



CITY OF ORLANDO
SOUTH DOWNTOWN VISION PLAN
APPENDICES



MEMORANDUM

TO: Joel West

FROM: Tom Kohler and Jordan Cook

DATE: May 16, 2008

RE: **South Downtown Redevelopment Plan Update: Market Scan**
(RERC 28-075)

EXECUTIVE SUMMARY

Real Estate Research Consultants, Inc. was retained by Glatting Jackson Kercher Anglin, Inc to investigate the market supportability of uses for the South Downtown Redevelopment Plan. The area analyzed include approximately 580 +/- acres bound by East Michigan Street to the south, South Orange Avenue to the east, State Road 408 to the north and Interstate 4 to the west. The land uses which have been evaluated include residential, office, hotel, industrial, as well as retail, restaurants and services.

The range of development potential for the study area was analyzed for the time period from 2008 through 2030. The following tables summarize our findings regarding the study area's potential range of development based on a low growth scenario and a high growth scenario.

STUDY AREA LOW GROWTH POTENTIAL						
Land Use	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Residential (Units)	84	211	211	211	211	927
Office (SF)	85,305	143,173	205,853	232,904	263,509	930,744
Industrial (SF)	83,562	116,060	119,362	139,503	145,022	603,510
Retail, Restaurant & Services (SF)	12,478	57,682	57,682	57,682	57,682	243,205
Hotel (Rooms)	75	75	50	50	50	300

STUDY AREA HIGH GROWTH POTENTIAL						
Land Use	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Residential (Units)	225	562	562	562	562	2,471
Office (SF)	227,479	381,795	548,942	621,077	702,692	2,481,984
Industrial (SF)	139,270	193,434	198,937	232,505	241,704	1,005,850
Retail, Restaurant & Services (SF)	33,423	152,636	152,636	152,636	152,636	647,965
Hotel (Rooms)	75	75	50	50	50	300

Note: the incremental square footages or units may not add to the total amount due to rounding.

The study area's range of development potential between 2008 and 2030 is based upon current land use and zoning regulations. If any of the current land uses in the study area change in the future some of these opportunities may decrease or increase. However, given current market conditions and trends it is likely the study area's development potential will fall within the ranges given.

SITE DESCRIPTION AND CONTEXT

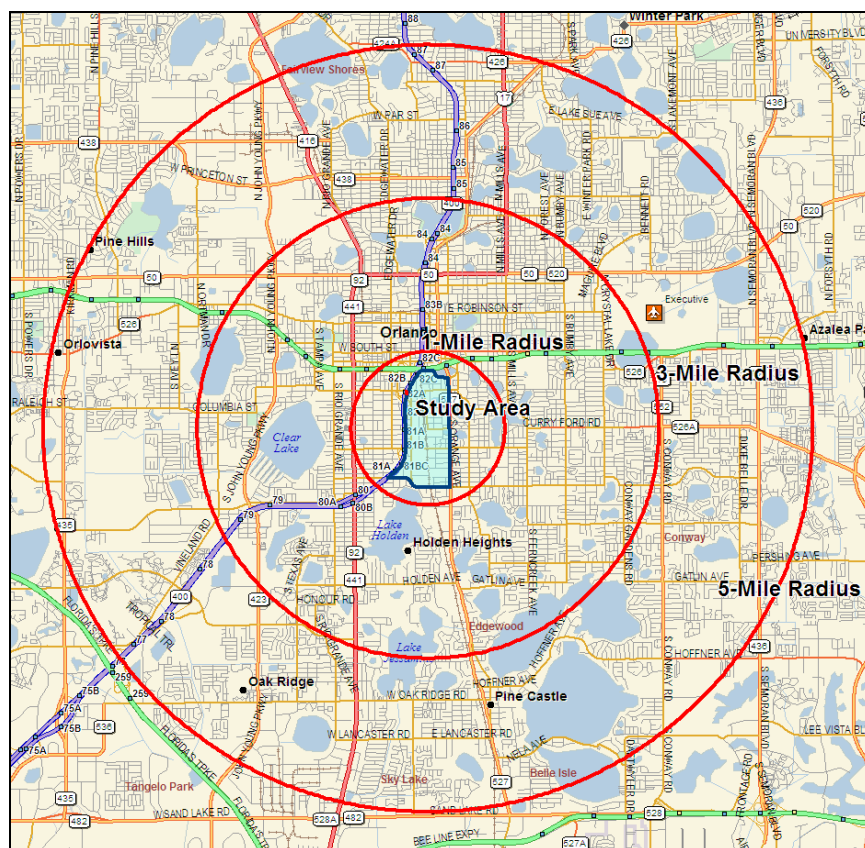
RERC's analysis of supportable land uses pertains to the South Downtown Redevelopment Plan Update located just south of downtown Orlando, Florida. The study area, bound by East Michigan Street to the south, South Orange Avenue to the east, State Road 408 to the north and Interstate 4 to the west, is approximately 580+/- acres in size in Orange County. The following aerial generally depicts the area of analysis as described.



STUDY AREA CHARACTERISTICS

As an additional reference for demographic characteristics within the study area, RERC reviewed data obtained from Claritas, a third-party vendor of socioeconomic and demographic information. Key characteristics regarding population, average household income, and households were examined for the 1-, 3- and 5-mile radii around the site. The following map illustrates the location of the site as well as the 1-, 3- and 5-mile radii.

1-, 3-, and 5-Mile Radii Map & Study Area



The following table presents estimated population, households, and average household income data for the 1-, 3- and 5-mile radii in 2000 and 2007 and projected figures for 2012. Between 2007 and 2012, the population within the 1-mile radius is projected to grow annually at a rate of approximately .07%, while the 3-mile radius is projected to grow annually at a rate of approximately .74%. The 5-mile radius is projected to grow at a higher rate than both the 1- and 3-mile radii between 2007 and 2012 at 1.42% annually. The number of households in the 1-mile radius during the same time period is projected to grow approximately 3.47% or .69% annually. The household in the 3- and 5-mile radii are projected to increase at about twice the rate projected in the 1-mile radius. The number of households in the 3-mile radius is projected to grow approximately 7.39% or 1.48% annually, while the number of households in the 5-mile radius is projected to grow approximately 8.44% or 1.69% annually. The average household income remains healthy and strong with increases for all periods in the 1-, 3-, and 5-mile radii.

DEMOGRAPHIC CHARACTERISTICS: 2000, 2007 & 2012						
	1 Mile		3 Mile		5 Mile	
Year	Population	Annual % Change	Population	Annual % Change	Population	Annual % Change
2000	10,716		104,294		269,315	
2007	10,629	-0.12%	109,634	0.73%	292,262	1.22%
2012	10,668	0.07%	115,297	0.74%	312,962	1.42%
Year	Households	Annual % Change	Households	Annual % Change	Households	Annual % Change
2000	4,742		43,406		108,745	
2007	4,871	0.39%	47,124	1.22%	120,392	1.53%
2012	5,040	0.69%	50,607	1.48%	130,548	1.69%
Year	Average Household Income	Annual % Change	Average Household Income	Annual % Change	Average Household Income	Annual % Change
2000	\$51,763		\$48,690		\$48,325	
2007	\$62,277	2.90%	\$56,309	2.24%	\$54,059	1.70%
2012	\$66,906	1.49%	\$60,930	1.64%	\$58,122	1.50%

Source: Claritas, RERC

In summary, the small amount of projected population growth is not surprising considering the mature nature of the built environment within the surrounding residential neighborhoods. Aside from redevelopment sites, there are few opportunities for growth. However, Claritas projects growth based on historical trends, which may not remain constant over time. It is possible for the areas to achieve higher growth due to potential government policy changes in the future that could promote urban infill development versus suburban sprawl. In the interim, the strong income potential will offset any low growth in population and households.

RESIDENTIAL DEMAND

Residential demand is largely driven by increases in population and households. As mentioned in the demographic section, the study area and the radii are mature markets with limited opportunity for new residential growth aside from redevelopment sites. However, it is reasonable to assume development policies may encourage urban infill and higher density in the future rather than suburban sprawl. Therefore, the study area's potential residential growth in the future is likely to increase, though it will be a small percentage of the City of Orlando's overall household growth.

The number of households in the City of Orlando in 2007 was estimated at 91,570. Between 2007 and 2012, the number of households in the City is projected to grow 7.67% or 1.53% annually. The following table provides the City of Orlando's population and household figures for 2000 and 2007, as well as projected 2012 population and household figures.

CITY OF ORLANDO SELECT CHARACTERISTICS: 2000, 2007 & 2012					
	2000	2007	2012	Annual Growth	
				2000-2007	2007-2012
Population	187,096	203,697	216,068	1.2%	1.2%
Households	81,312	91,570	98,591	1.7%	1.5%

Source: Orlando Economic Development Commission

The study area will absorb a portion of the future household and population growth anticipated in the City. Given the possibility that development policies may encourage urban infill and higher densities, it is reasonable to assume the study area could potentially capture a low of 3% and a high of 8% of household growth in the City. The low and the high capture rates provide a range of development. It is likely the actual amount of residential development will fall within the range.

To project potential household growth through 2030, RERC applied the annual household growth projected for the period of 2007 to 2012, 1,404 households or 1.53%, to all subsequent periods. Therefore, between 2008 and 2030, the City of Orlando could absorb an additional 30,892 households or 1,404 households annually given projected growth trends. Given a low capture rate of 3% and a high capture rate of 8%, the study area's household growth could range from 978 to 2,471 households during the period between 2008 and 2030. The following chart outlines the City of Orlando and the study area's potential household growth by period.

INCREMENTAL RESIDENTIAL GROWTH BY PERIOD, 2007-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
City of Orlando Households	2,808	7,021	7,021	7,021	7,021	30,892
Study Area Capture						
Low Capture Rate (3%)	84	211	211	211	211	927
High Capture Rate (8%)	225	562	562	562	562	2,471

Source: Claritas, RERC

Note: The incremental numbers may not add up to the total due to rounding.

The residential product needed to accommodate these additional households will be a mix of both owner and renter occupied housing. To project the number of owner and renter occupied housing units into the future, RERC reviewed the 2007 and projected 2012 percentage mix of owner and renter occupied housing obtained from Claritas, a third-party vendor of socioeconomic and demographic information. The following chart outlines the mix of owner occupied and renter occupied housing for the City of Orlando and the 1-mile radius.

OWNER V. RENTER OCCUPIED HOUSING		
	2007	2012
City of Orlando		
Owner Occupied	35.9%	34.3%
Renter Occupied	54.9%	55.9%
1-Mile Radius		
Owner Occupied	36.8%	36.7%
Renter Occupied	63.2%	63.3%

Source: Claritas, RERC

In the 1-mile radius, the percent of owner occupied housing was 36.8% in 2007 and projected to remain relatively constant at 36.7% in 2012. To estimate owner occupied and renter occupied housing for the study area, RERC applied the projected 2012 mix of owner and renter occupied housing to the range of potential household growth absorbed in the study area between 2008 and 2030. The following chart outlines the range of potential residential growth for the study area between 2008 and 2030.

INCREMENTAL RESIDENTIAL GROWTH BY PERIOD						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Study Area Low Capture Rate (3%)						
Owner Occupied	31	77	77	77	77	340
Renter Occupied	<u>53</u>	<u>133</u>	<u>133</u>	<u>133</u>	<u>133</u>	<u>586</u>
Total Units	84	211	211	211	211	927
Study Area High Capture Rate (8%)						
Owner Occupied	83	207	207	207	207	909
Renter Occupied	<u>142</u>	<u>355</u>	<u>355</u>	<u>355</u>	<u>355</u>	<u>1,563</u>
Total Units	225	562	562	562	562	2,471

Source: Claritas, RERC

Note: The incremental numbers may not add up to the total due to rounding.

In summary, residential demand in the study area could range from 927 units to 2,471 units during the period of 2008 through 2030. About 63% of the units will likely be renter occupied, while the remaining 27% of the units will be owner occupied. Thus, the study area could absorb 586 to 1,563 renter occupied residential units and 340 to 909 owner occupied units between 2008 and 2030.

OFFICE DEMAND

Office demand is driven largely by growth in employment categories that actually utilize office space for business operations. In order to estimate future needs for office space within the metro area, RERC has reviewed trends in relationships between office-using employment and occupied office space determined through local surveys. The following observations summarize key trends that affect the outlook for office development in metro Orlando over the next two decades.

The Orlando metro area had the following office characteristics from 2000 through 2007:

METRO ORLANDO OFFICE INVENTORY SUMMARY 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
<u>Space Inventory:</u>								
Total Inventory	43,371,574	45,763,238	47,686,048	48,582,857	49,633,800	50,440,268	52,244,276	54,144,565
Occupied Sq Ft	40,509,050	41,141,151	42,059,094	42,315,668	42,784,336	44,639,637	47,699,024	49,433,988
Occupancy %	93.4%	89.9%	88.2%	87.1%	86.2%	88.5%	91.3%	91.3%
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2000-2007
<u>Growth Characteristics:</u>								
Total Inventory Annual Growth	5.5%	4.2%	1.9%	2.2%	1.6%	3.6%	3.6%	3.2%
Occupied Sq Ft Annual Growth	1.6%	2.2%	0.6%	1.1%	4.3%	6.9%	3.6%	2.9%
Additions to Supply	2,391,664	1,922,810	896,809	1,050,943	806,468	1,804,008	1,900,289	10,772,991
Absorption	632,101	917,943	256,574	468,667	1,855,302	3,059,387	1,734,964	8,924,938

Source: Orange County Property Appraiser, RERC

The Orlando MSA has approximately 54 million square feet of office inventory and continues to experience decreases in office vacancy and increases in lease rates. The metro area office inventory has grown at an average annual rate of 3.2% from 2000 through 2007. The period from 2000 through 2001 had the highest growth (5.5% per year). Between 2000 and 2007, an average of approximately 1.5 million square feet of inventory has been added to the market annually.

For the purposes of estimating the office potential in the study area, RERC evaluated the office trends in the 1-mile radius. This allowed us to examine historical trends and occupancy that may be difficult or misleading in a smaller area. The major office characteristics of this 1-mile radius are summarized in the following table:

1 MILE RADIUS OFFICE INVENTORY SUMMARY 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
<u>Space Inventory:</u>								
Total Inventory	1,368,236	1,368,236	1,368,236	1,368,236	1,368,236	1,368,236	1,643,182	1,643,182
Occupied Sq Ft	1,200,779	1,279,413	1,338,462	1,345,481	1,308,564	1,347,088	1,544,478	1,528,103
Occupancy %	87.8%	93.5%	97.8%	98.3%	95.6%	98.5%	94.0%	93.0%
								Total 2000-2007
	<u>2000-2001</u>	<u>2001-2002</u>	<u>2002-2003</u>	<u>2003-2004</u>	<u>2004-2005</u>	<u>2005-2006</u>	<u>2006-2007</u>	
<u>Growth Characteristics:</u>								
Total Inventory Annual Growth	0.0%	0.0%	0.0%	0.0%	0.0%	20.1%	20.1%	2.7%
Occupied Sq Ft Annual Growth	6.5%	4.6%	0.5%	-2.7%	2.9%	14.7%	14.7%	3.5%
Additions to Supply	0	0	0	0	0	274,946	274,946	274,946
Absorption	78,634	59,049	7,019	-36,917	38,524	197,390	197,390	327,324

Source: Orange County Property Appraiser, RERC

The 1-mile radius contains about 1.6 million square feet and has averaged annual additions to supply of 39,000 square feet between 2000 and 2007. Inventory has averaged annual growth of 2.7% in the past seven years. Occupancy trends have hovered between about 87% and 99%, just slightly above the metro area. Historically, this has been a strong office market and current activity indicates this will continue.

A significant portion of the office space in the study area and surrounding 1-mile radius is medical in nature due to the location of Orlando Regional Hospital within the study area. The following table provides a comparison of the 1-mile radius to the metro Orlando office market.

1 MILE RADIUS CAPTURE OF THE METRO AREA OFFICE MARKET 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
<u>Space Inventory:</u>								
Total Inventory	3.2%	3.0%	2.9%	2.8%	2.8%	2.7%	3.1%	3.0%
Occupied Sq Ft	3.0%	3.1%	3.2%	3.2%	3.1%	3.0%	3.2%	3.1%
								Total 2000-2007
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	
<u>Growth Characteristics:</u>								
Additions to Supply	0.0%	0.0%	0.0%	0.0%	0.0%	15.2%	14.5%	2.6%
Absorption	12.4%	NA	NA	-7.9%	2.1%	6.5%	11.4%	3.7%

Source: Orange County Property Appraiser, Collier's Arnold Office Market Reports, Real Estate Research Consultants, Inc.

The current inventory in the 1-mile radius represents about 3% of the total Orlando metro office space. This percentage has remained relatively constant in the past seven years. This market has a limited supply of vacant property for development compared to emerging areas such as Lake Mary or southeast Orange County. Annual additions to supply in the study area have accounted for 0% to 15% of metro activity in the past seven years with an average of 2.6% for the period.

RERC employed its proprietary model that estimates the demand for office space based on the amount of non-agricultural employment in the metro area. For each employment category, the percentage of employees requiring office space was established and applied against the amount of office space required per employee.

This model has been repeatedly tested against historic employment and compared with actual occupied office space in the metro area. The estimated demand matches well with the historical data.

Historical employment was used through 2007 and future employment was projected using employment growth rates and trends from the historical data. Through 2030, employment growth was estimated at approximately 2.9% per year, which is conservative given the 4% to 7% growth achieved over the past three years. The following office absorption for the metro area would occur based upon these employment assumptions:

PROJECTED METRO ABSORPTION OFFICE SPACE, 2008-2030		
Period	Absorption	Average Annual Absorption
2008-2010	3,159,431	1,053,144
2011-2015	5,302,706	1,060,541
2016-2020	7,624,190	1,524,838
2021-2025	8,626,071	1,725,214
2026-2030	9,759,608	1,951,922

Source: RERC

Since 2000, the 1-mile radius has captured as high as 15% of the metro area office additions to supply but has averaged 2.6% over the period. We believe it may be possible for the 1-mile radius to achieve between 3% and 8% capture of metro area office demand. The following table summarizes the supportable inventory in the 1-mile radius, applying a lower capture of 3% and a higher capture of 8% to the metro absorption. The low and the high capture provide a range of development potential. It is likely actual development will fall within the range, but it is possible, although unlikely, for development to exceed or fall below the range.

1 MILE RADIUS CAPTURE OF METRO OFFICE DEMAND, 2008-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Metro Demand	3,159,431	5,302,706	7,624,190	8,626,071	9,759,608	34,472,006
1-Mile Radius						
Low Capture (3%)	94,783	159,081	228,726	258,782	292,788	1,034,160
High Capture (8%)	252,755	424,216	609,935	690,086	780,769	2,757,760

Source: RERC

The 1-mile radius currently is comprised of commercial development and residential neighborhoods. It is likely a large amount of the additional office space projected for the 1-mile radius will be located in the study area. The majority of the land within the 1-mile radius and outside the study area is, for the most part, zoned residential. Therefore, it is reasonable to assume 90% of the range of projected office development for the 1-mile radius will be captured in the study area. Given this assumption, the following chart outlines the potential range of office development in the study area by period between 2008 and 2030.

STUDY AREA CAPTURE OF 1 MILE RADIUS OFFICE DEMAND, 2008-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Study Area						
Low Capture (3%)	85,305	143,173	205,853	232,904	263,509	930,744
High Capture (8%)	227,479	381,795	548,942	621,077	702,692	2,481,984

Source: RERC

In summary, the demand for additional office space in the study area exists. It is likely potential demand will range from about 931,000 square feet to about 2.5 million square feet between 2008 and 2030.

INDUSTRIAL DEMAND

Industrial demand is driven largely by growth in employment categories that utilize industrial space for business operations, such as warehousing, manufacturing, and some transportation-related enterprises. In order to estimate future needs for industrial space within the metro area, RERC has reviewed trends in relationships between industrial-using employment and occupied industrial space determined through local surveys. The following observations summarize key trends that affect the outlook for industrial development in metro Orlando over the next two decades. The Orlando metro area had the following industrial characteristics from 2000 through 2007:

METRO ORLANDO INDUSTRIAL INVENTORY SUMMARY 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
Space Inventory:								
Total Inventory	123,626,095	128,662,586	131,379,907	133,552,920	137,124,525	139,722,017	142,812,033	146,372,095
Occupied Sq Ft	114,911,341	117,758,152	119,612,404	120,159,933	126,773,740	130,395,876	133,910,260	136,005,376
Occupancy %	93.0%	91.5%	91.0%	90.0%	92.5%	93.3%	93.8%	92.9%
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2005	2000-2007
Growth Characteristics:								
Total Inventory Annual Growth	4.1%	2.1%	1.7%	2.7%	1.9%	2.2%	2.5%	2.4%
Occupied Sq Ft Annual Growth	2.5%	1.6%	0.5%	5.5%	2.9%	2.7%	1.6%	2.4%
Additions to Supply	5,036,491	2,717,321	2,173,013	3,571,605	2,597,492	3,090,016	3,560,062	22,746,000
Absorption	2,846,811	1,854,252	547,529	6,613,807	3,622,136	3,514,384	2,095,116	21,094,035

Source: Orange County Property Appraiser, RERC.

The Orlando metro area had approximately 146 million square feet of industrial space as of year-end 2007. From 1990 to 2000, the area absorbed about 21.7 million square feet. Absorption fell slightly from 2000 through 2005 as the economy slowed then rebounded. Absorption over the past seven years averaged about three million square feet per year. During the past decade, the overall occupancy rate of industrial space has risen from a low of 88% to as high as 94%; at the current time, it is approximately 93%.

For the purposes of estimating the industrial growth in the study area, RERC evaluated the industrial trends in the 3-mile radius. This allowed us to examine historical trends and occupancy that may be difficult or misleading in a smaller area. The major industrial characteristics of the 3-Mile radius are summarized in the following table:

3-MILE INDUSTRIAL INVENTORY SUMMARY 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
<u>Space Inventory:</u>								
Total Inventory	8,849,615	9,397,864	9,434,290	9,491,818	9,827,641	9,846,641	10,121,587	10,667,496
Occupied Sq Ft	8,467,624	8,507,339	8,443,511	8,543,574	8,699,726	8,876,911	9,328,783	9,560,132
Occupancy %	95.7%	90.5%	89.5%	90.0%	88.5%	90.2%	92.2%	89.6%
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	Total 2000-2007
<u>Growth Characteristics:</u>								
Total Inventory Annual Growth	6.2%	0.4%	0.6%	3.5%	0.2%	2.8%	2.8%	2.7%
Occupied Sq Ft Annual Growth	0.5%	-0.8%	1.2%	1.8%	2.0%	5.1%	5.1%	1.7%
Additions to Supply	548,249	36,426	57,528	335,823	19,000	274,946	274,946	1,817,881
Absorption	39,715	-63,828	100,063	156,152	177,185	451,872	451,872	1,092,508

Source: Orange County Property Appraiser, CoStar, Real Estate Research Consultants, Inc.

The 3-mile radius contains about 10.7 million square feet and has averaged annual additions to supply of about 260,000 square feet between 2000 and 2007. Inventory has had an averaged annual growth rate of 2.7% in the past seven years. Occupancy trends have hovered between about 88% and 96%, just slightly above the metro area. Historically, this has been a strong industrial market and current activity indicates this will continue.

The following table provides a comparison of the 3-mile radius to the metro Orlando industrial market.

3-MILE RADIUS CAPTURE OF THE METRO AREA INDUSTRIAL MARKET 2000-2007								
	2000	2001	2002	2003	2004	2005	2006	2007
<u>Space Inventory:</u>								
Total Inventory	7.2%	7.3%	7.2%	7.1%	7.2%	7.0%	7.1%	7.3%
Occupied Sq Ft	7.4%	7.2%	7.1%	7.1%	6.9%	6.8%	7.0%	7.0%
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	Total 2000-2007
<u>Growth Characteristics:</u>								
Additions to Supply	10.9%	1.3%	2.6%	9.4%	0.7%	8.9%	7.7%	8.0%
Absorption	1.4%	NA	NA	2.4%	4.9%	12.9%	21.6%	5.2%

Source: Orange County Property Appraiser, Collier's Arnold Office Market Reports, Real Estate Research Consultants, Inc.

The current inventory in the 3-mile radius represents about 7.3% of the total Orlando metro

industrial space. This percentage has remained relatively constant in the past seven years. This market has a limited supply of vacant property for development compared to emerging areas such as southeast Orange County. Annual additions to supply in the 3-mile radius have accounted for 0.7% to 10.9% of metro activity in the past seven years with an average of 8% for the period.

RERC employed its proprietary model that estimates the demand for industrial space based on the amount of non-agricultural employment in the metro area. For each employment category, the percentage of employees requiring industrial space was established and applied against the amount of industrial space required per employee.

This model has been repeatedly tested against historic employment and compared with actual occupied industrial space in the metro area. The estimated demand matches well with the historical data. The following industrial absorption for the metro area would occur based upon these employment assumptions:

PROJECTED METRO ABSORPTION INDUSTRIAL SPACE, 2008-2030		
Period	Absorption	Average Annual Absorption
2008-2010	4,642,341	1,547,447
2011-2015	6,447,788	1,289,558
2016-2020	6,631,236	1,326,247
2021-2025	7,750,160	1,550,032
2026-2030	8,056,794	1,611,359

Source: RERC

Since 2000, the 3-mile radius has captured as high as 10.9% of the metro area office additions to supply but has averaged 8% over the period. We believe it may be possible for the 3-mile radius to achieve between a 6% and a 10% capture of metro area industrial demand. The following table summarizes the supportable inventory in the 3-mile radius, applying a lower capture of 6% and a higher capture of 10% to the metro absorption. The low and the high capture provide a range of development potential. It is likely actual development will fall within the range.

3-MILE RADIUS CAPTURE INDUSTRIAL SPACE, 2008-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Metro Demand	4,642,341	6,447,788	6,631,236	7,750,160	8,056,794	33,528,319
3-Mile Radius						
Low Capture (6%)	278,540	386,867	397,874	465,010	483,408	2,011,699
High Capture (10%)	464,234	644,779	663,124	775,016	805,679	3,352,832

Source: RERC

The study area will absorb a portion of the industrial demand captured in the 3-mile radius. Given the commercial and residential zoning characteristics of the 3-mile radius, it is reasonable to assume about 30% of the demand could be absorbed in the study area. Given this assumption, the following chart outlines the potential range of industrial development in the

study area by period between 2008 and 2030.

STUDY AREA CAPTURE INDUSTRIAL SPACE, 2008-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Study Area						
Low Capture	83,562	116,060	119,362	139,503	145,022	603,510
High Capture	139,270	193,434	198,937	232,505	241,704	1,005,850

Source: RERC

The study area could capture about 30% of the growth occurring in the 3-mile radius. Potential industrial demand could range from about 600,000 square feet to over one million square feet between 2008 and 2030. The above figures indicate current land use regulations. As these regulations are modified to increase density and development opportunities, industrial uses may be substantially reduced as uses yielding higher values will displace industrial demand.

RETAIL DEMAND

Retail demand is driven largely by growth in resident population that patronizes retail establishments and personal services business operations, such as grocery stores, department stores, and other specialty merchandise enterprises.

RERC examined the existing retail and restaurant inventory in the study area. This brief analysis revealed about 49,000 square feet of retail space and about 17,000 square feet of restaurant space currently exists in the study area. The study area's retail and restaurant space will increase substantially when the SODO project is complete in October of 2008. The project will add about 186,000 square feet of retail and restaurant space. It will be the most significant retail project in the study area. The following chart outlines existing retail and restaurant inventory in the study area.

STUDY AREA RETAIL & RESTAURANT SPACE INVENTORY BY YEAR BUILT						
	Pre-1970	1970-1979	1980-1989	1990-1999	2000-2008*	Total
Retail Space (SF)	48,509	0	0	0	0	48,509
% of Current Inventory	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Annual Additions to Supply		0	0	0	0	
Restaurant Space (SF)	7,838	0	4,691	2,952	1,755	17,236
% of Current Inventory	45.5%	0.0%	27.2%	17.1%	10.2%	100.0%
Annual Additions to Supply		0	469	295	195	

Source: Orange County Property Appraiser, RERC

*Note until April 15, 2008

To calculate demand in the study area, RERC used its proprietary retail, restaurant, and services demand models. The models were calibrated based on the most recent Economic Census data for the Orlando MSA. The models generate the amount and nature of retail, restaurant and services space supportable within a given trade area based upon the number of households and the average household's effective buying income at a given point in time.

The study area's average household effective buying income is healthy and strong; however, due to the mature nature of the housing market, projected household growth in the study area is

expected to be minimal and potentially understated, as stated in the demographic section. Therefore, RERC projected retail, restaurant and services demand based the study area's capture of the City of Orlando's growth in households as discussed in the residential section. At a 10% capture rate, the study area could potentially absorb 927 to 2,471 of the total households projected for the City of Orlando between 2008 and 2030. The following chart outlines the study area's potential household growth between 2008 and 2030.

INCREMENTAL HOUSEHOLD GROWTH BY PERIOD, 2007-2030						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Study Area						
Low Capture Rate	84	211	211	211	211	927
High Capture Rate	225	562	562	562	562	2,471

The models estimate the total potential retail, restaurants, and services demand supported within a given area (e.g. within three miles); it does not calculate where the trade area's population will most likely do their shopping.

RERC's models allocated estimated retail demand into grocery, convenience goods and shopper goods. Convenience goods establishments include beer, wine and liquor stores; drug stores and pharmacies; convenience stores and gasoline; and cosmetic, health and beauty stores. In contrast, shopper goods establishments include department stores; discount stores; furniture and home furnishings stores; appliances, electronics and computer stores; building materials, hardware and garden supplies; apparel and accessory stores; and miscellaneous retail stores.

The restaurants demand is allocated into four categories: full-service restaurants, limited-service restaurants, specialty food services, and drinking places. Full-service restaurants are those in which alcohol is available for sale. Limited-service restaurants primarily consist of fast-food. Specialty food services include establishments offering specialized products, such as ice cream, pretzels, or coffee. Drinking places consist of establishments relying on the sale of alcohol as their primary source of revenue. The market area for restaurant establishments relates to their location and area surrounding the establishments. Full-service restaurants have a larger market area and are usually located adjacent to a regional attractor such as a shopping mall or large strip center or along a highly traveled corridor. Limited-service restaurants, drinking establishments, and specialty food services have smaller market areas. These establishments are flexible to the surrounding environment and are typically located at intersections near various types of uses, including gas stations, shopping centers, employment centers, or highway interchanges.

The services category includes personal services such as travel agents, dry cleaning, hair and nail salons and video rentals and medical services such as doctors, dentists and walk-in clinics often found in a retail setting.

The following chart outlines the incremental amount of retail, restaurant, and services space supportable by period between 2008 and 2030 given the study area's lower range of potential household growth. Once again, the models project the amount of supportable space by a given trade area's population; it does not reflect where the trade area's population will actually shop. Therefore, a portion of the demand will remain within the study area, but some of the demand will leak out of the study area.

TOTAL RETAIL, RESTAURANT & SERVICES SUPPORTABLE DEMAND (LOW CAPTURE)						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Retail						
Grocery Store	995	2,685	2,685	2,685	2,685	11,736
Convenience Goods	936	2,526	2,526	2,526	2,526	11,042
Shopper Goods	<u>6,420</u>	<u>17,326</u>	<u>17,326</u>	<u>17,326</u>	<u>17,326</u>	<u>75,723</u>
Total	8,351	22,537	22,537	22,537	22,537	98,501
Restaurants						
Full Service Restaurants	714	1,927	1,927	1,927	1,927	8,421
Limited Service Restaurants	480	1,295	1,295	1,295	1,295	5,659
Specialty Food Services	105	283	283	283	283	1,236
Drinking Places	<u>20</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>53</u>	<u>232</u>
Total	1,318	3,558	3,558	3,558	3,558	15,548
Services						
Finance, Insurance & Real Estate	1,185	2,977	2,977	2,977	2,977	13,094
Personal Services	85	214	214	214	214	942
Medical Services	516	1,297	1,297	1,297	1,297	5,704
Legal Services	224	563	563	563	563	2,478
Social Services	175	440	440	440	440	1,935
Professional & Business Services	<u>622</u>	<u>26,095</u>	<u>26,095</u>	<u>26,095</u>	<u>26,095</u>	<u>105,002</u>
Total	2,808	31,587	31,587	31,587	31,587	129,155
Total	12,478	57,682	57,682	57,682	57,682	243,205

Source: RERC, Claritas

Given the study area's higher capture rate of the City of Orlando's household growth, the following chart outlines the incremental amount of supportable retail, restaurant and services space by period between 2008 and 2030.

TOTAL RETAIL, RESTAURANT & SERVICES SUPPORTABLE DEMAND (HIGH CAPTURE)						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Retail						
Grocery Store	2,665	7,152	7,152	7,152	7,152	31,273
Convenience Goods	2,508	6,729	6,729	6,729	6,729	29,425
Shopper Goods	<u>17,197</u>	<u>46,147</u>	<u>46,147</u>	<u>46,147</u>	<u>46,147</u>	<u>201,787</u>
Total	22,370	60,029	60,029	60,029	60,029	262,484
Restaurants						
Full Service Restaurants	1,912	5,132	5,132	5,132	5,132	22,439
Limited Service Restaurants	1,285	3,449	3,449	3,449	3,449	15,081
Specialty Food Services	281	754	754	754	754	3,295
Drinking Places	<u>53</u>	<u>141</u>	<u>141</u>	<u>141</u>	<u>141</u>	<u>618</u>
Total	3,531	9,476	9,476	9,476	9,476	41,433
Services						
Finance, Insurance & Real Estate	3,175	7,930	7,930	7,930	7,930	34,895
Personal Services	228	571	571	571	571	2,510
Medical Services	1,383	3,454	3,454	3,454	3,454	15,201
Legal Services	601	1,501	1,501	1,501	1,501	6,603
Social Services	469	1,172	1,172	1,172	1,172	5,156
Professional & Business Services	<u>1,666</u>	<u>69,504</u>	<u>69,504</u>	<u>69,504</u>	<u>69,504</u>	<u>279,682</u>
Total	7,522	84,131	84,131	84,131	84,131	344,048
Total	33,423	153,636	153,636	153,636	153,636	647,965

Source: RERC, Claritas

Given the study area's high and low capture of the household growth projected for the City of Orlando between 2008 and 2030, the study area could support about an additional 243,000 to 648,000 square feet of retail, restaurant, and services space. As mentioned earlier, the models project the amount of demand supportable by the additional households; it does not indicate where the area's population will likely do their shopping. Thus, some of the supportable demand will be absorbed in the study area, while some will leak out of the study area.

In addition to the range of supportable demand generated by the projected households in the study area, RERC estimated the amount of retail, restaurant and services supported by household growth attributed to the Orlando Regional Hospital and to the SODO project. When complete, the SODO project will add 300 apartments to the area, which will attract 300 new households. It is reasonable to assume a portion of Orlando Regional Hospital's future employees will reside in the study area since the hospital is located within it. The Orlando Regional Hospital projects an additional 13,000 employees will be employed by 2030. We believe it is a conservative assumption to assume 10% of the employees may reside in the study area. The following chart outlines Orlando Regional Hospital's employment growth and the study area's capture by period between 2008 and 2030.

ORLANDO REGIONAL HOSPITAL EMPLOYMENT GROWTH						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Employment	1,616	2,846	2,846	2,846	2,846	13,000
Study Area Capture (10%)	162	285	285	285	285	1,300

Source: Orlando Regional Hospital, RERC

The number of incremental residential units is outlined in the following table. Given 10% of ORHS employment growth and the SODO apartment units, a total of 1,600 households could be added to the area and could support additional retail, restaurant and services.

INCREMENTAL RESIDENTIAL UNITS DRIVING NEW RETAIL						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
SODO	300					
ORHS Employment Growth	162	285	285	285	285	1,300
Total	462	285	285	285	285	1,600

Source: Orlando Regional Hospital, Orlando Business Journal, RERC

Based on 1,600 additional households between 2008 and 2030, the study area could support the following amount of retail, restaurant and services space. The amount of supportable space below purely illustrates the amount of space supported by household growth attributed to Orlando Regional Hospital and SODO. It should be considered as part of the range of supportable retail, restaurant and services space generated by the study area based on its capture of the City of Orlando's household growth.

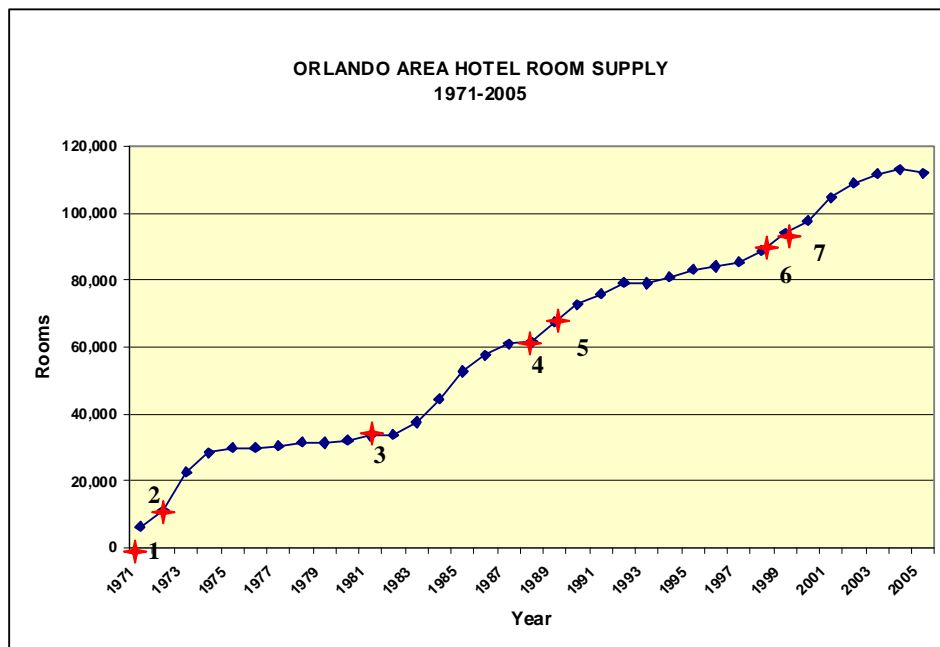
TOTAL RETAIL, RESTAURANT & SERVICES SUPPORTABLE DEMAND (GENERATED BY ORHS EMPLOYMENT GROWTH & THE SODO APARTMENTS)						
	2008-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total
Retail						
Grocery Store	5,472	3,627	3,627	3,627	3,627	19,980
Convenience Goods	5,149	3,413	3,413	3,413	3,413	18,799
Shopper Goods	<u>35,311</u>	<u>23,402</u>	<u>23,402</u>	<u>23,402</u>	<u>23,402</u>	<u>128,920</u>
Total	45,933	30,442	30,442	30,442	30,442	167,699
Restaurants						
Full Service Restaurants	3,927	2,602	2,602	2,602	2,602	14,336
Limited Service Restaurants	2,639	1,749	1,749	1,749	1,749	9,635
Specialty Food Services	577	382	382	382	382	2,105
Drinking Places	<u>108</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>72</u>	<u>395</u>
Total	7,250	4,805	4,805	4,805	4,805	26,471
Services						
Finance, Insurance & Real Estate	6,519	4,021	4,021	4,021	4,021	22,605
Personal Services	469	289	289	289	289	1,626
Medical Services	2,840	1,752	1,752	1,752	1,752	9,847
Legal Services	1,234	761	761	761	761	4,278
Social Services	963	594	594	594	594	3,340
Professional & Business Services	<u>3,421</u>	<u>35,247</u>	<u>35,247</u>	<u>35,247</u>	<u>35,247</u>	<u>144,408</u>
Total	15,445	42,665	42,665	42,665	42,665	186,103
Total	68,628	77,911	77,911	77,911	77,911	380,273

Source: RERC, Claritas

In summary, the study area may absorb 927 to 2,471 of the households projected for the City of Orlando between 2008 and 2030. During the same period, these households could support approximately an additional 243,000 to 648,000 square feet of retail, restaurant and services space. Within the study area, Orlando Regional Hospital and SODO could be attributed with 1,600 additional households moving to the area by 2030. These households would support about an additional 380,000 square feet of space, which falls within the range of supportable demand. As mentioned earlier, the models do not necessarily indicated where the area's population will do their shopping. Thus, the study area will capture only a portion of the supportable demand generated between 2008 and 2030.

HOTEL DEMAND

Currently, the Orlando area ranks second in the U.S. behind Las Vegas in terms of total hotel supply, offering approximately 111,000 hotel rooms. The following chart reflects the historical Orlando area room supply, as well as major theme park openings.



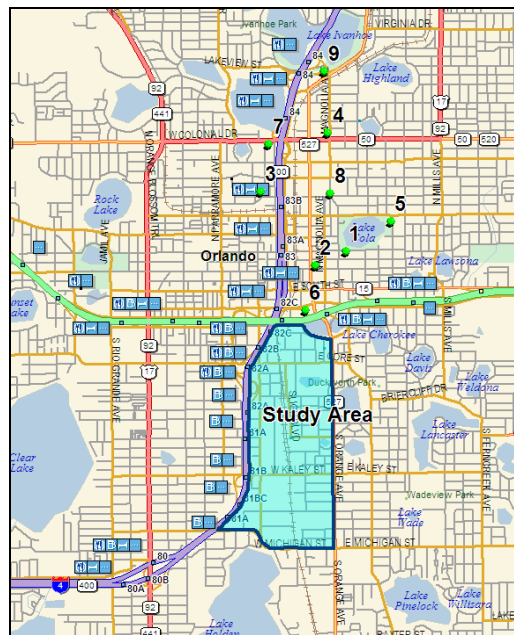
Source: ECFRPC, Florida Statistical Abstract, OOCVCB, RERC

<u>Data Label</u>	<u>Major Theme Park Opening</u>	<u>Year</u>
1	Magic Kingdom	1971
2	Sea World	1973
3	EPCOT	1982
4	Disney-MGM Studios	1989
5	Universal Studios	1990
6	Animal Kingdom	1998
7	Island's of Adventure	1999

Historically, the average annual growth in hotel room supply has remained positive with few flat growth periods. For most of the past 30 years, hotel supply and demand have been in equilibrium. However, growth in occupied room nights began to slow in the late 1990's and, in 2001, demand decreased due to the events of September 11th. Since 2001, occupied room nights have grown but at a slower rate.

Occupancy in the hotel business is calculated by dividing the number of rooms sold by the number of rooms available. The current year-end 2007 occupancy rate for the metro area was 67.9%, up from 67.7% in 2006. Average Daily Rate, or ADR, is calculated by dividing room revenue by rooms sold (occupied). Average daily rates (ADRs) in the metro area increased 5.9% in 2005 to \$91.91, surpassing the 2000 peak of \$89.83. ADR in year-end 2007 was \$105.82.

We identified nine hotel properties within close proximity to the study area. There are other hotels within the area but we did not consider them to offer significant competition to future hotel product. The following map shows where the selected hotel product is concentrated.



Source: RERC

The following table profiles the pertinent data for these properties.

SELECT ORLANDO HOTELS						
Map Label	Property	Address	# of Rooms	Year Opened	Chain	Classification
1	Embassy Suites	191 E. Pine St.	167	2000	Yes	Upscale
2	Westin Grand Bohemian	325 S. Orange Ave	250	2001	Yes	Upscale
3	Marriott Orlando	400 W. Livingston St.	290	1986	Yes	Upscale
4	Courtyard by Marriott	730 N. Magnolia Ave.	200	1999	Yes	Upscale
5	EO Inn & Spa	227 N. Eola Dr.	17	NA	No	Upscale
6	Courtyard at Lake Lucerne	211 N. Lucerne Circle	30	1985	No	Upscale
7	The Lexington (1)	304 W. Colonial Dr.	276	1973	No	Upscale
8	Travelodge	409 N. Magnolia Ave	74	1958	Yes	Economy
9	Ivanhoe Plaza Hotel	60 S. Ivanhoe Blvd.	<u>337</u>	1985	No	Midscale
	Total		1,641			
	Total Upscale		1,230	75.0%		
	Total Midscale		337	20.5%		
	Total Economy		<u>74</u>	<u>4.5%</u>		
	Total		1,641	100.0%		
	Total Chain		981	59.8%		
	Total Independent		<u>660</u>	<u>40.2%</u>		
			1,641	100.0%		

(1) Condo-hotel

Source: Smith Travel Research, RERC

For our analyses, hotel product has been defined by actual or estimated average room rate alone. The five price categories include:

- Luxury – top 15% average room rates
- Upscale – next 15% average room rates
- Midscale – middle 30% average room rates
- Economy – next 20% average room rates
- Budget – lowest 20% average room rates

Note many of the hotels categorized as upscale in the downtown market would most likely be considered mid-scale if they were located on more suburban sites. However, this downtown rate structure takes them into the upscale category.

Currently, we are only aware of four proposed properties in the area. In addition to these projects, there are many other potential developments of unknown and speculative nature that could have significant impacts.

- 150 room Hampton Inn and Suites, which will be developed as a part of a larger mixed use project called Capital Plaza III. In addition to the hotel, the development will include 121 residential condominiums plus 180,000 square feet of office space. The property is located at the southeast corner of Pine Street and Rosalind Avenue and will be developed by Highwoods Properties, Inc. The timing of the project is currently unknown.
- 150 room hotel at Center Place which is anticipated to be an upscale/luxury class hotel. This is also a mixed use project with 353,000 square feet of office space that could be developed in the first phase. Timing is not firm, but the first phase could be open by 2009. The project is at the northwest corner of Livingston Street and Orange Avenue.
- 280 room hotel at Tradition Towers, a mixed-use luxury, high-rise development. In addition to the hotel component, the project includes 156 condominiums, about 54,000 square feet of office space, and about 12,000 square feet of retail space. The property is located at 150 East Central Boulevard, the current site of the University Club. The University Club will be located in the project when complete. The timing on this project is speculative.
- 355 room Hilton Hotel will be integrated with the Bumby Arcade on Church Street. The hotel will be located in the vacant parking lot of Church Street Station and will be attached to the existing ballroom. Plans include a roof top restaurant and lounge. The timing of the projects is currently unknown.

Our research indicates the following implications for each of the potential lodging product types for consideration in the study area:

- *Midscale Hotels without Food & Beverage* (For example: Holiday Inn, La Quinta, or Comfort Inn) – The national pipeline for midscale hotels without food and beverage (select-service hotels) has the largest percentage increase in the number of rooms. Some of the planned product will take the place of aging motel inventory in highway and tertiary locations. Another segment of the new rooms is planned for secondary locations in high-density urban and suburban areas. Many of these hotels are wood-framed construction with less complex design than extended stay hotels. Construction costs for

this segment have not increased as much as those costs for more elaborate full-service properties.

- *Midscale Hotels with Food & Beverage* (For example: Holiday Inn or Best Western) – This is a highly desirable hotel product for developers as evidenced by prolific new construction of this product type. With lower construction costs and higher operating leverage than traditional full-service hotels, midscale hotels with food and beverage (focused-service hotels) are an important product type for new development. With lower per-room development costs than full-service hotels and competitive room rates when opened, these products are now planned for urban and lower density sites as alternatives to aging full-service and midscale hotels. Recent increases in development costs for midscale hotels with food and beverage reflect both changes in material pricing and the development of these products in markets with higher barriers to entry.

Assuming the potential office, residential, and hospital development in the study area, and based on our research of the metro area, recent project work and analysis, RERC believes there will be sufficient demand for additional lodging product in the future. The nearest cluster of hotel product to the study area is in downtown Orlando and is currently adequately serving that market. As the amount of development product in this area increases, that could change in the future.

We believe the study area could anticipate market demand to support approximately 150 lodging units by 2015. The demand for hotel rooms in the near term will largely be driven by the hospital. The potential market demand is best accommodated in a midscale property with a national hotel flag (chain) affiliation.

Between 2016 and 2030, we anticipate market demand could support an additional 150 lodging units. The demand for additional hotel rooms during this phase will be driven primarily by office development. The additional office users will require hotel units to accommodate out of town guests. The potential market demand is best accommodated in a midscale property with a national hotel flag (chain) affiliation.

The following table presents our findings regarding the potential real lodging space in the study area. These findings are based on current market activity and trends as well as previous studies conducted and staff knowledge.

HOTEL ROOM DEMAND 2008-2030	
2008-2015	150
2015-2030	150

To be competitive in the submarket, a hotel property should include amenities and services comparable to those of other mid-scale properties in the metro Orlando area. This would also include a small meeting space component of about 1,000 to 2,000 square feet comparable in size to that which is prevalent in the market for mid-scale product.

REPORT
FUTURE YEAR ANALYSIS
WATER, WASTEWATER AND STORMWATER
SOUTH DOWNTOWN REDEVELOPMENT PLAN

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APPENDICIES

Appendix A

- Exhibit A: Existing Major Water Lines
- Exhibit B: Development Zone Map
- Exhibit C: Existing Fire Flow Nodes
- Exhibit D: Existing Wastewater Zone Map
- Exhibit E: Stormwater Basin Map

Appendix B

- Exhibit A: Future Growth Map
- Exhibit B: Proposed Fire Flow Nodes
- Exhibit C: Proposed Lift Station Locations

1.0 Introduction

The City of Orlando has embarked on the creation of a Growth Management Plan amendment for the South Downtown Redevelopment Plan. The area being studied is bounded by Orange Avenue to the east; SR 408 to the north; I-4 to the west; and Michigan Street to the south. The study area comprises of around 600 parcels and it encompasses approximately ± 550 Acres. The area currently includes medical related facilities centered around the ORHS campus, an older industrial area west of the CSX Railroad, as well as resurgent neighborhoods north and south of ORHS. We understand that ORHS is currently conducting a future development analysis for their campus. Coordination with their consultant, GAI consultants was conducted during this study. The development plan for the area will include future needs relative to land use, transportation, landscape, parks and recreation and infrastructure. This report addresses the projected utilities infrastructure improvements required to sustain the future development.

2.0 Purpose and Scope

The purpose of this study was to investigate the existing water, wastewater and drainage facilities within the study area and evaluate the improvements necessary for these utilities to accommodate the future development of the study area.

The approach to the study began with collecting existing data from the City of Orlando's wastewater and stormwater divisions and Orlando Utilities Commission water department. The data included the City of Orlando's Growth Management Plan (GMP) for Potable Water and Wastewater, Amended April 9, 2007. This plan is based upon the land use by Level of Service (LOS). The data collected was analyzed to understand the current conditions of the utilities infrastructure. Next, the existing and proposed land use plan for the area was obtained from members of the team. This plan was used to evaluate the increase in water and wastewater demand and determine the stormwater management needs for the study area. The findings of the evaluation were used to formulate recommendations for the improvement to the utilities infrastructure.



3.0 Existing Conditions

3.1 Water

Research of the available as-built water maps and meetings with the City staff and Orlando Utilities Commission helped define the existing alignment and conditions of the water mains. Water pipes within the study area are made of Ductile Iron (DI), Cast Iron (CI) and some of the others are Unknown (UNK). Based upon the most current compilation of water use records, the Average Daily Flow for the study area was approximately 1.36 MGD in 2004. This was obtained from the billing data of all the parcels within the study area. The water use records are presented in “Appendix A – Water Use Records (2004)”. The major water mains existing within the area are depicted in “Exhibit A-Major Existing Water Lines”.

As a comparison, the City’s GMP for potable water and wastewater, Level of Service method was used in conjunction with the existing development data. Table 1 presents the potable water demand by LOS. The water demand based upon the Level of Service compares closely to the billing data.

Table 1: Potable Water Calculations- Existing

Land Use Type	Existing (2008)	Units	Design Flow	units	Average Daily Flow gpd (Existing)
Single Family	77	dwelling units	325	g/du/d	25,025
Multi Family	623	dwelling units	200	g/du/d	124,600
Office	1,511,603	sq.ft.	0.15	g/sqft/d	226,740
Retail/Commercial	302,836	sq.ft.	0.13	g/sqft/d	39,369
Hotel	22	Rooms	187	g/rm/d	4,114
Industrial	2,023,196	sq.ft.	0.22	g/sqft/d	445,103
Hospital	2,004,066	sq.ft.	0.22	g/sqft/d	440,895
Public Benefit Use	38,040	sq.ft.	0.08	g/sqft/d	3,043
Total				(gpd)	1,308,889
				(MGD)	1.31

The adequacy of the sizing of the potable water mains significantly depends on the fire flow requirements for the respective area. The study area was divided into twelve (12) zones for better understanding the water demands for each of the zone in the study area. These zones are depicted in



“Exhibit B – Development Zone Map”. The ISO methodology was used for determining the fire flow necessary for providing fire protection at selected locations in each of the zones within the study area. The locations within the zones were selected based upon the maximum total square foot area of the largest floor in the building, plus 50% of the total area of the other floors. The data for the floor area and the number of floors were obtained from the Orange County Property Appraiser’s records. The estimated location of maximum fire flow in the respective zones and the major water lines are depicted in "Exhibit C – Nodes for Fire Flow Calcs". The fire flow calculations for the respective zones are presented below in Table 2 and are based on substituting the values for the factors in the formula:

$$\text{Needed Fire Flow} = (C_i) (O_i) (1 + (X_i + P_i))$$

where;

A_i - Effective Area

C_i - factor related to type of construction

O_i - factor related to type of occupancy

X_i - factor related to the exposure buildings

P_i - factor related to communication between buildings

Table 2: Fire Flow Calculations - Existing Development

Zones	Max Living Area (SF)	Floors	Effective Area A _i	C _i	Round C _i to nearest 250 gpm	O _i	1+(X _i +P _i)	Fire Flow (gpm) w/ min 2,000 gpm
1	258,682	20	135,808	5,307	5,250	0.85	1.00	4,463
2	19,890	1	19,890	2,031	2,000	0.85	1.00	2,000
3	95,950	2	71,963	3,863	3,750	0.85	1.00	3,188
4	52,304	1	52,304	3,293	3,250	0.85	1.00	2,763
5	599,684	8	337,322	8,363	8,250	0.85	1.00	7,013
6	6,798	1	6,798	1,187	1,250	0.85	1.00	2,000
7	265,904	5	159,542	5,752	5,750	0.85	1.00	4,888
8	47,008	1	47,008	3,122	3,000	0.85	1.00	2,550
9	35,646	2	26,735	2,354	2,250	0.85	1.00	2,000
10	42,320	1	42,320	2,962	3,000	0.85	1.00	2,550
11	96,558	1	96,558	4,475	4,500	0.85	1.00	3,825
12	129,982	1	129,982	5,192	5,250	0.85	1.00	4,463

The following assumptions were made for the calculation of the fire flow requirement:

- Occupancy combustibility classified as Limited - Combustible (C-2) for all the buildings
- Buildings rated as sprinklered (i.e. X_i & P_i = 0)



The existing fire flow calculations were input to the OUC's hydraulic model to benchmark the demand for the study area. The results of the hydraulic model are presented in Table 3 as follows:

Table 3: Results of Hydraulic Model - Existing

Zones	Residual Head (ft)	Fire Flow (gpm) w/min 2,000	Demand Node	Location of Node
1	233	4,463	J20392	6" x 8" tee at S Lucerne cir W & Kuhl Avenue
2	179	2,000	J3124	6" x 6" tee at Atlanta Avenue & Piedmont Street
3	238	3,188	J9384	6" x 20" tee at Lucerne Terrace & W Gore Street
4	225	2,763	J744	8" x 10" tee near Atlanta Avenue on Columbia Street
5	224	5,100	J3588	6" x 16" tee at S Orange Avenue & Fernwood Street
6	221	2,000	J8034	6" x 10" tee at S Division Avenue & 19th Street
7	226	4,888	J5204	2" x 16" tee at Lake Beauty Dr & Kuhl Avenue
8	221	2,550	J10518	10" x 12" cross at W Kaley Street & S Division Avenue
9	238	2,000	J15300	6" x 16" tee at Lucerne Terrace & W Kaley Street
10	217	2,550	J9970	6" x 12" tee at W Michigan Street & 29th Street
11	233	3,825	J21396	12" x 16" cross at Grant Street & s Orange Avenue
12	198	4,463	J6980	6" x 12" tee 550' north of W Grant Street on S Division Avenue

Source: Hydraulic Model Results by OUC

[To convert the residual head to psi = (Residual Head – Local Elevation) x 0.434]

The local elevation in the study area is in the range of 100 ft to 110 ft. Therefore, the results indicate that the pressure in the water mains is in the range of 30 to 55 psi, which is above the OUC's requirement of 20 psi.

3.2 Wastewater

The existing condition of the wastewater system was determined from the as-built wastewater maps obtained from City's staff in the wastewater department. The sanity sewer system within the study area is gravity driven. Wastewater pipes within the study area are made of Poly Vinyl Chloride (PVC), Concrete (CONC), Vitrified Clay (VC) and Cast Iron (CI). For the purpose of better understanding the sewer system, the study area was divided into four (4) Zones. The configuration of the Zones is depicted in the "Exhibit D - Wastewater Zone Map", in Appendix A.



Zone 1: This area encompasses the approximate north half of the study area. Many of the sewer pipes that are to the south of Gore Street and north of Gore Street within the Zone converge to 24" pipe along Gore Street. From Gore Street this 24" diameter pipe carries the wastewater to Lift Station #1, which is located north-west of the study area at the intersection of South Street and Brown Avenue.

Zone 2: This zone is in the west and south-west portion of the study area. A 14-inch Cast Iron pipe takes the sewage from the north and south portions of this zone in a westerly direction along 19th and 23rd street to South Paramore Avenue and then northerly along South Paramore Avenue to Lift Station#18, which is located at the intersection of South Paramore Avenue and Miller Avenue.

Zone 3: This zone is a private sewer system in the study area. These private sewer pipes within Zone 3 forms two networks of 8 inch and 10 inch diameter pipes. These pipes connect to the 10 inch diameter City sewer pipe on Kaley Street.

Zone 4: The south-east portion of the study area is categorized as Zone 4. This is primarily the Residential parcels in the study area. The sewer pipes in the south portion bounded by Crystal Lake Street, Kunze Avenue and Orange Avenue flows south to Lift Station #24 which is on Joseph Street just south of Michigan Street. The flow from Lift Station #24 is pumped to a sanitary manhole on Michigan Street near Orange Avenue and continues north on Orange Avenue via an 8" line. The sewage from Zone 4 flows north along Orange avenue to Lift Station #1, which is located north-east of the study area at the intersection of South Street and South Brown Avenue.

The wastewater flow for the existing conditions was determined using the Level of Service method from the City's GMP for Potable water and wastewater. The analysis indicates that the wastewater flow for the study area is on the order of 0.69MGD. Table 4 summarizes the flows.



Table 4: Wastewater Flow - Existing Conditions

Land Use Type	Existing (2008)	Units	Design Flow	units	Average Daily Flow gpd (Existing)
Single Family	77	dwelling units	250	g/du/d	19,250
Multi Family	623	dwelling units	190	g/du/d	118,370
Office	1,511,603	sq.ft.	0.08	g/sqft/d	120,928
Retail/Commercial	302,836	sq.ft.	0.09	g/sqft/d	27,255
Hotel	22	rooms	119	g/rm/d	2,618
Industrial	2,023,196	sq.ft.	0.12	g/sqft/d	242,784
Hospital	2,004,066	sq.ft.	0.08	g/sqft/d	160,325
Public Benefit Use	38,040	sq.ft.	0.08	g/sqft/d	3,043
Total				(gpd)	694,573
				(MGD)	0.69

3.3 Stormwater

The existing condition of the stormwater infrastructure was determined from the stormwater maps and discussion with the City staff. The study area contains three land locked lakes. These lakes are Lake Lucerne, Lake of the Woods and Lake Beauty. The stormwater systems within the study area are discharged to these lakes. As a result, the lakes are interconnected with storm lines. The stormwater is discharged not only to these lakes that are within the study area but also to Clear Lake, Lake Holden, Lake Angel, Lake Lurna and Lake Copeland that are in the nearby vicinity of the study area. For the purpose of better understanding of the stormwater system, the study area has been divided into seven (7) Basins. The configurations of the basins are depicted in Exhibit E - Stormwater Basin Map, in Appendix A. A description of the lakes within the basins is presented in Table 5 below:



Table 5: Details of the Stormwater Basin

Basin	Lake	Basin Area (Ac.)	Lake Area (Ac.)	Drainage Wells (inch)	Outfall
1	Lake Lucerne	301	17	10, 12, 12, 12, 20	Clear Lake & Lake Cherokee
2	Lake of the Woods	174	4	12, 20, 20	Lake Cherokee
3	Lake Angel	356	10	6, 8, 12, 20, 20, 24	-
4	Lake Beauty	50	2	-	Lake Lurna
5	Lake Copeland	50	15	10	Lake Lurna
6	Lake Lurna	126	7	12, 20	Lake Holden
7	Lake Holden	UNK	UNK	UNK	UNK

With the exception of recently redeveloped parcels, almost all of the properties within the study area were developed without on-site stormwater management facilities. As a result, the treatment volumes from these sites, as well as storm event volumes flow to the existing lakes via the stormwater system within the roadways. The lakes and associated drainwells manage the treatment and attenuation of runoff.



4.0 Future Development Recommendations

The anticipated growth of the developments within the study area is depicted on Exhibit A in Appendix B. The Exhibit shows the area divided into 12 zones with the projected increase in various building types. This projected development forms the basis for the analysis of future utility requirements. The increases in water demand and wastewater generation were estimated and the changes to the existing utility infrastructure were determined. Table 6 presents the Land use by Level of Service for the existing and future developments.

Table 6: Land Use by Level of Service

Land Use Type	Existing (2008)	Growth	Maximum	Units
Single Family	77	23	100	dwelling units
Multi Family	623	2,400	3,023	dwelling units
Office	1,511,603	2,200,000	3,711,603	sq.ft.
Retail/Commercial	302,836	400,000	702,836	sq.ft.
Hotel	22	400	422	Rooms
Industrial	2,023,196	300,000	2,323,196	sq.ft.
Hospital	2,004,066	3,300,000	5,304,066	sq.ft.
Public Benefit Use	38,040	120,000	158,040	sq.ft.

4.1 Water

The projected potable water demand for the study area is presented on Table 7. The increased demand for potable water was calculated to be approximately 1.74 MGD. The total future demand is expected to be on the order of 3.09 MGD. Using a maximum daily demand (MDD) peaking factor of 2.0 produces a maximum daily demand of approximately 6.18 MGD.



Table 7: Potable Water Flow Projection by LOS

Land Use Type	Growth	Units	Design Flow	units	Average Daily Flow gpd (Future)
Single Family	23	dwelling units	325	g/du/d	7,475
Multi Family	2,400	dwelling units	200	g/du/d	480,000
Office	2,100,000	sq.ft.	0.15	g/sqft/d	315,000
Retail/Commercial	400,000	sq.ft.	0.13	g/sqft/d	52,000
Hotel	400	Rooms	187	g/rm/d	74,800
Industrial	300,000	sq.ft.	0.22	g/sqft/d	66,000
Hospital	3,300,000	sq.ft.	0.22	g/sqft/d	726,000
Public Benefit Use	120,000	sq.ft.	0.08	g/sqft/d	9,600
Total				(gpd)	1,730,875
				(MGD)	1.73

As stated earlier, the fire flow demand will dictate the adequacy of the water system. The fire flow demand for the future development was calculated as shown on Table 8 below. This data was used in the hydraulic model by Orlando Utilities Commission (OUC). The worst case scenarios for fire flow demand location within the zones were selected for the analysis.

Table 8: Flow Calculation- Future Development

Zones	Max Living Area (SF)	Floors	Effective Area Ai	Ci	Round Ci to nearest 250 gpm	Oi	1+(Xi+Pi)	Fire Flow (gpm) w/ min 2,000 gpm
1	150,000	5	90,000	4,320	4,250	0.85	1.00	3,613
2	200,000	6	116,667	4,919	5,000	0.85	1.00	4,250
3	300,000	6	175,000	6,024	6,000	0.85	1.00	5,100
4	300,000	6	175,000	6,024	6,000	0.85	1.00	5,100
5	400,000	6	233,333	6,956	7,000	0.85	1.00	5,950
6	200,000	6	116,667	4,919	5,000	0.85	1.00	4,250
7	250,000	6	145,833	5,499	5,500	0.85	1.00	4,675
8	125,000	4	78,125	4,025	4,000	0.85	1.00	3,400
9	50,000	3	33,333	2,629	2,750	0.85	1.00	2,338
10	100,000	3	66,667	3,718	3,750	0.85	1.00	3,188
11	100,000	3	66,667	3,718	3,750	0.85	1.00	3,188
12	125,000	4	78,125	4,025	4,000	0.85	1.00	3,400

The following assumptions were made for the calculation of the fire flow requirement:



- Occupancy combustibility classified as Limited - Combustible (C-2) for all the buildings
- Buildings rated as sprinklered (i.e. Xi & Pi = 0)
- Areas between 50,000 to 100,000 – Floors assumed 3
- Areas between 100,000 to 125,000 – Floors assumed 4
- Areas between 125,000 to 150,000 – Floors assumed 5
- Areas above 250,000 – Floors assumed 6

The Hydraulic analysis revealed that the available fire flow will not be adequate without modification to portions of the infrastructure. The recommended changes are presented on Table 9.

Table 9: Recommended Changes to the Water Infrastructure

Zones	Proposed Changes	Estimated Length (ft)
1	Add 8" line on America Street from Hughey to Franklin	200
2	Replace 2" line with 6" line on Atlanta Avenue from Raleigh to Columbia	450
3	Replace 2" line with 8" line on Lucerne from Gore Street to Columbia street	1200
4	Replace 6" line with Atlanta Avenue to 8" line and more if needed	1500
5	No Changes	
6	Replace 6" line on Atlanta Avenue with 8" line and more if needed	1325
7	No Changes	
8	Add 8" line continuing Atlanta Avenue to Grant Street based on new proposed road	1500
9	Replace 2" line with 6" line on Esther Street form Lucerne to Orange Avenue	700
10	Add 6" line from Grant Street to Michigan	1050
11	Add 6" line from the proposed 6" line in Zone 10, make 6" loop line on Jersey, Kunz and Crystal Lake St	2500
12	No Changes	

The recommended changes were incorporated in the hydraulic model and the results indicate that the fire flow will accommodate the proposed demand. Table 10 presented the summary of the fire flow at the minimum 20 psi residual pressure. Exhibit B in Appendix B presents the locations of the demand nodes used in the analysis.



Table 10: Hydraulic Analysis Results (OUC) - Including Recommended Changes

Zones	Proposed add'tl max day demand (gpm)	Available Fire Flow (gpm)	Residual Head (Ft)	Demand Node	Approximate Location of the Node
1	176	3613	191	J24022	Intersection of Franklin Lane and America Street
2	159	4250	174	J22318	Intersection of Raleigh Street and Atlanta Avenue
3	100	4000	187	J484	On Lucerne Terrace: Midway between Gore Street and Columbia Street
4	195	4000	149	J19	1,300 ft north of W Kaley St on Atlanta Ave
5	1102	5950	163	J26768	Intersection of Kuhl Avenue and Copeland Drive
6	118	4250	181	J3824	Intersection of Kaley Street and Atlanta Avenue
7	124	4675	202	J21254	Intersection of Pennsylvania Street and Bellevue Avenue
8	152	3400	201	J21254	Dead end of the 700-ft 6" main within Yelvington Properties
9	15	2338	186	J23	On Esther Street: Midway between Orange Avenue and Lucerne Terrace
10	104	3188	197	J25	Dead end of the 8" main on 27th St
11	96	3188	170	J27	Intersection of W Crystal Lake St & Kunze Ave
12	64	3400	177	J31084	Intersection of Grant Street and Paseo Avenue

Source: Hydraulic Model Results by OUC

[To convert the residual head to psi = (Residual Head – Local Elevation) x 0.434]

The local elevation in the study area is in the range of 100 ft to 110 ft. Therefore, the results indicate that each indicated demand node will have a residual pressure above 20 psi at the specified fire flow demand. As a result of this analysis, we strongly recommend that the developers design buildings with needed fire flows below 4000 gpm. Also note that 4000 gpm is not available at every area at or above 20 psi.



4.2 Wastewater

The projected wastewater flow for the study area is presented on Table 11 below. The existing wastewater flow is estimated to be around 0.69 MGD. Wastewater flow increase is projected to be approximately 1.02 MGD. The City of Orlando's, Engineering Manual Standards for Wastewater Facilities Design Section 9.02, B requires a maximum daily demand (MDD) peaking factor of 2.5 times average daily flow (ADF). Therefore, the peak flow is expected to increase by approximately 2.55 MGD.

Table 11: Wastewater Flow Projection by LOS

Land Use Type	Growth	Units	Design Flow	Units	Average Daily Flow gpd (Future)
Single Family	23	dwelling units	250	g/du/d	5,750
Multi Family	2,400	dwelling units	190	g/du/d	456,000
Office	2,100,000	sq.ft.	0.08	g/sqft/d	168,000
Retail/Commercial	400,000	sq.ft.	0.09	g/sqft/d	36,000
Hotel	400	Rooms	119	g/rm/d	47,600
Industrial	300,000	sq.ft.	0.12	g/sqft/d	36,000
Hospital	3,300,000	sq.ft.	0.08	g/sqft/d	264,000
Public Benefit Use	120,000	sq.ft.	0.08	g/sqft/d	9,600
			Total	(gpd)	1,022,950
				(MGD)	1.02

The study area is divided into 12 Zones (see Exhibit B in Appendix A – Development Zone Map). The existing and projected sewer flow from these 12 Zones are as presented in Table 12 below:



Table 12: Wastewater Flow Projection by 12 Zones

Zones	Existing Flow (gpd)	Future anticipated flow (gpd)	Total Flow (gpd)
Zone 1	114,352	110,050	224,402
Zone 2	12,504	95,500	108,004
Zone 3	22,182	41,475	63,657
Zone 4	93,969	109,050	203,019
Zone 5	151,574	301,300	452,874
Zone 6	73,881	63,050	136,931
Zone 7	101,278	59,900	161,178
Zone 8	15,404	93,550	108,954
Zone 9	21,517	6,800	28,317
Zone 10	51,273	58,800	110,073
Zone 11	15,784	55,800	71,584
Zone 12	23,212	27,675	50,887
Total	696,931	1,022,950	1,719,881

In discussing the future needs with the staff at the City of Orlando wastewater department, we understand that the existing sewer system is adequate to handle the existing flows. However, the system cannot accommodate any significant increase in wastewater flows.

The ORHC facility is in the process of designing a sewer system that will accommodate their future growth. GAI Consultants, Inc is in the process of completing this study and design. We understand from discussions with GAI, that it is planned to construct a Lift Station in the vicinity of the intersection of Columbia Street and Orange Avenue within the study area. We further understand that the lift station is being designed to accommodate the future sewer needs of Zones 5 and 7 as shown on Exhibit C in Appendix B. The projected sewer flow from these Zones 5 and 7 is the range of 0.6 MGD. The flow from the lift station will be transported north along Orange Avenue from Colombia Street via an 8-inch force main. This 8-inch line will be installed using directional bore methods and will connect to the existing 18-inch force main line (city's intra line) at S. Lucerne Circle. Since the ORHC sewer design will accommodate the flows from Zones 5 and 7, the south downtown redevelopment plan will need to be focused on the future sewer design for the remaining zones.



Following the discussions with the staff at the City's wastewater department and in consideration of the sewer design for the ORHC facility, it was determined that the most acceptable option to accommodate the future sewer needs for the remainder of the study area is to design and construct two (2) lift stations that will connect to the 18-inch force main north of the study area. The flow to the lift stations will be via the existing gravity sewer system. Property will need to be acquired for Lift Station locations.

One of the lift stations (Lift Station A) will be located in the vicinity of Gore Street and Orange Avenue. The lift station will be connected to the existing 24 inch gravity line on Gore Street. The future Average Daily Flow (ADF) anticipated for the north portion of the study area (Zone 1, 2, 3, 4 and 6) is calculated to be around 0.75 MGD. From this lift station a force main will be connected to the 8-inch force main being planned for Orange Avenue. The total flow downstream of this connection will be approximately 1.35 MGD ADF (0.75 MGD plus 0.6 MGD from Zones 5 & 7). The force main size in this leg on Orange Avenue will need to be increased to a 12-inch line from Gore Street to the 18-inch tie-in at S. Lucerne Circle.

As described in Section 3.2, many of the existing sewer pipes that are to the south of Gore Street and north of Gore Street within the approximate north half of the study area converge to 24" pipe along Gore Street. However, the effluent north of Ernestine Street in Zone 1 flow toward America Street, combines with offsite flows from west of the study area, and then flows east to Orange Avenue and eventually to Lift Station 1. In order to limit the flows to the proposed lift station at Gore and Orange Avenue to the study area, the lines north of Ernestine Street will need to be redirected south to the 24 inch line on Gore Street. This could be accomplished by disconnecting the sewer tie-ins at America Street, installing new manholes and raising the invert elevations so that the pipes flow south toward Gore Street.

The second lift station (Lift Station B) will accept and direct the effluent from the south-west portion of the study area which encompasses Zones 8, 10 and 12. The total future flow from these Zones is estimated to be around 0.27 MGD which includes approximately 0.09 MGD of the existing flow. We recommend that the Lift Station be located in the vicinity of Kaley Street and Atlanta Avenue. The approximate locations where the lift stations are proposed are depicted on Exhibit C in Appendix B.



Because of the planned reconfiguration of the roadways in this south-west quadrant, we anticipate that the majority of the sewer lines to this proposed lift station will be new construction. It is estimated that there will be about 2400 LF of 8-inch and 5700 LF of 6-inch new gravity sewer lines. The existing gravity sewer lines in the area can be directed to the proposed Lift Station. We recommend that the effluent from within the study area that flows to Lift Station #18 be disconnected east of the I-4 Corridor and redirected to the proposed lift station at Kaley and Atlanta Avenue.

From this lift station, a minimum 8-inch force main is proposed following the Atlanta Avenue alignment north toward the tie-in to the 18" forcemain (City's Intra line) at the point north of Gore Street where it crosses Atlanta Avenue. Approximately 4700 linear feet of forcemain is anticipated. Since Atlanta Avenue is not continuous between Piedmont Street and Gore Street, a utility easement will be required in this leg of the pipe run.

The south-east portion of the study area encompasses Zones 9 and 11. This is primarily the Residential parcels in the study area and the new SOTO Development on Grant Street. The existing sewer lines in these zones flow east towards 8" line along Orange Avenue as well as east of Orange Avenue to Lift Station #1. The total estimated future flow from these Zones 9 and 11 is approximately 0.099 MGD (99,000 gpd) which includes around 0.037 MGD (37,000) gpd of the existing flow. The flow within these Zones 9 and 11 could continue in the current direction.

The majority of the gravity sewer pipelines within the study area are comprised of Vitrified Clay pipe (VC), Concrete pipe (Conc) and Cast Iron pipe (CI). According to the city staff, any improvement to the sanitary sewer system within the study area will have to include replacement of these older pipes. We have outlined the quantity of existing pipes that will require replacement in Table 13 below. The quantities are associated with the lift station to which they will be connected.



Table 13: Sewer Pipelines to be Replaced

Pipe Diameters (ins)	Total Length in Feet		Total pipe length(ft)
	Lift Station A	Lift Station B	
8	15,862	6,863	22,725
10	646	6,657	7,303
12	779	1,848	2,627
24	2,167	0	2,167

4.3 Stormwater

The stormwater capacity is adequate for the existing south downtown district. However, there is a study underway by the City to determine the deficiency in terms of stormwater capacity for Lake of the Woods in Basin 2 (Appendix A, Exhibit B). It is being planned that the area to the west of Basin 2 beyond railway tracks will be discharged directly to Clear Lake which is to the west of the study area. Additionally, there are individual projects like Orlando Regional Healthcare that have addressed the drainage issues for the areas they control. The Orlando Regional Healthcare-Phase 1 infrastructure improvements for drainage system are depicted in "Appendix A, Exhibit G - ORH Phase 1 Drainage improvement map".

The study area is part of a larger landlocked drainage basin that relies only on drainage wells for volume recovery. With the exception of some recently redeveloped areas, there are no pollution abatement collection and treatment systems on the majority of properties in the study area. Future development will need to provide on-site stormwater treatment facilities. In order to gauge the level of on-site treatment facilities needed, a rational method for calculating runoff was employed for each zone identified on Exhibit C of Appendix A. The impervious area for each zone was taken as 80 percent of the total area. Also, a 1 inch runoff was used in the analysis. Table 14 presents an estimate of the treatment volume for each zone.

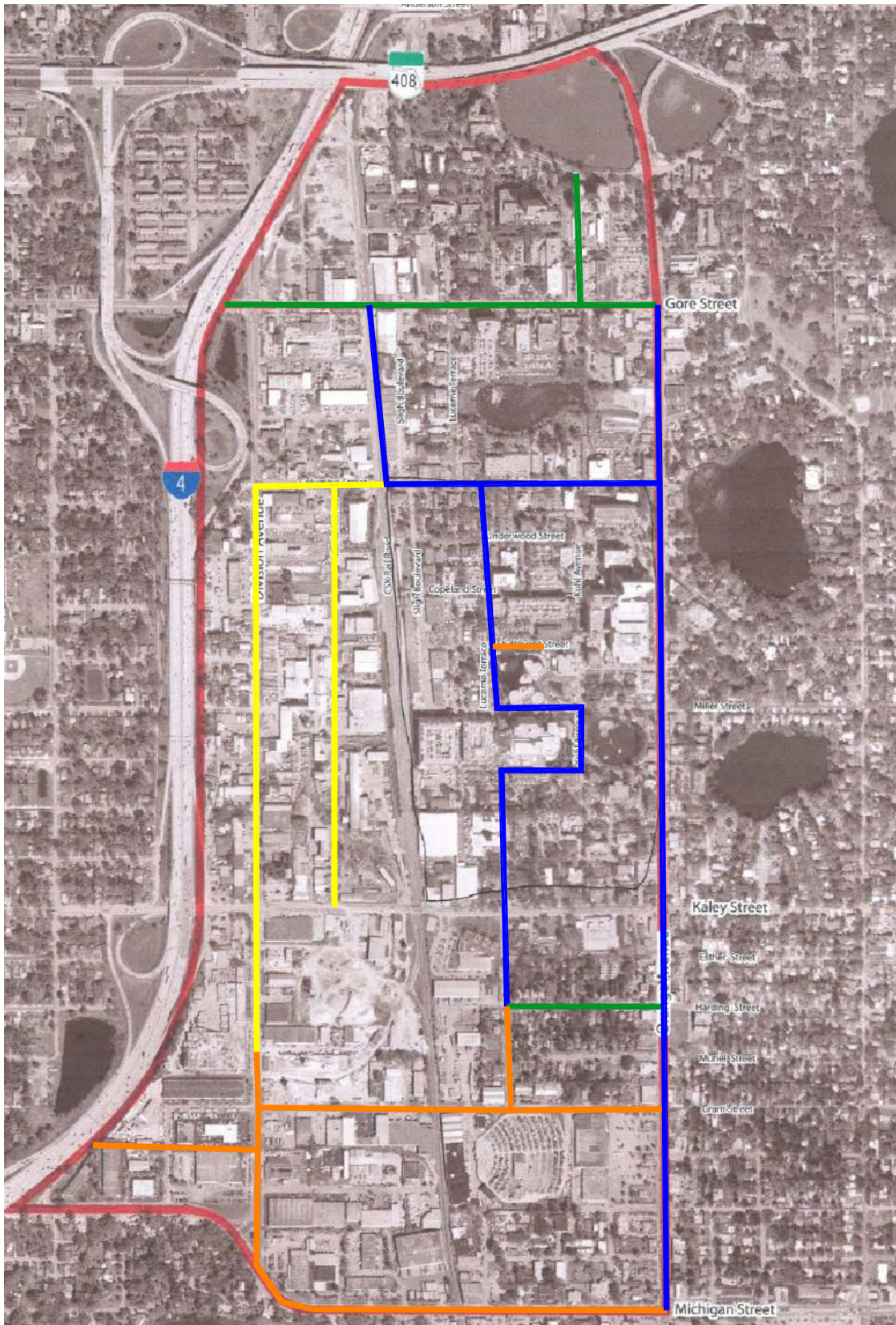


Table 14: Estimated Water Quality Volume by Zone

Zones	Acres	Area (Sq.Ft.)	Impervious Area (Sq.Ft.)	Pervious Area (Sq.Ft.)	Rainfall (inch)	Runoff Coefficient	Treatment Volume (Cu.Ft)
1	81.79	3,562,666	2,850,133	712,533	1.00	0.78	231,573
2	44.03	1,917,881	1,534,305	383,576	1.00	0.78	124,662
3	35.62	1,551,684	1,241,347	310,337	1.00	0.78	100,859
4	60.56	2,637,863	2,110,290	527,573	1.00	0.78	171,461
5	42.18	1,837,194	1,469,755	367,439	1.00	0.78	119,418
6	55.57	2,420,627	1,936,502	484,125	1.00	0.78	157,341
7	33.48	1,458,583	1,166,866	291,717	1.00	0.78	94,808
8	48.45	2,110,290	1,688,232	422,058	1.00	0.78	137,169
9	31.49	1,371,689	1,097,351	274,338	1.00	0.78	89,160
10	37.90	1,650,992	1,320,793	330,198	1.00	0.78	107,314
11	43.32	1,886,848	1,509,478	377,370	1.00	0.78	122,645
12	35.62	1,551,684	1,241,347	310,337	1.00	0.78	100,859

As individual sites are developed within the study area, the treatment volume will need to be collected and abated on site using retention ponds, where practical, swales and exfiltration trenches that can percolate the runoff into the soil. Other methods could include ponds with underdrains, bio-swales and underground vaults. These methods will significantly improve the water quality of the receiving water bodies within the study area. Other innovative methods that can be used to reduce runoff and improve water quality from the individual sites include pervious pavement, and garden roofs. Additionally, the stormwater can be collected and reused for landscape irrigation and custodial uses. New storm sewer lines will likely be incorporated in the individual development plans and may take the form of tie-ins to the existing system along the roadways.





20" Watermain
16" Watermain
12" Watermain
10" Watermain

Existing Major Water Lines

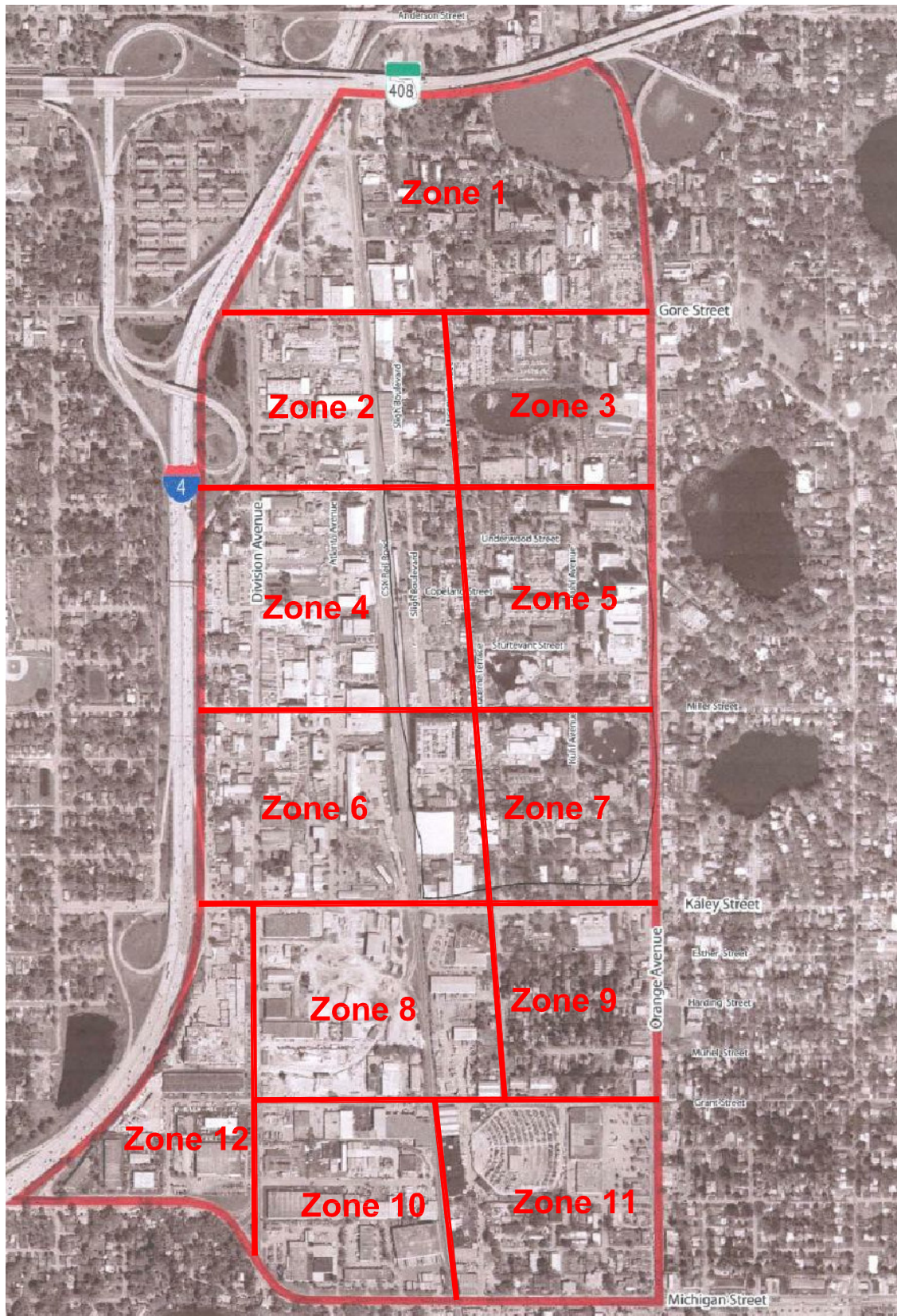


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**South Downtown Orlando
Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

**EXHIBIT
A**



Development Zone Map

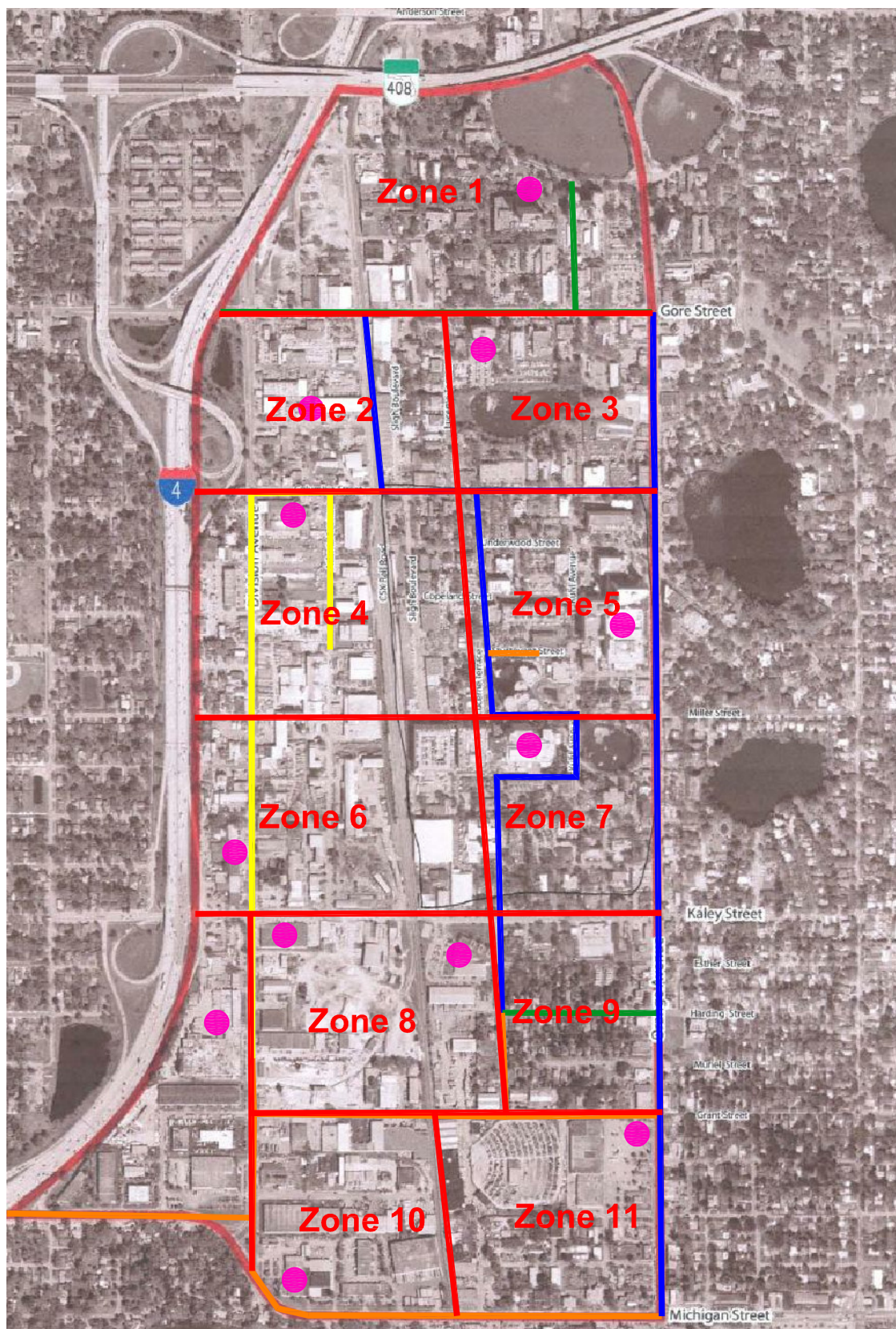


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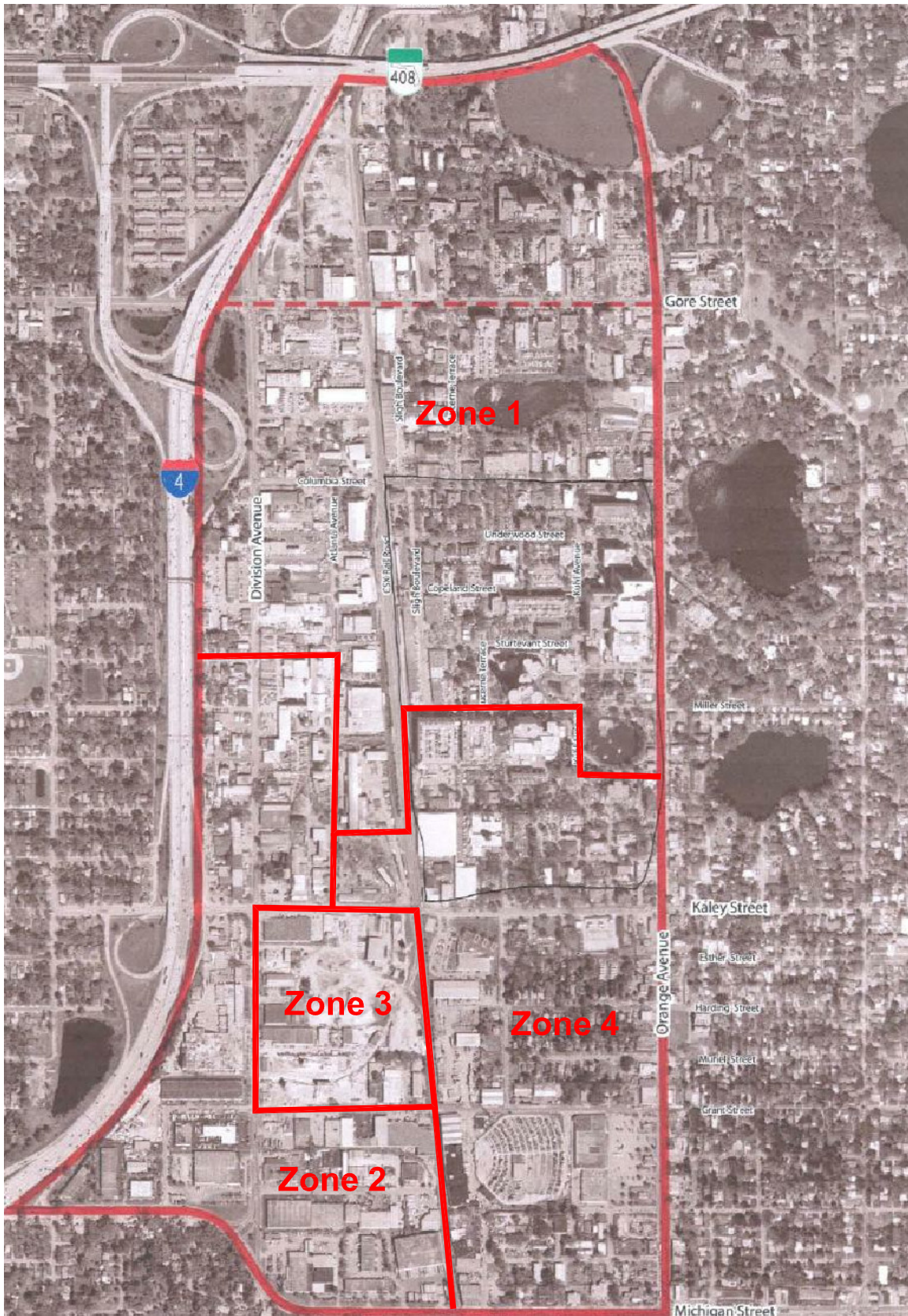
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AUTHORIZATION NO. EB-000654

**South Downtown Orlando
Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

**EXHIBIT
B**



\\Server1c\07.Civil\ACTIVE PROJECTS\06-07.339 Doubay Site Bithlo\Drawing



Wastewater Zone Map

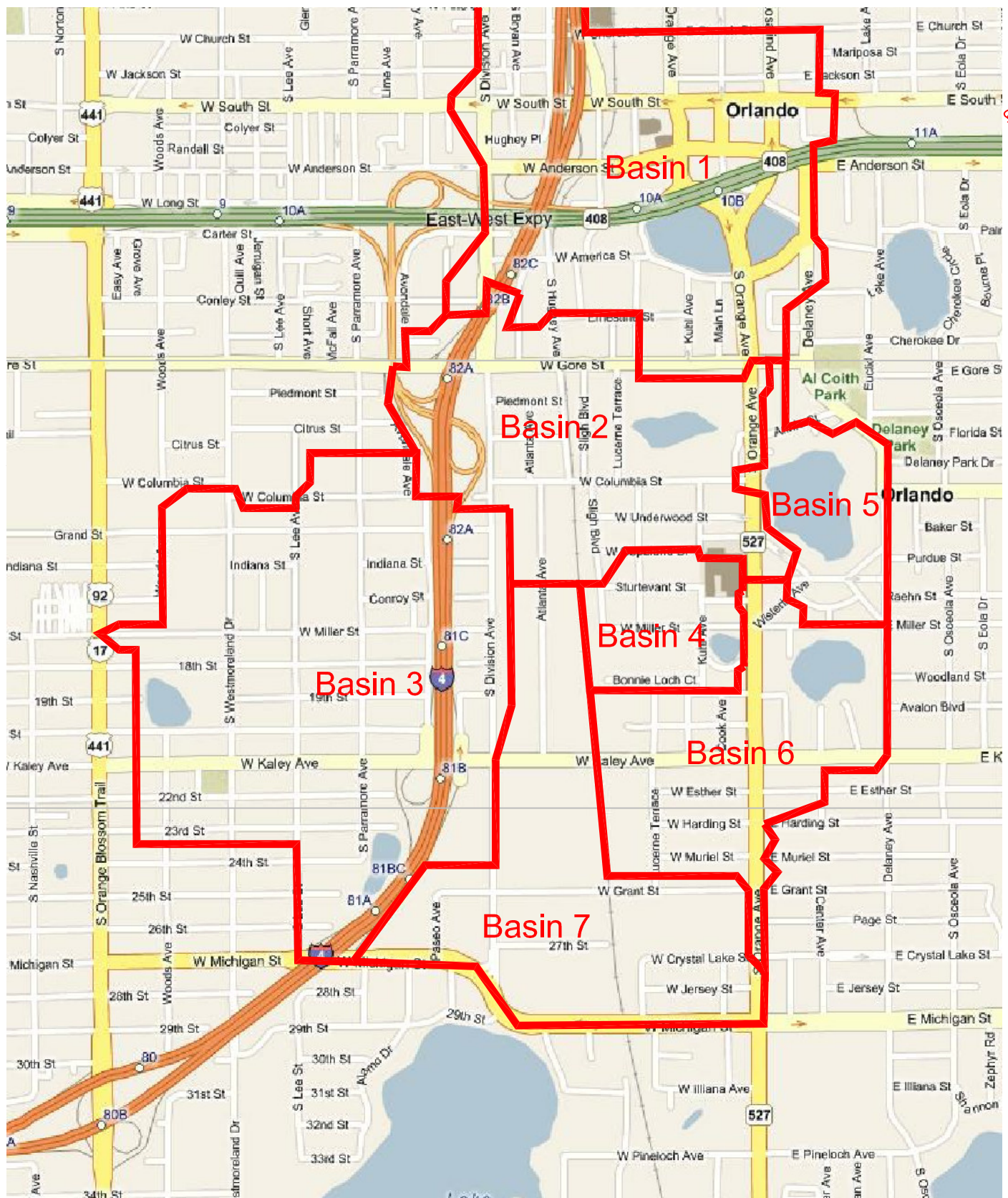


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**South Downtown Orlando
Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

**EXHIBIT
D**



MAGNETIC

Stormwater Basin Map

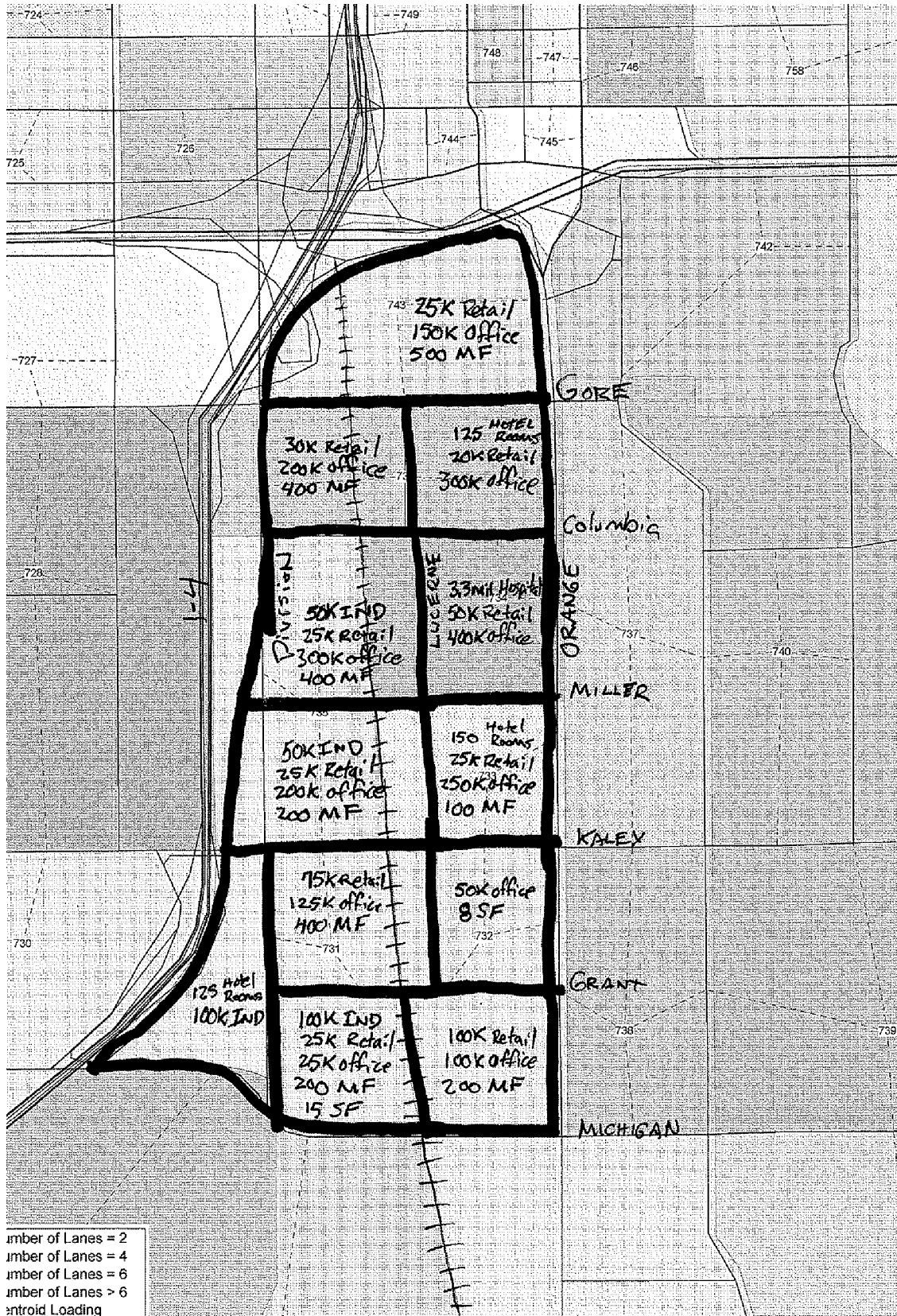


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**South Downtown Orlando
Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

**EXHIBIT
E**



Number of Lanes = 2
 Number of Lanes = 4
 Number of Lanes = 6
 Number of Lanes > 6
 Centroid Loading

Future Growth Map

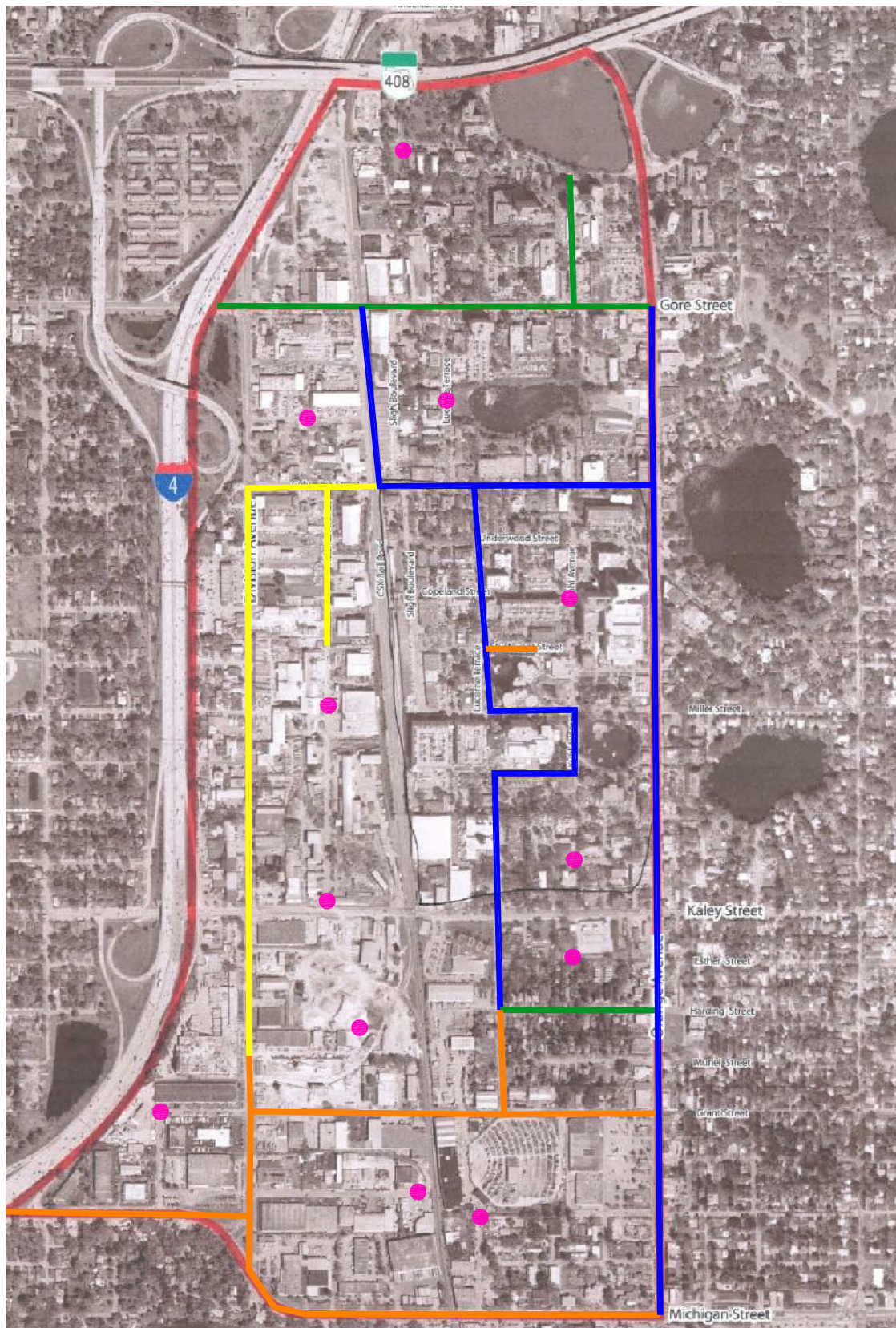


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**South Downtown Orlando
 Revopelment
 ORLANDO, FLORIDA
 PROJECT No. LA08-07.399**

**EXHIBIT
 A**



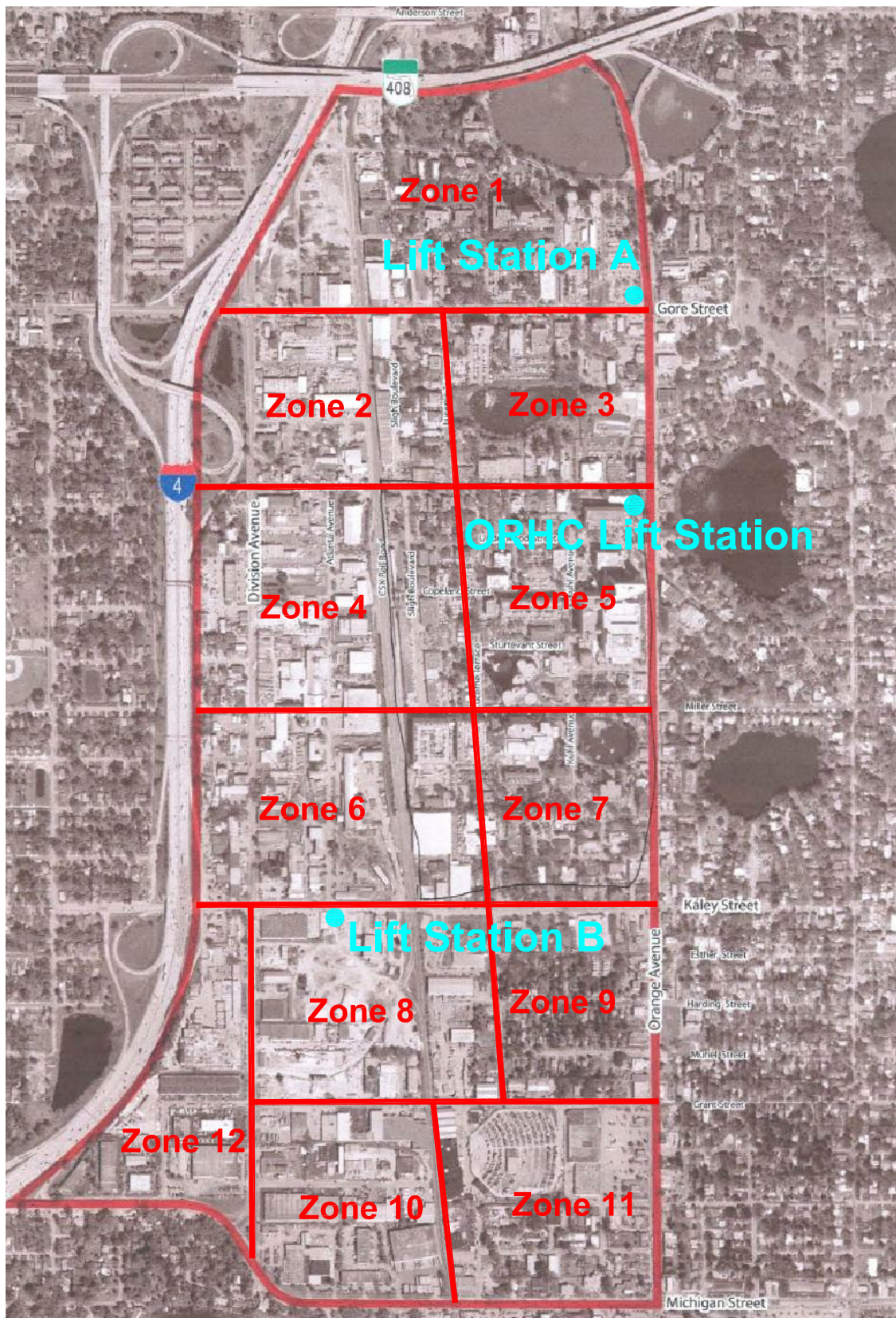
Max Fireflow Location



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Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

EXHIBIT
B



Proposed Lift Station Locations



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AUTHORIZATION NO. EB-000654

**South Downtown Orlando
Revelopment
ORLANDO, FLORIDA
PROJECT No. LA08-07.399**

EXHIBIT

C



MEMORANDUM

TO: Mr. Joel R. West, AICP
Glatting Jackson Kercher Anglin Lopez Rinehart
120 N. Orange Avenue
Orlando, FL 32801

FROM: Babuji Ambikapathy, P.E., AICP

DATE: July 31, 2008

SUBJECT: City of Orlando – South Downtown Redevelopment Plan -
Transportation Planning Services
(GMB Project No. 07-117.01)

OVERVIEW

By the year 2030, City of Orlando will be a lively city with world class amenities serving the diverse population and culturally rich Downtown. With growing population and new businesses and institutions springing up everyday, the City of Orlando, especially the Downtown Area will continue to experience unprecedented growth over the coming years. Addressing the future transportation needs of this central part of the City will help in ensuring a vibrant and great City setting to live, work and play. The related agencies in-charge of this tremendous task have started to work on a grand Vision Plan for the City, of which the South of Orlando Downtown, generally bound by the East-West Expressway, S. Orange Avenue, Michigan Street and I-4 is a part of this Vision Plan.

The City of Orlando Website has stated the following about the South of Downtown Vision Plan:

“The Vision Plan is intended to illustrate how the South of Downtown district could evolve over the next 20 to 50 years. The Vision Plan is based on: (1) market projections for the type and amount of development that could be expected at this location; (2) recommended changes to the type, density and intensity of development allowed at various locations within the district; and (3) infrastructure improvements needed to accommodate new development.”

The goals as set by the Vision Plan are to:

- ✚ Accommodate future development within the Orlando Health (Orlando Regional Healthcare System) campus;
- ✚ Accommodate new medical office, retail and residential development outside the Orlando Health campus;
- ✚ Encourage mixed-use development in proximity to the commuter rail station;
- ✚ Support redevelopment and intensification of industrial areas along I-4;
- ✚ Improve infrastructure within the study area; and
- ✚ Protect existing property rights.

To meet the above mentioned challenges by developing suitable strategies and to incorporate an extensive transportation plan for the South Downtown Area, this study completed an exhaustive analysis of all the related transportation elements for the existing and future scenarios and provided recommendations related to the traffic element to maintain a successful transportation system in the study area.

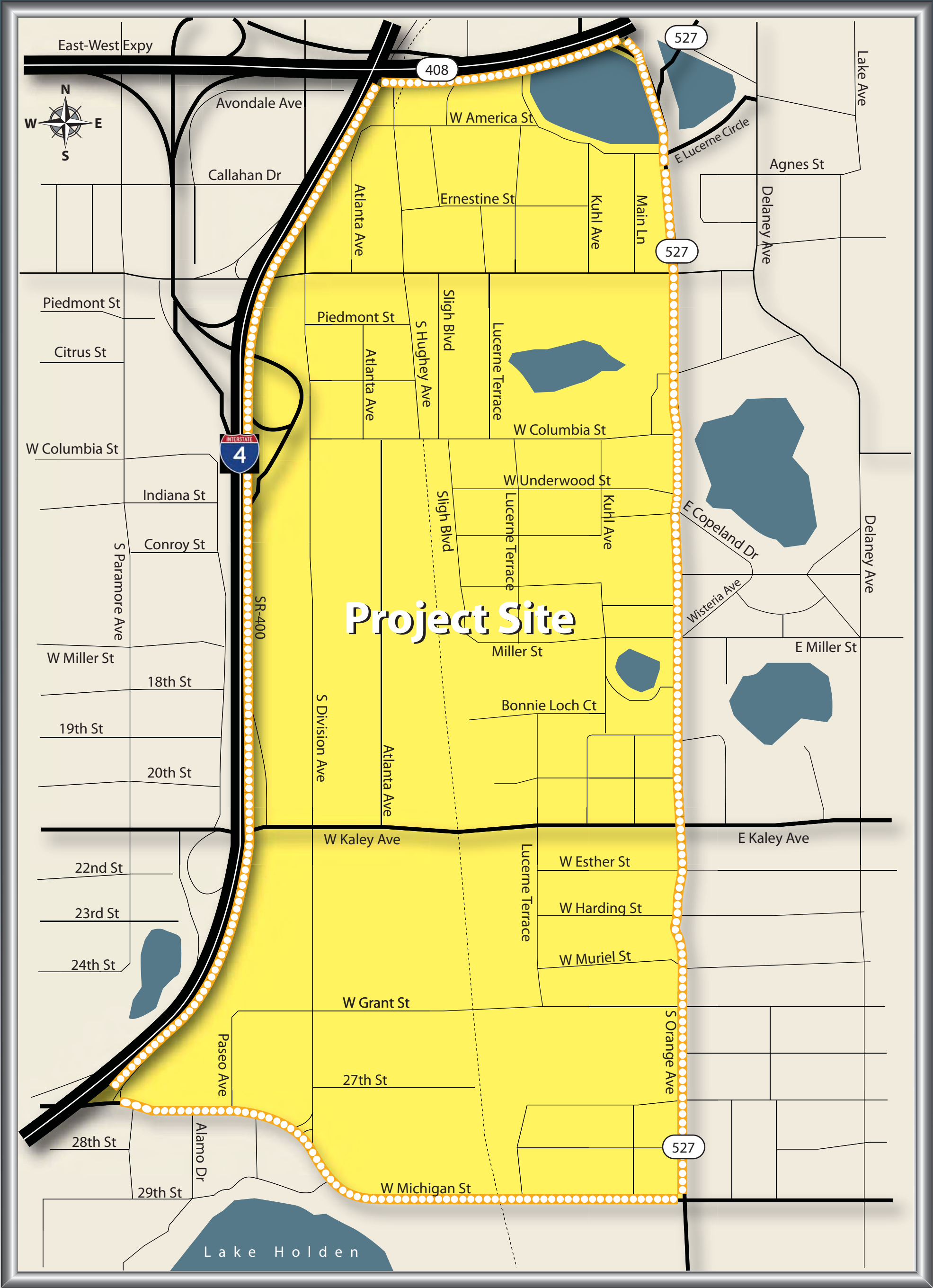
1. INTRODUCTION

The main aim of this technical memorandum is to document the findings of the year 2008 and the year 2030 transportation assessment for the south downtown area of the City of Orlando, Florida. Figure 1 depicts the study area limits and the major roadway segments within the study area. As indicated in Figure 1, the study area extends roughly between Orange Avenue in the east and Division Avenue in the west and between Michigan Street in the south and Gore Street in the north. The transportation element for the south downtown area includes all the major east-west and north-south segments, the existing pedestrian and bicycle related facilities, and the existing transit facilities. The major east-west roadway segments include Michigan Street, Grant Street, Kaley Avenue, West Miller Street, Columbia Street, and Gore Street and the major north south streets include Orange Avenue, Lucerne Terrace, Kuhl Avenue, and Division Avenue.

As South Downtown Area continues to experience substantial increase in traffic volumes of all the transportation modes (vehicle, bus, and pedestrian traffic), it is of paramount importance to have an accurate and thorough understanding of the existing and proposed traffic patterns to plan for a flourishing and vibrant future South Downtown Area. Essentially, this memorandum is prepared in support of the transportation analysis for the Growth Management Plan (GMP) amendment.

1.1 Transportation Concurrency Exception Area (TCEA)

Transportation concurrency is defined as the provision of adequate transportation infrastructure at a city or county's adopted level of service (LOS) standard, concurrent with the impacts of development. However, as cities and counties all over Florida began to implement transportation concurrency requirements, conflicts have started to surface with the comprehensive planning goals and objectives. As many cities attempted to revitalize their downtown areas, the comprehensive planning goals and objectives of



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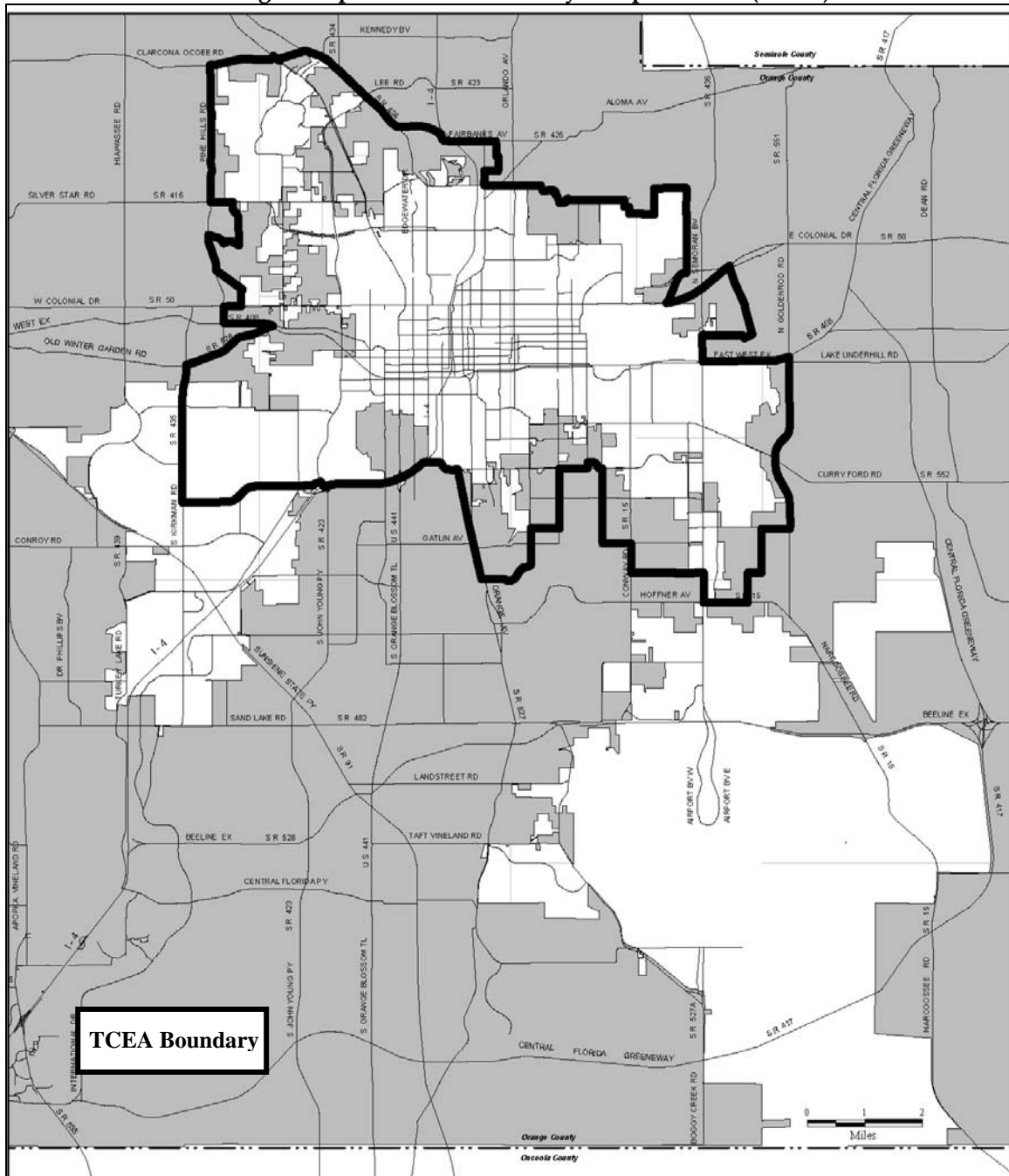
City of Orlando - South Downtown Redevelopment Plan

Figure 1
Project Location Map

urban infill and redevelopment were hindered because of transportation concurrency requirements. In 1994, following an extensive debate over this issue, the Florida Statutes were finally amended to allow exceptions to transportation concurrency requirements. (Source: *Institute of Transportation Engineers, Urban Area Revitalization: Transportation Concurrency Exception Areas-Concept and Application*, Wallace, Robert P, January 2005)

In the same lines, the TCEA was first established in the year 1998 for the City of Orlando in its Growth Management Plan (GMP) to justify Urban Redevelopment, Urban Infill, and Downtown Revitalization and to recognize the efficient use of its transportation infrastructure, the diversity of choices for travel and the proximity of interdependent land uses. As such, based on the adopted TCEA boundaries proposed for the City of Orlando, the subject South Downtown Study Area was also identified as a designated TCEA. Figure 2 indicates the existing TCEA boundary of the City of Orlando. The projected update for the current TCEA is set for August 1st, 2009.

Figure 2
City of Orlando - South Downtown Redevelopment Plan
Existing Transportation Concurrency Exception Area (TCEA)



Source: City of Orlando Planning and Development Department

2. EXISTING CONDITIONS

The analysis of the existing year 2008 peak hour roadway Level of Service (LOS) analysis for the study roadway segments and a brief explanation of pedestrian, bicycle, and the transit facilities to provide an insight into the existing circulation patterns of all transportation modes is provided below:

2.1 Existing Roadway Link LOS Analysis

The traffic count information that the City of Orlando had provided from the previous traffic studies (South Orange Retail Development Traffic Impact Analysis dated September 2005, ORHS Campus Build-out dated October 2006, and The Downtown Orlando Transportation Plan dated November 2006) and 2007 Orange County Count Database were used for the analysis.

The peak hour turning movement count data obtained from the above mentioned traffic studies were used to obtain the mid block peak hour peak direction traffic volumes to assess the roadway LOS for Grant Street, Miller Street, Columbia Street, and Division Avenue. Since these traffic studies have traffic data from the year 2005 through the year 2006, the traffic data was grown to the year 2008 conditions by multiplying the raw traffic counts with the corresponding peak season factor and then growing linearly by an annual growth rate of 2% per year to obtain the year 2008 traffic counts. The annual growth rate of 2% per year was used in the South Orange Retail Development Traffic Impact Analysis Study dated September 2005.

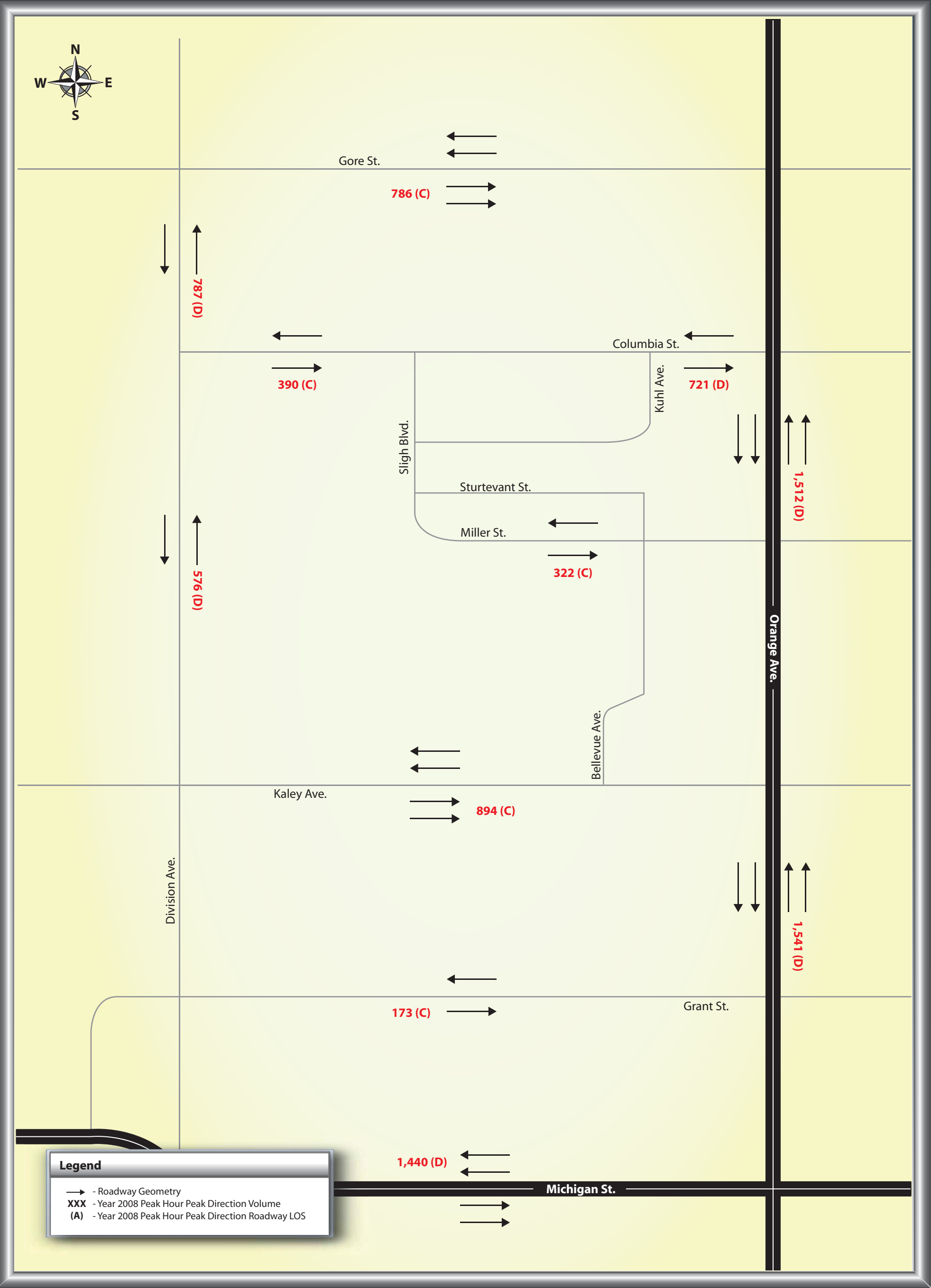
For the remaining roadway segments along Michigan Street, Kaley Avenue, Gore Street, and Orange Avenue within the South Downtown Area, the roadway segment LOS was evaluated using the peak hour peak direction volumes obtained from the 2007 Orange County Count Database. The counts along these roadway segments were completed during the months of October and November 2007, and hence were adjusted only by the peak season factor (based on the available year 2006 peak season factors) and not by the growth factor mentioned in the previous paragraph.

The peak hour peak direction roadway LOS analysis is shown in Table 1. The existing 2008 peak hour peak direction volumes along the different roadway segments within the study area were compared to the existing peak hour peak direction capacities obtained from Table 4-7 of the 2002 Quality/LOS Handbook to obtain the existing year peak hour peak direction LOS. As shown in Table 1, all the roadway segments are found to operate at LOS D or better. In addition, Figure 3 exhibits the study segments with the year 2008 peak hour peak direction volumes and directional number of lanes within the South Downtown Area.

Table 1
City of Orlando - South Downtown Redevelopment Plan
Year 2008 Roadway Analysis

Roadway Segments	Number of Lanes	LOS Standard	Peak Hour Peak Direction		Existing Capacities*				
			Volume	LOS	A	B	C	D	E
Michigan Street									
S Orange Avenue to S Division Avenue	4	E	1,440	D	0	220	1,360	1,710	1,800
Grant Street									
S Orange Avenue to Division Avenue	2	E	173	C	0	0	480	760	810
Kaley Avenue									
S Orange Avenue to Division Avenue	4	E	894	C	0	220	1,360	1,710	1,800
W Miller Street									
S Orange Avenue to Sligh Boulevard	2	E	322	C	0	0	480	760	810
W Columbia Street									
S Orange Avenue to Kuhl Avenue	2	E	721	D	0	0	480	760	810
Kuhl Avenue to Division Avenue	2	E	390	C	0	0	480	760	810
Gore Street									
S Orange Avenue to Division Avenue	4	E	786	C	0	220	1,360	1,710	1,800
S Orange Avenue									
Michigan Street to Kaley Avenue	4	E	1,541	D	0	220	1,360	1,710	1,800
Kaley Avenue to Gore Street	4	E	1,512	D	0	220	1,360	1,710	1,800
Division Avenue									
Michigan Street to Columbia Street	2	E	576	D	0	0	504	798	851
Columbia Street to Gore Street	2	E	787	D	0	0	504	798	851

*Note: The Existing Capacities were obtained from Table 4-7 of the 2002 FDOT Quality/LOS Handbook (Version Date 5/17/07)



2.2 Existing Bicycle and Pedestrian Facilities

Based on the information obtained from the City of Orlando and the Final Report of the “Downtown Orlando Transportation Plan” prepared by HDR, dated November 2006, bike lanes do not currently exist in the South Downtown Area. However, there are existing signed bike routes along Delaney Avenue, East Copeland Drive, Wisteria Avenue, and Jasmine Avenue, located just east of the study area. Designated Bicycle parking facilities currently are not provided in the study area. A map showing the existing bicycle routes in the vicinity of the South Downtown Area is furnished as Figure 4 (source:: *City of Orlando*).

It is important to create an effective pedestrian network for a lively downtown experience, which should not only provide comfort but also safety at any point of time. Currently side-walks of different widths are provided along major roadway segments in the South Downtown Area including Orange Avenue, Kaley Avenue, Division Avenue, etc. The Final Report on “Downtown Orlando Transportation Plan” categorized the pedestrian routes into two different categories as: Primary and Secondary Pedestrian Streets. Primary Pedestrian Streets have been assigned to receive strong pedestrian emphasis either because they carry heavy pedestrian volumes or they have an important aesthetic role. Secondary Pedestrian Streets also serve important pedestrian corridors, but are less important in terms of anticipated pedestrian and visual and functional design structure of the streetscape. Based on these categorizations, Orange Avenue, Division Avenue, and Lucerne Terrace in the study area form secondary pedestrian streets.

Bike Lane

- Off Street Bike Lane
- Bike Lane
- Signed Route

NORTH

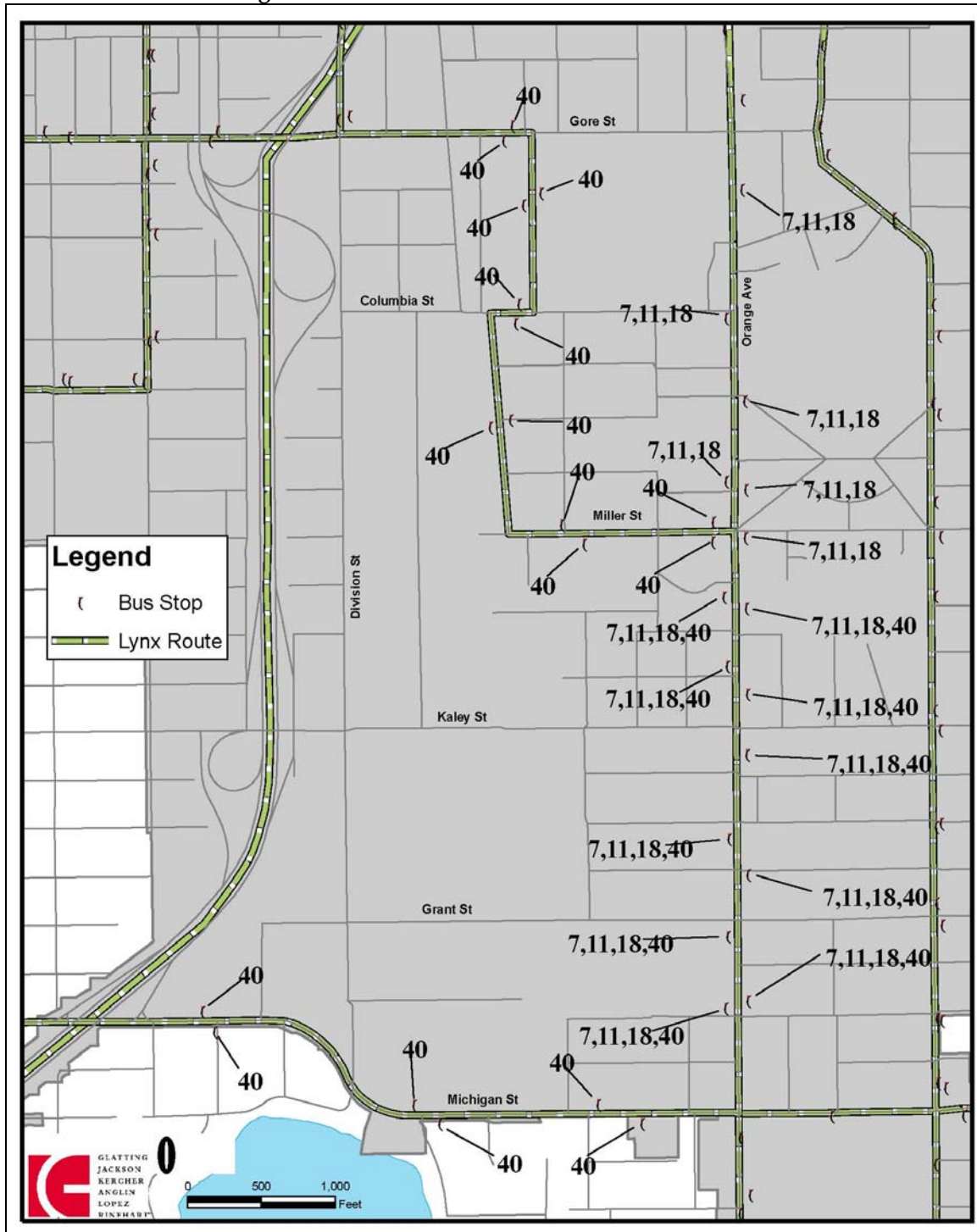
GMB Engineers & Planners, Inc.
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2.3 Existing Transit Service

The Central Florida Regional Transportation Authority (known as LYNX) currently operates (as of January 2008) 4 transit routes (link #s 7, 11, 18, and 40) in the South Downtown Area (*source: LYNX*). All the routes start at LYNX central station and terminate at different destinations passing through the South Downtown Area. Link #'s 7, 11, and 18 have stops entirely along Orange Avenue, while link # 40 has stops along Gore Street, Lucerne Terrace, Sligh Boulevard, Miller Street, Orange Avenue, and Michigan Street. A map illustrating the link numbers, routes, and bus stops within the study area is furnished as Figure 5 (*Source: Glatting Jackson Kercher Anglin Lopez Rinehart*).

Based on the information from LYNX, the estimated average monthly rider-ship for link # 7 was 25,526, the average monthly riders-ship for link #11 was 33,788, the average monthly rider-ship for link # 18 was 37, 854, and the average monthly rider-ship for link # 40 was 40,660 for the year 2007. An estimated average number of 1,580 commuters board and alight at the bus stops located within in the South Downtown Area for all of the links combined. Table 2 provides the existing transit operating characteristics for Link #s 7, 11, 18, and 40 including route limits, service frequencies, and service hour duration for weekdays, Saturdays, and Sundays.

Figure 5
City of Orlando - South Downtown Redevelopment Plan
Existing LYNX Bus Network for the South Downtown Area



Source: Glatting Jackson Kercher Anglin Lopez Rinehart

Table 2
City of Orlando - South Downtown Development Plan
Existing Transit Operating Characteristics for LYNX Buses

Link #	Route Name	Route Limits	Service Frequencies (minutes)			Service Hour Duration		
			Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
7	S. Orange Avenue/ Florida Mall	LCS - Florida Mall	60	60	60	4:30 AM-12:30 AM	4:30 AM-10:35 PM	8:35 AM-5:15 PM
11	S. Orange Avenue/ OIA	LCS - OIA	30	30	30	4:45 AM-12:05 AM	4:45 AM-10:20 PM	5:35 AM-9:05 PM
18	S. Orange Avenue/ Kissimmee	LCS - Osceola Square Mall	60	60	60	5:00 AM-11:05 PM	5:00 AM-11:05 PM	--
40	Americana Blvd./ Universal	LCS - Universal Orlando Parking Garage	60	60	60	4:30 AM-1:35 AM	4:30 AM-10:35 PM	4:45 AM-8:35 PM

Abbreviations:

LCS - LYNX Central Station, OIA - Orlando International Airport

3. FUTURE CONDITIONS

Based on discussions with the City of Orlando Project Staff, the future analysis year was set as 2030. As such, this memorandum presents the analysis of the future year 2030 peak hour roadway Level of Service (LOS) analysis for the study roadway segments and required capacity improvements to accommodate the projected traffic demand in the South Downtown Area. Moreover, a brief explanation of the proposed pedestrian, bicycle, and the transit facilities was presented, albeit not necessarily planned till the horizon year 2030 and mostly planned for the interim years, to provide an insight into the future circulation patterns of all the transportation modes.

3.1 Future Traffic Projection Methodology

To obtain an accepted future year 2030 traffic projections for the South Downtown Area, GMB in coordination with the City of Orlando and Glatting Jackson Kercher Anglin Lopez Rinehart has followed the following steps:

- ✚ Obtained the data on the development potential for the traffic analysis zones (TAZs) or parcels within the study area and converted them into Socio-economic Data (SE Data) categories of ZDATA1 and ZDATA2 for use in the transportation model.
- ✚ Used the latest available 2025 Orlando Urban Area Transportation System (OUATS) model to update the SE Data for the TAZs within the study area.
- ✚ Accurately represented the **proposed modifications to the interchanges** in the revised OUATS 2025 highway network along I-4, especially at **Kaley Avenue and Michigan Avenue**, to match the I-4 Master Plan related improvements.
- ✚ Revised any programmed and planned future improvements in the vicinity of the study area and incorporated the improvements, if missing, in the 2025 OUATS model. As part of the planned improvements within the study area, **Lucerne Terrace realignment and improvement** from East-West Expressway to Michigan Street is incorporated in the year 2025 OUATS model.
- ✚ Consulted with the City of Orlando Staff to include any additional improvements (if any) within the study area in the 2025 OUATS model.

The SE Data used in the transportation model, the derivation of the revised SE data used in the revised year 2025 OUATS model, and the revised year 2025 Model Plot with two-way volumes and total number of lanes for the study are provided in Appendix A of this memorandum for reference. As the next step, the year 2025 traffic projections from the OUATS model were derived and grown to the year 2030 using suitable growth rates. Realizing that the build-out land use of the study area by the year 2025 will only prompt minimal growth between the year 2025 and the year 2030, an annual growth rate of 1% was used for all of the study segments with the exception of a few roadway segments. For the roadway segments along Michigan Street and Orange Avenue, an annual

growth rate of 0.5% was used to obtain the year 2030 volumes from the year 2025 volumes, because of the already low annual growth rate predicted between the existing year 2008 and the year 2025 model volumes.

3.2 Future Roadway Link Analysis

Table 3, self explanatory in style, provides the peak hour peak direction volumes and LOS for the year 2030 traffic conditions. However, it should be noted that the existing roadway number of lanes and capacities were used in this analysis to derive the additional capacity needs, if needed, by the year 2030. The Table also provides the year 2025 model volumes, the annual growth rates derived using the year 2025 model volumes and comparison of the present analysis results with the year 2026 results obtained from the Traffic Impact Analysis Report prepared for ORHS Campus, dated October 2006 (previous Traffic Impact Analysis Report). Based on the year 2030 roadway link analysis, the roadway segments along **Orange Avenue between Kaley Avenue and Gore Street, Lucerne Terrace between Kaley Avenue and Gore Street, and Division Avenue between Columbia Street and Gore Street** was projected to fail. The analysis results compares well with the results from the previous Traffic Impact Analysis Report. A visual representation of the peak hour peak direction volumes and the projected LOS for the year 2030 within the study area is furnished in Figure 6.

In addition, an **Area-wide analysis** was also performed to identify the need for additional capacity for the north-south or east-west segments as shown in Table 4. We have considered the segment with the highest Peak Hour Peak Direction volume along the east-west or north-south roadways for this analysis. Based on Table 4, the total volume-over-capacity (V/C) ratio for the east-west roadway segments indicates that the total roadway capacity with the existing number of lanes is sufficient to handle the projected year 2030 traffic in the South Downtown Area. However, based on the total V/C ratio for the north-south roadway segments, an additional capacity of a **bi-directional two (2) lane roadway capacity** should be made available by the year 2030.

This could be achieved by any of the following options:

- Four-laning of the existing two-lane Division Avenue
- Six-laning of the existing four-lane Orange Avenue
- Extending and reconstructing Atlanta Avenue to a three lane roadway (with bi-directional turn lane in the middle) from Kaley Avenue to Gore Street.
- Extending and reconstructing Kuhl Avenue/Bellevue Avenue to a three lane roadway (with bi-directional turn lane in the middle) from Kaley Avenue to Gore Street.

Table 3
City of Orlando - South Downtown Redevelopment Plan
Year 2030 Roadway Link Analysis

Roadway Segment	Number of Lanes	LOS Standard	Peak Hour Peak Direction ³		Future Capacities ¹					Year 2026 Peak Hour Peak Direction - Previous Report ⁷		Existing Daily AADT ⁸		2025 AADT ⁹	2008 - 2025 Annual Growth Rate	2030 AADT	2025 - 2030 Annual Growth rate
			Volume ^{4,5}	LOS ⁶	A	B	C	D	E	Volume	LOS						
Michigan Street																	
S Orange Avenue to S Division Avenue	4	E	1,579	D	0	220	1,360	1,710	1,800	NA	--	37,310		40,912	0.54%	41,934	0.50%
Grant Street																	
S Orange Avenue to Division Avenue	2	E	588	D	0	0	480	760	810	NA	--	3,400		11,322	12.94%	11,888	1.00%
Kaley Avenue																	
S Orange Avenue to Division Avenue	4	E	1,613	D	0	220	1,360	1,710	1,800	1,605	D	21,563		38,916	4.47%	40,862	1.00%
W Miller Street																	
S Orange Avenue to Sligh Boulevard	2	E	647	D	0	0	480	760	810	716	D	NAv	5,322	12,452	7.44%	13,074	1.00%
W Columbia Street																	
S Orange Avenue to Kuhl Avenue	2	E	710	D	0	0	480	760	810	1,086	F	NAv	11,917	13,669	0.82%	14,353	1.00%
Kuhl Avenue to Division Avenue	2	E	769	E	0	0	480	760	810	664	D	NAv	6,446	14,793	7.19%	15,533	1.00%
Gore Street																	
S Orange Avenue to Division Avenue	4	E	1,419	D	0	220	1,360	1,710	1,800	NA	--	16,310		29,455	4.48%	30,928	1.00%
S Orange Avenue																	
Michigan Street to Kaley Avenue	4	E	1,793	E	0	220	1,360	1,710	1,800	NA	--	36,088		42,409	0.97%	43,470	0.50%
Kaley Avenue to Gore Street	4	E	2,135	F	0	220	1,360	1,710	1,800	2,335	F	35,734		50,963	2.37%	52,237	0.50%
Lucerne Terrace																	
Michigan Street to Kaley Avenue	2	E	336	C	0	0	480	760	810	NA	--	NAv	NAv	6,473	NAP	6,796	1.00%
Kaley Avenue to Gore Street	2	E	842	F	0	0	480	760	810	866	F	NAv	NAv	16,193	NAP	17,003	1.00%
Division Avenue																	
Michigan Street to Columbia Street	2	E	847	E	0	0	504	798	851	1,067	F	NAv	9,521	16,290	3.95%	17,105	1.00%
Columbia Street to Gore Street	2	E	1,292	F	0	0	504	798	851	1,429	F	NAv	13,008	24,864	5.06%	26,107	1.00%

Note:

NAv - Not Available; NAP - Not Applicable

1. The Future Capacities were obtained from Table 4-7 of the 2002 FDOT Quality/LOS Handbook (Version Date 5/17/07)

3. K and D factors from the 2007 Orange County Count Database for Michigan Street, Kaley Avenue, Gore Street, and Orange Avenue were used to obtain the Peak Hour Peak Direction Volumes, and a K factor of 0.09 and a D factor of 0.55 were used for the remaining roadway segments.

4. Peak Hour Peak Direction Volume is obtained by multiplying the 2030 AADT with the recommended K and D factors.

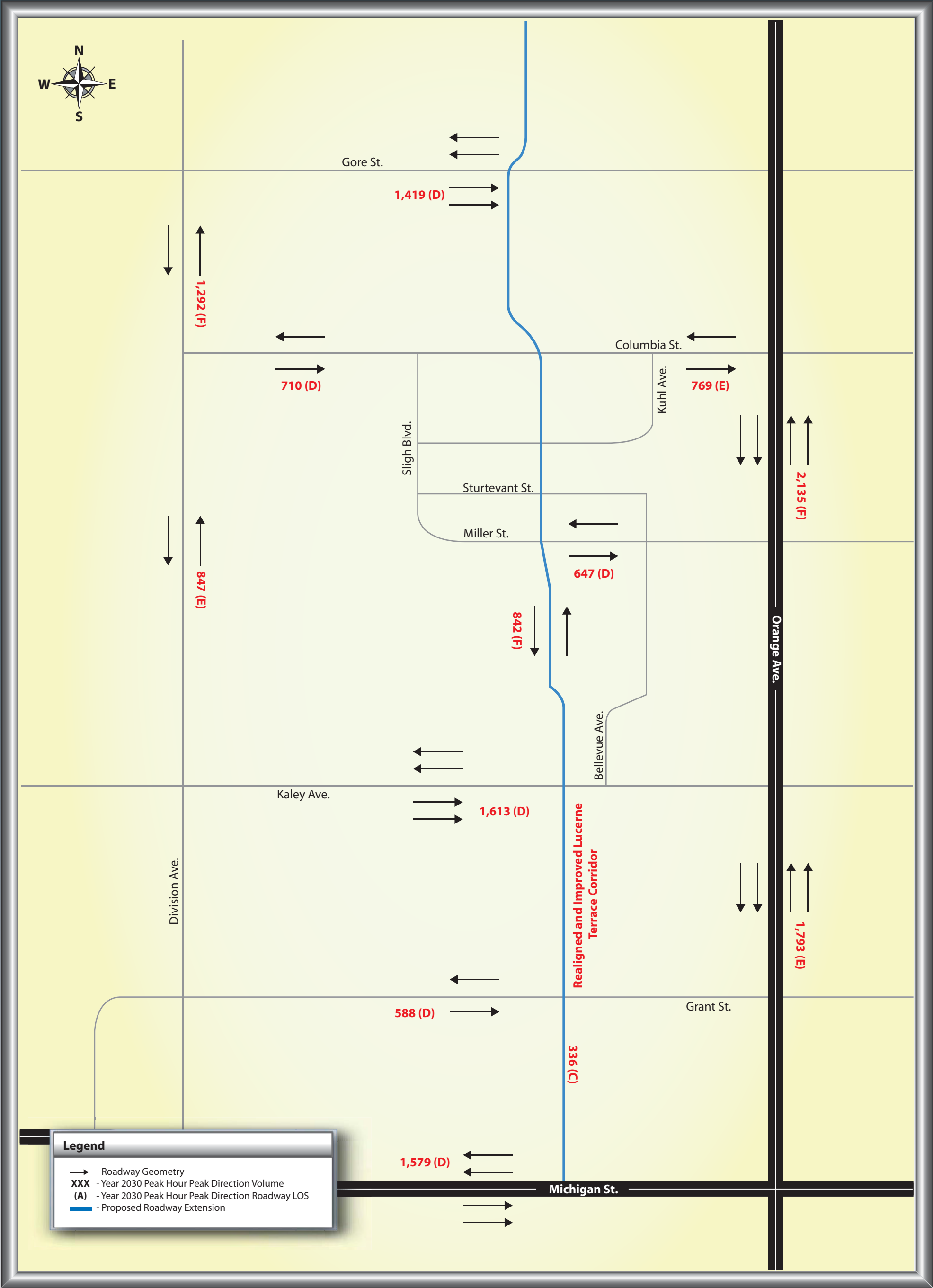
5. The year 2030 AADT was obtained by the growing the 2025 OUATS model AADT volulmes using an appropriate annual growth rate. An annual growth rate of 0.5% was used for Michigan Street and Orange Avenue, and an annual growth rate of 1% was used for the remaining roadway segments, owing to the build-out landuse structure of the South Downtown Area.

6. The failing roadway segments are shown in color and bold letters.

7. The Peak Hour Peak Direction Volume and LOS were obtained from the Traffic Impact Analysis Report prepared for the ORHS Campus, dated October, 2006.

8. When the existing AADT volumes were not available, a K factor of 0.11 and a D factor of .55 were used to obtain the daily AADT from the Peak Hour Peak Direction volumes

9. The latest MOCF of 0.97 from the FDOT Traffic Count Database was used to convert the PSWADT to AADT.



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3751 Maguire Boulevard, Suite 111
Orlando, Florida 32803

City of Orlando - South Downtown Redevelopment Plan

Figure 6
Year 2030 Peak Hour Peak Direction
Roadway Volumes & LOS, and
Roadway Geometry

Table 4
City of Orlando - South Downtown Redevelopment Plan

Year 2030 Areawide Analysis

Roadway Segment	Peak Hour Peak Direction ¹			Required Additional Capacity ³	
	Volume	Capacity	v/c		
East-West Orientation					
Michigan Street					
S Orange Avenue to S Division Avenue	1,579	1,800	0.88		
Grant Street					
S Orange Avenue to Division Avenue	588	810	0.73		
Kaley Avenue					
S Orange Avenue to Division Avenue	1,613	1,800	0.90		
W Miller Street					
S Orange Avenue to Sligh Boulevard	647	810	0.80		
W Columbia Street					
S Orange Avenue to Kuhl Avenue	710	810	0.88		
Kuhl Avenue to Division Avenue	769	810	0.95		
Gore Street					
S Orange Avenue to Division Avenue	1,419	1,800	0.79		
Total East-West	5,968	7,020	0.85		None
North-South Orientation					
S Orange Avenue					
Michigan Street to Kaley Avenue	1,793	1,800	1.00		
Kaley Avenue to Gore Street	2,135	1,800	1.19		
Lucerne Terrace					
Michigan Street to Kaley Avenue	336	810	0.42		
Kaley Avenue to Gore Street	842	810	1.04		
Division Avenue					
Michigan Street to Columbia Street	847	851	1.00		
Columbia Street to Gore Street	1,292	851	1.52		
Total North-South	4,269	3,461	1.23	1 lane in each direction	

Note:

1. K and D factors from the 2007 Orange County Count Database for Michigan Street, Kaley Avenue, Gore Street, and Orange Avenue were used to obtain the Peak Hour Peak Direction Volumes, and a K factor of 0.09 and a D factor of 0.55 were used for the remaining roadway s
2. The segment with the highest peak hour peak direction volume was considered for the area wide analysis.
3. Required additional capacity (in number of lanes) is calculated using the following equation:
Additional Capacity = (Total Capacity - Total Volume)/ Capacity of a single lane{ assumed as 810 in this case.}

3.3 Future Bicycle and Pedestrian Facilities

Based on the information obtained from the City of Orlando and the Final Report of the “Downtown Orlando Transportation Plan” prepared by HDR, dated November 2006, bike lanes are proposed by the year 2010 along Gore Street between I-4 and Delaney Avenue, along Kaley Avenue between Division Avenue and Orange Avenue and along Orange Avenue between Kaley Avenue and Michigan Street.

By the year 2010, signed bike routes are planned along Lucerne Terrace between East-West Expressway and Columbia Street, along Sligh Boulevard between Columbia Street and Miller Street, and along Miller Street between Sligh Boulevard and Orange Avenue.

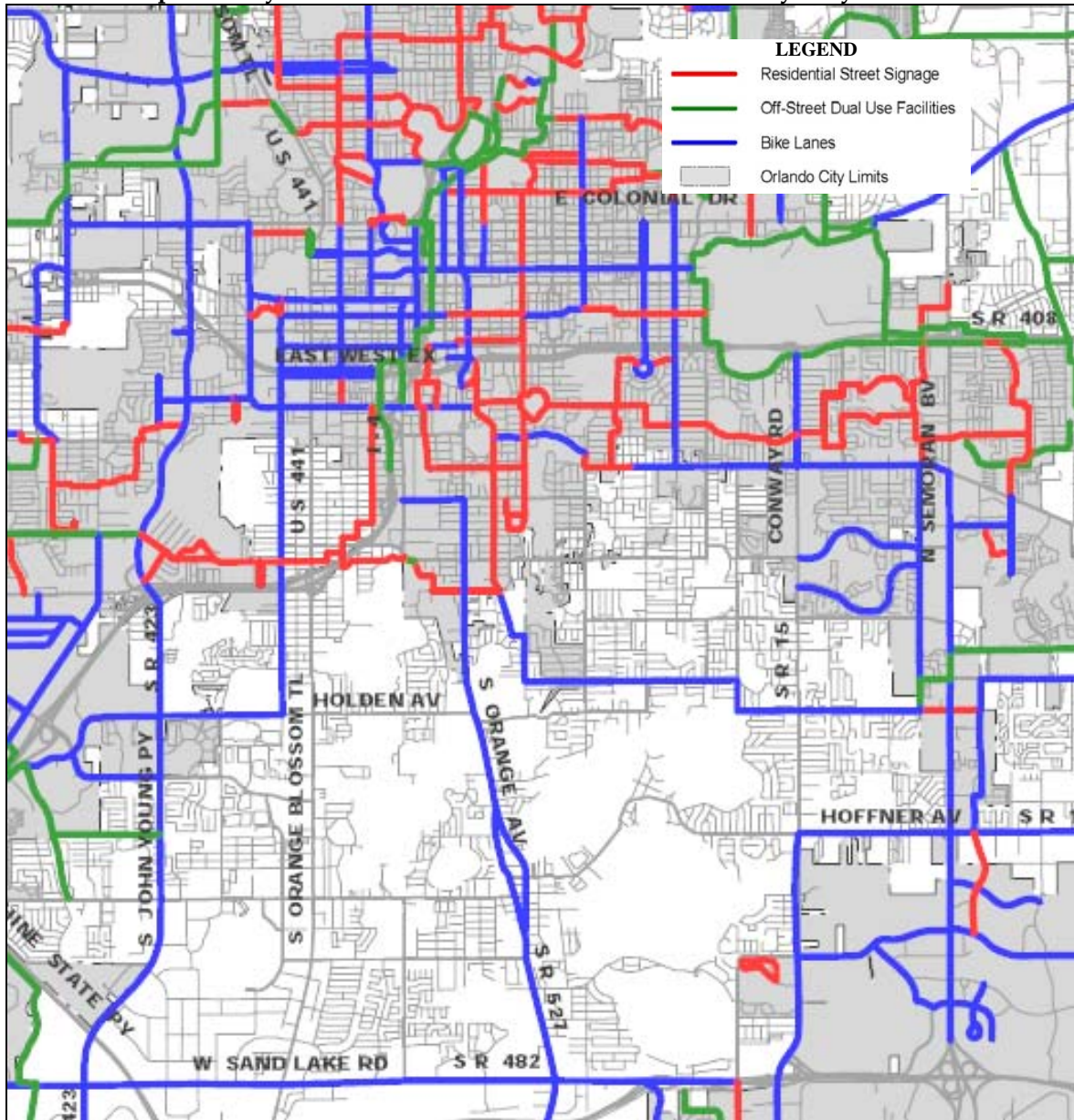
Also, a bike route is proposed along Division Avenue between East-West Expressway and Michigan Street for the future years beyond 2010.

The proposed bicycle facilities within and in the vicinity of the South Downtown Area are shown in Figures 7 (through the year 2010) and 8 (beyond the year 2010) (*Source: City of Orlando Economic Department of Planning*).

By the year 2030, extensive pedestrian facility improvements listed below will be completed to provide and adhere to the three principles of bicycle and pedestrian guidelines: Positive, Connected, and Inviting (*Source: The final report on “Downtown Orlando Transportation Plan”*).

- ✚ Every trip begins and ends as a pedestrian and should be a first class experience.
- ✚ Create an environment that generates a positive pedestrian culture.
- ✚ Apply the Hierarchy of Primary and Secondary Pedestrian Streets.
- ✚ The built roadway environment requires five key elements for success: Security, Convenience, Efficiency, Comfort and Welcome.
- ✚ Update streetscape guidelines and building code for shade, awning and canopy/building design requirements on primary and secondary pedestrian streets to reinforce hierarchy.
- ✚ Update Land Development Code for ground level building transparency requirements.
- ✚ Modify gateway underpasses and overpasses of I-4 and SR 408 to enhance pedestrian and bicycle connectivity between Downtown and surrounding neighborhoods.

Figure 7
City of Orlando - South Downtown Redevelopment Plan
Proposed Bicycle Facilities for the South Downtown Area by the year 2010



Source: City of Orlando Economic Planning Department

Existing And Proposed Bike Facilities

EXISTING SIGNED ROUTE PROPOSED

. Signed Route
 Bike Lane
 Off Street
 ■ Bike Rack

NORTH

GMB Engineers & Planners, Inc.
South Downtown Redevelopment Plan – Transportation Planning Services – Final Technical Memorandum
Page 21

3.4 Future Transit Service

3.4.1 Future LYNX Bus Service

Based on the latest Transit Development Plan (TDP) completed by LYNX for the fiscal years 2009 till 2018, the Transit Authority for the Central Florida Region has listed several improvements, either expanding the current routes or adding new routes over the next ten years. Moreover, the TDP also listed potential programs; both bus and rail related future facilities for the Central Florida Region. The LYNX has stated the following in the latest TDP.

"Over the next ten to fifteen years, transit service in Central Florida will grow beyond the traditional fixed route bus to a multi-modal network that will include flex-routes, deviated fixed-routes, bus rapid transit (BRT), and commuter rail, as well as para-transit service and car/van pools. The goal of this multi-modal approach is to better meet the wide range of mobility needs throughout the region as efficiently and effectively as possible. This new service structure also brings to an end the past approach of the standard size fixed-route transit bus fits the needs of all."

To evaluate the need for future improvements, LYNX completed a 20 year Comprehensive Operations Analysis (COA) in the year 2006. The COA included an origin/destination survey, which provided LYNX with a snapshot of the transit travel patterns throughout the Central Florida Region. The following three service plan time periods have been identified by the COA:

- ✚ Near-Term (1 - 5 Year Plan)
- ✚ Short-Range (6 - 10 Year Plan)
- ✚ Long-Range (11 - 15 Year Plan)

Transit services design as part of the COA result in the restructuring and redistribution of transit resources, maximizing cost saving opportunities, redirecting transit resources to more productive routes and service areas, while providing appropriate levels of service to each transit/travel market.

Transit services included in the COA 15 Year Plan include;

- ✚ Commuter Rail. New commuter rail service is included from Saxon Boulevard in Volusia County to Poinciana Boulevard in Osceola County.
- ✚ Main Line Corridor Routes. The Long-Range Vision includes proposals for new routes along major arterial roadways that are proven transit markets (e.g., SR 436 and Colonial Drive). Frequent service is proposed along these corridors, with enhanced passenger amenities.
- ✚ Express Routes. An extensive network of regional routes is proposed as a means to provide fast and convenient point-to-point service to/from Downtown Orlando, Orlando International Airport, Canadian Court at International Drive, and Disney.

- ✚ Local & Neighborhood Routes. An extensive network of local routes is proposed to connect residential neighborhoods and commercial districts with the Regional Routes and Main Line Corridor Routes.
- ✚ Call-and-Ride Zones. The Long-Range Vision also includes new dial-a-ride services in select low density areas.

To meet the challenges of providing service through a multi-destination network, LYNX has developed a new service classification system in its latest TDP with a vision of 15 to 20 years. These new service classifications that are applicable to the South Downtown Area are: (Source: LYNX)

High Capacity Transit

“High Capacity transit services are the backbone of the proposed LYNX long range network. These services are envisioned to directly follow major corridors and only deviate to serve a major transit hub that offers other transit types that feed the high capacity transit line. Services that are included as high capacity transit include commuter rail, bus rapid transit, and high frequency bus lines.”

Link 109 – South Orange Avenue

100 series links are designated for the High Capacity Transit within the Central Florida Region. As for the South Downtown Area, Link 109 is proposed to operate from the LYNX Central Station (LCS) to the proposed Sand Lake Road Commuter Rail Station via South Orange Avenue. The main aim of this Link is to consolidate the existing Link Routes 7, 11, and 18.

Downtown LYMMO Service

Within the Long-Range Vision, the existing LYMMO service which exists only in the Downtown Area is proposed to expand till the South Downtown Area from South of Orlando City Hall to the Orlando Regional Medical Center (ORMC)/ Amtrak Station area. The ORMC/ Amtrak Station area is a planned Rail Station when the Commuter Rail begins operation by the year 2013.

Regionals

These bus services are designed to operate with a limited number of stops during peak passenger demand periods to directly connect major activity centers. These routes generally operate from transit centers and/or park-and-ride lots. The existing 3-D routes to Walt Disney World are a good example of this type of service.

LYNX proposes to give 200 series links to the Regional Bus Service within the Central Florida Region. As such Regional Bus Service does not include the South Downtown Study Area.

Collectors

These types of routes are most similar to the majority of the existing LYNX bus routes. These routes primarily connect communities with major activity centers, key destinations, and high capacity transit services.

LYNX proposes to give 300 series links to the Bus Service on Collectors within the Central Florida Region. As such this Bus Service does not include the South Downtown Study Area.

Local Circulators

These services focus on neighborhood circulation and provide a connection to the overall transit system at a nearby transit center. Local circulators can include secondary local bus routes, deviated fixed routes, and flex routes. LYNX proposes to give 400 series links to the Local Circulators within the Central Florida Region.

The consolidated maps of the 100, 200, 300, & 400 series links for the Central Florida Region as furnished in the TDP prepared by the LYNX are provided in the Appendix B of this memorandum.

3.4.2 Future Regional Rail Programs

Based on the Central Florida MPO Alliance – Year 2025 Long Range Transportation Plan (LRTP) for Regional Transit Projects, the following transit systems are proposed which include the South Downtown Area.

Commuter Rail Service

As the City of Orlando continues to experience unprecedented population and employment growth, the city continues to experience increases in congestion and decreases in mobility along the existing transportation network. As such, to meet future transportation demands, to expand mobility choices, to provide an alternative to the I-4 corridor, and to encourage pedestrian and bicycle modes of travel, the Florida Department of Transportation has proposed a Commuter Rail System in the Central Florida Region. The Central Florida Commuter Rail system is included in the Regional Transit System concept Plan. This system will use existing CSX railroad tracks, and will eventually consist of 61.5 miles of service between DeLand, Orlando, and Poinciana. The corridor will provide a transportation option for commuters traveling from as far as Daytona Beach on the northern end and from Polk County on the southern end. The train will provide service during the morning and afternoon rush hours. It will operate on a 30-minute frequency during those peak hours and a two-hour frequency during non-peak hours.

Based on the current project schedule, the first phase of the Commuter Rail System will run from Debary to downtown Orlando and is planned to be operating by 2010. The second phase will run from downtown Orlando to the Poinciana Industrial Park south of Kissimmee by 2014. The third phase will run from DeLand to Debary at a future date

not yet determined. As for the South Downtown Area, the Orlando Amtrak/ORMC station, near the intersection of Sligh Boulevard and Columbia Street, is a partnership between the community and one of the region's largest employers, Orlando Regional Medical Center and its two hospitals for women and children. Surrounding medical facilities are within easy walking distance of the station, as are local restaurants and neighboring parks. Because of the location of one of the crucial rail stations (ORMC station) and the enhanced bicycle and pedestrian facilities, it is believed that the transit system will help in relieving some percentage of the vehicular traffic from the study area roadway segments.

Light Rail Transit System

The latest 2025 LRTP adopted by the Metroplan Orlando, identified a Light Rail Transit (LRT) project that would be implemented on Interstate 4 extending from Central Parkway in Altamonte Springs to Celebration. The LRT system is planned to extend eventually to Sanford. Even though the proposed LRT system is not cost feasible, this system could be implemented in the long run as additional funding sources become available.

The graphical representation of the proposed Commuter Rail System and a Vision Plan figure showing the proposed transit services for the Central Florida region is provided in Appendix B of this memorandum.

APPENDICES

Appendix A – Socio-Economic Data used in the Revised Year 2025 OUATS Model and Total Volume Plot

Appendix B – Supporting documents for the Future Transit Services

APPENDIX A

Socio-Economic Data used in the Revised Year 2025 OUATS Model and Total Volume Plot

Table A1.1 - BY2000 Original ZDATA

Study Area TAZ Zones		Year 2000 Original OUATS ZDATA1				
		SF units	SF population	MF units	MF population	Hotel Rooms
731		0	0	0	0	0
732		62	176	38	69	0
733		3	7	12	36	0
734		0	0	20	28	0
735		3	5	0	0	0
736		3	7	4	5	0
743		7	17	546	837	0
Total		78		620		0

Study Area TAZ Zones		Year 2000 Original OUATS ZDATA2					
		Industrial Emp.	Commercial Emp.	Service Emp.	Total Emp.	Industrial Sq. Feet	Commercial Sq. Feet
731		286	584	1,720	2,590	158,889	233,600
732		189	227	764	1,180	105,000	90,800
733		51	96	1,372	1,519	28,333	38,400
734		32	41	2,802	2,875	17,778	16,400
735		785	322	905	2,012	436,111	128,800
736		119	166	1,569	1,854	66,111	66,400
743		146	200	1,927	2,273	81,111	80,000
Total		1,608	1,636	11,059	14,303	893,333	654,400

Table A1.2 - Additional Growth

Study Area TAZ Zones		Year 2025 Additional OUATS ZDATA1				
		SF units	SF population	MF units	MF population	Hotel Rooms
731.1				400		125
731.2		15		200		
731.3						
732.1		8				
732.2				500		
733				100		150
734						
735				600		
736.1				400		
736.2						125
743				500		
Total		23		2,700		400

Study Area TAZ Zones		Year 2025 Additional OUATS ZDATA2					
		Industrial Emp.	Commercial Emp.	Service Emp.	Total Emp.	Industrial Sq. Feet	Commercial Sq. Feet
731.1		0	188	500	688		75,000
731.2		180	63	100	343	100,000	25,000
731.3		180	0	0	180	100,000	
732.1		0	0	600	600		
732.2		0	1,000	400	1,400		400,000
733		0	63	1,000	1,063		25,000
734		0	125	16,400	16,525		50,000
735		180	125	2,000	2,305	100,000	50,000
736.1		0	75	800	875		30,000
736.2		0	50	1,200	1,250		20,000
743		0	63	600	663		25,000
Total		540	1,750	23,600	25,890	300,000	700,000

Table A1.3 New FY2025 = old FY2025 - (old FY2025-BY2000)+SODO+WINNIE PALMER+ Additional Growth

Study Area TAZ Zones		Year 2025 Total OUATS ZDATA1				
		SF units	SF population	MF units	MF population	Hotel Rooms
731.1		0		400		125
731.2		15		200		
731.3						
732.1		70		38		0
732.2				200		
733		3		112		150
734		0		20		0
735		3		600		0
736.1		3		404		0
736.2						125
743		7		1,046		0
Total		101		3,020		400

Study Area TAZ Zones		Year 2025 Total OUATS ZDATA2					
		Industrial Emp.	Commercial Emp.	Service Emp.	Total Emp.	Industrial Sq. Feet	Commercial Sq. Feet
731.1		286	772	2,220	3,278	158,889	308,600
731.2		180	63	100	343	100,000	25,000
731.3		180	0	0	180	100,000	
732.1		189	227	1,364	1,780	105,000	90,800
732.2		0	250	400	650		100,000
733		51	159	2,372	2,582	28,333	63,400
734		32	166	19,202	19,400	17,778	66,400
735		965	447	2,905	4,317	536,111	178,800
736.1		119	241	2,369	2,729	66,111	96,400
736.2		0	50	1,200	1,250		20,000
743		146	263	2,527	2,936	81,111	105,000
Total		2,148	2,636	34,659	39,443	1,193,333	1,054,400

General Notes:

1. The 300,000 Sq. Feet of Commercial and 300 Multi Family units of SODO and 400,000 Sq. Feet of Service of Winnie Palmer were added to the Additional Development.
2. Conversion factors of 1.8, 2.5, and 4.0 per 1,000 Sq. Feet were used to convert industrial, commercial, and service gross area to number of employees, respectively and vice versa.
3. In Table 1.3:

3.1 FY 2025 is the adopted 2025 OUATS model

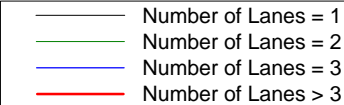
3.2 BY 2000 is the adopted 2000 OUATS model

Table A1.0.2 - Year 2025 Original ZDATA

Study Area TAZ Zones		Year 2025 Original OUATS ZDATA1				
		SF units	SF population	MF units	MF population	Hotel Rooms
731		4	9	18	32	106
732		66	187	55		0
733		7	16	15	46	100
734		8	19	26	38	76
735		8	15	24	30	0
736		7	15	4	22	0
743		30	74	589	909	42

Study Area TAZ Zones		Year 2025 Original OUATS ZDATA2					
		Industrial Emp.	Commercial Emp.	Service Emp.	Total Emp.	Industrial Sq. Feet	Commercial Sq. Feet
731		634	915	3,405	4,954	352,222	366,000
732		264	372	1,342	1,978	146,667	148,800
733		84	163	2,391	2,638	46,667	65,200
734		55	112	4,583	4,750	30,556	44,800
735		1,103	508	2,528	4,139	612,778	203,200
736		258	286	2,840	3,384	143,333	114,400
743		270	283	2,698	3,251	150,000	113,200

South Downtown Redevelopment Plan



APPENDIX B

Supporting documents for the Future Transit Services

Routes 100-112

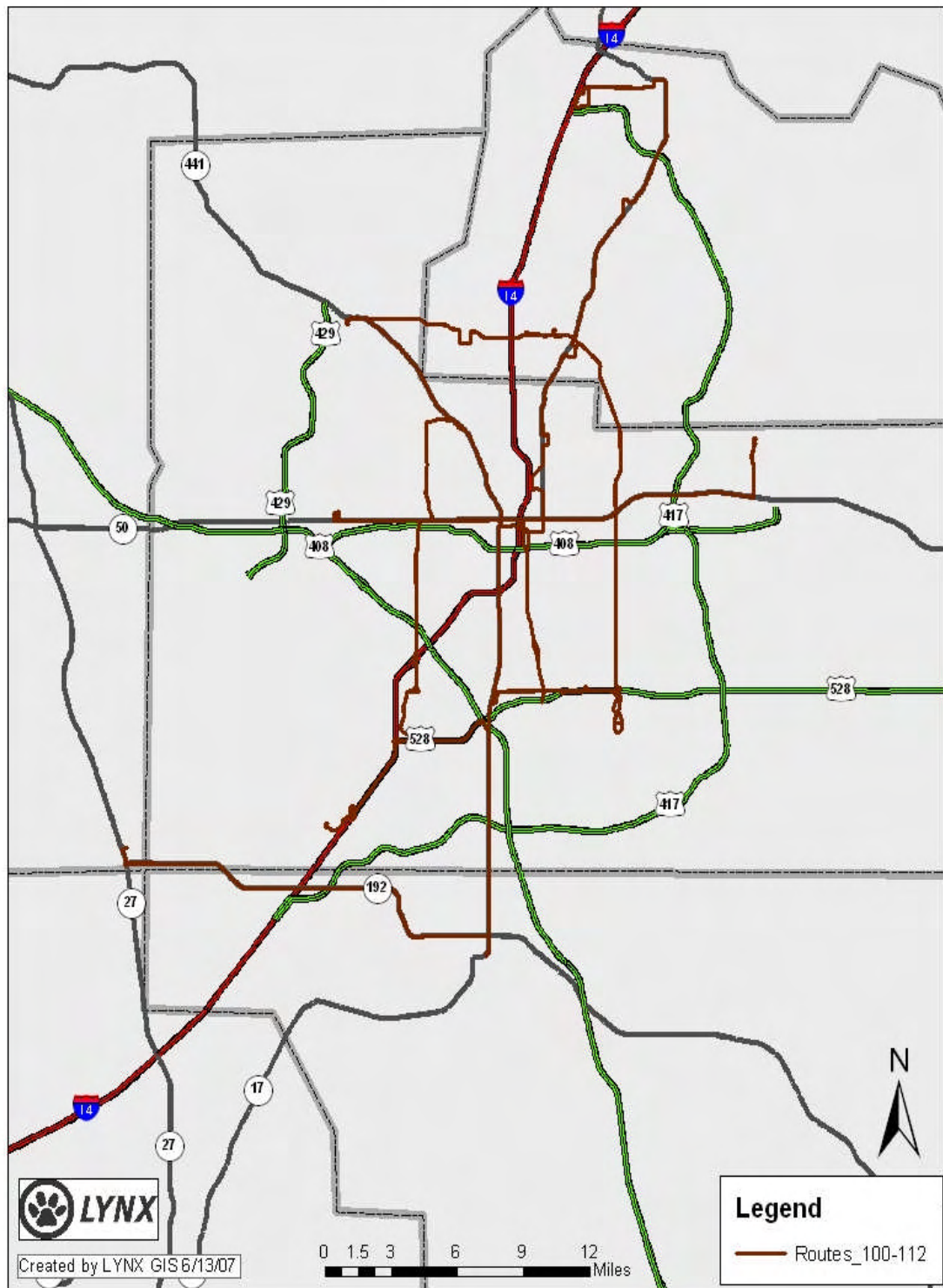


Figure 4-4 Consolidated Map of 100 Series Links
Source: LYNX GIS – 2007

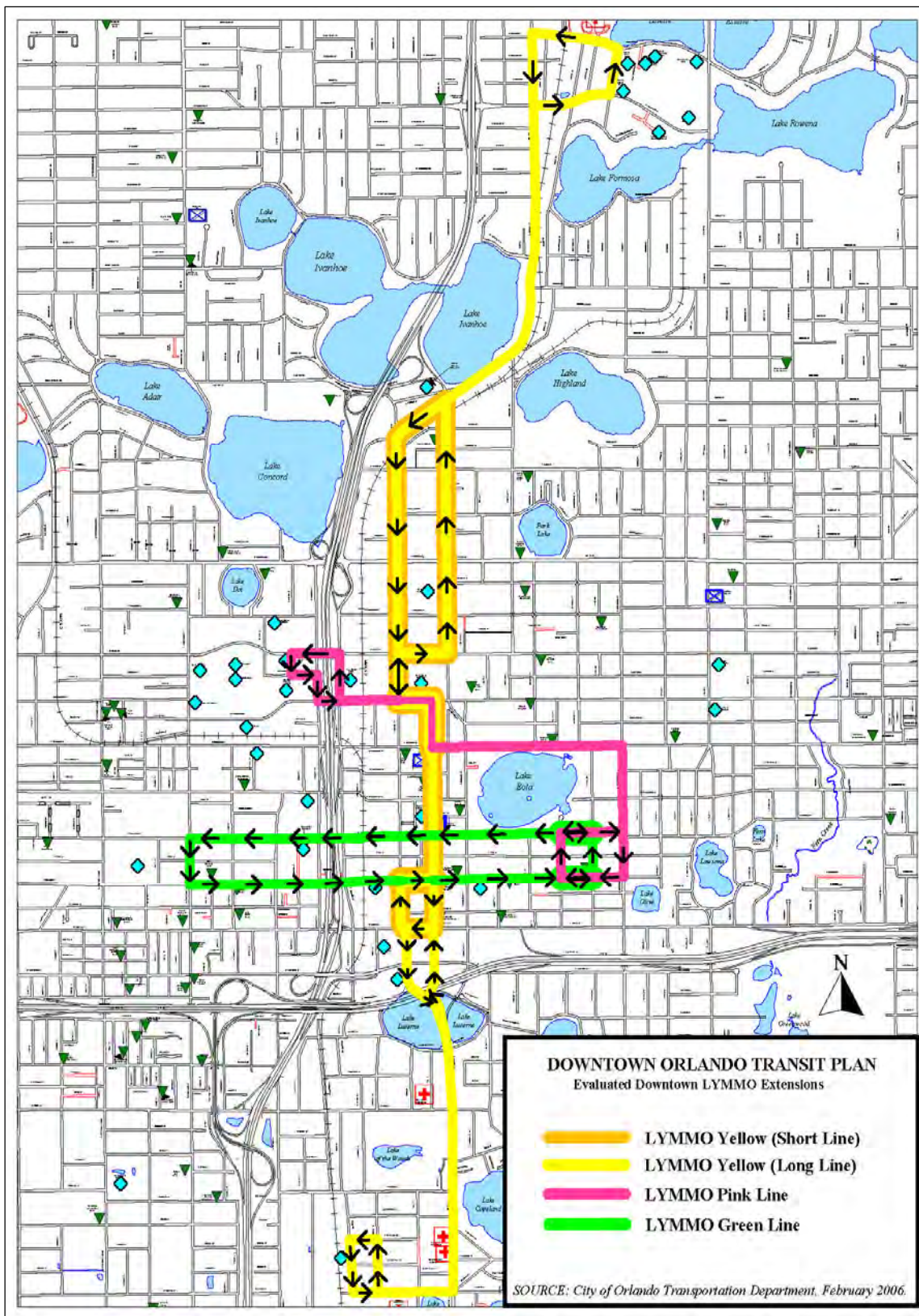


Figure 4-5 Proposed LYMMO Alignment
Source: City of Orlando Transportation Department – 2006

Routes 200-281

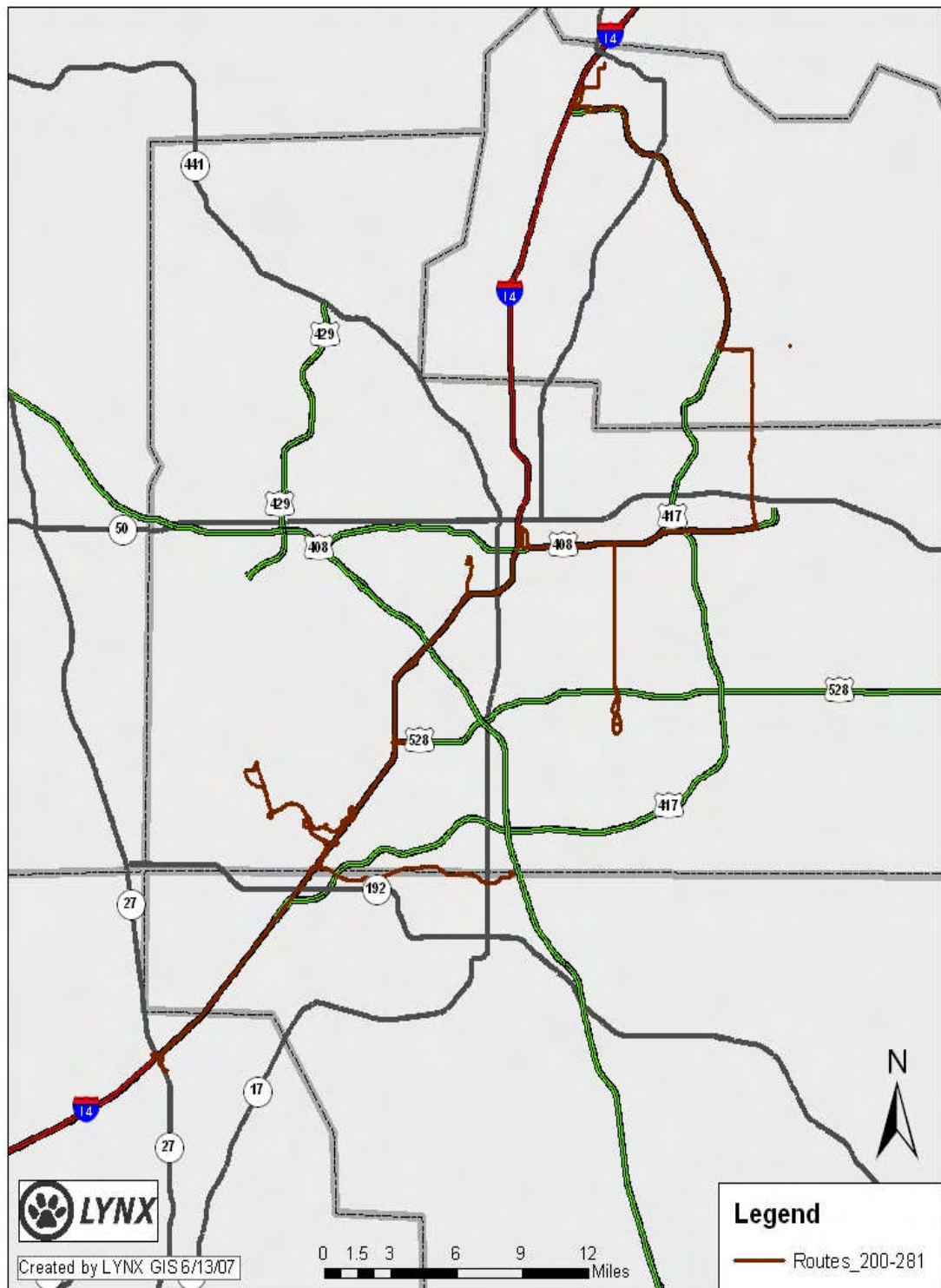


Figure 4-7 Consolidated Map of Proposed 200 Series Links
Source: LYNX GIS – 2007

Routes 300-338

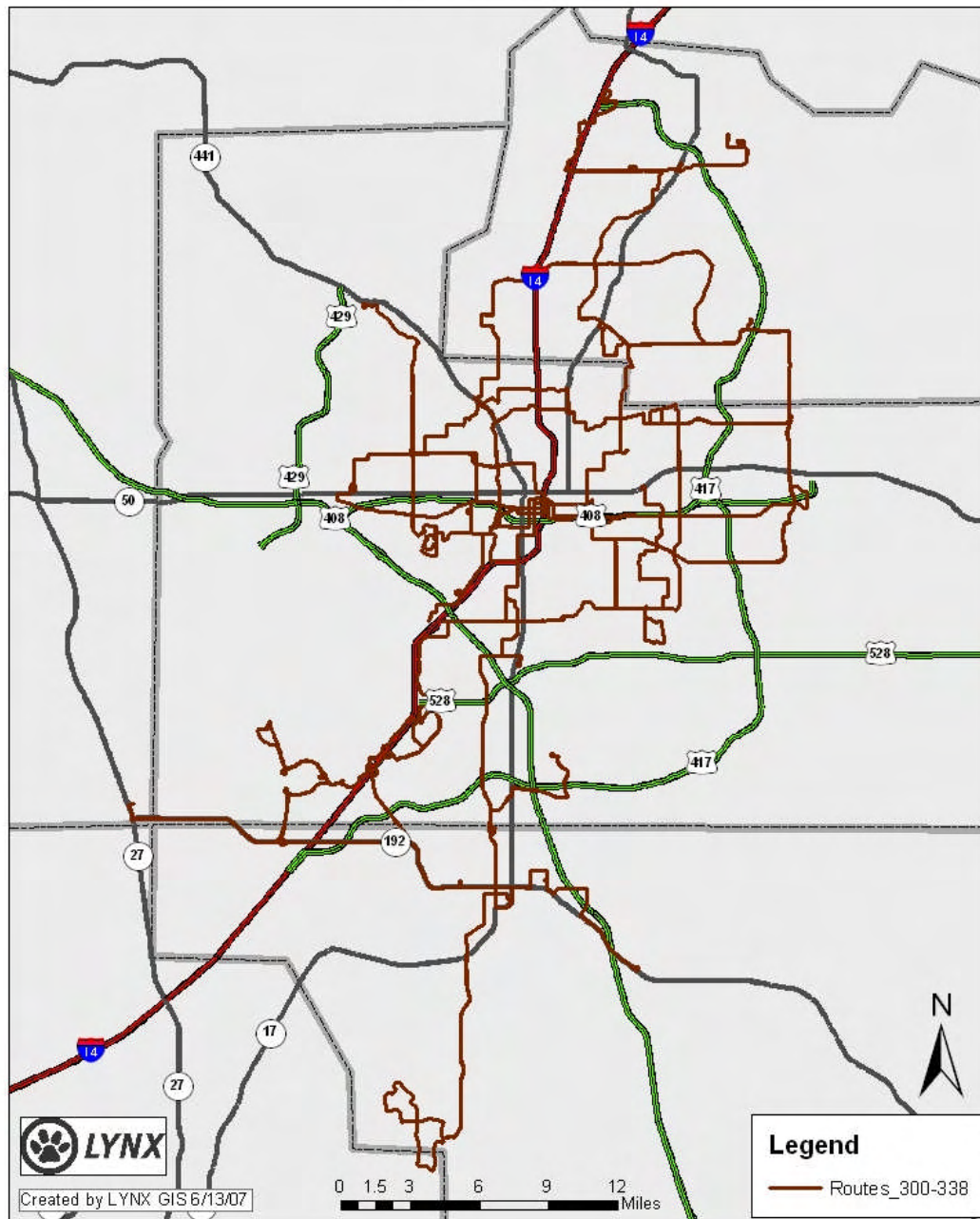


Figure 4-8 – Consolidated Map of 300 Series Links
Source: LYNX GIS – 2007

Routes 400-440

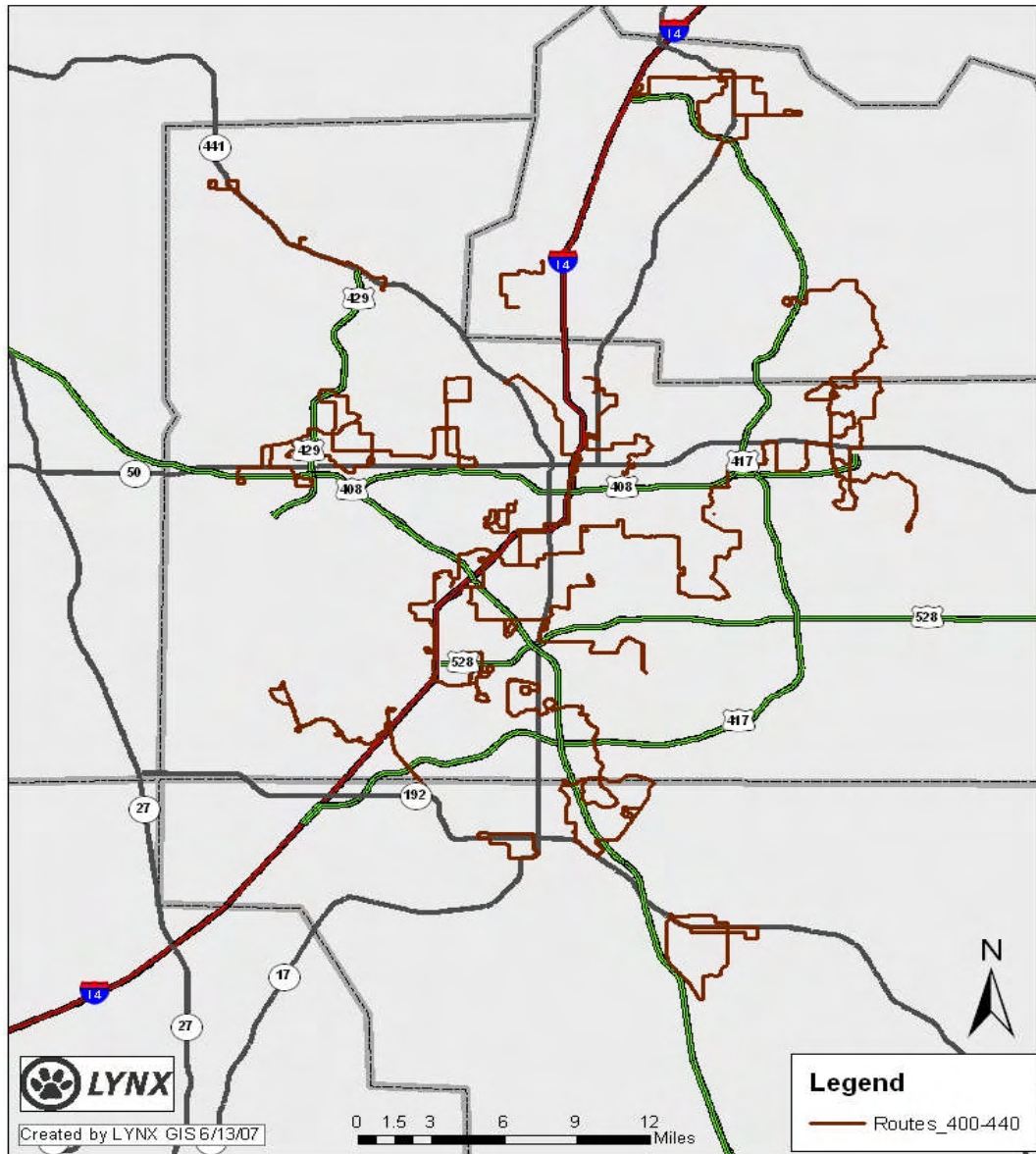


Figure 4-9 – Consolidated Map of 400 Series Links
Source: LYNX GIS – 2007

Central Florida rail-transit system

KEY: ■ Planned, no date ■ First leg, to be completed 2009 ■ Second leg, to be completed 2013 ● Stations ■ Station-stop times

Proposed stops along the planned commuter-rail route could draw transit-oriented development — a mix of compact condos and town homes, shops and businesses.

The train is supposed to speed commutes. Boarding at 6 a.m. at the DeBary stop gets you to downtown Orlando in 47 minutes; to Polk in 84 minutes.

For comparison, a *Sentinel* reporter recently drove the same route from DeBary to downtown leaving at 6 a.m. It took 26 minutes. To Polk, via South Orange Blossom Trail, 72 minutes.

But as many Central Floridians know, the commute on I-4 isn't always so easy. Leaving at 8:32 a.m., the same drive took 38 minutes to downtown and 87 minutes to Polk. That's 3 minutes slower than the commuter rail.

— Eitan Horowitz

DeLand/AMTRAK STATION

On Old New York Avenue. No development plans now because segment from DeBary to DeLand is not yet scheduled.

DeBARY/PROGRESS ENERGY LOT

Off Highbanks Road in residential neighborhood. Plans to extend Saxon Boulevard in time for line's opening in 2009. More than 600 acres of vacant land. Talks about a 'transit village' to include housing, retail and office.

SANFORD/STATE ROAD 46

Several miles from downtown. Many tracts of land for sale. Some talks about mixed-use development to include homes, shops.

LAKE MARY/DOWNTOWN

At Old Lake Mary Road and Lake Mary Boulevard. Planning area calls for housing densities of about 18 homes per acre; condo buildings with 1st-floor shops and 2nd-floor residences. City plans upscale office buildings immediately next to station.

ALTAMONTE SPRINGS/STATE ROAD 436

S.R. 436 at Ronald Reagan Boulevard. Now a mix of impound lots, dilapidated houses and businesses. Plans allow transit development. Early development interest in building mix of residential and retail with shared parking and pedestrian walkways around station.

ORLANDO/FLORIDA HOSPITAL

Inside bustling Florida Hospital complex along Rollins Street. Surrounded by medical offices and many small, older commercial buildings. Possibilities for new retail, offices and some residential.

ORLANDO/LYNX

Downtown at Garland Avenue and Livingston Street. Plans for an office complex and mix of hotel and condos nearby.

ORLANDO/AMTRAK STATION

Long-standing station near center of Orlando Regional Medical Center complex. Large retail and residential development planned just south of station.

SAND LAKE ROAD

Mostly industrial yards and fast-food joints; few undeveloped parcels. Not a walkable area conducive to residential development. Planners envision bus connections to Orlando International Airport.

OSCEOLA PARKWAY

Fast-developing stretch of retail that includes Wal-Mart, just south of Orange County line. Could attract residential building.

LONGWOOD/DOWNTOWN

Ronald Reagan Boulevard across from the city's historic district. Land-use plans already allow mixing commercial and residential. City will encourage restaurant next to station.

WINTER PARK/PARK AVENUE

Amtrak station beside Central Park. Posh restaurants and shops close by. New condos and retail planned near park.

ORLANDO/CHURCH STREET STATION

Once thriving, currently many vacancies. Condo tower planned nearby.

MEADOW WOODS

Large stretches of open area, near some newer developments, an undeveloped recreation area and Cypress Creek High School.

KISSIMMEE AMTRAK

Older station near downtown Kissimmee by many shops, restaurants. City wants transit center with Lynx buses, Greyhound, Amtrak and commuter rail. Mixed condo-retail planned nearby.

POINCIANA INDUSTRIAL PARK

Mixed area of light industrial companies and some residential development. Nearby development is short-term rentals; could change to more permanent residences.

SOURCES: Florida Department of Transportation/Central Florida Commuter Rail Transit Project, *Sentinel* research

DANA FASANO/ORLANDO SENTINEL

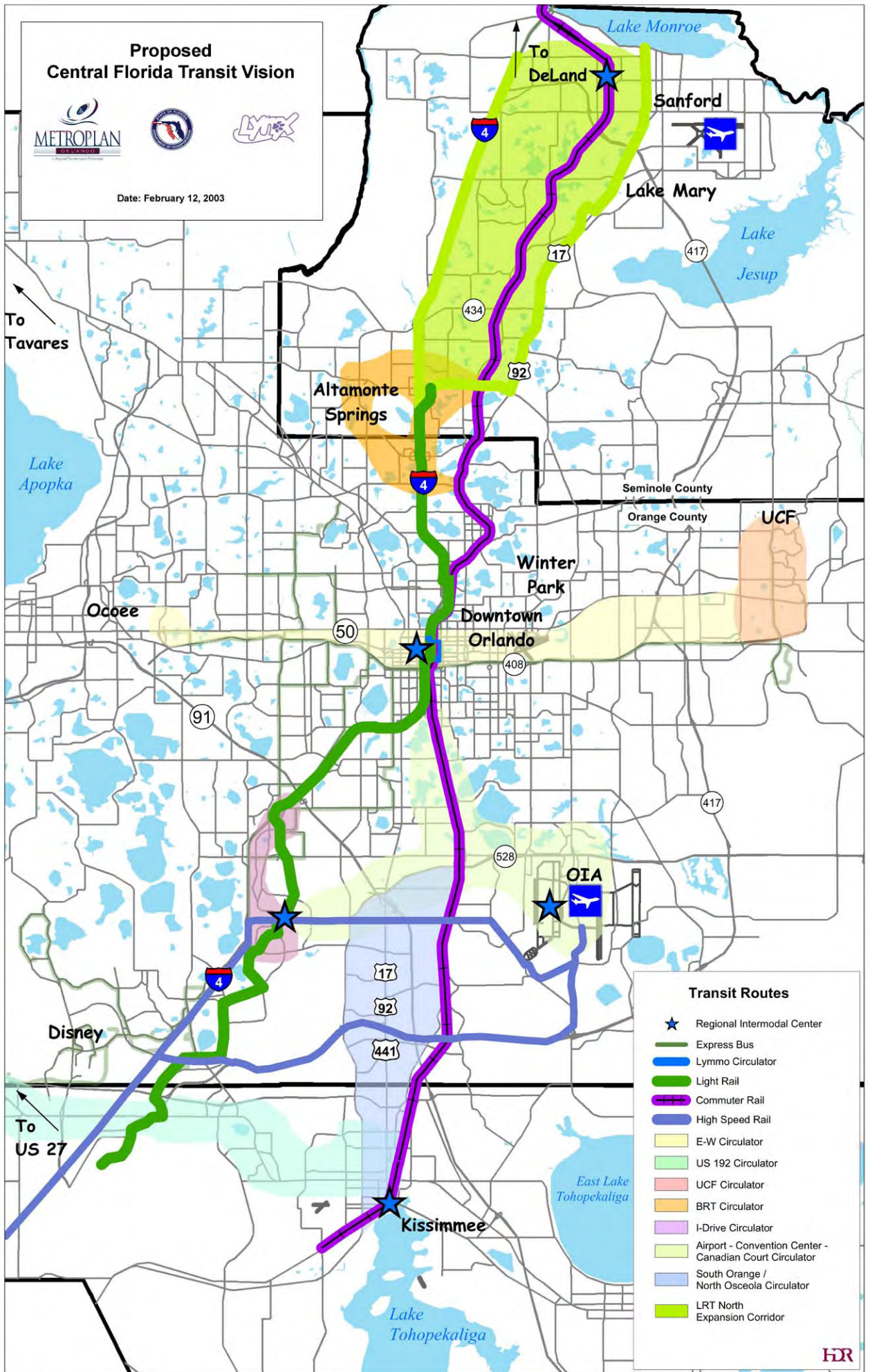
Figure 4-6 Proposed Commuter Rail Alignment

Source: Florida Department of Transportation/Central Florida Commuter Rail

Proposed Central Florida Transit Vision



Date: February 12, 2003



Transit Routes

- ★ Regional Intermodal Center
- Express Bus
- Lymmo Circulator
- Light Rail
- Commuter Rail
- High Speed Rail
- E-W Circulator
- US 192 Circulator
- UCF Circulator
- BRT Circulator
- I-Drive Circulator
- Airport - Convention Center - Canadian Court Circulator
- South Orange / North Osceola Circulator
- LRT North Expansion Corridor



PRELIMINARY COSTING EXERCISE

SOUTH DOWNTOWN REDEVELOPMENT PLAN ORLANDO, FLORIDA

A. Basis of Opinion

This analysis of cost was produced from information furnished by Joel West of Glatting Jackson Kercher Anglin and included the following:

- Memo outlining road improvements from GMB Engineers.
- Future Year Analysis Water, Wastewater & Storm water Plan, from Law & Associates
- Appendix A – Water Use Records (2004)
- Appendix B – Exhibits by Law & Associates
- Table 3 – Year 2030 Area wide Analysis for Roadways
- Existing Conditions Analysis by Law & Associates

B. Project Description

Carlsson Inc. was contracted to develop a preliminary costing exercise to assist the Owner in determining the “should cost” pricing of this project with the understanding that this project will be developed in multiple phases. This project consists of the upgrades to the existing water, wastewater, storm drainage and related roadways for the South Downtown Redevelopment Area.

C. Project Phasing

This estimate was developed using multiple construction phases.

D. Basis for Pricing

Pricing shown reflects probable costs of construction obtainable in Central Florida on the date of this statement of probable costs. This opinion is a determination of fair market value for the construction of this project. It is not a prediction of low bid.

It is understood that this project will secure firm bids within 12 months; therefore escalation of costs are not considered within this cost opinion.

General Requirements and Conditions are computed at 10% to cover all requirements for the General Contractor to include costs for on-site set up, project management, field supervision, equipment rental, field support, temporary utilities, safety, clean up and insurance. This cost does not include either minority participation differential or shift differential/premium time. General Contractor's Overhead and Profit used is 8%. Bonding is set at 2%.

Carlsson Inc. assumes that the Owner will make available an on-site lay down area; therefore, no additional monies have been added for lay down areas off-site.

Due to the preliminary nature of the information received to complete this exercise, a 15% Design/Construction Contingency has been added to the summary sheet. This contingency will also be used to cover any unforeseen conditions.

E. Items Excluded From This Estimate

Items, which are not included in this opinion, include, but are not limited to:

- Professional Fees and Testing
- Owner furnished and Owner installed items.
- Permitting or licensing fees
- Water or sewer tap fees
- Permanent utility charges
- Permanent telephone charges

F. Items Affecting the Cost Opinion

Items, which may change the estimate and construction cost, include, but are not limited to, the following:

- Modifications to the scope of work included in this opinion.
- Unforeseen conditions.
- Special phasing requirements.
- Restrictive technical specifications.

- Non-Competitive bid conditions.
- Sole source specifications of materials or products.
- Bids delayed beyond the projected schedule.
- Changes to design and systems not reflected in the information received by Carlsson Inc. after September 2, 2008

G. Statement of Probable Cost

Carlsson, Inc. has no control over the cost of labor and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This opinion of probable cost is made on the basis of experience, qualifications, and best judgment of a professional construction consultant familiar with the construction industry. Carlsson, Inc. cannot and does not guarantee that proposals, bids or actual construction costs will not vary from this or subsequent cost opinions. Carlsson, Inc. staff of professional cost consultants has prepared this opinion in accordance with generally accepted principles and practices. This staff is available to discuss its contents with any interested party.

H. Recommendations for Cost Control

Carlsson, Inc. recommends that the Owner, Architect and Engineers carefully review this document, including line item descriptions, unit prices, clarifications, exclusions, inclusions and assumptions, contingencies, escalation and markups.

Requests for modifications of any apparent errors or omissions to this document must be made to Carlsson Inc., within seven (7) days of receipt of this opinion. Otherwise, it will be understood that the contents have been concurred with and accepted.

I. General Assumptions

- Sales tax has been included in each line item for permanent materials only.
- No sole source mark ups have been included. It is assumed that the design team will specify at least two manufacturers for each building item.
- Assume hauling of materials for disposal is no more than 20 miles roundtrip.



**Water, Wastewater , Stormwater & Road Improvements
South Downtown Redevelopment Plan
Preliminary Submittal
City of Orlando, Florida**

SUMMARY

ELEMENT	Four Laning Division Ave from Kaley To Gore	Six Laning Orange Ave from Kaley to Gore	Extend and Reconstruct Atlanta Ave	Extend and Reconstruct Kuhl/Bellevue Ave
		\$ -	\$ -	\$ -
WATER	\$ 1,132,944	\$ 1,132,944	\$ 1,132,944	\$ 1,132,944
WASTEWATER	\$ 5,436,214	\$ 5,436,214	\$ 5,436,214	\$ 5,436,214
STORMWATER	\$ -	\$ -	\$ -	\$ -
ROADWAYS	\$ 3,607,147	\$ 4,766,604	\$ 6,314,963	\$ 6,314,963
Subtotal	\$ 10,176,305	\$ 11,335,761	\$ 12,884,120	\$ 12,884,120
General Requirements	\$ 1,017,630	\$ 1,133,576	\$ 1,288,412	\$ 1,288,412
Subtotal	\$ 11,193,935	\$ 12,469,338	\$ 14,172,532	\$ 14,172,532
GC OH&P (8%)	\$ 895,515	\$ 997,547	\$ 1,133,803	\$ 1,133,803
Bonds/Insurance	\$ 223,879	\$ 249,387	\$ 283,451	\$ 283,451
Subtotal	\$ 12,313,328	\$ 13,716,271	\$ 15,589,786	\$ 15,589,786
Contingency (15%)	\$ 1,846,999	\$ 2,057,441	\$ 2,338,468	\$ 2,338,468
SUBTOTAL	\$ 14,160,328	\$ 15,773,712	\$ 17,928,254	\$ 17,928,254



Description	Qty	Unit	Unit Cost	Subtotals	Division Total
WATER LINES UPGRADE (TABLE 9)					
Add 8" line on America St from Hughey to Franklin	220	LF	\$ 43.95	\$ 9,669	
Replace 2" line with 6" line on Atlanta Ave from Raleigh to Columbia	450	LF	\$ 39.80	\$ 17,910	
Replace 2" line with 8" line on Lucerne from Gore to Columbia	1200	LF	\$ 49.55	\$ 59,460	
Replace 6" line with Atlanta Ave to 8" line and more if needed	2825	LF	\$ 52.90	\$ 149,443	
Add 8" line continuing Atlanta Ave to Grant Street	2160	LF	\$ 43.95	\$ 94,932	
Replace 2" line with 6" line on Esther Street from Lucerne to Orange	1100	LF	\$ 39.80	\$ 43,780	
Add 6" line from Grant Street to Michigan	1620	LF	\$ 41.25	\$ 66,825	
Add 6" line from proposed 6" line in Zone 10 make 6" loop	3780	LF	\$ 41.25	\$ 155,925	
Misc Connections, Etc.	1	LS	\$ 75,000.00	\$ 75,000	
Patch, Resurface, Repair Roads as necessary	1	LS	\$ 250,000.00	\$ 250,000	
Excavation/Backfill	1	LS	\$ 200,000.00	\$ 200,000	
Flush and Test	1	LS	\$ 10,000.00	\$ 10,000	
TOTAL WATER				\$ 1,132,944	

Wastewater
South Downtown Redevelopment Plan



Description	Qty	Unit	Unit Cost	Subtotals	Division Total
WASTEWATER UPGRADES					Exhibit E showed ORH Improvement-not included in this project
New 8" line in southwest area	2400	LF	\$ 55.00	\$ 132,000	Proposed new roads in existing Private property
New 6" line in southwest area	5700	LF	\$ 55.00	\$ 313,500	Estimated sewer line requirements
New Lift Stations	2	EA	\$ 220,000.00	\$ 440,000	
Increase force main from 12" to 18" line	5200	LF	\$ 85.95	\$ 446,940	
New 8" FM from LS-B to exist 18" FM	4700	LF	\$ 62.00	\$ 291,400	
REPLACE OLD PIPES IN ZONE 9 AND 11 (Table 13)					
8" Line	22725	LF	\$ 55.00	\$ 1,249,875	
10" Line	7303	LF	\$ 70.00	\$ 511,210	
12" Line	2627	LF	\$ 82.00	\$ 215,414	
24" Line	2167	LF	\$ 125.00	\$ 270,875	
Misc Connections, Etc.	1	LS	\$ 450,000.00	\$ 450,000	
Patch, Resurface, Repair Roads as necessary	1	LS	\$ 700,000.00	\$ 700,000	
Excavation/Backfill	1	LS	\$ 400,000.00	\$ 400,000	
Flush and Test	1	LS	\$ 15,000.00	\$ 15,000	
TOTAL WASTEWATER UPGRADES				\$ 5,436,214	

Stormwater
South Downtown Redevelopment Plan



Description	Qty	Unit	Unit Cost	Subtotals	Division Total
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* Stormwater upgrades to be provided on a site by site basis or under a master stormwater plan (if appropriate).

TOTAL STORMWATER UPGRADES				\$	-
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Roadway Improvements
South Downtown Redevelopment Plan



Description	Qty	Unit	Unit Cost	Subtotals	Division Total
Four Laning Division Ave from Kaley To Gore					
Remove exist pavement	17323	SY	\$ 15.00	\$ 259,845	
Load/Haul Debris	1	LS	\$ 50,000.00	\$ 50,000	
Excavate/Backfill	34645	CY	\$ 25.00	\$ 866,125	
Grade	311810	SF	\$ 0.50	\$ 155,905	
Base Course	34645	SY	\$ 6.50	\$ 225,193	
Prep & Roll Sub Base	34645	SY	\$ 0.90	\$ 31,181	
Asphalt Wear Surface	34645	SY	\$ 19.00	\$ 658,255	
Asphalt Binder Course	33645	SY	\$ 22.00	\$ 740,190	
Stripping/Markings	13320	LF	\$ 2.20	\$ 29,304	
Curbs	8880	LF	\$ 25.00	\$ 222,000	
Sidewalks	5940	SY	\$ 50.00	\$ 297,000	
Landscaping (Sod, etc.) Allowance	1	LS	\$ 72,150.00	\$ 72,150	
TOTAL FOUR LANE DIVISION				\$ 3,607,147	
Six Laning Orange Ave from Kaley to Gore					
Remove exist pavement	23386	SY	\$ 15.00	\$ 350,790	
Load/Haul Debris	1	LS	\$ 66,500.00	\$ 66,500	
Excavate/Backfill	46078	CY	\$ 25.00	\$ 1,151,950	
Grade	414707	SF	\$ 0.50	\$ 207,354	
Base Course	46078	SY	\$ 6.50	\$ 299,507	
Prep & Roll Sub Base	46078	SY	\$ 0.90	\$ 41,470	
Asphalt Wear Surface	46078	SY	\$ 19.00	\$ 875,482	
Asphalt Binder Course	46078	SY	\$ 22.00	\$ 1,013,716	
Stripping/Markings	17716	LF	\$ 2.20	\$ 38,975	
Curbs	11810	LF	\$ 25.00	\$ 295,250	
Sidewalks	6593	SY	\$ 50.00	\$ 329,650	
Landscaping (Sod, etc.) Allowance	1	LS	\$ 95,960.00	\$ 95,960	
TOTAL SIX LANE ORANGE				\$ 4,766,604	

Roadway Improvements
South Downtown Redevelopment Plan

Description	Qty	Unit	Unit Cost	Subtotals	Division Total
Extend and Reconstruct Atlanta Ave					
Remove exist pavement	23560	SY	\$ 15.00	\$ 353,400	
Load/Haul Debris	1	LS	\$ 90,000.00	\$ 90,000	
Excavate/Backfill	62205	CY	\$ 25.00	\$ 1,555,125	
Grade	559855	SF	\$ 0.50	\$ 279,928	
Base Course	62205	SY	\$ 6.50	\$ 404,333	
Prep & Roll Sub Base	62205	SY	\$ 0.90	\$ 55,985	
Asphalt Wear Surface	62205	SY	\$ 19.00	\$ 1,181,895	
Asphalt Binder Course	62205	SY	\$ 22.00	\$ 1,368,510	
Stripping/Markings	23917	LF	\$ 2.20	\$ 52,617	
Curbs	15945	LF	\$ 25.00	\$ 398,625	
Sidewalks	8900	SY	\$ 50.00	\$ 445,000	
Landscaping (Sod, etc.) Allowance	1	LS	\$ 129,546.00	\$ 129,546	
EXTEND ATLANTA AVE				\$ 6,314,963	
Extend and Reconstruct Kuhl/Bellvue Ave					
Remove exist pavement	23560	SY	\$ 15.00	\$ 353,400	
Load/Haul Debris	1	LS	\$ 90,000.00	\$ 90,000	
Excavate/Backfill	62205	CY	\$ 25.00	\$ 1,555,125	
Grade	559855	SF	\$ 0.50	\$ 279,928	
Base Course	62205	SY	\$ 6.50	\$ 404,333	
Prep & Roll Sub Base	62205	SY	\$ 0.90	\$ 55,985	
Asphalt Wear Surface	62205	SY	\$ 19.00	\$ 1,181,895	
Asphalt Binder Course	62205	SY	\$ 22.00	\$ 1,368,510	
Stripping/Markings	23917	LF	\$ 2.20	\$ 52,617	
Curbs	15945	LF	\$ 25.00	\$ 398,625	
Sidewalks	8900	SY	\$ 50.00	\$ 445,000	
Landscaping (Sod, etc.) Allowance	1	LS	\$ 129,546.00	\$ 129,546	
EXTEND KUHL/BELLVUE				\$ 6,314,963	
/				\$ 21,003,677	