URB 103

THE CITY OF
PORTLAND
OREGON

CONNIE McCREADY
MAYOR

OFFICE OF
PLANNING AND
DEVELOPMENT

BUREAU OF
PLANNING
621 S.W. ALDER ST.
PORTLAND, OR 97205

FRANK FROST
ACTING DIRECTOR
248-4253

CODE
ADMINISTRATION
248-4250

LONG RANGE
PLANNING
248-4260

SPECIAL
PROJECTS
248-4509

TRANSPORTATION
PLANNING
248-4254

HOUSING AND
POPULATION
248-5525

8 July 1980

MEMORANDUM

TO: Doug Obletz, Portland Development Commission

FROM: Michael Fisher, Bureau of Planning MEF

SUBJECT: Parking for Morrison Street Downtown Development

Purpose This memo discusses the "Morrison Street Downtown Development; Parking Demand Analysis," as prepared in May, 1980 by Bartman-Aschman Associates, Inc. for the Portland Development Commission.

The memo begins with a basic discussion of the parking lid in Downtown, and the importance of parking management within this lid. It discusses each of Bartman-Aschman assumptions which underly the parking demand analysis. An attempt is made to interpret the Downtown Parking and Circulation Policy in light of each of the consultant's assumptions.

A. Downtown Parking and Circulation Policy

A basic finding in the current study of the Downtown Parking and Circulation Policy Update is: Transit usage and development in Downtown will continue to grow at a rate equal to that of new commercial development. This is the basic reason why substantial commercial growth in Downtown has been accommodated since 1973 without increasing the supply of Downtown parking. Apparently, a redistribution of the parking supply has occurred.

This fact supports the point of view that the Downtown does not need to increase its parking supply. In general policy terms, the Downtown should maintain its parking lid. To keep a lid however requires that a parking management plan be implemented to encourage the appropriate redistribution of the current parking inventory.

The lid acts as a discipline to encourage the most efficient use of the available parking and Downtown land. Perhaps even more consequential, adding parking would reduce transit usage and slow transit growth.

With severe capacity limitations projected for the regional freeway system, transit growth and development appears to be the best strategy to increase regional access to the Downtown.

B. Parking Demand Analysis

This section provides comments on some of the assumptions used by the consultant to estimate parking demand.

1. Transit usage The consultant's survey has found the following modal split for shoppers who do not work in Downtown:

	Transit	Auto	Walk/Taxi
J. C. Penny	75%	18%	7%
M. & F.	64%	25%	11%
Nordstroms	38%	53%	9%
Total	52%	38%	10%

The survey results show a high transit usage to the retail core. The consultant's assumed modal split to the Morrison Street Development (55% auto) is questionable in light of the survey results (39% auto). From a policy viewpoint increasing the percent of auto usage to the retail core should not be encouraged. At a minimum, the existing percent auto usage should be maintained.

2. "Design day" assumption

The "design day" assumption used in the parking demand analysis represents the top 20 to 40 shopping days per year. (The top 20 days are termed "peak day", while the remaining 325 days are termed "average day" conditions).

Using the "design day" assumption is questionable from two points of view. First, the sizing of parking facilities to meet "design day" requirements would result in excess parking for eight out of every nine days. If the spaces are not filled, the garage would not operate with maximum economic efficiency. If the spaces are filled (probably with long-term parking), the City's support of transit growth and development would be undermined.

Second, Tri-Met has excess capacity in the off peak periods (afternoon) which correspond to the peak demand period for shopping trips. In other words, the parking for the Morrison Street Development could be sized on average day conditions, and that the additional access needs generated during peak shopping periods (the top forty days of the year) could be accommodated by the transit system.

This strategy would require careful promotion and public education. Free bus rides could be offered to shoppers making purchases in the retail core. Package handling is a problem, but improvements to buses could be made to assist shoppers with purchases. The City should encourage stores to make home deliveries where possible.

3. Auto occupancy The assumed average auto occupancy (1.4 persons per car) may be low for future conditions. With rising gasoline and parking costs, auto occupancy will likely increase. The City could encourage ridesharing to the retail core by providing special incentives.

4. % Shoppers Working Downtown The assumed % shoppers who work Downtown was reduced from that found in the survey. This assumption raises two concerns:

   First, it is questionable that the Downtown should compete, head to head, with regional shopping centers, like Washington Square or the Lloyd Center. Regional shopping centers are well dispersed throughout the region to serve trade areas reasonable commuting distance. It would not be efficient to encourage these trips to be diverted Downtown where parking is limited.

   Second, the Downtown retail core should continue to emphasize its special location in the center of region, and in the hub of region's transit system. The Downtown is unique, since it has a large office market readily accessible. The Downtown market should be expanded, but on the basis of its strength as an office center, a transit hub, and a specialty center serving the entire region.

In summary, the assumptions made for transit usage, "design day" conditions, auto occupancy, and % shoppers working downtown, are of concern. If these assumptions were adjusted, the maximum parking ratio for retail development, as currently established in the Downtown Parking and Circulation Policy, may be adequate for the parking requirements of the Morrison Street Development. The consultants' conclusions regarding the office and hotel parking ratios (1 sp/2000 sq. ft. and 0.5 spaces/room) are accepted.

We would be pleased to discuss these concerns with you at your convenience. Thank you for an opportunity to comment on this project.

MF:db

cc: Don Bergstrom, Bureau of Traffic Engineering
Bob Conradt
Steve Dotterrer, Bureau of Planning
Arnold Cogan, Cogan & Associates

DRAFT FOR REVIEW

MORRISON STREET
DOWNTOWN DEVELOPMENT

PARKING DEMAND
ANALYSIS

Prepared for
City of Portland
Development Commission

by
Barton-Aschman Associates, Inc.
Pasadena, CA

May, 1980

CONTENTS

LIST OF FIGURES AND TABLES

Figures

Tables

EXECUTIVE SUMMARY

Cadillac Fairview US has proposed to build a major development in Downtown Portland, Oregon. The development would consist of retail uses, an office building and a hotel on a four-block site bounded by Morrison, Third, Taylor and Fifth Streets in Downtown Portland.

Barton-Aschman Associates has been retained by the Portland Development Commission to investigate the parking demand and calculate the parking supply needed by the proposed development. The parking analysis is to take into account the amount of business that the development is likely to receive from Downtown employees and the influence of transit on the overall parking demand.

Over 1,360 interviews were conducted by Barton-Aschman Associates and pedestrian and vehicular occupancy counts were undertaken in Downtown Portland in order to document existing conditions.

The interviews and surveys showed that 45% of the people shopping in the major department stores Downtown are in fact Downtown employees. Also, the survey showed that between 50 and 60% of the Downtown shoppers (exclusive of Downtown employees) arrived by bus, taxi or on foot. These numbers serve to dramatically reduce the supply of on-site parking that must be provided in order to accommodate the demand.

Projecting the above shopper characteristics into the future and applying them to the proposed development yields the following parking supply requirements:

Use	Parking Supply
Retail	605 - 905 spaces
Office	150 - 250
Hotel	125 - 175
	880 -1,330
Less Shared Spaces	50 - 70
New Supply Required	830 -1,260 spaces

Non-concurrent peak activity periods allow for the consideration of shared spaces between office and hotel uses. These shared spaces reduce the overall space requirement to 830-1,260 spaces.

Although this parking supply seems very large in a Downtown where a major transit commitment has been made, it should be emphasized that these numbers reflect and, in fact, support that commitment. The provision of 830-1,260 spaces will make the Morrison Street Downtown Development the most transit-oriented retail facility outside of New York City.

If the Morrison Street Downtown Development were built in a suburban location without transit and without the potential for Downtown employee patronage, the development would require 3,500-5,400 spaces--or approximately four times as many as are required in its proposed location.

1.

INTRODUCTION

Barton-Aschman Associates has been retained to review the required parking supply for Cadillac Fairview's proposed Morrison Street Downtown Development located in Downtown Portland. At the present time, the proposal is still in the planning stages and, therefore, the precise amount of development has not yet been determined. The proposal ranges are as follows:

Retail	400-600,000 square feet
Office	300-500,000 square feet
Hotel	250-350 rooms

The proposed site for the development is bounded on the north by Morrison Street and on the east by Third Avenue. The site encompasses four square blocks and it is proposed that all streets will remain open and the four blocks will be connected by pedestrian overpasses. The site is very well located with respect to transit in that the existing Fifth Avenue bus transit mall runs along the west side of the site and the Banfield light rail line is planned to run inbound on Morrison Street and outbound on Yamhill Street through the project site.

STUDY PURPOSE

The purpose of this study is to determine the appropriate parking ratios for the alternate land uses proposed as a part of the development. These parking ratios must be determined in the context of the Portland Downtown environment--transit usage, potential walk-in trade, Downtown employee population, anticipated growth in retail and office space, etc.

Because the development itself is still in the formulation stages, a specific number cannot be recommended. Rather, this report will concentrate upon developing appropriate parking ratios which can then be applied to the final plan.

STUDY SCOPE

As originally envisioned, this study would rely on existing data and it would compare the proposed development in Downtown Portland to a number of other downtown retail/office facilities that are being constructed in the western United States. However, very early in the study it became evident that there was not sufficient data available regarding parking patterns in Downtown Portland and, therefore, new data was collected. Also, because there is a strong feeling that the success of the Portland Transit System makes Portland's situation unique, it was obvious that a detailed comparison of the Morrison Street Downtown Development to other downtown Developments would be of little use in determining the appropriate parking ratios for Portland Development.

Therefore, the scope of the study was expanded to include a substantial amount of new data collection. Interviews of Downtown shoppers, surveys of vehicle occupancy and pedestrian counts were taken during the first week of April, 1980.

In addition, major retailers in Downtown Portland were contacted and a limited amount of data was supplied to the study team by the retailers.

This report does not discuss the traffic generation, traffic distribution or the potential traffic impacts that might result from the implementation of the proposed development. The report does not discuss the actual design of the parking facilities nor the access or loading treatments of the development. This report is strictly an analysis of the parking supplies and demands for the development.

The report does not attempt to relate the parking needs of this development to the "parking lid" now in effect in Downtown Portland. The issue of the parking lid is now under study by the City of Portland as a part of the update of the Downtown Parking and Circulation Plan and Policy. This study provides a strictly analytical evaluation of

the parking supplies and demands of this development. The results of this study will be forwarded to the City for incorporation into the on-going study of parking and circulation in the Downtown. The relation to the parking lid will be investigated after the appropriate parking demand has been determined for the development.

Also for the purposes of a purely analytical approach to parking demand, the report disregards the following maximum parking rates that are now in effect in Downtown Portland:

Retail	1 space per thousand square feet
Office	1 space per thousand square feet
Hotel	1 space per room

STUDY PROCEDURES

The following steps were followed in the conduct of the parking demand analysis:

1. Existing data was collected from governmental agencies and from Downtown retailers. New data collection was also conducted in the form of pedestrian counts, vehicle occupancy surveys and Downtown shopper interviews.

2. Interviews with both public and private agencies were conducted in order to gain background data.

3. Data was summarized from the interviews and pedestrian counts so that Downtown Portland shopping patterns could be identified.

4. Parking ratios for the development were calculated based upon the data collected in the above surveys.

2.
EXISTING CONDITIONS

A series of data collection efforts was undertaken to document the existing shopping patterns of the Portland central business district. Data was collected during the first week of April, 1980 at three Downtown department stores--Nordstrom's, JCPenney, and Meier and Frank. The results of this data collection are summarized in the following paragraph.

SURVEY RESULTS

Pedestrian Generation

Pedestrian counts at every door of both the JCPenney and the Nordstrom's Downtown stores were taken from 9:30 a.m. until 6:00 p.m. The counts were summarized on a 15 minute basis so that peak accumulations could be determined. The JCPenney store had approximately 2,550 patrons in and another 2,550 patrons out of the store during the daylong period. The Nordstrom's store had almost 5,000 patrons in and 5,000 out during the same 9:30 a.m. to 6:30 p.m. period.

When converted into a trip generation rate, the Penney's store generated 92 person trips per thousand square feet of store area while the Nordtrom's store generated 64 trips per thousand square of store area.

A regional shopping center in a suburban location generates approximately 63 trips per thousand square feet of floor area on an average day. Therefore, the trip generation rate for the Nordstrom's store will be used in this analysis.

Figures 1 and 2 show the arrival and departure patterns for customers in and out of the two department stores. Both stores peak in activity at approximately 12:00 noon. The Nordstrom's store experienced a peak accumulation of 10% of the inbound traffic. The peak accumulation occurred during the middle of the noon hour. 1975 counts supplied by Meier and Frank showed that their peak accumulation was 11% of their patrons and it occurred also during the noon hour.

Shopper Interviews

Over 1,600 interviews were conducted outside of Nordstrom's, Meier and Frank and JCPenney to ascertain the number of employees, the mode of arrival, trip purpose, and duration. Zip codes were also collected to help in the assignment of automobile trips to the street network. This zip code information, however, has not been used in this analysis. It will be used in subsequent traffic impact analyses of the proposed development.

Figure 3 shows a copy of the interview survey form used to conduct the interviews.

Table 1 shows that of the 1,630 interviews conducted, slightly over 45% of the people interviewed said that they worked in Downtown. Also, approximately 75% of those interviewed said that they were going to shop in more than one store.

Table 2 shows that approximately 40% of the Downtown shoppers (exclusive of the CBD employees) arrived at the store by way of the automobile. Fifty percent use bus and another 10% either walked or took a taxi to the store. Table 3 shows a breakdown of mode of arrival by store indicating that a much larger proportion of the JCPenney customers use transit than do the Nordstrom's customers.

Table 4 shows that 30% of the people shopping in Downtown said that they were going to stay in Downtown for less than one hour. Another 50% said that they would stay between one and three hours. This duration information is consistent with 1975 Meier and Frank surveys that showed that the average time of a customer in their store was 29 minutes. These duration patterns are shorter than would be expected in a large shopping center. Very few people stay at a regional shopping center less than one hour and the greatest majority of the patrons stay at the shopping center between one and three hours.

Nordstrom Shopper Counts, Portland, Oregon Date: April 3, 1980, Thursday

ENTRANCE / EXIT	SHOPPER MOVEMENT	TIME (09:30AM - 06:00PM)																																			TOTAL
		AM											Noon				PM																					
		9:30	9:45	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00	12:15	12:30	12:45	1:00	1:15	1:30	1:45	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45	4:00	4:15	4:30	4:45	5:00	5:15	5:30	5:45	6:00	
Morrison - Broadway	IN	32	27	33	49	65	30	57	72	66	95	101	149	114	84	95	97	77	67	77	63	53	49	55	58	67	55	54	40	41	56	53	58	32	21	2136
	OUT	8	22	20	37	62	33	43	60	65	55	81	108	160	122	86	107	94	68	67	79	69	79	56	57	70	68	57	62	56	56	54	39	39	41	2160
Morrison - Park	IN	17	15	13	21	27	24	26	28	44	33	52	68	62	57	37	31	30	23	33	10	21	32	31	31	24	27	22	23	40	34	21	20	20	12	1009
	OUT	2	11	14	13	13	25	35	27	41	27	46	50	53	47	49	39	36	19	20	20	24	42	52	26	35	23	44	40	27	34	34	30	30	22	1053
Yamhill - Park	IN	19	18	21	21	22	30	27	32	29	23	37	35	30	25	38	37	32	16	13	14	18	19	25	27	18	10	85	23	13	21	11	18	24	9	780
	OUT	4	8	9	9	8	12	10	11	22	24	19	9	27	18	27	28	16	13	10	8	8	6	11	12	16	12	14	14	11	15	10	14	23	15	443
Yamhill - Broadway	IN	7	15	14	13	24	23	32	26	30	70	89	61	53	48	50	37	34	12	32	11	18	49	39	38	24	37	20	20	17	29	27	24	13	10	1046
	OUT	8	5	14	16	15	26	15	41	40	43	58	95	63	96	65	56	63	22	8	9	33	57	36	29	29	31	25	31	23	27	38	23	31	42	1153
TOTAL	IN	75	75	81	104	138	107	142	158	169	221	279	311	259	214	220	202	173	118	155	98	110	149	150	154	133	129	121	106	111	140	112	116	89	52	4977
	OUT	22	46	57	75	98	96	103	139	168	149	204	212	303	273	227	225	209	122	109	116	134	184	155	124	150	132	140	127	107	132	116	110	123	120	4839

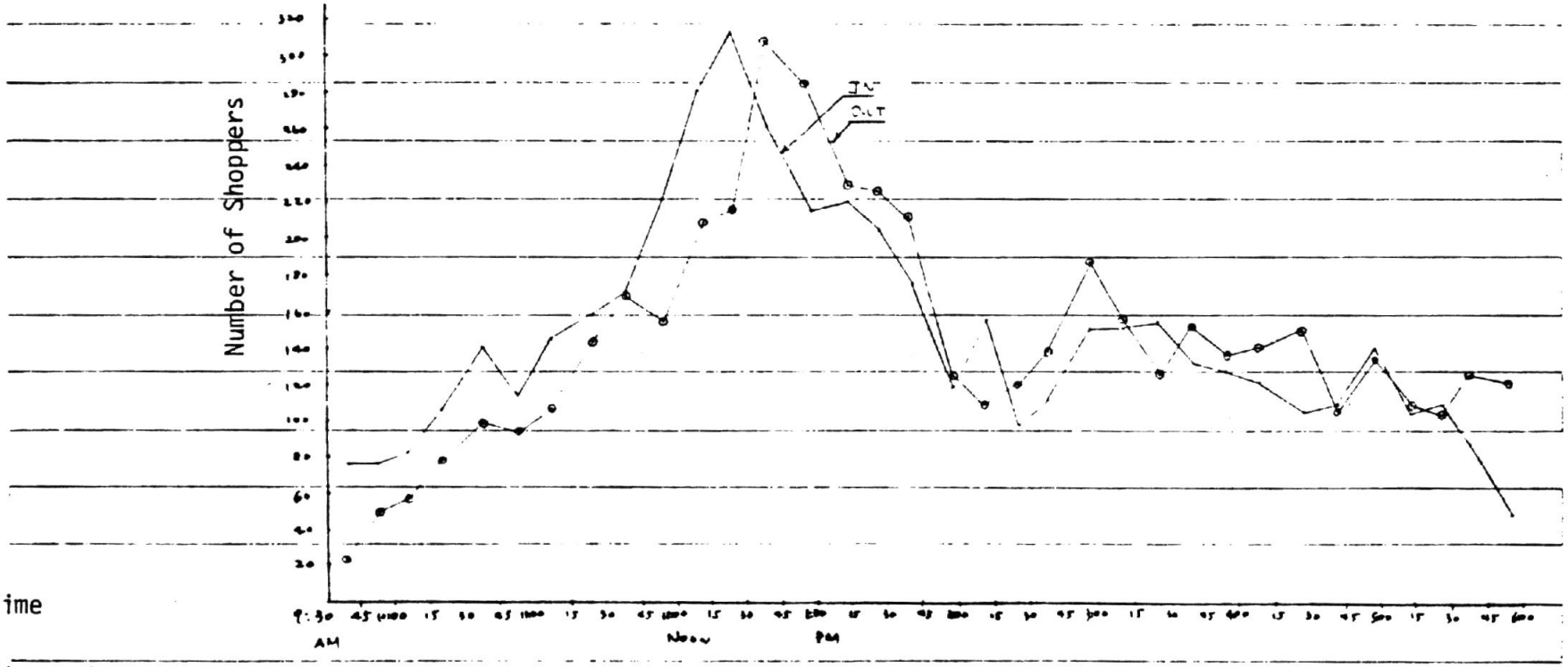

Figure 1

SHOPPER ARRIVALS & DEPARTURES - NORDSTROM'S

J C Penny Shopper Counts, Portland, Oregon Date: April 3, 1980, Thursday

ENTRANCE/EXIT \ TIME (09:30 AM – 06:00 PM)		9:30–9:45	9:45–10:00	10:00–10:15	10:15–10:30	10:30–10:45	10:45–11:00	11:00–11:15	11:15–11:30	11:30–11:45	11:45–12:00	12:00–12:15	12:15–12:30	12:30–12:45	12:45–1:00	1:00–1:15	1:15–1:30	1:30–1:45	1:45–2:00	2:00–2:15	2:15–2:30	2:30–2:45	2:45–3:00	3:00–3:15	3:15–3:30	3:30–3:45	3:45–4:00	4:00–4:15	4:15–4:30	4:30–4:45	4:45–5:00	5:00–5:15	5:15–5:30	5:30–5:45	5:45–6:00	TOTAL
MORRISON – 4th	IN	6	10	14	8	8	9	6	8	13	18	30	54	20	20	16	14	19	8	9	16	18	7	7	10	6	8	13	15	9	8	4	11	6	4	412
	OUT	6	6	9	6	11	9	4	6	6	13	15	29	22	22	23	22	10	9	14	13	13	5	10	12	13	5	12	7	5	12	12	10	2	6	379
MORRISON – 5th	IN	10	26	26	21	31	42	27	28	33	75	85	74	75	76	41	89	53	43	44	37	37	29	58	46	29	29	31	20	33	29	24	36	10	8	1355
	OUT	9	18	33	15	37	32	26	32	24	49	68	62	65	67	36	62	75	48	45	43	42	17	51	41	34	28	27	21	23	25	25	28	10	14	1232
5th	IN	10	18	15	27	14	13	18	21	26	42	38	68	39	48	33	31	22	22	38	20	23	24	22	20	32	17	19	19	3	9	25	16	6	2	800
	OUT	13	6	20	14	11	14	20	17	38	43	49	66	49	46	43	42	26	27	29	30	27	17	18	30	36	19	21	22	13	14	21	19	9	1	870
TOTAL	IN	26	54	55	56	53	64	51	57	72	135	153	176	134	144	90	134	94	73	91	73	78	60	87	76	67	54	63	54	45	46	53	63	22	14	2567
	OUT	28	30	62	35	59	55	50	55	68	105	132	157	136	135	102	126	111	84	88	86	82	39	79	83	83	52	60	50	41	51	58	57	21	21	2401

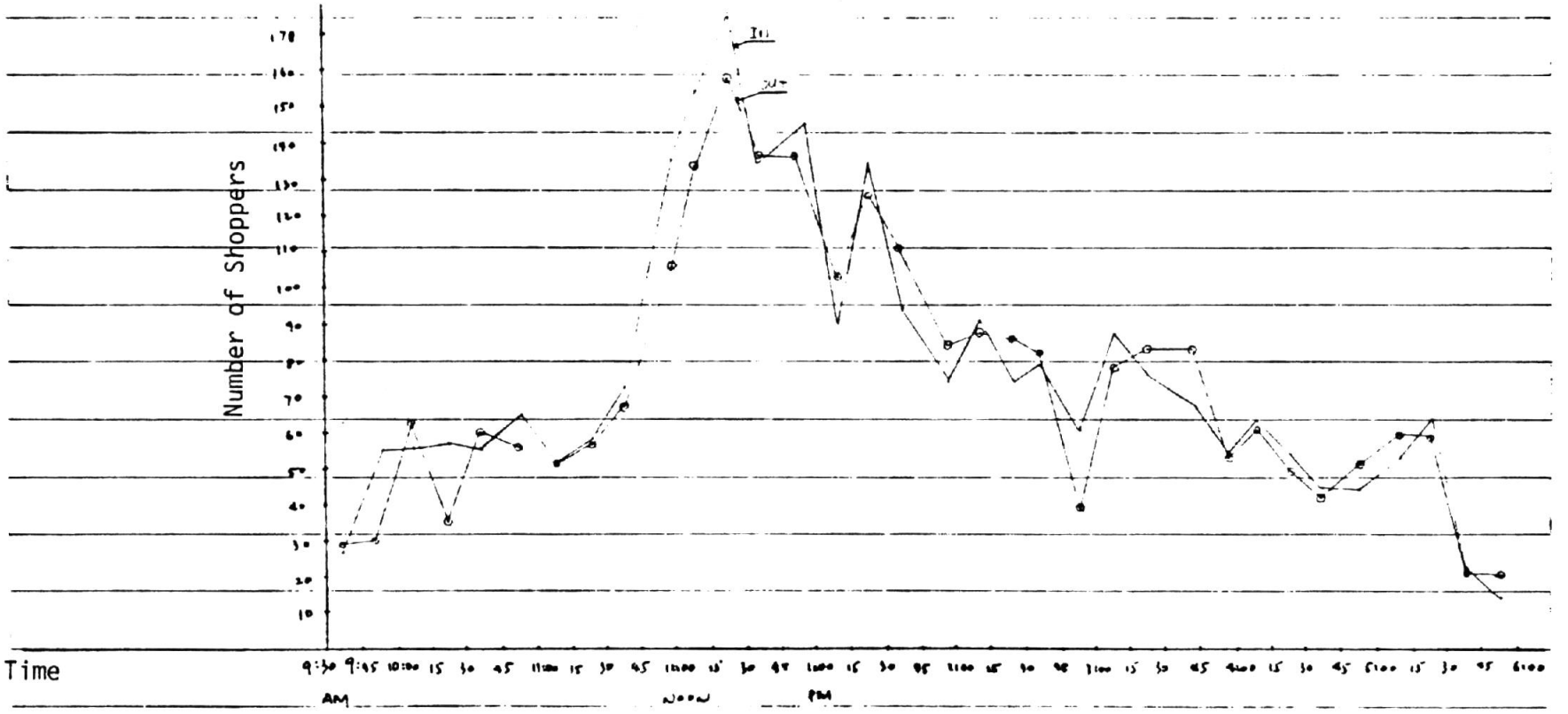

Figure 2

SHOPPER ARRIVALS & DEPARTURES - JCPENNEY

Figure 3
PORTLAND SHOPPER INTERVIEW SURVEY

STATION: JCP 1 JCP 2
M&F 1 M&F 2
NORDS 1 NORDS 2

TIME: 9 10 11 12 1 2 3 4 5 (hour)
00 15 30 45 (minutes)

TRIP PURPOSE CODE

1 - Work	6 - Bank
2 - Shopping	7 - Restaurant
3 - School	8 - City Hall/Library
4 - Social/Recreation	9 - Post Office
5 - Personal Business	10 - Other (specify)

ASK THESE QUESTIONS

1. Do you work in Downtown?		2. How did you arrive Downtown?				3. Will you shop more than one store?		4. How long will you stay Downtown? (in hours)	5. Zip Code of your home address	6. What is the purpose of your trip Downtown?
Yes	No	Auto	Bus	Taxi	Walk	Yes	No			

Interviewer: _____

Table 1
SHOPPER INTERVIEW RESULTS

Number of Interviews	1630	
Percent of Shoppers Who Work Downtown		46.5%
Percent of Shoppers who will Shop in More Than One Store		75.2%

Table 2
MODE OF ARRIVAL

Auto	38.6%
Bus	51.5%
Taxi	0.7%
Walk	9.2%
	100.0%

Table 3
MODE SPLIT BY DEPARTMENT STORES
(Shoppers who do not work in downtown only)

Department Store	MODE SPLIT				
	Auto	Bus	Taxi	Walk	Total
JCPenny	23 (17.7%)	97 (74.6%)	0	10 (7.7%)	130 (100.0%)
M & F	70 (25.2%)	177 (63.7%)	2 (0.7%)	29 (10.4%)	278 (100.0%)
Nordstrom	244 (52.6%)	175 (37.7%)	4 (0.9%)	41 (8.8%)	464 (100.0%)
Total	337 (38.6%)	449 (51.5%)	6 (0.7%)	80 (9.2%)	872 (100.0%)

Table 4
SHOPPING DURATION

Less than 1 hour	30.0%
1 - 2 hours	31.0%
2 - 3 hours	19.0%
3 - 4 hours	9.0%
4 - 5 hours	4.0%
Over 5 hours	7.0%
	100.0%

Table 5 shows the responses of the interviewees with respect to trip purpose. Slightly over half of the people entering the three department stores said that their primary purpose in coming Downtown was to shop. The significant factor in this table is that almost half of the people who are shopping in Downtown Portland are in fact merely stopping off during a trip that has a primary purpose other than shopping.

Vehicle occupancy counts were taken as cars entered the parking garages serving the retail activities Downtown. The locations surveyed included the Morrison Park East and West structures, the Pioneer Square garage and two surface lots in the vicinity of the retail core. Over 750 cars were surveyed and the average auto occupancy was 1.4 persons per car.

INTERPRETATION OF RESULTS

The interview results shows that the Downtown retail area does in fact have a very high percentage of Downtown employees as retail customers. The activity concentrates at noon time and at 5:00 p.m. when the percentage of CBD employees entering the department stores reaches approximately 66%. During the mid-morning and mid-afternoon periods when most of the CBD employees are at their jobs, this percentage falls to 25 to 30%.

The peak accumulation of shoppers occurs during the noon hour. When the central business district employees are factored out of the picture, the peak accumulation of non-employees occurs slightly before noon.

The use of transit by Downtown shoppers is extremely high which can at least in part be attributed to the location of the three department stores very near the bus transit mall. Nordstrom's customers have a lower tendency to use transit than do JCPenney customers.

Although the majority of the people said that they were going to shop in more than one store, the relatively short duration times suggest that people are coming Downtown for very specific buying purposes and then leaving rather quickly.

Table 5
TRIP PURPOSE

Work	10.0%
Shop	52.0%
School	6.0%
Social/Recreational	6.0%
Personal Business	14.0%
Bank	2.0%
Restaurant	4.0%
Other	6.0%
	100.0%

APPLICATION OF DATA

In order to apply the information obtained during the surveys and pedestrian counts, one must carefully consider the peaking characteristics of retail land uses. Typically when traffic and parking planning is done for shopping centers and major retail facilities, three different types of activity periods are considered--average day, design day and peak day. An average day represents a typical shopping weekday. A design day represents the 20th to 40th highest day of the year. It would normally occur as a weekday sometime before the Thanksgiving and Christmas shopping season began. A peak day represents one of the highest 20 days per year and it is usually found in the period immediately prior to Christmas.

Retail establishments typically provide a traffic and roadway system capable of accommodating traffic on a design day at an acceptable level of service. Parking supplies on the other hand are designed to meet the peak days of the year. This is because much of the business and in fact most of the profit generated by retail establishments over the year occurs during the pre-Christmas peak. This time period is so critical to retailers that they are willing to provide an adequate parking supply for these peak days of the year.

Confidential sales information from the Downtown JCPenney store was provided in order to allow us to expand the April pedestrian counts to reflect average, design and peak days of the year in Downtown Portland. A design day would experience 66% greater pedestrian levels than were seen during the April counts, while a peak day would experience 130% of the activity seen in April. The monthly sales variations provided by JCPenney were consistent with other retail data in our files and therefore we believe that they are appropriate for use in this study.

3.
FUTURE CONDITIONS

Both land-use changes and changes in Downtown patterns must be considered before applying the existing data to the proposed development.

LAND-USE CHANGES

The economic consulting firm of Lord and Associates has projected the following major changes in Downtown land-uses during the 1980s:

1. Approximately 5,000,000 square feet of office space will be developed in Downtown Portland resulting in an increase of 25,000 employees to the Downtown work force.

2. A total of 1,000,000 square feet of retail development is proposed over the same 10-year period.

3. There is a market for two major hotels in Downtown Portland.

4. Government office buildings, a theater and up to 4,000 new residential units could also be developed during the 1980s.

The results of these land-use changes would be to bring more employees to the central business district and more non-CBD employees to Downtown area to shop and live.

TRANSPORTATION CHANGES

In addition to increasing the bus service to/from Downtown, the Banfield light rail line will be developed from Eversham to Downtown Portland. The alignment now being planned for the light rail line would route the line inbound on Morrison Street along the north side of the proposed development and outbound on Yamhill Street through the center of the project. This would provide direct access to the proposed development.

The long-range goal of the City of Portland is to develop a mass transit system which would ultimately carry 65-75% of all the passenger trips to and through the Downtown area. An April, 1979 report, "An Assessment of Alternative Alignments for Light Rail Transit in Downtown Portland," suggest that if the successful trends of the transit patronage increases continue, "a 50% Downtown modal split (auto/transit) would be achieved between the years 1990 and 2000."

In the shorter range, Tri-Met has projected an annual growth in ridership of 11% per year between 1980 and 1985.

APPLICATION OF CHANGES

The two factors that most affect the potential parking demand of the proposed development are the mode split of patrons to the development and the percent of Downtown employees who will use the facilities.

The Downtown employees now make up approximately 45% of the shoppers at the three major department stores Downtown. However, over the next 10 years over 25,000 new employees will be added to the Downtown area. In this same time period, 1,000,000 square feet of retail is proposed to be added. Since this retail use typically requires a population base of 150,000 to 250,000 people, it is clear that the retail space will require more new customers than the new office space users can provide. Therefore, the percentage of Downtown employees that make up the market area for Downtown retail will be reduced in the future. Also, on design and peak days, non-employee shoppers can be expected to increase in percentage over what was counted in the April, 1980 counts.

In terms of future projections, the mode split has been calculated at 50% transit for an average day, 45% for design day and 40% for a peak day. The base number of 50% on an average day takes into consideration the usage patterns of the Nordstrom's customers. This increasing use of the automobile to reach Downtown retail on design and peak days is due to the tremendous increase in person trips generated on these days. In addition, since these design and peak days usually represent times when a great deal of shopping is done and a large number of purchases are made, the handling of packages makes these trips somewhat less susceptible to transit.

It should be emphasized here that the 40% transit usage on a peak day will make the Morrison Street Downtown Development the highest transit-oriented center outside of New York City. Typical transit usage to a suburban shopping center is in the neighborhood of 5% of the total trips. The highest transit usage to any retail facility on the west coast now is approximately 20% at Stonestown Shopping Center in San Francisco, California. The Morrison Street Downtown Development will double this transit usage even on a peak day.

4.
PARKING DEMAND

This chapter discusses the analysis and calculation for the individual land uses and presents a parking ratio for each land use.

RETAIL

Table 6 shows a summary of the retail shopping characteristics and assumptions described earlier in this report.

Person trip generation is based upon the Nordstrom's counts since they were the most representative of a regional shopping center.

Mode split shows the percentage of persons arriving by auto. The increases in automobile arrivals during the design and peak days reflect the tendency of shoppers to drive on those days when they are likely to have a number of packages to carry. The mode split numbers also relate to the results of the surveys conducted at the Nordstrom's store.

Non-CBD employees shows the percentage of shoppers that will come from outside the central business district. The number increases slightly over existing because the retail in the central business district will grow faster than will the office population.

Auto occupancy remains constant at 1.4 persons per automobile for all conditions.

Peak accumulation remains at 11%, the same as was found in the Meier and Frank surveys.

Table 6

SUMMARY OF RETAIL SHOPPER CHARACTERISTICS

	Existing Conditions	Projected Conditions		
Season	Average	Average	Design	Peak
Inbound Pedestrian Generation (person trips/1000 square feet)	32.0	32.0	53.1	73.7
Percent Arrival by Auto	40.0%	50.0%	55.0%	60.5%
Percent Non-CBD Employee	55.0%	55.0%	60.0%	65.0%
Auto Occupancy (persons per car)	1.4	1.4	1.4	1.4
Peak Accumulation	11.0%	11.0%	11.0%	11.0%
Full Utilization Factor	0.85	0.85	0.90	0.95

Full-utilization factor is a design adjustment used to plan an adequate parking supply. Once the precise parking demand is calculated, that demand is divided by the "full-utilization factor" to provide a supply that takes into account parking turnover, searching time, single cars parked in two stalls, etc. Typical parking lots are planned to operate at 85% of their actual capacity except on design and peak days when somewhat higher parking congestion is tolerable to shoppers.

Retail parking demand has been calculated three different ways in order to determine an appropriate parking ratio for the proposed development. First, typical parking generation rates used in retail facility planning have been applied to the Downtown site. Second, person trip generation rates have been used as the basis for calculating maximum parking demand. Lastly, the present maximum accumulation at the Nordstrom's store was projected forward and calculated as a parking ratio. A summary of the three methods is presented below.

Parking Ratio

A regional shopping center typically uses 5.5 spaces per 1,000 square feet as a standard for design. Recent Barton-Aschman Associates' research reported in the Urban Land Institute Publications indicated that the 5.5 ratio could be reduced based upon transit potential, trade area characteristics, competition, and other factors.

Applying the transit and the CBD employee factors to the peak parking demand ratios typically found at retail centers yields parking ratios of 0.98, 1.65 and 2.25 spaces per 1,000 square feet for average, design and peak days respectively. Table 7 shows a summary of the calculations leading up to these parking ratios.

Person Trip Calculations

Table 8 takes the person trips generated by the retail users on a given day and factors out the central business district employees and then the non-employees that arrive by transit. A division of that result by 1.4 auto occupancy yields the number inbound autos that have to be accommodated in a given day. An 11% peak accumulation

Table 7

RETAIL PARKING SUPPLY CALCULATION USING PARKING RATIO TECHNIQUE

Factor	Season		
	Average	Design	Peak
Parking Demand (Spaces/1000 s.f.)	3.0	4.5	5.5
Percent Non-CBD Employee	X0.55	X0.60	X0.65
	1.65	2.70	3.56
Percent Auto Arrival	X0.50	X0.55	X0.60
	0.83	1.48	2.14
Full Utilization Factor	÷0.85	÷0.90	÷0.95
MORRISON STREET PARKING RATIO (Spaces/1000 s.f.)	0.98	1.65	2.25
MORRISON STREET PARKING RATIO (1 space/X s.f.)	1/1020	1/600	1/445

Table 8

RETAIL PARKING SUPPLY CALCULATION USING THE PERSON-TRIP TECHNIQUE

Season	Average	Design	Peak
Entering Person Trips (person trips/1000 s.f.)	32.0	53.1	73.7
Percent Non-CBD Employee	X 0.55	X 0.60	X 0.65
	17.6	31.9	47.9
Percent Auto Arrival	X 0.50	X 0.55	X 0.60
	8.8	17.0	28.7
Auto Occupancy	÷ 1.4	÷ 1.4	÷ 1.4
	6.28	12.53	20.5
Peak Accumulation	X 0.11	X 0.11	X 0.11
	0.69	1.38	2.25
Full Utilization Factor	÷ 0.85	÷ 0.90	÷ 0.95
MORRISON STREET PARKING RATIO (spaces/1000 s.f.)	0.81	1.53	2.37
MORRISON STREET PARKING RATIO (1 space/ X s.f.)	1/1235	1/655	1/420

factored by the "full-utilization factor" yields the parking ratio for the development. The results show parking ratios of 0.81, 1.53 and 2.37 spaces per thousand square feet for average, design and peak days respectively.

Accumulation

The counts at the Nordstrom's store showed a maximum accumulation of 490 persons in the store at 12:30 p.m. Of this total, 290 were non-CBD employees. Table 9 shows the calculation of parking ratio based on this 290 non-CBD employee accumulation. The 290 persons are factored by the transit mode split and then by the auto occupancy and seasonal adjustment factor. The application of the full-utilization factor yields the maximum number of parked cars that should be planned for the Nordstrom store. Since the Nordstrom store is 154,000 square feet, a division by 154 yields a parking ratio for the store. The results show that the parking ratio would be 0.79, 1.36 and 1.95 for average, design and peak days respectively.

Retail Summary

The maximum allowable rate now in effect in Downtown Portland for retail uses (1 space per 1,000 square feet) would adequately accommodate average day conditions, but it would not accommodate either design day or peak day traffic. Since outlying shopping centers provide parking for peak-day demand, the provision of only average day parking supply would put the Morrison Street Downtown Development at a serious competitive disadvantage. Table 10 shows the results of averaging the three techniques just described. It is recommended that on-site provision be supplied to accommodate design-day demand. Therefore, a parking ratio of 1.51 spaces per thousand square feet (or 1 space per 660 square feet) should be provided for the retail space in the Morrison Street Downtown Development.

Peak-day parking demand can take place off-site in other lots/structures in the vicinity of the proposed development. The primary off-site demand will be accommodated in the Morrison Park East structure.

The use of the recommended parking ratio would yield a need for 605-905 spaces depending upon the final size of the development.

Table 9

RETAIL PARKING SUPPLY CALCULATION USING THE ACCUMULATION TECHNIQUE

Season	Average	Design	Peak
Peak Accumulation (persons in store)	290	290	290
Percent Auto Arrival	X 0.50	X 0.55	X 0.60
	145	159.5	174
Auto Occopancy	÷ 1.4	÷ 1.4	÷ 1.4
	103.6	113.9	124.3
Seasonal Adjustment	X 1.00	X 1.66	X 2.30
	103.6	189.1	285.9
Full Utilization Factor	÷ 0.85	÷ 0.90	÷ 0.95
	121.8	210.0	300.9
Nordstrom's Store Size (000 s.f.)	÷ 154	÷ 154	÷ 154
MORRISON STREET PARKING RATIO (spaces/1000 s.f.)	0.79	1.36	1.95
MORRISON STREET PARKING RATIO (1 space /X s.f.)	1/1265	1/735	1/515

Table 10

RETAIL PARKING RATE SUMMARY

Technique	Parking Ratio (Spaces/1000 S.F.) Average	Design	Peak
Ratio	0.98	1.65	2.25
Person Trip	0.81	1.53	2.37
Accumulation	0.79	1.36	1.95
Average	0.86	1.51	2.19
MORRISON STREET PARKING RATIO (1 space/X s.f.)	1/1160	1/660	1/455

OFFICE

Surveys similar to those conducted for the retail development were not taken at office locations because of time constraints. However, much documentation does exist as to the historical treatment of CBD office space vs. parking supply.

The maximum allowable parking supply in Downtown Portland for office space is 1 space per 1,000 square feet, however, much less than that has been provided recently for office developments adjacent to the transit mall where excellent transit access is available. The Morrison Street Downtown Development does have excellent transit potential and, therefore, the following analysis was performed taking the transit accessibility into consideration.

At the present time, 40-50% of the Downtown office workers arrive to their offices by bus. Since the overall goal of Downtown Transit is to attain a 60-75% transit usage and 50% overall transit usage appears achievable by 1990-2000, it is clear that a substantial portion of the office development travel can be served by transit. Therefore, it is recommended that the parking ratio for the office development be established so that transit usage will be taken into account and in fact encouraged.

The parking ratio calculated for the office space assumes a high transit usage and an increase in auto occupancy to reflect possible incentives to carpools. Assuming an 85% transit usage and assuming that 25% of the auto parking spaces would be reserved for carpools (three or more persons), a parking ratio of 1 space per 2,000 square feet of office development would result.

This ratio would require 150 to 250 spaces be allocated to office use.

HOTEL

At the present time the maximum parking allowable Downtown for a hotel use is 1 space per room. With 250 to 350 rooms being planned as a part of the Morrison Street Downtown Development, a 250 to 350 space parking lot could be allocated to the hotel. However, with transit availability and the possible orientation of the hotel to serve the traveling businessman, it may be possible to reduce the parking supply to 0.50 spaces per room. If convention/meeting facilities are planned to be a part of the

hotel, then 0.75-1.0 spaces per room would be more appropriate. If the 0.50 spaces per room were used as a planning guideline, then the parking supply should be 125 to 175 spaces.

SHARED PARKING

If the office and hotel uses are served in the same parking facility, there may be potential to reduce the total parking supply even further in order to reflect shared parking between the two land uses.

The office peak parking occurs during noontime and the early afternoon and then office parking lots typically begin to empty into the late afternoon. The hotel peaks occur during the late afternoon, night and early morning. Again, in the absence of a major convention/meeting facility in the hotel, the mid-afternoon period should see virtually all of the office demand but only 60% of the hotel demands discussed above.

Thus the maximum simultaneous demand would be:

Office	150-250 spaces
Hotel	75-105 spaces
Total	225-355 spaces

This would represent a reduction of 50 to 70 spaces between these two land uses.

RECOMMENDED PARKING SUPPLY

Considering the combined, shared parking described above, the total recommended supply would be 830-1,260 spaces. This supply would represent a design-day condition with 90% of the spaces filled for the retail space and the office and hotel sharing spaces so that virtually all their spaces were filled in the mid-afternoon overlapping peak period. Because of the greater shopping variety offered by the Morrison Street Downtown Development, retail spaces will likely be occupied for a somewhat longer duration than are the existing spaces. In any event, short-term parking of three hours or less should accommodate 80 to 85% of the demand with two-thirds of the demand handled in two hours or less.

Table 11

RECOMMENDED PARKING SUPPLY MORRISON STREET DOWNTOWN DEVELOPMENT

Land Use	Spaces Required	Comment
Retail	605 - 905	Design Day based on 1.51 sp/1000 s.f.
Office	150 - 250	1 sp/2000 s.f. (assumes 85% transit and 25% carpool)
Hotel	125 - 175	0.50 spaces/room
Sub Total	880 -1,330	
Shared Parking	-50 -70	Shared Office and Hotel Spaces
Recommended Supply	830 -1,260	