TRAFFIC ENGINEERING EVALUATION

PROPOSED REDEVELOPMENT
120 – 126 NORTH AVENUE
BOROUGH OF DUNELLEN
MIDDLESEX COUNTY, NEW JERSEY

Prepared for:

120-126 North Avenue
Urban Renewal, LLC

Prepared by:

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INTRODUCTION

The purpose of this Traffic Engineering Evaluation is to assess the traffic impacts associated with the redevelopment of the subject property located at 120 – 126 North Avenue in the Borough of Dunellen, Middlesex County. The site has approximately 150 feet of frontage along the north side of North Avenue. The site is currently occupied by a 4,800 square foot two, story office building with no on-site parking, approximately 1,250 square feet of retail space and a single-family home with a driveway and parking in the rear, and a single-family home with a driveway and parking in the rear. There is one driveway serving the 124 North Avenue property and one driveway serving the 126 North Avenue property.

The proposal is to demolish the existing structures and construct a mixed-use, residential, and commercial building consisting of 33 units of multifamily housing (mid-rise) in two stories over approximately 2,192 square feet of ground floor retail space and ground floor parking with capacity for 35 parking spaces, including 2 ADA compliant parking spaces and 8 Electric Vehicle Charging Station (EVCS).

EXISTING CONDITIONS

The site is located at 120 – 126 North Avenue. The site currently contains an office building and a multifamily housing building. The surrounding properties generally consist of a mix of commercial and residential uses. There are many options for dining, shopping, and entertainment within walking distance of the subject site that improve the ability for a tenant of the project to become more automobile independent and not own a personal vehicle or not own a second vehicle. The adjacent roadway of North Avenue serving the subject site is described as follows:

North Avenue is also known as NJ Route 28, is an Urban Principal Arterial under the jurisdiction of NJDOT. There are sidewalks on both sides of the street. Two-hour parking is permitted on both sides of the street. North Avenue is a two-way street and connecting Route 22 in Bridgewater in the west and Route 27 in Elizabeth in the east. The posted speed limit is 30 MPH. North Avenue is controlled by traffic signals at its intersections with Washington Avenue one-quarter mile to the west and at Rock Avenue less than one-half mile to the east.

Mass Transportation Options

There are bus stops on North Avenue for the 59 and 113 bus with routes between the Dunellen Train Station and Newark. The Dunellen NJ Transit Rail Station is a 6-minute/0.3-mile walk from the subject site. Frequent mass transportation services during the peak commuting hours are attractive alternatives to commuting by passenger car or owning a car.

DEVELOPMENT PROPOSAL

The proposed development consists of the construction of 33 units of multifamily housing (mid-rise) in two stories over approximately 2,192 square feet of ground floor commercial space and ground floor parking with a total capacity of 35 parking spaces, including 2 ADA compliant

parking spaces and 8 EVCS. Proposed access to the site would be provided by one full-movement driveway on North Avenue.

TRIP GENERATION

According to the *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers, Multifamily Housing (Mid-Rise) includes apartments, townhouses, and condominium located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Trip generation for the proposed 33-unit, multifamily housing building was calculated using the NJDOT HAPS trip generation, which is based on the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition*. The average trip generation rate for "Dense Multi-Use Urban" setting/location was chosen to replicate the surrounding traffic conditions. Table 1 - Trip Generation Summary, tabulates the trip generation for the proposed 33-units of Multifamily Housing (Mid-Rise) with 2,192 square feet of retail space. As shown in Table 1, the proposed 33 units of Multifamily Housing (Mid-Rise) would generate 12 vehicle trips during the AM peak hour, 15 vehicle trips during the PM peak hour, and 15 trips during the Saturday peak hour. The approximately 2,192 square feet of retail space would generate 2 vehicle trips during the AM peak hour, 36 vehicle trips during the PM peak hour, and 30 vehicle trips during the Saturday peak hour. Based on this small square footage of retail space, the NJDOT guidelines for pass-by percentage is 100 percent during the PM peak hour and 38.6 percent during the Saturday peak hour. The vehicle trip generation calculations would be considered conservative. On average, this proposed development is expected to generate 1 vehicle entering or exiting the site every 4 minutes during the AM, 1 vehicle trip entering or exiting every minute during the PM peak hour, and approximately 1 vehicle trip entering or exiting every 1.5 minutes during the Saturday peak hour.

According to the NJDOT HAPS trip generation, the existing 4,800 square feet of office space, 1,250 square feet of retail spaces, and 2 single-family homes would generate 14 trips during the AM peak hour, 97 trips during the PM peak hour, and 30 trips during the Saturday peak hour. The proposed redevelopment of the site would generate an increase of approximately 4 new trips during the AM peak hour, 7 new trips during the PM peak hour, and 1 less new trip during the Saturday peak hour.

According to Transportation Impact Analysis for Site Development, published by the Institute of Transportation Engineers (ITE), an increase of less than 100 vehicle trips would not change the level of service of the local street network nor appreciably increase the volume-to-capacity ratio of an intersection approach. Also, NJDOT Access Management Code considers a significant increase in trips greater than 100 peak hour trips AND greater than a 10 percent increase in previously anticipated daily trips. Therefore, the proposed development is not anticipated to significantly impact the operations of the local streets.

However, we obtained historic traffic volumes from April 10, 2019, from the NJDOT website for Route 28/West Front Street, approximately 1.3 miles to the east, between Compton Ave and

Melrose Place, which carries approximately 700 to 1,000 vehicles per hour in two directions during the AM and the PM weekday peak hours. If the portion of Route 28 near the subject site carries similar AM and PM peak hour traffic volumes, the number of trips generated by the proposed development would be less than 5 percent of the traffic volumes on Route 28/North Avenue. Traffic volumes fluctuate more than 10 percent from day to day. Therefore, the increase in traffic generated by the proposed development would be imperceptible by motorist traveling along North Avenue.

PARKING GENERATION

At 1 parking space per one-bedroom unit, 1.5 parking spaces per two-bedroom unit, 1.75 per three-bedroom unit, and 1 space per 200 square feet of commercial space, the total parking requirement is 53 parking spaces. The adjustment for bicycle parking spaces is to subtract 11 from the required 53 to reduce the requirement to 42 parking spaces. The EVCS will reduce the parking by 10 percent to 37 required parking spaces. The site plan proposes 35 on-site parking spaces. There are 4 on-street parking spaces adjacent to the site, where customers of the commercial space would likely park.

Due to the proximity of bus service and rail service, as well as local dining, shopping, and entertainment options, it is anticipated that not all the potential residents of this proposed multifamily housing units would own a vehicle and would take advantage of the frequent and convenient commuter mass transportation services, as well as the local dining, shopping, and entertainment options.

Parking Generation, 5th Edition, published by ITE, provides data supporting a lower parking demand for Multifamily Housing (Mid-Rise) in a General Urban/Suburban setting/location, within one-half mile of a rail transit station, Monday through Friday, between 10 PM and 5 AM. The average peak parking demand is 0.61 parked vehicles per bedroom or 31 parked cars for 51 total bedrooms (17 one-bedroom units, 14 two-bedroom units, and 2 three-bedroom units).

Shared Parking Technique

To justify the deviation from the 53 required parking spaces for the mixed-use development, an industry accepted technique called “shared parking” was employed. This parking analysis focused on the industry accepted “shared parking” technique, which involves calculating the hourly parking demand of each land use within a mixed-use development by using the temporal distribution of the parking demand of each land use, as provided in *Parking Generation, 5th Edition*, published by the Institute of Transportation Engineers (ITE). This effort involved determining the square footage of retail and the number of residential units, establishing the parking requirements for each individual land use from the local Ordinance parking requirements, minus the 10% for the EVCS, then totaling each hourly parking demand for each use in the proposed development to determine the peak parking demand and the associated hour of the day. These data are tabulated in an Excel spreadsheet, which allows input of the proposed square footage of the retail use and number of residential units to determine a more

realistic parking supply. The maximum parking demand for the proposed project for the single peak hour would be the minimum parking supply for the proposed project. We performed this shared parking analysis for a typical weekday and a typical Saturday.

We calculated the parking requirements of the 33 dwelling units with 51 total bedrooms based on the ITE average peak parking demand per bedroom and 2,192 square feet of retail sales space based on the local Ordinance parking requirements for the individual uses proposed within the subject site. We used the temporal distribution data provided in the *Parking Generation, 5th Edition*, published by the ITE for each land use to prepare the shared parking analysis.

Based on the hourly variation in parking demand from the data provided in *Parking Generation, 5th Edition*, we determined the peak parking demand for the combination of the land uses in the mixed-use development. We established the weekday and Saturday parking demand of the shared parking situation, as summarized in the Shared Parking Requirements Summary tables, attached. During the daytime hours, the residential cars are driven away from the site, while the retail customers' cars are driven to the site. In the late evening hours when the retail establishments close and the residents return home the reverse parking demand would occur. With approximately 50 percent of the residential parking demand off-site during the midday hours, those vacant parking spaces are available for the retail parking demands. We determined the maximum parking demand for the mixed-use development to be 31 parked cars between 12 midnight and 6 AM on a weekday and 34 parked cars from 9 AM to 10 AM on a Saturday. Based on the results of the Shared Parking Analysis, the 35 on-site parking spaces would be adequate to support the average peak parking demand of 34 parked cars of the project.

SITE REVIEW

The standard parking spaces are 9-feet wide by 18-feet long. The drive aisles are 24 feet wide. These dimensions meet the Residential Site Improvement Standards (RSIS). The 2 ADA parking spaces are designed to be accessible. Adequate pedestrian access should be provided between the building elevators and the parking area.

DRIVEWAY ACCESS

Adequate sight distance should be provided from the proposed exit driveway on North Avenue. With a posted speed of 35 MPH, the design speed of North Avenue is 40 miles per hour thus resulting in a recommended stopping sight distance of 305 feet, in accordance with A Policy on Geometric Design of Highways and Streets (AASHTO). The intersection sight distance for passenger cars is 445 feet. The available sight distance is 445 feet in each direction from the proposed site exit driveway.

CONCLUSIONS

Based upon our trip generation evaluation, it is our professional opinion that the proposed 33-unit, Multifamily Housing (Mid-Rise) building with approximately 2,192 square feet of retail space would not generate a significant amount of vehicle trips and would not have a significant impact on traffic conditions during the AM and PM peak commuter traffic hours or on the Saturday peak hour.

With a proposed parking ratio of 0.71 on-site parking spaces per bedroom, the proposed 35 on-site parking spaces will satisfy the ITE *Parking Generation, 5th Edition* average peak parking demand of 0.61 parked cars per bedroom. The 4 on-street parking spaces adjacent to the subject property would adequately serve the needs of the project's commercial customers. The site should be designed with adequate parking and circulation for the residents of the project.

In conclusion, the development of this project would have no significant impact on the traffic operations of area roadways and intersections and would not have a significant impact on local parking conditions.

The foregoing is a true representation of my findings.

Lee D Klein

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Google Maps

120 North Ave, Dunellen, NJ 08812 to Dunellen Station, South Washington Avenue & Prospect Avenue, Dunellen, NJ

Walk 0.3 mile, 6 min

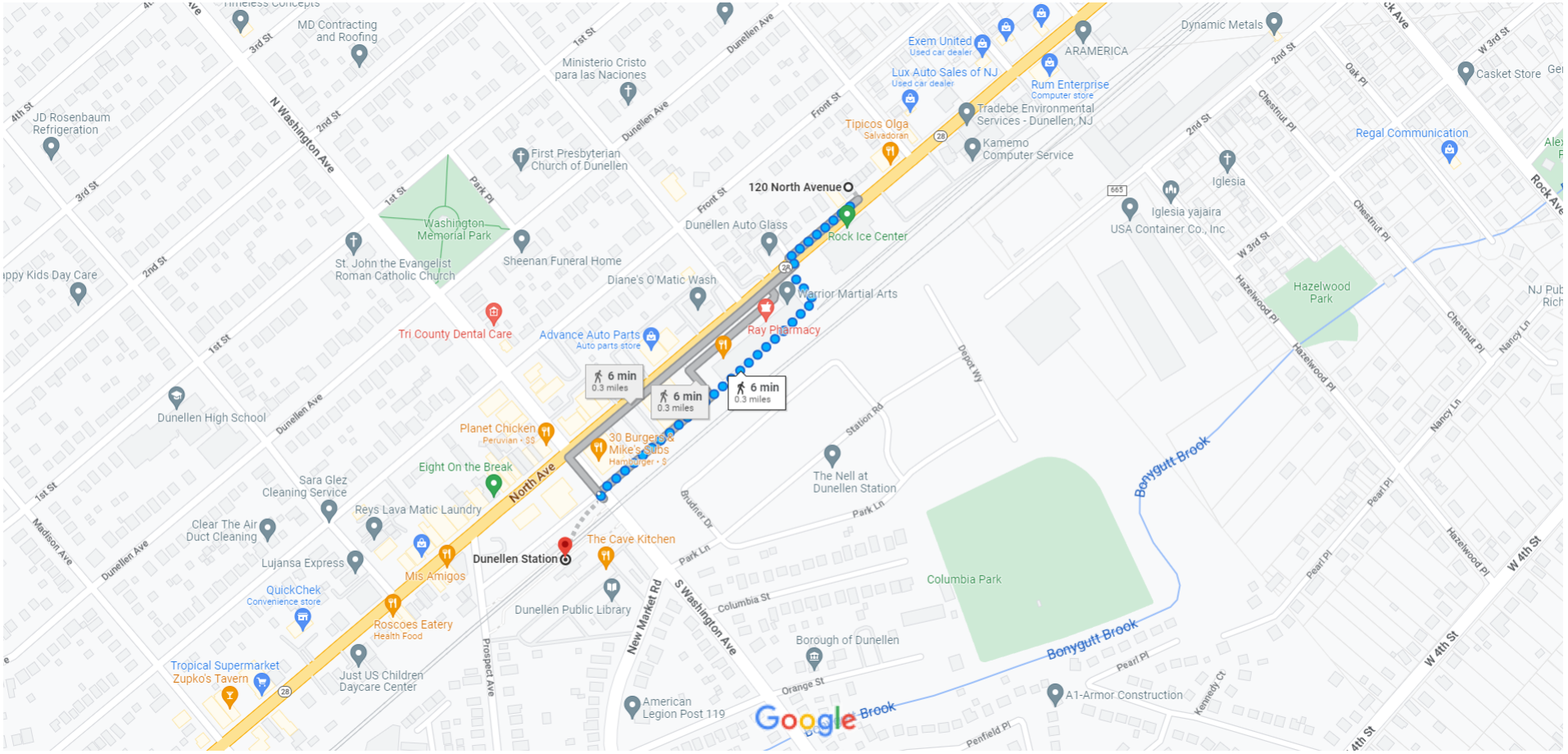

Table 1 - Trip Generation Summary
Dunellen Mixed-Use Development, 120 - 126 North Avenue, Dunellen, Middlesex County, NJ

			WEEKDAY						SATURDAY		
			AM PEAK HOUR			PM PEAK HOUR			PEAK HOUR		
CODE	LAND USE	AMOUNT	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
EXISTING USES											
210	Single-Family Detached (Average Rate)	2 units	0	2	2	2	1	3	11	9	20
710	General Office Building (> or = 200,000 SF)	4,800 SF	9	2	11	23	48	71	1	1	3
820	Shopping Center (Formulas)	1,250 SF	1	0	1	12	12	24	10	9	19
	Pass By Percentage (PM)	-100.0%				(12)	(12)	(24)			
	Pass By Percentage (Sat)	-38.6%							(4)	(3)	(7)
	Total New Strip Retail Plaza Trips		1	0	1	0	0	0	6	6	12
	TOTAL EXISTING SITE-GENERATED TRIPS		**10**	**5**	**14**	**37**	**61**	**97**	**22**	**20**	**42**
PROPOSED USES											
221	Multifamily Housing (Mid-Rise)(Average Rate)	33 units	3	9	12	9	6	15	7	8	15
820	Shopping Center (Formulas)	2,192 SF	1	1	2	18	18	36	15	15	30
	Pass By Percentage (PM)	-100.0%				(18)	(18)	(36)			
	Pass By Percentage (Sat)	-38.6%							(6)	(6)	(12)
	Total New Strip Retail Plaza Trips		1	1	2	0	0	0	9	9	19
	TOTAL PROPOSED SITE-GENERATED DRIVEWAY TRIPS		**4**	**10**	**14**	**27**	**23**	**50**	**23**	**23**	**45**
	TOTAL CHANGE IN NEW SITE-GENERATED TRIPS		**(5)**	**5**	**(0)**	**(10)**	**(38)**	**(47)**	**0**	**3**	**3**

Note: (##) indicates a decrease in trip generation
Source: NJDOT, HAPS, Trip Generation, August 25, 2022

TABLE 1 - PHASE 1 SHARED PARKING REQUIREMENTS SUMMARY

INSTITUTE OF TRANSPORTATION ENGINEERS - SHARED PARKING METHODOLOGY

120-126 North Ave, Dunellen, NJ	PARKING SPACES REQUIRED					PARKING	
Development Proposed	**Variable**	**Minimum Off-street**	**Maximum Total**				
				ITE, Parking Generation, 5th Edition, Average Peak Parking Demand Per			
Multifamily Housing (Mid-Rise)	1 bedroom	0.61		**0.61** parked cars per bedroom (within 1/2 mile of a rail station)			
Multifamily Housing (Mid-Rise)	2 bedroom	1.22					
Multifamily Housing (Mid-Rise)	3 bedroom	1.83					
Ordinance parking requirements							
Retail (Food)	2,192	10.96		Ordinance (1 per 200 SF GFA 1st Floor Area, plus 1 Additional Space for Each 300 SF of Additi			
One-bedroom Apartments	17	10.00					
Two-bedroom Apartments	14	17.00					
Three-Bedroom Apartmetns	2	3.66					
Total required spaces		**41.62**					
Spaces provided		***35***					
Subtotals							
Totals							
INTERIM TOTAL							

Peak Parking Accumulation	**ITE Code**	**Size**	**Variable**		**Weekday Rate**	**Weekday**	**Sat Rate**	**Saturday**
Retail (Food)	820	2,192	sq ft		2.00	10.96	2.00	10.96
Assumed capture parking						0%		0%
Net retail parking demand						10.96		10.96
Retail (Non Food)	xxx	-	sq ft		2.00	-	2.00	-
Assumed capture parking						10%		10%
Net retail parking demand						-		-
Bank	xxx	-	sq ft		2.00	-	2.00	-
Assumed capture parking						10%		10%
Net retail parking demand						-		-
Quality Restaurant	931	-	sq ft		5.00	-	5.00	-
Assumed capture parking						10%		10%
Net retail parking demand						-		-
Theatre	xxx	-	sq ft		5.00	-	5.00	-
Assumed capture parking						10%		10%
Net retail parking demand						-		-
Office	710	-	sq ft		2.00	-	2.00	-
Assumed capture parking						10%		10%
Net retail parking demand						-		-
Apartment -1 Shared Space/Unit	221	17	units		0.61	10.37	0.61	10.37
Apartment -1 Reserved Space/Unit	221	17	units		0.61	10.37	0.61	10.37
Apartment -1 Shared Space/Unit	221	14	units		1.83	25.62	1.83	25.62
Apartment -1 Reserved Space/Unit	221	14	units		1.83	25.62	1.83	25.62

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TABLE 1 - PHASE 1 SHARED PARKING REQUIREMENTS SUMMARY

INSTITUTE OF TRANSPORTATION ENGINEERS - SHARED PARKING METHODOLOGY

WEEKDAY	Mixed Use Development								
SHARED PARKING								Apartment	**Mixed-Use**
				Retail (Food)				Residential	**Demand**
MAXIMUM DEMAND				11				31	**31**
6:00 AM	-	-	-	1	-	-	-	25	**27**
7:00 AM	-	-	-	3	-	-	-	22	**25**
8:00 AM	-	-	-	7	-	-	-	19	**26**
9:00 AM	-	-	-	8	-	-	-	17	**25**
10:00 AM	-	-	-	8	-	-	-	17	**25**
11:00 AM	-	-	-	9	-	-	-	16	**25**
12:00 PM	-	-	-	11	-	-	-	15	**26**
1:00 PM	-	-	-	10	-	-	-	15	**25**
2:00 PM	-	-	-	6	-	-	-	15	**21**
3:00 PM	-	-	-	5	-	-	-	15	**20**
4:00 PM	-	-	-	5	-	-	-	18	**22**
5:00 PM	-	-	-	7	-	-	-	20	**27**
6:00 PM	-	-	-	10	-	-	-	21	**30**
7:00 PM	-	-	-	9	-	-	-	21	**30**
8:00 PM	-	-	-	7	-	-	-	23	**30**
9:00 PM	-	-	-	5	-	-	-	25	**30**
10:00 PM	-	-	-	2	-	-	-	28	**30**
11:00 PM	-	-	-	-	-	-	-	29	**29**
12:00 AM	-	-	-	-	-	-	-	31	**31**
Peak parking accumulation									**31**
Total spaces required									**31**

SATURDAY	Mixed Use Development								
SHARED PARKING								Apartment	**Mixed-Use**
				Retail (Food)				Residential	**Demand**
MAXIMUM DEMAND				11				31	**34**
6:00 AM	-	-	-	2	-	-	-	30	**31**
7:00 AM	-	-	-	3	-	-	-	29	**32**
8:00 AM	-	-	-	6	-	-	-	27	**33**
9:00 AM	-	-	-	8	-	-	-	25	**34**
10:00 AM	-	-	-	10	-	-	-	23	**33**
11:00 AM	-	-	-	11	-	-	-	22	**33**
12:00 PM	-	-	-	10	-	-	-	21	**31**
1:00 PM	-	-	-	9	-	-	-	20	**29**
2:00 PM	-	-	-	7	-	-	-	21	**29**
3:00 PM	-	-	-	5	-	-	-	21	**26**
4:00 PM	-	-	-	4	-	-	-	22	**26**
5:00 PM	-	-	-	4	-	-	-	23	**27**
6:00 PM	-	-	-	4	-	-	-	23	**27**
7:00 PM	-	-	-	6	-	-	-	22	**29**
8:00 PM	-	-	-	4	-	-	-	23	**27**
9:00 PM	-	-	-	4	-	-	-	24	**28**
10:00 PM	-	-	-	4	-	-	-	25	**29**
11:00 PM	-	-	-	-	-	-	-	27	**27**
12:00 AM	-	-	-	-	-	-	-	31	**31**
Peak parking accumulation									**34**
Total spaces required									**34**