had rode the bus had switched to using the auto and another had switched to walking (Table 21). In Norfolk, a trend for travel to be diverted from auto to transit for trips to the mall may have been occurring.

Table 21

Change in Mode of Access for Norfolk

Before	After			
	Auto	Walk	Bus	Other
Auto	45	5	6	0
Walk	1	19	2	1
Bus	1	1	26	0
Other	0	1	1	2

Provide Access for Captive Riders

Whether or not the third objective, providing those without autos access to the mall, was being accomplished could be only partially answered by a survey of mall-users.

Another look at Table 9 shows that transit was being used for trips to the mall much more in Norfolk than in Charlottesville or Winchester, and several reasons can be given for this. Norfolk is part of a five-city metropolitan area, and transit is usually well-patronized in large cities. Also, no fares were being charged for short, intra-CBD trips by transit and this may have been attracting riders. No information was available to substantiate this speculation, however. In Winchester a larger proportion of mall-users were from out of town as compared to Charlottesville or Norfolk. No transit service was being offered to them, so they could not access the mall by bus. A problem facing both Charlottesville and Winchester which may have had a direct influence on ridership to the mall was the level of service being offered. Winchester was operating three routes on 30-minute headways and Charlottesville was operating six routes on 1-hour headways. Neither system was seeking to compete with the automobile.

Telephone interviews were conducted with the operators of the transit systems in each of the three cities. Inquiries were made as to the level of service provided, route relocations, and any problems being encountered in providing service in the mall area. No major problems were reported by any of the operators for any phase of mall development. Norfolk and Winchester had gone through route relocations and some complaints had been received then. However, the transit service in neither city felt that ridership had been affected in any way during that period. In Norfolk, some merchants complained that at one time riders waiting for a bus in inclement weather had waited in the entrances to their shops. Subsequently, shelters had been provided at the bus stops. On the other hand, in Charlottesville transit passengers frequently were found to be enjoying a pastry while waiting for the bus in a bakery.

Sometimes increased level of transit service is cited as one of the objectives of building a mall. Although benefits can be derived from transit malls, usually the only benefit resulting from pedestrian malls is in the form of improved traffic flow in the CBD, which can reduce travel time and increase running speeds. Even these benefits are usually insignificant. No reports of an increase in level of service because of the mall were received from the three Virginia companies interviewed.

In Norfolk, 3 of 38 bus riders mentioned that the stop locations were too far from the mall, and 8 of the 38 complained that buses took too long to come downtown. Although these complaints

may have been justified, the stop locations were as close as possible to the mall and running times, as stated above, were not being affected significantly by the pedestrian malls.

The merchants surveyed seemed satisfied with the transit service at all three malls. Charlottesville merchants registered the most serious problems with transit prior to the construction of the mall, but during construction the city had taken over ownership of the bus service and completely renovated the system. All rolling stock had been replaced, routes had been changed, and, in effect, a whole new system had been implemented. One complaint about the hours of service was received in the merchants' survey.

From the findings reported here, it is concluded that pedestrian malls can have a beneficial effect on transit service. The improvement of service and facilities can be stimulated and ridership may be increased. The social goal of reducing dependence on the auto for access to the mall was being accomplished in Norfolk. Finally, transit operations did not seem to have been hampered in any way by modified bus routes or new traffic flow patterns, except during a familiarization period immediately after the changes.

Pedestrian Activity

With respect to vehicular modes of transportation, a pedestrian mall is an origin or destination. Vehicles approach it, service it, then leave it. However, to the pedestrian, the mall is both an origin and destination and a link. A mall serves as a link when it is located between two activity centers, such as a financial district and governmental district, and serves as a corridor between them. Stores can benefit from the exchange of traffic between the two centers, and the exclusion of vehicles from the mall can encourage pedestrian activity. The mall acts as a destination for those who shop, socialize or eat lunch there.

Many considerations affect whether or not a walking trip is made and how it is routed.⁽³⁾ Two considerations, convenience of the trip and safety, were selected to find how a pedestrian mall can influence them. The goal of the transportation engineer is to try to assure convenience and safety within the mall in order to encourage or increase pedestrian travel.

Improved Convenience

The convenience of walking has a great influence on whether or not pedestrian trips will be made. In addition to trip length,

factors such as obstructions, vertical climbs, directness of route, and delays can cause a pedestrian to reroute his trip or switch to another mode of travel.⁽¹⁵⁾ A variety of measures can be taken to improve the pedestrian walkways, and those taken in the 22 cities surveyed are summarized in Table 22.

Sidewalk improvements, cited most frequently, can include improvements such as widening, removing obstacles, providing ramps for wheelchairs to negotiate curbs, and providing benches to allow pedestrians to rest. As was the case with goods delivery improvements, the least costly and least sophisticated aids were reported to be provided most frequently.

The pedestrians were asked if they had encountered obstacles in their path on the way to the mall, and their responses are shown in Table 23. Although most pedestrians indicated they had had no problems, this result must be viewed in its proper perspective. Pedestrians rarely express emphatic reaction to their walking environment,⁽¹⁶⁾ and if obstructions had been encountered, they may have been disregarded or accepted as a routine occurrence.

No specific comments about the status of pedestrian access were received from the merchants or pedestrians surveyed.

Table 22

Improvements Made to Improve Walk Access

Sheltered Walkways	5
Grade-Separated Walkways	2
Pedestrian Traffic Signals	10
Improved Sidewalks	15
Mid-Block Crosswalks	6
Other Improvements	4

Number of participants in survey: 22

Table 23

Do Pedestrians Encounter Obstructions
When Walking to the Mall?

City	Yes	No
Charlottesville	5	44
Norfolk	1	33
Winchester	3	46

Improved Safety

The decision to make a pedestrian trip is also influenced by one's perception of how safe it will be. There should be no pedestrian-vehicle conflicts within the mall after vehicles have been prohibited. However, the literature does not document whether or not improvements made to make pedestrian access more convenient also improve safety in the region around the mall. If there is an increase in pedestrian activity around the mall, the frequency of accidents may be expected to increase proportionately. If parking lots on the access road for the mall are located across the street from the mall then people using the lots will have to cross the street to access the mall and thus expose themselves to possible accidents. On the other hand, where there are a large number of pedestrians, drivers may be alert to people on the roadways. Additionally, where improvements are made to separate pedestrians from vehicles temporally or spatially, accidents may decrease.

Since accident reports were unavailable, only city officials' comments and the results of the pedestrian survey are considered here.

City officials indicated that problems with pedestrian-vehicle conflicts had been greatly alleviated by their malls (Table 24). In Winchester, although no pedestrian fatalities had occurred prior to construction of the mall, pedestrian-vehicle conflicts had been common on Loudoun St. as people tried to cross the street or enter parked cars. According to City Manager Wendell Seldon, vehicle speeds had been so low that accidents rarely occurred, but conflicts had been frequent.⁽¹⁷⁾ The mall had virtually eliminated those problems.

Pedestrians were asked if they had encountered conflicts with vehicles, and their responses are tabulated in Table 25.

Table 24

City Officials' Appraisal of Pedestrian-Vehicle Conflicts

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Before	2	9	4	3	4
After	15	4	1	1	0

Table 25

Do Pedestrians Encounter Conflicts with Vehicles
When Walking to the Mall?

City	Yes	No
Charlottesville	5	44
Norfolk	7	27
Winchester	5	45

Without accident reports it is difficult to objectively substantiate the subjective responses given on the questionnaires. It appears from the responses received on questionnaires from city officials and pedestrians that safety from vehicles in the CBD may have been improved by the malls.

An additional aspect of safety which should be examined with respect to pedestrian malls is personal safety from assault or robbery. Perceived safety in this area will greatly influence whether or not a trip is made and how it is routed.

Increased Pedestrian Travel

Merchants on the mall can profit from new tripmakers in terms of a potential increase in clientele, and diversion of trips from energy-consuming modes can contribute to reduced congestion and to energy conservation.

Because of the "oasis" image of a pedestrian mall, it attracts trips other than shopping trips. From the study it was found that about 75% of the mall-users who had walked to the mall fell into one of three groups: those who had come to the mall for recreational purposes, those who had come to shop, and those who had come to eat lunch (Table 26). The recreational group included all people who had come to the mall for no specific reason related to

the services offered by the mall tenants. The elderly, people with a day off from work, and even vagrants who had come to socialize or "just see what's going on" were included. More of this group had walked than had come by the other modes of travel. The number of shoppers who had come by foot was not disproportionate with the number of shoppers who had come by all other modes. The third group was composed largely of office workers who had walked to the mall to eat lunch.

Fifty-four of 128 pedestrians asked said that after the mall had been constructed they had come to the area of the mall more frequently than before, but 63 indicated that they had come the same number or fewer times (Table 27). However, from the phrasing of the question, it is not possible to draw an accurate conclusion concerning increased pedestrian trips to the mall.

Walking to the pedestrian mall rather than riding the automobile can aid in conserving energy and reducing congestion. A comparison of the modes of travel used to get to the downtown area before the mall was built to those used after construction is shown in Table 28. A trend towards decreased automobile access and increased walk access may have been occurring, but no significant change was recorded. Forty-five percent of those responding to the question indicated that they had had automobiles available for making the trip (Table 29). Thus, it appears that walking may have been reducing use of the automobile as a form of transportation to the pedestrian malls.

Table 26

Trip Purposes of People Who Walk to Malls

Purpose	Walk	All Others
Recreation	37	28
Shop	34	98
Lunch	23	10
Work	18	56
Other	16	60
	128	252

Table 27

Do Pedestrians Come Downtown More Frequently than Before Mall?

Yes	No
54	63

Table 28

Change in Mode of Access

	Auto	Walk	Bus	Other	N
Before	60%	26%	12%	2%	301
After	52%	34%	11%	3%	380

Table 29

Do Pedestrians Have Automobiles Available?

City	Yes	No	No Response
Charlottesville	25	16	8
Norfolk	16	16	2
Winchester	10	25	14

The pedestrians interviewed who had walked to the mall were passive in their comments about provisions for walking to the mall. Consequently, no problems regarding walk access were identified. No reports dealing specifically with walking access to pedestrian malls were found in the literature search, but it seems that traditional measures of impedance would be applicable to the trip to the mall. A comparison of the distance walked and volume of walking trips attracted to a pedestrian mall with those of a shopping street may provide insight into the distance from the mall and types of pedestrian amenities that are justifiable. There was a trend for the proportion of people coming downtown by foot to increase, which may be an indication that improvements made for walking access are effective.

Goods Movement

There has been an increasing interest in planning for goods delivery in urban areas in recent years. Transportation planning procedures are centered upon moving people and not moving goods. Yet, the movement of goods is a significant proportion of transportation in urban areas, as delivery vehicles constitute up to 30% of the vehicles on CBD streets.⁽³⁾ Pedestrian malls provide an excellent opportunity to test and demonstrate schemes for improving efficiency and economy in the movement of goods.

The survey of 22 city officials showed that improvements to side and rear alleys, provision of loading zones, and placing time restrictions on goods delivery were most commonly being used to provide truck service to stores. Some officials indicated that loading bays had been constructed (Table 30). Roughly half (12 of 22) felt that problems of one magnitude or another still existed but only four felt that problems had worsened (Table 31).

Table 30

Improvements Made to Facilitate Goods Delivery

Alleys Improved	16
Loading Zones Provided	12
Delivery Times Restricted	10
Loading Bays Constructed	6
Other	2

Number of participants in survey: 22

Table 31

City Officials' Appraisal of Goods Delivery

Before	After		
	No Problem	Minor Problem	Problem
No Problem	7	3	0
Minor Problem	1	5	1
Problem	0	1	1
Considerable Problem	1	0	0
Major Problem	1	0	1

One cannot expect all goods delivery problems to be solved by the construction of a mall, and perhaps it is more reasonable to expect a worsening of the problem. What is encouraging about the above findings is that no overall reduction in the level of goods delivery service was reported, and that low-cost, easy to implement methods were being used to maintain the level of service. A closer look at the problems of individual merchants at the three malls in Virginia follows.

While most city officials surveyed indicated that goods delivery had not been adversely affected by the mall, merchants on the three malls in Virginia did not agree. Table 32 presents the responses given by merchants when questioned regarding goods delivery before and after the mall was constructed, and it can be seen that a significant change for the worse was recorded.

In Charlottesville, no vehicles were being allowed on the mall except by permit or in an emergency. Therefore, deliveries were being made via rear or side entrances or were being carried from a side street into the front entrance. Those merchants indicating use of carry-in and front delivery seemed to be having the most problems (Table 33). Telephone follow-ups to those stores indicating a worsening of delivery problems all indicated the lack of vehicular access to their storefront as a problem. Most of these stores had no other entrances to make delivery to, and it was inconvenient to hand-truck goods from a nearby street, especially in inclement weather.

Table 32

Merchants' Opinions of Goods Delivery

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Before	52	14	6	0	1
After	46	21	13	3	3

Table 33

Degree of Problems with Goods Delivery in Charlottesville

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Rear Delivery	10	4	1	0	0
Front Delivery	8	3	2	1	1
Carry-in from Side Street	7	4	3	1	1

Although permitting delivery trucks to use the mall during inactive hours might have eased the delivery problems of some of these businesses, they were not being allowed for several reasons. Preservation of the pedestrian environment and protection of the brick and concrete pavements from oil and grease stains were cited as two considerations. No recurring complaints about goods delivery problems had been received by Downtown Charlottesville, Inc. (the merchant organization), or city hall, so it appears that merchants felt they could live with the existing situation.

Another problem cited in Charlottesville was that loading zones were poorly delineated and frequently other vehicles were using them for short-term parking. Better delineation, more strict monitoring of loading zone use and, if necessary, creation of several short-term parking spaces near the mall are ways of possibly alleviating such problems.

In Norfolk, delivery vehicles were being allowed on the mall during restricted hours and several cross-streets were open to traffic to provide better vehicular access to stores. As in Charlottesville, businesses utilizing front delivery and carry-in delivery seemed to be having more serious problems than those using rear delivery (Table 34). Twenty of the 30 merchants surveyed were utilizing front delivery and only seven were using rear entrances. A study of goods delivery by Shriver and Holland, Assoc. had pointed out that many merchants felt their rear entrances were security risks and that front delivery policies had encouraged them to permanently block rear entrances.⁽¹⁴⁾ This may account for the fact that in the present study a high proportion of stores were found to be using front entrances for goods delivery.

Table 34

Degree of Problems with Goods Delivery in Norfolk

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Rear Delivery	4	2	0	0	0
Front Delivery	7	4	3	1	0
Carry-in from Side Street	2	1	3	1	1

No single problem applied to all the establishments in Norfolk having problems with goods delivery; problems seemed to be specific to the individual businesses. The most frequently cited problems were the hours vehicles were being allowed on the mall. One restaurant open until 2:00 a.m., was finding it difficult to receive supplies before the 10:00 a.m. delivery curfew, and one retailer desired to deliver merchandise in the evenings after stores were closed to avoid traffic congestion. The extension of delivery hours to include the night hours could have aided merchants facing time conflicts, but also could have detracted from the attractiveness of the mall in the evening.

The Shriver and Holland study mentioned above had recognized the need for adequate rear entrance service to the mall, and had identified five blocks which were in need of improvement. The recommendations from the study have not been implemented at the time of this writing.

The fewest problems with goods delivery being experienced by the three malls studied were encountered in Winchester. The Loudoun St. Mall had an alley running parallel on the west which had been improved to facilitate goods delivery and vehicles were also being permitted on the mall from 6:00 to 10:00 a.m. Only five buildings on the Loudoun St. Mall had no rear entrances, (18) and in response to their needs the decision to allow vehicles on the mall had been made. Most of the businesses, 23 of 30, were using rear entrances for deliveries, while 19 of 23 were using front entrances (Table 35). (These numbers add to more than 30 because some businesses were using both front and rear entrances.)

Table 35

Degree of Problems with Goods Delivery in Winchester

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
Rear Delivery	13	7	3	0	0
Front Delivery	12	2	4	0	0
Carry-in from Side Street	0	2	2	0	1

Dissatisfaction with rear entrance facilities was expressed by several merchants contacted, with the lack of adequate maneuvering space for large trucks and lack of loading areas behind one building being the primary concerns. Problems with security were not an issue in Winchester as they were in Norfolk. The only other problem mentioned was the time restrictions on delivery.

From contact with merchants on the three malls in Virginia, it appears that the most commonly cited problem encountered in the delivery of goods that is attributable to the pedestrian mall is a lack of truck access to the store front. This problem is inevitable in any fully pedestrian mall, and rear entrance and side-street carry-in deliveries should be encouraged. The exclusion of other vehicles from loading zones used by delivery vehicles should be strictly enforced. If front access is mandatory, delivery can be allowed during restricted hours, but it must be borne in mind that to retain its attractiveness, the mall must be preserved for pedestrians. If crime is a problem and front access is provided, merchants may block rear entrances permanently, which may hamper provisions for goods delivery if the pedestrian precinct is expanded. If front access is allowed, hours of delivery must be established at each individual mall depending on the merchants' needs. Most merchants at the malls have shown a great deal of flexibility in adjusting to constraints on goods delivery, and their continued cooperation with access limitations and time restrictions will aid considerably in maintaining the downtown area for pedestrians.

CONCLUSIONS AND RECOMMENDATIONS

The study of three malls in Virginia examined the effects of pedestrian malls on the access of people to the downtown area and the delivery of goods to merchants in that area. Based on a review of the literature and three questionnaire surveys, the following conclusions are offered.

1. Pedestrian malls can provide an impetus for improving transportation facilities in CBDs.
2. Very few attempts have been made to quantitatively evaluate the effects of malls on transportation activities, but the consensus of city officials and transportation engineers is that they are beneficial if properly designed and managed.
3. Automobile travel downtown can be improved by the construction of a pedestrian mall because the mall often necessitates actions to accommodate displaced

traffic and parking. Improved operation of the road system and increased traffic flow are often side effects of these actions.

4. Transit service to pedestrian malls provides the opportunity to reduce dependence on the automobile for trips to the malls. In Norfolk, there was a trend for trips to the mall to be diverted from automobile to transit.
5. Pedestrian malls hinder the delivery of goods to merchants by restricting access physically or temporally, but most merchants are able to adjust their operations to offset the restraints imposed by the malls.

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18. Irvin Shendow, Chairman, Downtown Development Committee, Winchester, Virginia. In conversation, July 6, 1978.

APPENDIX A

QUESTIONNAIRES UTILIZED IN CITY OFFICIALS,
MERCHANTS AND PEDESTRIAN SURVEYS

3532



COMMONWEALTH of VIRGINIA

HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

JACK H. DILLARD, HEAD
VIRGINIA HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

BOX 3817 UNIVERSITY STATION
CHARLOTTESVILLE, VIRGINIA 22903
IN REPLY PLEASE REFER TO FILE NO. 30.2.8

The Virginia Highway and Transportation Research Council is conducting an evaluation of the impact of pedestrian malls on transportation. We are seeking information from selected cities with malls across the nation concerning the motivation for constructing malls, funding, and transportation improvement. We request your cooperation in completing and returning the attached questionnaire by March 24, 1978.

Should you have any questions or comments concerning this study, please contact Mr. Neal Robertson or me at the above address or call (804) 977-0290. If you would like a copy of our final report on the survey, please indicate this at the appropriate place on the questionnaire.

Thank you for your cooperation and assistance.

Sincerely,

A handwritten signature in cursive script that reads "William Oliver".

William Oliver
Research Assistant

WO:sk

Attachment

cc: Mr. J. H. Dillard

Mr. M. C. Anday

QUESTIONNAIRE
Survey of Mall Development

Your cooperation in completing this questionnaire survey on the development of malls is solicited. If you feel that others are better qualified to complete the attached questionnaire, or portions of it, please forward it to them. Feel free to add any information in the questionnaire that you feel may be pertinent to the study. Please return the completed questionnaire by March 24, 1978.

Please return to: William Oliver
Virginia Highway and Transportation Research Council
Box 3817 - University Station
Charlottesville, Virginia 22903

1. City ALL CITIES (22 Respondents)
2. Position of respondent _____
Phone Number _____
3. Date mall construction begun _____
Date mall construction completed _____
4. Construction of the mall proposed by (mark all that apply)
 - a. Merchant group 16
 - b. Civic group 7
 - c. Central city landowners 9
 - d. City government 19
 - e. Other (Please specify) 1
5. What specific objectives was the mall designed to achieve?

	Primary Objective	Secondary Objective	Not an Objective
a. Compete with suburban shopping centers	<u>8</u>	<u>5</u>	<u>8</u>
b. Attract new businesses downtown	<u>14</u>	<u>5</u>	<u>3</u>
c. Increase retail sales	<u>14</u>	<u>5</u>	<u>3</u>
d. Increase property values	<u>10</u>	<u>6</u>	<u>5</u>
e. Reduce pedestrian/vehicle conflicts	<u>9</u>	<u>10</u>	<u>2</u>
f. Reduce traffic congestion	<u>7</u>	<u>7</u>	<u>6</u>
g. Reduce air or noise pollution	<u>1</u>	<u>10</u>	<u>10</u>
h. Improve cultural environment	<u>8</u>	<u>10</u>	<u>3</u>
i. Make downtown esthetically attractive	<u>17</u>	<u>4</u>	<u>1</u>
j. Develop central activity center	<u>13</u>	<u>5</u>	<u>3</u>
k. Other (Please specify)	<u>3</u>	<u>1</u>	<u>0</u>

6. Indicate who conducted each of the following studies pertaining to the mall.

3534

	No Study Made	City Agency	Merchant Group	Civic Group	Private Firm	Other (Specify)
a. Mall feasibility	3	4	1	1	7	1
b. Transportation/parking	2	5	0	0	6	1
c. Environmental impact	10	6	0	0	2	0
d. Economic impact	10	1	0	0	6	0
e. Mall design	0	4	1	1	9	1
f. Other (specify)	0	0	0	0	0	0

7. Indicate who financed each of the following studies pertaining to the mall.

	No Study Made	City Agency	Merchant Group	Civic Group	Private Firm	Other (Specify)
a. Mall feasibility	2	9	4	0	0	1
b. Transportation/parking	1	14	0	0	0	1
c. Environmental impact	7	7	0	0	0	0
d. Economic impact	6	8	1	0	0	0
e. Mall design	0	14	1	0	0	1
f. Other (specify)	0	0	0	0	0	0

8. In your opinion, how serious were the following problems in the vicinity of the current mall prior to its construction?

	No Problem	Minor Problem	Considerable Problem	Major Problem
a. Traffic accidents	5	14	3	0
b. Traffic congestion	3	7	4	4
c. Scarcity of parking	4	3	5	5
d. Poor transit service	7	8	2	1
e. Delivery of goods to downtown	10	7	2	2
f. Pedestrian/vehicle conflicts	2	9	4	4
g. Crime	5	11	6	0
h. Vandalism or vagrancy	6	7	6	1
i. Decline of central city property values	0	6	7	6
j. Attraction of shoppers to downtown	1	1	7	9
k. Attraction of businesses to downtown	1	3	6	5
l. Air or noise pollution	9	8	3	0
m. Sanitation	11	5	5	0
n. Other (specify)	0	0	0	1

9. What sources were contacted to obtain financial support for the mall?

a. Federal agencies (specify)	<u>18</u>
b. State agencies (specify)	<u>4</u>
c. City agencies (specify)	<u>17</u>
d. Merchant groups (specify)	<u>10</u>
e. Private companies	<u>5</u>
f. Civic groups	<u>2</u>
g. Individual donations	<u>1</u>
h. Other (specify)	<u>2</u>

10. What percentages of the total cost of the mall were supplied by the groups below?

a. Federal agencies	<u>14</u>	Numbers represent number of cities who received funding from the sources contacted.
b. State agencies	<u>2</u>	
c. City agencies	<u>19</u>	
d. Merchant groups	<u>8</u>	
e. Private companies	<u>3</u>	
f. Civic groups	<u>1</u>	
g. Individual donations	<u>1</u>	
h. Other	<u>5</u>	

11. Were the funds provided by the agencies identified in question 10 designated for specific uses? (If yes, please specify the designation)

a. Federal agencies	Yes <u>5</u>	No <u>17</u>	<u> </u>
b. State agencies	Yes <u>2</u>	No <u>20</u>	<u> </u>
c. City agencies	Yes <u>3</u>	No <u>19</u>	<u> </u>
d. Merchant groups	Yes <u>0</u>	No <u>22</u>	<u> </u>
e. Private companies	Yes <u>0</u>	No <u>22</u>	<u> </u>
f. Civic groups	Yes <u>0</u>	No <u>22</u>	<u> </u>
g. Individual donations	Yes <u>0</u>	No <u>22</u>	<u> </u>
h. Other (Please specify)	Yes <u>3</u>	No <u>19</u>	<u> </u>

12. In your opinion, how serious were the following problems in the vicinity of the mall during construction?

	No Problem	Minor Problem	Considerable Problem	Major Problem
a. Traffic accidents	<u>12</u>	<u>8</u>	<u>0</u>	<u>0</u>
b. Traffic congestion	<u>4</u>	<u>11</u>	<u>3</u>	<u>0</u>
c. Scarcity of parking	<u>4</u>	<u>5</u>	<u>5</u>	<u>1</u>
d. Poor transit service	<u>8</u>	<u>6</u>	<u>5</u>	<u>0</u>
e. Delivery of goods to downtown	<u>5</u>	<u>7</u>	<u>3</u>	<u>1</u>
f. Pedestrian/vehicle conflicts	<u>8</u>	<u>7</u>	<u>3</u>	<u>1</u>
g. Impediments to pedestrians	<u>3</u>	<u>7</u>	<u>4</u>	<u>2</u>
h. Crime	<u>13</u>	<u>6</u>	<u>1</u>	<u>0</u>
i. Vandalism or vagrancy	<u>12</u>	<u>5</u>	<u>3</u>	<u>0</u>
j. Attraction of shoppers to downtown	<u>8</u>	<u>5</u>	<u>2</u>	<u>0</u>

	No Problem	Minor Problem	Considerable Problem	Major Problem
k. Air or noise pollution	<u>10</u>	<u>7</u>	<u>3</u>	<u>0</u>
l. Sanitation	<u>8</u>	<u>8</u>	<u>4</u>	<u>0</u>
m. Other (specify)	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>

13. Which of the following modifications were made to streets to improve traffic flow around and access to the mall?

	Major Artery	Minor Streets
a. New street constructed	<u>6</u>	<u>3</u>
b. Street widened	<u>8</u>	<u>5</u>
c. One-way street implemented	<u>9</u>	<u>6</u>
d. Direction of one-way flow changed	<u>6</u>	<u>3</u>
e. Grade separation provided	<u>3</u>	<u>0</u>
f. Parking prohibited	<u>8</u>	<u>7</u>
g. Loading/unloading area provided	<u>4</u>	<u>11</u>
h. Traffic signal equipment changed	<u>18</u>	<u>11</u>
i. Traffic signal phasing or timing changed	<u>15</u>	<u>11</u>
j. None	<u>2</u>	<u>1</u>
k. Other (please specify)	<u>1</u>	<u>1</u>

14. Which of the following modifications were made to improve transit service to downtown?

a. Headways improved	<u>2</u>	f. New equipment purchased	<u>5</u>
b. Routes changed	<u>7</u>	g. Bus priority lanes implemented	<u>3</u>
c. Stop locations changed	<u>9</u>	h. None	<u>5</u>
d. Shelters provided	<u>8</u>	i. Other (please specify)	<u>2</u>
e. Fares changed	<u>4</u>		

15. Which of the following measures were taken to improve or increase parking availability in the vicinity of the mall?

a. On-street parking increased	<u>4</u>	e. Preferential parking rates	<u>6</u>
b. Off-street parking increased	<u>16</u>	f. Merchant validation stamp provided	<u>8</u>
c. Additional lots provided	<u>15</u>	g. Other (please specify)	<u>1</u>
d. Parking garages constructed	<u>15</u>		

16. How has annual transit ridership in the downtown area changed since the mall was built?
5 No change 10 Increase 0 Decrease

17. Which of the following provisions have been made to encourage bicycle or pedestrian access?

BICYCLES

PEDESTRIANS

a. Bike racks	<u>13</u>	d. Sheltered walkways	<u>5</u>
b. Bike routes	<u>5</u>	e. Grade-separated walkways	<u>2</u>
c. Other (please specify)	<u>0</u>	f. Pedestrian traffic signals	<u>10</u>
		g. Additional or improved sidewalks	<u>15</u>
		h. Mid-block crosswalks	<u>6</u>
		i. Other (please specify)	<u>4</u>

18. Which of the following improvements or modifications were made with respect to goods delivery to merchants located on the mall?

a. Rear or side access alleys improved	<u>16</u>
b. Time restrictions placed on goods delivery	<u>10</u>
c. Loading/unloading bays constructed	<u>6</u>
d. Deliveries consolidated to utilize fewer vehicles	<u>0</u>
e. Other (please specify) _____	<u>2</u>

19. Which of the following provisions were made in the mall design for emergency services?

a. Access alleys to mall	<u>6</u>
b. Adequate width on mall for vehicles	<u>18</u>
c. Water outlets or hydrants	<u>16</u>
d. Police telephones	<u>5</u>
e. Other (please specify) _____	<u>2</u>

20. In your opinion, how serious are the following problems in the vicinity of the mall now?

	No Problem	Minor Problem	Considerable Problem	Major Problem
a. Traffic accidents	<u>16</u>	<u>5</u>	<u>1</u>	<u>0</u>
b. Traffic congestion	<u>11</u>	<u>8</u>	<u>1</u>	<u>0</u>
c. Scarcity of parking	<u>13</u>	<u>4</u>	<u>1</u>	<u>1</u>
d. Poor transit service	<u>13</u>	<u>4</u>	<u>2</u>	<u>0</u>
e. Delivery of goods to downtown	<u>10</u>	<u>9</u>	<u>3</u>	<u>0</u>
f. Pedestrian/vehicle conflicts	<u>15</u>	<u>4</u>	<u>1</u>	<u>0</u>
g. Crime	<u>10</u>	<u>10</u>	<u>2</u>	<u>0</u>
h. Vandalism or vagrancy	<u>6</u>	<u>12</u>	<u>4</u>	<u>0</u>
i. Decline of central city property values	<u>15</u>	<u>6</u>	<u>0</u>	<u>1</u>
j. Attraction of shoppers to downtown	<u>6</u>	<u>9</u>	<u>6</u>	<u>1</u>
k. Attraction of businesses to downtown	<u>4</u>	<u>13</u>	<u>4</u>	<u>1</u>
l. Air or noise pollution	<u>17</u>	<u>3</u>	<u>2</u>	<u>0</u>
m. Sanitation	<u>18</u>	<u>3</u>	<u>1</u>	<u>0</u>
n. Other (specify)	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>

21. In your opinion, how successful was the mall in accomplishing the previously specified objectives?

	Very Successful	Moderately Successful	No Change	Detrimental
a. Compete with suburban shopping centers	0	9	8	0
b. Attract new businesses	5	11	4	0
c. Increase retail sales	6	8	6	0
d. Increase downtown property values	9	8	2	0
e. Increase downtown employment	4	11	2	0
f. Reduce traffic congestion	12	3	4	0
g. Reduce pedestrian/vehicle conflicts	12	5	3	0
h. Improve cultural environment	9	6	4	0
i. Reduce air or noise pollution	5	4	9	0
j. Make downtown esthetically attractive	13	5	2	0
k. Develop central activity center	6	11	3	0
l. Other (please specify)	2	0	0	0

22. Would you like a copy of our final report on the survey? Yes 17 No 5

Additional Comments: _____

Thank you very much for your time and effort in completing this questionnaire.

DEPARTMENT OF HIGHWAYS & TRANSPORTATION
JOHN E. HARWOOD, COMMISSIONER

L. E. BUSLER, III
DEPUTY COMMISSIONER AND
CHIEF ENGINEER

P. ROYER, JR.
DIRECTOR OF PLANNING



UNIVERSITY OF VIRGINIA
DR. FRANK L. HERFORD, JR., PRESIDENT
SCHOOL OF ENGINEERING & APPLIED SCIENCE
JOHN F. GIBSON, DEAN
DR. LESTER A. HOLL, CHAIRMAN
DEPARTMENT OF CIVIL ENGINEERING

COMMONWEALTH of VIRGINIA

HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

W. K. H. DILLARD, HEAD
VIRGINIA HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

BOX 3817 UNIVERSITY STATION
CHARLOTTESVILLE, VIRGINIA 22903

IN REPLY PLEASE REFER TO FILE NO. 30.2.8

The Virginia Highway and Transportation Research Council is conducting an evaluation of the impact of pedestrian malls on transportation in the vicinity of the mall. You can help us in this study by completing the attached questionnaire and returning it by March 24, 1978. The information you provide will remain confidential, and will be included in summary form in the final report. Enclosed is a self-addressed, stamped envelope for your convenience.

Should you have any questions concerning the questionnaire or the study, please contact Mr. R. N. Robertson at the above address, or call (804) 977-0290.

Thank you for your cooperation and assistance.

Sincerely,

William Oliver
Research Assistant

WO:shk

QUESTIONNAIRE

Survey of Merchants in Virginia

Your cooperation would be appreciated in a survey to aid in evaluating the impacts of the pedestrian mall upon transportation in the downtown area. This study is being done by the Virginia Highway and Transportation Research Council. Please complete this questionnaire and return it in the enclosed envelope by March 24, 1978. If you feel that some responses need clarification, feel free to include comments. Should you have any questions, please call R. N. Robertson at (804) 977-0290.

1. Type of business ALL MERCHANTS (93 RESPONDENTS)
(i.e. restaurant, clothing retail, bank, etc.)
2. What is your position?
 - a. Owner _____
 - b. Manager _____
 - c. Other (please specify) _____
3. How long has this business been at its present location?
_____ years _____ months
4. Prior to construction of the mall, how serious did you consider the following problems to be?
 - a. Business not located on mall at that time 17

	No Problem	Minor Problem	Problem	Considerable Problem	Major Problem
b. Delivery of merchandise	<u>52</u>	<u>14</u>	<u>6</u>	<u>0</u>	<u>1</u>
c. Traffic congestion downtown	<u>18</u>	<u>21</u>	<u>19</u>	<u>9</u>	<u>9</u>
d. Scarcity of parking	<u>15</u>	<u>16</u>	<u>23</u>	<u>13</u>	<u>13</u>
e. Poor transit service	<u>31</u>	<u>20</u>	<u>18</u>	<u>3</u>	<u>2</u>
f. Air or noise pollution	<u>35</u>	<u>22</u>	<u>8</u>	<u>6</u>	<u>3</u>
g. Attraction of clientele	<u>25</u>	<u>19</u>	<u>15</u>	<u>7</u>	<u>7</u>
h. Crime	<u>23</u>	<u>34</u>	<u>14</u>	<u>2</u>	<u>4</u>
i. Vandalism or vagrancy	<u>14</u>	<u>35</u>	<u>19</u>	<u>6</u>	<u>4</u>
j. Sanitation	<u>34</u>	<u>26</u>	<u>16</u>	<u>2</u>	<u>0</u>
k. Attraction of new businesses	<u>16</u>	<u>12</u>	<u>23</u>	<u>14</u>	<u>9</u>
l. Decline of property values	<u>19</u>	<u>14</u>	<u>19</u>	<u>11</u>	<u>5</u>
m. Other (please specify)	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>

5. When the mall was proposed, what effect did you feel it would have upon your establishment?

- a. Benefit 46
 b. No effect 16
 c. Detriment 18
 d. Not located downtown at that time 12

6. In your opinion, how serious were the following problems during construction of the mall?

- a. Business not located on mall at that time 15

	No Problem	Minor Problem	Considerable Problem	Major Problem
b. Delivery of merchandise	<u>25</u>	<u>16</u>	<u>18</u>	<u>11</u>
c. Traffic congestion downtown	<u>16</u>	<u>18</u>	<u>18</u>	<u>10</u>
d. Scarcity of parking	<u>11</u>	<u>19</u>	<u>26</u>	<u>7</u>
e. Poor transit service	<u>22</u>	<u>22</u>	<u>14</u>	<u>9</u>
f. Air or noise pollution	<u>12</u>	<u>19</u>	<u>18</u>	<u>14</u>
g. Attraction of clientele	<u>7</u>	<u>24</u>	<u>16</u>	<u>12</u>
h. Crime	<u>23</u>	<u>27</u>	<u>12</u>	<u>7</u>
i. Vandalism or vagrancy	<u>18</u>	<u>28</u>	<u>14</u>	<u>9</u>
j. Sanitation	<u>23</u>	<u>20</u>	<u>17</u>	<u>7</u>
k. Other (please specify)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

7. During construction of the mall, what effect did the construction have upon your business?

- a. Benefit 4
 b. No effect 34
 c. Detriment 36
 d. Not located on mall at that time 14

8. Since completion of the mall, in your opinion how serious are the following problems in the vicinity of the mall?

	No Problem	Minor Problem	Considerable Problem	Major Problem
a. Delivery of merchandise	<u>46</u>	<u>21</u>	<u>13</u>	<u>3</u>
b. Traffic congestion	<u>49</u>	<u>17</u>	<u>15</u>	<u>3</u>
c. Scarcity of parking	<u>32</u>	<u>29</u>	<u>13</u>	<u>4</u>
d. Poor transit service	<u>50</u>	<u>18</u>	<u>5</u>	<u>4</u>
e. Air or noise pollution	<u>73</u>	<u>8</u>	<u>1</u>	<u>0</u>
f. Attraction of clientele	<u>44</u>	<u>17</u>	<u>13</u>	<u>5</u>
g. Crime	<u>29</u>	<u>37</u>	<u>12</u>	<u>2</u>
h. Vandalism or vagrancy	<u>16</u>	<u>38</u>	<u>15</u>	<u>6</u>
i. Sanitation	<u>57</u>	<u>18</u>	<u>10</u>	<u>3</u>
j. Attraction of new businesses	<u>35</u>	<u>19</u>	<u>15</u>	<u>6</u>
k. Decline of property values	<u>46</u>	<u>13</u>	<u>8</u>	<u>3</u>
l. Other (please specify)	<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>

9. Now that construction has been completed, what effect do you feel the mall has had upon your business?

- a. Benefit 53
 b. No effect 19
 c. Detriment 17

10. What methods are used to deliver merchandise or supplies to your place of business?
 (Mark any that apply)

- a. Rear delivery 46
 b. Front delivery 55
 c. Carry from nearby street 29
 d. Time-restricted delivery 24
 e. Joint delivery (Joint delivery is the use of a common vehicle by several businesses to receive and/or deliver supplies or merchandise) 0
 f. Other 1

11. How does the number of your customers now compare with the number before the mall was completed?

- a. Increased 44
 b. No change 17
 c. Decreased 19
 d. Not on mall before completion 13

General comments and observations: _____

Thank you very much for your cooperation in completing this questionnaire.

ALL MALL-USERS
380 Respondents

Pedestrian Survey of Mall Development

OBSERVE THE FOLLOWING:

1. Age a. 0-15 3 d. 41-55 95
 b. 16-25 103 e. over 56 74
 c. 26-40 99
2. Sex a. M 231 b. F 142

ASK THE FOLLOWING:

3. From where did you come to the mall today ?
- | | |
|------------------------|-----------|
| a. Home | 263 |
| b. School | 7 |
| c. Work | 91 |
| d. Other shopping area | 1 |
| e. Recreation | 0 |
| f. Other (specify) | <u>16</u> |
| g. No response | 2 |
4. What is the main purpose of your trip to the mall today ?
- | | |
|---------------------|-----------|
| a. Work | 74 |
| b. Shop | 132 |
| c. Recreation | 65 |
| d. Business related | 53 |
| e. Lunch | 33 |
| f. Other (specify) | <u>23</u> |
5. How did you come to the mall today ?
- | | |
|--------------------|----------|
| a. Auto | 198 |
| b. Walk | 128 |
| c. Bicycle | 5 |
| d. Bus | 44 |
| e. Taxi | 5 |
| f. Other (specify) | <u>0</u> |
| g. No response | 0 |

IF AUTO:

6. Did you have any trouble finding a parking space ?
- | | | |
|-------------------------|------------------|---------------------------|
| a. <u>33</u> Yes | b. <u>150</u> No | c. <u>14</u> Did not park |
| d. <u>1</u> No response | | |
7. Do you feel you had to park too far from the mall ?
- | | | |
|-------------------------|------------------|---------------------------|
| a. <u>26</u> Yes | b. <u>159</u> No | c. <u>12</u> Did not park |
| d. <u>1</u> No response | | |
8. Do you often encounter traffic congestion in the vicinity of the mall ?
- | | | | |
|------------------|------------------|-------------------------|------------------------|
| a. <u>50</u> Yes | b. <u>124</u> No | c. <u>3</u> No response | d. <u>21</u> Sometimes |
|------------------|------------------|-------------------------|------------------------|

Continue to question 9.

IF WALK OR BICYCLE:

6. Do you often encounter obstructions in your path when you come to the mall ?
- | | | |
|-----------------|------------------|-------------------------|
| a. <u>9</u> Yes | b. <u>123</u> No | c. <u>0</u> No response |
|-----------------|------------------|-------------------------|
7. Do you often have conflicts with cars or trucks when you come to the mall ?
- | | | |
|------------------|------------------|-------------------------|
| a. <u>17</u> Yes | b. <u>126</u> No | c. <u>0</u> No response |
|------------------|------------------|-------------------------|

8. Was a car available to you for this trip to the mall?

3544 a. 41 Yes b. 58 No c. 10 No response

Continue to question 9.

IF BUS:

6. Do you feel that the bus stop is too far from the mall?

a. 3 Yes b. 40 No c. 1 No response

7. Do you feel the bus took too much time to bring you downtown?

a. 8 Yes b. 35 No c. 1 No response

8. Was a car available to you for this trip to the mall?

a. 13 Yes b. 30 No c. 1 No response

Continue to question 9.

IF TAXI:

6. Do you feel you had to walk too far from the taxi to the mall?

a. 0 Yes b. 5 No c. 0 No response

7. Do you often encounter traffic congestion in the vicinity of the mall?

a. 2 Yes b. 3 No c. 0 No response

8. Was a car available to you for this trip to the mall?

a. 1 Yes b. 4 No c. 0 No response

9. Do you feel that you come downtown now more often than before the mall was built?

a. 135 Yes b. 187 No c. 3 Don't know
d. 55 No response or not applicable

10. Before the mall was built how did you usually come downtown?

a. Auto 181 d. Bus 36 g. No response or not applicable 79
b. Walk 78 e. Taxi 2
c. Bicycle 2 f. Other (specify) 2

11. What street intersection is nearest your home?

_____ and _____

a. Out of town 148