


TECHNICAL MEMORANDUM

Project: Westlake Avenue North On-Street Parking Study

Subject: Spring and Summer Results

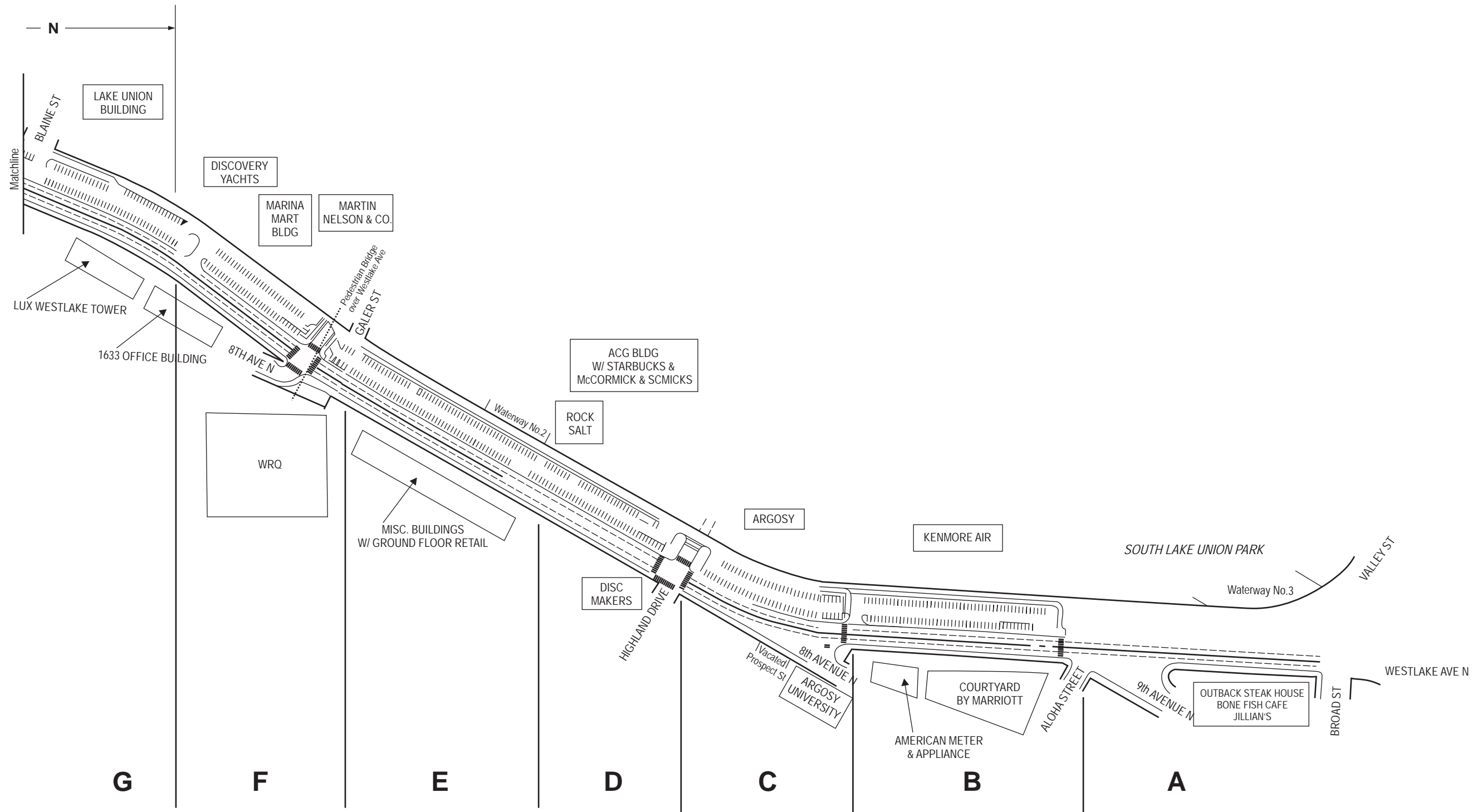
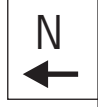
Date: January 18, 2006

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This technical memorandum presents the inventory and findings of the Spring and Summer 2005 parking surveys for Westlake Avenue N from just north of Valley Street to just south of the Aurora Bridge. The purpose of this study is to document how often and for how long parking is used by area employees, marina customers, retail and restaurant customers, and residents. The data and analysis were intended to determine if parking management techniques, include time-limited parking and/or meters, would improve parking conditions along Westlake Avenue N. Parking data were collected in the spring and summer because the data were expected to vary by season.

The spring 2005 data collection occurred on Tuesday May 24th through Thursday May 26th. The summer data were collected on Tuesday August 9th through Thursday August 11th. The summer data collection was intended to capture the peak boating season.

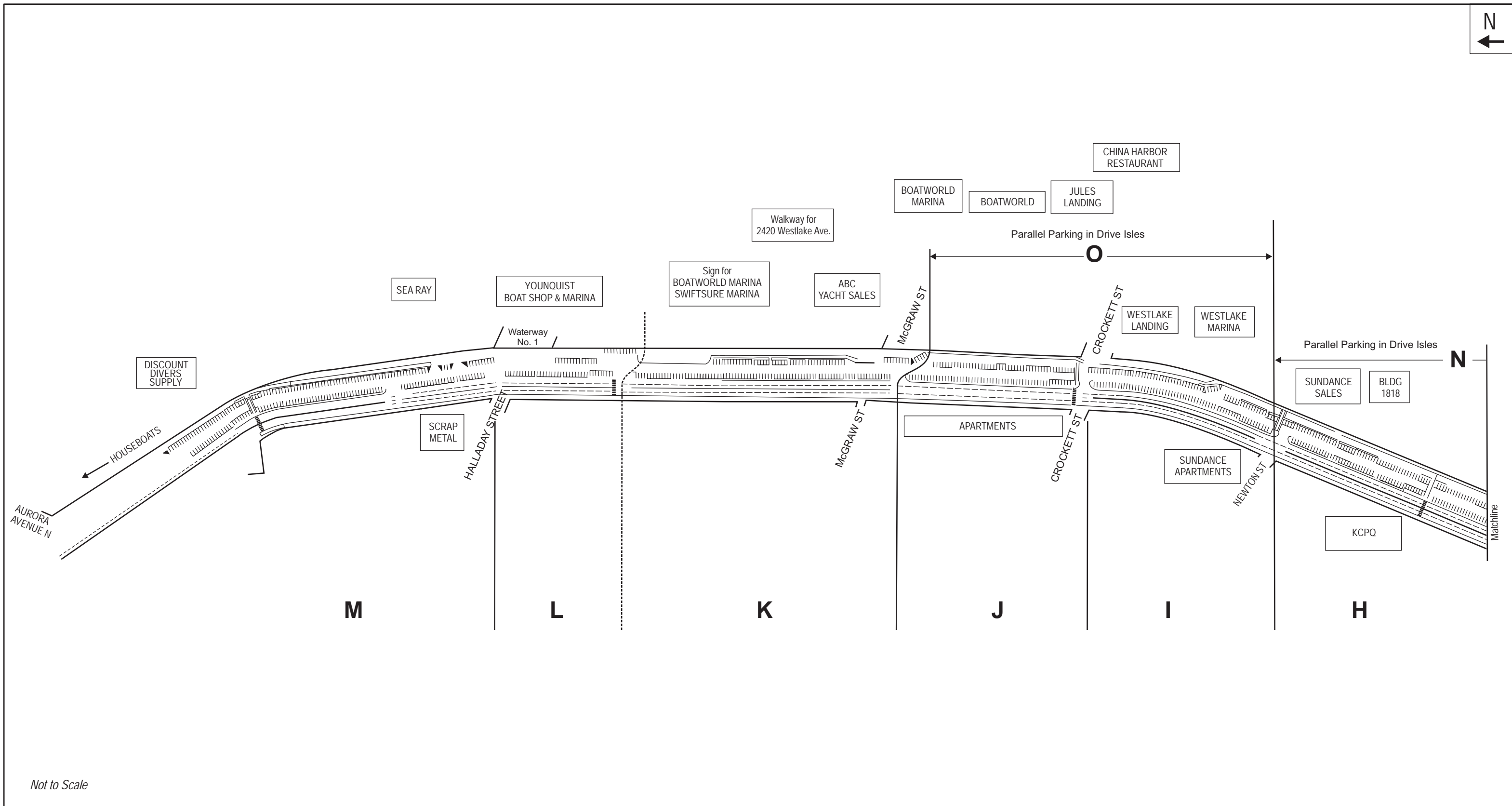
The study area and inventory areas for the Westlake Avenue N Parking Study are shown on Figure 1 (Figure 1A shows the south half of the corridor and Figure 1B shows the north half of the corridor). The area has been divided into segments for the purpose of collecting and compiling the parking data. The map segments will be referred to in the report discussion. There are approximately 1,269 parking spaces, of which approximately 83% are unrestricted spaces.



Not to Scale

WESTLAKE AVENUE NORTH PARKING STUDY

Figure 1A
Study and Inventory Areas
South Half of Corridor



Not to Scale

WESTLAKE AVENUE NORTH PARKING STUDY

Figure 1B
Study and Inventory Areas
North Half of Corridor

1. Study Methodology

The parking supply inventory for Westlake Avenue N was performed by Heffron Transportation, Inc. Parking demand data were collected by Operations Management Group (OMG) using their hand-held electronic data collection tool. A sequence number was assigned to every parking space within each map segment to ensure consistency in the data collection. The inventory and sequence numbers included all parking spaces by type, and all pavement gaps so as not to be confused with a parking space. The inventory also included parking in undesignated spaces (squeeze spaces where users essentially established extra parking spaces) and the number of spaces occupied by dumpsters.

The spring data collection was conducted on Tuesday May 24 through Thursday May 26, 2005, and the summer data collection was on Tuesday August 9 through Thursday August 26, 2005. Parking activity was recorded at 30-minute intervals from 8:00 A.M. to 8:00 P.M. on weekdays. One pass through was conducted at 5:00 A.M. to estimate vehicles related to residents and live-aboards from the house boats.

The first three letters or numbers of the vehicle license plate were recorded into a hand-held electronic device during each 30-minute interval. This technique provided block specific and area-wide utilization data in ½-hour increments within ½-hour time periods. Vacant spaces were noted in the manual count. All public parking spaces were counted and included parallel parking spaces in the driving aisles.

Parking duration was calculated by counting the ½-hour time periods occupied by the same vehicle. For each parking area and restriction type, the number of vehicles parked by duration was then summarized in charts. Turnover was estimated by summarizing the number of parked cars by duration. A high turnover rate is characterized by many vehicles parking for short periods of time. Compliance rates for one-hour and two-hour spaces were calculated from the number of parked cars in compliance relative to the total number of parked cars from 8:00 A.M. to 8:00 P.M.

Residential parking activity at the north end of Westlake, in the vicinity of the houseboats was of interest, so additional data were collected during the summer period. The data included a recording of the full license plate to determine the number of parking cars that remained in that parking area all day and/or overnight or moved to another stall in the same area. A summary is included in this report, under subarea “M”.

2. Parking Space Inventory

The data collection effort provided a complete inventory of public parking on Westlake Avenue N. The inventory is presented in Table 1. The table is keyed to map segments shown on Figure 1. In total, there are 1,269 parking spaces in the study area. Eighty three percent (83%) of the spaces are unrestricted, 13% are two-hour spaces, approximately 1% are one-hour spaces, and load/unload are less than 1% of the spaces. The parking restriction type was inventoried for each hour from 1:00 P.M. to 8:00 P.M. For the most part, changes in restriction type occurred at 8:00 P.M. when restricted spaces became unrestricted spaces.

It total, there were 23 spaces occupied by dumpsters throughout the corridor during the spring data collection. Many dumpsters were in different locations during the summer data collection. These spaces were counted in the inventory. There are also 17 motorcycle spaces and 1 consulate space.

Squeeze spaces were noted in the data collection, but not the inventory. Squeeze spaces were not counted in the inventory, because although used, they would not be available with additional enforcement and would not contribute to the inventory. In addition, the utilization rate of squeeze spaces was below that of a legal space and the overall utilization would be affected very little.

Table 1. Westlake Avenue N Parking Inventory¹

Street Segment	Map Code	Number of Parking Spaces by Type of Space					Other Spaces ²	
		Load/Unload	One-Hour	Two-Hour	Unrestricted	Disabled		Total
Broad to Aloha Streets	A			13		1	14	
Aloha Street to 8 th Ave	B				87	1	88	
8 th Ave to Highland Drive	C			44	36	1	81	
Highland Drive to driveway (Rock Salt)	D			30	35	2	67	
Driveway (at Rock Salt) to pedestrian bridge	E			13	96	4	113	
Pedestrian bridge to driveway at Discovery Yachts	F		6	18	32	2	58	1-D
Driveway at Discover Yachts to Blaine Street	G				74	2	76	
Blaine Street to Newton Street	H			16	116	4	136	4-D, 5-MC
Drive Aisle from Lake Union Bldg to Newton Street	N	5			28	4	37	1-C
Newton Street to Crockett Street	I	2		26	84	2	114	4-D
Crockett Street to McGraw Street	J		8		76	2	86	2-D
Drive aisle, Crockett Street to McGraw Street	O				20		20	
McGraw Street to driveway on west side	K				130		130	6-D, 4-MC
Driveway on west side to Holiday Street	L				59	1	60	2-D, 4-MC
Holiday Street to location of Discount Drivers Supply	M				186	3	189	4-D, 4-MC
TOTAL		7	14	160	1,059	29	1,269	23-D, 17-MC, 1-C
Percent of Total		1%	1%	13%	83%	2%	100%	

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Inventory at 1:00 P.M. reflecting daytime hours. Parking restriction type may change after 1:00 P.M. Most changes occur after 7:00 P.M.
2. Other includes: (D) Dumpsters, (MC) Motorcycle, (C) Consulate. Dumpster spaces are included in the number of unrestricted spaces since dumpsters are dropped into the marked parking lots.

Due to the length of the study area, Westlake Avenue N was divided into segments for analysis. Each segment reflects similar land use types and similar parking needs. The segments for analysis are presented in Table 2 and show each map code included in the segment.

Table 2. Westlake Avenue N Parking Segments for Analysis ¹

Street Segment	Adjacent Activity	Map Code	One-Hour	Two-Hour	Un-restricted ²	Other ³	Total Space
Broad Street to Highland Drive	South Lake Union Park, tourism (Kenmore Air, Argosy)	A,B,C	--	57	123	3	183
Highland Drive to Discovery Yachts	Restaurant and office	D,E,F	6	61	162	9	238
Driveway at Discover Yachts to Newton Street	Office on both sides of Westlake, Sundance Sales, and parking in drive aisle	G,H,N	--	16	214	19	249
Newton Street to McGraw Street	Westlake Marina, China Harbor Restaurant, Landings, parking in drive aisle Apartments on west side	I,J,O	8	26	174	12	220
McGraw Street to Holiday Street	Yacht and marine supplies, house boats	K,L	--	--	181	9	190
Holiday Street to location of Discount Drivers Supply	Marine industrial, and retail	M	--	--	182	7	189
Total			14	160	1,036	59	1,269

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. *Parking inventory at 1:00 P.M. reflecting daytime hours.*
2. *Unrestricted spaces do not include spaces occupied by dumpsters.*
3. *Other spaces include load/unload, disabled parking spaces, and spaces occupied by dumpsters.*

The spaces occupied by dumpsters, motorcycle spaces, disabled-person spaces, and load/unload were not included in the analysis of utilization and turnover. Spaces occupied by dumpsters are 100% utilized and are not available for vehicles. Squeeze spaces were also excluded from the utilization calculation and were recorded separately. Therefore, the parking supply was assumed to be 1,210 spaces.

3. Parking Utilization

Parking utilization by time of day was determined for each subarea and restriction type. Subareas were previously defined in Table 2. Within each subarea, the parking accumulation for spring and summer are plotted on graphs, which are presented below. The parking accumulation is presented by graphing the number of spaces occupied at 5:00 A.M. and then from 8:00 A.M. to 8:00 P.M. The last time period in the graphs reflects the data collected between 7:30 P.M. to 8:00 P.M.

Each chart also shows the total number of available spaces. The practical capacity for parking is defined at 85% utilization. It is important to provide a “cushion” in excess of necessary parking spaces to allow for the dynamics of vehicles parking (i.e., circulating in search of a space, and moving in and out of parking space). When occupancy exceeds the practical capacity, drivers will experience

delays and frustration while searching for a parking space, as well as contribute to area traffic congestion while circling the block looking for parking. Practical capacity is used to determine the adequacy of a parking system. The City of Seattle considers utilizations above about 80% to be the threshold where additional parking management techniques should be implemented. Utilization rates reaching approximately 70% are candidates for additional parking management measures so that parking management tools are implemented before parking reached capacity. The City also uses parking management techniques to support the goal of reducing automobile trips, particularly for commuting. Short-term parking limits that favor retail and restaurant use are preferred to long-term parking that could be used by commuters.

Utilization is most descriptive by subarea, as the subareas differ in the type of parking necessary to support the adjacent activities. A picture of utilization as parking accumulation over the day, combined with the turnover characteristics provides an overall picture and description of parking characteristics by subarea.

4. Parking Duration, Turnover, and Compliance

Parking turnover is a measure of the number of vehicles that can park in a single parking space over a time period. It is a function of parking duration. High turnover rates occur when vehicles park for a short amount of time and many vehicles can park in a single space over the course of the day. Low turnover rates occur when vehicles park for long periods of time and few vehicles park in a single space during the day. Most retail, restaurant and service businesses require high turnover rates for on-street parking. Parking duration was calculated for the hours of 8:00 A.M. to 8:00 P.M.

Parking compliance was evaluated to determine if existing parking time limits are being observed. However, most parking along Westlake Avenue is unrestricted, and compliance is not an issue. There are some two-hour parking spaces in each subarea, and one-hour spaces in map segments F and J. The duration data do reveal if there is unusual activity, such as numerous all-day parking in front of restaurants and retail, or a large number of vehicles out of compliance with the parking restriction type. The following sections describe the parking utilization, duration, and compliance for each sub-area along Westlake Avenue.

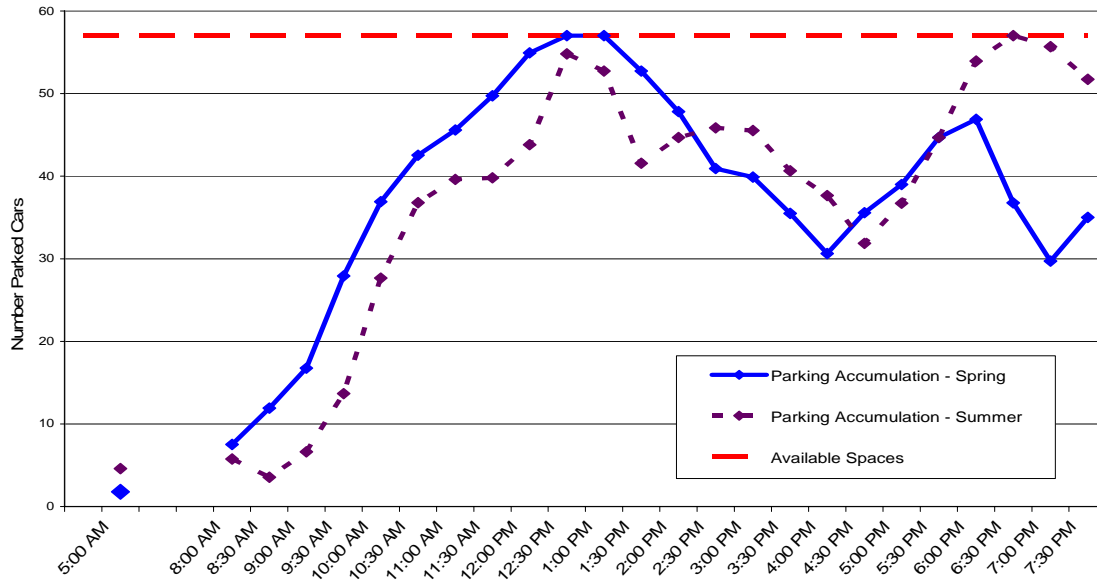
5. Survey Results

5.1. Subarea ABC (Map Segments A, B, & C): Tourism and South Lake Union Park

This subarea is at the south end of study area. The parking serves South Lake Union Park, Kenmore Air, and Argosy Cruise Lines. There are 183 total parking spaces, of which 57 are two-hour spaces and 123 are unrestricted spaces.

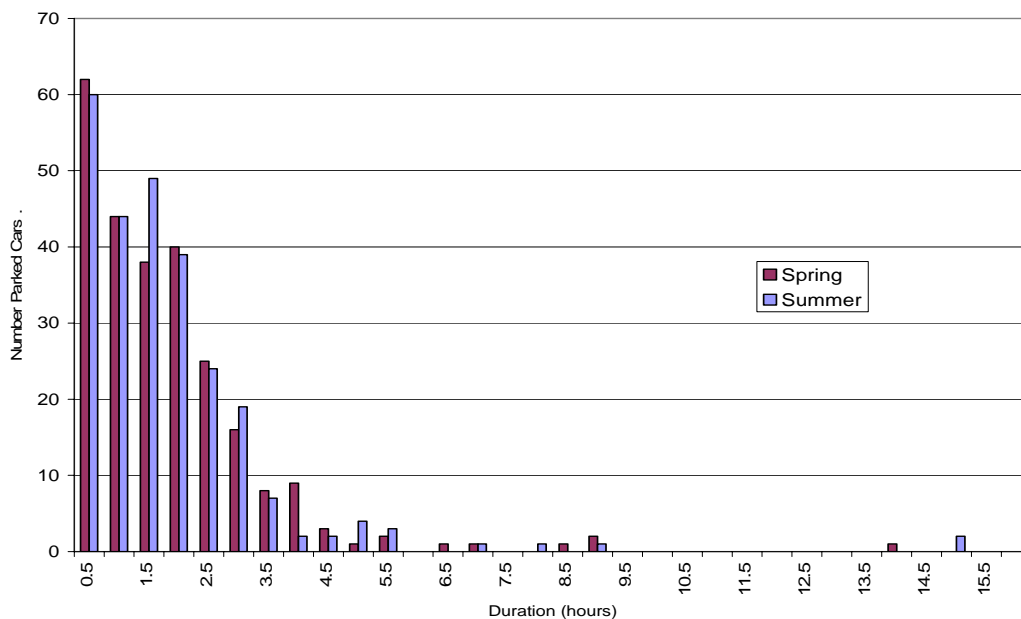
Parking utilization for **two-hour spaces** is presented in Figure 2. During the spring there were a few parked cars at 5:00 A.M. At 8 A.M. there were 8 parked cars and the utilization increased steadily to fill the two-hour spaces at about 12:00 to 1:00 P.M. The utilization then dropped slightly and increased to 62% utilization at 6:30 P.M. The summer parking activity tracked very closely to the spring, except that at about 6:30 P.M. the parking utilization increase to 100% and stayed higher than during the spring in the evening hours, up to 8:00 P.M. It is likely that the higher utilization during summer evenings is related to the tourist activities in this area.

Figure 2. Parking Utilization for Two-Hour Spaces – Subarea ABC



Parking duration is presented in Figure 3. During the spring data collection there were 254 parked cars from 8:00 A.M. to 8:00 P.M. in the 57 two-hour spaces. Fifty seven two-hour spaces equals 342 available time periods for parking. Of the 254 parked cars in two-hour spaces, 70 parked for more than two hours indicating 28% are staying over-time, and the compliance rate is 72%. The summer data tracks very closely to the spring data, with 258 parked cars. The compliance rate is 74%. The summer and spring parking duration patterns are very similar.

Figure 3. Parking Duration for Two-Hour Spaces - Subarea ABC



It is also revealing to look at the number of parked cars in the ½ hour following the time restriction. Cars that parked for 2-½ hours or less will be referred to as “**nearly compliant.**” In this subarea using spring data, there were 25 nearly compliant vehicles. Drivers simply know that with low enforcement, staying over the time period is likely not to result in a parking ticket. If the additional 25 vehicles parked for only 2 hours the combination of compliant and nearly compliant vehicles would be 82%. During the summer survey, the combined compliant plus nearly compliant rate would be 84%.

There are **123 unrestricted parking spaces** in this subarea. Figure 4 presents the parking utilization. During the spring data collection there were 25 cars parked at 5:00 A.M. and then 88 parked cars at 8:00 A.M. The utilization increased to 100% by 9:30 A.M. and stayed at 100% until 1:30 P.M. Utilization dropped slightly until 5:30 P.M. and the increased again to 7:30 P.M. This increase in evening demand may be related to area restaurants. The summer data collection resulted in nearly identical results mid-day and a higher utilization after 1:30 P.M., reaching 100% utilization in the evening at 7:00 P.M.

Figure 4. Parking Utilization for Unrestricted Spaces – Subarea ABC

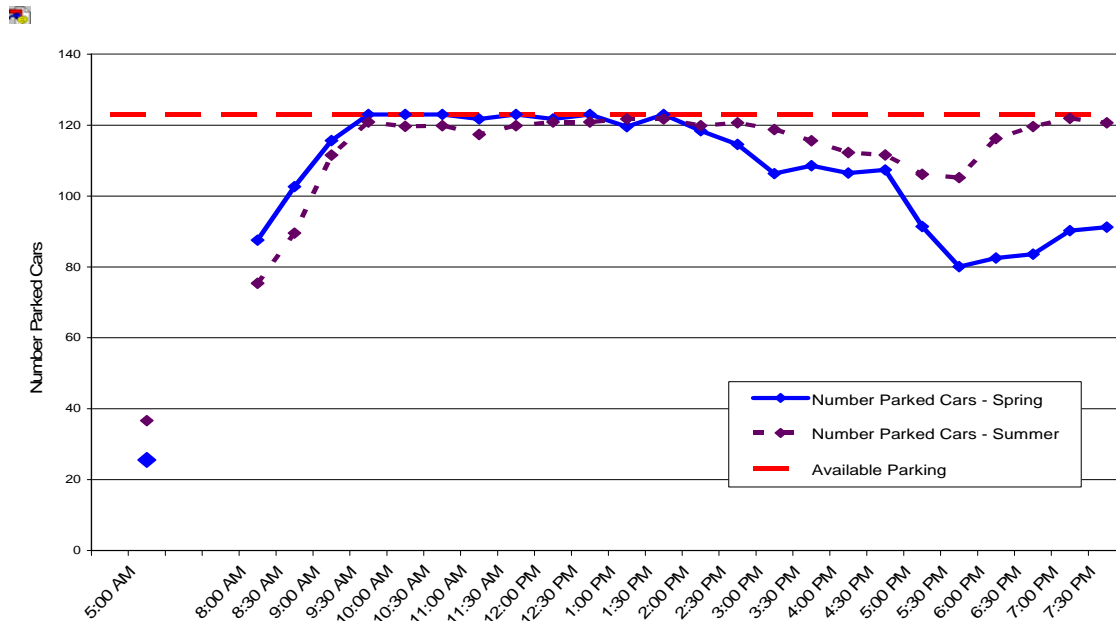
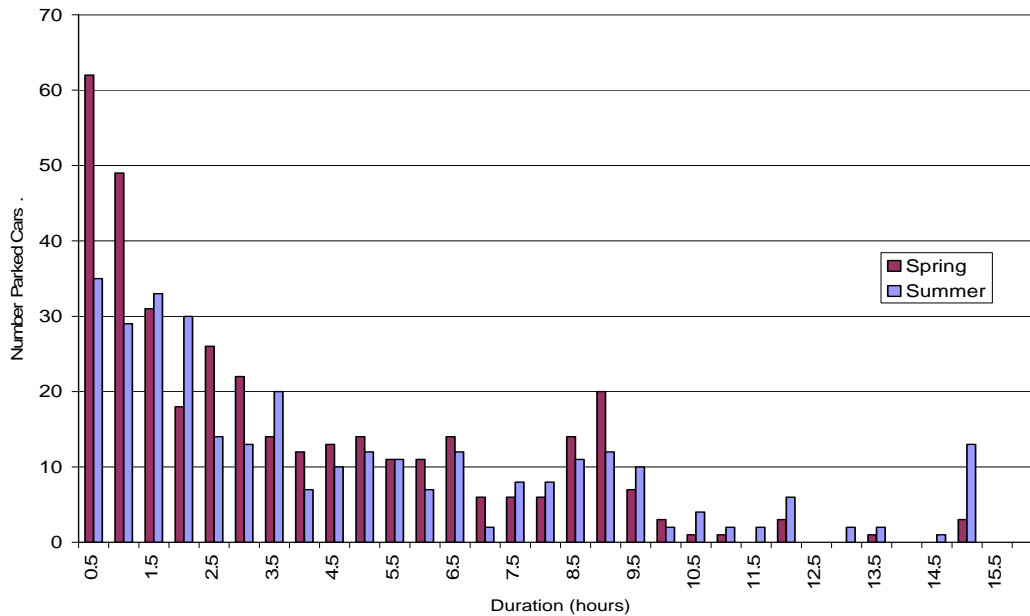


Figure 5 presents the parking duration in the unrestricted spaces. During the spring there were a total of 368 parked cars in the 123 unrestricted spaces. Of these, 160 parked for two hours or less, or 43% of all unrestricted parked cars. An additional 74 parked for up to four hours, or 20% of all unrestricted parked cars. During the summer data collection there were fewer cars parked for 1 hour or less, and more cars parked for 7.5 hours or more. The duration between 1 and 7.5 hours was very close to the same for spring and summer conditions. The longer duration during the summer is likely related to tourist activities such as Kenmore Air in this area.

Figure 5. Parking Duration for Unrestricted Parking Spaces – Subarea ABC

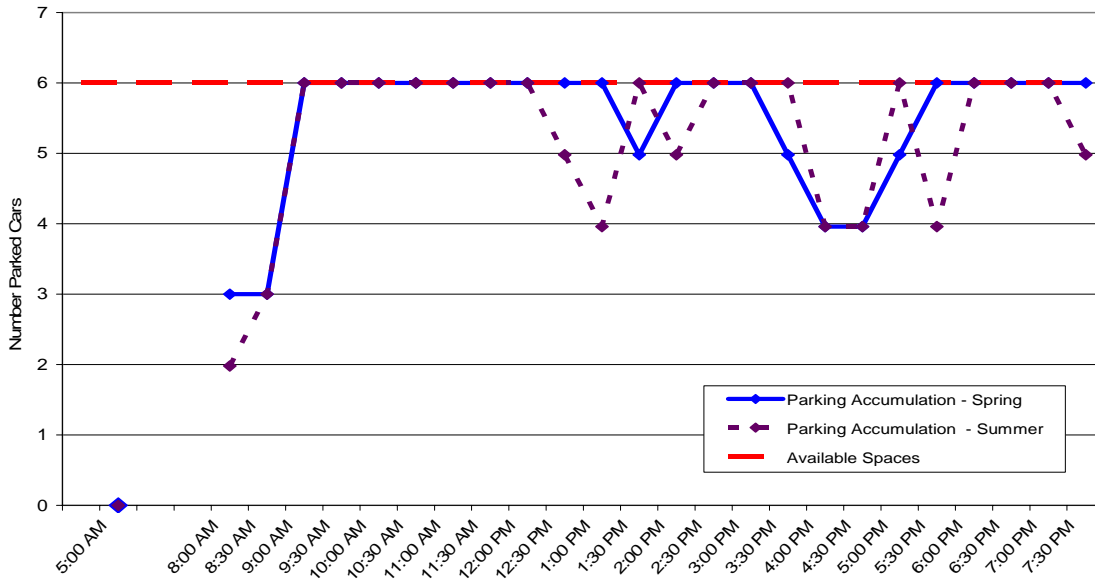


5.2. Subarea (DEF): Restaurants, Office, Marine Retail

This subarea is the next segment north and extends just past the pedestrian bridge over Westlake Avenue N. The parking serves the AGC Building, Starbucks, a major restaurant (McCormick and Schmick), yacht supply retailer and marina facilities. There are office buildings on the west side of Westlake Avenue N. There are 238 total parking spaces with 6 one-hour spaces, 61 two-hour spaces, and 162 unrestricted spaces. There is a large private parking lot that serves the AGC building and restaurant. Public parking in this lot is available for a fee; restaurant patron’s parking is validated. This parking lot has approximately 130 to 150 spaces, but it was not included in the parking survey.

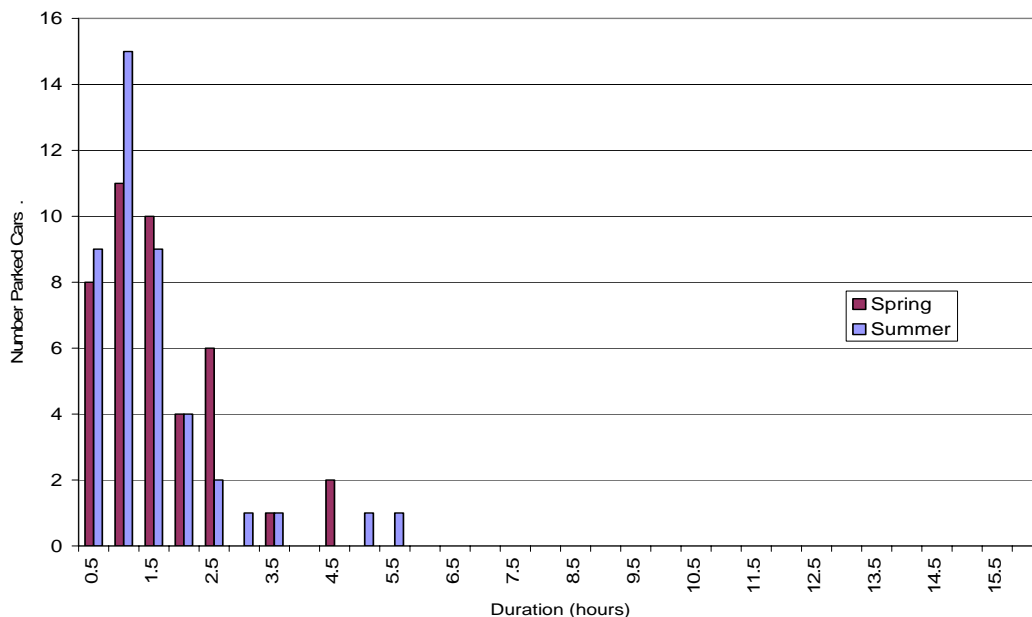
The **six one-hour spaces** are located in map segment F, and appear to serve the Marine Mart building and Discovery Yachts. As shown on Figure 6, the six one-hour spaces were filled by 9:00 A.M., and were occupied for much of the day. The number of one-hour parking periods is 72, indicating an average utilization of 58% in the one-hour spaces using the spring data. The summer utilization tracks very closely to the spring data. The variation is not significant with the small number of spaces.

Figure 6. Parking Utilization for One-Hour Spaces – Subarea DEF



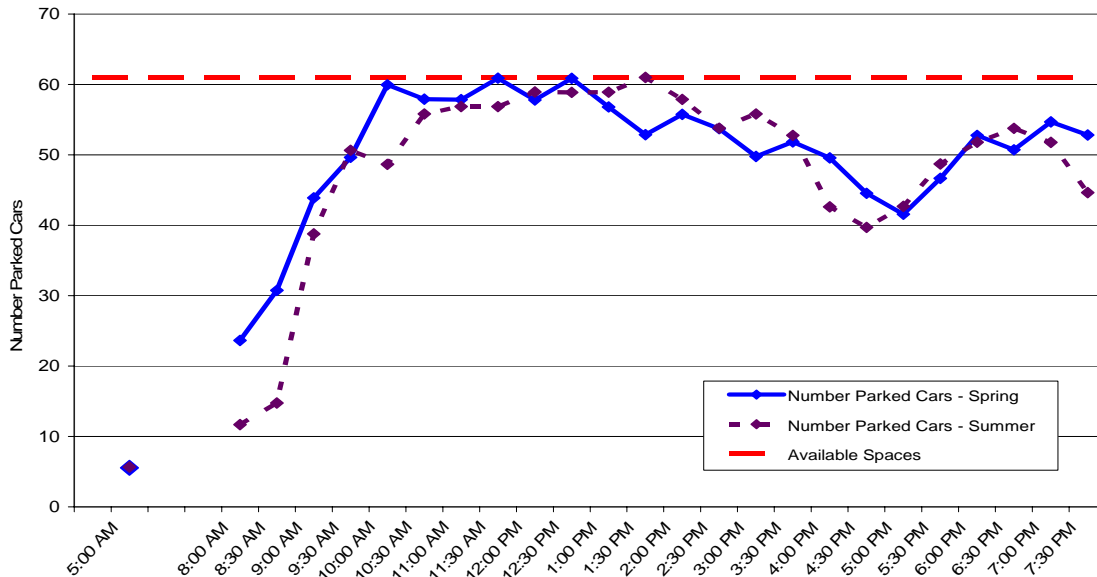
The parking duration for the six one-hour spaces is presented in Figure 7. The spring data show that there were 42 parked cars throughout the day in the six one hour spaces, and 23 (55%) parked for more than one hour, or a compliance rate of 45%. The high over-time parking rate could indicate that the one-hour spaces are not matched well to the parking needs for the nearby uses. Cars parked for 2-1/2 hours or less accounted for 93% of parked cars. The summer data show a higher number of cars parked for 1 hour or less. The total number of parked cars was 43, only one more than during the spring.

Figure 7. Parking Duration for One-Hour Parking Spaces – Subarea DEF



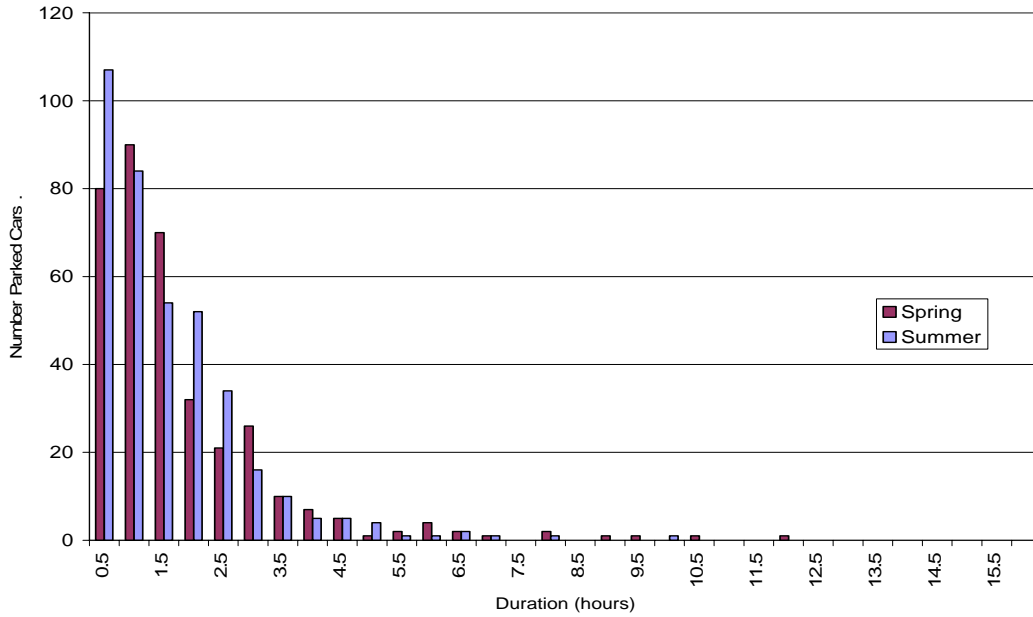
Parking utilization for the **61 two-hour spaces** is presented in Figure 8. During the spring data collection there were 6 cars parked at 5:00 A.M. At 8:00 A.M. there were 24 parked cars and the utilization increased rapidly to 100% by 10:00 A.M. and maintaining 100% utilization until 12:30 P.M. The utilization drops to 42 at 5:00 P.M. and the rises again and hovers at 53 parked cars (87%) utilization at 6:00 P.M. to the end of the day. The summer data is nearly identical to the spring data.

Figure 8. Parking Utilization for Two-Hour Spaces – Subarea DEF



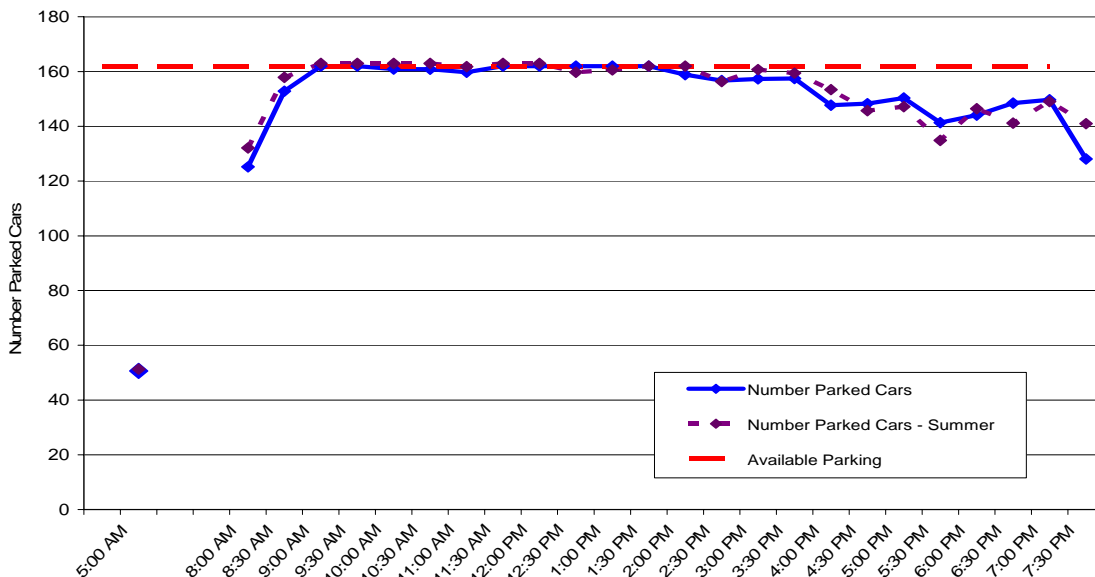
Parking duration for the two-hour spaces is presented in Figure 9. Using spring data there were 357 parked cars from 8:00 A.M. to 8:00 P.M. in the 61 two-hour spaces. Sixty one two-hour spaces equals 366 available time periods for parking. Of the 357 parked cars in two-hour spaces, 272 parked for two hours or less, indicating that 24% parked over two hours, or a compliance rate of 76%. In this subarea the ½ hour following two hours of parking are 21 vehicles parking for 2-½ hours. If the additional 25 vehicles parked for only 2 hours the compliance rate would be 83%. The summer data are similar, with a greater number parking for ½ hour, fewer parking between 1 and 1-1/2 hours, and more parking from 2 to 2-1/2 hours. The number of cars parked for 2-1/2 hours or less could reach a compliance rate of 78%.

Figure 9. Parking Duration for Two-Hour Parking Spaces – Subarea DEF



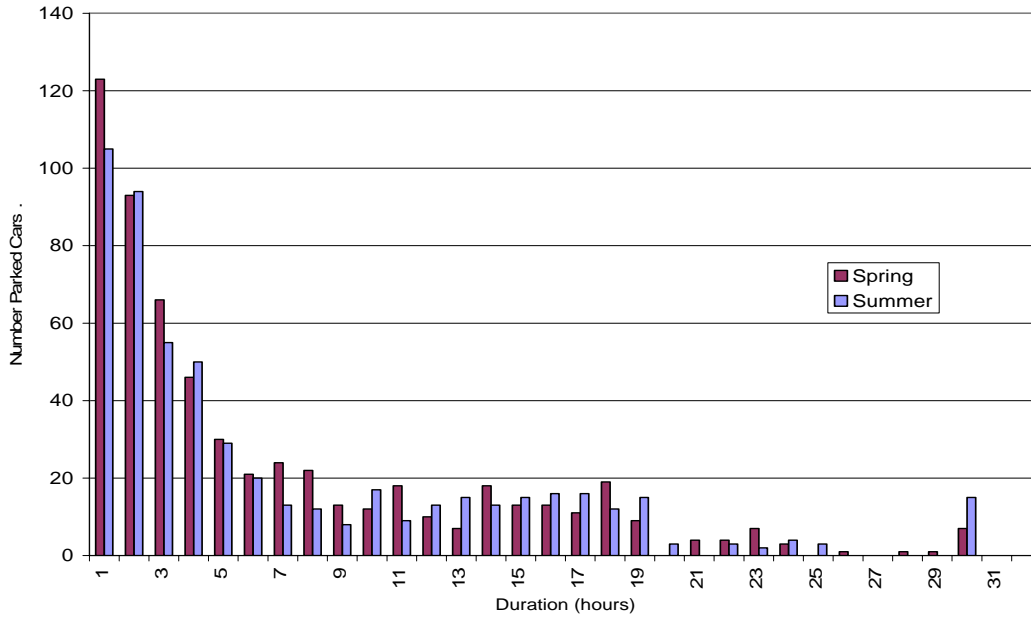
Parking utilization is presented below in Figure 10 for the **162 unrestricted spaces** in this subarea. During the spring data collection there were 51 cars parked at 5:00 A.M. and then 125 parked cars at 8:00 A.M. The utilization increased to 100% by 9:00 A.M. and stayed at 100% until 1:30 P.M. Utilization dropped slightly until 7:30 P.M. but stayed above the practical capacity of 85% until 7:00 P.M. The summer data is almost identical to the spring data.

Figure 10. Parking Utilization for Unrestricted Spaces – Subarea DEF



The parking duration for the unrestricted spaces, as shown in Figure 11, discloses a relatively high turnover rate. Using the spring data there were a total of 596 parked cars in the 162 unrestricted spaces, of which 328 parked for two hours or less, or 55% of all parked cars. Of these 596 parked cars, an additional 97 parked for up to four hours, or 16% of the parked cars. The summer data is very similar to the spring data.

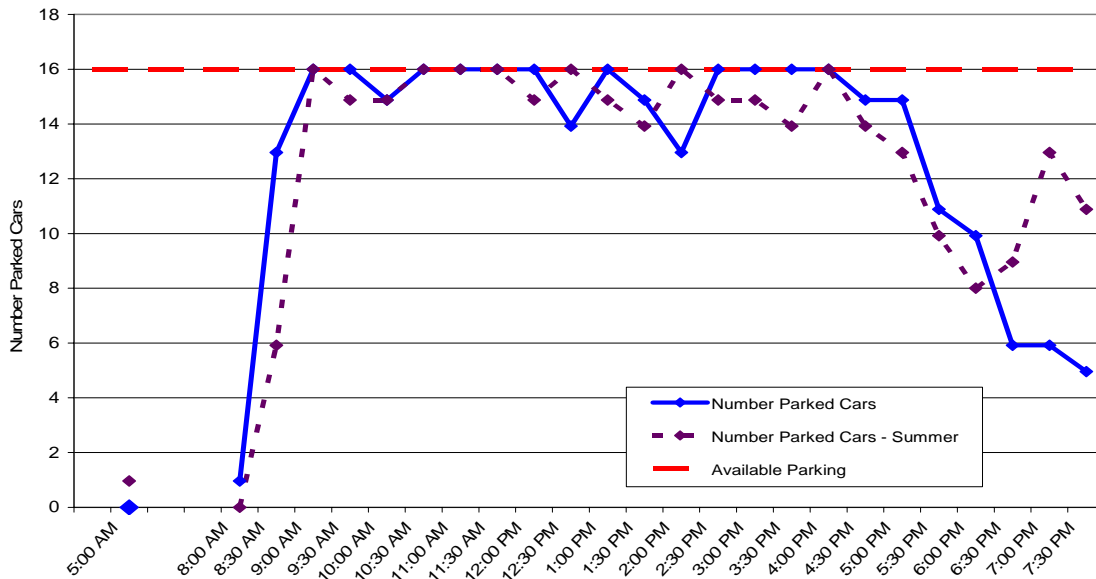
Figure 11. Parking Duration for Unrestricted Spaces – Subarea DEF



5.3. Subarea (GHN): Major Office and Marine Retail

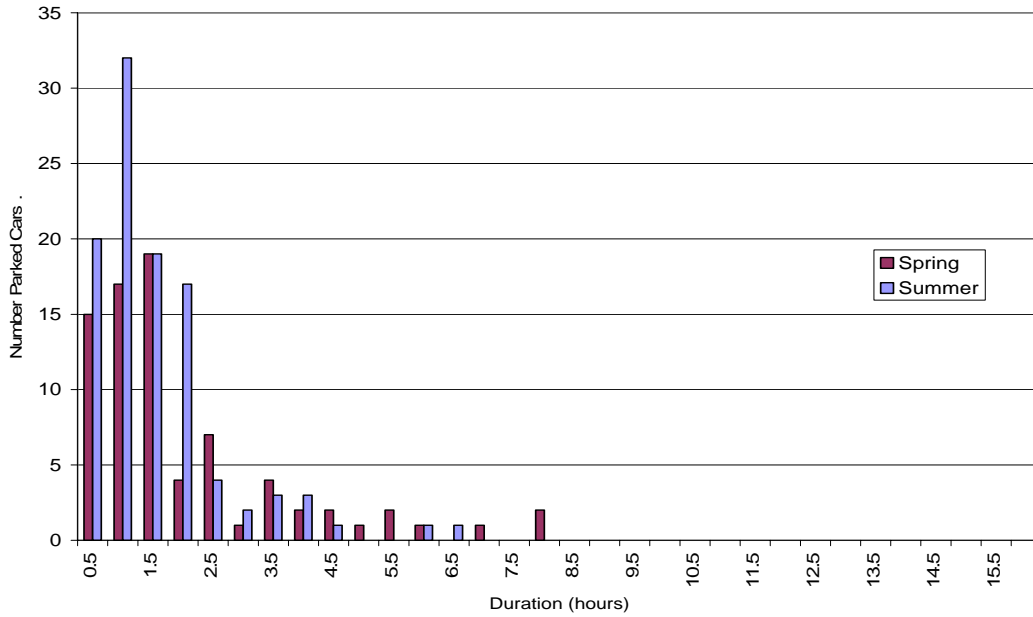
This subarea includes map reference areas G and H and parking spaces in parallel drive aisles identified as parking area N. This parking area serves office buildings on both sides of Westlake Avenue N and marine retail. There are 16 two-hour spaces and 214 unrestricted spaces. Parking utilization for the **16 two-hour spaces** is presented in Figure 12. The two-hour spaces were 100% utilized by 9:00 A.M. and remained over 85% until about 5:30 P.M. The spring and summer data tracked very closely, except that utilization increased during the summer in the evening after 6:00 P.M.

Figure 12. Parking Utilization for Two-Hour Spaces – Subarea GHN



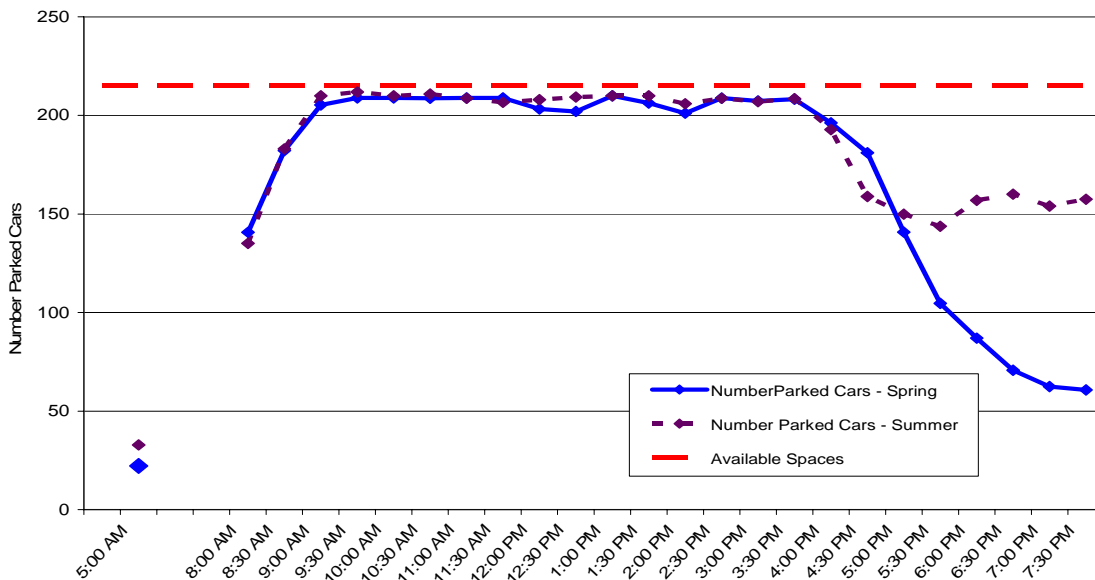
Parking duration for the two-hour spaces is presented in Figure 13. Using spring data there were 78 parked cars from 8:00 A.M. to 8:00 P.M. in the 16 two-hour spaces. Of the 78 parked cars in two-hour spaces, 55 parked for two hours or less, indicating that 29% parked over two hours, or a compliance rate of 71%. In this subarea, the ½ hour following two hours of parking was 7 cars parked for 2-½ hours. If the additional 7 cars parked for only 2 hours the compliance rate would be 79%. The summer data is similar except that there were more cars parked for two hours or less. There were more total parked cars in the summer at 103. The number of parked cars for 2-1/2 hours or less would indicate a potential compliance rate of 89% using summer data.

Figure 13. Parking Duration for Two-Hour Parking Spaces – Subarea GHN



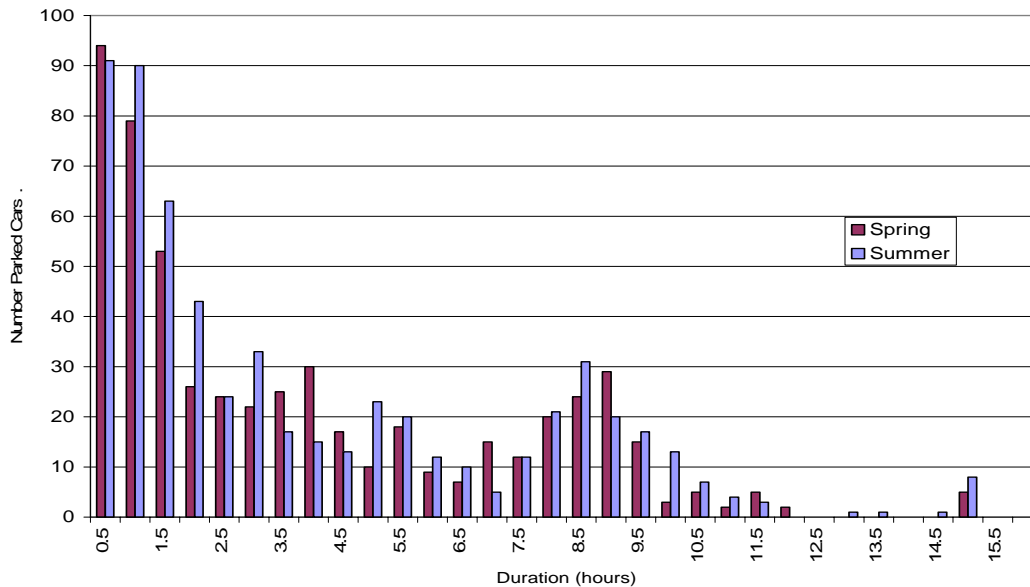
Parking utilization is presented below in Figure 14 for the **214 unrestricted spaces** in this subarea. The spring data showed that there were 22 cars parked at 5:00 A.M. approximately 141 cars parked at 8:00 A.M. and then 205 cars at 9:00 A.M. The utilization remained at almost 100% until approximately 4:00 P.M., and then dropped steadily until 8:00 P.M. The summer data is identical except that the utilization remains high in the evening hours after 5:00 P.M. at about 72%.

Figure 14. Parking Utilization for Unrestricted Spaces – Subarea GHN



The parking duration in the unrestricted spaces as shown in Figure 15 discloses a relatively high turnover rate. Using spring data there were a total of 551 parked cars in the 214 spaces throughout the day. There were 252 cars parked for two hours or less, 51% of all parked cars. An additional 95 parked for up to four hours, or 17% of the parked cars. Summer parking showed similar results, but with a greater number of total parked cars at 598.

Figure 15. Parking Duration for Unrestricted Spaces – Subarea GHN



5.4. Subarea (IJO): Marinas, Marine Retail, Restaurant, Apartments

This subarea includes map references for areas I and J and parking spaces in parallel drive aisles identified as parking area O. This subarea serves marinas, marine retail (Jake’s Landing and Julie’s Landing), and a major restaurant (China Harbor). There are residential apartments on the west side of Westlake Avenue N. There are a total of 220 spaces: 8 one-hour spaces, 26 two-hour spaces, and 176 unrestricted spaces (the rest are disabled or motorcycle spaces or occupied by dumpsters).

The **8 one-hour spaces** are located in map segment J and appear to serve the landings and Boat World, a marine retailer. Figure 16 presents the parking utilization for these one-hour spaces. During the spring data collection there were no cars parked at 5:00 A.M. and then 6 cars parked at 8:00 A.M. There were seven cars parked at 11:00 A.M. and the utilization stayed above 7 and up to 100% until 7:00 P.M. The summer data appears different in the A.M. because there were no cars parked until 9 A.M. The utilization went up to 100% in the evening hours, beginning at 6:00 P.M.

The parking duration is presented in Figure 17 for the 8 one-hour spaces. With the spring data there were 51 parked cars with 17 parked for more than one hour, indicating that 33% parked for more than one hour, or a compliance rate of 67%. In this subarea the ½ hour following two hours of parking had 8 parked cars. If the additional 8 cars parked for only 1 hour the compliance rate would be 82%. The high over-time parking rate could indicate that the one-hour spaces are not matched well to the parking needs for the nearby uses. With the summer data there were 59 parked cars, reflected in a greater number of parked cars for ½ hour, 1 hour, and 2 hour time periods.

Figure 16. Parking Utilization for One-Hour Spaces – Subarea IJO

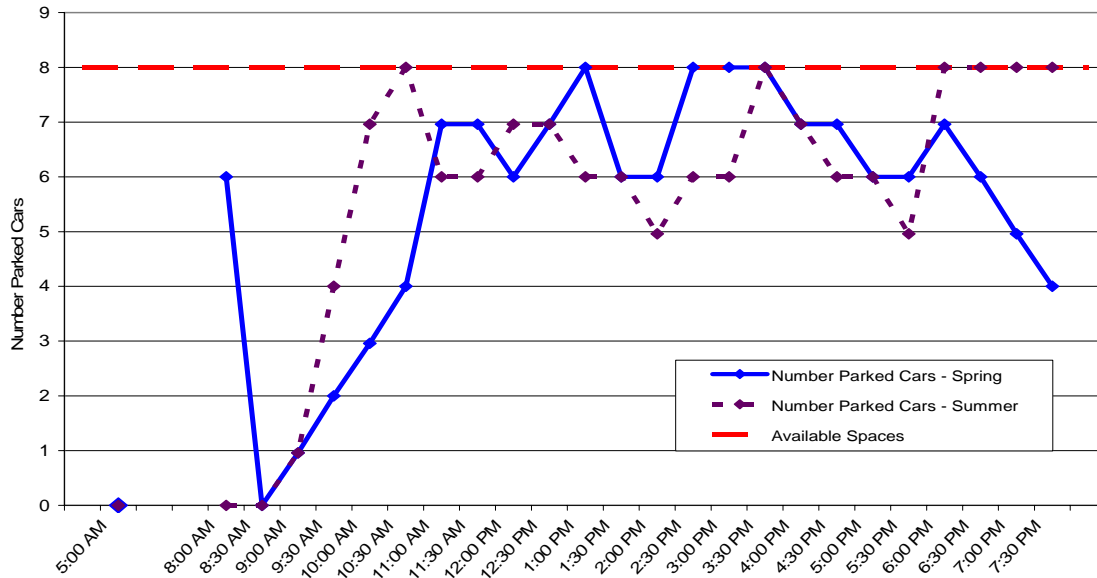
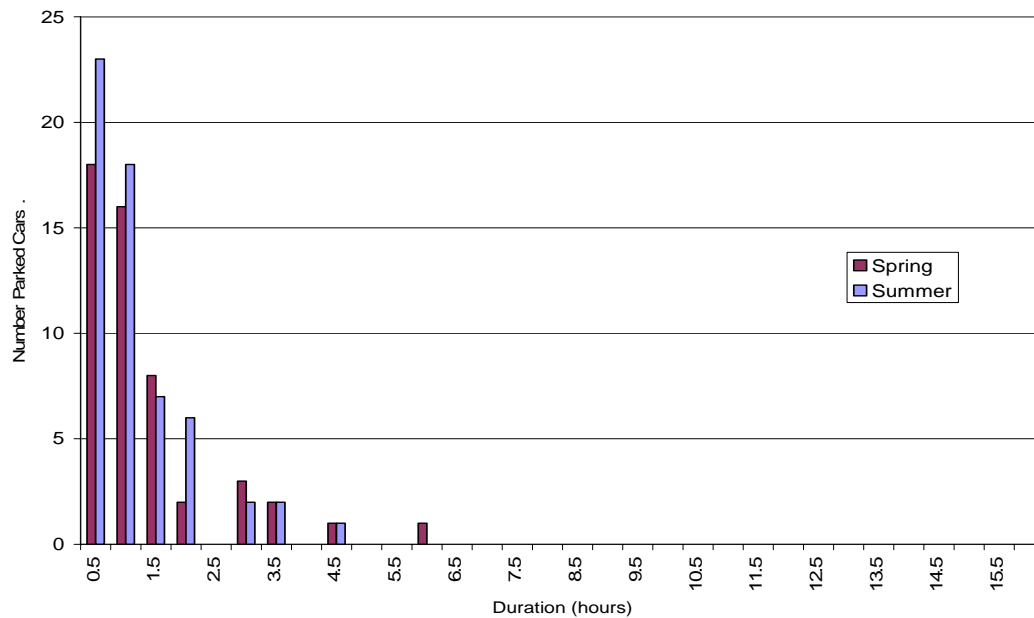
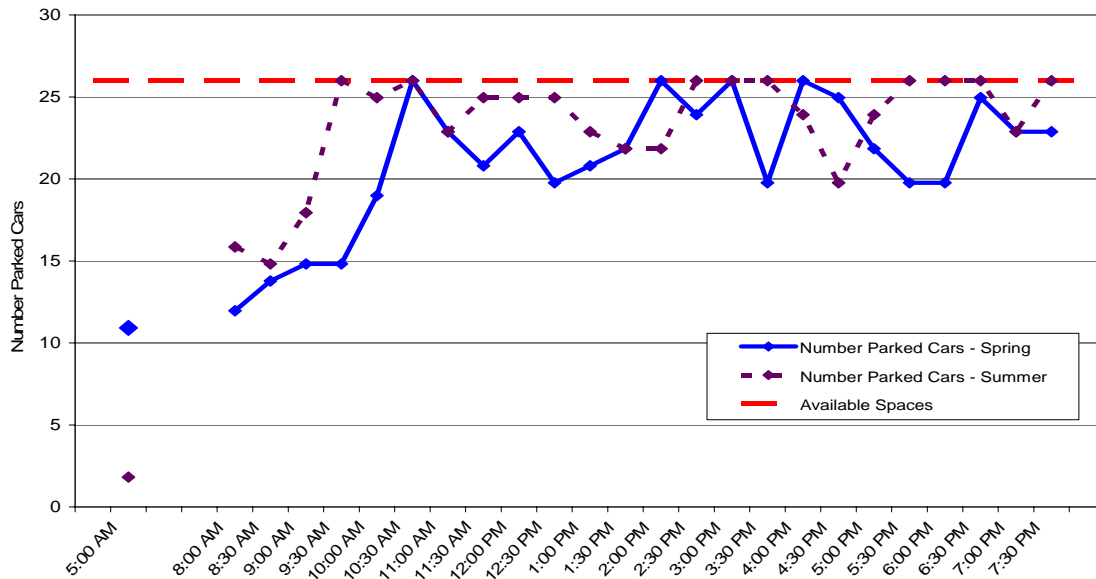


Figure 17. Parking Duration for One-Hour Parking Spaces – Subarea IJO



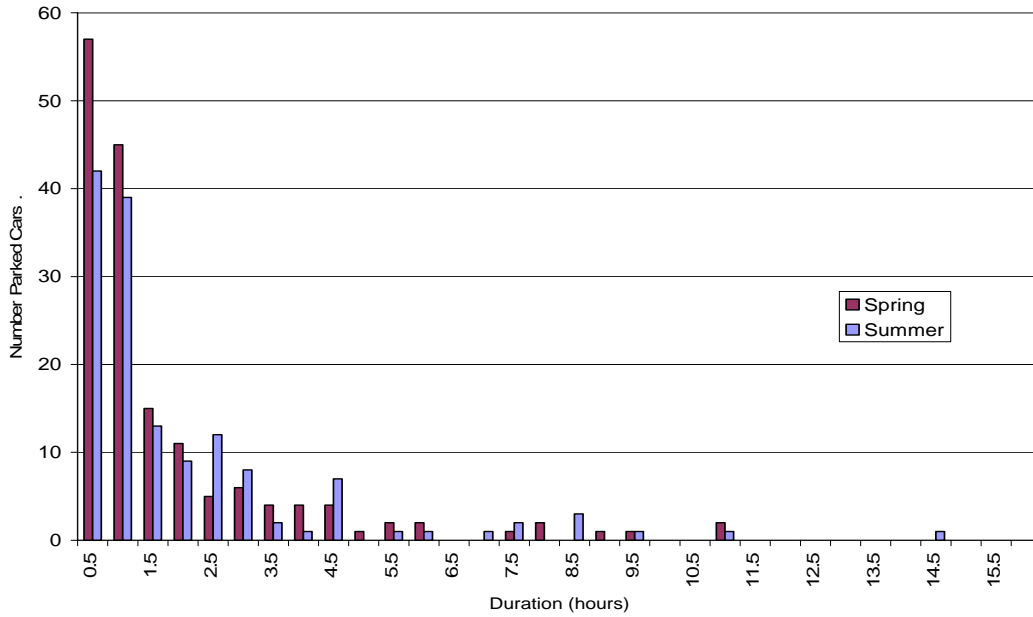
Parking utilization for the **26 two-hour spaces** is presented in Figure 18. With the spring data there were 11 cars parked at 5:00 A.M. At 9:00 A.M. there were 15 parked cars and the utilization reached 100% at 10:00 A.M. The utilization was at 20 to 26 parked cars throughout the remainder of the day. The summer data showed a very similar parking utilization pattern as the spring data, with 100 percent utilization at 7:30 P.M.

Figure 18. Parking Utilization for Two-Hour Spaces – Subarea IJO



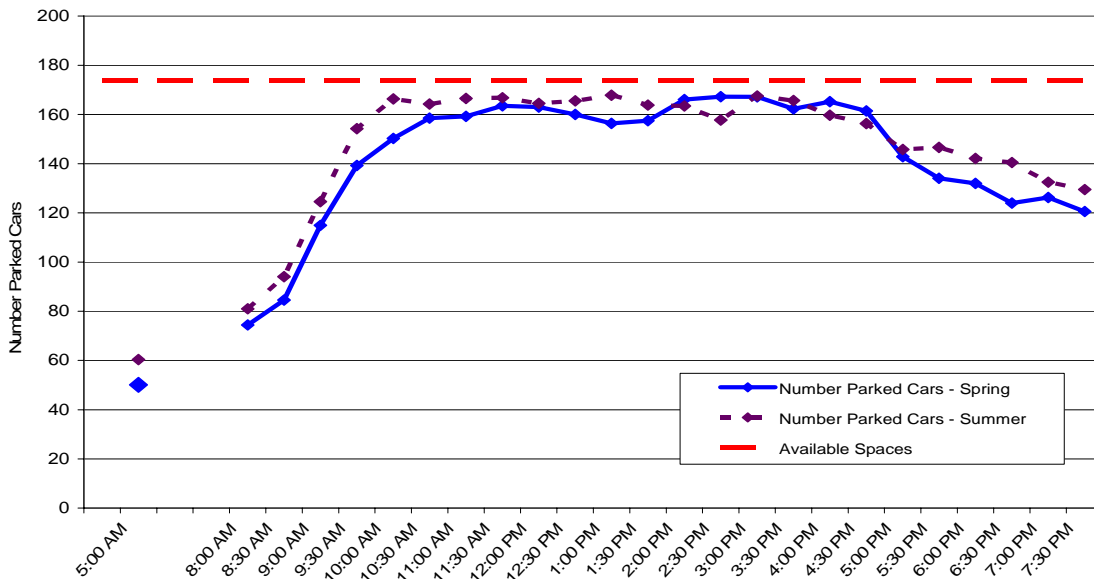
Parking duration for the two-hour spaces is presented in Figure 19. Using the spring data there were 163 parked cars from 8:00 A.M. to 8:00 P.M. in the 26 two-hour spaces. Of the 163 parked cars in two-hour spaces, approximately 31 parked for more than two hours indicating that 22% parked over-time, or a compliance rate of 78%. The summer data shows fewer cars parked for two hours or less, resulting in a compliance rate of 72%.

Figure 19. Parking Duration for Two-Hour Parking Spaces – Subarea IJO



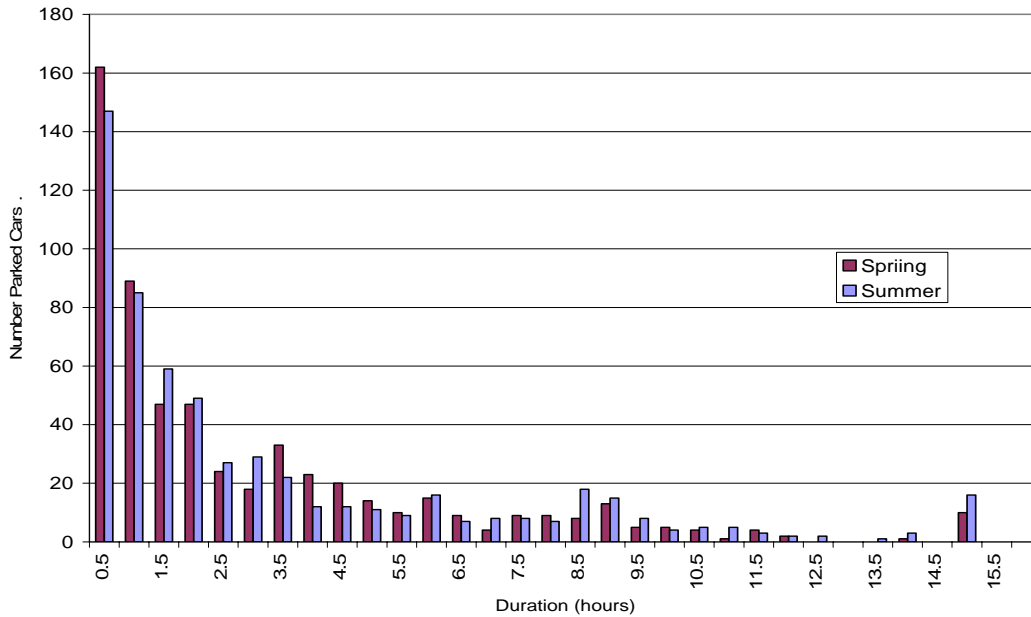
Parking utilization is presented below in Figure 20 for the **174 unrestricted spaces** in this subarea. Using the spring data there were 50 cars parked at 5:00 A.M. and then 74 cars parked at 8:00 A.M., increasing steadily to 160 (92%) at 10:30 A.M. The utilization hovered around 160 until 4:30 P.M. and then dropped to 120 parked cars by 7:30 P.M. The summer data was almost identical to the spring data.

Figure 20. Parking Utilization for Unrestricted Spaces – Subarea IJO



The parking duration in the unrestricted spaces, shown in Figure 21, shows a relatively high turnover rate. Using the spring data there were a total of 586 parked cars in the 174 unrestricted spaces. Of these 586 parked cars, 345 parked for two hours or less, which is 58% of the parked cars, and 162 parked for ½-hour or less. There are several retail shops and restaurants in this area that contribute to the high parking turnover rate. The summer data showed very similar parking duration characteristics.

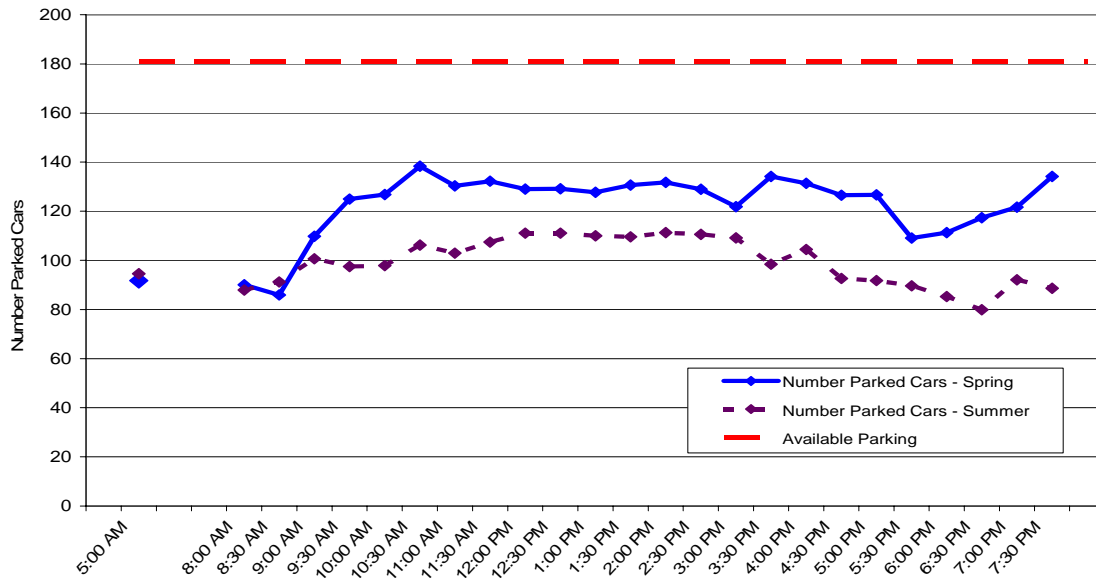
Figure 21. Parking Duration for Unrestricted Spaces – Subarea IJO



5.5. Subarea (KL): Marinas and Boating Supplies

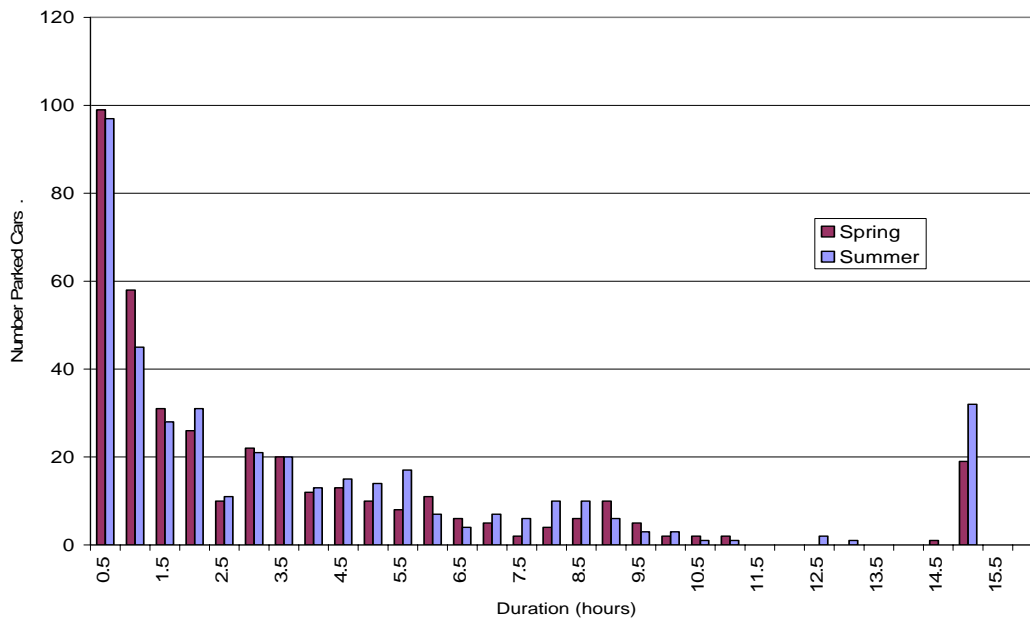
This subarea includes yacht and marine facilities, as well as some house boats. There are **181 unrestricted spaces** and no time-limited parking. Parking utilization is presented below in Figure 22 for this subarea. Using the spring data there were 92 cars parked at 5:00 A.M., and 86 at 8:30 A.M. There were about 125 spaces filled at 9:30 A.M. and then this fluctuated between 120 and 140 parked cars until 5:00 P.M. The utilization was under the practical capacity of 85%, or 154 occupied spaces. The summer data collection resulted in a lower utilization through the day.

Figure 22. Parking Utilization for Unrestricted Spaces – Subarea KL



The parking duration in the unrestricted spaces is shown on Figure 23. This area has a relatively high turnover rate. Using the spring data there were a total of 384 parked cars in the 181 unrestricted spaces. Of these 384 parked cars, 214 parked for two hours or less, or 56%. Sixty four cars parked for up to four hours, or 17% of the parked cars. The summer data was very similar to the spring data. A few duration periods showed a higher number of parked cars.

Figure 23. Parking Duration for Unrestricted Spaces – Subarea KL

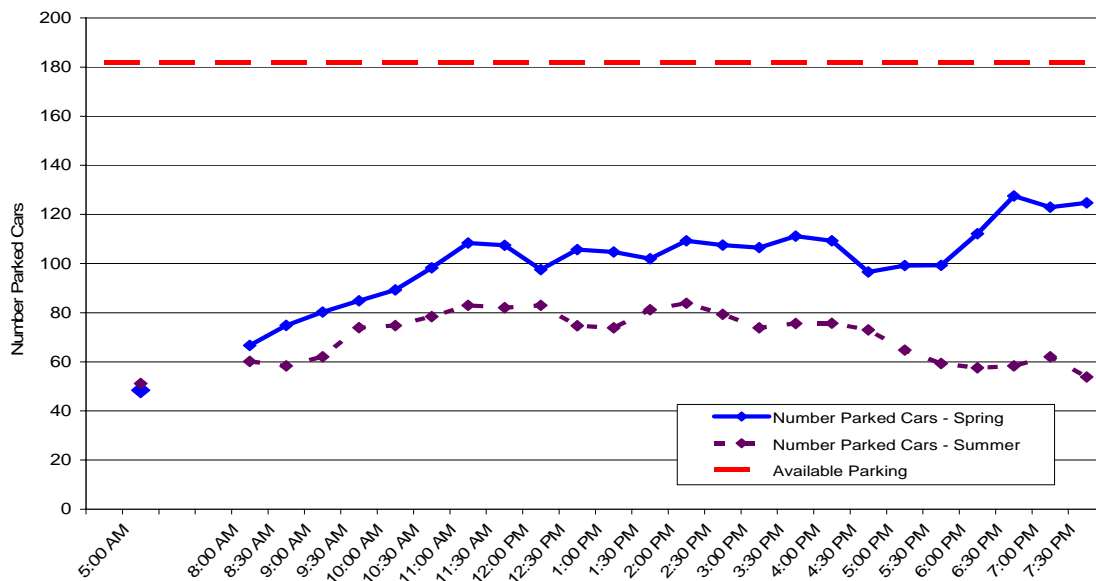


5.6. Subarea (M): Marine Supplies and Industrial Marine

This subarea is the last segment at the north end of the study area. The subarea includes marine supplies and industrial marine activities. There is a large grouping of residential houseboats located north of this subarea. There are 182 unrestricted spaces and no time-limited parking.

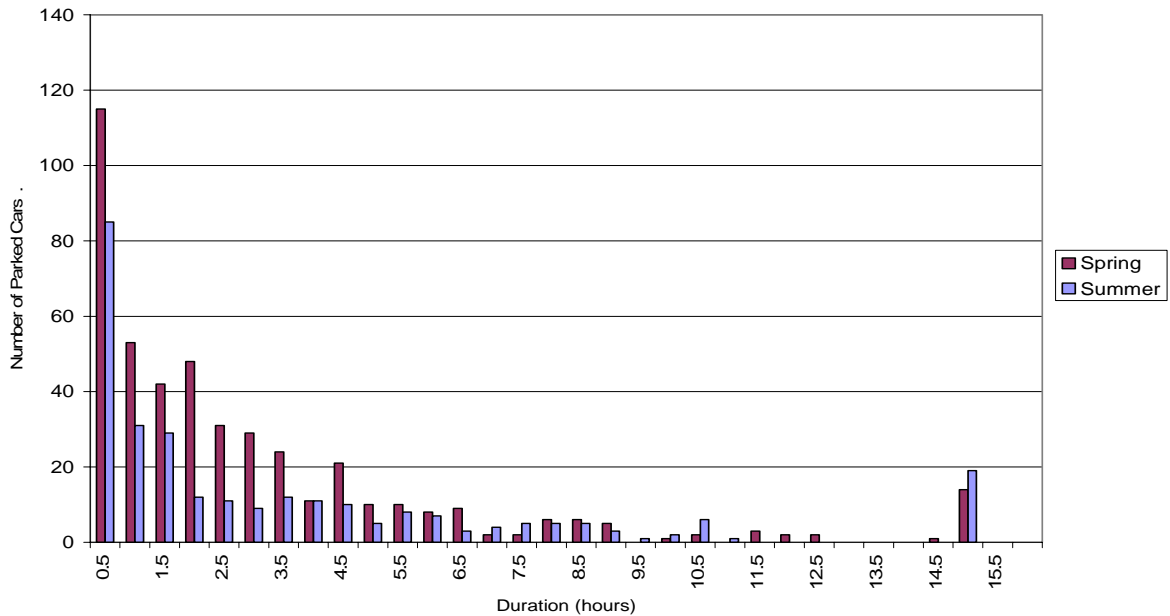
Parking utilization is presented below in Figure 24 for the **182 unrestricted spaces** in this subarea. Using the spring data there were 48 cars parked at 5:00 A.M., 67 at 8:00 A.M. and reaching 108 at 11:00 A.M. The parking occupancy hovered just above 100 spaces until 5:30 P.M. and then increased up to 128 after 6:30 P.M. Parking occupancy in this subarea is below the capacity. There were 16 cars that parked all day, from 5:00 A.M. to 8:00 P.M. and 3 additional cars that parked from 8:00 A.M. to 8:00 P.M. These cars are likely parking for the boat houses. There were 48 cars parked cars at 5:00 A.M., which were likely parked all night. The summer data was the same as the spring data early in the morning, but then remained at a lower utilization throughout the day.

Figure 24. Parking Utilization for Unrestricted Spaces – Subarea M



The parking duration in the unrestricted spaces, shown in Figure 25, discloses a relatively high turnover rate. During the spring data collection of the 457 parked cars, 258 parked for two hours or less, or 56% of all parked cars. An additional 95 parked for up to four hours, or 20 percent of the parked cars. The duration data include the same car that parked more than one time. There are fewer cars parked for almost all the duration periods due to the lower utilization.

Figure 25. Parking Duration for Unrestricted Spaces – Subarea M



Additional data were collected during the summer to estimate the residential parking activity. For this subarea, the full license plate was recorded during each pass through by the data collector. (Normally only the first three digits of the license plate number is collected for efficiency.) The full license plate recording provided a record of the number of times a vehicle left and returned, and the total duration that the car was parked even if the car left and returned more than once. A summary of this parking activity is presented in Table 2.

Table 2. Parking Frequency in Subarea M

Number of times parked	1	2	3	4	5	6
Number Cars	153	39	15	3	1	1
Number 5 A.M. to 8 P.M.	17	0	0	0	0	0

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. August 2005

Table 3 shows that of the 212 unique parked cars throughout the day, 153 parked only one time. Figure 24 shows that approximately 50 cars were parked at 5 A.M., and it is assumed that these cars belong to residents of the nearby houseboats. Table 3 also shows that 17 of the cars parked at 5:00 A.M. (during the summer) stayed all day without moving. These cars may be residential and the owner used an alternative form of transportation or did not leave the house on that day. The 50 cars that were parked at 5:00 A.M. also indicate that there is residential parking occurring both on Westlake Avenue and at other private locations within subarea M.

Peak parking demand was 128 parked cars at 6:30 P.M. during the spring data collection, which includes existing residential parking demand. There are 182 parking spaces in this area, and so the estimated surplus of available spaces is 54 spaces. If there is a demand for 50 residential spaces at

5:00 A.M., and that demand also occurs at 6:30 P.M. then there is adequate capacity to implement a residential parking zone.

Table 3 goes on to show that there were 39 cars that were found to park within subarea M, twice in one day. Fifteen cars parked three times in one day. These vehicles are parking for longer duration than indicated by Figure 25 (since they could be counted as two, 4-hour parkers, when the total duration may be 8 hours.) This shows that there may be a need for longer duration parking in this zone, which could be related to nearby residential uses.

6.0 Summary of Spring and Summer Data Collection

Parking data were collected mid-week on May 24, 25, and 26, 2005 and mid-week on August 9, 10, and 22, 2005. Parking activity was surveyed by recording license plate numbers by stall at 30-minute intervals with one pass-through at 5:00 A.M. and then continuous data collection from 8:00 A.M. to 8:00 P.M. The data collection provided information on utilization, compliance by parking restriction type, and average parking duration. The study area was along Westlake Avenue N from the south end at Broad Street to the north at Discount Divers supply, under the Aurora Bridge.

The study area included all public parking located on the east side of Westlake Avenue N, a total of 1,269 spaces. Peak parking utilization is summarized in Table 3. Parking utilization measures the percentage of spaces that were occupied. As shown previously in the detailed utilization charts for each area, the peak parking demand occurs during daytime hours with very high utilization rates between 9:00 A.M. and 4:00 P.M.

Table 3. Westlake Avenue N – Peak Parking Utilization

Street Segment	Adjacent Activity	Subarea (Map Code)	Peak Utilization by Type of Parking		
			1-hour Parking	2-hour Parking	Unrestricted Parking
Broad Street to Highland Drive	South Lake Union Park, tourism (Kenmore Air, Argosy)	A,B,C	--	100%	100%
Highland Drive to Discovery Yachts	Restaurant and office	D,E,F	100%	100%	100%
Driveway at Discover Yachts to Newton Street	Office on both sides of Westlake, Sundance Sales, and parking in drive aisle	G,H,N	--	100%	96%
Newton Street to McGraw Street	Westlake Marina, Chinatown, Landings, parking in drive aisle Apartments on west side	I,J,O	100%	100%	92%
McGraw Street to Holiday Street	Yacht and marine supplies, house boats	K,L	--	--	77%
Holiday Street to location of Discount Drivers Supply	Marine industrial, and retail	M	--	--	70%

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May and August 2005

Key findings for utilization, based on the spring and summer data collection, are: summarized below:

- Parking accumulation reached or exceeded the practical capacity of 85% for the area between the south end and McGraw Street during both the spring and summer surveys. Utilization rates reaching approximately 70% are candidates for additional parking management measures so that parking management tools are implemented before reaching capacity. Utilization rates in the segment from McGraw Street to Halladay Street (subarea KL) were 77% with spring data and 61% with summer data. From Halliday north (subarea M) utilization rates were 76% and 61% for the spring and summer surveys, respectively.
- Spring and summer parking data showed very similar characteristics for utilization and duration. The primary differences are that more vehicles parked in the evenings during the summer and a few locations had vehicles parked for long duration. Both of these differences are likely related to boating, tourist activities and restaurant activities along the corridor. A fall data collection effort is not expected to deliver significantly different results.

The duration data were compiled to show turnover characteristics by subarea as shown in Table 4. In every subarea, except ABC, there was a significant turnover rate in the unrestricted spaces. The total average turnover of spaces, by subarea is summarized in Table 4. The total is summarized as an indicator of the demand for 2 hour parking because the unrestricted spaces showed a relatively high turnover rate and the two hour spaces were generally a small portion of parking compared to the number of unrestricted spaces. The number of cars that parked for two hours or less ranged from 52% to 64% throughout the corridor. The highest rate was in subareas DEF and IJO where there is restaurant activity.

Table 4. Westlake Avenue N Parking Duration Summary

Street Segment	Adjacent Activity	Subarea (Map Code)	% of Vehicles Parked		
			< 2 Hours	2 – 4 Hours	> 4 Hours
Broad Street to Highland Drive	South Lake Union Park, tourism (Kenmore Air, Argosy)	A,B,C	55%	20%	25%
Highland Drive to Discovery Yachts	Restaurant and office	D,E,F	64%	16%	20%
Driveway at Discover Yachts to Newton Street	Office on both sides of Westlake, Sundance Sales, and parking in drive aisle	G,H,N	52%	16%	32%
Newton Street to McGraw Street	Westlake Marina, Chinatown, Landings, parking in drive aisle Apartments on west side	I,J,O	64%	15%	21%
McGraw Street to Holiday Street	Yacht and marine supplies, house boats	K,L	53%	16%	31%
Holiday Street to location of Discount Drivers Supply	Marine industrial, and retail	M	56%	19%	25%

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May and August 2005

For each of the parking zones, the number of parked cars in the ½ hour following the time restriction was somewhat significant. What this means is that with meters and/or added enforcement, the available one-hour and two-hour spaces available over a day, can be increased by encouraging a slightly shorter parking duration. Key findings of the duration data, based on spring and summer data are summarized below.

- The market for two-hour parking appears to be strong throughout the corridor.
- In some segments, the number of four-hour parkers suggests consideration of a four-hour parking limit. Four hours may provide a better match for boating and recreational activities in the corridor than the traditional two hour limits. It could also be related to employees of the area leaving during the day for lunch or other errands and returning.
- Parking at 5:00 A.M. was observed through most of the study area. The number of vehicles parked throughout the corridor at 5:00 A.M. was just over 300 in the spring and 341 in the summer. The majority of these were parked at the north end of the study area in subarea KL and M (140 in the spring and 146 in the summer). The need for residential parking at select locations, in addition to sub area M, should be considered as part of future parking management measures.
- Long-term parking in the corridor could be related to employment adjacent to the parking, or it could be related to commuters using the unrestricted parking as a park-and-ride location for downtown. If so, fewer unrestricted free spaces may limit use of this area as a park-and-ride. However, it would also change the use of the free parking for nearby employees.

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