FINAL REPORT
DECEMBER 2009

DOWNTOWN MOBILITY STUDY

SUBMITTED TO:
CITIES OF BRADENTON
AND PALMETTO

SUBMITTED BY:
RENAISSANCE PLANNING GROUP

DOWNTOWN MOBILITY STUDY

December 2009

Cities of Bradenton and Palmetto

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Funding Support Provided by the Florida Department of Transportation and the Sarasota/Manatee Metropolitan Planning Organization

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION

In a way unlike any since the boom years of the 1920s, the rules truly have changed. Florida and its communities are facing a series of challenges that threaten the state's long-term fiscal health, its livability and its very character. With boom-burbs gone bust and empty storefronts lining many suburban commercial corridors, there is a heightened interest in quality redevelopment, infill and mobility strategies that strengthen the economic vitality of Florida's cities. This push comes from several sources, including rising fuel costs and a greater interest in developing alternative forms of transportation, a national and statewide emphasis to reduce greenhouse gas emissions linked to climate change, and concerns about long-term energy sustainability.

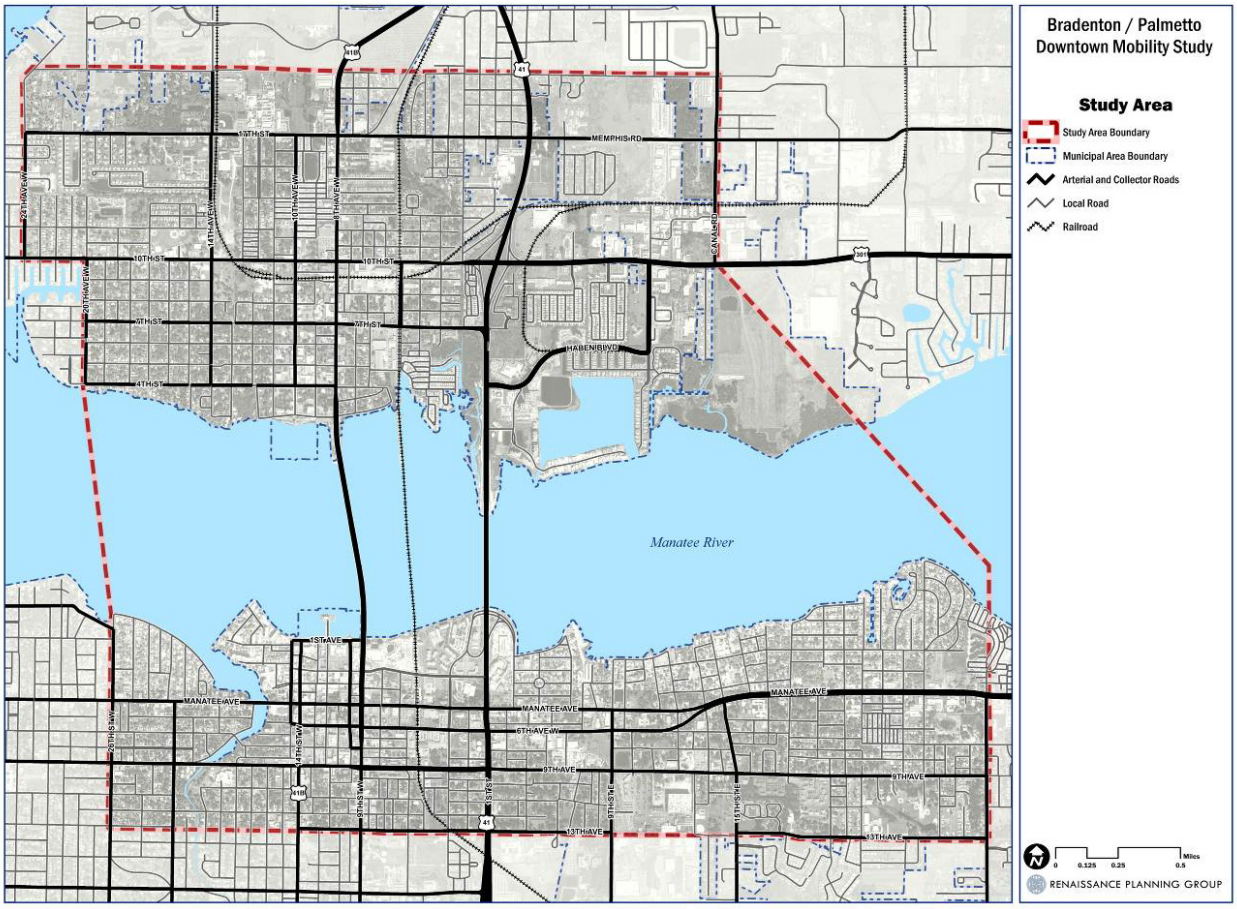
Perhaps most significantly, the Florida Legislature acted in 2008 to change the rules concerning transportation concurrency to encourage development within the state's urban centers. With the passage of SB 360, the Legislature expressed its interest in shifting statewide policy from conventional growth management based on roadway levels of service to create transportation concurrency exception areas in Florida's dense urban areas. Based on criteria set by the new law, the cities of Bradenton and Palmetto are now exempt from state-mandated concurrency to achieve and maintain roadway level of service standards. Instead, the communities must create and define funding strategies for a mobility plan that addresses development of alternatives to single-occupant vehicle travel. This is a major change in the rules that supports redevelopment and mobility goals for both Bradenton and Palmetto.

Cities largely remain the state's economic engines, serving as hubs for business, government, health care, culture and entertainment. With the state's population and revenues in decline, cities provide the regional access and concentration of resources that draw jobs, people and the services they need. Their effectiveness at generating economic activity requires thoughtful attention and careful planning to achieve the proper urban form and enhanced multimodal mobility and access necessary to benefit the community and region.

STUDY GOALS AND CONTEXT

The Bradenton/Palmetto Downtown Mobility Study represents a two-year effort to imagine, analyze, plan and build consensus for viable mobility strategies that effectively serve the regional and local travel needs in the downtown areas of both cities. Figure ES-1 identifies the study area, which generally focuses on the downtown areas of both Palmetto and Bradenton, including adjacent neighborhoods. The goal of the study is to define a long-term vision and strategic blueprint for mobility that supports the redevelopment and revitalization goals of both cities to make their downtown areas inviting, attractive and economically sustainable destinations that benefit the entire community and region. Both communities have completed redevelopment plans for their downtown and waterfront areas. Thus, the outcome of this extensive planning process is a practical, cost efficient plan that provides a balanced set of recommendations intended improve livability, personal mobility and access, while also serving regional and through traffic needs.

FIGURE ES – 1: STUDY AREA



The creation of the Tampa Bay Area Regional Transportation Authority (TBARTA) and its adopted Regional Multimodal Master Plan has major implications for Palmetto and Bradenton. TBARTA has given new impetus to various forms of regional transportation, particularly inter-county passenger rail, Bus Rapid Transit and express bus connections, which include both Palmetto and Bradenton as important anchors of this regional network.

The study evaluates near- and long-term transportation improvement options, including the feasibility of recommendations to convert the one-way streets of Manatee Avenue and 6th Avenue into two-way streets, as well as a possible series of street connections to enhance circulation, the placement of roundabouts, improved access for existing and future transit service, and ensuring continued truck access for deliveries. Transit enhancements, bicycle and pedestrian connectivity, and parking availability are essential to an effective downtown mobility plan.

At the outset, the study sought to define a balanced traffic circulation and mobility plan in support of the economic vitality and enhanced livability of the downtown area, while also maintaining traffic flow and improving safety. This entailed creation of a phased implementation program for transportation projects tied to development and traffic growth in the area. Recommendations include an implementation action plan that identifies capital project priorities, funding strategies and policy changes to improve downtown mobility and access in both communities. The study

entails a blend of technical analysis with focused public participation activities to create a mobility improvement plan that reflects consensus on strategies and priorities for each local government. Because of the complexity and competing demands of the downtown transportation network, a primary objective of the study entailed substantial efforts to achieve acceptance by the Florida Department of Transportation as well as other stakeholders in the community.

PROJECT PARTNERS

The Sarasota/Manatee Metropolitan Planning Organization (MPO) allocated funding for the Bradenton/Palmetto Downtown Mobility Study through its Congestion Management Process, and the Florida Department of Transportation provided the funds to conduct the study. The City of Bradenton provided the contractual and administrative oversight of the consulting contract, with Bradenton and the City of Palmetto serving as joint project managers for the completion of the study. Other agency study partners have included Manatee County Government, the Bradenton Downtown Development Authority (DDA) and the Central Community Redevelopment Agency.

With funds coming from the MPO's Congestion Management Process, the study established a horizon year of 2013 to focus on near-term, low cost projects that could improve mobility and relieve congestion. A longer term vision helped provide the framework for these strategies.

RECOMMENDED MOBILITY PLAN

Figure ES-2 presents the recommended short- and long-term strategies for the Downtown Mobility Study. Tables ES-1and 2 shows the breakdown of these projects into short, intermediate and long-term horizons, with planning-level costs developed for each. The Plan first established a long-term regional vision for transportation serving the downtown area, with short-term projects through the 2013 analysis year designed to make substantial progress toward achieving the study goals. With more than $60 million in recommended transportation improvements, the study recommends starting small with projects that can be achieved in a financially feasible way over the next several years.

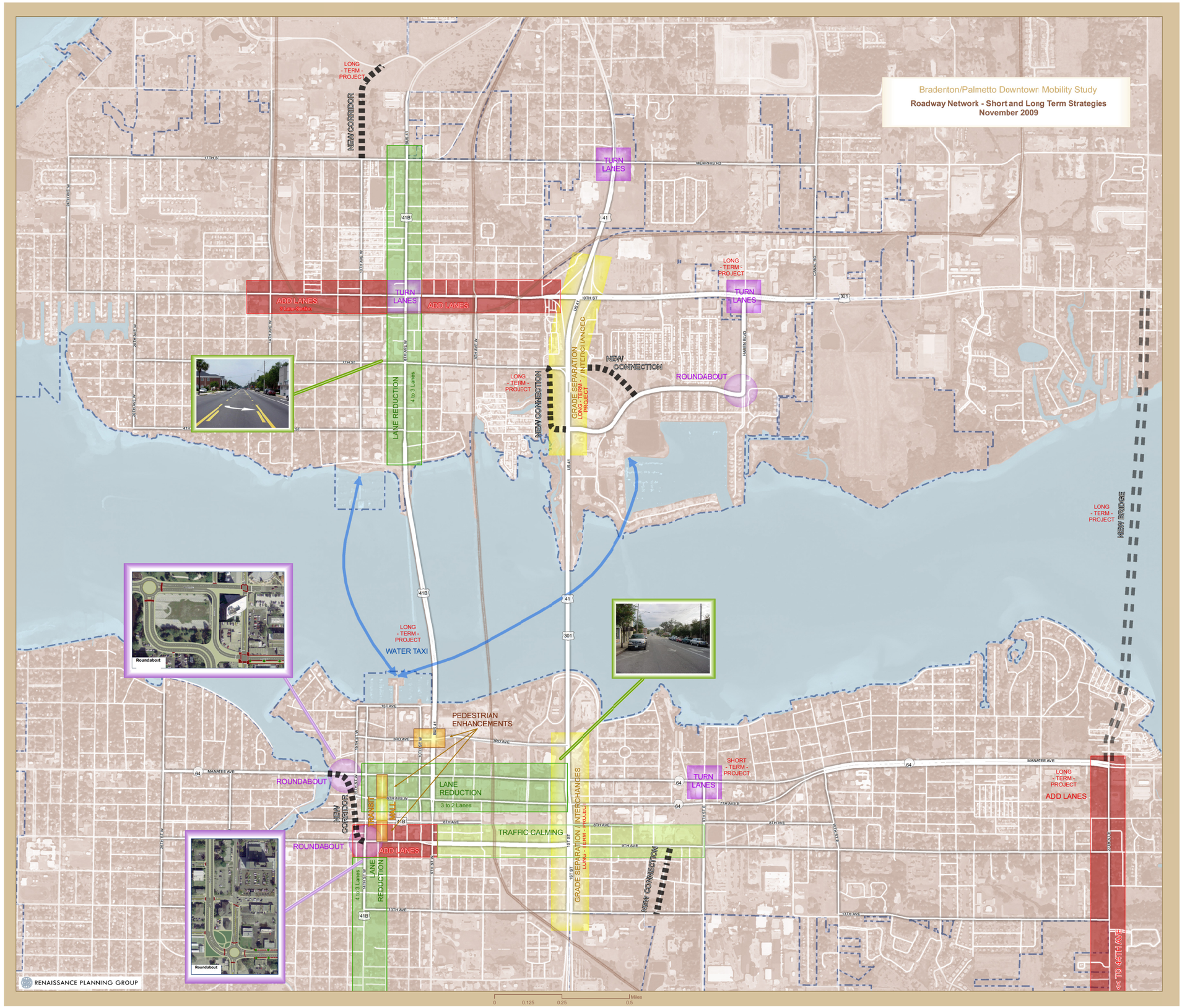

Braderton/Palmetto Downtowr Mobility Study
Roadway Network - Short and Long Term Strategies
November 2009
LONG - TERM - PROJECT
NEW CORRIDOR
TURN LANES
ADD LANES
ADD LANES
TURN LANES
LANE REDUCTION
4 to 3 Lanes
NEW CONNECTION
GRADE SEPARATION / INTERCHANGES
LONG - TERM - PROJECT
NEW CONNECTION
ROUNDABOUT
LONG - TERM - PROJECT
TURN LANES
LONG - TERM - PROJECT
NEW BRIDGE
LONG - TERM - PROJECT
WATER TAXI
PEDESTRIAN ENHANCEMENTS
ROUNDABOUT
ROUNDABOUT
NEW CORRIDOR
TRANSIT MALL
LANE REDUCTION
4 to 3 Lanes
ADD LANES
LANE REDUCTION
3 to 2 Lanes
TRAFFIC CALMING
GRADE SEPARATION / INTERCHANGES
LONG - TERM - PROJECT
NEW CONNECTION
SHORT - TERM - PROJECT
TURN LANES
LONG - TERM - PROJECT
ADD LANES
TO 49TH AVE
Roundabout
Roundabout
RENAISSANCE PLANNING GROUP
Miles

Figure ES-2

TABLE ES – 1 SHORT AND MID-TERM PROJECT COSTS

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
SHORT-TERM	2nd Street East	Riverfront Blvd	Manatee Ave	Enhance pedestrian facilities	Bradenton	Bradenton	$170,000
	9th (MLK Jr.) Avenue	9th St W	9th St E	Reduce outside lane widths, add on-street parking, and enhance pedestrian facilities	Bradenton	Bradenton	$1,240,000
	6th St Ct E	11th Ave E	13th Ave E	Construct 2 lane undivided road	Bradenton	Bradenton	$810,000
	Manatee Avenue	26th St W	15th St W	Add bicycle lane signage and pavement markings	Bradenton	FDOT	$10,000
	Manatee Avenue and 9th Street E			Add left turn lane westbound	Bradenton	FDOT	$330,000
	9th St E	Manatee Ave	US Hwy 301	Add bicycle lane signage and pavement markings	Bradenton	FDOT/Bradenton	$10,000
	River Ride	9th St W	1st St (US 41)	Add multi-use trail adjacent to Riverwalk	Bradenton	Bradenton	$100,000
	9th St W and 3rd Ave			Enhance pedestrian facilities	Bradenton	Bradenton	$30,000
	Green Bridge Trail	Bradenton	Palmetto	Add multi-use trail	Bradenton	FDOT	$550,000
	13th Street Transit Station	6th Ave	8th Ave	Transit station transfer facility	Bradenton	MCAT	$2,040,000
	10th Street	15th Ave W	8th Ave W	Add continuous center turn lane	Palmetto	Palmetto	$2,210,000
	10th Street	8th Ave W	5th Ave W	Add one eastbound lane, bicycle lanes, add signage, and pavement markings	Palmetto	FDOT	$1,620,000
	10th Street	24th Ave W	8th Ave W	Fill bicycle lane gaps, add signage, and pavement markings	Palmetto	Palmetto	$520,000
	4th Street and 20th Avenue	8th Ave W	10th St W	Add share the road signage, and pavement markings	Palmetto	Palmetto	$10,000
	Manatee Avenue and 15th St W			Intersection improvements	Bradenton	FDOT	$170,000
	Haben Blvd and Rivera Dunes			Roundabout	Palmetto	Palmetto	$370,000
	Willow-Ellenton Trail	10th St W	Canal Rd	Add multi-use trail within railroad ROW	Palmetto	Palmetto	$930,000
	Short-term total						**$11,120,000**

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
MID-TERM	Manatee Avenue	15th St W	9th St W	Modify continuous left turn lane into a series of left turn lanes with curb extensions to prevent through movement, maintain two through lanes, and enhance pedestrian facilities.	Bradenton	FDOT	$2,320,000
	6th Avenue	15th St W	9th St W	Reduce from 3 lane to 2 lane, enhance pedestrian facilities, and add multi-use path	Bradenton	FDOT	$2,350,000
	14th Street West	8th Ave	26th Ave	Reduce from 4 lane undivided to 3 lane with center turn lane, enhance pedestrian facilities, and add multi-use path	Bradenton	FDOT	$8,100,000
	9th (MLK Jr.) Avenue	15th St W	9th St W	Widen from 3 lane undivided to 4 lane divided with enhance pedestrian facilities	Bradenton	Bradenton	$2,110,000
	15th Street West	Manatee Ave	9th Ave	Widen from 2 lane undivided to 4 lane divided with enhance pedestrian facilities	Bradenton	Bradenton	$2,610,000
	Manatee Avenue	15th St E	27th St E	Reduce outside lane widths and add bicycle lanes	Bradenton	FDOT	$880,000
	Rails with Trails	Riverwalk	13th Ave	Add multi-use trail within the railroad ROW	Bradenton	Bradenton	$990,000
	Manatee Ave Roundabout	Manatee Ave	15th St W	Roundabout	Bradenton	FDOT	$1,190,000
	9th Ave Roundabout	15th St W	9th Ave	Roundabout	Bradenton	FDOT	$570,000
	Bradenton Circulator			Capital cost and 5 year operating cost to provide downtown transit circulator	Bradenton	MCAT	$6,640,000
	US Hwy 41 and 17th Street			Add right turn lanes northbound and southbound and left turn lanes eastbound and westbound	Palmetto	FDOT/County	$760,000
	US Hwy 301 and Haben Blvd			Reconstruct northbound right turn to channelized with merge	Palmetto	FDOT	$330,000
	Haben Blvd and 10th Street E (US Hwy 301)			Reconstruct northbound right turn	Palmetto	Palmetto	$330,000

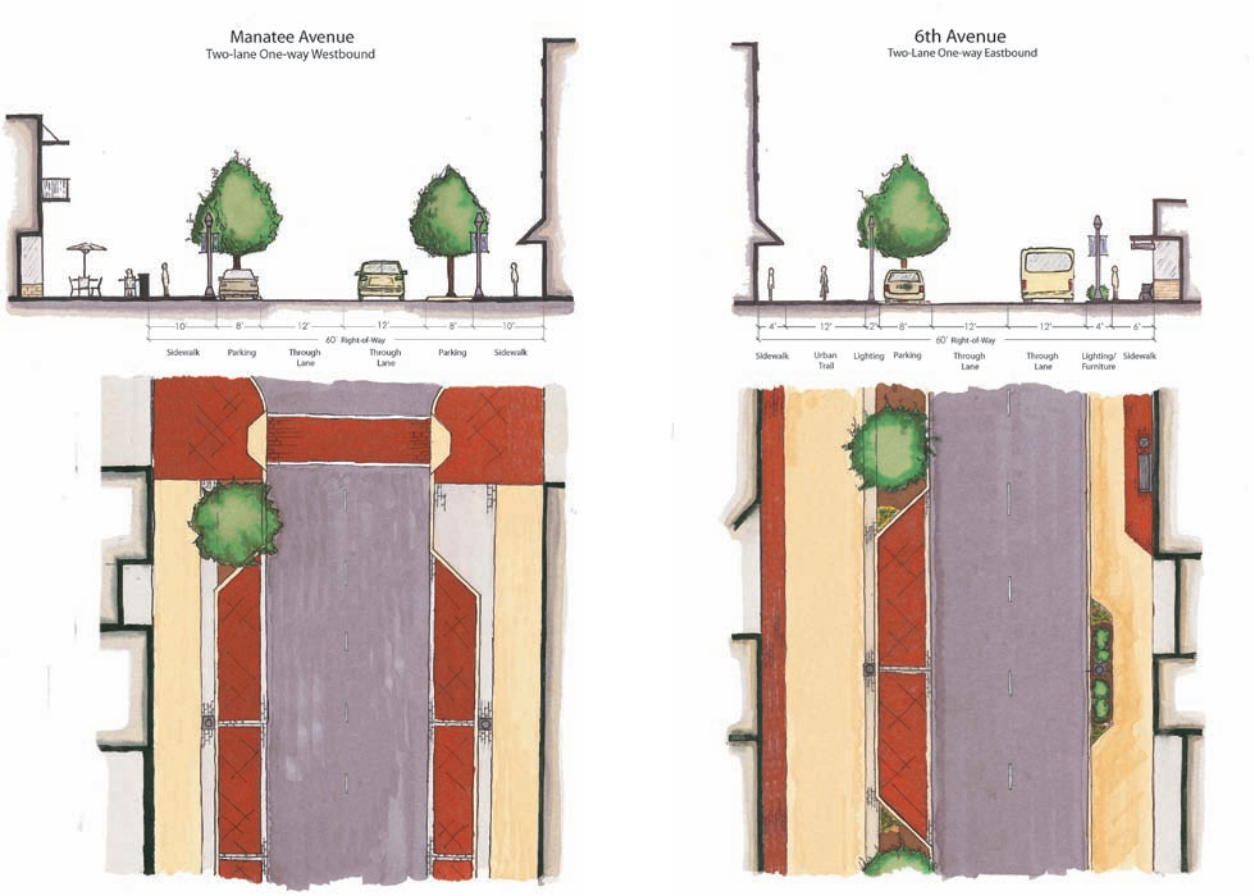
	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
	8th Avenue West (Bus 41)	17th St	Green Bridge	Reduce from 4 lane undivided to 3 lane with center turn lane, bicycle lanes, and enhanced pedestrian facilities	Palmetto	FDOT	$9,060,000
	8th Avenue W and 10th St W			Add left turn lane westbound and right turn lane northbound	Palmetto	FDOT	$810,000
	7th St Connection	Haben Blvd	7th St W	Construct 2 lane undivided	Palmetto	Palmetto	$3,110,000
	10th Avenue W	17th St	Terra Ceia Bay Blvd	Construct 2 lane undivided	Palmetto	Palmetto	$3,060,000
	14th Street Trail	10th St W	Blackstone Park	Add multi-use trail within road ROW	Palmetto	Palmetto	$530,000
	Downtown Palmetto Trail	Green Bridge	10th St W	Add multi-use trail	Palmetto	Palmetto	$1,090,000
	Palmetto Downtown Circulator			Capital cost and 5 year operating cost to increase service on MCAT Route13	Palmetto	MCAT	$6,290,000
	Mid-term Total						**$53,130,000**
	GRAND TOTAL						**$64,250,000**

TABLE ES – 2 LONG TERM PROJECTS AND ESTIMATED COSTS

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
LONG	**Option 1**						
	US 41/301 Interchanges	9th Ave	Manatee Ave	Interchange Series	Bradenton	FDOT	$150,000,000
	Option 2						
	New Bridge	US Hwy 301	Manatee Ave	New 4 lane bridge	Bradenton/ Palmetto	FDOT	$150,000,000
	27th Street East	New Bridge	US Hwy 301	Widen from 2 lane undivided to 4 lane divided	Bradenton	FDOT	$14,720,000

There are three "signature" projects in the short-term recommendations. First is the relatively minimal road diet or lane reduction on Manatee Avenue and 6th Avenue through downtown Bradenton, as shown in Figure ES-3. This improves pedestrian accessibility, helps to overcome a major barrier between the downtown core and adjacent commercial and residential areas to better unify downtown, and, with strategic improvements to MLK, Jr. Avenue and other surrounding locations, maintains traffic flow for non-local traffic. Two roundabouts at Manatee Avenue and 15th Street, and MLK, Jr. Avenue and 14th Street support this recommendation in the mid-term horizon, but are not essential to the proposed modification of Manatee and 6th Avenues. The study recommends a short-term trial of the lane reduction using traffic cones prior to actual construction.

FIGURE ES – 3: MANATEE & 6YH CONCEPTUAL DESIGNS



The second signature project is the modification of the Green Bridge/Tamiami Trail to enhance the multimodal environment for this designated Scenic Highway. By relocating the existing barrier and other minor modifications to create a 10' multi-use path as shown in Figure ES-4, the Green Bridge can become the backbone of an outstanding bicycle and pedestrian network serving the two cities. This is a very low cost medication with the potential to increase use of non-auto modes for transportation purposes and draw many visitors to help market the downtown area.

FIGURE ES – 4: RECOMMENDED GREEN BRIDGE DESIGN MODIFICATION

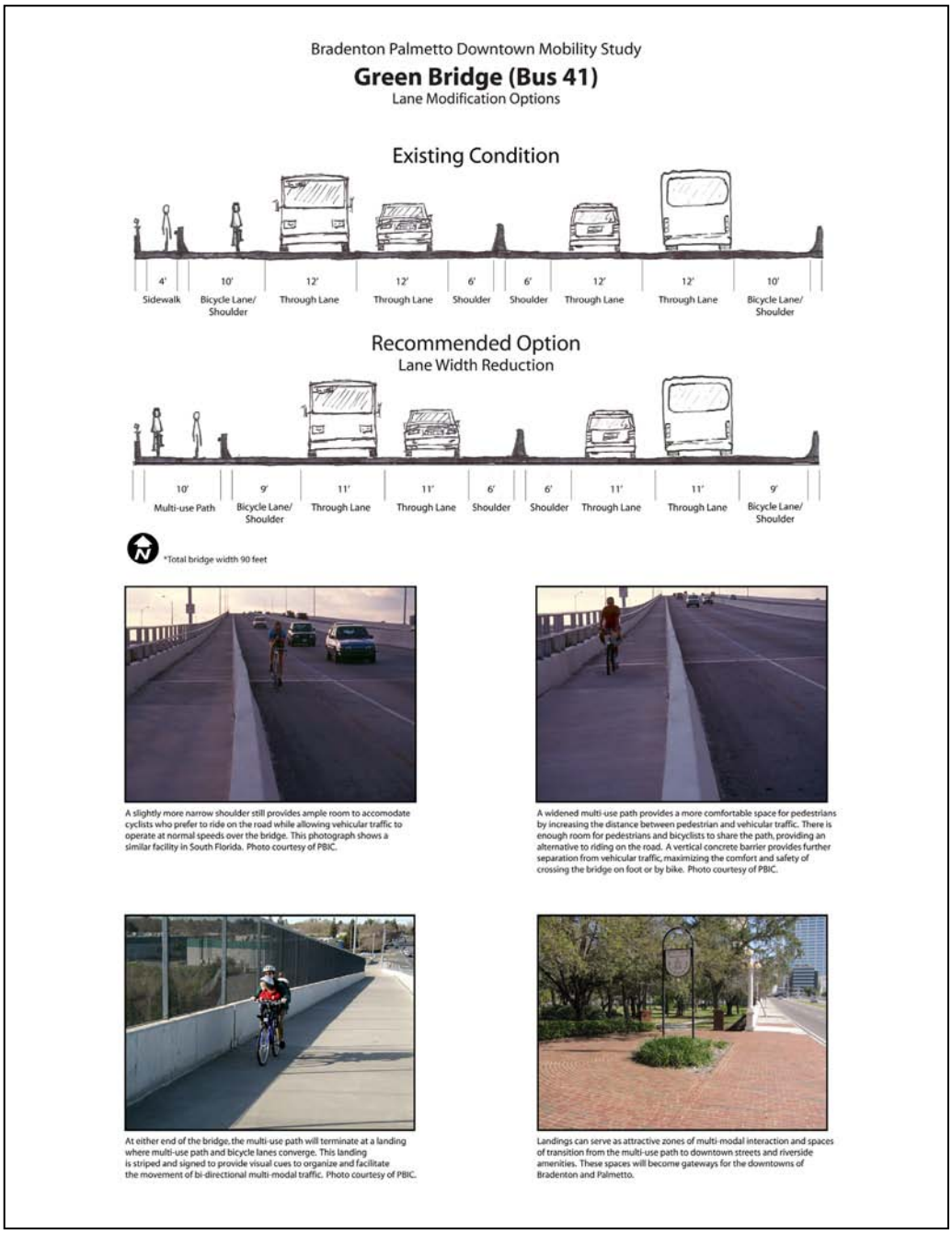
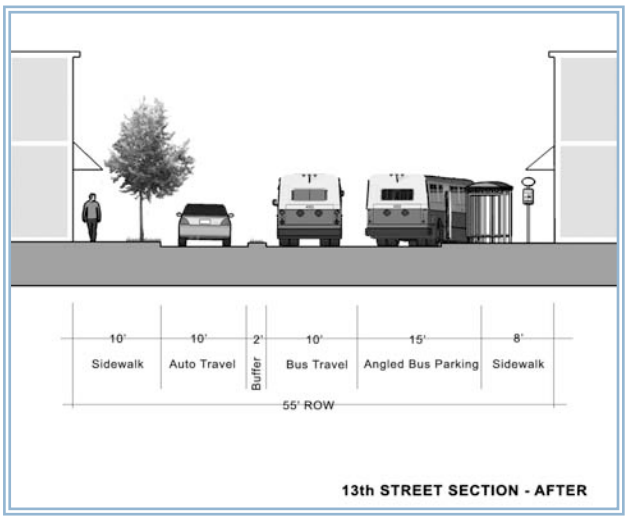


FIGURE ES – 5: DESIGN CONCEPT FOR THE 13TH STREET TRANSIT MALL



The third major project is the construction of a Transit Mall for Manatee County Area Transit on 13th Street West in downtown Bradenton. Funded with a federal grant, the project entails conversion of the existing roadway to allow both waiting buses and cars to share the road with a much-enhanced pedestrian environment that improves north-south connectivity. As identified in Figure ES-5, this provides a dedicated transit staging / transfer area that is controlled and policed by MCAT. A downtown transit circulator route would provide improved transit connectivity between local origins and destinations to this transfer point. In the longer term, Bus Rapid Transit linkages to Sarasota and express bus or even passenger rail service to Tampa and St. Petersburg will help anchor Palmetto and Bradenton as highly accessible and economically vital destinations.

A key interim step for longer-term strategies includes conducting a Project Development and Environmental (PD&E) Study to fully evaluate the potential grade separation of US 41/301 at Haben Boulevard, as well as alternative ways to improve connectivity and access in this area. This should be examined as a key element of the "Regional US 41" concept to improve north-south traffic flow in the study area. The long-term alternative to the Regional 41 concept is to construct a third bridge across the Manatee River. This new bridge found much support from key stakeholders during the course of the Downtown Mobility Study.

Finally, because the Downtown Mobility Study is a multi-year, multi-phase effort, establishing benchmarks and targets is an effective way to measure progress toward plan implementation and keep the study fresh. The study recommends that the cities initiate a monitoring program in partnership with the Sarasota/Manatee MPO and Florida Department of Transportation to document progress toward achieving the mobility goals outlined in this study. A monitoring report would fit within the MPO's established Congestion Management Process, and should include three main categories: 1) Local Government Mobility Strategy Actions, 2) Land Development Activity, and 3) Transportation Characteristics, Trends and Patterns, consistent with performance measures used in this study.

KEY SUPPORTING FINDINGS

Origin-Destination Study

A key data collection effort entailed an identification of how many travelers in the study area were making a local stop or merely traveling through to reach a destination elsewhere. The results were surprising. From a license plate survey conducted in the spring of 2008 at the study area's main entry and exit points, about one-third (35 percent) of traffic on the major roadways was traveling through without a destination stop in the two downtowns. Of perhaps even greater interest, only about 11 percent of traffic on SR 64 (Manatee Avenue and 6th Avenue) from the eastbound or westbound directions travels through the study area. The origin-destination study revealed possible ways to redirect non-local traffic to use other corridors, such as 9th Street East in Bradenton, and also provided information supporting multimodal transportation and parking strategies to make local travel more efficient.

Traffic Conditions

Traffic volumes have remained relatively flat on downtown area roadways over the last decade, despite the growth boom in Manatee County of the early to mid- 2000s. The outcomes of this recommended plan result in improved mobility and access for the downtown areas without sacrificing the mobility of through travelers and regional needs. Even with the lane reductions on Manatee Avenue and 6th Avenue, average delay changes by only 15 seconds and the peak congestion period lasts less than an hour with 2013 traffic, which is only a minor increase from current conditions. While the bridges and access points on either side of the river experience congestion today, the sections of Manatee Avenue and 6th Avenue in the downtown core of Bradenton are not congested today. Using current traffic levels, the duration of congestion with the lane reduction and projected growth through 2013 would be less than 15 minutes, occurring during one or two cycle lengths at the most. This is well below what most cities would argue is an acceptable level of congestion for a thriving, economically healthy downtown.

Multimodal Quality of Service

The existing environment for bicyclists, pedestrians and transit users, with the exception of isolated facilities along a few roadways in both cities, is generally poor. There is a lack of facilities, poor connectivity and limited buffer areas between vulnerable road users and passing traffic. Crossing streets on foot can be a challenge. The recommended plan, with the addition of a downtown transit circulator in Bradenton and a better network supporting non-auto travel, raises the quality of service for all modes and provides a foundation for growth in recreational and transportation trips using multimodal facilities and services. The Green Bridge, 13th Street Transit Mall, the MLK, Jr. Avenue traffic calming, and other strategies create improved connections within the downtown area and its linkages to surrounding neighborhoods and other parts of Manatee County.

Public Participation

The community played a significant role in shaping the study recommendations. Three public workshops, multiple steering committee and stakeholder meetings, neighborhood briefings and other activities helped to define areas of consensus or agreement. Initial scenarios or project concepts were rejected or refined based on public input. Recommendations that did not generate sufficient consensus to move into the near-term list of strategies were deferred to later years and further discussion. Examples include potential grade separations on US 41/301 south of the Manatee River, a third bridge, and lane reductions for increased pedestrian safety, convenience and comfort to 8th Avenue in Palmetto and 14th Street in Bradenton. Of particular interest was how initial study recommendations for MLK, Jr. Avenue in Bradenton affected the south/central Bradenton neighborhood located along that corridor. After consultation with neighborhood residents and leaders, a modified plan was developed that addressed their concerns over traffic speeds and pedestrian safety, and include improved pedestrian crossing areas and street network connections to improve access in this area.

PLAN ACTIONS AND OUTCOMES

The Downtown Mobility Study recommended plan is a win-win for personal mobility and economic development in Manatee County, and represents many hours of hard work by the community stakeholders and their representatives to develop a cohesive transportation strategy that supports the visions of both communities and the region. The input of FDOT, MCAT and other agency partners helped to improve the plan and make it more achievable.

As a result, this is not an idealistic or grand vision plan with mere hopes of becoming reality. Rather, from the input of many agency and public stakeholders, along with extensive and thorough technical analysis, it is a mobility plan that is firmly grounded in the achievable. Initial ideas imagined the "what if" possibilities to tame traffic and create walkable downtown districts, while moving traffic efficiently and captivating large numbers of people willing to ride transit, ride their bikes and stroll to their destinations. From those initial ideas, the project moved quickly into a process of defining workable, realistic and financially attainable solutions that helped create a great destination while ensuring safe, convenient and balanced transportation options.

Key implementation actions include amending both cities' comprehensive plans to incorporate the recommendations of this study into their required SB 360 mobility plans; moving forward on improved wayfinding and signage, both within the downtown and connecting to it; revising parking policies and practices to provide incentives for non-auto travel while improving the urban character; establishing a more robust Transportation Demand Management program to reduce peak period automobile travel, and accomplishing projects as part of coordinated project development, such as for street resurfacing and drainage improvements.

PROJECT OVERVIEW

PROJECT OVERVIEW

INTRODUCTION

The cities of Palmetto and Bradenton are wrestling with a difficult balancing act of trying to serve regional mobility needs while focusing on redevelopment initiatives to make their downtown areas more attractive and desirable places for people to live, work and visit. This inherent conflict is common to many downtowns. In fact, a primary reason downtown central business districts exist in the first place is because of the transportation access provided by waterways, rail lines, bridges, highways and streetcars. The historic legacy of both cities is tied to rail and river access as a distribution point for agricultural products, goods and services. Since those early settlement days in Southwest Florida, Bradenton and Palmetto have continued to grow as centers of government, civic, health care and cultural activities in Manatee County.

This conflict between livability and regional mobility is particularly acute in Palmetto and Bradenton, with the combination of geographic features, seasonal traffic demand, and a constrained regional road network that forces regional traffic through the downtowns and across the congested Manatee River bridges. The vitality of the downtown areas and surrounding neighborhoods in both cities depends on a balanced approach to transportation that will meet mobility needs, increase accessibility and help sustain local community development goals.

For several years, both cities have been experiencing peak period traffic congestion and accessibility problems due to rapid growth in the region and constraints on the major transportation corridors providing access to and through the downtown areas. While traffic volumes have remained relatively stable for several years, even through the economic boom years earlier in the decade, increased downtown development activity has attracted more residents, workers and visitors to the area, adding to the pressure on the downtown street network. Both downtowns serve as destinations for employment, health care and government services in Manatee County, yet their location means that downtown traffic competes with more regional and tourism-related traffic traveling to the beaches and locations in adjacent counties. This poses a conflict between efforts to humanize and revitalize the downtowns for greater pedestrian comfort and accessibility, and ensuring that automobile and truck traffic moves efficiently to and through the area.

Both communities have completed redevelopment plans for their downtown and waterfront areas that aim to improve livability, promote economic vitality and enhance the character of these community focal points. Transportation access and adequate personal mobility are essential to realizing their community development objectives. As residential and non-residential development occurs in the downtowns and surrounding parts of northern and eastern Manatee County, creative, effective and financially achievable mobility strategies are needed to ensure that the desired character and economic vitality of the downtown areas can be sustained long into the future.

STUDY OBJECTIVES

The Downtown Mobility Study is intended to identify viable transportation projects that can improve circulation, access and mobility in downtown Palmetto and Bradenton based on the long-range redevelopment plans of both cities and growth in surrounding areas in Manatee County. The study evaluates the land use/urban form objectives and policies contained in the cities' Comprehensive Plans, Evaluation & Appraisal Reports, and the "Downtown By Design" master plan, which is the guiding redevelopment plan for Bradenton. Specifically, the study evaluates near- and long-term transportation improvement options, including the feasibility of recommendations to convert one-way streets, such as Manatee Avenue and 6th Avenue, into two-way streets with a possible series of street connections to enhance circulation, the placement of roundabouts, improved access for existing and future transit service, and ensuring continued truck access for deliveries. Parking availability, transit enhancements and bicycle/pedestrian connectivity are also considerations.

At the outset, the study sought to define a balanced traffic circulation and mobility plan in support of the economic vitality and enhances livability of the downtown area, while also maintaining traffic flow and improving safety. This entailed creation of a phased implementation program for transportation projects tied to development and traffic growth in the area. Recommendations include an implementation action plan that identifies capital project priorities, funding strategies and policy changes to improve downtown mobility and access in both communities. The study entails a blend of technical analysis with focused public participation activities to create a mobility improvement plan that reflects consensus on strategies and priorities for each local government. Because of the complexity and competing demands of the downtown transportation network, a primary objective of the study entailed substantial efforts to achieve acceptance by the Florida Department of Transportation as well as other stakeholders in the community.

PROJECT PARTNERS

The Sarasota/Manatee Metropolitan Planning Organization (MPO) established priority funding through its Congestion Management Process for the Bradenton/Palmetto Downtown Mobility Study, and the Florida Department of Transportation (FDOT) provided the funds to conduct the study. The City of Bradenton provided the contractual and administrative oversight of the consulting contract, with Bradenton and the City of Palmetto serving as joint project managers for the completion of the study. Other agency study partners include Manatee County Government and the Bradenton Downtown Development Authority (DDA).

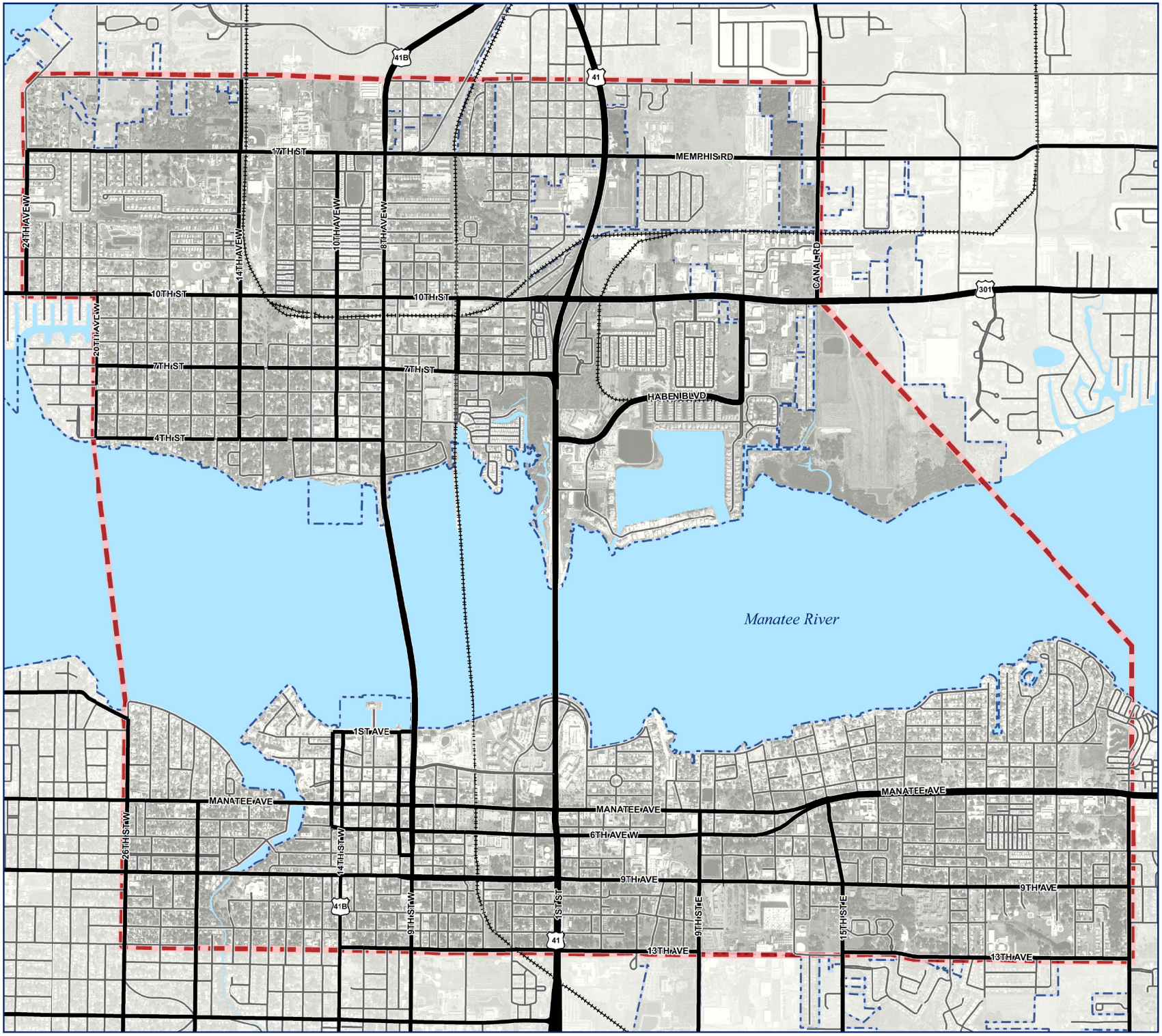
A steering committee was established at the beginning of the project to guide the process and review study documents. The project partners were instrumental members of the steering committee, along with invited stakeholders that included the Manatee Chamber of Commerce, the Bradenton Central Community Redevelopment Agency (CRA), the Bradenton and Palmetto Police Departments, and Manatee County Area Transit.

STUDY AREA

As shown in Figure 1, the primary study area includes the downtown areas of Palmetto and Bradenton from about 21st Street on the north; 13th Avenue on the south; Wares Creek on the west (20th Avenue in Palmetto); 27th Street East in Bradenton and Canal Street in Palmetto. The study focused on access and travel within the two downtown areas, and addressed the larger regional context concerning principal arterial roads and bridges serving the downtown areas in the two municipalities. The study area included adjacent residential areas to the downtown core because of the interaction of those neighborhoods with the destinations and traffic patterns in the downtown area.

LEGISLATIVE CONTEXT

Recent state legislation provides an important backdrop for the Downtown Mobility Study. In 2008, the Florida Legislature passed and the Governor signed into law HB 697, which requires local governments to develop strategies to reduce Greenhouse Gas Emissions and take steps to conserve energy as part of their comprehensive plans. The law recognizes the linkage of land use and transportation in that land use is the primary driver of vehicle miles traveled (VMT), VMT pushes gasoline consumed, and gasoline consumed produces CO2 emissions. The legislation requires that comprehensive plans promote compact, mixed-use, high density / intensity development with transportation alternatives, while discouraging single-use, automobile dependent development patterns. Specifically, the law states that the "traffic circulation element shall incorporate transportation strategies to address reduction in greenhouse gas emissions from the transportation sector."



Bradenton / Palmetto Downtown Mobility Study

Figure 1

Study Area

- Study Area Boundary
- Municipal Area Boundary
- Arterial and Collector Roads
- Local Road
- Railroad

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

SB 360

On June 1, 2009, Governor Crist signed into law Senate Bill 360, called the "Community Renewal Act," which is intended to direct development toward urban centers, in part by removing the layer of state oversight on transportation concurrency. The bill introduced a new way to define what constitutes an urban area, with a definition for Dense Urban Land Areas (DULA). The list released by the Department of Community Affairs (DCA) on July 1, 2009 includes Bradenton and Palmetto among 238 municipalities and eight counties that automatically qualify as DULAs, based on their population having at least 1,000 persons per square mile and a population over 5,000 for municipalities. Within DULAs, state-mandated transportation concurrency regulations do not apply, but any existing regulations enacted by a local government ordinance are still valid, per Home Rule Powers to adopt ordinances and fees. Municipalities that qualify as DULAs are now automatically Transportation Concurrency Exception Areas (TCEAs) throughout the entire municipality.

This legislation provides an important backdrop for the cities of Bradenton and Palmetto because of its emphasis on "alternative mobility strategies." Although SB 360 eliminates state-mandated transportation concurrency review, it contains a requirement that local governments are now to incorporate alternative transportation policies and strategies in support of a regional transportation vision. These so-called Mobility Plans are required within two years of the official designation of DULA local governments (by July 1, 2011). The Mobility Plans must be followed and projects and programs must be funded; they are not just to be created and placed on a shelf. Local governments have until July 1, 2011 to define an implementation and financially feasible plan for the mobility strategies called for within the legislation. In other words, by 2011, the cities of Bradenton will need to show funding for projects they intend to advance into their respective Capital Improvements Programs (CIP). Larger, longer term projects will need to be coordinated with the Sarasota/Manatee MPO and FDOT.

HB 697

Another important policy consideration for the Downtown Mobility Study is the requirement that local governments adopt policies and strategies to reduce greenhouse gas emissions. HB 697, passed by the Florida Legislature and signed into law in 2008, mandates that local governments amend the land use and transportation elements of their comprehensive plans to incorporate climate change strategies. The Department of Community Affairs (DCA) has prepared a draft rule to implement the new law. Its provisions include analysis and policies to reduce sprawl and promote energy efficient land use patterns, including factors such as minimum density/intensity standards, transit-oriented development, jobs-housing balance and mixed-use development in compact urban centers. Specific requirements include:

- ☐ 163.3177(6)(a) … "The future land use plan shall be based upon surveys, studies, and data regarding the area, including … the discouragement of urban sprawl; energy efficient land use patterns accounting for existing and future electric power generation and transmission systems; greenhouse gas reduction strategies; …"
- ☐ 163.3177(6)(b) … "The traffic circulation element shall incorporate transportation strategies to address reduction in greenhouse gas emissions from the transportation sector."

HB 697 requires that local governments define energy conservation areas on the future land use map, and support that designation with objectives, policies and strategies. The downtown areas are logical locations for such designation, with the capability to reduce vehicle miles of travel through land use and mobility actions.

Tampa Bay Area Regional Transportation Authority

In addition, the Florida Legislature created the Tampa Bay Area Regional Transportation Authority (TBARTA) in 2007, with a focus on regional mobility solutions in the greater West Central Florida area. TBARTA has completed a regional multimodal transportation master plan, which identifies a mid-term (2035) and long-term (2050) plan for various forms of transit linking the region. The TBARTA master plan defines downtown Bradenton as a Tier 1 regional anchor, a term used to describe an area with a "very dense cluster of destinations." Palmetto and the Cortez Road/DeSoto mall area are defined as Tier 2 regional anchors. The TBARTA master plan includes three mid-term projects that converge on the downtown study area:

- ☐ Bus Rapid Transit (exclusive lane, with 15-20 minute frequency) between downtown Bradenton and downtown Sarasota. This would connect with and match the proposed BRT from Siesta Drive/Bee Ridge Road in Sarasota to the Sarasota/Bradenton International Airport. There is an existing underutilized rail line that could be used, as is proposed by Sarasota County. In the long-term, this evolves into frequent short-distance rail service.
- ☐ Bus Rapid Transit (mixed traffic, 20-30 minute frequency) along SR 64 (Manatee Avenue) between Anna Maria Island and I-75.
- ☐ Express bus service between downtown Palmetto and Bradenton to St. Petersburg via the Sunshine Skyway bridge and to Tampa via US 301 and I-75.

In addition, the long-term plan (2050) includes "peak hour focused, long distance rail (every 20-30 minutes) along the US 41 corridor between Bradenton and Hillsborough County, with connections to Lakeland and Brooksville.

The TBARTA master plan is essentially a "conversation-starter" as a basis for entering into a more detailed planning and engineering analysis to confirm the technology, alignment and service characteristics, discussing revenue options and defining priorities. However, it provides a regional vision and framework for the Downtown Mobility Study, and serves as a basis for both Bradenton and Palmetto to address SB 360 requirements in their respective comprehensive plans.

STUDY CONTEXT

STUDY CONTEXT

DOWNTOWN CONNECTIVITY OF KEY ORIGINS/DESTINATION

One of the greatest challenges of Bradenton and Palmetto is the lack of connectivity between places of interest that draw people into the downtown area. Despite its great potential, it is not a unified district and lacks a strong downtown identity. This is a reflection of the highways that divide downtown and create barriers for walking and bicycling. For instance, the Village of the Arts in Bradenton is a renowned destination located immediately south of downtown Bradenton's Old Main Street and riverfront destinations. Yet, the Village and these attractions are separated by a series of wide, fast roads, sterile parking lots next to narrow sidewalks and uninviting land uses. In Palmetto, a steady stream of traffic on US Business 41 and 10th Street divides restaurants and shops on either side of the road from the neighborhoods, riverfront and 10th Avenue downtown destination.

REDEVELOPMENT PLANS

One of the drivers behind this Downtown Mobility Study is the goal of improving the downtown environment in both cities as a destination to attract new residents, visitors and businesses. For much of the past two decades, there has been a focus to bring more growth and development to downtown through redevelopment to strengthen the economic vitality and livability. This includes reconnecting the downtown areas with the Manatee River waterfront and surrounding neighborhoods, revitalizing existing neighborhoods, and enhancing commercial corridors with landscaping, streetscaping and new restaurants, retail businesses and higher wage jobs.

BRADENTON

The study area for Bradenton's Mobility Study is comprised of three Community Redevelopment Areas (CRAs), as well as several single family residential areas. The Urban Central Business District makes up 28 percent of the entire area under study, while the total area studied contains roughly 20 percent of the City's total area.

The CRAs include:

- ☐ The downtown CRA;
- ☐ The 14th Street CRA, and
- ☐ The Central CRA.

CRA plans have already been developed for the Downtown and 14th Street CRAs. The Downtown CRA plan envisions a lively, well connected, mixed use district, with densities and intensities transitioning from the most intense, near the Riverfront, to the less intense mixed use and residential, south of the Riverfront. Though the plan does not recommend specific densities and intensities, the study's market analysis includes the following assumptions:

- ☐ 1150 additional dwelling units by 2011 (230 residential units annually between 2006 and 2011)
- ☐ An additional 180,000 square feet of retail space by 2011
- ☐ An additional 132,000 square feet of office space by 2011

The 14th Street CRA Plan (otherwise known as the Tamiami Trail Revitalization Strategy) divides the study area into several sub-districts. The two sub-districts that are located within the mobility study area are the Urban Core and Urban Village.

According to Downtown by Design, the city's downtown redevelopment plan, Bradenton anticipates an additional 1,150 dwelling units, 180,000 square feet of retail space, and 132,000 square feet of office space. The Tamiami Trail Redevelopment Strategy (the 14th Street redevelopment plan) recommends a transition in density and intensity from 40 dwelling units per acre/1.0 floor area ratio to 25 dwelling units per acre/.35 floor area ratio along the fringe of the Urban Core.

The City released a development update in April 2008 that states the various projects that have recently been completed, those that are under construction, and those that have gained preliminary approval (non-residential uses are expressed in square feet; residential projects expressed in number of dwelling units).

TABLE 1 – PLANNED DEVELOPMENT PROJECTS LOCATED IN THE STUDY AREA

PROJECT	STATUS	NON-RESIDENTIAL	RESIDENTIAL
Tropicana Juice Storage	Complete	105,860 sq ft	n/a
Riverwalk Professional Center	Complete	41,000 sq ft	n/a
Mainstreet Apartments	Complete	n/a	252
Bradenton Village	Phase I Complete; Phase II Under Construction	n/a	280
Manatee County Courthouse	Complete	230,000 sq ft	
Manatee Memorial Hospital	Under Construction	345,092	n/a
Promenade at Riverwalk	Under construction	115,000	350
Downtown City Central	Preliminary Approval	80,000	106
Metro Marquee	Preliminary Approval	48,000	138
River Park Grand Hotel	Preliminary Approval	140 rooms	n/a
Riviera Southshore	Preliminary Approval	n/a	691

PALMETTO

The study area encompasses roughly 86 percent of the incorporated city. All of the City's future land use categories are represented within the study area, including low and medium density residential, commercial, and industrial.

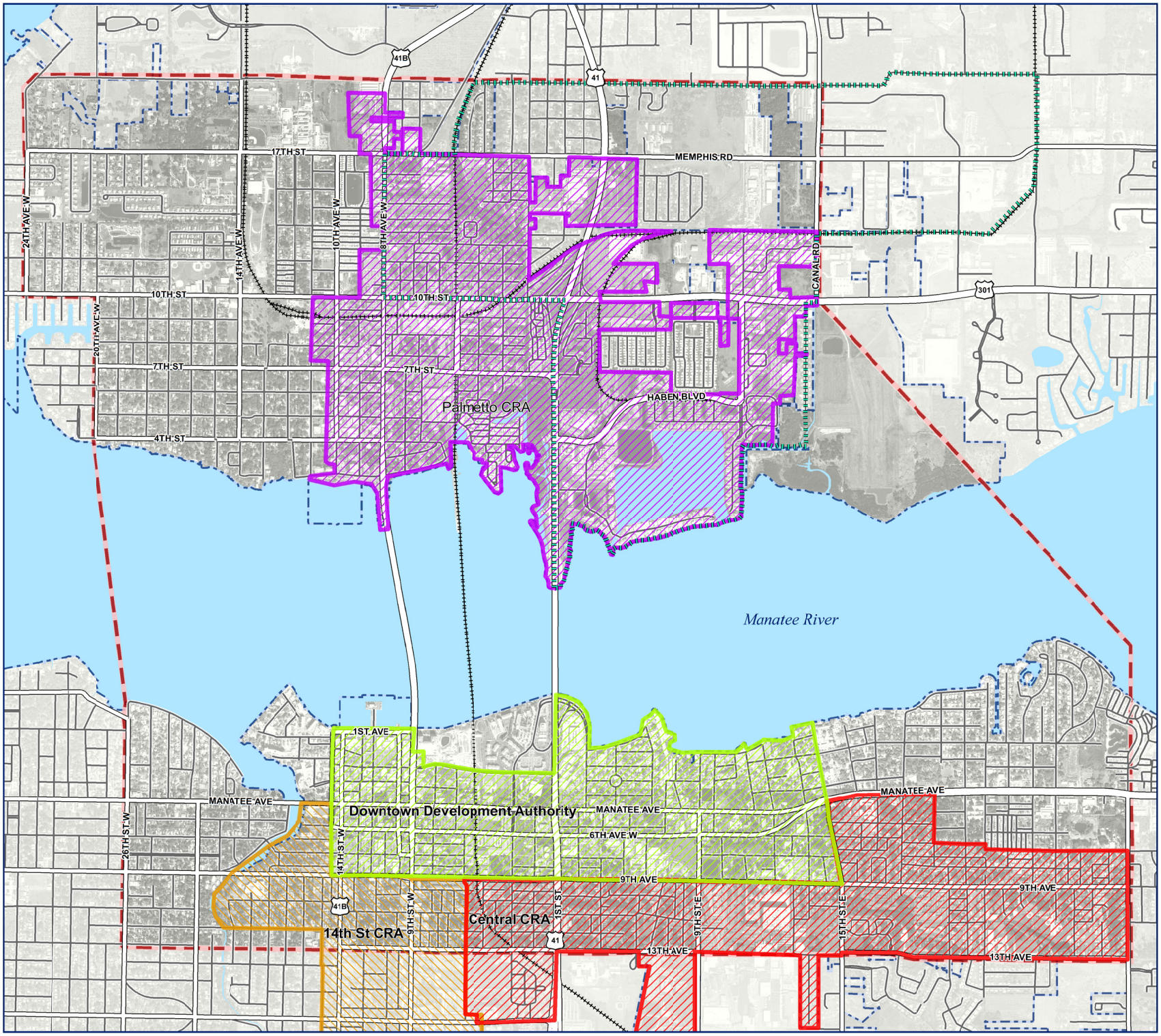
There are roughly 950 acres of residential, 273 acres of commercial (residential and commercial uses permitted), 133 acres of industrial, and roughly 500 acres dedicated to public uses, such as schools, civic buildings, and recreational sites.

The City's Community Redevelopment Area (CRA) lies in the heart of the study area. "General Commercial and Commercial Core" designations line Business 41, allowing a mix of residential, retail, office, and other general commercial uses. In 2005, the City estimated roughly 4,000 residential units in various phases of development within the CRA.

The City of Palmetto's Waterfront Redevelopment Plan envisions an old-Florida style urban village with a "re-energized core" facing the waterfront. The plan estimates the construction of up to 2,100 dwelling units, either within townhouse style development or within mixed-use (2-4 story buildings) with densities ranging from 8-15 units per acre. The plan also envisions a 400-slip marina and the redevelopment of 8th Avenue, 10th Avenue, and 7th Street.

Redevelopment plan recommendations for both Palmetto and Bradenton envision lively, walkable areas with a mix of retail, office, commercial, and higher density residential. These areas will be well connected and will incorporate the community's major focal point, the Manatee River. However, scales of development vary by city and sub-area.

Both the Bradenton and the Palmetto redevelopment areas are surrounded by primarily single family residential neighborhoods that are unlikely to change in the foreseeable future.



Bradenton / Palmetto Downtown Mobility Study

Figure 2

SPECIAL PLANNING AREAS MAP

- Central CRA - Bradenton
- Downtown Development Authority – Bradenton
- 14th St CRA - Bradenton
- Palmetto CRA
- Palmetto / North Manatee County Enterprise Zone
- Arterial or Collector Road
- Local Road
- Railroad
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

COMPREHENSIVE PLANS

In September 2008, the City of Bradenton transmitted amendments to the Comprehensive Plan for state review based on the City's adopted Evaluation and Appraisal Report (EAR). Of relevance to the Downtown Mobility Study, the nature of these amendments was to build upon the City's Downtown by Design and Manatee County Community Character Study and remake downtown as a walkable, pedestrian-oriented district with a greater mix of residential, retail and office land uses. The Comprehensive Plan amendments shifted more residential of increasing density in the downtown core, while reducing the density of residential development in the rest of the City. To accomplish this, the amendments reduced the amount of land designated for commercial and other non-residential uses, concentrating mixed use development into defined commercial corridors and urban village centers. The cumulative impact of these changes is to substantially reduce the total number of dwelling units and non-residential allowable square footage in the entire City, while creating a greater mix of residential and non-residential development in the urban core area that largely comprises the Downtown Mobility Study Area. The downtown core area allows for a maximum floor area ratio of 5.0 and a maximum base density of 60 dwelling units per acre, with development arranged in block dimensions to maintain a pedestrian scale. These development intensities would support higher forms of mass transit, assuming the market responds.

The Florida Department of Community Affairs found Bradenton's Comprehensive Plan amendments in compliance in November 2009.

Palmetto's Evaluation and Appraisal Report (EAR) for its Comprehensive Plan was adopted in September 2007. The EAR recognized Palmetto's transition from a small town residential environment to become a "hot spot" for development activity, mostly located along the Manatee River waterfront and the area just north of downtown. The City has been involved in significant redevelopment and infill development focused primarily on attracting mixed housing to its downtown area, enhancing the character and vitality of its cultural center, and converting obsolete industrial and retail land uses into mixed use and commercial areas. In addition, the City has maintained a strong focus in its Comprehensive Planning efforts on preserving its neighborhood and residential character.

TRANSPORTATION PERFORMANCE MEASURES

The challenge for the study area is achieving a workable balance in the competing transportation needs from regional traffic and serving local redevelopment plans and improving multimodal accessibility for local destinations. Conventional speed-based traffic performance measures of level of service and delay are not the best indicators of mobility within a downtown environment. A functioning downtown thrives on proximity of land uses with a significant interaction of people using all modes, a high level of property access, and streets that are accommodating and comfortable for pedestrians. Therefore, it is important to define measures of effectiveness that help achieve a balance among these competing user groups.

Downtown environments fundamentally differ from suburban environments, such as Lakewood Ranch, because they do not have the right-of-way to accommodate the necessary turn lanes with landscaped medians to handle queuing vehicles in an automobile-oriented environment. In suburban areas, the primary challenge for transportation is handling the conflict points with other motor vehicles. Within downtown, these conflicts points involve multiple types of users, each with distinct needs for their trip. For instance, motor vehicles may be driving through an intersection while other motor vehicles are anxiously trying to park, while other users want to cross the street on foot or travel safely in a bicycle.

Getting away from the traditional Level of Service measure of effectiveness for improvements, the Downtown Mobility Study is evaluating the alternatives on a segment basis and the overall network benefit. When evaluating the segments in the study area the measures incorporate both automobile and multi-modal factors to evaluate an alternative.

Segment measures:

- ☐ Target speed
- ☐ Crossing distance (width of the street)
- ☐ Increased buffer or lateral separation from traffic
- ☐ Physical accommodation for non-auto modes

Network measures:

- ☐ Travel time
- ☐ Connectivity
- ☐ Signed/marked bicycle facilities
- ☐ Transit availability and frequency

EXISTING CONDITIONS

EXISTING CONDITIONS

INVENTORY OF MULTIMODAL TRANSPORTATION NETWORK

Gaps/Barriers/Accessibility

The downtown areas of Bradenton and Palmetto are separated by the Manatee River, and together function as the employment, financial and cultural center of Manatee County. With less than 10 percent of the households in Manatee County located in the downtown area, traffic converges to the area from four major US and state highways. North and south of the downtowns, US 41 splits into US 41 and US Business 41, respectively, carrying the majority of the north / south traffic into the downtowns. US 301 and State Road 64 connect the downtowns to Interstate 75 and the residential areas to the east. Additionally SR 64 is a major corridor to the beaches on Anna Maria Island and Longboat Key. The convergence of these major regional roadways introduces conflicting travel patterns on the downtown network, which leads to traffic congestion and limits accessibility.

Though both downtowns have a reasonably connected grid network, the connection between the two cities is limited to two major bridges, DeSoto Bridge (US 41) and Green Bridge (US Business 41). These two bridges serve local and regional traffic, experiencing congestion and delays at peak periods during the day. One of the major issues for both downtowns is the need balance the regional needs of these facilities with local visions of a vibrant walkable downtown.

Appendix A presents a full discussion of transit service availability, gaps and accessibility for the downtown study area.

Bradenton

Bradenton's traditional grid network in the downtown is relatively well connected with the exception of a few gaps. For example, along 8th Avenue, gaps exist between 9th Street and US 41/US 301. In addition, the location of the Manatee Memorial Hospital prevents 3rd Avenue from functioning as a proper through-street.

Manatee Avenue and 6th Avenue one-way facilities pose several concerns for Bradenton's downtown, both from a vehicular standpoint and pedestrian point of view. The one-way traffic facilitates higher speeds than is intended by the posted speeds of 35 mph. This creates an environment which promotes through traffic over local access, leading to unsafe travel conditions for all users of the network, and also discounts local businesses supporting a downtown destination for both walk-up and drive-by clientele. The current configuration of Manatee and 6th Avenue tends to confuse many drivers, leading to "last-minute" lane changes and backtracking. For pedestrians, the high volumes of traffic and high speeds, in conjunction with the lack of pedestrian refuges lead to an unfriendly walking environment, both real and perceived. There is only one portion of Manatee Avenue (15th Street E to 27th Street E) with a restrictive median, meaning there is a raised or green area of at least 10 feet. The

remaining Manatee Avenue segments have non-restrictive (painted at-grade area of at least 10 feet) or no median facilities; 6th Avenue has no medians at all.

Transit service currently converges on the downtown Manatee County Area Transit facility at the County Courthouse, at 12th Street W. This facility is capacity-constrained, meaning that if service is increased no additional vehicles can access the transfer point. The site also lacks useful amenities for patrons, and as a public space cannot be controlled or policed by MCAT. While multiple bus routes serving various corridors converge in the downtown area at the Courthouse, there is no transit service that connects the various destinations in the downtown area. There is no Sunday service provided, and weekday and Saturday service ends at 8 PM. MCAT has received grant funding to extend service hours on six of its 10 routes to 11 PM Monday through Saturday for a two-year period.

The City has long recognized the need for a concurrency exception area in the downtown to support redevelopment, including the 14th Street CRA and Downtown DDA boundaries. Other potential concerns include a drop in speed limit on Manatee Avenue, west of 15th Street E where the road begins to curve. The speed limit drops from 45 mph to 35 mph, even though the road is designed for much higher speeds. The initial intent was to have a school zone designated for this area, but the sight distance coming around the curve prevented an official designation from FDOT; thus the speed limit was lowered. The City has some pedestrian and bicycle facilities (e.g. Barcarrota Boulevard, 9th Street E); however, there is no regional trail network serving the two cities.

Palmetto

Palmetto's roads are relatively well-connected by a grid network that tends to break down east of US 41. Traffic circulation issues exist at US 301 and US 41 as drivers traveling west on US 301 get backed up trying to travel south on US 41. This leads to an increase in traffic along Haben Boulevard as drivers try to bypass the US 41/301 interchange. The area surrounding US 41 and US 301 is a pedestrian activity center with high numbers of people living in apartments and mobile homes who often walk to nearby shopping opportunities, such as the Wal-Mart and Palmetto Marketplace.

8th Avenue (US Business 41) is a major 4-lane undivided thoroughfare characterized by multiple driveway cuts. The lack of left turn lanes (or lack of prohibited left turns) leads to traffic in the left lane stopping until there is a gap in traffic to turn left. This causes potential safety problems as cars behind the left-turning vehicle often try to shift lanes to avoid a delay, and creates potential conflict for pedestrians using the sidewalk as turning vehicles are more focused on shooting the gap than observing whether pedestrians may be present. In addition, the actual travel speeds along 8th Avenue are much higher than the posted speeds of 30 to 35 mph, exacerbating the left turn lane issue.

The majority of arterial and collector roadways in Palmetto do not have medians. Sidewalk facilities exist on most of the roadways in the study area and the buffer spacing is considered typical (three to eight feet) for 15 of the 43 roadway segments. Transit coverage in the Palmetto part of the study area is generally acceptable, with no major gaps in service. There is no Sunday service provided, and

weekday and Saturday service ends at 7:30 PM. MCAT has recently completed construction of a transfer center on 8th Avenue north of the study area.

Multimodal Quality of Service

The pedestrian and bicycle accommodations in Bradenton and Palmetto vary widely in terms of presence of facilities, condition, accessibility, safety and usage. Bicycle and pedestrian trips are either utilitarian or recreational. In any case, connectivity of sidewalks and bike paths is crucial for improving walkability/bikability and is becoming increasingly important as gas prices rise and people seek alternative modes of travel. Additionally, both cities are comprised of significant numbers of elderly (Palmetto – 19.9 percent; Bradenton – 25.4 percent) and low-income individuals (about 14 percent for both cities), who are most likely to be transportation disadvantaged. The Complete Streets movement (www.completestreets.org) advocates having roadways that serve all users, regardless of age or ability, to improve livability, accessibility and safety. FDOT's ART_PLAN model was used to calculate a pedestrian level of service based on the following inputs (which are all shown in Appendix B):

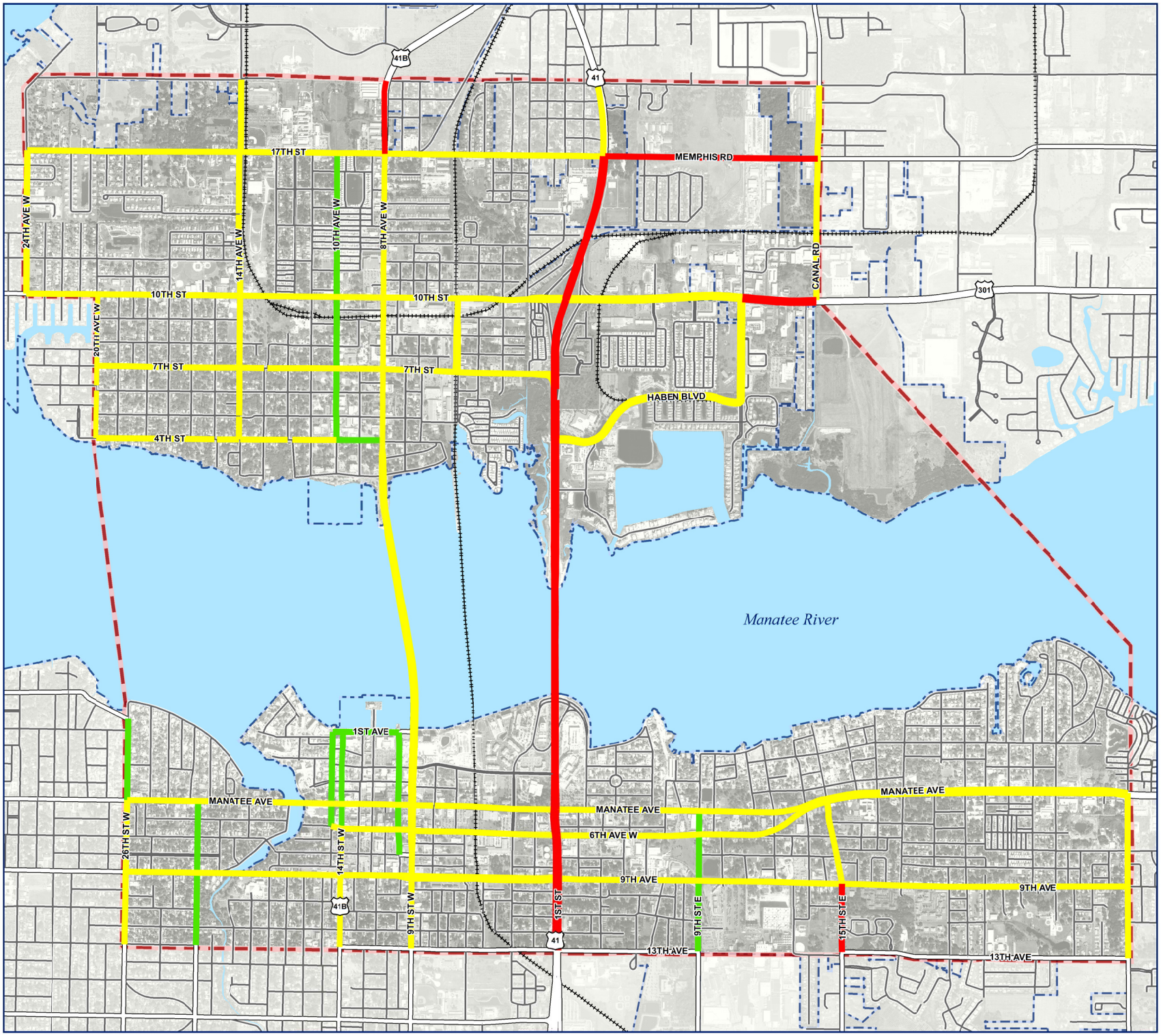
Pedestrian Factors (aka inputs):

- ☐ Sidewalk: Is a sidewalk present? If only partially, what side and percent of the segment has a sidewalk?
- ☐ Width: How wide is the sidewalk?
- ☐ Buffer space: What is the buffer distance between the road and the sidewalk?
  - Adjacent: less than three feet
  - Typical: three to eight feet
  - Wide: greater than eight feet
- ☐ Protection: Are there barriers between the road and sidewalk that help protect pedestrians, such as poles, trees, or parked cars? If only partially, what percent of the sidewalk is protected?
- ☐ Crosswalk: Do the signalized intersections have crosswalks?
- ☐ Pedestrian Signal: Do the signalized intersections have pedestrian signals?

Roadway Factors (aka inputs)

- ☐ Posted Speed: What is the posted speed?
- ☐ Number of Through Lanes: How many through lanes are present?
- ☐ Median Type: What type of median?
  - Restrictive: raised or green area of at least 10 feet
  - Non-Restrictive: painted at grade area of at least 10 feet
  - None: restrictive or non-restrictive is less than 10 feet or pedestrian refuge is less than 5 feet or no median
- ☐ Left Turn Lanes: Are there left turn lanes at signalized intersections?
- ☐ Traffic Volumes: What is the ratio of volume to capacity (V/C ratio)?
- ☐ Traffic Speeds: What is the posted speed for vehicles?
- ☐ Width of Lane: How wide is the outside travel lane and/or bicycle lane?

Figure 3, Pedestrian Quality of Service, show two roadway segments in Palmetto with a LOS of A or B: 10th Avenue and 4th Street. The remaining segments in Palmetto predominantly score a LOS of C or D, with a few exceptions scoring the worst (E or F). This includes a portion of 8th Avenue (US Business 41), Memphis Road (17th Street), US 301 and US 41. Bradenton has significantly better coverage in that either all or portions of the following roadways score LOS A or B: 26th Street W, 22nd Street W, 15th Street W, 14th Street W, 10th Street W, 1st Avenue and 9th Street E. The only roadways with a LOS E or F include 1st Street (US 41) and the southern portion of 15th Street E.



Bradenton / Palmetto Downtown Mobility Study

Figure 3

Pedestrian Level of Service

Level of Service Grade

- A or B
- C or D
- E or F
- Study Area Boundary
- Municipal Boundary
- Arterial or Collector Road
- Local Road
- Railroad

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

In general, bicycle facilities include bike lanes, paved shoulders or bike paths (trails), but for the purposes of this analysis, trails are not considered. Bicycle amenities, such as bike racks/lockers, bikes on buses, water stations, and restroom facilities are also important in achieving a multimodal downtown; however these are not taken into account for the quality of service analysis.

Bicycle quality of service is calculated very similarly to pedestrian quality of service in that the same methodology is used. The following bicycle and roadway factors are input into the ART_PLAN model:

Bicycle Factors (aka inputs)

- ☐ Lane/shoulder: Is a bike lane or a minimum 4' paved shoulder present?
- ☐ Outside Lane Width: What is width of the outside travel lane?
  - Narrow - less than eleven feet
  - Typical - 11 to 13.5 feet
  - Wide - greater than 13.5 feet
  - Specify - user specified
- ☐ Condition: What is the condition of the pavement?
  - Desirable: smooth and barrier-free
  - Typical: minor pavement damage and debris
  - Undesirable: major pavement damage and impediments
- ☐ Parking: Is on-street parking allowed? If only partially, what percent of the segment has parking?

Roadway Factors (aka inputs)

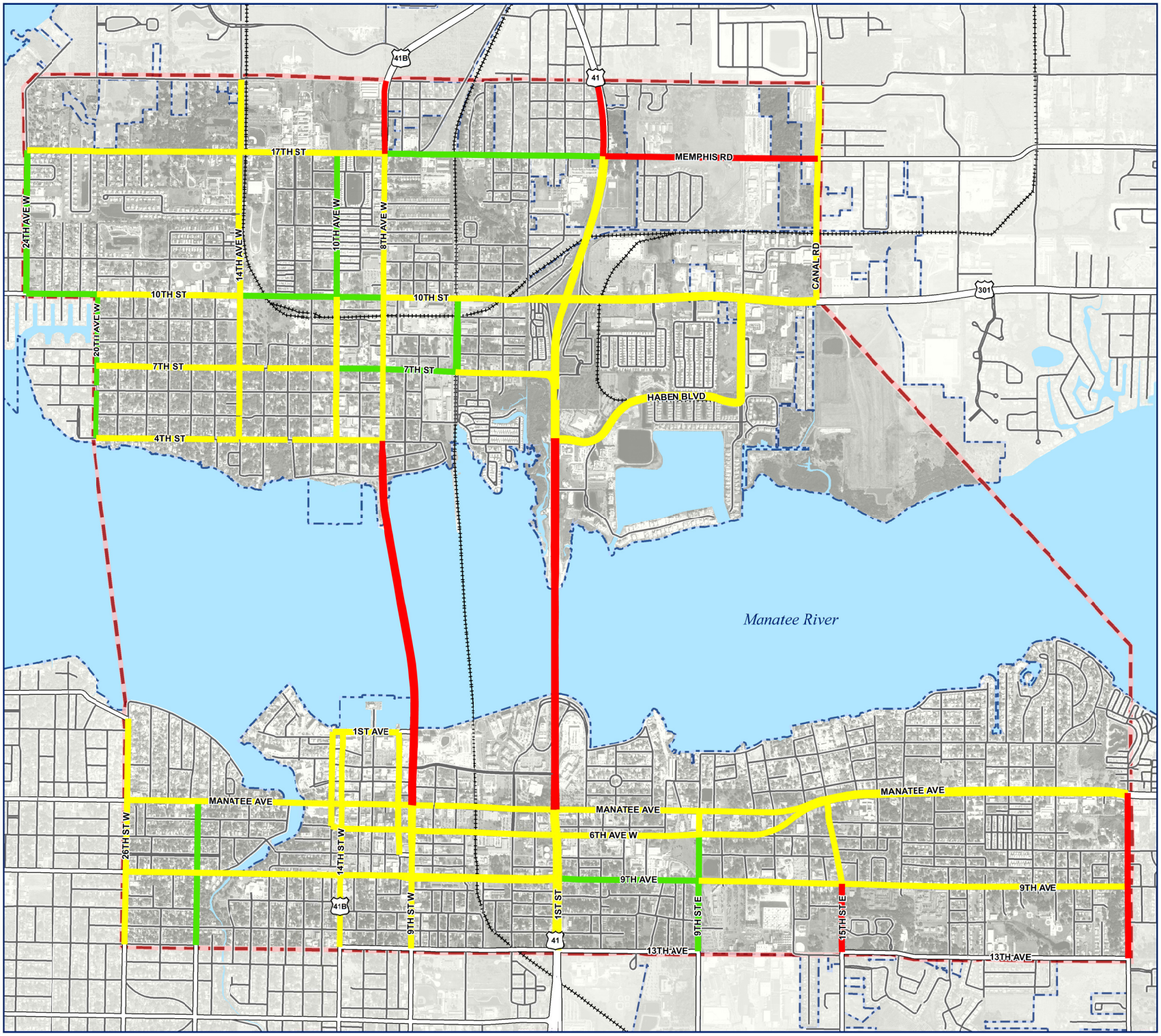
- ☐ Posted Speed: What is the posted speed?
- ☐ Number of Through Lanes: How many through lanes are present?
- ☐ Median Type: What type of median?
  - Restrictive: raised or green area of at least 10 feet
  - Non-Restrictive: painted at grade area of at least 10 feet
  - None: restrictive or non-restrictive is less than 10 feet or pedestrian refuge is less than 5 feet or no median
- ☐ Left Turn Lanes: Are there left turn lanes at signalized intersections?
- ☐ Traffic Volumes: What is ratio of volume to capacity (V/C ratio)?
- ☐ Traffic Speeds: What is the posted speed for vehicles?

Interestingly, in order for a roadway segment to achieve a LOS of A or B, it is not absolutely necessary that a bicycle facility be present. Shown on Figure 4, Bicycle Quality of Service map, Palmetto has more roadways with a LOS of B or better. The following roadways (portions of) have LOS A or B:

Palmetto:

- ☐ 24th Avenue W
- ☐ 20th Avenue W
- ☐ 10th Avenue W
- ☐ 10th Street
- ☐ 7th Street
- ☐ 17th Street
- ☐ Bradenton
- ☐ 22nd Street
- ☐ 9th Avenue
- ☐ 9th Street E

Roadways with bicycle LOS E or F include portions of 26th Street E, 15th Street E in Bradenton, the two bridges and 8th Avenue, US 41 and Memphis Road in Palmetto. The remaining roadways have LOS C or D. The bridge quality of service issue is worth further discussion. Neither pedestrians or bicyclists are permitted to use the DeSoto Bridge (US 41) because of its design and lack of facilities. On the Green Bridge (US Business 41), both pedestrians and cyclists share use of a four foot wide sidewalk, which is separated by a barrier from the travel lanes. There is a 10 foot wide break-down lane on the bridge, which is also signed and marked as a bicycle lane. However, the high traffic volumes and speed discourage all but the most experienced cyclists from using this break-down lane to cross the bridge. The narrow sidewalk is an impediment to bicyclists or groups of pedestrians who find they cannot cross without conflicts.



Bradenton / Palmetto Downtown Mobility Study

Figure 4

Bicycle Level of Service

Level of Service Grade

- A or B
- C or D
- E or F
- Study Area Boundary
- Municipal Boundary
- Arterial or Collector Road
- Local Road
- Railroad

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

TRAVEL PATTERNS (ORIGIN-DESTINATION SURVEY)

Automobile travel patterns within the study area reflect a mix of local and non-local traffic. Local stakeholder experience and FDOT travel information indicated that a portion of the automobile trips causing delays within the study area are the result of a large proportion of through traffic originating from outside of the municipalities and destined for external locations. The question of how much of the traffic demand on downtown corridors is attributable to through traffic without an origin or destination in the two downtowns is central to the types of mobility improvement strategies to be evaluated.

To develop a base understanding of local and non-local automobile travel patterns, the study team conducted an automobile trip origin-destination survey. A license plate image recording survey technique was used at eight strategic locations along major corridors at the edge of the study area. The video logs were recorded on April 10, 2008 from 4:30 to 6:30 PM to capture entering and exiting license plate numbers. This approach records the licenses plates of vehicles that pass through specific points of entry and compares them to licenses plates recorded at various exiting locations. An accurate account for traffic movements entering and exiting the study area is developed.

The analysis was focused only on recording the travel patterns of traffic entering and exiting the study area. As a result, the analysis does not determine internal travel patterns, but does provide some insight into how many trips originate and terminate in the study area. Thirty cameras were used at the locations as described in Table 2. More than 42,000 trips were recorded over the two hour period, with 85 percent of the trips accurately recorded for analysis. Some locations experienced a lower level capture rate (i.e. US 301 south of 13th Ave W and 14th St W south of 13th Ave W), but a significant sample size was still maintained.

TABLE 2 – SURVEY LOCATION DESCRIPTIONS

ID	Location	# of Lanes	Camera	CamID	Camera location
1	US 41 north of 21st St E	4	4	1NBR	Roadside
1	US 41 north of 21st St E	4		1NBM	Median
1	US 41 north of 21st St E	4		1SBM	Median
1	US 41 north of 21st St E	4		1SBR	Roadside
2	Business US 41 north of 21st St W	4	4	2NBR	Roadside
2	Business US 41 north of 21st St W	4		2NBM	Median
2	Business US 41 north of 21st St W	4		2SBM	Median
2	Business US 41 north of 21st St W	4		2SBR	Roadside
3	US 301 east of Canal Rd	4	4	3EBR	Roadside
3	US 301 east of Canal Rd	4		3EBM	Median
3	US 301 east of Canal Rd	4		3WBM	Median
3	US 301 east of Canal Rd	4		3WBR	Roadside
4	SR 64 (Manatee Ave) east of 27th St E	6	4	4EBR	Roadside
4	SR 64 (Manatee Ave) east of 27th St E	6		4EBM	Median
4	SR 64 (Manatee Ave) east of 27th St E	6		4WBM	Median
4	SR 64 (Manatee Ave) east of 27th St E	6		4WBR	Roadside
5	US 301 south of 13th Ave W	7	6	5NBR	Median, road sides
5	US 301 south of 13th Ave W	7		5NBM	
5	US 301 south of 13th Ave W	7		5NBM2	
5	US 301 south of 13th Ave W	7		5SBM	
5	US 301 south of 13th Ave W	7		5SBM2	
5	US 301 south of 13th Ave W	7		5SBR	
6	9th St W south of 13th Ave W	2	2	6NB	Road sides
6	9th St W south of 13th Ave W	2		6SB	
7	14th St W south of 13th Ave W	4	2	7NB	Road sides
7	14th St W south of 13th Ave W	4		7SB	
8	SR 64 (Manatee Ave) west of 26th St W	4	4	8EBO	Roadside
8	SR 64 (Manatee Ave) west of 26th St W	4		8EBI	Roadside
8	SR 64 (Manatee Ave) west of 26th St W	4		8WBI	Roadside
8	SR 64 (Manatee Ave) west of 26th St W	4		8WBO	Roadside
			30		

License plates were manually recorded from the videos obtained. Vehicles whose plates were missed and those that were not completely clear were tabulated as a wildcard to identify a capture rate. The peak hour volumes recorded at these locations by automatic traffic recorders were used to verify the license plate log samples recorded. Details are provided in Table 3.

FILE	TOTAL RECORDS	TOTAL WILD CARDS	TOTAL MISSES	% CAPTURE	2-HR Volume	PHV
1NBM_A.xls	969	43	1	95%		
1NBM_B.xls	708	23	20	94%		
1NBR_A.xls	748	49	20	91%		
1NBR_B.xls	495	26	0	95%	2920	1749
1SBM_A.xls	608	10	7	97%		
1SBM_B.xls	386	19	0	95%		
1SBR_A.xls	475	29	19	90%		
1SBR_B.xls	486	27	57	83%	1955	1164
2NBM_A.xls	595	43	20	89%		
2NBM_B.xls	389	21	13	91%		
2NBR_A.xls	646	20	6	96%		
2NBR_B.xls	398	18	2	95%	2028	1072
2SBM_A.xls	361	4	11	96%		
2SBM_B.xls	245	12	5	93%		
2SBR_A.xls	623	46	8	91%		
2SBR_B.xls	423	14	5	96%	1652	863
3EBM_A.xls	1031	44	40	92%		
3EBM_B.xls	628	19	21	94%		
3EBR_B.xls	560	83	48	77%		
3EBR_A.xls	1049	102	106	80%	3268	1450
3WBM_A_041308	814	49	20	92%		
3WBM_B_041308	518	20	0	96%		
3WBR_A_041008	613	21	0	97%		
3WBR_B_041108	361	23	0	94%	2306	1129
4EB.xls	3744	313	237	85%	3744	1955
4WB.xls	2694	176	34	92%	2694	1541
5NB.xls	4583	655	422	77%	4583	1873
5SB.xls	5353	404	601	81%	5353	2169
6NB_A.xls	714	37	167	71%		
6NB_B.xls	441	57	43	77%	1155	621
6SB_A.xls	707	20	88	85%		
6SB_B.xls	385	30	25	86%	1092	596
7NB_A.xls	900	73	63	85%		
7NB_B.xls	588	93	15	82%	1488	662
7SB_B.xls	516	80	69	71%		
7SB_A.xls	953	160	91	74%	1469	823
8EBI_A_C.xls	937	113	141	73%		
8EBI_B_C_041108.xls	523	29	66	82%		
8EBO_A-APRIL14.xls	928	35	52	91%		
8EBO_B.xls	556	59	45	81%	2944	1629
8WBI_B.xlsx	740	161	134	60%		
8WBI_A.xls	1262	107	241	72%		
8WBO_A.xls	1122	32	0	97%		
8WBO_B.xls	553	20	0	96%	3677	2186
Total	**42328**	**3419**	**2963**	**85%**	**42328**	**21482**

TABLE 3 – LICENSE PLATE CAPTURE RATE

The survey locations are identified in Figures 5 and 6 included the following:

- ☐ US 41 north of 21st St E
- ☐ US Business 41 north of 21st St E
- ☐ US 301 east of Canal Rd
- ☐ SR 64 (Manatee Ave) east of 27th St E
- ☐ US 301 south of 13th Ave W
- ☐ 9th St W south of 13th Ave W
- ☐ 14th Street W south of 13th Ave W
- ☐ SR 64 (Manatee Ave) west of 26th St W

FIGURE 5 – PALMETTO SURVEY LOCATIONS

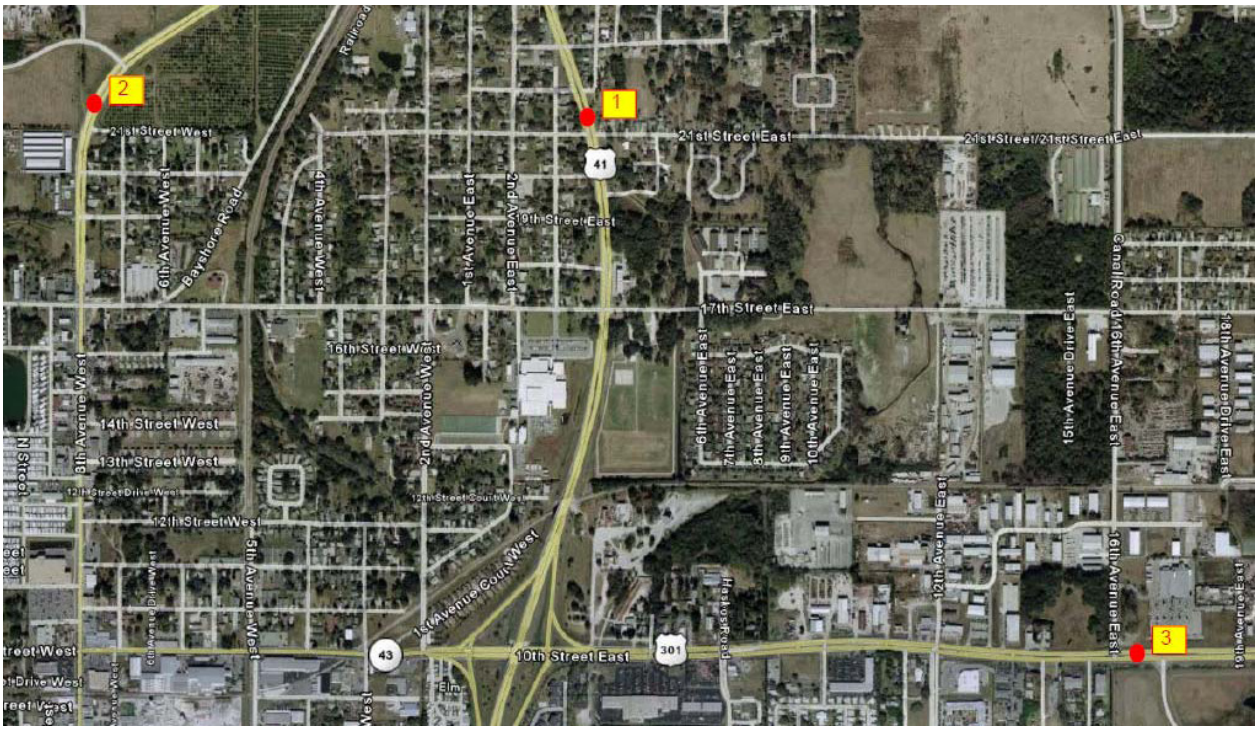


FIGURE 6 – BRADENTON SURVEY LOCATIONS

The survey resulted in significant findings. The results verified that 35 percent of the trips pass through the Bradenton and Palmetto study area. As the information below highlights, the data also identifies specific corridors heavily used for non-local, through trips. This information allows for recommendations to focus on specific corridors and intersections to improve mobility. With some recommendations the data validates local resident's concerns about reducing traffic volume and slowing traffic speeds. The information also identifies potential corridors and intersections that can increase capacity while maintaining local connectivity.

Some of the key findings are:

- ☐ 64 percent of eastbound traffic that exited Bradenton at Location 4 (SR 64 east of 27th St. East), entered from the other locations of the study area, including:
  - 29 percent from US 301 south of 13th Ave W and
  - 11 percent from SR 64 west of 26th St. W.
- ☐ 60 percent (991 vehicles) of southbound traffic entering Palmetto at Location 2 (Bus US 41 north of 21st St W), exited at the other locations of the study area including.
  - 111 vehicles at 9th St W south of 13th Ave W and.
  - 229 vehicles at 14th St W south of 13th Ave W.
- ☐ 59 percent (2702 vehicles) of northbound traffic that enters Bradenton at Location 5 (US 301), exited at the other locations of the study area including.
  - 939 vehicles at SR 64 west of 26th Street West.
  - 677 vehicles at US 41 north of 21st Street, and
  - 402 vehicles at US301 east of Canal Road.

- ☐ At Survey Locations 2 (Bus 41 north of 21st Street West), 3 (US 301 east of Canal Road), 4 (SR 64 east of 27th Avenue) and 6 (9th St W south of 13th Avenue West), at least 10 percent of traffic entering the study area exited in the same location.

FINDINGS PER CORRIDOR

The license plates recorded at one location were compared to the records at other locations to identify common license plates. Results are shown in Table 4 and 5.

TABLE 4 – COMMON LICENSE PLATES AT STUDY LOCATIONS

		DESTINATION									
		1 NB	2 NB	3 EB	4 EB	5 SB	6 SB	7 SB	8 WB	TOTAL	RECORDS
ORIGIN	1 SB	136	67	91	79	365	21	43	213	1015	1955
	2 SB	106	281	63	66	37	98	111	229	991	1652
	3 WB	111	50	429	79	163	49	58	196	1135	2306
	4 WB	66	29	65	399	141	40	63	298	1101	2694
	5 NB	677	58	402	939	295	80	76	175	2702	4583
	6 NB	39	116	53	71	60	105	49	52	545	1155
	7 NB	61	162	112	89	56	76	0	68	624	1488
	8 EB	198	244	219	338	121	54	0	245	1419	2944
	TOTAL	1394	1007	1434	2060	1238	523	400	1476	9532	18777
	RECORDS	2920	2028	3268	3744	5353	1092	1469	3677	23551	

TABLE 5 – PERCENTAGES OF TRIPS

		DESTINATION								
		1 NB	2 NB	3 EB	4 EB	5 SB	6 SB	7 SB	8 WB	TOTAL
ORIGIN	1 SB	5%	3%	3%	2%	9%	2%	3%	6%	52%
	2 SB	4%	14%	2%	2%	1%	9%	8%	6%	60%
	3 WB	4%	2%	13%	2%	4%	4%	4%	5%	49%
	4 WB	2%	1%	2%	12%	3%	4%	4%	8%	41%
	5 NB	23%	3%	12%	29%	7%	7%	5%	5%	59%
	6 NB	1%	6%	2%	2%	1%	10%	3%	1%	47%
	7 NB	2%	8%	3%	3%	1%	7%	0%	2%	42%
	8 EB	7%	12%	7%	11%	3%	5%	0%	7%	48%
	TOTAL	48%	49%	44%	64%	29%	48%	27%	40%	

FIGURE 7 – US 41 (PALMETTO) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 52% of the trips are regional and do not stop in the study area
- ☐ 19% entering this point exit at US 301 in Bradenton
- ☐ 11% entering this point exit west Bradenton

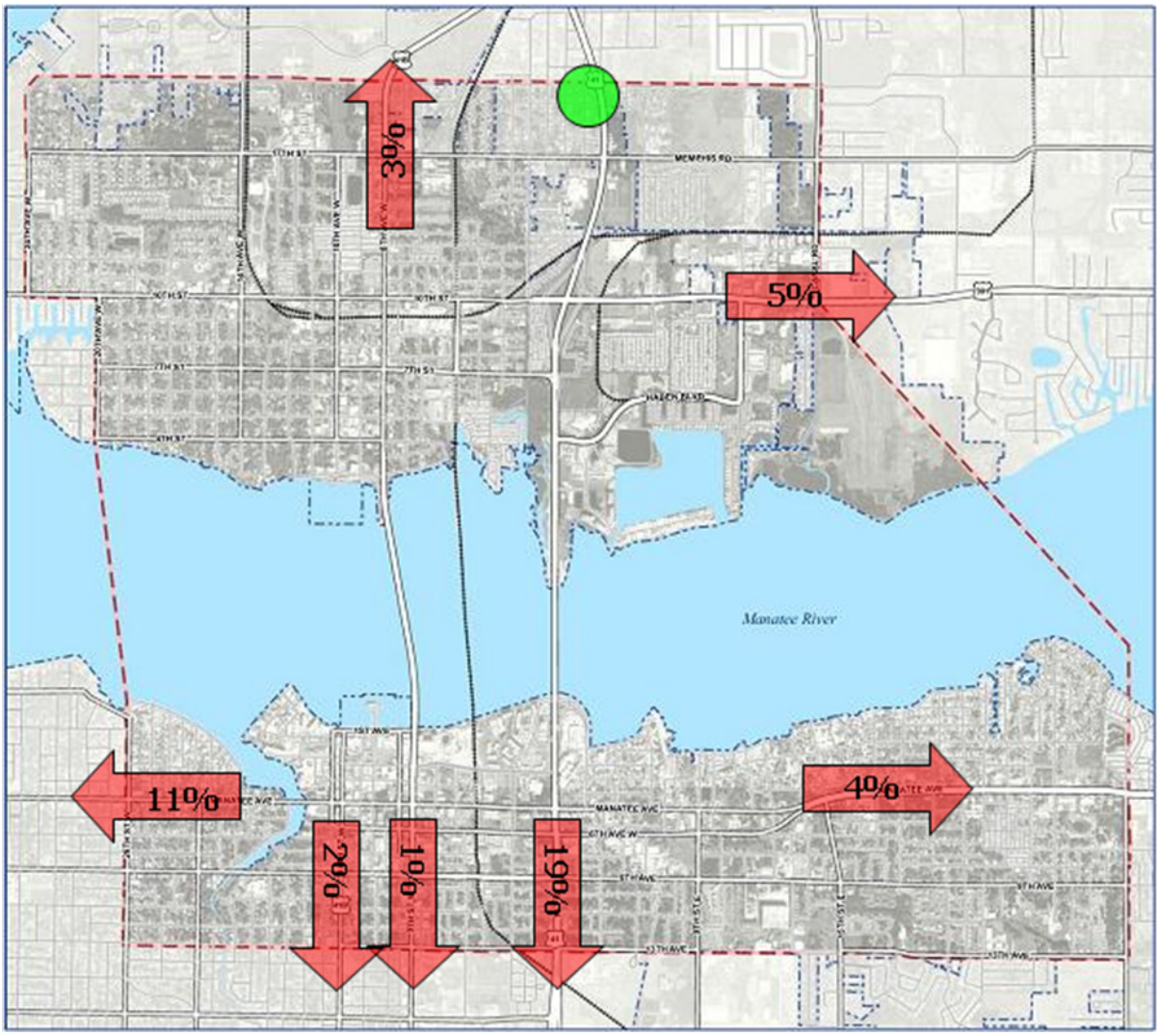


FIGURE 8 – US BUSINESS 41 (PALMETTO) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 56% of the trips are regional and do not stop in the study area
- ☐ 15% entering this point exits south of the study area
- ☐ 14% entering this point exit west Bradenton
- ☐ 13% entering this point exits the same location

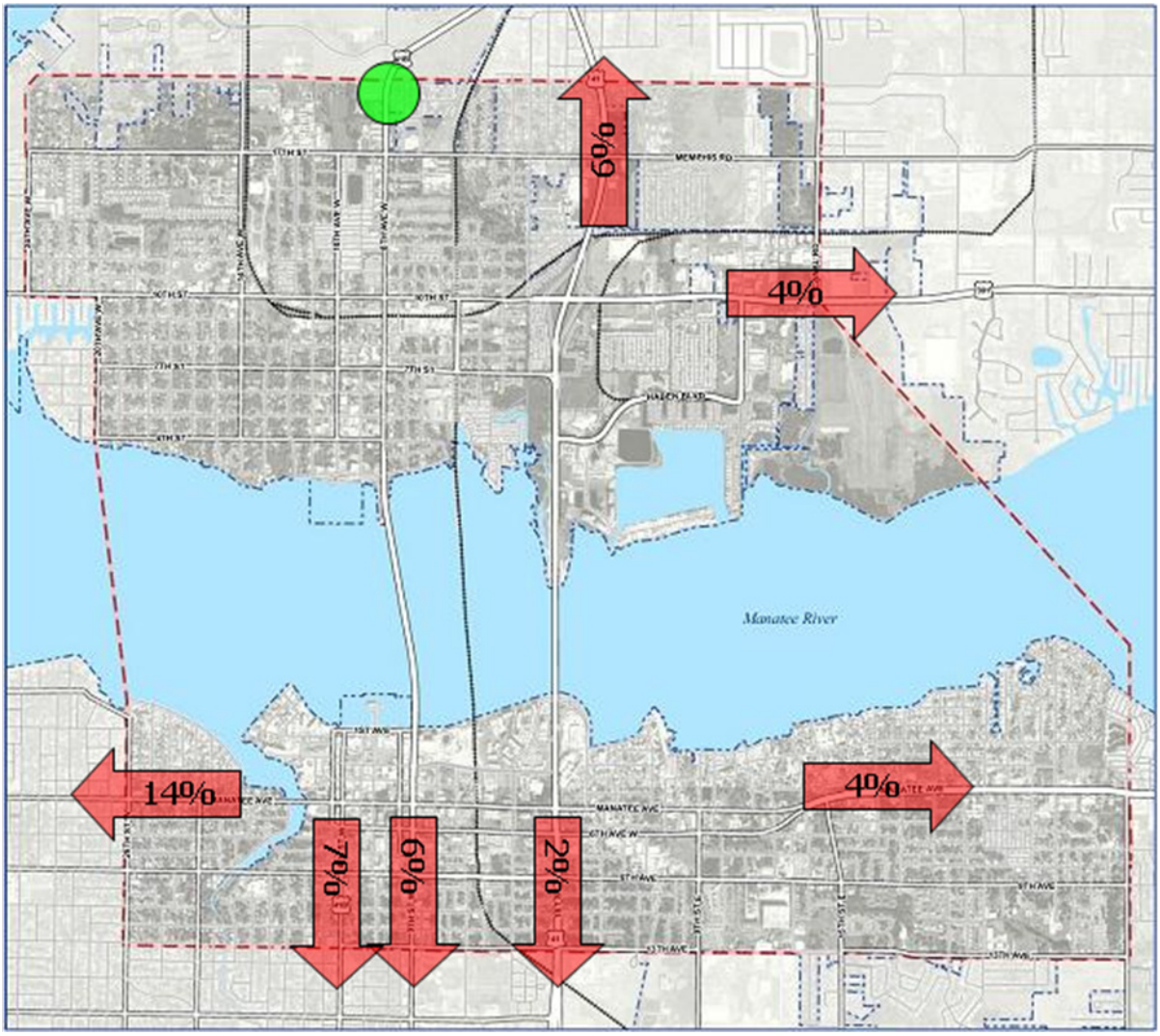


FIGURE 9 – US BUSINESS 301 (PALMETTO) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 49% of the trips are regional and do not stop in the study area
- ☐ 19% entering this point exits the same location

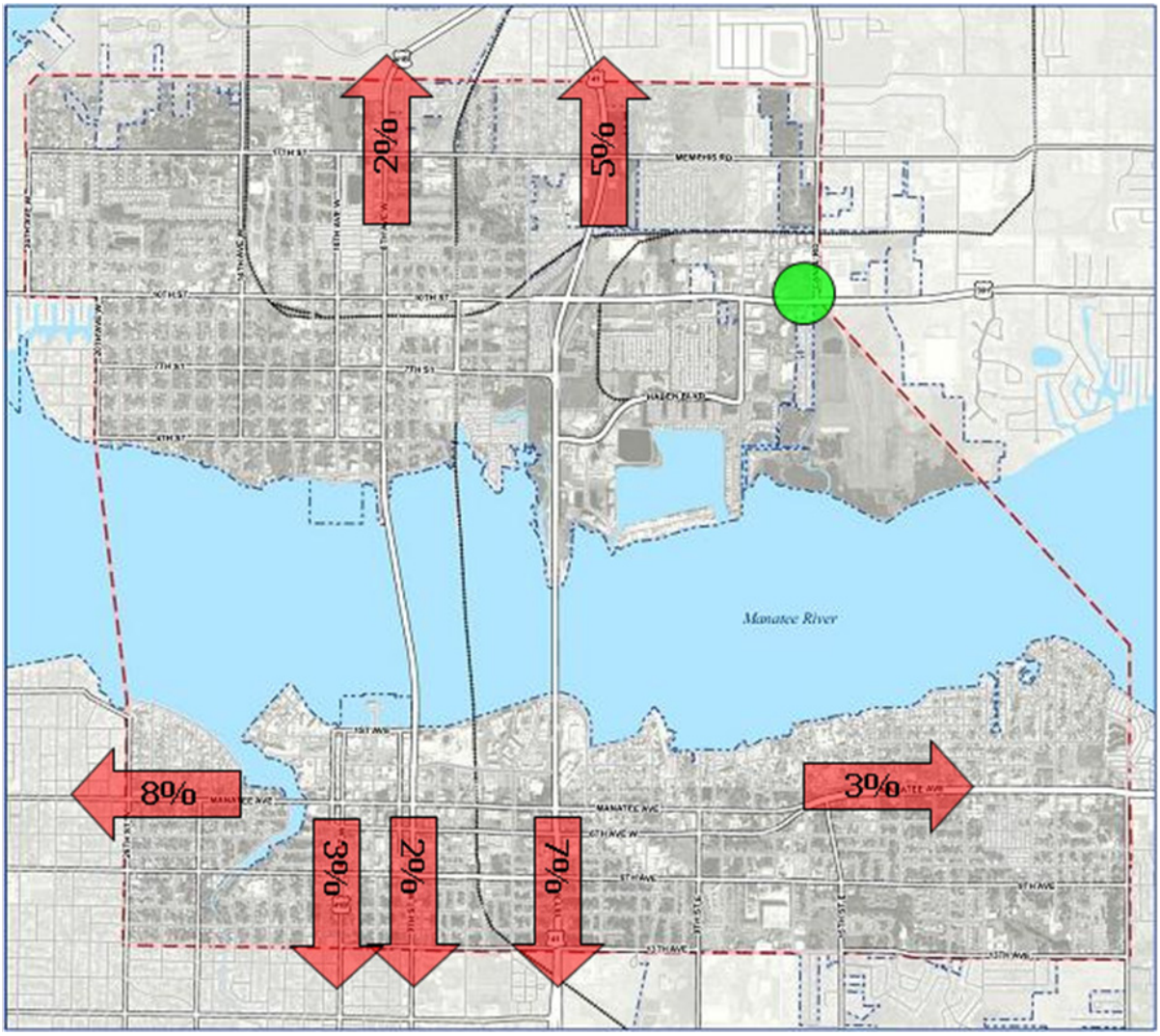


FIGURE 10 – SR 64 (BRADENTON) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 41% of the trips are regional and do not stop in the study area
- ☐ 15% entering this point exits the same location
- ☐ 11% entering this point cuts through the downtown to west Bradenton

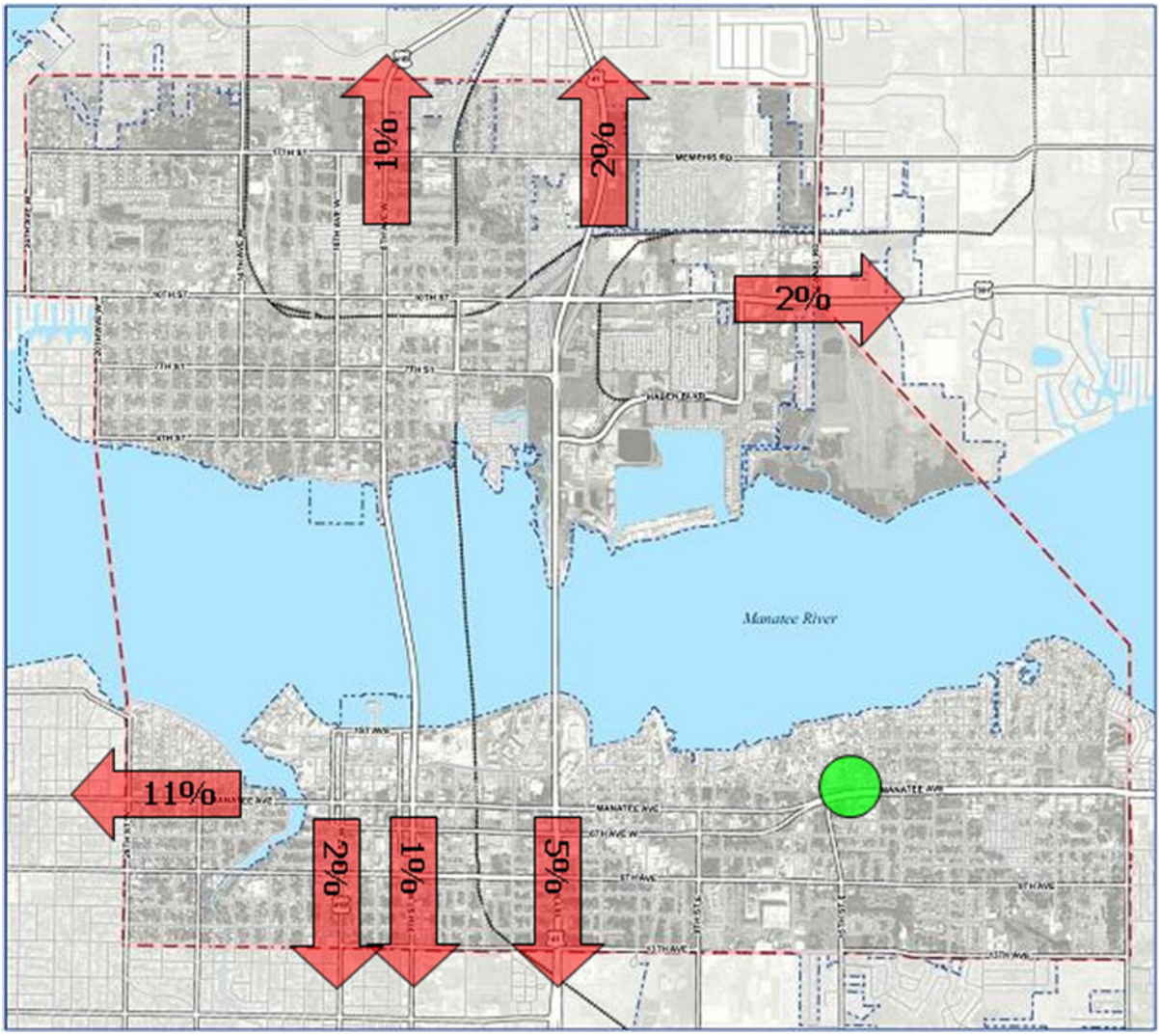


FIGURE 11 – US 301 (BRADENTON) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 59% of the trips are regional and do not stop in the study area
- ☐ 24% entering this point crosses the DeSoto Bridge and exits the study area
- ☐ 20% entering this point exit east on SR 64

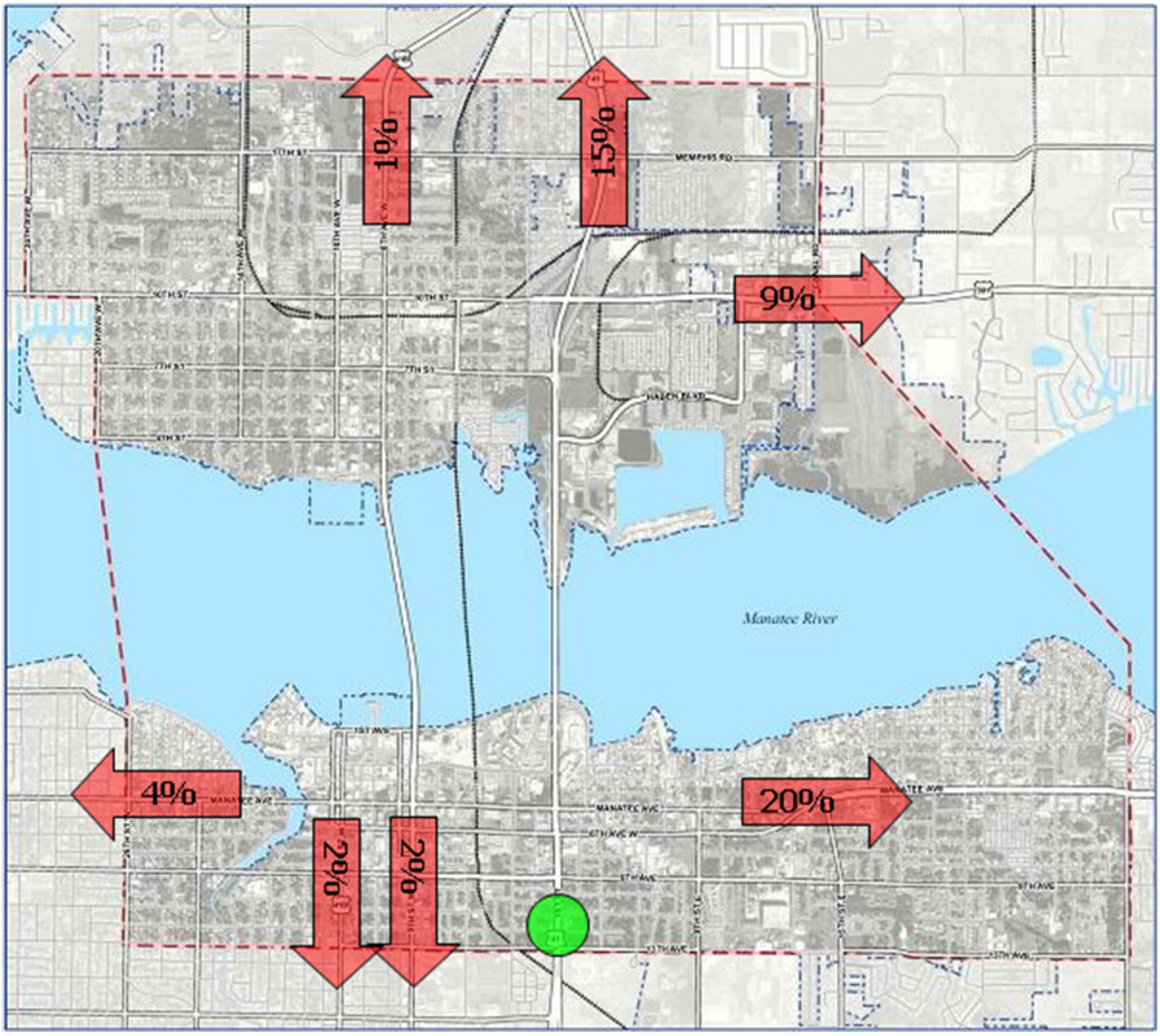


FIGURE 12 – 9TH STREET (BRADENTON) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 47% of the trips are regional and do not stop in the study area
- ☐ 18% entering this point crosses the river and exits the study area
- ☐ Traffic south of the river distributes evenly across the regional road network

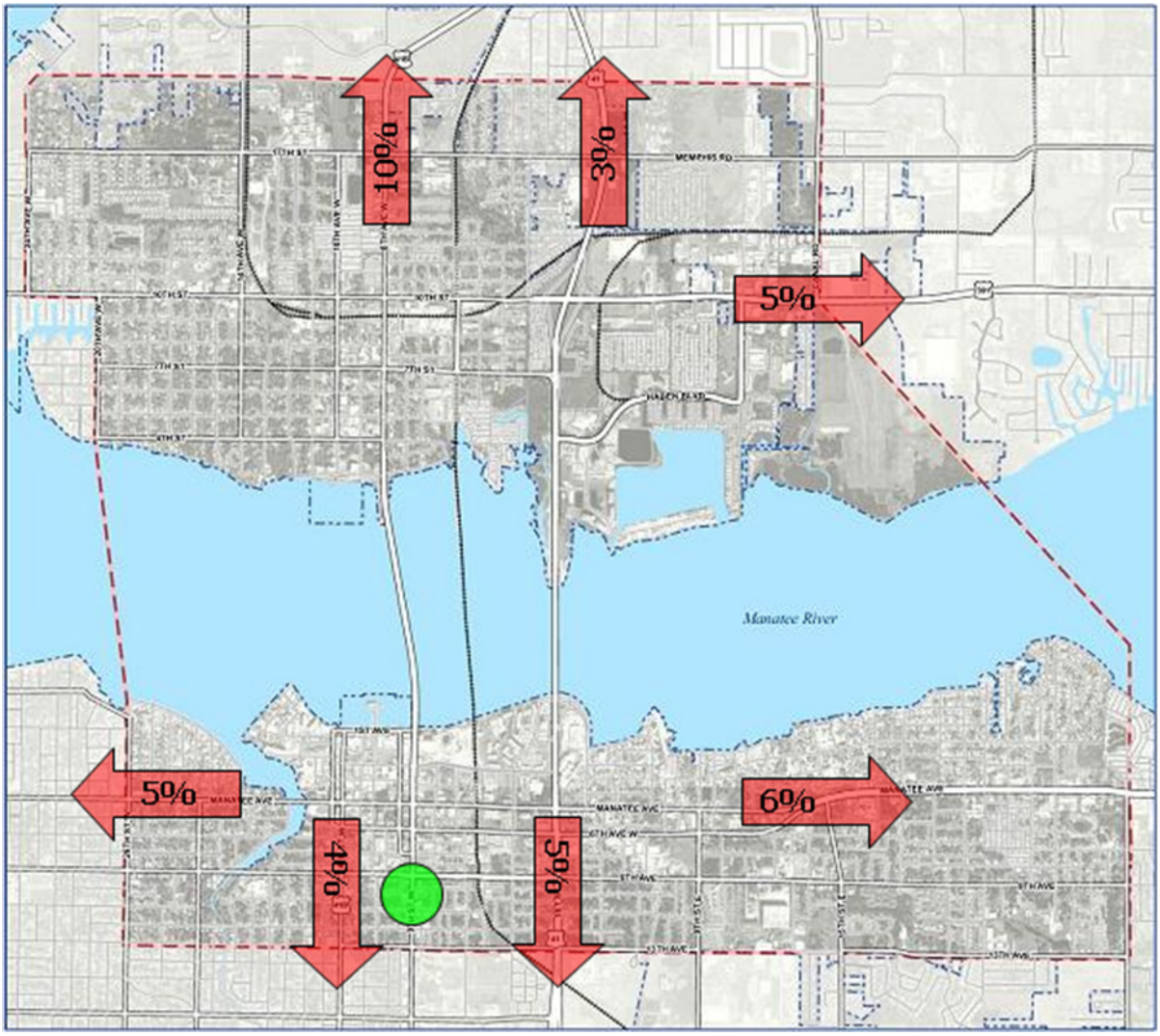


FIGURE 13 – 14TH STREET W (BRADENTON) TRIP ENTRY AND DESTINATION DIAGRAM

- ☐ 42% of the trips are regional and do not stop in the study area
- ☐ 23% entering this point crosses the river and exits the study area
- ☐ Traffic south of the river distributes evenly across the regional road network

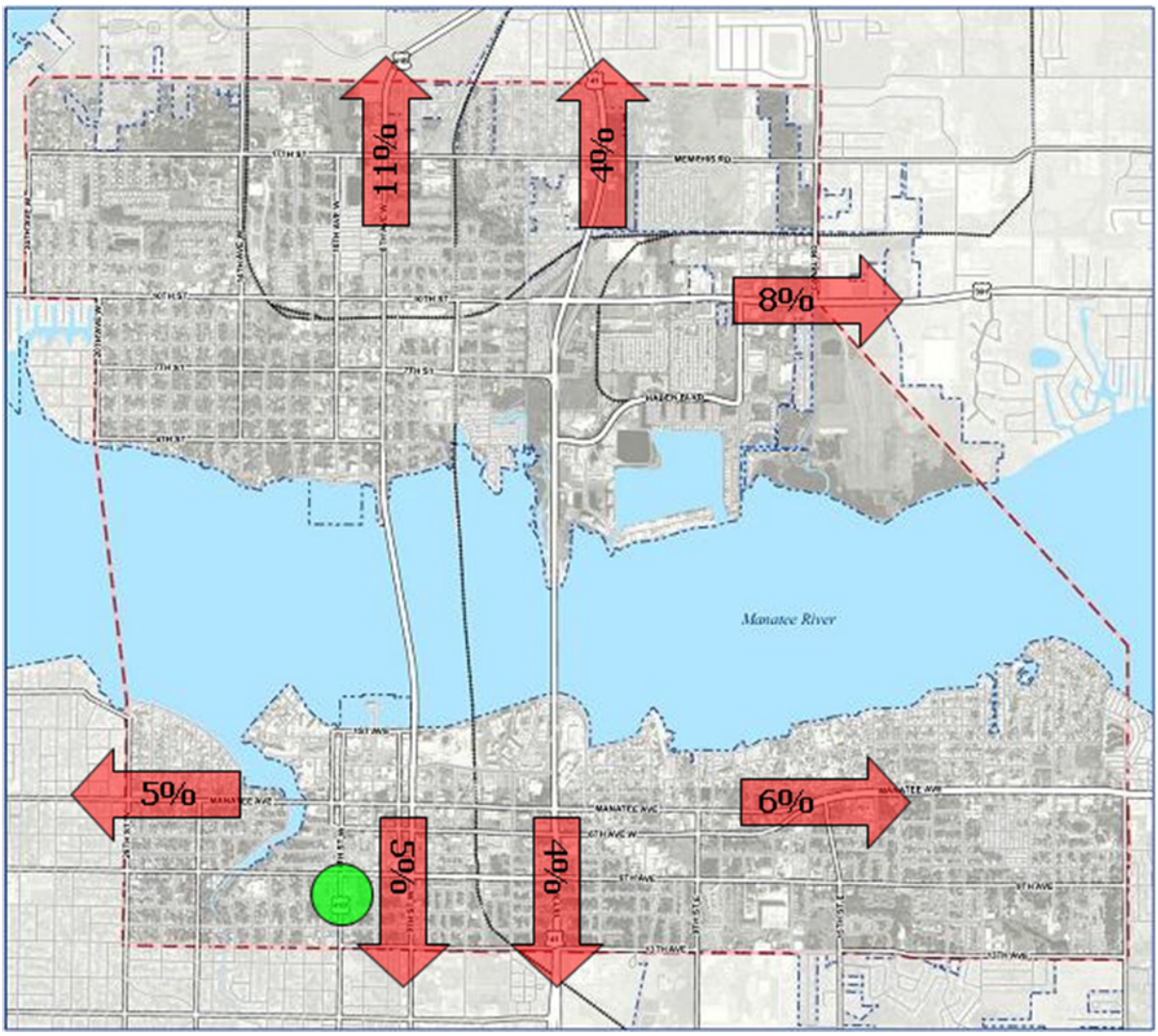
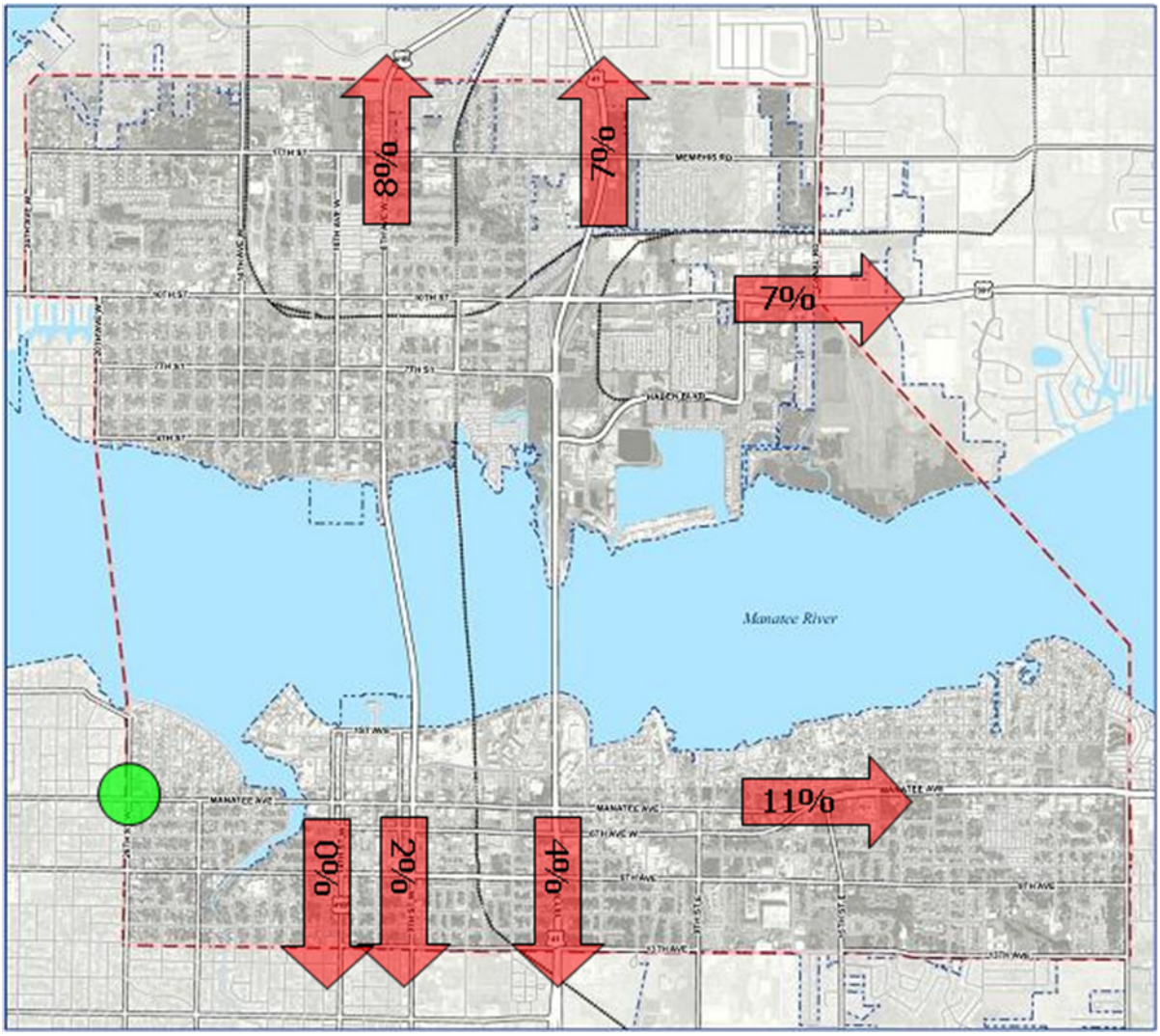


FIGURE 14 – MANATEE AVE WEST (BRADENTON) TRIP ENTRY AND DESTINATION DIAGRAM

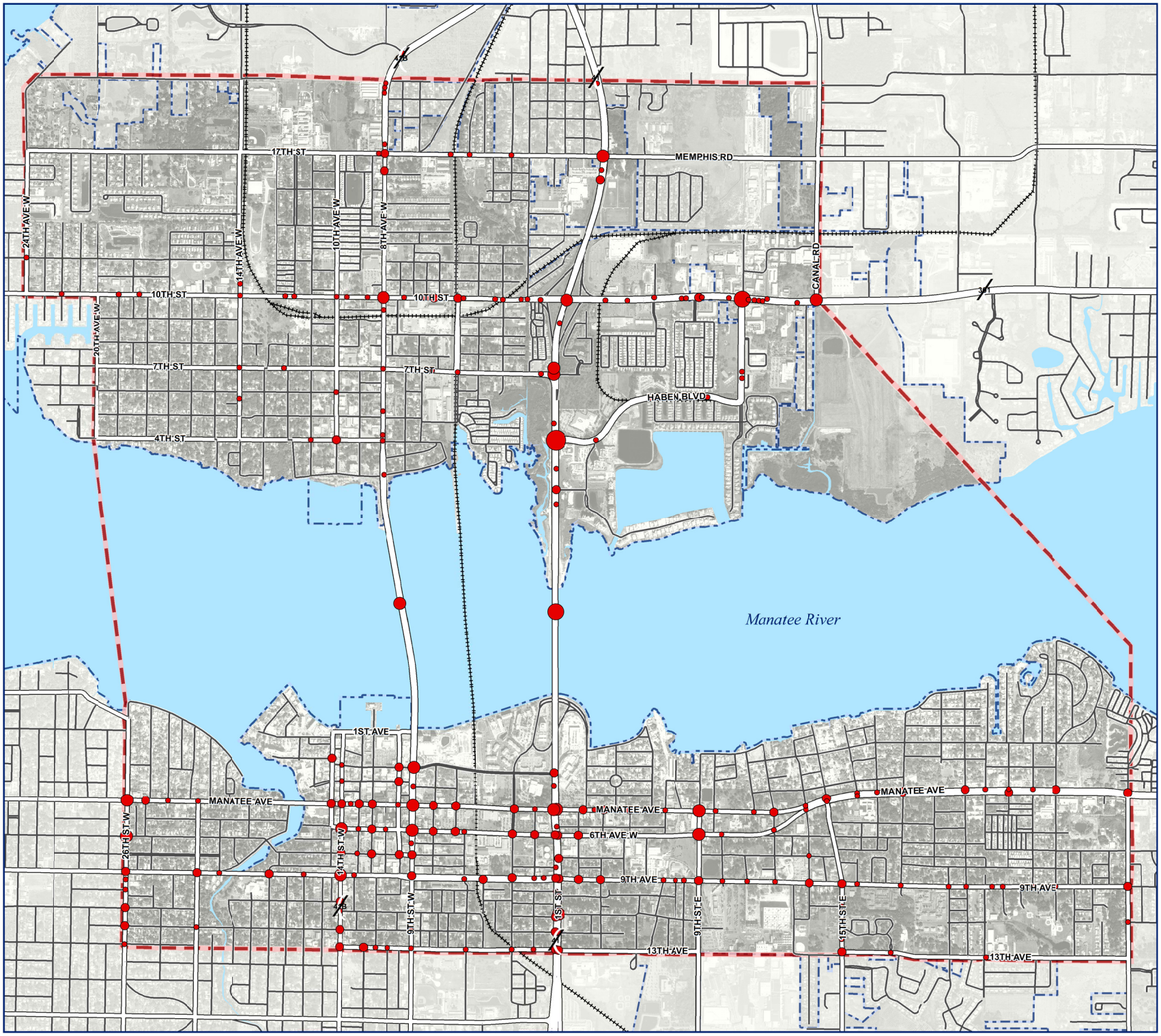
- ☐ 48% of the trips are regional and do not stop in the study area
- ☐ 11% entering this point cut through downtown Bradenton exiting at SR 64
- ☐ 23% entering this point crosses the river to exit the study area



The results of the O-D survey revealed that the downtown study functions more as a destination than previously might have been thought. While there is indeed a large percentage of traffic traveling through the study area on a typical weekday, the local share of trips with a destination in the study area was greater than non-local, or regional trips. In particular, for Manatee Avenue (SR 64), only 11 percent of the traffic continued east- or westbound through the downtown area. In addition, travel on US Business 41 is more locally-oriented than travel on US 41/301. The implications for this pattern are that strategies to disperse traffic across multiple streets and better balance trips across modes appear to be viable approaches to solving downtown mobility problems. It is important that both local and regional transportation needs be addressed.

CRASH DATA

Three years of crash data from 2006 to 2008 were compiled from the City of Bradenton, City of Palmetto, Manatee County and the Florida Highway Patrol. The data entailed summaries of crashes occurring at an intersection, influenced by an intersection and mid-block crashes between intersections on the public roads involving automobiles, pedestrians or bicycles. For this planning level of analysis, the presence and location of the crash to define areas of concentration was the primary focus. The severity, time of day and conditions were not summarized separately. The crash data by location helped inform the planning process and guide consideration of various strategies. Representatives of the Palmetto and Bradenton police departments reviewed the crash data during discussions about safety issues in the study area. Figure 15 presents the summary of crash data for this analysis period.



Bradenton / Palmetto Downtown Mobility Study

Figure 15

Number of Crashes

- 1 - 2
- 3 - 10
- 11 - 50
- 51 - 100
- 101 - 206
- Arterial or Collector Road
- Local Road
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Mi

RENAISSANCE PLANNING GROUP

Most of the crashes in the study area were located at intersections of the major roadway facilities, with Haben Boulevard a particular trouble spot. The intersection of Haben Boulevard at US 41/US 301 had 206 crashes over the three year period, the highest aggregate total of all the intersections. The Haben Boulevard and US 301 intersection had the 3rd highest with 79 crashes over the analysis period. The two major intersections of Haben Boulevard had 285 crashes, 257 more than US 41 at SR 64 (Manatee and 6th Avenue). The intersections of SR 64 (Manatee Ave and 6th Avenue) and 3rd Avenue on US Business 41 in Bradenton had a high concentration of crashes, largely due to the heavy north-south and east-west traffic volume, but also because the short block between US Business 41 and 10th Street creates inadequate storage lengths on 3rd Avenue for traffic approaching US business 41. The short blocks on Manatee Avenue and 6th Avenue create abrupt lane changes in both the AM and PM peak periods for traffic both entering and exiting the municipal parking garage on 10th Street.

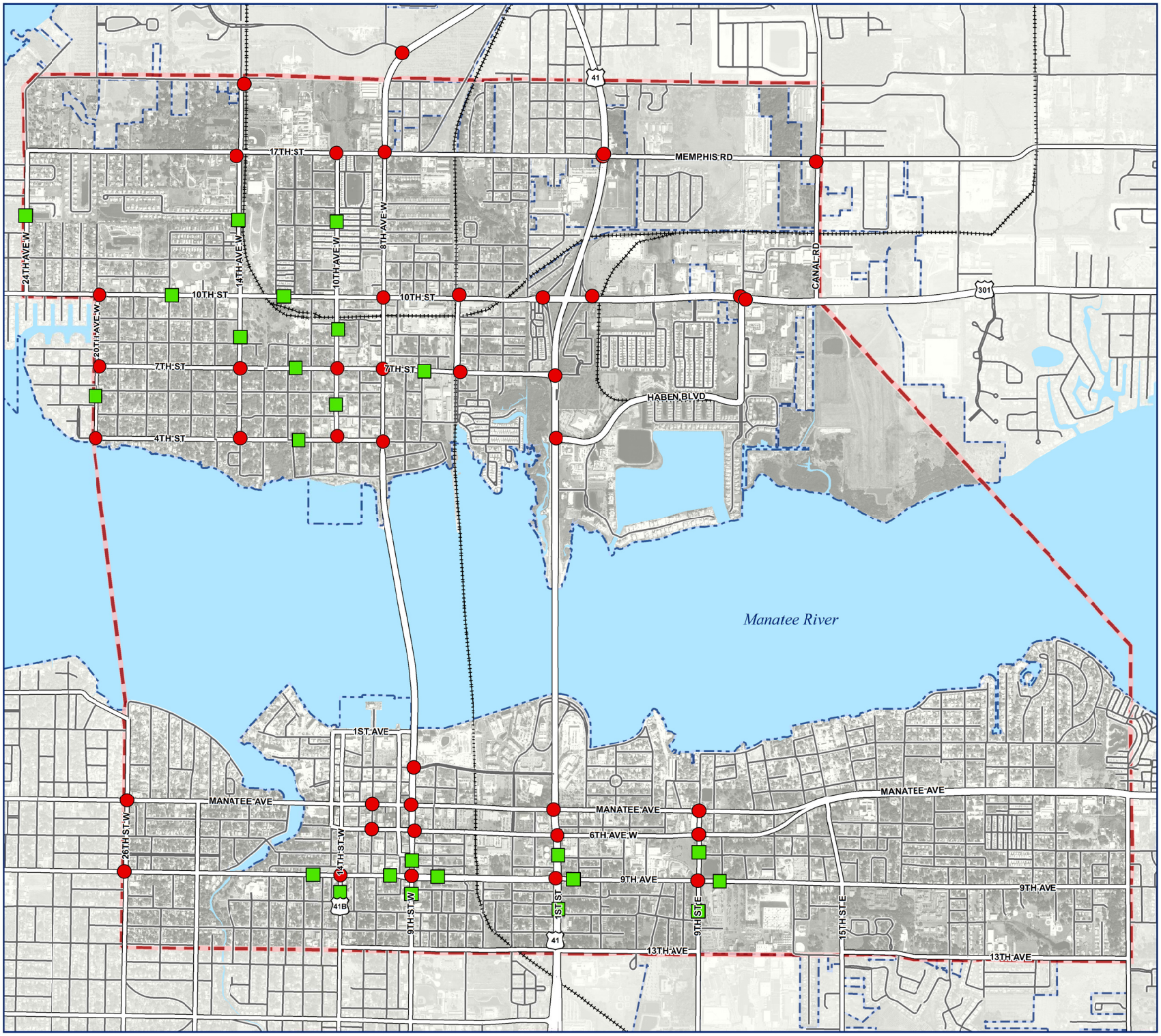
Finally, there were a significant number of crashes on the bridges between Bradenton and Palmetto, with the DeSoto Bridge (US 41/301) having between 50 and 100 crashes over the period. This likely reflects the relatively high speeds on the bridge, narrow travel lanes and back-ups often caused by the Haben Boulevard intersection in the PM peak period, or the Manatee Avenue and 6th Avenue intersections in the AM peak period. Police officers in both cities noted the number of DeSoto Bridge crashes were a function of the abrupt stops motorists often have to make as they crest the apex of the bridge. A lesser number occurred on the Green Bridge, likely because it is a newer facility with lower traffic volumes, the presence of break-down lanes and slower approach speeds.

TRAFFIC DATA

Figure 16 presents traffic count data collection locations. Mid-block count locations were selected to help fill in the data gaps from available permanent count stations established by FDOT on SR 64, US 41/301 and US Business 41. Turning movement counts were collected from 4-6 PM in the 3rd week of February 2008 for critical intersections needed for the base coverage for the micro-simulation model to understand traffic patterns and flows in the peak season. The PM peak period was chosen as the most relevant period of analysis for the downtown travel flows because of retail, office and government-related functions in the vicinity of the study area. FDOT recommended additional counts for intersections along Manatee Avenue and 6th Avenue in order to conduct a more detailed operational analysis of this corridor, and these were collected in July 2008 and April 2009. Table 6, shows the average annual daily traffic (AADT) volumes for roadways in the study area.

TABLE 6 – AVERAGE ANNUAL DAILY TRAFFIC (AADT)

ROAD	FROM	TO	AADT	MUNICIPALITY
MANATEE AVE	26TH ST W	15TH ST W	45,500	BRADENTON
MANATEE AVE	15TH ST W	9TH ST W	25,000	BRADENTON
MANATEE AVE	9TH ST W	1ST ST E	21,500	BRADENTON
MANATEE AVE	1ST ST E	9TH ST E	22,500	BRADENTON
MANATEE AVE	9TH ST E	15TH ST E	20,000	BRADENTON
6TH AVE W	15TH ST W	9TH ST W	23,000	BRADENTON
6TH AVE W	9TH ST W	1ST ST E	20,000	BRADENTON
6TH AVE W	1ST ST E	9TH ST E	19,500	BRADENTON
7TH AVE E	9TH ST E	15TH ST E	19,500	BRADENTON
MANATEE AVE	15TH ST E	27TH ST E	18,000	BRADENTON
1ST ST	MANATEE AVE	6TH AVE	57,000	BRADENTON
9TH ST W	MANATEE AVE	6TH AVE	26,000	BRADENTON
8TH AVE	14TH ST W	10TH ST W	16,500	BRADENTON
US 41	HABEN BLVD	MANATEE AVE	61,000	BRIDGE
BUS 41	4TH ST	MANATEE AVE	34,000	BRIDGE
US 41	MEMPHIS RD	10TH ST E	35,500	PALMETTO
BUS 41	21ST ST	17TH ST	20,500	PALMETTO
8TH AVE W	17TH ST	10TH ST	24,500	PALMETTO
8TH AVE W	10TH ST	7TH ST	29,500	PALMETTO
10TH ST	10TH AVE W	8TH AVE W	15,500	PALMETTO
10TH ST	8TH AVE W	US 41	22,500	PALMETTO
10TH ST	US 41	HABEN BLVD	37,500	PALMETTO
10TH AVE W	17TH ST	10TH ST	3,160	PALMETTO
10TH AVE W	10TH ST	7TH ST	4,683	PALMETTO
10TH AVE W	7TH ST	4TH ST	3,474	PALMETTO
7TH ST	20TH AVE W	14TH AVE W	2,389	PALMETTO
7TH ST	14TH AVE W	10TH AVE W	2,389	PALMETTO
7TH ST	10TH AVE W	8TH AVE W	2,389	PALMETTO
7TH ST	8TH AVE W	5TH AVE W	9,506	PALMETTO
7TH ST	5TH AVE W	US 41	9,506	PALMETTO



Bradenton / Palmetto Downtown Mobility Study

Figure 16

Traffic Count Locations

- Mid-block Count
- Turning Movement
- Arterial or Collector Road
- Local Road
- Railroad
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

As part of the count data collection, the study team also collected truck, pedestrian and bicycle counts. These counts were uniformly relatively low. For example, the highest truck volume counted was southbound on US 41/301, with 90 trucks in the peak hour, which is about four percent of total traffic. The highest percentage truck location was on SR 64 at 9th Street East (23 percent or about 25 vehicles in the peak hour), which can be attributed to the Tropicana facility. At certain times of the year there is more truck activity associated with the Tropicana plant, but truck traffic overall is not a major influence on travel patterns and characteristics in the study area.

LEVEL OF SERVICE AND DELAY

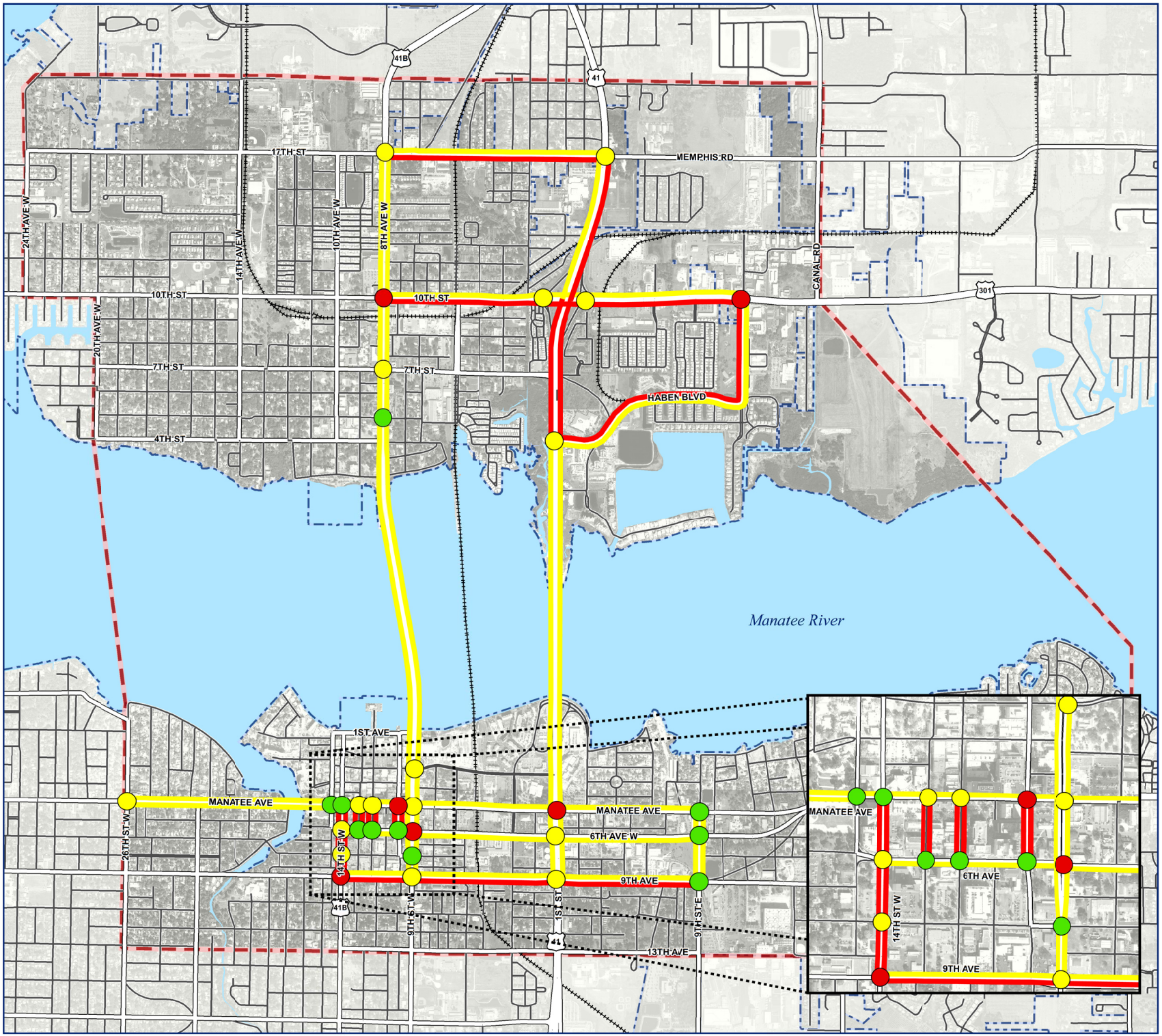
As a screening tool, the study evaluated generalized roadway operating conditions to assess overall system performance, which led to a more detailed operational analysis to develop and evaluate specific alternatives. From the 2008 traffic counts collected as part of this study and data collected by the FDOT, existing roadway level of service was determined for the PM peak hour and evaluated with FDOT's ART_PLAN level of service software.

Figure 17 presents the existing PM peak hour level of service on functionally classified study area roadway segments. A majority of the roadways in the study area are within the LOS standards established by the comprehensive plans of both cities. The screening identified both the Green and DeSoto Bridges exceeding their LOS standard, this is largely due to the intersections anchoring the segments at both ends. The downstream traffic on the DeSoto Bridge (US 41/US 301) experiences delays at the Haben Boulevard intersection north of the Manatee River, and at the intersections of SR 64 and MLK, Jr. Avenue. These intersections have heavy east-west movements competing with the north-south traffic crossing the river. The same situation is occurring on the Green Bridge, the north-south traffic is competing with the heavy east-west movements of SR 64.

The major roadways in the core of Bradenton have been flagged as exceeding the LOS because of the number of closely spaced signals and relatively short segments on SR 64 (Manatee Avenue and 6th Avenue) and 14th Street West. The same situation is occurring on 10th Street in Palmetto with traffic approaching US Business 41.

The primary roadway networks – US 41/301, US Business 41, SR 64 (Manatee and 6th Avenues) – were modeled in Synchro (version 7) for the purpose of developing a traffic analysis tool to test potential operational improvements. The first step is to model and validate existing conditions using current field conditions (i.e., traffic volumes, geometry and signal timings). Current signal timings were obtained from the City of Bradenton, Manatee County and FDOT for use in this analysis. Appendix C presents the existing conditions analysis outputs from the Synchro model in Highway Capacity Manual format.

The existing delay and levels of service (LOS) associated with the network intersections are presented in Figure 17.



Bradenton / Palmetto Downtown Mobility Study

Figure 17

Existing Network 2008 Traffic Volume PM Directional LOS

Intersection Level of Service Grade

- A or B
- C or D
- E or F

Roadway Level of Service Grade

- A or B
- C or D
- E or F
- Arterial or Collector Road
- Local Road
- Railroad
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Mi

RENAISSANCE PLANNING GROUP

TABLE 7 – INTERSECTION VC DELAY

INTERSECTIONS	EXISTING CONDITIONS (2008 VOLUME / 2008 NETWORK)	
	V/C Ratio	Delay
10th Street @ Bus 41	1.02	69.0
US 301 @ Haben Blvd	1.01	81.7
Manatee Ave @ 12th Street	0.72	13.7
6th Ave @ 12th Street	0.45	9.8
7th Street @ Bus 41	0.68	20.2
17th Street @ US 41	0.97	48.6
17th Street @ Bus 41	0.59	32.2
5th street @ Bus 41	0.71	13.1
8th Street @ Bus 41	0.50	29.1
Manatee Ave @ 10th Street	0.71	17.9
Manatee Ave @ US 41	1.06	57.3
Manatee Ave @ Bus 41	0.97	45.9
3rd Ave @ Bus 41	1.07	46.2
6th Ave @ 10th St	0.62	19.0
Manatee Ave @ 13th Street	0.67	10.4
6th Ave @ 13th Street	0.47	15.1
6th Ave @ 14th Street	0.68	21.4
14th Street @ 8th Ave	0.51	43.3
Manatee Ave @ 14th Street	0.70	6.0
Manatee Ave @ 15th Street	0.80	1.1
6th Ave @ Bus 41	0.88	38.7
6th Ave @ US 41	0.86	37.9
6th Ave @ 9th St E	0.66	15.6
Manatee Ave @ 26th St	0.92	44.0
9th Ave @ Bus 41	0.76	31.8
9th Ave @ US 41	0.70	33.6
9th Ave @ 14th Street	0.81	87.1
Haben Blvd @ US 41	0.98	36.7
9th Ave @ 9th Street	0.42	21.3
Manatee Ave @ 9th Street	0.56	19.1
US 301 @ US 41 SB	0.79	22.3
US 301 @ US 41 NB	0.70	29.7

BRADENTON AREA

The main observation from the existing conditions analysis is that the north-south travel on the regional roadway network, principally the US 41/301 corridor, experiences significant levels of traffic congestion and delay. The northbound traffic operates at an average travel speed of 17 mph through the study area, with more than 150 seconds of delay. Southbound traffic operates at just over 20 mph with 95 seconds of delay in the PM peak hour. Most of this delay occurs because of the competing demand for travel between the eastbound through movement on 6th Avenue and the northbound through movement on US 41/301. Another factor is the closely spaced signals at 9th Avenue (MLK, Jr. Avenue, 6th Avenue and Manatee Avenue).

A six-block section of Manatee Avenue and 6th Avenue through downtown Bradenton (US Business 41 to 15th Street West) is identified in the generalized LOS analysis as operating at LOS E and F conditions. However, a more detailed analysis reveals that the intersections operate at LOS C or better, with a mere 28 seconds of delay in the eastbound direction, and 45 seconds of delay in the westbound direction. The perceived congestion in the PM peak period does not extend longer than one or two cycles of the traffic signals' timing.

PALMETTO AREA

The main observation from the existing traffic conditions within the City of Palmetto portion of the study area is that traffic generally operates within the adopted level of service standard in the PM peak period, with one exception. The traffic volume approaching US Business 41 on 10th Street from the west indicates the segment between 10th Avenue and US Business 41 is deficient. This is a relatively short segment and the intersection signal timing gives first priority to the north-south traffic flow on US Business 41 and second to the eastbound traffic of 10th Street approaching from US 301. Delay at this approach is in excess of 134 seconds and the through movement is 17 percent over capacity.

A more detailed analysis was also performed for the study area segments and intersections in the City of Palmetto. It found that there are some critical movements at Memphis Avenue (17th Street), Haben Boulevard, and the interchange of US 301 at US 41 with some delay, but all operate within an acceptable level of service.

Measures of Effectiveness (MOEs) – Travel Time / Delay / Speed

As highlighted in the Transportation Performance Measures section, the existing roadway network was calibrated and summarized in Synchro 7 from turning movement counts and signal timing data obtained from the local entities. The major network (Manatee Ave., 6th Ave., US 41 and US Bus 41) was used as the baseline condition to measure the alternatives against traffic growth in the horizon year (2013) and recommended modifications. Table 8 shows the travel time, delay and speed of the major facilities under existing conditions.

TABLE 8 – MEASURES OF EFFECTIVENESS

	DISTANCE (MILES)	TRAVEL TIME (HRS: MIN : SEC)	DELAY (HRS: MIN : SEC)	AVERAGE SPEED (MPH)
Manatee Ave (9th Street E -> 14th Street W)	1.35	0:05:02	0:02:04	14
6th Ave (9th Street E -> 14th Street W)		0:05:45	0:02:46	16
US 41 (9th Avenue -> Haben Boulevard)	1.77	0:06:07	0:02:30	17
US 41 (Haben Boulevard -> 9th Avenue)		0:05:11	0:01:35	20
US Business 41 (9th Avenue -> 17th Street)	2.56	0:09:54	0:04:31	16
US Business 41 (17th Street -> 9th Avenue)		0:09:16	0:03:54	17

ISSUES AND OPPORTUNITIES

Figure 18 presents a summary map that identifies key issues, opportunities and constraints for mobility in the downtown study area. An initial version of this map provided a foundation for discussion at the first public workshop, and public comments were used to further refine the map and table.

Each issue and opportunity is categorized into the following types:

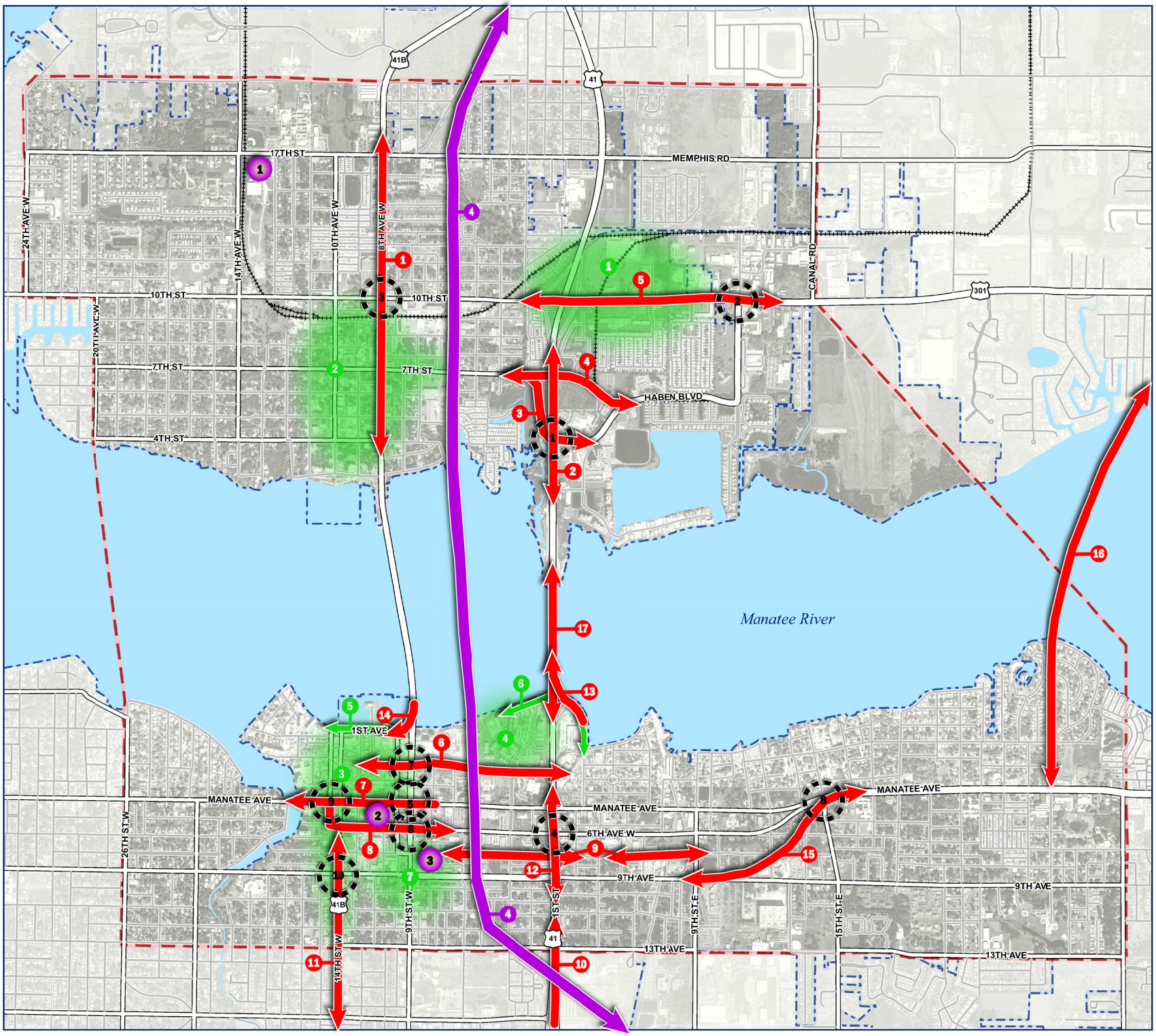
- ☐ Roadway Network (shown in **red**)
- ☐ Transit System (shown in **purple**)
- ☐ Bike/Pedestrian System (shown in **green**)
- ☐ Study Intersections (shown in **black**)

Within each of those types, the issues/opportunities are separated geographically into Palmetto, Bradenton and whole study area and numbered (which corresponds to the map).

TABLE 9 – ISSUES AND OPPORTUNITIES MAP KEY

ROADWAY NETWORK	
PALMETTO	US 41 B (8th Ave W)- main through corridor; could be made more livable, especially if 7th St becomes a gateway; need to address no left turn lane and through capacity issues
	Grade separate Haben Blvd
	Grade separate US 41 from start of bridge to US 41/301 interchange and extend Haben Blvd to meet up with 7th St
	Build Haben Blvd extension and align with 7th St
	US 301 near interchange to Haben Blvd: Not enough spacing to the left on US 301 to go south, so people are bypassing US 301 interchange going to Haben Blvd and then going south on US 41
BRADENTON	3rd Avenue does not function as a good through-street because you cannot go east of Desoto Bridge (near hospital)
	Manatee Avenue- signal spacing or signal timing (signals at 9th, 10th, 12th, 14th and 15th St)
	6th Avenue- signal spacing or signal timing (signals at 9th, 10th, 12th and 14th)
	Need to connect 8th Ave to create a grid (to connect back into west); gap between 9th St & US 41/US 301
	US 301/41 NB is relatively free flow until you get near RR tracks (after Tropicana); if one is traveling in the left lane it is difficult to merge back into the center lane to go north across the bridge - due to regular queue back-ups to 13th Ave and closely spaced signals at Manatee Avenue (in peak season/peak hour, it is much worse)
	14th Street is a redevelopment corridor- lends itself to a livable roadway concept design (Village of Arts is here)
	Grade separate US 41 (1st Street)
	On-ramp to US 41 N (near War Memorial)
	Off-ramp from US 41B onto 1st Avenue
	Connect 9th Avenue to 7th Avenue
WHOLE STUDY AREA	Potential 3rd bridge- Ellenton/Gillette to 26th St E
	Desoto bridge- breakdown lane could serve as an additional lane

TRANSIT SYSTEM	
PALMETTO	Small bus shelter at 17th St, W of Business 41
BRADENTON	MCAT transfer location- show existing transit locations; new location needs to be identified
WHOLE STUDY AREA	Regional rail connection- use underutilized asset- rail line • Should reserve space for intermodal hub (on 9th Ave) that would connect Manatee County to Tampa Bay • Could serve as a catalyst for E-W bus service, mixed-use development, etc • Should not be difficult to share space with Tropicana freight traffic
BIKE/PEDESTRIAN SYSTEM	
PALMETTO	Pedestrian Activity Center: US 301/US 41 (mobile home area to retail/shopping)
	Pedestrian Activity Center: Downtown Palmetto
BRADENTON	Pedestrian Activity Center: Downtown Bradenton- along Manatee Ave near Main St; Barcarrota Blvd (existing facilities in place)
	Pedestrian Activity Center: Area between bridges north of 3rd Avenue (civic uses can be built)
	3rd Ave, especially near riverfont and Main Street
	Difficult for pedestrians traveling underneath Desoto Bridge (W to E) to the hospital and hotels • A promenade is being built along riverfront, but connection is dark, unfriendly and a perceived barrier • If we improved this connection, it could enhance access to downtown
	Pedestrian Activity Center: Village of the Arts
	Pedestrian Activity Center: Expanded urban central business district overlay
WHOLE STUDY AREA	N/A
STUDY INTERSECTIONS	
PALMETTO	US 41 & Haben Blvd – multiple WB left turns
	US 301 & Haben Blvd -WB left turns from US 301 onto Haben Blvd (near Walmart)
	8th Ave (US 41 B) & 10th St- conflicts on left turns, limited capacity for EB and WB, heavy traffic NB and SB
BRADENTON	6th Ave & 1st St (Desoto Bridge)- high traffic volumes at each approach to intersection
	SB right turns onto Manatee Ave from Bus 41 (9th St W) – shared thru-right turn lane causes issues
	6th Ave & 9th St W- turn lane distance is too short/queue back-ups for those taking SB lefts onto 6th Ave
	3rd Ave & 9th St W- if one is traveling WB on 3rd Ave, there are too many people going left and right; not enough through-traffic, so those going through have trouble; heavy traffic coming off bridge
	15 St E & Manatee Ave – proposed roundabout
	15 St W & Manatee Ave- proposed roundabout
	14th St W & 9th Ave – tight lanes; opportunity for redevelopment



Bradenton / Palmetto Downtown Mobility Study

Issue and Opportunities

- Study Intersection
- Roadway Network
- Bicycle and Pedestrian System
- Pedestrian Activity Center
- Transit System
- Transit Activity Center
- Arterial and Collector Roads
- Local Road
- Railroad
- Study Area Boundary
- Municipal Area Boundary

Figure 18

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

PUBLIC INVOLVEMENT

PUBLIC INVOLVEMENT

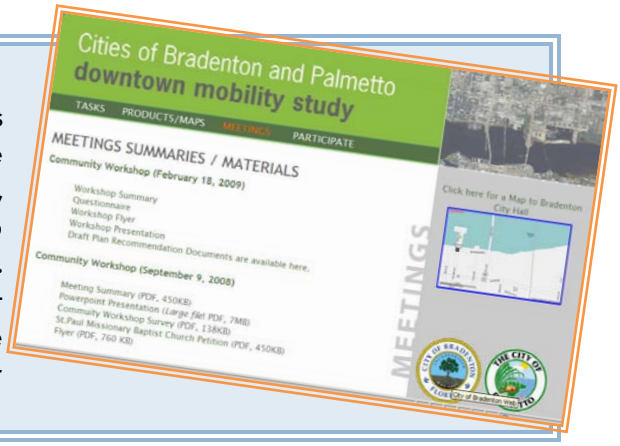
ENGAGEMENT PROCESS

Public Involvement Activities

Generally speaking, the purpose of the public involvement plan for the Bradenton/Palmetto Downtown Mobility Study was to provide various opportunities through which the community could provide their input and ideas for addressing downtown transportation issues, and to obtain feedback on alternatives to build consensus on solutions that best reflected the varied needs and interests in the study area. Therefore, the study included a range of public outreach mechanisms, including community workshops and meetings, one-on-one interviews, steering committee meetings and a project website.

Project Web Site

The project web site www.downtownmobility.com was established to provide interested parties with up-to-date project information, results of public outreach activities, and a means to provide additional comments and sign up to receive communications, announcements and the like. This venue allows people to stay apprised of project activities throughout the course of the study. The web site was updated at key milestones, such as before and after workshops.



Focus Groups

Two focus groups were held early in the study: one in Bradenton and one in Palmetto. Focus group discussions produce insights not easily obtained in other settings. This setting allows participants to relate their own personal experiences and ideas in an informal environment, resulting in honest feedback. The primary purpose of these discussions was to highlight and pinpoint the study's goals and objectives, and generate a list of issues and ideas. Focus group participants included business and community interests, such as neighborhoods, chamber of commerce and individual businesses. Outreach to invite participants occurred through local organizations and members of the project steering committee. Some of the specific topics of discussion included:

Is parking downtown a problem?
Why did you decide to locate your business downtown? Or Why did you decide to live downtown?
How do you think downtown is going to change? How do you want it to change?
Is beautification of downtown streets important to you or your business?
What do you see as major impediments to connecting to the two downtowns?
Do you walk or cycle downtown? Why or why not? If so, what streets? Would you if the facilities were present and safe?
What improvements would you like to see on downtown streets?

From these groups, the study team was able to better understand and refine some of the major mobility issues related to automobile travel, pedestrian and cycling and transit. Major issues and ideas for improvement were all rolled into the draft mobility scenarios.

Steering Committee Meetings

A project steering committee was established to guide the study process and provide feedback on study findings. Multiple steering committee meetings were held about every six weeks beginning in April 2008 through spring of 2009 at key junctures during the course of the study. Committee members included representatives from the cities of Bradenton and Palmetto, the Bradenton Downtown Development Authority, the Central Community Redevelopment Agency (CRA), the Palmetto CRA, the Sarasota/Manatee Metropolitan Planning Organization, Florida Department of Transportation, Manatee County and the Manatee Memorial Hospital. In addition, it was common for other interested groups to participate actively in the meetings, such as the Bradenton Police Department, the Manatee Chamber of Commerce, and several downtown business interests. The questions and feedback provided by stakeholders at these meetings were essential in determining next steps and ensuring the study remained true to its goals and objectives.

E-Newsletter

An electronic newsletter for the Bradenton/Palmetto Downtown Mobility Study was released in May 2008 as a notification for an upcoming Community Workshop and to provide a status update. The e-newsletter revisited the focus group meetings and highlighted major points made there, as well as findings from the existing conditions inventory and analysis, the origin-destination survey and land use analysis. Next steps wrapped up the newsletter.

Community Workshops

Three public workshops were held throughout the course of the study at key junctures: review existing conditions, proposed mobility alternatives, and draft implementation plan.

WORKSHOP #1

The kick-off community workshop for the Bradenton/Palmetto Downtown Mobility Study was held at the Central Bradenton Library on May 8, 2008 (see Workshop Flyer in Appendix F). About 50 people attended the workshop, which consisted of an open house, review of existing conditions maps, presentation and group exercise. The primary purpose of the first workshop was to assess the existing conditions work already completed and gain insight into projects or ideas the community wanted to be considered.

A mapping exercise allowed participants to take a hands-on approach in identifying transportation issues in Bradenton and Palmetto, as well as near-term and long-term solutions.

Workshop # 1 Survey Results

The purpose of the survey was to gauge intensity of feelings about mobility issues and opportunities in downtown Bradenton and Palmetto in response to various statements. Each survey respondent was asked to rank each statement on a scale of 1 to 10, with 1 being least supported and 10 meaning strongly supported. A total of 22 surveys were tallied and computed and the following portrays the general findings. (The survey can be found in Appendix F).

The majority of attendees at the workshop work in Bradenton (64%).

About 45 percent of attendees live in Palmetto and 36 percent live in Bradenton.

PALMETTO GROUP	
ISSUES (PROBLEM INTERSECTIONS)	10th Street & 8th Avenue W US 41 & Haben Boulevard US 41 & 17th Street Haben Boulevard at Riviera Dunes
NEAR TERM STRATEGIES	Additional bike lane room and multi-use path on Green Bridge Right turn lane needed on US 41 approaching Haben Boulevard 8th Avenue More pedestrian safety Signal corrections Traffic calming Park and Ride location at 8th Avenue W and north of 17th Street Pedestrian bridges (and pedestrian path connecting the two bridges) US 41 & 17th Street US 41 & north of 17th Street
LONG TERM STRATEGIES	Future transit connections using existing rail line; East-west multi-use trail extending across study area US 41 travel lane widening

BRADENTON GROUP	
ISSUES (PROBLEM INTERSECTIONS)	Manatee Avenue & 6th Avenue one-way pairs; 3rd Avenue; Traffic coming off of DeSoto Bridge cutting through on 3rd Avenue to avoid intersection at Manatee Avenue Used for cut-through to get to Manatee Memorial Hospital This will lead to more problems as the proposed condo developments (just north of 3rd Avenue) are built.
NEAR TERM STRATEGIES	Convert one-way pair to two-way streets with bike lanes, wider sidewalks and parking; Enhance 9th Avenue to carry more of the traffic load (in conjunction with converting one-ways); Install roundabouts at Manatee Avenue & 15th Street E and Manatee Avenue & 15th Street W; Close 12th Street W to vehicular traffic (make pedestrian only); US 41 (1st Street)- Do whatever it takes to make this "the" regional facility to take traffic off of US 41 B (9th Street) and especially through downtown; Improve walking/cycling conditions on Green Bridge; Transit circulators in downtown Bradenton and downtown Palmetto, connecting the two downtowns in a circulating loop Add more parking facilities on periphery (especially on circulator route)
LONG TERM STRATEGIES	Connect 9th Avenue to Manatee Avenue at both ends (once 9th Avenue is enhanced as an alternative east-west facility); Pedestrian walkovers; 3rd Avenue & 9th Street W North of Manatee Ave, near courthouse Water taxi; N of 3rd Avenue, E of Green Bridge Transit – use existing rail line for local or regional transit.

Existing Conditions

The surveys indicated a slightly greater preference for slowing down traffic and improving pedestrian safety on the main corridors as compared to moving traffic through the downtowns to ease congestion/reduce delays. This is further supported by the average score of 7.55 for better defining bicycle and pedestrian connections within the downtown area and surrounding neighborhoods. Increased parking in the downtown is moderately supported (6.3) and expansion of transit service is supported even more so (7.3). The following summarizes survey findings for various statements, with the resulting score on a scale of 1 to 10:

- ☐ The study recommendations should focus on helping to move traffic through the downtowns to ease congestion and reduce delays for people going to other places – 6.35
- ☐ The main corridors of Manatee Avenue, 6th Avenue and 14th Street in Bradenton and 8th Avenue in Palmetto, need to be modified to slow down traffic and improve pedestrian safety and accessibility – 7.05
- ☐ The bicycle and pedestrian connections within the downtown area and to surrounding neighborhoods need to be better defined, with bike facilities or wide sidewalks constructed – 7.55
- ☐ The availability and frequency of transit service in the downtown areas must be substantially expanded to justify increases in future development intensity/density – 7.3
- ☐ There is insufficient or poorly located parking in the downtown area today; more parking is needed to support future development – 6.3

Potential Downtown Transportation Strategies

The potential transportation solutions were met with somewhat neutral support across the board, except for the suggestion to make each of the bridges over the Manatee River one-way, which generated an average score of only 2.88. The conversion of Manatee Avenue and 6th Avenue to two-way roads and 14th Street to a two-lane, divided road scored 6.75 and 6.80, respectively. This indicates a desire to have Bradenton become more pedestrian/cyclist friendly as on-street parking, wider sidewalks and bike lanes would likely be a part of this redesign. Opening up 7th Street (in Palmetto) to Haben Boulevard and making it a pedestrian-friendly gateway into the City was met with moderate support (scores of 6.20 and 6.47 respectively).

- ☐ Convert Manatee Avenue and 6th Avenue into two-way roads to improve accessibility, slow traffic and add design features (on-street parking, bike lanes, wider sidewalks, etc) – 6.75
- ☐ Convert 14th Street in Bradenton into a two-lane, divided roadway to support redevelopment and create a safer pedestrian and bicyclist environment – 6.80
- ☐ Install roundabouts to keep traffic flowing but more slowly at locations such as 15th Street E and other locations along Manatee Avenue in Bradenton – 5.31
- ☐ Make each of the bridges over the Manatee River one-way to improve regional traffic flow – 2.88
- ☐ The study should consider flyovers or interchanges at intersections on roads providing access to the DeSoto Bridge (US 41/US 301) – 5.40
- ☐ Make 7th Street as an east-west pedestrian-friendly gateway into Palmetto – 6.47
- ☐ Improve east-west connectivity in Palmetto by opening up 7th Street to Haben Boulevard – 6.20

Summary Results for Bradenton and Palmetto

Regarding the conversion of one-ways, there was not much difference between Palmetto and Bradenton residents' responses. A couple of Palmetto residents scored this with a "1", but for the most part, it was scored 6 or higher, regardless of residency.

Regarding the one-way bridges statement, Bradenton residents tended to rate this a little more favorable than Palmetto residents (Bradenton had one score of 8 and two scores of 5; Palmetto had one score of 7; the rest of the scores were 3 or below)

No difference in scoring for transit question… residents of both cities scored this 6 or higher.

The question regarding flyovers or interchanges on roads providing access to the Desoto Bridge was generally scored higher by Palmetto residents.

PUBLIC WORKSHOP #2

On the evening of September 9, 2008 Workshop #2 (see Appendix G for flyer) was held at the Palmetto public library to present draft strategies for enhancing the downtown mobility of Bradenton and Palmetto. The presentation focused on four areas of the study process; Review of Study Objectives, Previous Work and Status, Presentation of Mobility Scenarios/Strategies, and Next Steps. Participants then moved to facilitated breakout tables, sharing ideas of what strategies they support, strategies they do not support or new strategies not discussed. The subgroups where divided between Transit Strategies, Roadway Networks Strategies, and Bicycle and Pedestrian Networks Strategies. There were more than 100 people in the audience, many representing the Central CRA neighborhoods located along Martin Luther King, Jr. Avenue in Bradenton, some of whom arrived by private bus owned by area churches.

At the conclusion of the workshop, information was gathered from each table and surveys were provided to gather additional comments from participants. Specific concerns were raised throughout the evening's discussions. The majority of the participants were present to discuss and oppose the conversion of Martin Luther King, Jr. Avenue to a one-way street, which was an earlier mobility strategy that had been evaluated but discarded prior to the workshop. Residents expressed concerns that more traffic diverted to this corridor would further "box" them in and create a greater disconnect to the downtown area. Some residents expressed concerns regarding safely accommodating truck traffic around proposed roundabouts. Most of the residents present verbally supported the idea of creating a Transit Mall along 13th Street W in Bradenton, which would further enhance the pedestrian connection between the residential areas and the downtown.

Workshop #2 Survey Results

The entire survey is available in Appendix G. Participants were asked to rate the following near-term and long-term strategies on a 1 to 5 scale, where 1 = Hate this idea; 2 = Not the best option; 3 = I'm on the fence; 4 = Like this idea; and 5 = Love this idea. A majority of respondents voted overwhelming against all of the statements, likely reflecting the fact that many showed up to the meeting already upset about the proposed one-way conversion of MLK, Jr. Avenue.

Construct a roundabout at Manatee Ave. and 15th St. W and connect 15th Street W to 9th Avenue
Majority of respondents hated this idea (87.1%)
Replace one lane of traffic on Manatee Avenue and 6th Avenue with on-street parking, wider sidewalks and other amenities while keeping it as a one-way pair
About half of the respondents hated this idea (57.5%) **Only 6.8% loved the idea**
Create additional capacity (continuous 4 lanes) on 9th Avenue/Martin Luther King, Jr. with a connection to 15th Street West
92% of respondents hated this idea
Reduce 14th Street in Bradenton and 8th Avenue in Palmetto (Business 41) to a 2 lane road with a center turn lane, on-street parking and enhanced pedestrian amenities
67.2% hate this idea **14.8% on the fence**
Reconnect the grid street network along 8th Avenue, 15th Street and 3rd Avenue in Bradenton, and 7th Street and 10th Avenue in Palmetto
About half of respondents are on the fence (55.3%) **29.8% hate this idea**
Convert US 41/US 301 to a controlled access regional road with an urban interchange in Bradenton and overpasses at Manatee Avenue, Haben Boulevard, 7th Street and 17th Street
52.3% on the fence **25% hate the idea**
Construct a roundabout at 9th Street and 9th Avenue and a new road connection from 9th Street E to Manatee Avenue on the east
89.1% hate the idea
Widen 15th Street W to 4 lanes from 9th Avenue/MLK Avenue, Jr. to Manatee Avenue
87.9% hate the idea
How do you feel about a downtown hybrid electric circulator operating every 10-15 minutes as an option for expanding transportation choices and helping reduce the number of vehicles in the downtown area?
48.1% on the fence **28.8% hate the idea** **11.5% love the idea**
Would you support a re-allocation of local and state/federal funds to enable an increase in MCAT bus service frequency to 30 minutes or better on routes serving downtown (Routes 1, 2, 3, 4, 9, 13 and 99)
47.1% on the fence **19.6% hate the idea** **13.7% like the idea**
Are you supportive of a long-term strategy to bring passenger rail service (via TBARTA) to Bradenton and Palmetto, connecting to Tampa and St. Petersburg?
46.2% on the fence **23.1% love the idea**
A potential Transit Mall corridor is along 13th Street W between 8th Avenue W and 6th Ave W. This concept would include the creation of a dedicated transit right-of-way and construction of a multi-use transfer facility at 13th St W and 8th Ave W.
54.2% on the fence **14.6% hate the idea** **12.5% love the idea**

It should be noted that in response to this workshop, the recommended mobility plan for Bradenton was revised to address neighborhood concerns about MLK, Jr. Avenue and create an additional outlet for the neighborhood south of MLK, Jr. Avenue. A subsequent community meeting was held with representatives of the affected neighborhoods to discuss the study alternatives, issues and potential solutions, which was an effective way to respond to the community concerns expressed at the 2nd workshop. It helped set a positive foundation for the final workshop on the recommended plan.

PUBLIC WORKSHOP #3

The final workshop for the Bradenton/Palmetto Downtown Mobility Study aimed to seek public input on the draft Multimodal Plan recommendations, including priorities and funding options. The workshop was held February 18 at the Bradenton Municipal Auditorium from 5:30 to 7:30 pm in an open house format. Short-term and long-term strategies focus on roadway, bicycle/pedestrian and transit improvements including project costs and an action plan to enhance mobility as a complement to downtown redevelopment goals. The recommendations proposed design improvements for a new Downtown Transit Center in Bradenton, modifications to support a shared path for cyclists and pedestrians on the Green Bridge, traffic flow/calming features such as roundabouts; and ways to make Manatee Avenue, 14th Street W (Bradenton) and 8th Avenue (Palmetto) more pedestrian-friendly while maintaining traffic flow.

The workshop began with an informal review of project materials, followed by a presentation. The presentation reviewed the plan's near-term and long-term recommendations for roadway, transit and bicycle/pedestrian projects. An implementation plan was also proposed, including potential funding options for an estimated $50 million in needed transportation projects. The following outlines the near-term implementation plan (0-3 years) for Bradenton and Palmetto.

BRADENTON	Manatee Avenue and 6th Avenue lane modifications
	MLK, Jr. Avenue restriping for on-street parking and calming
	13th Street transit mall
	Green Bridge shared use path
	9th Street E @ Manatee Avenue intersection improvements and signage
	Enhanced pedestrian facilities
PALMETTO	10th Street – Add center turn lane and intersection improvements
	Haben Boulevard roundabout
	Haben Boulevard / US 301 intersection improvements
	Green Bridge shared use path
	Bike and pedestrian markings on 4th and 20th Streets

After the presentation, the team was available to discuss the plan recommendations and answer questions. The attendees were asked to complete a brief questionnaire, which is summarized below. A majority of questionnaire respondents live and/or work in Bradenton.

Package of Proposed Mobility Strategies

Almost 90 percent of respondents support (with or without reservations) the recommended plan for automobile circulation in the two downtowns. The split is just about even between these two groups. Reservations are raised concerning charging for parking to get people to use garages, using angled parking as opposed to parallel parking, and implementing traffic calming on 17th Avenue West.

About 60 percent of respondents fully support the recommended bicycle and pedestrian circulation plan, while the remaining 40 percent support with reservations, including concern over having only one side of the bridge with a bike path. And 53 percent support the plan for transit circulation, 42 percent support with reservations, with one attendee indicating that a trolley or tram should be considered in place of a traditional bus. In addition, there was a need expressed for bus service on 15th Street East from MLK, Jr. Avenue to 26thAvenue East.

Individual Plan Components

(The following are comments made by workshop attendees and are paraphrased for ease of understanding).

Calming Manatee Avenue is unrealistic unless a vibrant downtown exists
No more roads should be closed in Bradenton; re-open 5th Street and 11th Avenue W
Make Manatee Avenue a two-way street and not a through-street; need something to use as a bypass to keep folks moving
Palmetto transit leaves a group at Business 41 and 26th Street W stranded (68-unit low-income apartments for seniors)
Provide density mitigation combined with concurrency waivers

Timing of Plan Components

About half of all respondents support a third bridge crossing of the Manatee River, while half do not support US 41 overpasses over major roadways. Related to near-term strategies, 41 percent of respondents support lane reductions on Manatee Avenue & 6th Avenue, 14th Street W in Bradenton and 8th Avenue in Palmetto, 35 percent support this with reservations and 24 percent do not support the proposal. And all respondents (100 percent) agree with the phasing of the plan components.

Additional Comments

The following are comments made by workshop attendees and are paraphrased for ease of understanding.

[Need] water taxi from Bradenton to Palmetto and out to the island
There is no reason to go to downtown Bradenton. Most "needs" are satisfied by Sarasota and Tampa; doubt that the financial and community leadership exists to create the "art & cultural mecca"
Looks like an excellent way to begin necessary "restructuring" of traffic patterns to enhance usage of downtown area
Maximize on-street parking in downtown to get visitors and retail even if it means decreasing sidewalk widths and making one-way streets with parking on one side
Traffic calming on 17th Avenue W; traffic calming on 9th Street W south of 9th Avenue W; and efficient travel through town, not to [town]

COMMUNITY MEETING

As noted above, a community meeting was held to address specific concerns expressed by the east and central Bradenton neighborhoods at the 2nd workshop in fall 2008. The goal was to ensure that any improvements along 9th Avenue (Martin Luther King Jr. Boulevard) are sensitive to the needs of the surrounding neighborhoods. The meeting's intent was to discuss how the team has responded to the concerns expressed at the 2nd public workshop, and let the community know that their issues would be carefully considered in developing the final plan recommendations. Draft recommendations were presented and the meeting followed an informal discussion/dialogue.

This meeting occurred prior to the final public workshop for the Bradenton/Palmetto Mobility Study, on February 18, 2009. Various community members were in attendance, including:

- ☐ Councilman Harold Byrd (City of Bradenton- Ward 5)
- ☐ Several church pastors with churches along MLK, Jr. Avenue
- ☐ 12 members of the public

The meeting followed an informal conversation/dialogue regarding the Downtown Mobility Study and more specifically the proposed projects on MLK, Jr. Avenue. The initial proposal recommended a four-lane divided roadway, with pedestrian enhancements for MLK, Jr. Avenue. Additionally, a roundabout was proposed at MLK Avenue and 14th Street West. The study team invited the group to review project maps, proposed cross-sections and provide input on the materials. Some specific comments/questions from the community and responses from the team included:

- ☐ No steadfast opposition to the extension of the west side of MLK Ave., since most of road is already four lanes
- ☐ Roundabout at MLK, Jr. Avenue and 14th St W: 1) Will this provide breaks in traffic for crossing opportunities? 2) Why is this better than traffic signal?
  - Increases pedestrian awareness
  - Reduces "drag racing" between traffic signals
  - Reduces traffic speeds and severity of crashes
- ☐ How is increased traffic on MLK, Jr. Avenue better for the neighborhood?
  - CRA plan indicates desire for business in the corridor – increased traffic will help accomplish this
  - Increased traffic will be slow moving
- ☐ Is this just a traffic bypass that will further isolate the neighborhood and create a barrier?
  - Allows for better utilization of the street grid in the Downtown and neighborhood
  - MLK is underutilized with excess capacity
  - Streetscape with wide sidewalks and parking will reduce speeds and increase pedestrian visibility
- ☐ What about the issues on the existing 4-lane section of MLK, Jr. Avenue, such as: high speeds; limited access; and crossing safety?
  - Explore options to reduce lane widths, provide parking, reduce crossing distance with curb bulb-outs, and complete missing street connections and present these are the final workshop

Overall, the meeting was a success in that the community was appreciative of being included in the planning process and everyone was eager to see improvements on MLK, Jr. Avenue and more visibility to support businesses. The project elements and context were reviewed to ensure fit within the city's transportation network. Overall, the message of how this project affects and improves the adjacent community was conveyed and accepted. The pastors and several members of the neighborhood attended the 3rd workshop, but with the issues largely resolved, many of those who showed up at the 2nd workshop to express their frustration did not participate in the final workshop.

Individual Meetings and Briefings

During the course of the study, there were several occasions where one-on-one or small informal group meetings were held to gain input and feedback on the analysis and/or recommendations. The first of these included a meeting with representatives of the Bradenton and Palmetto police departments to discuss safety issues in the downtown study area. This meeting focused on areas of automobile, pedestrian and bicyclist safety, including personal security. Key discussion points included crashes that occur frequently on the bridge approaches into either city as traffic sometimes comes to abrupt halt during peak periods, as well as select other problem intersection locations.

In addition, at the outset of the project, a meeting was held with representatives of the Bradenton Fire Department and emergency responders to understand safety and accessibility issues in the downtown area. This meeting helped to convey key study objectives and identify any problems in response times or other safety issues. In general, the representatives expressed interest in greater street connectivity (reclaiming lost components of the downtown grid) and converting one-way streets into two-way streets to improve accessibility to Manatee Memorial Hospital, but indicated there was not a response time concern related to downtown traffic or road characteristics. Traffic congestion is a problem at the US 41/301 and Manatee Avenue intersection, but alternative routes to the hospital do exist.

There were several briefings/presentations made to various groups during the course of the study. These forums provided an opportunity to present study objectives, analysis findings and preliminary recommendations, while offering an opportunity for participants to ask questions and discuss options. Such presentations were given to the Manatee Chamber of Commerce Board of Directors in April 2009 (which voted unanimously on the study recommendations, with two abstentions), the Chamber's Transportation Committee, the Palmetto City Commission and the Bradenton Downtown Development Authority, which oversees the Bradenton Community Redevelopment Agency and 14th Street CRA.

Prior to the final public workshop, individual meetings were held with the Bradenton mayor and each member of the Bradenton City Council, the Palmetto mayor and several of the Palmetto City Commission members. All commissioners were invited to sit down for a personal briefing with staff and consultants of the study recommendations, with an opportunity to ask questions and express opinions on the draft plan. The meetings lasted about one hour each, and provided a productive way to understand any questions or concerns. In several cases, the meetings provided a foundation for additional information to be brought forward at the public workshop to address issues identified by the elected officials.

Finally, in May of 2009, the study team met with select property owners in downtown Bradenton concerning two of the study's recommendations. These meetings were held with owners of the bank properties adjacent to 13th Street West, the site of the proposed Transit Mall facility for Manatee County Area Transit, and with the owner of the old City Hall site at 15th Street West and Manatee

Avenue, the site of a proposed roundabout. The purpose of the meetings was to brief the property owners on the study recommendations and rationale, and to get their feedback on the proposals. The property owners next to 13th Street expressed concerns about the location of the transit facility increasing the amount undesirable loitering and use of private restrooms in the two bank buildings by non-tenants of the buildings or bank patrons. They indicated security would have to visible and constant. In addition, the Bank of America property owner expressed reservations that the conversion of 13th Street West into a transit mall would limit access to an existing drive-through lane for the bank operations. The property owner of the old City Hall site discussed approved plans for development, which have been on old in the wake of the economic downturn that began in late 2007. He indicated a willingness to sell all or a portion of the property for use as a roundabout, and indicated it could help increase the accessibility and visibility of the parcel for future development, although it would mean less developable area.

OUTCOMES

The various methods by which public input was sought informed the development of the study alternatives, courses of action and final recommendations. In general, the workshops, individual meetings and community briefings provided important feedback on those concepts that had the most support and the greatest opposition, and offered insights into how recommendations could be developed to address concerns such as pedestrian safety, high speed traffic, neighborhood access, traffic flow and lack of transportation alternatives. The workshops especially afforded the staff and consultant team to probe key ideas and concepts so that public input could shape and refine the study recommendations.

MOBILITY ALTERNATIVES

MOBILITY ALTERNATIVES

OVERVIEW

Building upon the input received through focus group discussions and the first public workshop, the focus of the development of mobility alternatives was to define a long-range transportation strategy as a framework for congestion management and livability measures to be completed in the short term. This long-range vision is important because it typically entails larger, more costly capital projects that take tremendous effort and time to assemble the resources necessary to complete them. Short term projects should complement and fit within the long-range planning framework for the downtown area to ensure that resources are used efficiently and build toward the overall mobility goals for the area.

The following section describes the process of developing the long-range mobility strategy to guide the analysis and recommendation of shorter term mobility improvements.

The process for developing and evaluating future mobility scenarios entailed the following steps:

- ☐ Initial screening of long-term mobility scenarios using the existing base year (2000) travel demand model to determine the potential shifts in traffic associated with selected mobility improvements;
- ☐ Comparison of model runs of various scenarios with the base year condition to select a preferred long-term scenario for the downtown area;
- ☐ Development of future year (2013) traffic projections based on existing plus approved development, model-projected traffic volumes from the 2030 Long Range Transportation Plan, and historical traffic growth rates from FDOT and Manatee County sources;
- ☐ Identification of short-term congestion management/accessibility improvements that are consistent with the long-range roadway network;
- ☐ Evaluation of short-term strategy effectiveness relative to the performance measures for the 2013 horizon year, and
- ☐ Development of costs and phasing plan for recommended mobility strategies.

ROADWAY NETWORK SCENARIOS

Five scenarios were developed to identify potential long-term strategies to relieve traffic congestion issues in downtown Bradenton and Palmetto. These scenarios reflect different approaches to improve vehicle flow and capacity while enabling the City of Bradenton to achieve one of its primary redevelopment objectives: the enhancement of Manatee Avenue and 6th Avenue (SR 64 one-way pairs) for greater pedestrian accessibility, comfort and convenience. The scenarios examined various ways to help the slow down traffic through the downtown core and balancing the regional and local travel demands to support a stronger multimodal transportation network.

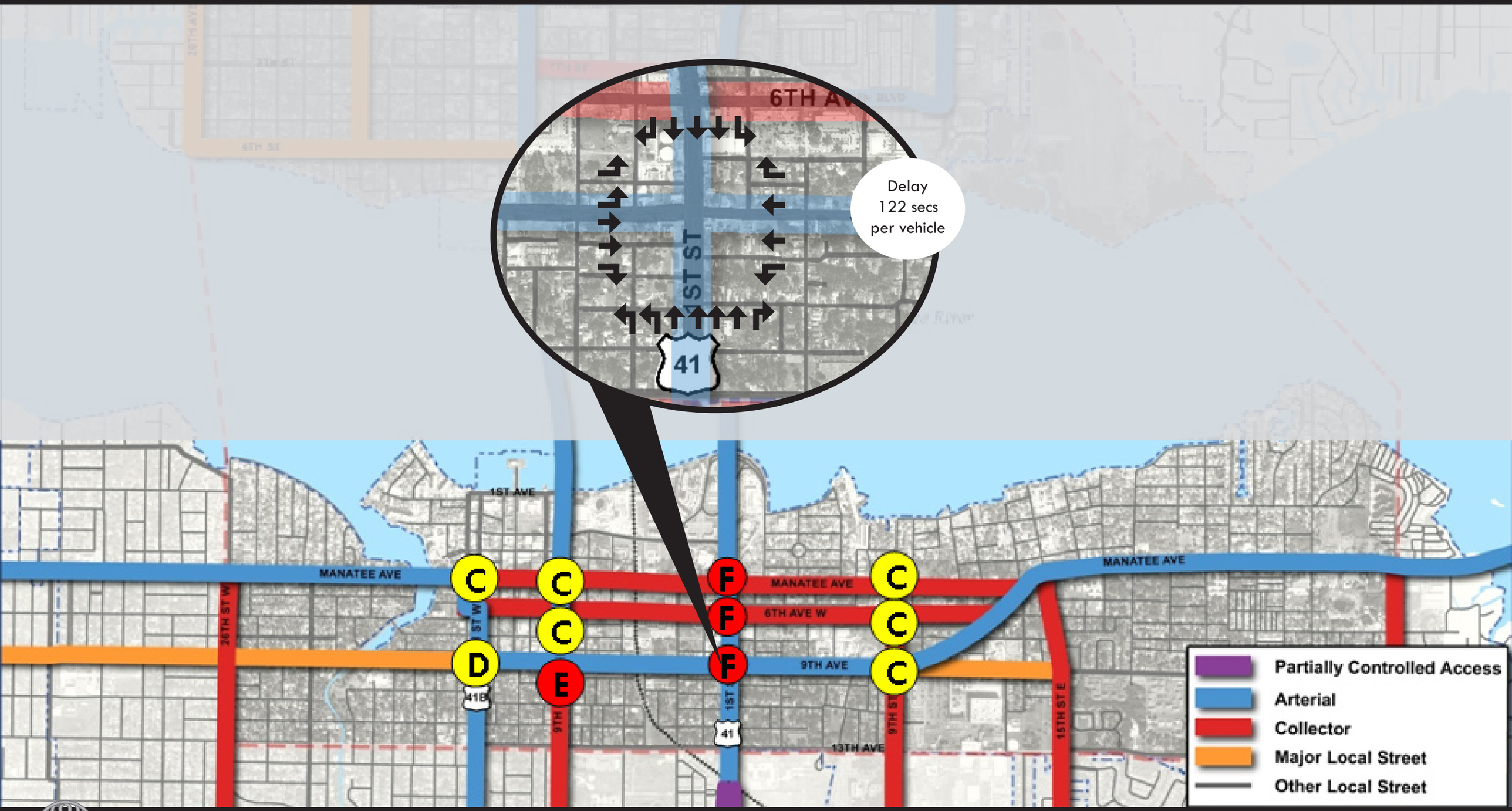
Initially, the study examined the feasibility of converting Manatee Avenue and 6th Avenue from one-way into two-way roads through downtown. However, a basic analysis of traffic volumes and capacity determined that the two-way east-west facilities could not accommodate the travel demand on SR 64. Given the high traffic volumes and constrained capacity on these roadways, this initial alternative was discarded early in the process after the first public workshop.

Using the peak period traffic turning movement counts at the key intersections and the origin-destination study described earlier in this report in combination with model runs using the Sarasota-Manatee-Charlotte regional travel demand model, the analysis identified probable travel pattern shifts that could be expected to result under each of the five scenarios. At this stage of the analysis, the scenarios were evaluated under existing conditions. Due to limitations in the regional model that showed an extreme level of traffic congestion in the downtown area, and the inability to forecast non-automobile travel associated with land use changes in the downtown area, the base year model served as the basis for screening potential scenarios and identifying the shifts in traffic.

STATE ROUTE 64 BYPASS

This scenario reroutes SR 64 away from Manatee Avenue and 6th Avenue in downtown Bradenton, using MLK, Jr. Avenue as an expanded two way alternative linking 15th Street on the west with SR 64 east of 9th Street East via a new roadway alignment. Manatee Avenue and 6th Avenue are converted to two-way roadways (within the existing right of way). This alternative reduces the traffic demand along Manatee Avenue and 6th Avenue, and allows for on-street parking, wider sidewalks, etc. Although MLK Jr. Ave. is assumed to be a four lane facility with right and left turn lanes at each intersection, the US Business 41 and US 41 intersections are both expected to operate over capacity. MLK Jr. Ave. would require turn lane improvements outside of the current right of way at each of the four intersections.

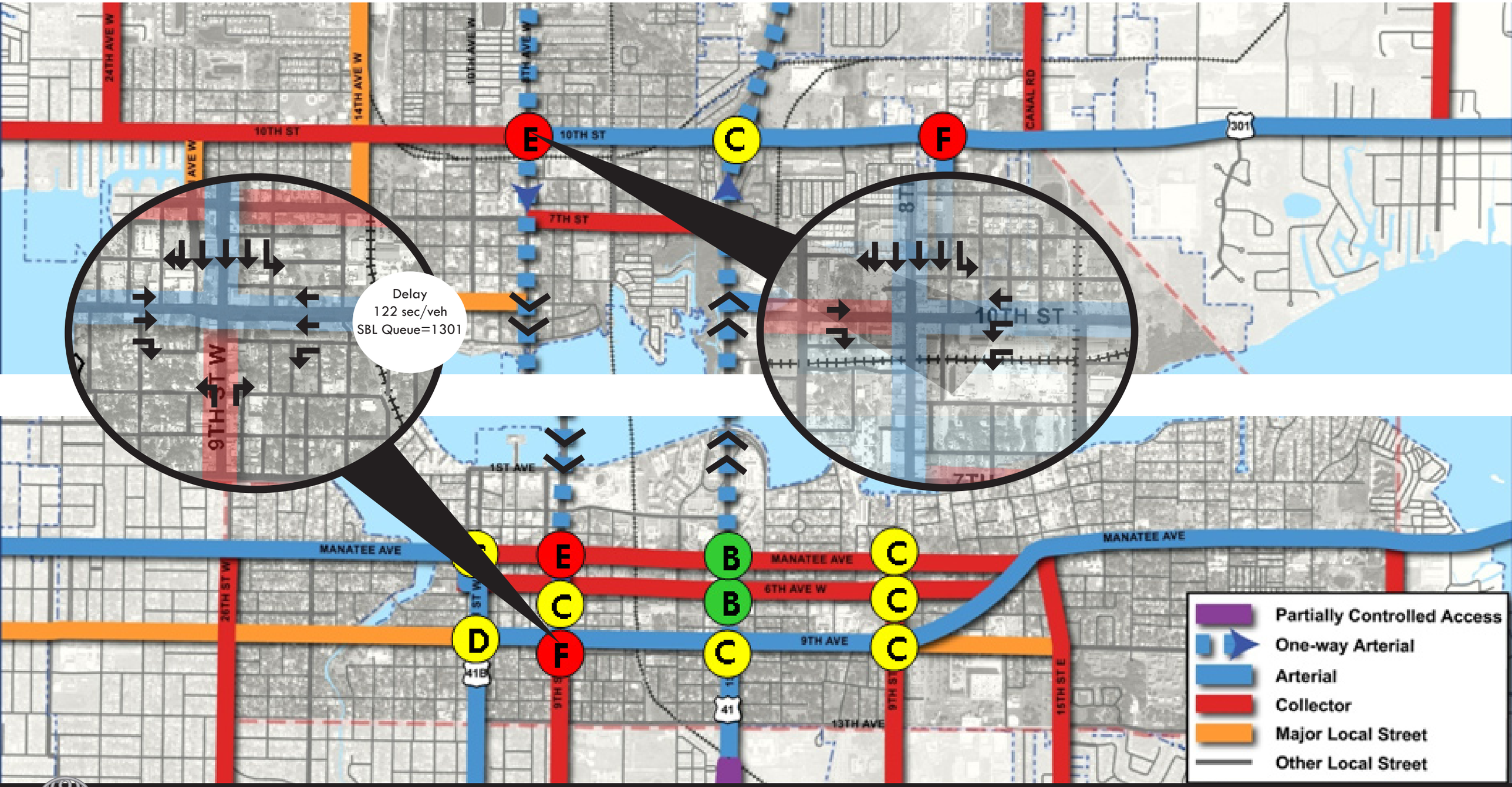
SR 64 BYPASS OPTION



STATE ROUTE 64 BYPASS AND ONE-WAY BRIDGES

In addition to the SR 64 Bypass concept, this alternative also includes a US 41 and US Business 41 one-way pair concept primarily to facilitate a higher volume of traffic crossing the river and reduce the turning conflicts at intersections on the bridge approaches. The one-way pair was assumed from the current US 41 and US Business 41 connection north of the study area through Palmetto, across the river and through downtown Bradenton to MLK, Jr. Avenue, with two-way traffic recurring south of MLK Jr. Ave. The one-way pair concept is within the existing right of way along US Business 41 and US 41, with two exceptions – an additional westbound left turn lane at 10th Street and US Business 41, and a free flow southbound right turn lane at Bus 41 and Manatee Avenue. Although the one-way concept is expected to improve operations at the US 41 intersections in Bradenton, the US Business 41 corridor does not have enough capacity to efficiently move all of the southbound traffic (the US Business 41 intersections are expected to operate over capacity).

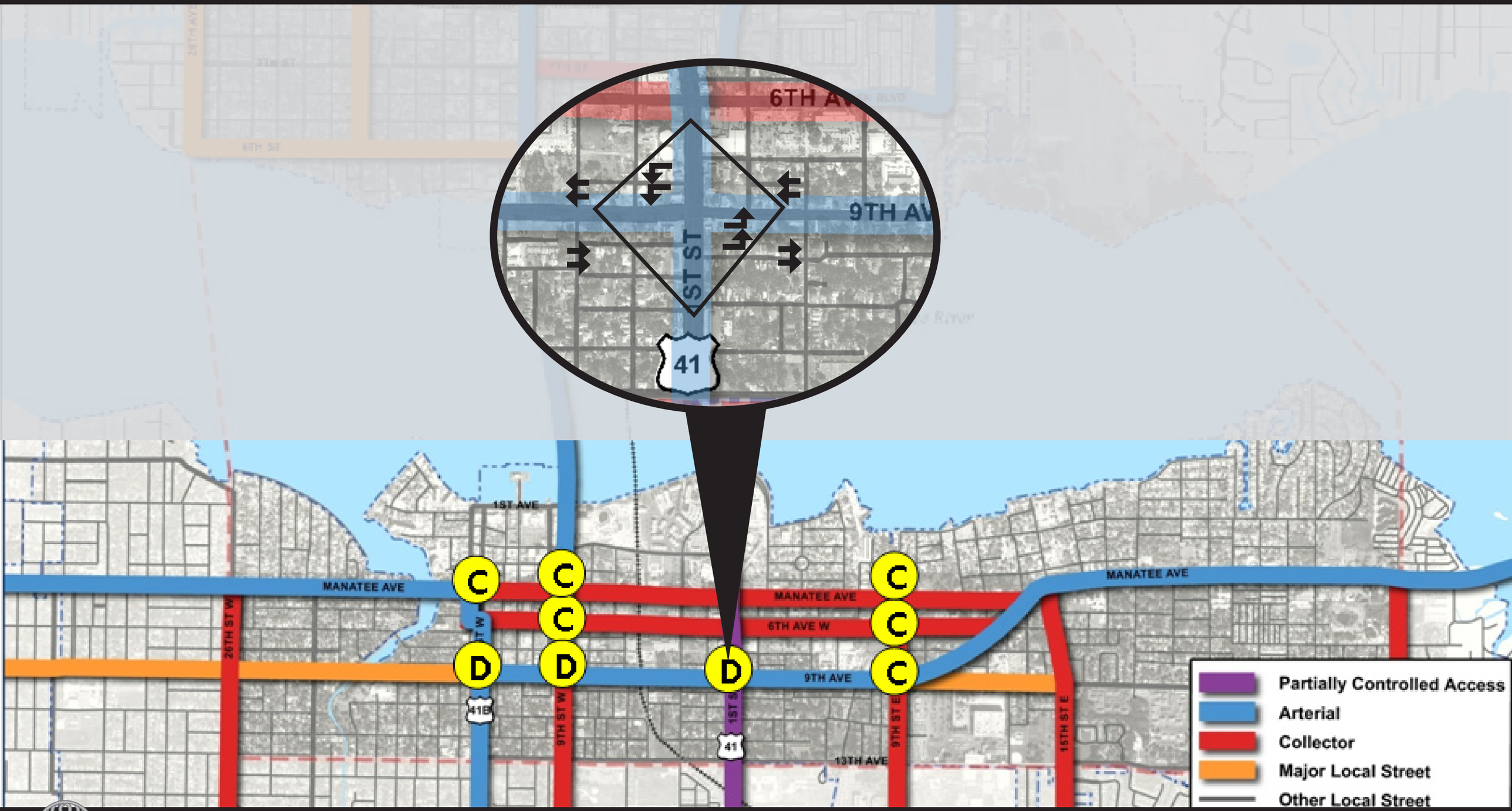
SR 64 BYPASS AND ONE WAY BRIDGE OPTION



STATE ROUTE 64 BYPASS AND REGIONAL 41

In addition to the SR 64 Bypass concept, this alternative also includes a "Regional US 41" concept, with grade separations and ramp access for existing at-grade intersections at the bridge approaches, including Haben Boulevard on the north side of the river, and Manatee Avenue, 6th Avenue and MLK, Jr. Avenue on the south. Upgrading US 41 to a regional partially-controlled access facility increases the capacity of US 41 and therefore shifts some demand from US Business 41 to the regional US 41 facility. Access to the US 41 facility is assumed to be via MLK Jr. Avenue in Bradenton and 10th Street in Palmetto. The new MLK, Jr. Avenue interchange is assumed to be a tight urban interchange design with dual left turn lanes entering the on ramps. The Regional US 41 facility would remain elevated from MLK, Jr. Avenue to the north to tie into the existing bridge over the river.

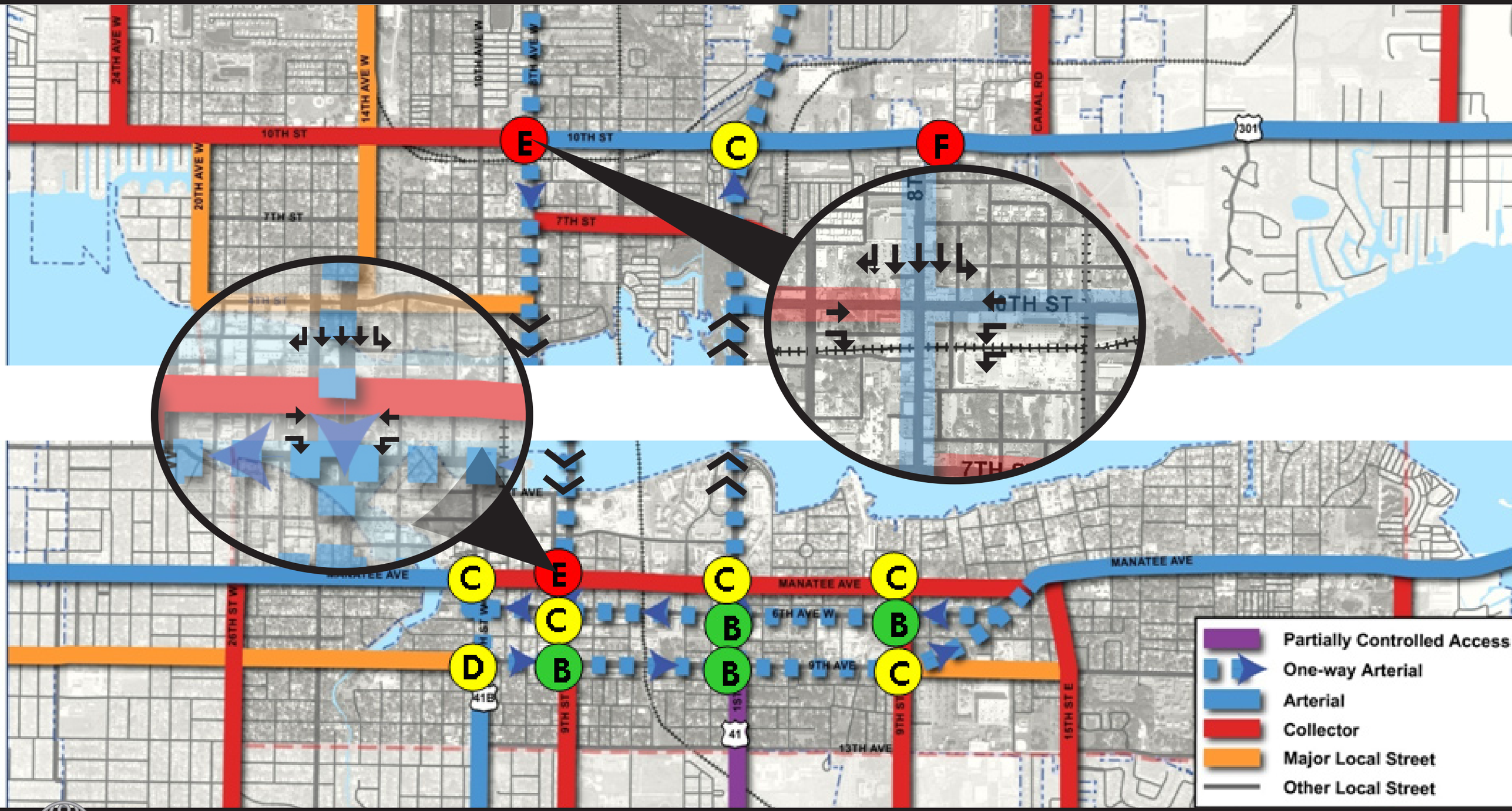
SR 64 BYPASS AND REGIONAL 41 OPTION



STATE ROUTE 64 ONE-WAY SHIFT AND ONE-WAY BRIDGES

This scenario assumes that the SR 64 one-way pair is shifted to the south creating a one way pair with 6th Avenue (one-way west) and MLK Jr. Avenue (one-way east). Manatee Avenue is converted to a two way street within the current right of way. In addition, this alternative includes the US 41 and US Business 41 one-way pair concept described in a previous alternative. The 6th Avenue corridor would be maintained within the existing right of way. The MLK Jr. Avenue corridor would require improvements outside of the existing right of way at US Business 41 and US 41 to facilitate the movements related to the connection back to two way roads – dual southbound left turn lanes at the US Business 41 intersection and dual free flow eastbound right turn lanes at the US 41 intersection.

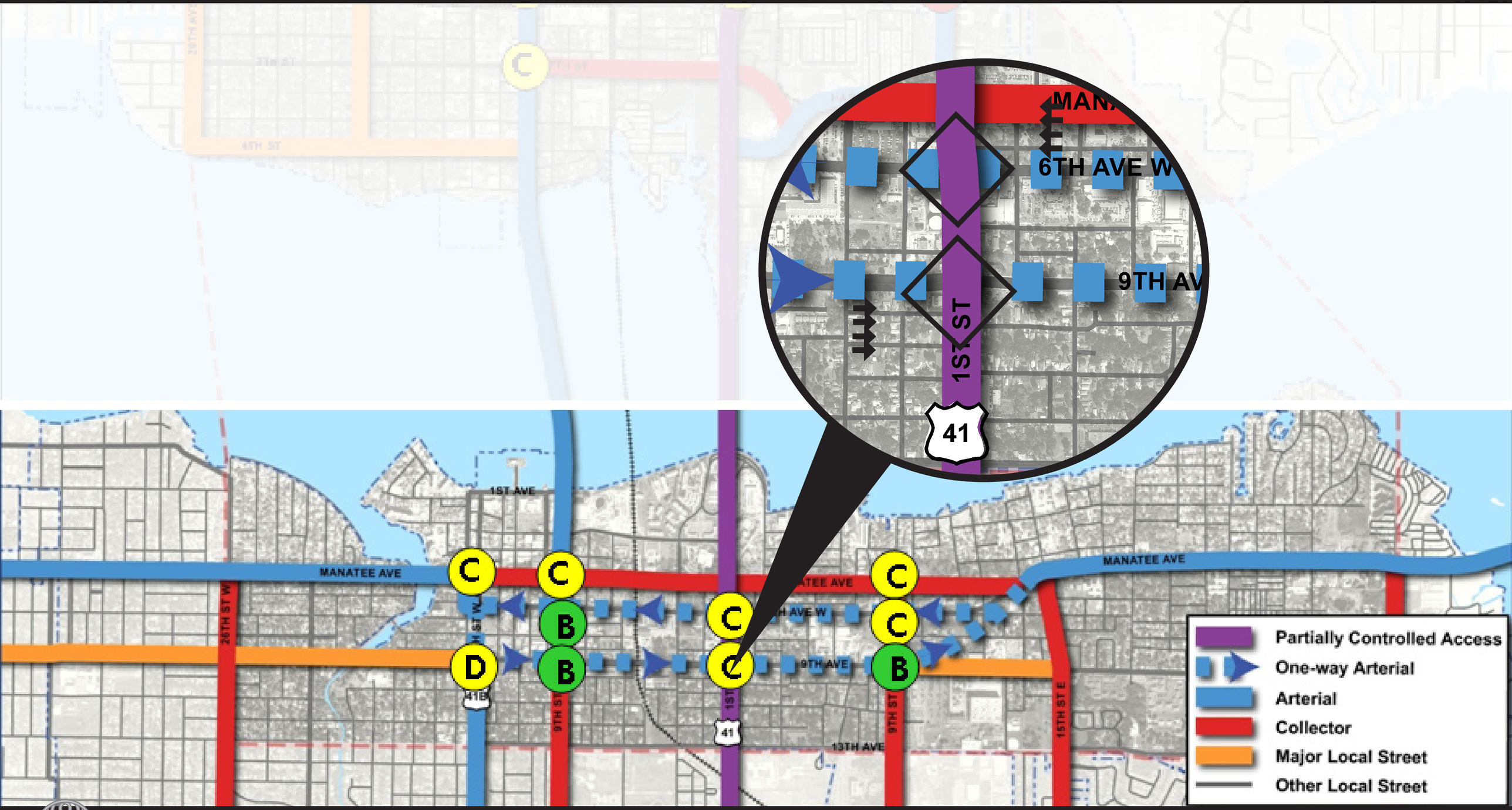
SR 64 BYPASS ONE WAY SHIFT AND ONE WAY BRIDGES OPTION



STATE ROUTE 64 ONE-WAY SHIFT AND REGIONAL 41

This scenario combines the SR 64 one way pair shift to the south with the Regional US 41 concept, requiring improvements to the MLK Jr. Avenue outside the current right of way at both US Business 41 and US 41. The one-way pair concept requires an additional US 41 directional interchange at 6th Avenue to provide full access to SR 64.

SR 64 BYPASS ONE WAY SHIFT AND REGIONAL 41 OPTION



RENAISSANCE PLANNING GROUP

RECOMMENDED LONG-TERM SCENARIO

Based on modeling results and stakeholder input, the preferred scenario is the SR 64 Bypass with the Regional US 41 concept. This option displayed the best ability to accommodate regional traffic in balance with local traffic needs by shifting non-local through traffic away from the downtown core. This reduces conflicting travel demand on the Manatee and 6th Avenue corridor by making better use of under-utilized capacity on MLK, Jr. Avenue and by eliminating at-grade turning conflicts on US 41/301. This option provides the greatest opportunity to transform existing streets in the downtown core to better support multimodal travel and redevelopment efforts in Bradenton and Palmetto.

The option of shifting the one-way pairs from Manatee and 6th Avenues to 6th Avenue and MLK, Jr. Avenue created conflicts with redevelopment plans of the Central CRA, and shifted intersection deficiencies from Manatee and 6th Avenue to 6th Avenue and MLK, Jr. Avenue. It also created the perception of shifting one problem in downtown to a residential neighborhood that is seeking to redevelop with businesses along MLK, Jr. Avenue.

The option of converting the two bridges into one-way facilities was rejected because of the inability to accommodate traffic transitioning from southbound US Business 41 to US 41/301 in Bradenton. Long queues occurred from the MLK, Jr. Avenue north all the way back onto the bridge. There simply is not enough capacity to handle the shift in all the southbound traffic volume to this facility. This alternative also does not conform to Palmetto's redevelopment plans for 8th Avenue (US Business 41) by creating a one-way facility geared toward regional through traffic movement.

Subsequent analysis presented in a later section demonstrates how the preferred scenario was modified for the 2013 horizon year based on right-of-way constraints, measures of effectiveness and neighborhood input.

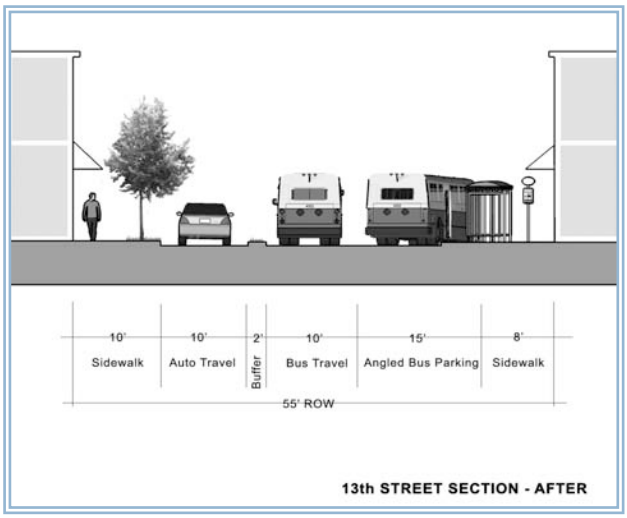
TRANSIT NETWORK ENHANCEMENTS

The overall goal of the transit circulation recommendations entail providing a higher quality of transit service to better meet the needs of the study area as a downtown destination by making transit a more viable choice of travel. While Palmetto currently enjoys a relatively good level of transit service in the study area with Route 13, the City of Bradenton lacks a well-defined transit presence in its downtown. Buses converge at the Manatee County Courthouse on 12th Street, but lack appropriate space for existing vehicles, let alone further expansion of service, and there are few amenities for patrons. Routes 3 and 99, among others, provide good east-west and north-south bus service into the downtown, but the service is relatively infrequent and is not oriented toward the downtown employment, residential and cultural destinations. Limited service hours (no Sunday or evening service) curtails potential ridership.

The two major recommendations for enhanced transit service entail providing a greater presence, utility and visibility for transit in the downtown area. First, the signature project for transit is the creation of a Transit Mall on 13th Street W between 8th Avenue and 6th Avenue, a currently underutilized, low-volume street block with nearly 60' of right-of-way. Manatee County Area Transit has $2 million in grant funds to construct a transit facility in the downtown area, and has been challenged over the last several years with finding a suitable location. This is a near-term project that can be implemented at relatively little capital cost within six to nine months.

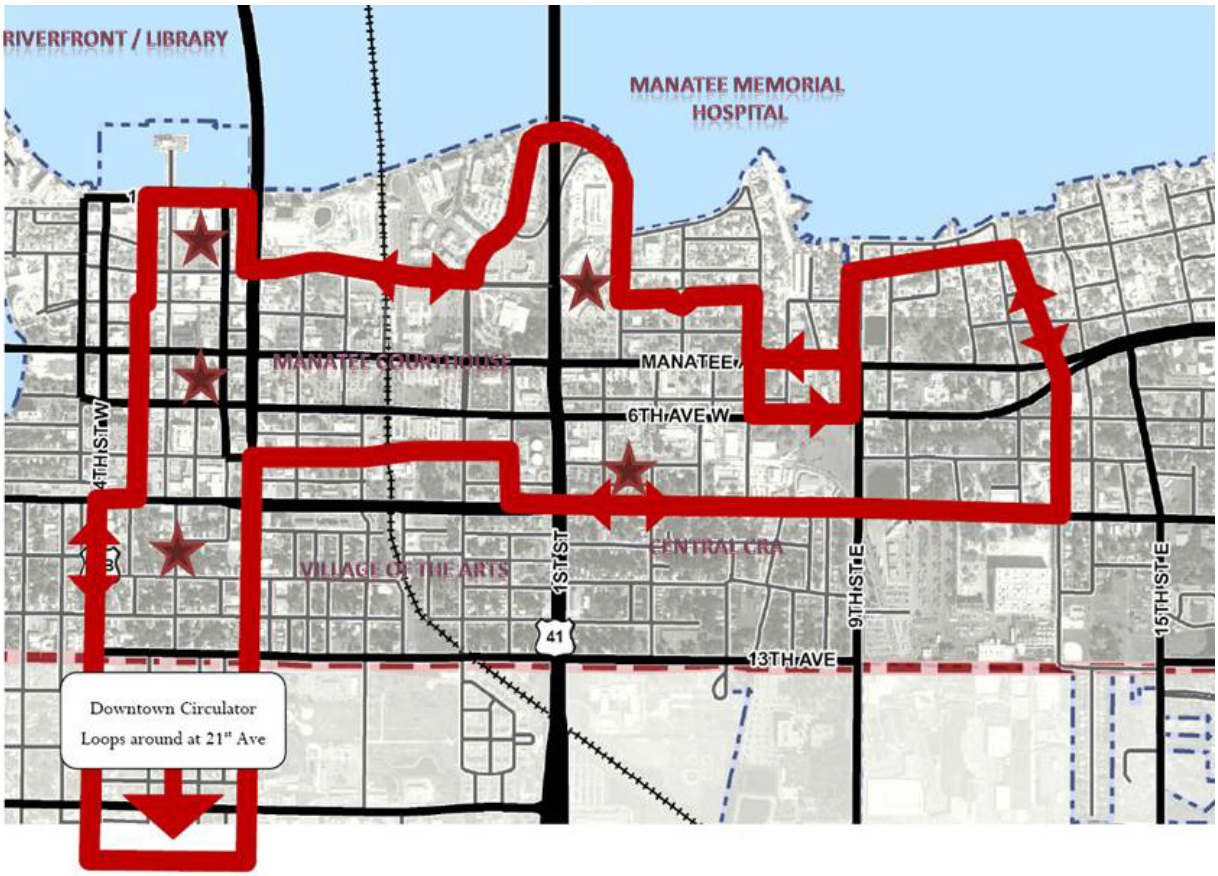
Rather than an off-street transfer facility like the Lemon Street Transit station in downtown Sarasota, the proposed Transit Mall would use the on-street right-of-way to create an in-line bus pull-out area with proper amenities for passengers, such as kiosks, waiting areas and driver facilities. The mall concept would maintain one lane of vehicle traffic flow along 13th Street to enable access to parking and the bank drive-through facility. Importantly, the mall concept would create a logical pedestrian connection between residential areas and destinations to the south with Old Main Street, the riverfront and civic uses to the north of Manatee Avenue. The creation of the Transit Mall would require Manatee County Area Transit to acquire use of the roadway, allowing for proper policing and maintenance in support of its use as a transit facility. Figure 24 presents a potential design concept for the 13th Street Transit Mall.

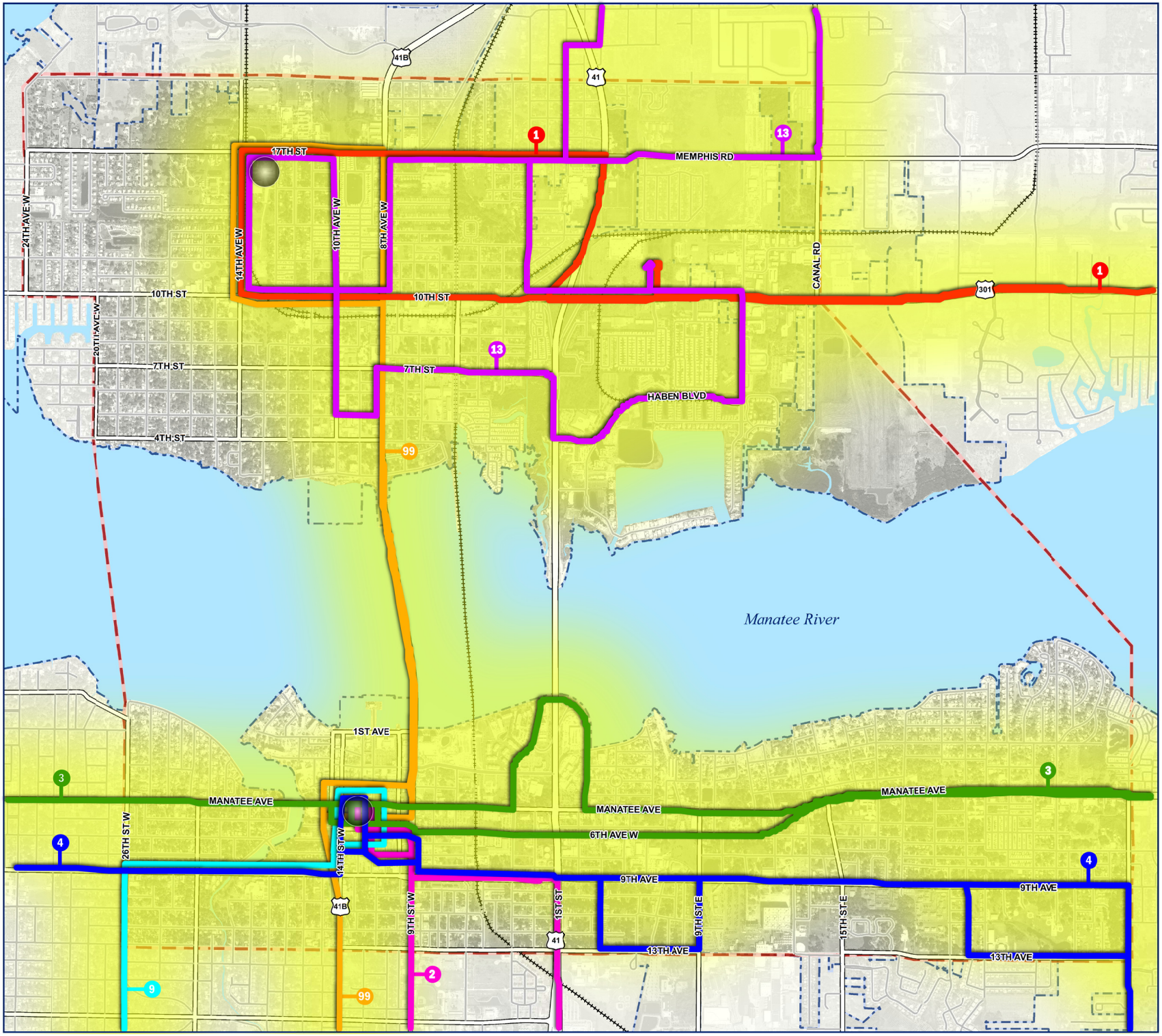
FIGURE 24 – DESIGN CONCEPT FOR THE 13TH STREET TRANSIT MALL



The second major transit recommendation is to create a downtown circulator service that would provide a higher level of service frequency that better connects downtown area origins and destinations. The circulator would help connect employment destinations like Manatee Memorial Hospital, the courthouse and the Manatee County Administration building with the riverfront, residential neighborhoods, the Central CRA and 14th Street redevelopment corridors, and the Village of the Arts district. The timing of the circulator is within the next five years, primarily to provide support for additional residential development approved and planned for the downtown area. The circulator would provide service every 10-15 minutes over a seven mile route using 3-4 vehicles. The type of vehicle has not been defined; it could be a regular bus, trolley or even solar-powered low-speed vehicles (LSVs). Figure 25 presents a map of the recommended circulator route location.

FIGURE 25 – RECOMMENDED CIRCULATOR ROUTE LOCATION





Bradenton / Palmetto Downtown Mobility Study

Figure 26

Transit Service

- Transit Route
- Major Transit Transfer Location
- Quarter Mile Service Area (6.2 sq. mi.)
- Study Area Boundary (9.54 sq. mi.)
- Municipal Area Boundary
- Arterial and Collector Roads
- Local Road
- Railroad

0 0.125 0.25 0.5 Miles

RENAISSANCE PLANNING GROUP

BICYCLE AND PEDESTRIAN NETWORK

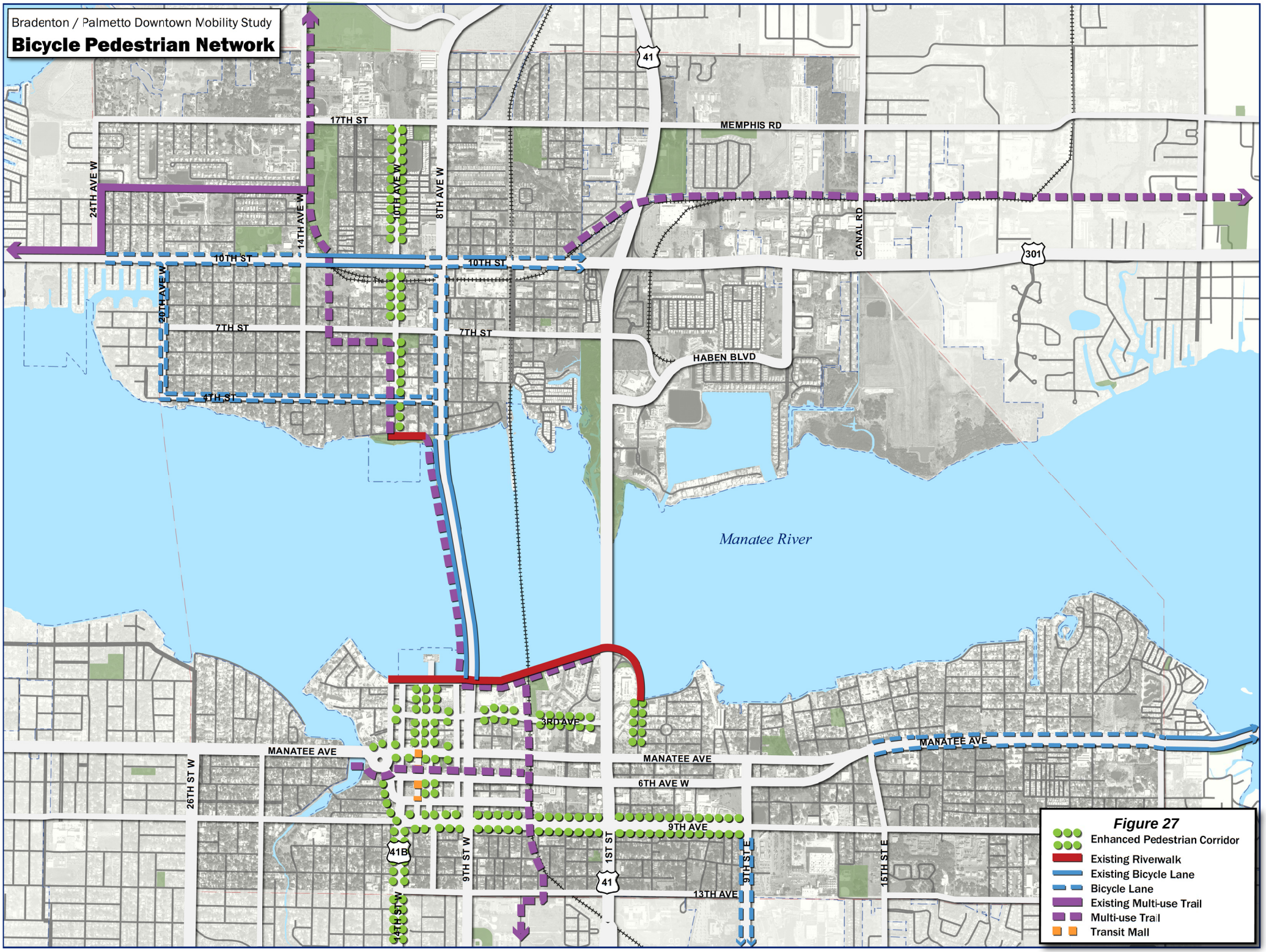
The recommended bicycle and pedestrian network is intended to complement the roadway and transit strategies described above by providing improved connectivity, safe refuge and a more comfortable environment for vulnerable road users. The primary objectives of the bicycle and pedestrian element of the Downtown Mobility Study are to connect downtown destinations with surrounding neighborhoods, natural and scenic areas, and improve safety. Figure 27 presents the recommended bicycle and pedestrian network.

The signature bicycle and pedestrian project recommended by the study is to retrofit the Green Bridge (US Business 41) to better accommodate both cyclists and pedestrians. This would entail moving the existing barrier separating the combined breakdown/bicycle lane from the existing 4' sidewalk to create a 10' multi- use path. While not the ideal width of 12-15', the 10' path nonetheless provides better protection for cyclists and more room for pedestrians and cyclists to use this scenic highway comfortably. The capital cost of this recommendation is relatively low, and is an important way to strengthen inter-city multimodal connectivity and enhance the economic vitality of the downtown area, especially considering the nearby DeSoto Bridge prohibits pedestrian and bicycle use. The Green Bridge multi-use path would connect with an existing and emerging network of sidewalks and bicycle facilities on both sides of the bridge, primarily the existing and planned Riverwalk defined by both cities. In essence, the Green Bridge becomes the spine of the downtown multimodal transportation network.

The bicycle and pedestrian connections on both sides of the river entail a combination of facility types and treatments that enhance the presence and comfort of these modes. In Palmetto, the Green Bridge project would connect users to an existing and planned network of bicycle lanes and multi-use trails providing connectivity throughout the downtown and into residential neighborhoods and other areas of the County, such as Snead Island and Ellenton. In Bradenton, the Green Bridge would connect users directly to the Riverwalk via the parking lot adjacent to the South Florida Museum. The supporting network would also include the planned Artisan Avenue linking the river to the renowned Village of the Arts district to the south. In addition, the enhanced Manatee and 6th Avenue corridor, MLK, Jr. Avenue, and the 13th Street Transit Mall to increase multimodal connectivity.

Bradenton / Palmetto Downtown Mobility Study

Bicycle Pedestrian Network



FUTURE TRAFFIC PROJECTIONS

FUTURE TRAFFIC PROJECTIONS

DEVELOPMENT/GROWTH TRENDS

Traffic volumes in the City of Bradenton and City of Palmetto have remained reasonably unchanged over the past 10 years, even with the rapid population growth in Manatee County. Traffic has reached a saturation point on the major roadways in downtown study area, and the areas to the west of downtown are predominantly built-out. While the City of Bradenton has replaced non-residential square footage with increased residential densities in its comprehensive plan for the downtown core of the study area, the City has concurrently reduced development potential for density in surrounding residential areas. The Manatee Avenue corridor leading to Anna Maria Island may see some redevelopment, but it will likely be at the same suburban scale of the current development pattern. The beach communities are likely at their development limits today given adopted policies and the limitations placed on barrier island development due to the Coastal High Hazard zone. While some redevelopment will occur, increasing densities on the beachfront is an unlikely scenario. Whatever development or redevelopment that does occur is not anticipated to affect downtown traffic.

The majority of Palmetto's downtown area is residential or low-scale commercial/retail and mixed uses, but no additional large scale development plans are anticipated within the study area. Palmetto's more intense growth is occurring on the US 301 corridor and far northern corridor of US Business 41 at 26th Street, both outside of the study area. While this growth may have some influence on traffic in the study area, it is equally likely that trips will be oriented toward I-75, I-275 and points north.

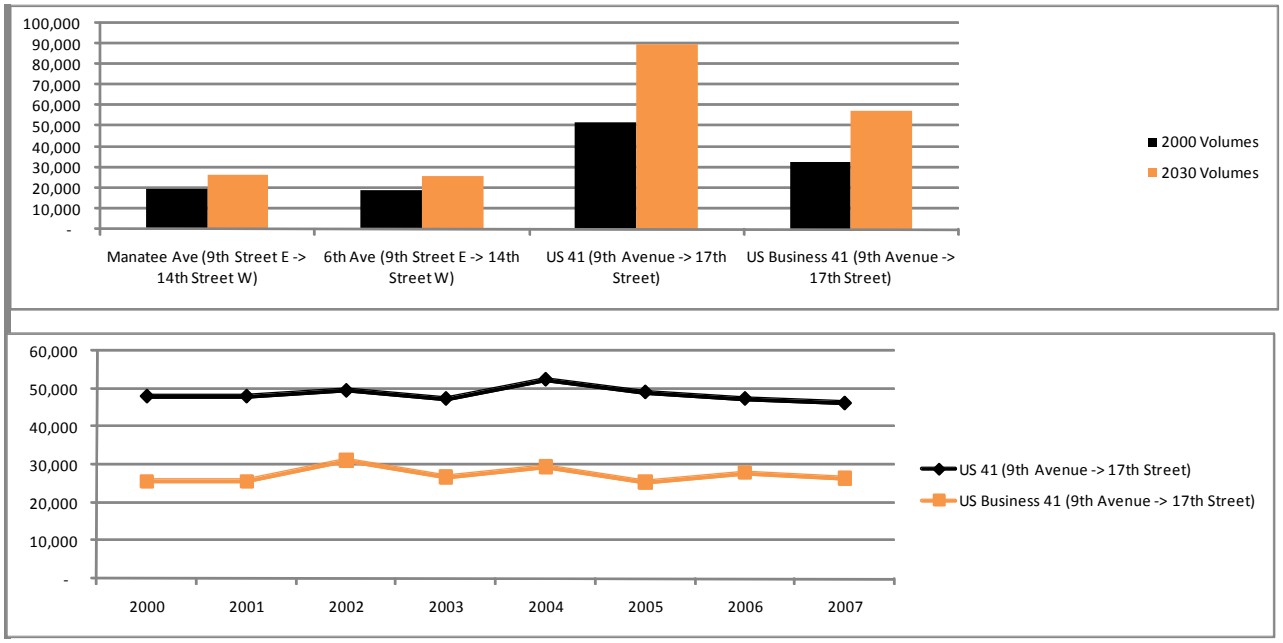
2030 LONG RANGE TRAFFIC PROJECTIONS

The Sarasota/Manatee 2030 Long Range Transportation Plan recognized an increasing level of congestion in and around downtowns of Bradenton and Palmetto in the future. One of the biggest concerns in the area was the severely congested conditions projected for the Green and DeSoto Bridges. For 2030 forecast, the 2030 Sarasota/Manatee/Charlotte travel demand model was used to project the traffic conditions based on anticipated population and employment growth in the region. Those population and employment projections were developed in 2004, and indicated that the cities of Bradenton and Palmetto would grow by roughly 15,000 more people and 20,000 more jobs in the study area by 2030. This was based on using a mid-point between the medium and high county population projections from the University of Florida Bureau of Business and Economic Research (BEBR). With current economic conditions and revised development assumptions, the 2035 population and employment forecast is likely to be lower for the study area. The 2035 forecast is under development, but the 2030 has been used for the analysis, and represents a likely worst-case aggressive growth scenario.

TABLE 10 – 2030 VOLUME PROJECTIONS AND GRAPH

	2000 VOLUMES	2030 VOLUMES	GROWTH %	ANNUAL GROWTH RATE
Manatee Ave (9th Street E -> 14th Street W)	20,000	27,000	35%	1.2%
6th Ave (9th Street E -> 14th Street W)	19,000	26,000	37%	1.2%
US 41 (9th Avenue -> 17th Street)	52,000	90,000	73%	2.4%
US Business 41 (9th Avenue -> 17th Street)	33,000	58,000	76%	2.5%

FIGURE 28 – 2030 VOLUME PROJECTIONS AND GRAPH



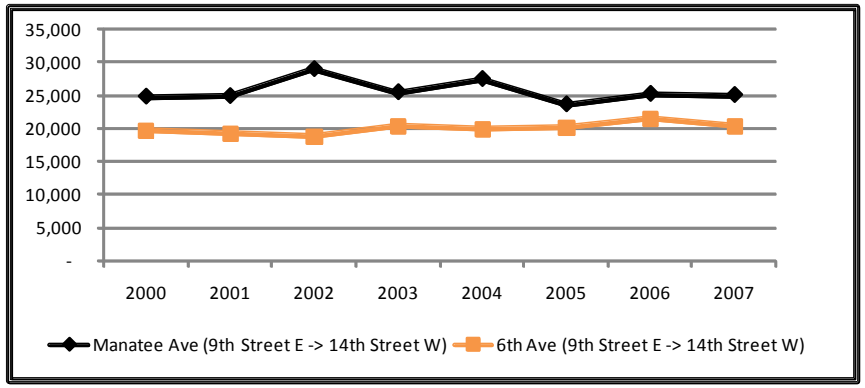
2013 HORIZON YEAR TRAFFIC

The Downtown Mobility Study is focused on achievable solutions that can be implemented in the relatively short term. The 2013 horizon year was chosen for analysis because of the MPO's Congestion Management Process funding source is intended for near-term, lower cost congestion management strategies, and the desire to sync recommended mobility strategies from the study with the FDOT Five Year Work Program and local government Capital Improvement Programs. The development of future year PM peak hour traffic estimate used three equally-weighted key variables to project the traffic in 2013. Historical traffic counts, which were obtained from the FDOT and Manatee County for the previous five years, established the trend during the development boom years. The 2030 travel demand model projections were used to establish the amount of future traffic based on growth throughout the region. Traffic from committed developments set the mark as to what to expect by 2013. These three variables were used to plot a growth rate or curve to be applied to the existing midblock and intersection traffic counts (collected for this project in February 2008) for use in the analysis. The following tables present the variables and outcomes for the development of 2013 horizon year traffic.

TABLE 11 – HISTORICAL VOLUME TREND

	2000	2001	2002	2003	2004	2005	2006	2007	GROWTH %	ANNUAL GROWTH RATE
Manatee Ave (9th Street E -> 14th Street W)	24,833	24,917	29,000	25,500	27,500	23,667	25,250	25,083	1%	0.1%
6th Ave (9th Street E -> 14th Street W)	19,667	19,333	18,833	20,333	20,000	20,167	21,500	20,333	3%	0.5%
US 41 (9th Avenue -> 17th Street)	48,000	48,000	49,500	47,400	52,400	49,100	47,400	46,200	-4%	-0.5%
US Business 41 (9th Avenue -> 17th Street)	25,720	25,660	31,200	26,880	29,420	25,480	28,000	26,580	3%	0.5%

FIGURE 29 – HISTORICAL VOLUME



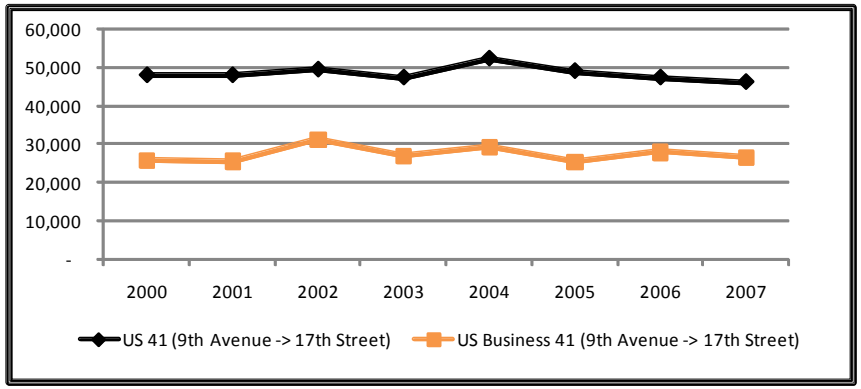


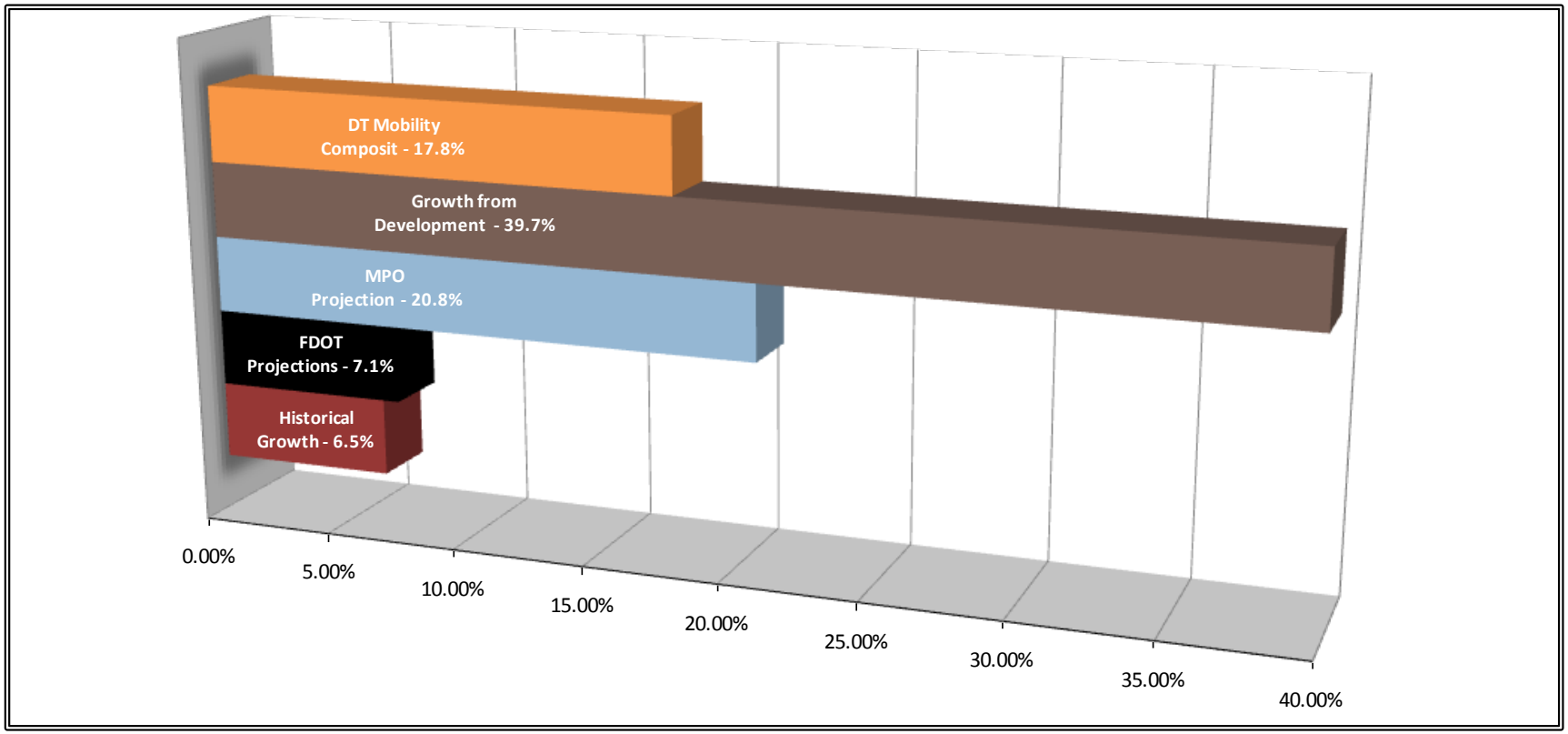
TABLE 12 – 2013 VOLUMES

STREET	FROM	TO	CITY	DIR	2007 COUNT	MINIMUM GROWTH %	HISTORICAL GROWTH %	FDOT PROJECTED GROWTH %	MODEL GROWTH %	DEVELOPMENT GROWTH (50%)	COMPOSIT GROWTH RATE	2013 VOL
10th Ave W	17th St	10th St	Palmetto	NS	3,224	2.00%	-	-	10.339%	-	2.00%	3,560
10th Ave W	10th St	7th St	Palmetto	NS	4,778	2.00%	-	-	4.335%	-	4.33%	5,907
10th Ave W	7th St	4th St	Palmetto	NS	3,545	2.00%	-	-	9.650%	-	9.65%	5,619
Bus 41	US 41	17th St	Palmetto	NS	18,900	2.00%	1.58%	2.01%	6.372%	3.07%	3.26%	22,186
Bus 41	17th St	10th St	Palmetto	NS	24,500	2.00%	1.45%	1.82%	4.431%	2.55%	2.56%	27,804
Bus 41	10th St	7th St	Palmetto	NS	28,500	2.00%	-3.45%	1.63%	3.717%	2.05%	2.00%	31,466
Bus 41	7th St	4th St	Palmetto	NS	28,500	2.00%	-3.45%	1.63%	2.985%	3.70%	2.00%	31,466
Bus 41	4th St	1st Ave (Bradenton)	Palmetto	NS	34,000	2.00%	2.16%	2.14%	4.656%	3.38%	3.08%	39,577
Bus 41	1st Ave	3rd Ave	Bradenton	NS	34,000	2.00%	2.16%	2.14%	3.604%	3.38%	2.82%	39,075
Bus 41	3rd Ave	Manatee Ave	Bradenton	NS	34,000	2.00%	2.16%	2.14%	2.550%	3.35%	2.55%	38,563
Bus 41	Manatee Ave	6th Ave	Bradenton	NS	27,000	2.00%	1.23%	1.66%	2.848%	1.35%	2.00%	29,810
Bus 41	6th Ave	8th Ave	Bradenton	NS	27,000	2.00%	1.23%	1.66%	3.281%	2.13%	2.08%	29,920
Bus 41	8th Ave	9th Ave	Bradenton	NS	27,000	2.00%	1.23%	1.66%	1.757%	2.13%	2.00%	29,810
Bus 41	9th Ave	13th Ave	Bradenton	NS	27,000	2.00%	1.23%	1.66%	0.990%	2.13%	2.00%	29,810
5th Ave	10th St	7th St	Palmetto	NS	4,970	2.00%	-	-	2.351%	-	2.35%	5,582
US 41	Bus 41	17th St	Palmetto	NS	27,500	2.00%	0.59%	-0.32%	4.359%	10.05%	3.67%	32,934
US 41	17th St	10th St	Palmetto	NS	36,500	2.00%	2.05%	1.54%	3.999%	9.22%	4.20%	44,838
US 41	10th St	7th St	Palmetto	NS	36,500	2.00%	2.05%	1.54%	3.543%	11.74%	4.72%	45,960
US 41	7th St	Haben Blvd	Palmetto	NS	36,500	2.00%	2.05%	1.54%	2.719%	11.81%	4.53%	45,547
US 41	Haben Blvd	3rd Ave (Bradenton)	Palmetto	NS	54,000	2.00%	1.39%	1.46%	2.990%	12.17%	4.50%	67,299
US 41	3rd Ave	Manatee Ave	Bradenton	NS	54,000	2.00%	1.39%	1.46%	3.012%	11.47%	4.33%	66,760
US 41	Manatee Ave	6th Ave	Bradenton	NS	52,000	2.00%	-4.27%	2.10%	2.023%	11.46%	2.83%	59,778
US 41	6th Ave	8th Ave	Bradenton	NS	52,000	2.00%	-4.27%	2.10%	2.101%	10.63%	2.64%	59,236
US 41	8th Ave	9th Ave	Bradenton	NS	52,000	2.00%	-4.27%	2.10%	2.230%	10.63%	2.67%	59,329
US 41	9th Ave	13th Ave	Bradenton	NS	61,000	2.00%	0.40%	2.20%	1.299%	9.07%	3.24%	71,545
Haben Blvd	10th St	Haben Blvd	Palmetto	NS	12,520	2.00%	-	-	4.484%	11.90%	8.19%	18,560
Canal Rd	29th St	17th St	Palmetto	NS	4,202	2.00%	-2.24%	-5.00%	15.631%	21.18%	7.39%	6,002
Canal Rd	17th St	10th St	Palmetto	NS	4,202	2.00%	-2.24%	-5.00%	16.504%	21.18%	7.61%	6,063
14th St W	1st Ave	3rd Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	3.153%	-	3.53%	20,931
14th St W	3rd Ave	Manatee Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	2.385%	-	3.27%	20,673
14th St W	Manatee Ave	6th Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	2.351%	-	3.26%	20,662
14th St W	6th Ave	8th Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	1.217%	-	2.88%	20,286
14th St W	8th Ave	9th Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	3.220%	-	3.55%	20,953

STREET	FROM	TO	CITY	DIR	2007 COUNT	MINIMUM GROWTH %	HISTORICAL GROWTH %	FDOT PROJECTED GROWTH %	MODEL GROWTH %	DEVELOPMENT GROWTH (50%)	COMPOSIT GROWTH RATE	2013 VOL
14th St W	9th Ave	13th Ave	Bradenton	NS	17,600	2.00%	5.88%	1.55%	3.058%	-	3.50%	20,898
9th St E	Manatee Ave	6th Ave	Bradenton	NS	4,521	2.00%	1.61%	3.30%	2.119%	-	2.34%	5,076
9th St E	6th Ave	8th Ave	Bradenton	NS	7,274	2.00%	1.69%	1.42%	5.029%	-	2.71%	8,316
9th St E	8th Ave	9th Ave	Bradenton	NS	7,274	2.00%	1.69%	1.42%	4.916%	-	2.68%	8,301
9th St E	9th Ave	13th Ave	Bradenton	NS	7,967	2.00%	-0.05%	0.94%	22.911%	-	7.93%	11,670
17th St	24th Ave	14th Ave	Palmetto	EW	9,030	2.00%	1.77%	0.73%	10.740%	1.05%	3.57%	10,762
17th St	14th Ave	10th Ave	Palmetto	EW	9,030	2.00%	1.77%	0.73%	18.395%	1.05%	5.49%	11,794
17th St	10th Ave	Bus 41	Palmetto	EW	9,030	2.00%	1.77%	0.73%	16.466%	1.05%	5.00%	11,527
17th St	Bus 41	US 41	Palmetto	EW	9,030	2.00%	1.77%	0.73%	6.267%	1.05%	2.45%	10,194
17th St	US 41	Canal Rd	Palmetto	EW	5,254	2.00%	-0.10%	-0.06%	9.413%	22.84%	8.02%	7,729
10th St	24th Ave	20th Ave	Palmetto	EW	16,500	2.00%	2.11%	2.20%	1.037%	6.73%	3.02%	19,145
10th St	20th Ave	14th Ave	Palmetto	EW	16,500	2.00%	2.11%	2.20%	4.201%	6.73%	3.81%	19,891
10th St	14th Ave	10th Ave	Palmetto	EW	16,500	2.00%	2.11%	2.20%	5.934%	6.73%	4.24%	20,310
10th St	10th Ave	Bus 41	Palmetto	EW	16,500	2.00%	2.11%	2.20%	2.653%	6.73%	3.42%	19,523
10th St	Bus 41	5th Ave	Palmetto	EW	16,500	2.00%	2.11%	2.20%	4.443%	6.73%	3.87%	19,949
10th St	5th Ave	US 41	Palmetto	EW	21,000	2.00%	1.35%	2.04%	3.595%	5.29%	3.07%	24,423
10th St	US 41	Haben Blvd	Palmetto	EW	32,000	2.00%	5.76%	2.03%	3.647%	7.70%	4.78%	40,422
10th St	Haben Blvd	Canal Rd	Palmetto	EW	32,000	2.00%	5.76%	2.03%	4.309%	11.39%	5.87%	42,564
7th St	20th Ave	14th Ave	Palmetto	EW	2,438	2.00%	-	-	0.872%	11.69%	6.28%	3,306
7th St	14th Ave	10th Ave	Palmetto	EW	2,438	2.00%	-	-	7.534%	11.69%	9.61%	3,858
7th St	10th Ave	Bus 41	Palmetto	EW	2,438	2.00%	-	-	2.237%	11.69%	6.96%	3,414
7th St	Bus 41	5th Ave	Palmetto	EW	9,699	2.00%	-	-	2.704%	2.94%	2.82%	11,147
7th St	5th Ave	US 41	Palmetto	EW	9,699	2.00%	-	-	3.051%	2.94%	2.99%	11,241
Haben Blvd	US 41	Haben Blvd	Palmetto	EW	12,020	2.00%	-	-	3.660%	14.98%	9.32%	18,765
3rd Ave	15th St W	14th St W	Bradenton	EW	3,820	2.00%	-	-	-	-	2.00%	4,218
3rd Ave	14th St W	10th St W	Bradenton	EW	3,820	2.00%	-	-	-	-	2.00%	4,218
3rd Ave	10th St W	Bus 41	Bradenton	EW	3,820	2.00%	-	-	-	-	2.00%	4,218
3rd Ave	Bus 41	US 41	Bradenton	EW	3,820	2.00%	-	-	-	75.65%	2.00%	4,218
Manatee Ave	26th St W	22nd St W	Bradenton	EW	47,500	2.00%	0.28%	1.39%	1.131%	2.75%	2.00%	52,444
Manatee Ave	22nd St W	15th St W	Bradenton	EW	47,500	2.00%	0.28%	1.39%	1.841%	2.75%	2.00%	52,444
Manatee Ave	15th St W	14th St W	Bradenton	EW	47,500	2.00%	0.28%	1.39%	0.864%	2.75%	2.00%	52,444
Manatee Ave	14th St W	10th St W	Bradenton	EW	24,500	2.00%	-2.31%	1.82%	1.673%	5.33%	2.94%	28,320
Manatee Ave	10th St W	Bus 41	Bradenton	EW	24,500	2.00%	-2.31%	1.82%	2.101%	2.96%	2.29%	27,437
Manatee Ave	Bus 41	US 41	Bradenton	EW	20,500	2.00%	-0.35%	1.49%	1.371%	4.93%	2.96%	23,719
Manatee Ave	US 41	9th St E	Bradenton	EW	20,500	2.00%	1.52%	2.08%	1.456%	6.73%	2.95%	23,704

STREET	FROM	TO	CITY	DIR	2007 COUNT	MINIMUM GROWTH %	HISTORICAL GROWTH %	FDOT PROJECTED GROWTH %	MODEL GROWTH %	DEVELOPMENT GROWTH (50%)	COMPOSIT GROWTH RATE	2013 VOL
Manatee Ave	9th St E	15th St E	Bradenton	EW	19,500	2.00%	0.75%	2.19%	1.909%	7.08%	2.98%	22,583
Manatee Ave	15th St E	27th St E	Bradenton	EW	18,000	2.00%	2.29%	2.60%	2.153%	7.67%	3.68%	21,563
6th Ave	15th St W	14th St W	Bradenton	EW	25,000	2.00%	3.25%	2.50%	2.605%	3.00%	2.84%	28,759
6th Ave	14th St W	10th St W	Bradenton	EW	25,000	2.00%	3.25%	2.50%	1.385%	3.00%	2.54%	28,335
6th Ave	10th St W	Bus 41	Bradenton	EW	25,000	2.00%	3.25%	2.50%	3.102%	3.00%	2.96%	28,933
6th Ave	Bus 41	US 41	Bradenton	EW	18,500	2.00%	-0.08%	2.77%	2.593%	3.46%	2.19%	20,613
6th Ave	US 41	9th St E	Bradenton	EW	17,500	2.00%	-3.20%	2.50%	2.529%	2.66%	2.00%	19,321
7th Ave	9th St E	15th St E	Bradenton	EW	19,500	2.00%	1.59%	2.49%	1.897%	2.38%	2.09%	21,624
9th Ave	26th St W	22nd St W	Bradenton	EW	6,870	2.00%	1.39%	0.51%	1.904%	-	2.00%	7,585
9th Ave	22nd St W	14th St W	Bradenton	EW	6,870	2.00%	1.39%	0.51%	1.919%	-	2.00%	7,585
9th Ave	14th St W	Bus 41	Bradenton	EW	6,870	2.00%	1.39%	0.51%	0.757%	-	2.00%	7,585
9th Ave	Bus 41	US 41	Bradenton	EW	6,870	2.00%	1.39%	0.51%	1.299%	-	2.00%	7,585
9th Ave	US 41	9th St E	Bradenton	EW	6,870	2.00%	1.39%	0.51%	1.207%	-	2.00%	7,585
9th Ave	9th St E	15th St E	Bradenton	EW	6,870	2.00%	1.39%	0.51%	0.995%	-	2.00%	7,585
9th Ave	15th St E	27th St E	Bradenton	EW	6,870	2.00%	1.39%	0.51%	1.803%	-	2.00%	7,585

FIGURE 30 – 2013 VOLUMES



RECOMMENDED MOBILITY PLAN

RECOMMENDED MOBILITY PLAN

Defining a mobility plan for the study area requires a balanced approach to meet the competing travel demands of the state road network, regional traffic, local redevelopment goals focused on increased walking, transit use and bicycling, and compatibility with surrounding neighborhoods. The multi-faceted mobility plan entails a series of transportation strategies that complement each other to respond to the overarching goals for the study: improve mobility and access of all users while providing support for desired downtown redevelopment. The objective of this report and its recommendations has been to craft a transformative plan that reinforces the overall goals while maintaining a practical orientation that strikes a proper balance between multimodal transportation needs in a cost-effective manner.

The central theme of the mobility plan is to better distribute traffic flow and create more connectivity. The lack of connectivity for all users has created a dysfunctional transportation network in the downtown area that segregates neighborhoods from their destinations, makes pedestrian access uncomfortable, and places too much pressure on the major state roads that traverse the study area. The recommended mobility plan embodies the following core principles:

- ☐ Make better use of available road capacity from the existing network;
- ☐ Recognize downtown as a destination by creating more livable streets with logical connections between origins and destinations, and
- ☐ Expand opportunities for better regional connectivity that will help the downtown study area thrive economically and socially.

Those principles are embodied in Figure 31, which presents a system plan map for the recommended strategies. The map shows recommended short term (by 2013) and longer term projects based on the analysis performed and input from stakeholders.

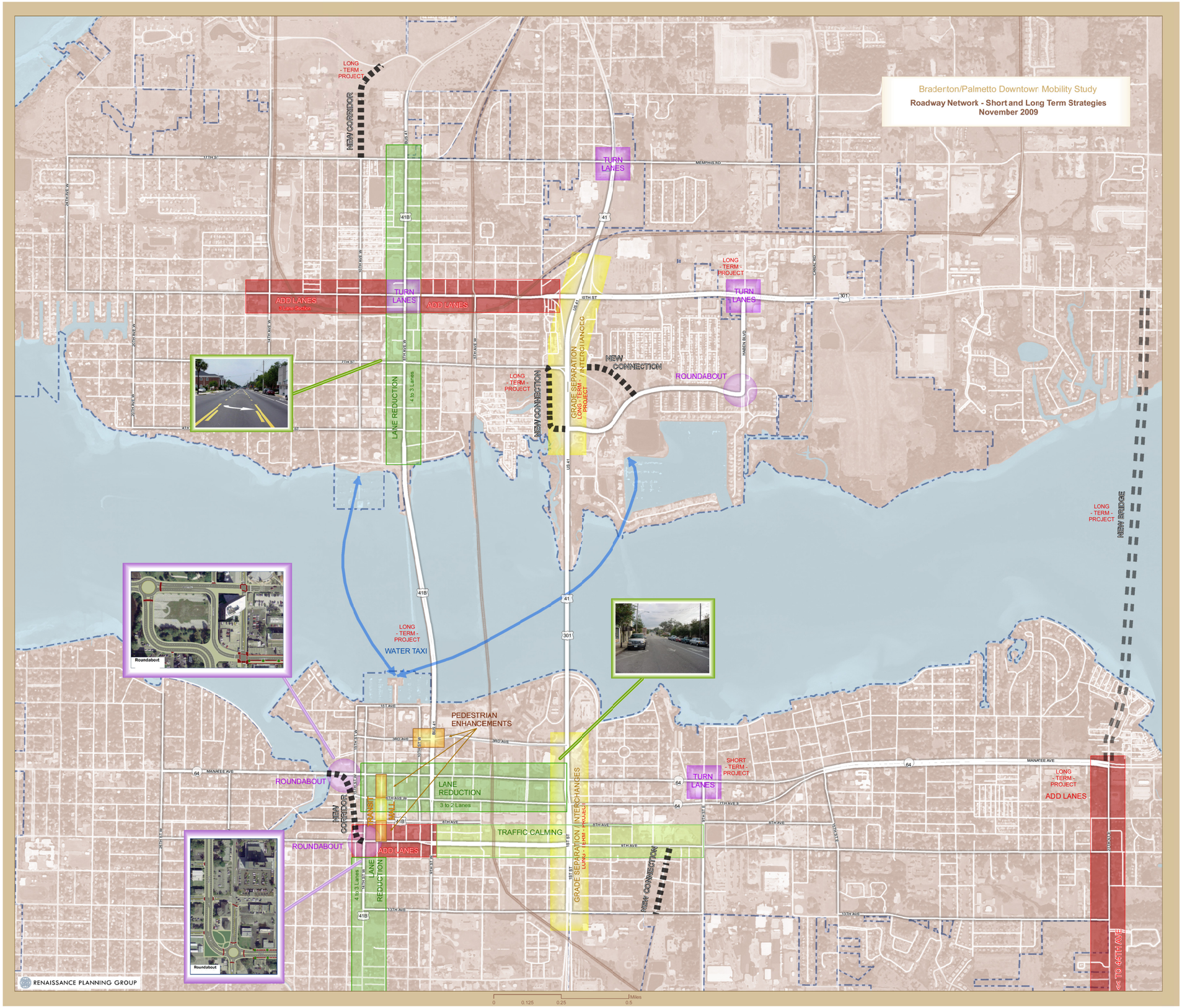

Braderton/Palmetto Downtowr Mobility Study
Roadway Network - Short and Long Term Strategies
November 2009
LONG - TERM - PROJECT
NEW CORRIDOR
TURN LANES
ADD LANES
TURN LANES
ADD LANES
LANE REDUCTION
4 to 3 Lanes
LONG - TERM - PROJECT
NEW CONNECTION
GRADE SEPARATION / INTERCHANGES
LONG - TERM - PROJECT
NEW CONNECTION
ROUNDABOUT
LONG - TERM - PROJECT
TURN LANES
LONG - TERM - PROJECT
NEW BRIDGE
LONG - TERM - PROJECT
WATER TAXI
PEDESTRIAN ENHANCEMENTS
ROUNDABOUT
ROUNDABOUT
NEW CORRIDOR
TRANSIT MALL
LANE REDUCTION
3 to 2 Lanes
TRAFFIC CALMING
ADD LANES
LANE REDUCTION
4 to 3 Lanes
GRADE SEPARATION / INTERCHANGES
LONG - TERM - PROJECT
NEW CONNECTION
SHORT - TERM - PROJECT
TURN LANES
LONG - TERM - PROJECT
ADD LANES
TO 49TH AVE
Roundabout
Roundabout
RENAISSANCE PLANNING GROUP
0 0.125 0.25 0.5 Miles

Figure 31

There is a need for additional roadway capacity across the Manatee River. This can either be accomplished through the Regional US 41 concept by creating grade separated interchanges where at-grade intersections now exist, or by building a third bridge across the river, approximately at the locations of Ellenton-Gillette Road and 27th Street E. Both represent major capital projects with environmental and community impacts, but represent different approaches to moving traffic by either using an existing regional corridor or creating a new regional corridor between I-75 and US 41/301. Through meetings with elected officials from both Palmetto and Bradenton, the new bridge crossing was generally preferred over the grade separations on the existing US 41/301 corridor.

The benefits of a new bridge/corridor are that it distributes traffic and allows regional trips to avoid the more congested downtown area to reach destinations to the south. The origin-destination survey revealed a large percentage of trips during the PM peak period traveling northbound are destined for locations along I-75. With Manatee County's planned construction of 44th Avenue from 15th Street E to Lockwood Ridge Road, this new bridge and widening of 27th Street E would allow for a strong connection between I-75, US 301 and Cortez Road to the DeSoto Square Mall and eventually Bradenton Beach. The impacts include significant environmental, historical and archeological impacts associated with Braden Castle and the Manatee River. However, the grade separations of US 41/301 would also have substantial environmental, aesthetic, business and community impacts. A more detailed analysis of each would need to occur through a Project Development and Environmental Study.

As shown in Figure 31, there are several other key projects that define the overall vision for mobility in the study area.

- ☐ Manatee Avenue and 6th Avenue lane reductions – reduces the barrier of high-speed traffic that splits the downtown while providing reduced crossing distance and more pedestrian accommodations.
- ☐ Green Bridge – improves a scenic multimodal connection that increases safety and comfort for pedestrians and bicyclists by better separating vulnerable road users from high speed traffic.
- ☐ 13th Street Transit Mall – defines a high quality public transit presence in downtown Bradenton that strengthens multimodal connectivity in the core area while providing a safe, secure environment with proper amenities for transit patrons and better facilities for drivers.
- ☐ 15th Street W Roundabouts – at Manatee Avenue and MLK, Jr. Avenue; provide a gateway entry into downtown that slow traffic speeds while helping to disperse traffic across the network in a safe, efficient manner.

The segregation of recommended projects into short- and longer term strategies was the result of identifying projects that are feasible and can be accomplished in the near term with minimal budgetary impacts, along with stakeholder input.

SHORT AND MID-TERM STRATEGIES

The following project summary sheets have been prepared to explain the key recommended projects for implementation in the short- or mid-term horizon. Each sheet identifies the purpose and need for the project, its impacts and benefits, and how it conforms to the long-term strategy.

8TH AVENUE (US BUSINESS 41) ROAD DIET	
Issue	With multiple driveway access points and the lack of refuge for left-turning vehicles, the segment of 8th Avenue from the Green Bridge to 17th Street creates a congestion and safety problem during peak periods because left-turning vehicles block through traffic, which causes sudden stops and lane changes. This situation reduces the effective capacity of the roadway, promotes aggressive driving, reduces pedestrian accessibility and inhibits the redevelopment potential of the downtown core.
Recommended Strategy:	Convert the four lane undivided roadway section between the Green Bridge and 17th Street to a two lane divided section with a center two-way left turn lane. With this strategy, the City would be able to add either on-street parking on one side of the road or widen the sidewalk with shade trees and other amenities to enhance the pedestrian environment.
Benefits	Based on results from a before/after study of a comparable situation on Edgewater Drive (SR 424) in the City of Orlando, this conversion can improve safety for all users of the roadway and accommodate the same amount of traffic, while encouraging greater pedestrian and bicycle travel. Creating a situation in which traffic moves steadily but more slowly would improve the visibility for businesses fronting the roadway.
Impacts	Slight reduction in theoretical roadway capacity for through traffic, and possible diversion to side streets for through traffic
Long Term Consistency	Consistent with overall long-term strategy of removing a share of regional, non-local through traffic from US Business 41/Green Bridge to US 41/301 (DeSoto Bridge), so that this corridor can become more supportive of multimodal travel and redevelopment goals.

13TH STREET TRANSIT MALL	
Issue	Transit operations at the Manatee County Courthouse lack a well-defined transit presence and do not provide for adequate bus staging, pedestrian amenities, or passenger information. The lack of a dedicated transit facility owned and maintained by the transit provider limits the ability to effectively monitor and maintain an environment that promotes and attracts transit users.
Recommended Strategy:	13th Street is a wide, low traffic volume street in the downtown core that is underutilized as a multimodal opportunity to strengthen access to transit and north-south pedestrian access between places of activity in downtown Bradenton. A potential Transit Mall corridor is along 13th Street W between 6th Avenue W and 8th Ave W. This concept would include the designation of a dedicated transit right-of-way, significant transit station location investment and the construction of a multi-use transfer facility on 13th Street W. The transit vehicles can be accommodated along with one travel lane for automobile access to adjacent commercial properties.
Benefits	Provides a dedicated transit presence with proper amenities in downtown Bradenton, where it will make transit more attractive and boost ridership. It will also contribute toward a more attractive and vibrant street that will help connect pedestrians traveling between areas to the south and north. MCAT has a $2 million grant through the Florida Department of Transportation for a dedicated transfer facility. That money can be spent largely on amenities and facilities supportive of operators and riders rather than acquiring property.
Impacts	Although it is a low volume street, this would mean that 13th Street is no longer used for bi-directional traffic flow in downtown. Adjacent property owners have expressed concerns about possible constraints on access, the perception of diminished property

	values and potential loitering.
Long Term Consistency	Consistent with expressed desire by MCAT to have a dedicated downtown transit transfer facility that can support increased bus operations, including local circulators and even private transit providers. It is not located adjacent to the CSX rail line; however, it is closer to existing downtown destinations that currently support transit use.
14TH STREET (US BUSINESS 41) ROAD DIET	
Issue	With multiple driveway access points and the lack of refuge for left-turning vehicles, the segment of 14th Street from 8th Avenue in downtown Bradenton to 26th Avenue creates a congestion and safety problem during peak periods because left-turning vehicles block through traffic, which causes sudden stops and lane changes. This situation reduces the effective capacity of the roadway, promotes aggressive driving, reduces pedestrian accessibility and inhibits the redevelopment potential of the downtown core.
Recommended Strategy:	Convert the four lane undivided roadway section between 8th Avenue and 26th Avenue to a two lane divided section with a center two-way left turn lane. With this strategy, the City can add on-street parking on one side of the road to provide a buffer between travel lane and sidewalk and to support mixed-use redevelopment along this roadway segment.
Benefits	Based on results from a before/after study of a comparable situation on Edgewater Drive (SR 424) in the City of Orlando, this conversion can improve safety for all users of the roadway and accommodate the same amount of traffic, while encouraging greater pedestrian and bicycle travel. Creating a situation in which traffic moves steadily but more slowly would improve the visibility for businesses fronting the roadway.
Impacts	Slight reduction in theoretical roadway capacity for through traffic, and possible diversion to side streets for through traffic
Long Term Consistency	Consistent with the City's 14th Street W CRA's goal for mixed-used, transit-supportive redevelopment of the aging motels and other land uses along this road segment.
15TH STREET WEST	
Issue	Inefficient traffic operations due to constrained downtown roadways and underutilized street network; existing traffic pattern does not recognize downtown as a destination
Recommended Strategy:	Construct roundabout on old City Hall property at Manatee Avenue west of existing 15th Street intersection, and create a new north-south road to link the roundabout with MLK Jr., Ave. via 15th Street W. Remove signal and full access at 15th Street W and Manatee Avenue and replace with right-in/right-out access. Redirect southbound left turn movement from Manatee Ave to 14th Street W. Remove eastbound right turn movement from 15th Street W to 6th Avenue. Construct 2nd roundabout at 14th Street W and MLK, Jr., Ave. to facilitate and calm traffic flow between Manatee Avenue, US 41 and the Central CRA.
Benefits	Enhances the distribution of traffic on the downtown roadway network, and creates a gateway that strengthens entry to the downtown core.
Impacts	Land acquisition is required to accommodate the geometry of the roundabouts and the widening of 15th Street W to accommodate 4 lanes of traffic.

Long Term Consistency	Consistent with overall downtown mobility strategy to create multiple options for distributing east-west traffic, and revitalization along key corridors within the downtown community and adjacent neighborhoods.

GREEN BRIDGE (US 41 BUSINESS)	
Issue	Both the Green Bridge and the nearby DeSoto Bridge (US 41/US 301) impede non-motorized travel between downtown Bradenton and downtown Palmetto because of a lack of comfortable, well-defined space for pedestrians and bicyclists. Bicyclists are actually prohibited from using the DeSoto Bridge, which does not have sidewalks or any accommodation for non-motorized modes. That leaves the Green Bridge as the only option in Manatee County for bicyclists and pedestrians to cross the river.
Recommended Strategy:	Reduce travel lane widths from 12' to 11' and a reduced width of the outside shoulder from 10' to 9.' This extra space would be used to add 6' to the existing sidewalk by moving the existing barrier, thus creating a 10' sidewalk/shared-use path on the western or southbound side of the bridge. Connections exist on the Palmetto side of the Manatee River to the Riverwalk; on the Bradenton side, there is an existing, but unused, utility box that inhibits access to the Riverwalk. This utility box can be removed at little cost to provide the proper access to Barcarrota Boulevard, the Riverwalk, and the rest of the bicycle network in downtown Bradenton.
Benefits	Enhanced bicycle and pedestrian accessibility between Palmetto and Bradenton. Reduction of greenhouse gas emissions and vehicle miles of travel for those who can make this a regular commuting pattern.
Impacts	Possible replacement of existing fencing may be required and relocation of the existing barrier to accommodate the 10' multi-purpose lane.
Long Term Consistency	This strategy does not impede or negative affect regional traffic mobility on US Business 41. The recommendation provides a key link in the regional multi-use trails network to connect the Bradenton Riverwalk with the Palmetto Riverwalk, both of which provide access to designated bicycle and pedestrian facilities in the adopted plans for Manatee County and the two municipalities.

HABEN BOULEVARD @ US 301	
Issue	Congestion at 10th Street and US 41/US 301 interchange; delays on US 41/301 @ Haben Blvd.; lack of east-west connectivity in Palmetto
Recommended Strategy:	Long-term: Create grade separation to promote regional through traffic by eliminating delays caused by existing traffic signal. Short-term: Extend 7th Street across US 41/301 north of Civic Center to access Haben Blvd and remove signal at Haben Blvd for right in/right-out access. Alternative: Extend Haben Blvd west across US 41/301 and north to connect at existing 7th Street. Detailed environment and design issues to be resolved with PD&E Study.

Benefits	Provides parallel east-west connection to reduce demand on 10th Street and US 41 interchange; provides improved access to 7th Street destinations, civic uses and downtown Palmetto and CRA. Long-term benefit is to improve mobility for regional north-south traffic in the US 41/301 corridor.
Impacts	Environmental impacts associated with estuary and wetlands on private property north of Civic Center. Increased traffic on Haben Boulevard in front of Manatee School for the Arts. Reduced access may be an issue pending completion of PD&E Study to determine access points for long-term grade separation strategy.
Long Term Consistency	The recommended strategy is to create a grade separation of the Haben Boulevard and US 301/41 intersection to improve traffic flow. This is an appropriate strategy in isolation or as part of a sequence of grade separations that would extend along US 301/ 41 south of the Manatee River to the existing overpass at the Red Barn flea market. A PD&E Study is necessary to determine the feasibility and cost-effectiveness of this recommendation for Haben at US 301/41.
Discussion	Several options were considered for this location. The key issues here involve finding a solution to the failing interchange at the US 41/US 301 interchange in Palmetto, and improving east-west mobility linking the Civic Center and Riviera Dunes neighborhood with downtown Palmetto. Haben Boulevard is already used as a convenient alternative to the interchange for motorists traveling across the river into Bradenton. Any additional development in this area would need better access to the areawide transportation network to reduce congestion-related delays and improve safety. The recommended strategy is to create a seamless link between Haben Boulevard and 7th Street, one of the main east-west gateways into downtown Palmetto and its redevelopment area. This would help extend the grid street network in Palmetto farther east, better distributing traffic to reduce congestion at the interchange, and improving access for properties in this area and to the downtown area. 7th Street is an underutilized road, with relatively low traffic volumes that provides retail, civic and employment destinations. The additional east-west connection could help alleviate operational problems at 8th Avenue (Business 41) and 10th Street due to heavy traffic volumes. This strategy can be accomplished in one of two ways: by extending 7th Street east across US 301 and north of the Civic Center to connect to Haben Boulevard, or extending Haben Boulevard west and north to connect with 7th Street on the west side of US 301. Either option would result in a one signalized intersection due to spacing problems with the interchange, leaving the other with a restricted right-in/right-out intersection access. Both have environmental impacts involving the estuary on the west side of US 301 and wetlands located on the north side of the Civic Center. A PD&E study would need to better delineate the extent of these constraints; however, the estuary is public land and the wetlands north of the Civic Center are in private ownership where a hotel development is planned. Even without a road connection from 7th Street to Haben Boulevard, any development on this site would require a mitigation plan for the wetlands.

MANATEE AVENUE AND 6TH AVENUE ROAD DIET	
Issue	Challenging pedestrian and bicycling environment in Bradenton downtown core due to heavy traffic, no buffer between sidewalk and travel lanes and wide crossing distances; creates barrier between downtown places of interest and residential areas
Recommended Strategy:	Eliminate one lane of through traffic between 10th Street and 13th Street on Manatee Avenue, and between 14th Street and 10th Street on 6th Avenue. Replace with wider sidewalks, on-street parking and curb bulb-outs
Benefits	Enhances pedestrian connectivity and safety, maintains traffic flow by keeping one-way pairs, and expands downtown environment and links to the south
Impacts	Slight reduction in theoretical roadway capacity for through traffic
Long Term Consistency	Consistent with the Downtown by Design Master Plan to promote a more walkable downtown destination. First component of an area-wide traffic plan that better utilizes MLK, Jr. Ave. and an extension of 15th Street West to maintain east-west traffic flow to the redeveloping areas and through downtown Bradenton
MLK, JR. AVENUE	
Issue	Main corridor serving Central CRA faces challenges from high traffic speeds that inhibit pedestrian and auto access, while lacking visibility to support redevelopment goals.
Recommended Strategy:	**9th Street E to 1st Street:** Reduce travel lane widths to add on-street parking and marked pedestrian crossings at intersections to calm traffic **1st Street to 15th Street W:** enhance pedestrian crossing at intersections and widening from 3 lanes undivided to 4 lanes divided from 9th Street W to 15th Street W. Enhance grid network in the Central CRA by connecting 6th Street E Court to 13th Avenue E. This will improve access to and from the residential neighborhood south of MLK, Jr. Avenue.
Benefits	Creates stronger multimodal corridor that increase visibility for desired redevelopment and infill development along MLK, Jr. Ave., while improving pedestrian safety to link the CCCRA to the core downtown district. Additional parking support existing churches and commercial development. Improves capacity of the downtown street network.
Impacts	Increased traffic through the corridor; additional right-of-way needed to support widening from 9th Street W to 15th Street W.
Long Term Consistency	Consistent with overall downtown mobility strategy to create multiple options for distributing east-west traffic, and use of roundabouts at 14th Street and MLK. Jr. Ave., and Manatee Avenue and 15th Street W to create gateways that improve flow and traffic safety.

DOWNTOWN BRADENTON TRANSIT CIRCULATOR	
Issue	Downtown Bradenton has several redevelopment areas and relatively far-flung destinations – Manatee Memorial Hospital, the County government building and Judicial Center, the Village of the Arts and surrounding residential areas. As downtown adds more residential development and redevelopment occurs in commercial areas, there is a need to capture more of the shorter trips being made and to provide connections from the downtown MCAT bus transfer facility.
Recommended Strategy:	13th Street is a wide, low traffic volume street in the downtown core that is underutilized as a multimodal opportunity to strengthen access to transit and north-south pedestrian access between places of activity in downtown Bradenton. A potential Transit Mall corridor is along 13th Street W between 6th Avenue W and 8th Ave W. This concept would include the designation of a dedicated transit right-of-way, significant transit station location investment and the construction of a multi-use transfer facility on 13th Street W. The transit vehicles can be accommodated along with one travel lane for automobile access to adjacent commercial properties.
Benefits	Provides a dedicated transit presence with proper amenities in downtown Bradenton, where it will make transit more attractive and boost ridership. It will also contribute toward a more attractive and vibrant street that will help connect pedestrians traveling between areas to the south and north. MCAT has a $2 million grant through the Florida Department of Transportation for a dedicated transfer facility. That money can be spent largely on amenities and facilities supportive of operators and riders rather than acquiring property.
Impacts	Although it is a low volume street, this would mean that 13th Street W is no longer used for bi-directional traffic flow in downtown. Adjacent property owners have expressed concerns about possible constraints on access, the perception of diminished property values and potential loitering.
Long Term Consistency	Consistent with expressed desire by MCAT to have a dedicated downtown transit transfer facility that can support increased bus operations, including local circulators and even private transit providers. Also consistent with long term plans defined by TBARTA for regional rail and/or Bus Rapid Transit connections to Bradenton. It is not located adjacent to the CSX rail line; however, it is closer to existing downtown destinations that currently support transit use.

TABLE 13 – SHORT AND MID-TERM PROJECTS AND COSTS

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
SHORT-TERM	2nd Street East	Riverfront Blvd	Manatee Ave	Enhance pedestrian facilities	Bradenton	Bradenton	$170,000
	9th (MLK Jr.) Avenue	9th St W	9th St E	Reduce outside lane widths, add on-street parking, and enhance pedestrian facilities	Bradenton	Bradenton	$1,240,000
	6th St Ct E	11th Ave E	13th Ave E	Construct 2 lane undivided road	Bradenton	Bradenton	$810,000
	Manatee Avenue	26th St W	15th St W	Add bicycle lane signage and pavement markings	Bradenton	FDOT	$10,000
	Manatee Avenue and 9th Street E			Add left turn lane westbound	Bradenton	FDOT	$330,000
	9th St E	Manatee Ave	US Hwy 301	Add bicycle lane signage and pavement markings	Bradenton	FDOT/Bradenton	$10,000
	River Ride	9th St W	1st St (US 41)	Add multi-use trail adjacent to Riverwalk	Bradenton	Bradenton	$100,000
	9th St W and 3rd Ave			Enhance pedestrian facilities	Bradenton	Bradenton	$30,000
	Green Bridge Trail	Bradenton	Palmetto	Add multi-use trail	Bradenton	FDOT	$550,000
	13th Street Transit Station	6th Ave	8th Ave	Transit station transfer facility	Bradenton	MCAT	$2,040,000
	10th Street	15th Ave W	8th Ave W	Add continuous center turn lane	Palmetto	Palmetto	$2,210,000
	10th Street	8th Ave W	5th Ave W	Add one eastbound lane, bicycle lanes, add signage, and pavement markings	Palmetto	FDOT	$1,620,000
	10th Street	24th Ave W	8th Ave W	Fill bicycle lane gaps, add signage, and pavement markings	Palmetto	Palmetto	$520,000
	4th Street and 20th Avenue	8th Ave W	10th St W	Add share the road signage, and pavement markings	Palmetto	Palmetto	$10,000
	Manatee Avenue and 15th St W			Intersection improvements	Bradenton	FDOT	$170,000
	Haben Blvd and Rivera Dunes			Roundabout	Palmetto	Palmetto	$370,000
	Willow-Ellenton Trail	10th St W	Canal Rd	Add multi-use trail within railroad ROW	Palmetto	Palmetto	$930,000
	Short-term total						**$11,120,000**

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
MID-TERM	Manatee Avenue	15th St W	9th St W	Modify continuous left turn lane into a series of left turn lanes with curb extensions to prevent through movement, maintain two through lanes, and enhance pedestrian facilities.	Bradenton	FDOT	$2,320,000
	6th Avenue	15th St W	9th St W	Reduce from 3 lane to 2 lane, enhance pedestrian facilities, and add multi-use path	Bradenton	FDOT	$2,350,000
	14th Street West	8th Ave	26th Ave	Reduce from 4 lane undivided to 3 lane with center turn lane, enhance pedestrian facilities, and add multi-use path	Bradenton	FDOT	$8,100,000
	9th (MLK Jr.) Avenue	15th St W	9th St W	Widen from 3 lane undivided to 4 lane divided with enhance pedestrian facilities	Bradenton	Bradenton	$2,110,000
	15th Street West	Manatee Ave	9th Ave	Widen from 2 lane undivided to 4 lane divided with enhance pedestrian facilities	Bradenton	Bradenton	$2,610,000
	Manatee Avenue	15th St E	27th St E	Reduce outside lane widths and add bicycle lanes	Bradenton	FDOT	$880,000
	Rails with Trails	Riverwalk	13th Ave	Add multi-use trail within the railroad ROW	Bradenton	Bradenton	$990,000
	Manatee Ave Roundabout	Manatee Ave	15th St W	Roundabout	Bradenton	FDOT	$1,190,000
	9th Ave Roundabout	15th St W	9th Ave	Roundabout	Bradenton	FDOT	$570,000
	Bradenton Circulator			Capital cost and 5 year operating cost to provide downtown transit circulator	Bradenton	MCAT	$6,640,000
	US Hwy 41 and 17th Street			Add right turn lanes northbound and southbound and left turn lanes eastbound and westbound	Palmetto	FDOT/County	$760,000
	US Hwy 301 and Haben Blvd			Reconstruct northbound right turn to channelized with merge	Palmetto	FDOT	$330,000
	Haben Blvd and 10th Street E (US Hwy 301)			Reconstruct northbound right turn	Palmetto	Palmetto	$330,000

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
	8th Avenue West (Bus 41)	17th St	Green Bridge	Reduce from 4 lane undivided to 3 lane with center turn lane, bicycle lanes, and enhanced pedestrian facilities	Palmetto	FDOT	$9,060,000
	8th Avenue W and 10th St W			Add left turn lane westbound and right turn lane northbound	Palmetto	FDOT	$810,000
	7th St Connection	Haben Blvd	7th St W	Construct 2 lane undivided	Palmetto	Palmetto	$3,110,000
	10th Avenue W	17th St	Terra Ceia Bay Blvd	Construct 2 lane undivided	Palmetto	Palmetto	$3,060,000
	14th Street Trail	10th St W	Blackstone Park	Add multi-use trail within road ROW	Palmetto	Palmetto	$530,000
	Downtown Palmetto Trail	Green Bridge	10th St W	Add multi-use trail	Palmetto	Palmetto	$1,090,000
	Palmetto Downtown Circulator			Capital cost and 5 year operating cost to increase service on MCAT Route13	Palmetto	MCAT	$6,290,000
	Mid-term Total						**$53,130,000**
	GRAND TOTAL						**$64,250,000**

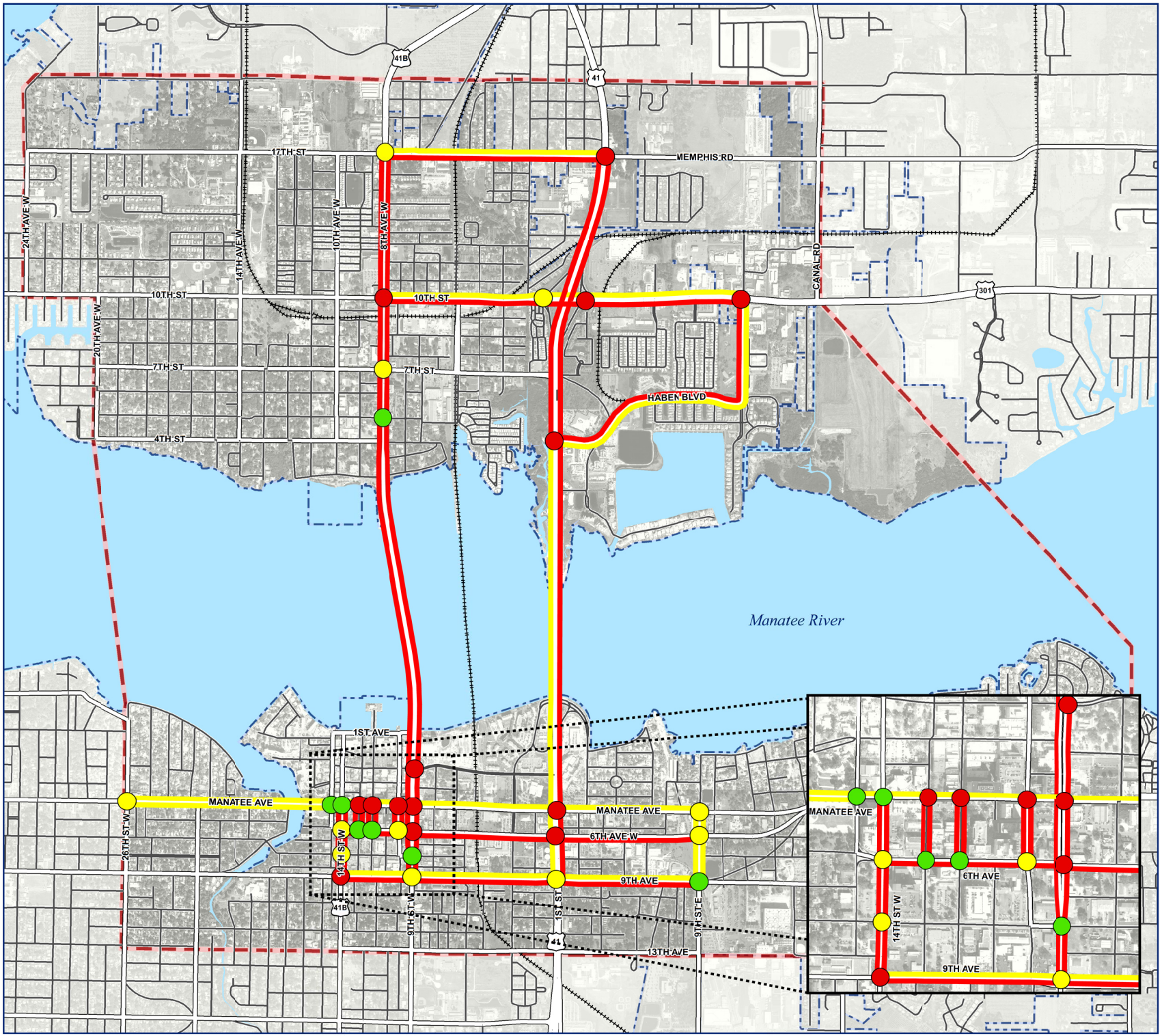
TECHNICAL ANALYSIS OF SHORT- AND MID-TERM STRATEGIES

The analysis process evaluated the traffic operations of the short- and mid-term strategies in the study area to determine if the recommended network modifications could support the projected traffic by 2013. Supporting the study's guiding principles of creating a downtown destination with a more balanced transportation network, the analysis incorporated the recommended strategies into the Synchro model and evaluated the mobility situation based on the performance measures identified earlier in this report. Based on more detailed analysis, the long term recommended strategy was modified slightly due to right-of-way constraints, community impacts and financial constraints.

For instance, the alignment of the "regional bypass" of SR 64 was modeled based on a conceptual drawing of a potential alignment done for the City of Bradenton several years ago, using MLK Jr. Avenue right-of-way to 9th Street East and then connecting back to SR 64 north of the Tropicana Plant. Tropicana has since constructed a new retention pond at the northeast corner of MLK Jr. Avenue and 9th Street E, and a high speed bypass was determined to be inconsistent with redevelopment plans of the Central CRA. Based on the two points mentioned, the SR 64 bypass concept was modified to use the excess capacity on MLK, Jr. Avenue and balance the east /west traffic between Manatee Avenue, 6th Avenue and MLK, Jr. Avenue with intersection improvements on the east side at 9th Street E at Manatee Avenue, and the 15th Street West / roundabouts on the west side.

FUTURE LEVEL OF SERVICE AND DELAY

The core of the study area is an established downtown area with various limitations on the projects that could be constructed. Because of these limitations, the recommended strategies focused on achievable solutions that could improve the mobility within the core of the study area, not necessarily fix what is already broken. As identified in Figure 32, without any improvements in the study area by 2013, the roadways and intersections operate at a Level of Service (LOS) of E or F. Figure 33, depicts the LOS results with the recommended mobility strategy, and although all the roadways and intersections still do not meet the LOS standards identified in the City of Bradenton's Comprehensive Plan, the situation is an improvement over the no build option. Table 14 identifies the volume-to-capacity ratio and delay associated with each intersection in the study area. The recommended short term strategies maintained or improved the volume-to-capacity ratio and delay on 75 percent of the intersections (24 intersections) in the core area. The volume-to-capacity and delay increased on six intersections, but only two of those reached deficient levels (MLK, Jr. Avenue at US 41 and MLK at US Business 41). Appendix D contains the intersection output files from the Synchro network model run for both the build and no build alternatives.



Bradenton / Palmetto Downtown Mobility Study

Figure 32

Existing Network 2013 Traffic Volume PM Directional LOS

Intersection Level of Service Grade

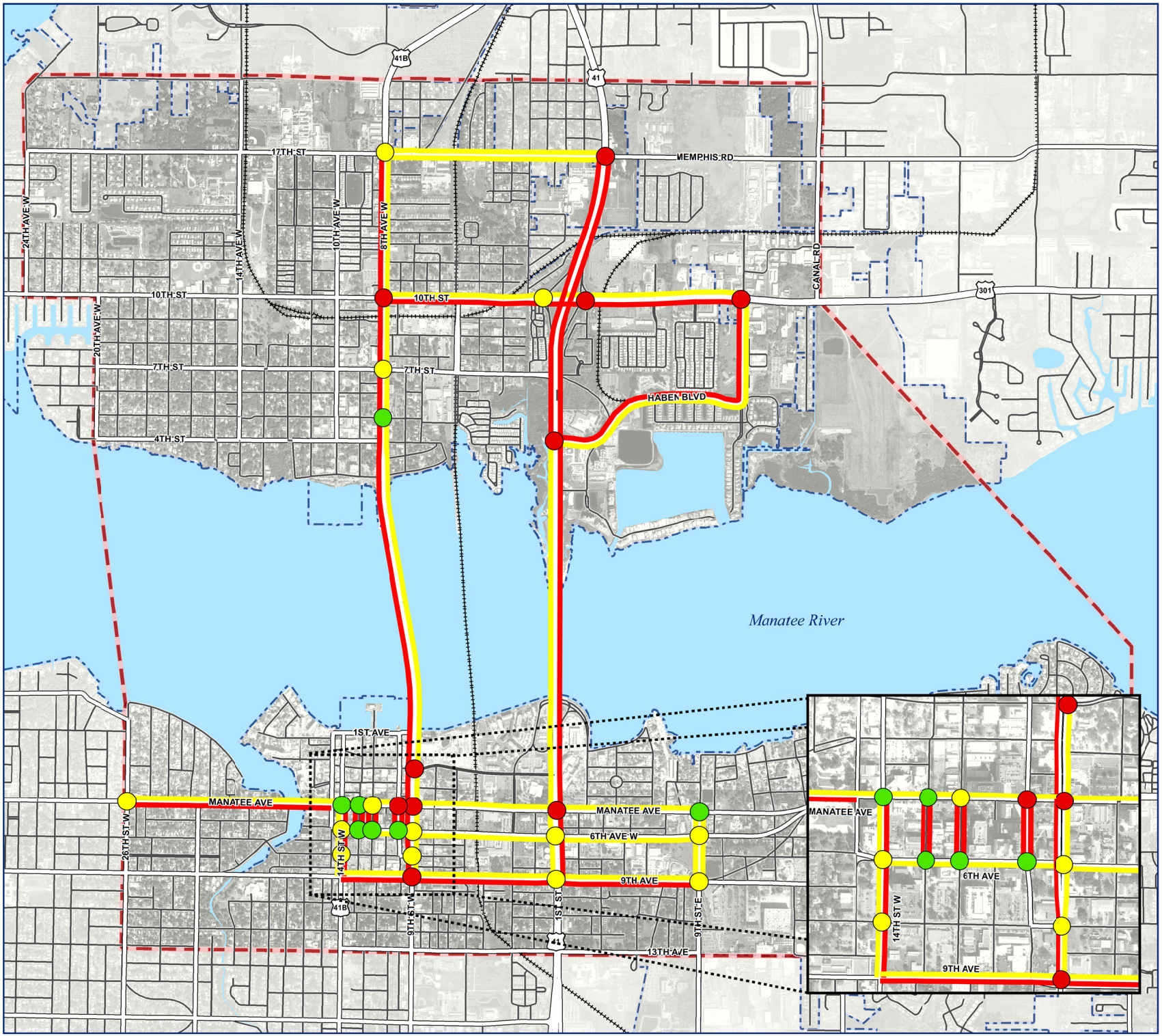
- A or B
- C or D
- E or F

Roadway Level of Service Grade

- A or B
- C or D
- E or F
- Arterial or Collector Road
- Local Road
- Railroad
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Mi

RENAISSANCE PLANNING GROUP



Bradenton / Palmetto Downtown Mobility Study

Figure 33

Future Network 2013 Traffic Volume PM Directional LOS

Intersection Level of Service Grade

- A or B
- C or D
- E or F

Roadway Level of Service Grade

- A or B
- C or D
- E or F
- Arterial or Collector Road
- Local Road
- Railroad
- Study Area Boundary
- Municipal Boundary

0 0.125 0.25 0.5 Mi

RENAISSANCE PLANNING GROUP

TABLE 14 – INTERSECTION LOS

INTERSECTIONS	NO BUILD (2013 VOLUME / 2008 NETWORK)		FUTURE CONDITIONS (2013 VOLUME / ALT NETWORK		FUTURE CONDITIONS DIFFERENCE	
	V/C Ratio	Delay	V/C Ratio	Delay	V/C Ratio	Delay
10th Street @ Bus 41	1.19	108.5	1.02	64.1	-17%	-44.40
US 301 @ Haben Blvd	1.46	227.6	1.46	227.6	0%	0.00
Manatee Ave @ 12th Street	0.83	16.1	0.97	17.5	14%	1.40
6th Ave @ 12th Street	0.52	10.0	0.50	10.3	-2%	0.30
7th Street @ Bus 41	0.80	25.8	0.80	25.7	0%	-0.10
17th Street @ US 41	1.21	155.2	1.05	63.8	-16%	-91.40
17th Street @ Bus 41	0.67	35.9	0.67	35.7	0%	-0.20
5th street @ Bus 41	0.80	14.6	0.80	14.7	0%	0.10
8th Street @ Bus 41	0.56	30.3	0.54	32.4	-2%	2.10
Manatee Ave @ 10th Street	0.82	20.9	0.96	37.3	14%	16.40
Manatee Ave @ US 41	1.22	93.3	1.13	85.6	-9%	-7.70
Manatee Ave @ Bus 41	1.12	91.2	1.05	86.6	-7%	-4.60
3rd Ave @ Bus 41	1.27	87.2	1.27	86.9	0%	-0.30
6th Ave @ 10th St	0.70	23.2	0.70	14.7	0%	-8.50
Manatee Ave @ 13th Street	0.77	13.7	0.96	14.3	19%	0.60
6th Ave @ 13th Street	0.54	14.2	0.53	6.9	-1%	-7.30
6th Ave @ 14th Street	0.79	24.5	0.58	23.5	-21%	-1.00
14th Street @ 8th Ave	0.57	32.0	0.50	27.9	-7%	-4.10
Manatee Ave @ 14th Street	0.81	7.7	0.89	4.3	8%	-3.40
Manatee Ave @ 15th Street	0.92	2.3	x	x	x	x
6th Ave @ Bus 41	1.02	60.9	0.86	25.6	-16%	-35.30
6th Ave @ US 41	0.98	49.3	0.91	34.2	-7%	-15.10
6th Ave @ 9th St E	0.74	21.0	0.74	19.7	0%	-1.30
Manatee Ave @ 26th St	0.99	55.5	0.99	55.5	0%	0.00
9th Ave @ Bus 41	0.83	39.5	1.02	56.7	19%	17.20
9th Ave @ US 41	0.81	38.7	1.11	54.8	30%	16.10
9th Ave @ 14th Street	1.13	156.0	x	x	x	x
Haben Blvd @ US 41	1.30	109.6	1.30	109.6	0%	0.00
9th Ave @ 9th Street	0.53	20.9	0.53	23.0	0%	2.10
Manatee Ave @ 9th Street	0.65	18.8	0.61	18.7	-4%	-0.10
US 301 @ US 41 SB	1.02	38.1	1.02	38.1	0%	0.00
US 301 @ US 41 NB	0.91	45.4	0.91	45.4	0%	0.00

Measures of Effectiveness (MOEs) – Travel Time / Delay / Speed

Based on the transportation performance measures established previously, the future conditions of the roadway network improved in all but one direction. As shown in Table 15, travel on US 41/301 southbound from Haben Boulevard to MLK Jr. Avenue is projected to experience 25 more seconds of travel time from delay, which reduces the average travel speed by one mile per hour. US Business 41 northbound is projected to have an improvement in travel time of over two minutes; this is largely due to the recommended improvements to the 10th Street at US Business 41 intersection.

TABLE 15 – MEASURES OF EFFECTIVENESS

	DISTANCE (MILES)	TRAVEL TIME (HRS : MIN : SEC)			DELAY (HRS : MIN : SEC)			AVERAGE SPEED (MPH)		
		2013 No Build	2013 with Strategies	Dif	2013 No Build	2013 with Strategies	Dif	2013 No Build	2013 with Strategies	Dif
Manatee Ave (9th Street E -> 14th Street W)	1.35	0:05:34	0:05:18	-0:00:16	0:02:36	0:02:29	-0:00:07	14.5	15.3	0.7
6th Ave (9th Street E -> 14th Street W)		0:06:38	0:05:15	-0:01:23	0:03:38	0:02:15	-0:01:23	12.3	15.5	3.2
US 41 (9th Avenue -> Haben Boulevard)	1.77	0:09:46	0:09:39	-0:00:07	0:06:10	0:06:03	-0:00:07	10.9	11.0	0.1
US 41 (Haben Boulevard -> 9th Avenue)		0:05:44	0:06:10	0:00:25	0:02:08	0:02:33	0:00:25	18.5	17.2	-1.3
US Business 41 (9th Avenue -> 17th Street)	2.56	0:12:55	0:10:49	-0:02:05	0:07:32	0:05:26	-0:02:05	11.9	14.2	2.3
US Business 41 (17th Street -> 9th Avenue)		0:11:28	0:11:24	-0:00:04	0:06:05	0:06:01	-0:00:04	13.4	13.5	0.1

Manatee Avenue and 6th Avenue Lane Reduction

One of the catalyst projects associated with the defining vision of the Downtown Mobility Study is the reduction of travel lanes on SR 64 (Manatee Avenue and 6th Avenue) in downtown Bradenton between 10th Street West and 13th Street West. This recommendation emerged after it was determined that a more aggressive strategy of converting the one-way roads into two-way roads would result in substantially greater traffic delays. A more detailed analysis was performed on this section to determine if the lane reduction strategy as developed would enable sufficient capacity to accommodate an acceptable level of automobile mobility. The Synchro model was coded and run isolating the lane reduction strategy alone, and the results revealed that two through lanes between 10th Street and 13th Street West on Manatee Avenue and 6th Avenue would be sufficient (Synchro results can be found in Appendix C and D). The lane group capacity results from both the existing and recommended geometry for the intersections in this section were compared against the 15 minute volumes in the peak period to determine the length and level of congestion. As shown in Figures 34 and 35, the analysis determined that the duration of congestion on Manatee and 6th Avenue is less than 15 minutes and the length of one traffic signal. With the recommended lane reduction strategy and traffic projections for 2013 as depicted in Figures 36 and 37, there are a few periods where traffic will exceed the capacity of the intersection, but at its worst the duration of congestion will be between 4:30 and 5:30 PM on 6th Avenue.

FIGURE 34 – MANATEE & 6TH CONCEPTUAL DESIGNS

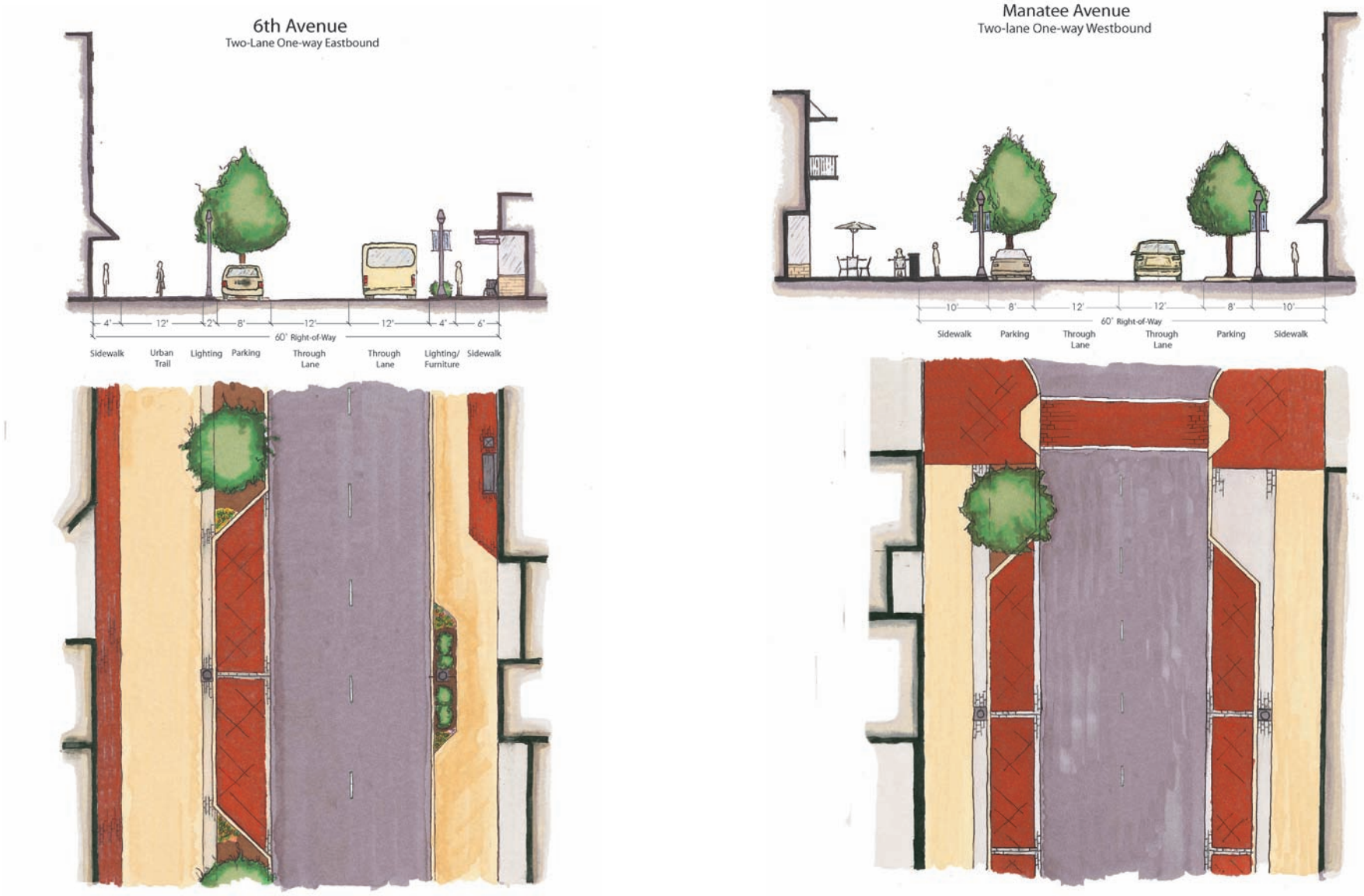


FIGURE 35 – MANATEE AVE EXISTING DURATION

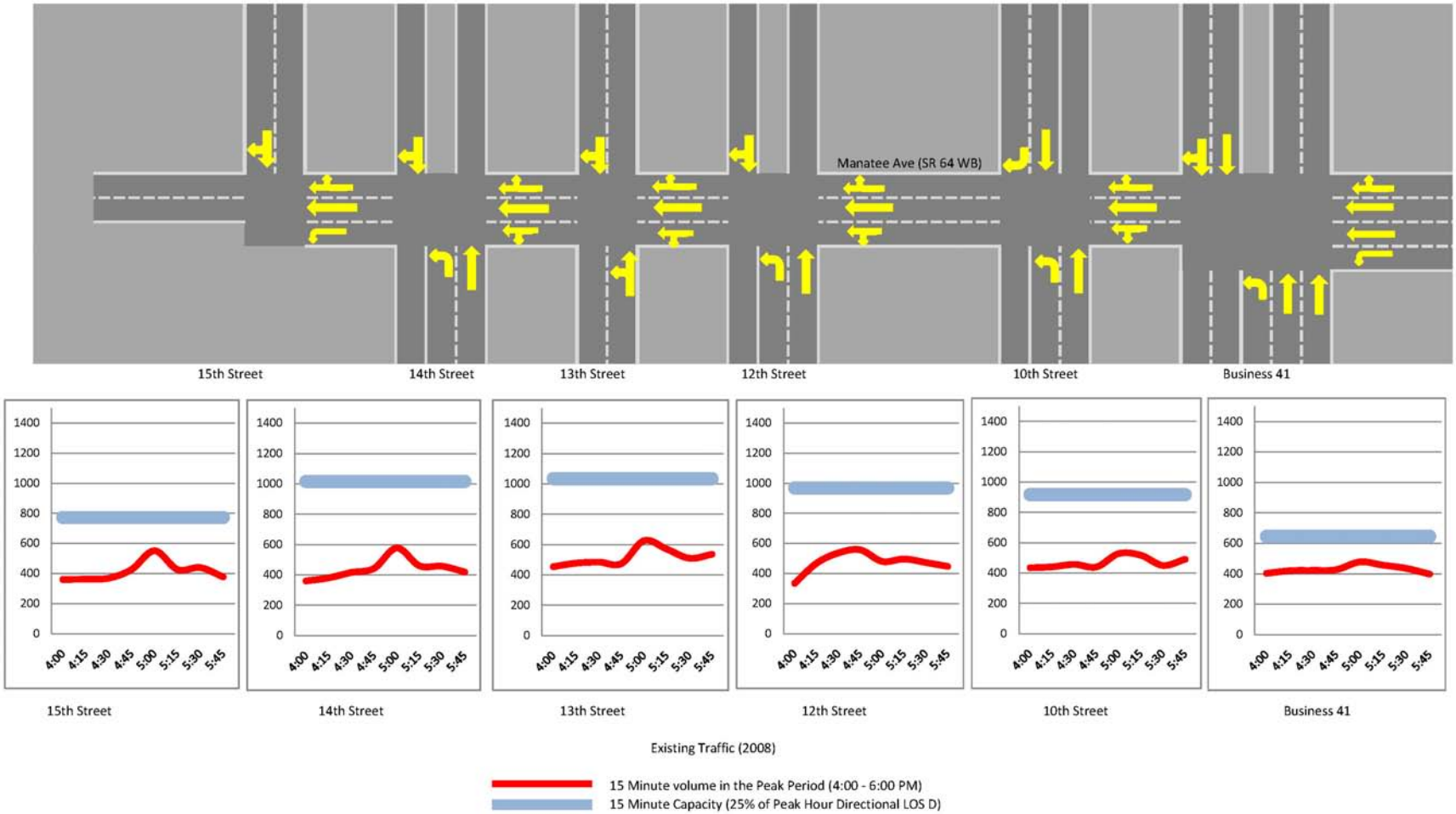


FIGURE 36 – MANATEE AVE 2013 DURATION WITH ALT

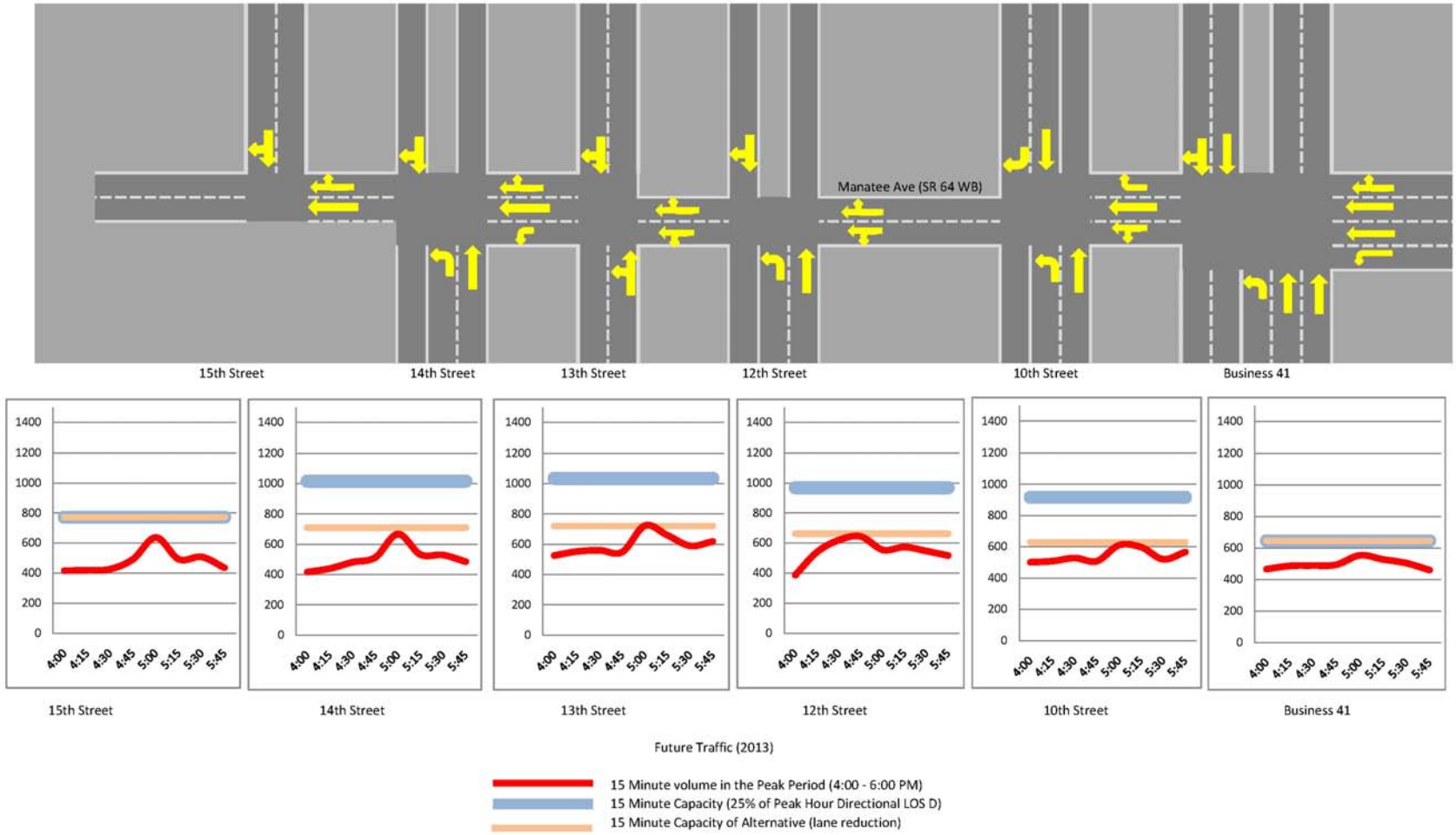


FIGURE 37 – 6TH AVE EXISTING DURATION

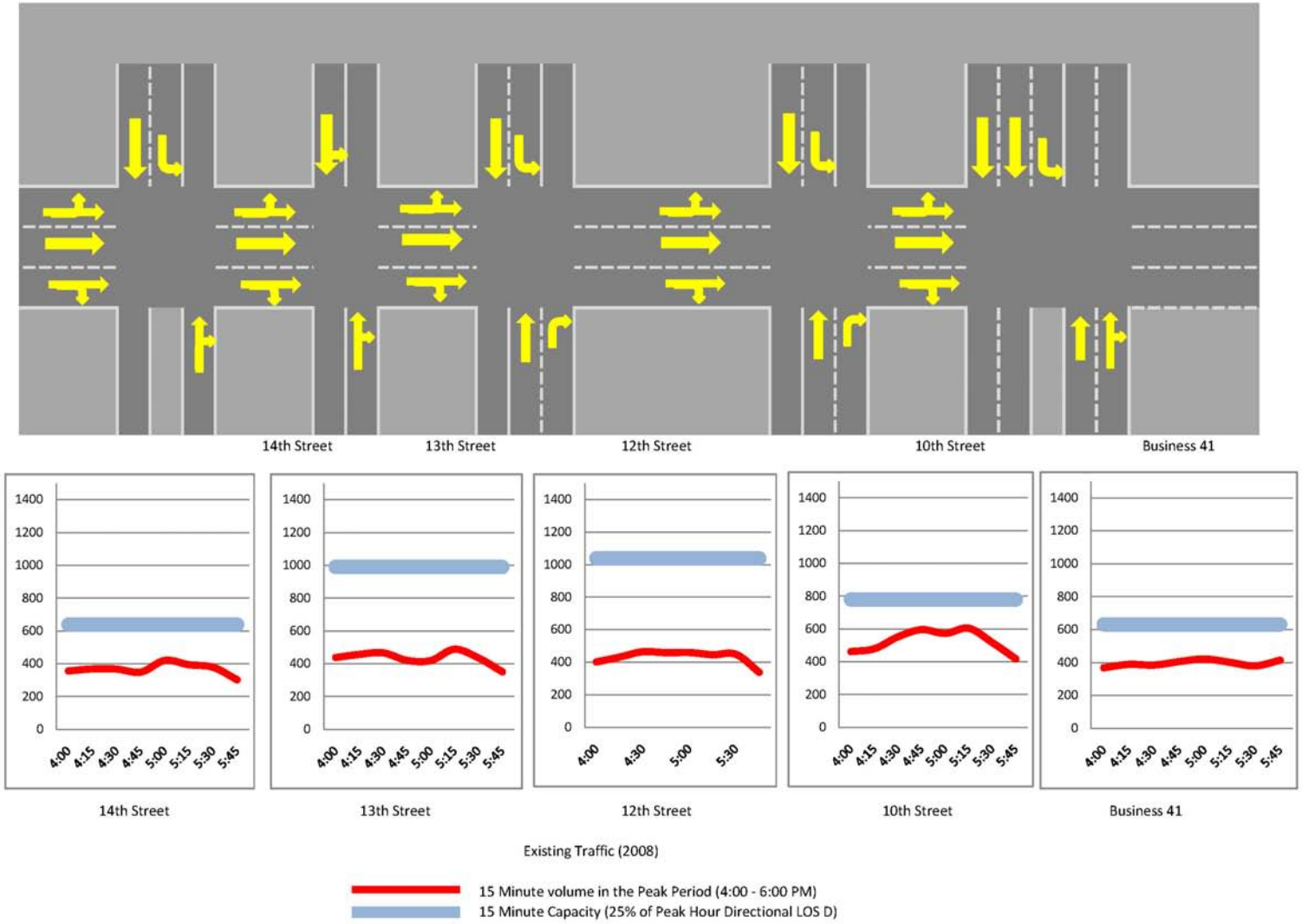
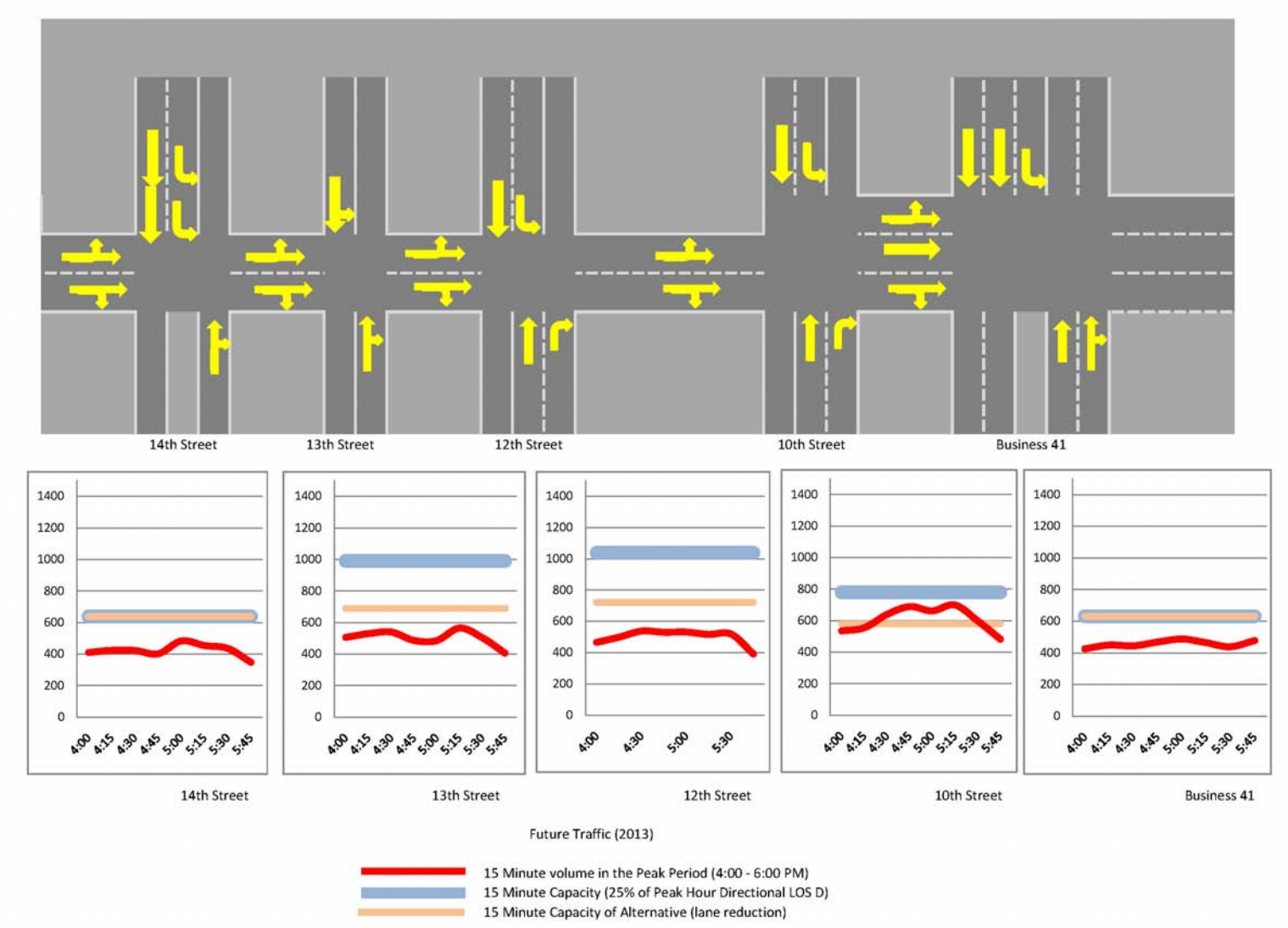


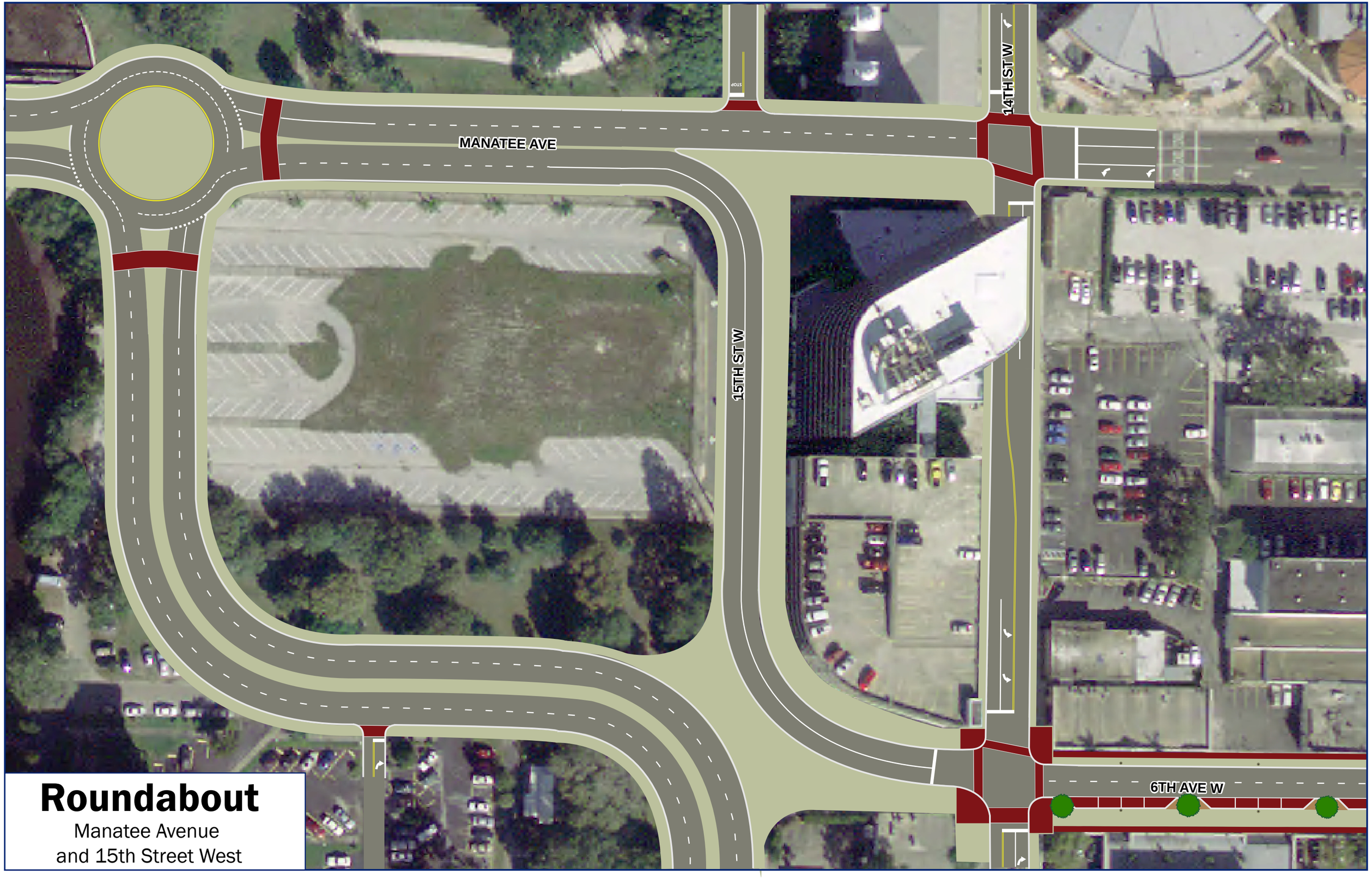
FIGURE 38 – 6TH AVE 2013 DURATION WITH ALT



15Th Street West / Roundabouts

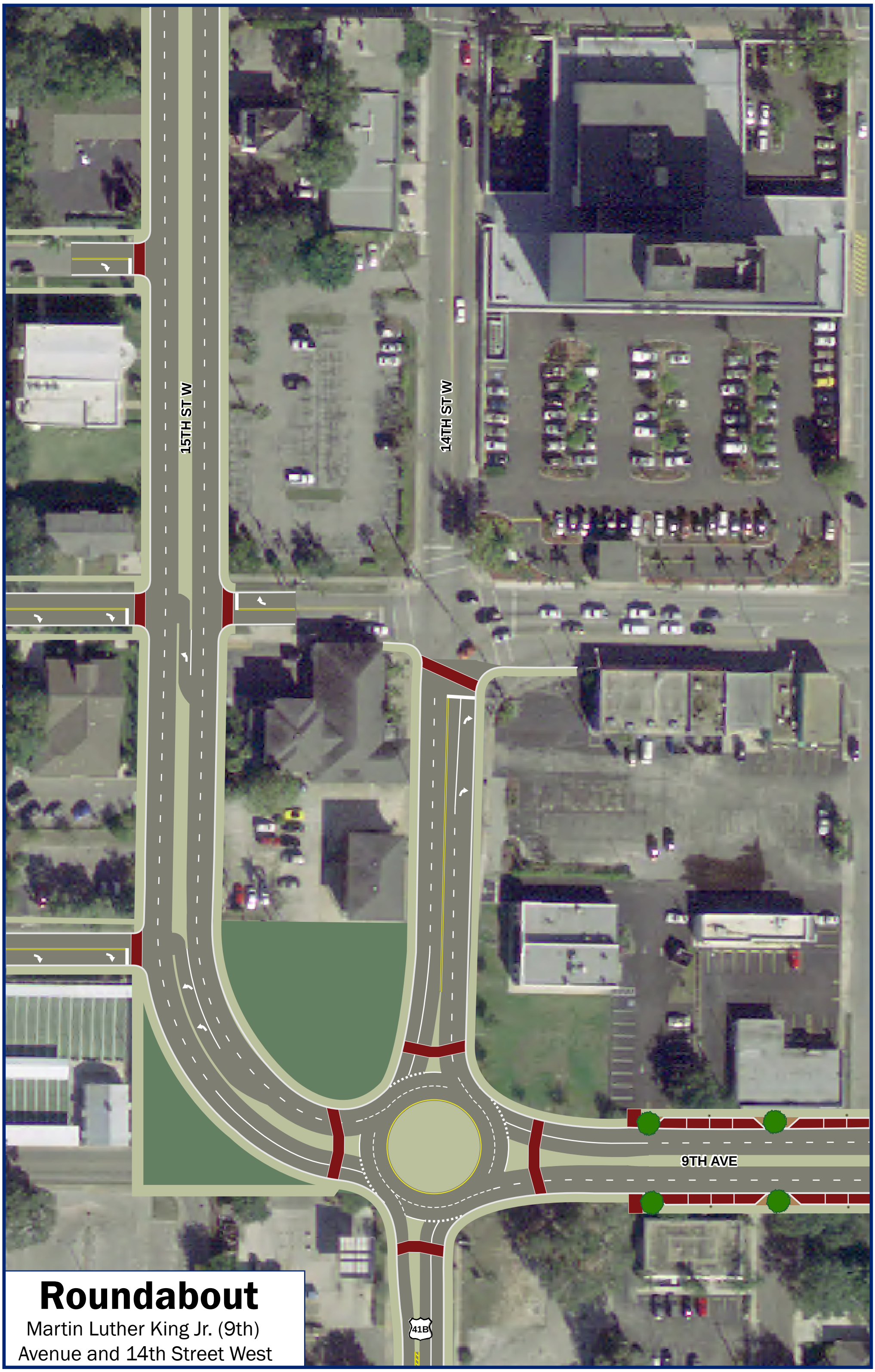
To provide a signature gateway into downtown Bradenton and support the balanced distribution of east/west traffic, the study recommends two proposed roundabouts. The two roundabouts, one on west SR 64 (just east of Wares Creek) and the other replacing the intersection of 14th Street West at MLK Jr. Avenue, work in tandem to slow down traffic speeds while maintaining traffic flow through the downtown area, and create a safe and attractive option to conventional signalized intersections that is more accommodating of pedestrians. The northern roundabout at SR 64 makes use of county-owned land, and leaves intact a large area for either public use or potential future development. The southern roundabout makes use of the small public park created from the former shuffleboard court on the west side of the 15th Street W and MLK, Jr. Avenue intersection. If the loss of this park is a concern, it could be swapped to the area created with the new roundabout on the north. Right-in/right-out access is possible on the north, east and south sides of that property. To support both of these roundabouts, 15th Street W would need to be widened to four lanes, as would the western end of MLK, Jr. Avenue (described elsewhere).

These roundabouts were analyzed and determined to be viable based on available right-of-way, and their ability to handle existing traffic demand. The future year analysis showed long queue lengths that extend into the downstream intersections; however, this is based on 95th percentile queue and growth projections of up to 20 percent. Both of these assumptions do not take into account potential mode shifts for a more urban land use.



Roundabout

Manatee Avenue
and 15th Street West



Roundabout

Martin Luther King Jr. (9th) Avenue and 14th Street West

Green Bridge

In the context of the Downtown Mobility Study, the issue of the Green Bridge (US Business 41) deserves careful consideration. As a key link between the two cities that provides direct access to the core downtown redevelopment areas, the Green Bridge is a vital, and underutilized, component of the downtown multimodal transportation network. Both cities have policies focusing on increasing the mix of land uses and densities within the downtown core, and are working toward transportation solutions that focus on multimodal mobility and connectivity rather than adding vehicle capacity.

Both the Green Bridge and the nearby DeSoto Bridge (US 41/US 301) impede non-motorized travel between downtown Bradenton and downtown Palmetto because of a lack of comfortable, well-defined space for pedestrians and bicyclists. Bicyclists are actually prohibited from using the DeSoto Bridge, which does not have sidewalks or any accommodation for non-motorized modes. That leaves the Green Bridge as the only option in Manatee County for bicyclists and pedestrians to cross the river. The current design contributes to higher carbon emissions and reduced personal mobility, particularly for lower income, young or elderly citizens who may not have other options. If implemented, any one of these options is likely to encourage more people to walk or bicycle across the bridge to connect with destinations on either side of the Manatee River, which would support the communities' shared goals for personal mobility and downtown redevelopment.

In light of today's current economic challenges and the limited dollars available for transportation funding, the proposed changes identified in Figure 41 to the Green Bridge in Bradenton and Palmetto represent a worthy transportation goal at an outstanding value. The State of Florida and communities across the nation are seeking ways to limit greenhouse gas emissions, reduce energy consumption and improve public health, and creating safe, comfortable and convenient multimodal transportation facilities is a primary means of achieving those goals. The recommended cross section identified in Figure 41, provides a cost efficient way to strengthen the connection between the two cities, providing local and regional linkages to employment, retail, residential and recreational destinations on both sides of the river. The Department would need to grant a variation from the FDOT standards for minimum shoulder width to allow the 9' breakdown lane (from 10' today), and retrofit the existing barrier/railing separating the path from the edge of the bridge to a minimum 54" in height to safely accommodate bicycle traffic.

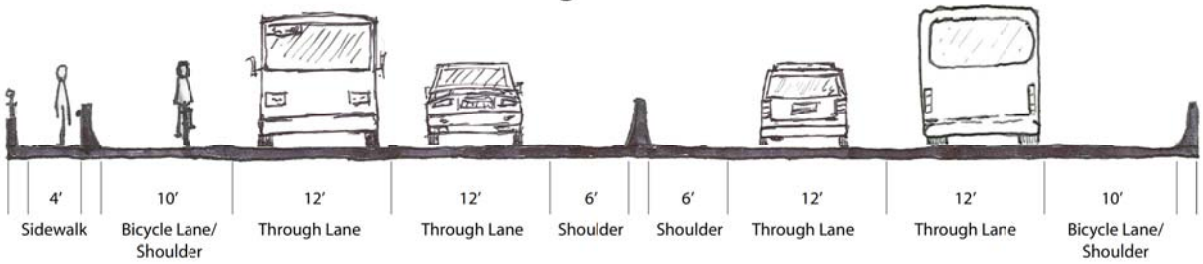
Bradenton Palmetto Downtown Mobility Study

Green Bridge (Bus 41)

Lane Modification Options

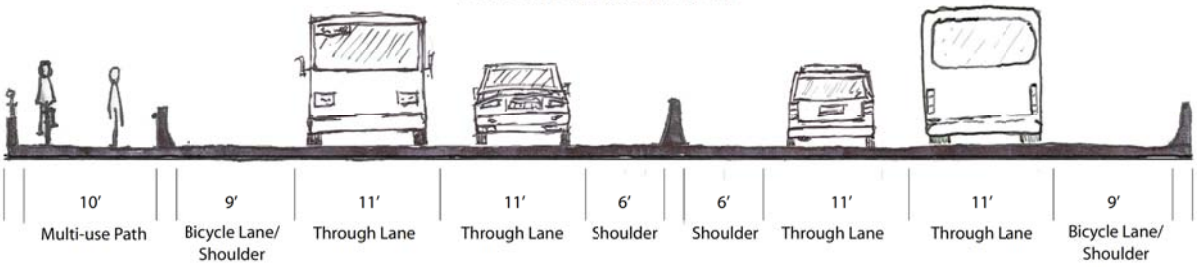
Figure 41

Existing Condition



Recommended Option

Lane Width Reduction



*Total bridge width 90 feet

A slightly more narrow shoulder still provides ample room to accomodate cyclists who prefer to ride on the road while allowing vehicular traffic to operate at normal speeds over the bridge. This photograph shows a similar facility in South Florida. Photo courtesy of PBIC.

A widened multi-use path provides a more comfortable space for pedestrians by increasing the distance between pedestrian and vehicular traffic. There is enough room for pedestrians and bicyclists to share the path, providing an alternative to riding on the road. A vertical concrete barrier provides further separation from vehicular traffic, maximizing the comfort and safety of crossing the bridge on foot or by bike. Photo courtesy of PBIC.

At either end of the bridge, the multi-use path will terminate at a landing where multi-use path and bicycle lanes converge. This landing is striped and signed to provide visual cues to organize and facilitate the movement of bi-directional multi-modal traffic. Photo courtesy of PBIC.

Landings can serve as attractive zones of multi-modal interaction and spaces of transition from the multi-use path to downtown streets and riverside amenities. These spaces will become gateways for the downtowns of Bradenton and Palmetto.

Transit Mall

The goal of the project would be to reduce the speed of vehicle travel, create a walkable retail and residential destination, provide alternative means of transportation to and around the downtown, provide transit with a travel advantage over automobiles, and enhance the character of the corridor. Various land use regulations should be explored to ensure that new development emphasizes the corridor, promoting pedestrian activity and transit use.

Note: Transit Malls have the most criticism and opposition associated with the type of transit vehicles used. Typical diesel buses create high levels of engine noise and emit undesirable exhaust fumes. To negate these issues the use of hybrid electric buses should be considered.

Transit Mall Characteristics

- Dedicated transit corridor
- Transit oriented design guidelines
- Retail emphasizing transit, pedestrian and bicycle
- Predominate transit amenities and shelters

Multimodal Quality of Service – Build Scenario

The environment for bicycle, pedestrian and transit use improves with the recommended plan. Using FDOT's ART_PLAN multimodal quality of service, each of these modes will benefit overall from the improvements identified. However, only transit shows a significant increase in the quality of service – from F to D – because of the added accessibility provided with the downtown circulator in Bradenton. The pedestrian and bicycle modes do not experience much improvement using the ART_PLAN tool because its algorithms emphasize roadway volumes and level of service conditions, which do not decrease enough to change the formula's outcomes.

MULTIMODAL QUALITY OF SERVICE	BICYCLE*	PEDESTRIAN*	TRANSIT
Existing	4.20 / D	3.40 / C	0.93 / F
Future	3.63 / D	3.38 / C	2.10 / D
* Lower scores are better for bicycle and pedestrian modes; higher scores are better for transit.			

LONG TERM PLAN

There are two options to remedy the long range projected traffic situation in the study area, and both come with an estimated cost of over $150 million dollars. The convergence of east / west traffic at, at-grade intersections on US 41 / US 301 causes significant delays because there is not enough traffic signal green time to support all the movements. Because of the delay on US 41 / 301, regional north south thru traffic spills over to US Business 41 and creates undo delays from regional traffic cutting through the downtowns.

One option would be to grade separate the at grade intersections on US 41 / US 301 in two sections; north of the river which would include an interchange at or around Haben Boulevard allowing for uninterrupted limited access between 17th Street (Memphis Street) and the river; and south of the river creating one interchange location at Manatee Ave and 6th Ave or at MLK Jr. Ave. limiting the access between the river and the US 41 / US 301 split at the Red Barn. This option would create additional capacity for regional thru traffic reducing the demands on US Business 41 and the intersections on State Road 64.

The other option is to construct a third bridge across the Manatee River east of the DeSoto Bridge. Conceptually the bridge would connect to US 301 at or around Ellenton Gillette Road north of the river and connect to State Road 64 at 27th Street E south of the river. With the bridge 27th Street E would also need to be widened to four lanes from SR 64 to US 301 to create a regional connection to employment to the south.

TABLE 16 – LONG TERM PROJECTS AND ESTIMATED COST

	LOCATION	FROM	TO	DESCRIPTION	MUNICIPALITY	MAINTENANCE	COST
LONG	**Option 1**						
	US 41/301 Interchanges	9th Ave	Manatee Ave	Interchange Series	Bradenton	FDOT	$150,000,000
	Option 2						
	New Bridge	US Hwy 301	Manatee Ave	New 4 lane bridge	Bradenton/ Palmetto	FDOT	$150,000,000
	27th Street East	New Bridge	US Hwy 301	Widen from 2 lane undivided to 4 lane divided	Bradenton	FDOT	$14,720,000

PROJECT COSTS

Cost estimates for recommended mobility projects were developed at a planning level in consultation with the Florida Department of Transportation, Manatee County and the cities of Bradenton and Palmetto. The project steering committee reviewed and approved the project costs, along with the unit costs used in the development of the project costs. The source of the unit costs came from various agencies. For transit operating costs, Manatee County Area Transit staff provided guidance on the cost per hour for bus service, along with the capital cost of transit infrastructure (e.g., shelters, kiosks, benches, etc.). For roadway projects, the primary source was FDOT construction estimates from 2007. This included costs for PD&E and engineering (assumed to be 20 percent of total project construction cost). Right-of-way (ROW) estimates used market value established by the Manatee County Property Appraiser for the parcels affected to develop a cost per square foot estimate, and the costs per parcel were aggregated to determine the total ROW cost for each recommended project, where appropriate.

Using these estimates, the recommended short- and mid-term projects entail a total cost of $64.3 million. The long-term costs were estimated at $150-200 million, inclusive of project components, such as the Haben Boulevard/US 41 grade separation. These projects are difficult to estimate given uncertainties of environmental impacts, mitigation and actual alignment, and should be investigated at a greater level of detailed analysis during the PD&E process.

Appendix E contains a summary of unit costs used in the development of the cost estimates.

IMPLEMENTATION STRATEGIES

IMPLEMENTATION STRATEGIES

KEY IMPLEMENTATION ISSUES & CHALLENGES

With this study, the community has a well-defined plan for improving transportation mobility, safety and access in the downtown area. The principal challenge to achieving the plan is a chronic lack of funding that is currently plaguing the state and all local governments in Florida. In the Sarasota/Manatee region the cost of the MPO's adopted Long Range Transportation Plan and project priorities far exceed projected available revenues. Adding major capital projects, such as a new bridge or grade separations at selected intersections on the regional road network will only exacerbate that situation without new funding sources identified. Other implementation challenges include the timing and coordination of strategies with road resurfacing, rehabilitation or drainage projects, which often go forward without considering ways to better accommodate pedestrians, cyclists and other vulnerable road users. Right-of-way acquisition presents a significant impediment to major capital improvements for mobility in the downtown area because of its built-up nature. In addition, these may not be appropriate remedies because of their community accessibility, socio-cultural and visual impacts. From a transit perspective, the downtown residential and retail market needs to be stronger so that ambitious redevelopment and infill plans can move forward to bring needed vitality and energy, creating a more vibrant 18-hour downtown. Ultimately, the main challenge to implementation, aside from funding, is the political will of both communities and their partners to define and advocate on behalf of the key catalyst projects that will help reinvent Palmetto and Bradenton as downtown destinations.

IMPLEMENTATION PLAN APPROACH

Comprehensive Plan Amendment

There are several strategies the community can define to move the recommended projects forward. The first step is to formally endorse the Downtown Mobility Study and begin using it as a planning framework to guide the Comprehensive Plan in both cities. As pieces of the study's recommendations go forward in this manner, they will have the force of law as they become parts of the Transportation Element and Capital Improvements Element. Through this mechanism and the mobility plan requirements of SB 360, the cities can further refine development mitigation approaches to address the broader mobility needs and strategies defined in this study. For instance, as residential or mixed-use infill or redevelopment projects occur, it is now possible to create a mechanism for them to contribute to transit operations, bicycle and pedestrian circulation, and other mobility management techniques in addition to or instead of roadway capacity to accommodate anticipated future growth. This would need to be defined in each city's mobility plan by 2011, per SB 360. It is recommended that the two cities – also in coordination with Manatee County – work together to define the priorities for mobility plan mitigation in the study area. This is the necessary first step toward meaningful progress on study recommendations.

Conventional transportation concurrency has limited the potential for downtown redevelopment in the past; however, with the approval of SB 360, the downtown areas gain an exception from achieving roadway level of service as a basis for concurrency as designated redevelopment areas with established CRAs. SB 360 creates Transportation Concurrency Exception Areas encompassing both cities, and enables home rule to guide how each city responds in terms of the standards to be applied for new development and fees generated to pay for mobility improvements. The law still requires

local governments with a TCEA to create transportation and land use strategies to improve mobility, particularly for alternative modes, along with a funding strategy.

HB 697, passed by the 2007 Legislature, requires local governments to adopt strategies in the land use and transportation elements of their Comprehensive Plan to reduce Greenhouse Gas Emissions (ozone, CO2). A significant share of GHG emissions comes from the transportation sector. Reducing vehicle miles of travel (VMT) is a key part of this equation, and the logical ways to do that in a downtown area are to add population (proximity to jobs) and increase the use of non-auto modes.

The net effect of these new laws is for both cities to define performance benchmarks in their Comprehensive Plans (and SB 360 mobility plans) that establish targets for project implementation and outcomes of this Downtown Mobility Study planning process. For instance, the cities should coordinate with MCAT to define targets and track changes in ridership as service improvements are made. As described below, the Comprehensive Plans should include a monitoring program to track trends and the evolution of the study recommendations while maintaining a focus on the overall vision and goals.

Wayfinding and Signage

Another key implementation strategy is to enhance the signage and wayfinding approaching and within the downtown study area. This should occur on two levels: local and regional. At the local level, the City of Bradenton has been working on a downtown wayfinding study. In both communities, the key wayfinding needs are to orient pedestrians, bicyclists and those looking to park to their destinations or opportunities to connect with other facilities (e.g., bicycle trails). This is where projects such as Bradenton's Artisan Avenue and the Riverwalk in both cities become critical elements of the local navigation system. Another important component is to have iconic signage that highlights the downtown destinations and various networks that improve connectivity, such as the 13th Street Transit Mall, the Green Bridge multi-use path, Old Main Street in Bradenton and 10th Avenue in Palmetto.

Regional wayfinding is critical to the mobility plan for the downtown study area. The Florida Department of Transportation focuses its signage on state roads, yet there are several local roads that complement regional accessibility. Travelers going northbound from south of downtown do not need to travel through the downtown study area to reach I-75, yet this appears to happen very frequently. 9th Street East in Bradenton is an underutilized four-lane road with a direct connection to SR 64. Signage should be developed to highlight this opportunity to better disperse traffic not oriented to the downtown area proper. Similarly, westbound traffic on SR 64 need not continue all the way in to US 41/301 to head south to the airport or other destinations south of downtown. Signage should be developed directing those motorists to use 9th Street E in the short-term. In the longer term, the recommended widening of 27th Street E and programmed construction of 44th Avenue by Manatee County will provide yet another way to distribute north-to-eastbound and west-to-southbound traffic

not destined for downtown Bradenton or to the beaches. In fact, the widening of 44th Avenue and 27th Street East proposed project would make SR 70 a more viable route to the beaches for many travelers coming from I-75 headed to Bradenton Beach or Longboat Key than going through downtown on SR 64.

Parking

Efforts should be made to direct those driving downtown to park in garages or the metered surface lots rather than on-street. Research by Donald Shoup in his book, "The High Cost of Free Parking," shows that roughly 30 percent downtown traffic is caused by those circulating in search of a proximate or free on-street parking spot near their destination. His general conclusion is that parking prices have a profound effect on travel choices. Both cities have a substantial amount of free parking, with Bradenton having more metered spaces. While parking has not been the focus of this study, and there does not appear to be a lack of parking, it is clear that there is no relationship between parking strategy and mobility strategies for the downtown area. To better support transit service and future investments, both cities and Manatee County must develop a consistent and targeted parking strategy that provides a disincentive for employer-paid other otherwise free parking. As improvements in public transportation occur to increase frequency, the span of service and the quality of the experience, it would be prudent to support that strategy with higher costs for parking and better use of garages or surface lots outside of the core downtown area. The principles of Downtown by Design and urban development place parking access lower in order than transit and pedestrian access. Parking lots should be well served by transit, with safe and convenient walking paths to logical destinations, but in the downtown context parking is a poor use of land and its ready availability worsens traffic congestion.

Transportation Demand Management

Related to the parking discussion above, the concentration of government and health care employment makes the area a ripe opportunity for expanded demand reduction strategies, such as carpool/vanpool and other related programs. Bay Area Commuter Services is a broker of TDM activities in FDOT District Seven, and FDOT District One has recently initiated a Commuter Assistance program to support TDM activities at the local level. With increasing levels of transit service and the requirement that local governments implement Greenhouse Gas Emissions reduction strategies, TDM is a viable consideration for Bradenton and Palmetto. This can begin by adopting a TDM ordinance for the downtown area that requires employers to participate in a trip-reduction strategy defined by the policy benchmarks in the Comprehensive Plan (mobility plan).

Another useful TDM tool for employers is to implement a Parking Cash-out program, which gives employees cash in lieu of employer-paid parking spaces. The cash is added to monthly paychecks and may be used by the employee for transit or spent on other needs if they don't drive. One relatively easy strategy to implement would require developers and existing parking lot owners to reserve spaces near the building entrance for carpool or vanpool use. This preferential parking gives an incentive to park closer or more cheaply than those who drive-alone. Other programs that can be implemented include a guaranteed ride home program, in which employers or the DDA for example, is willing to pay for the occasional use of a cab if the employee must leave early or late and misses their bus or carpool. Flexible work arrangements are also a TDM component. This may entail changes in work shift schedules to avoid the peak travel periods, increased use of telecommuting, or job-sharing.

Another strategy may be to offer reductions in parking requirements if the employers provide transit passes to their employees as a condition of granting site plan approvals, increases in density and other approvals. The employer provides a monthly or annual transit pass, perhaps in combination with changes in parking policies.

The key to TDM is the employer participation and use of incentives to reward employee participation. Without constant promotion and some oversight, it can be challenge to make a commute options program work effectively. The approach is to identify an overall marketing and program manager, with a liaison – usually in human resources – for each participating employer. FDOT and the MPO would be important partners for both cities.

Coordinated Project Development

With most of the study recommendations on state roads, coordination with FDOT and the MPO is essential. For instance, the Haben Boulevard and US 41/301 intersection is a high crash location that causes congestion during the peak hour. Potential solutions, including grade separation, require a PD&E study to examine alternative options, alignments and environmental impacts. This project would also address access issues related to apartments located north of the Manatee Convention Center, the 7th Street gateway into downtown Palmetto, and the existing interchange at US 41/301, which already experiences failing movements in the peak periods.

Clearly, given funding constraints, the best implementation strategy is to include recommended solutions with street rehabilitation, resurfacing and remediation (3-R) projects. This approach could be incorporated into the resurfacing and drainage improvement project for Manatee Avenue, which is scheduled for 2010. The opportunity to include the lane reduction and pedestrian enhancement strategy with this resurfacing is too great an opportunity to miss, and the design for it has been prepared. It is a win-win solution for both the City and the Department because it improves mobility and safety using funds that have already been allocated.

Other linkages abound. The Bradenton Artisan Walk concept meshes very well with the recommended strategies for MLK, Jr. Avenue to make better use of the available capacity of that road while ensuring a safe and slower traffic environment for neighborhood access and redevelopment. The 13th Street Transit Mall concept supports both endeavors by providing a linear north-south pedestrian corridor between Village of the Arts and Old Main Street, while improving transit access and service. The proposed roundabout at 15th Street West, 14th Street W and MLK, Jr. Avenue provides the capstone to the added capacity and traffic flow supporting desired redevelopment and mobility goals in this area.

Complete Streets Policy

One of the emerging movements of the last decade is the notion of "complete streets." There is a national coalition and advocacy effort aimed at changing policies for street design to better accommodate the needs of all users, not just vehicle traffic. Complete streets policies formalize a community's intent to plan, design, and maintain streets so they are safe for all users of all ages and abilities. Policies direct transportation planners and engineers to consistently design and construct the right-of-way to accommodate all anticipated users, including pedestrians, bicyclists, public transportation users, motorists, and freight vehicles. Many cities and counties in Florida and elsewhere, as well as state agencies like the North Carolina Department of Transportation, have adopted a complete streets policy.

Creating complete streets means transportation agencies must change their orientation toward building primarily for cars. Instituting a complete streets policy ensures that transportation agencies routinely design and operate the entire right of way to enable safe access for all users. Places with complete streets policies are making sure that their streets and roads work for drivers, transit users, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities. Each complete street is unique, but ingredients that may be found on a complete street include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, and more.

A complete streets policy for Bradenton and Palmetto would mean that any new streets, retrofits to existing roadways or developer modifications to the site facing a public roadway would be required to incorporate, as feasible, one or more complete streets features. This can be a strong reinforcement of the message that downtown streets are for everyone, and objectives solely based on speed and vehicle through-put are not the primary arbiters of design. Such a policy could be adopted as part of the Comprehensive Plan, or as a separate resolution taken up by the individual governing boards, as well as the Community Redevelopment Agencies.

REVENUE SOURCES

There are conventional and non-conventional funding sources that can be used for the Downtown Mobility Study. There is no single "silver bullet" funding source for improvements, but there can be an effective funding strategy for the Downtown Mobility Study that this section presents a short summary of existing and potential funding sources for consideration by the two cities to move forward various strategy recommendations.

CRA Funds

Given that much of the study area is part of one of several Community Redevelopment Areas established in Palmetto and Bradenton, the revenue generated from the tax increment of property valuation increases over time may be used on projects within the CRA where the revenue was generated. The key is the project to be funded has to be consistent with the CRA plan and support the overall purpose of the CRA as it relates to redevelopment and revitalization of the area. CRA funds have a lot of competing demands, but they can provide a useful match for other funding obtained from grants, developer mitigation and other public agency funding sources. Some of the most likely CRA-funded projects include the street treatments to encourage bicycling, walking and safe crossing, lighting, bus shelters, street furniture, sidewalk construction and bicycle parking.

Other Local Sources

Local transportation funding sources in Bradenton and Palmetto are very constrained, with most local revenue going toward maintenance and operations. The Manatee County local gas tax is dedicated to the Thoroughfare Plan and other components of the transportation network that are already defined. However, there are some potential funding strategies that may be worth exploring further. Parking fees could be a possible source of funding for the transit circulator service. The City of Orlando uses a portion of parking tickets to fund the City's school crossing guard program. Raising the price of tickets may be a challenge when they are already fairly high, but raising the cost of parking downtown may be a method of raising additional revenue. This may be more palatable to parking lot owners if there is a clear benefit being provided in return from the revenue. Establishing a surcharge on local property taxes in the downtown area, such as is done for streetlights in many communities, could also be considered. This operates like a Municipal Services Taxing Unit (or Benefit Unit), and entails directly affected property owners paying back a government entity for upfront funding to cover annual operating and capital costs associated with a government service. Those primarily benefitting from the service pay. The downtown circulator and other pedestrian enhancements could be funded this way, but consideration will have to be given for how this fits with the CRA tax increment financing program in place.

MPO Congestion Management Funds

The Sarasota/Manatee MPO allocates a share of its federal funding to support lower cost, near term transportation projects that are consistent with the MPO's Congestion Management Process to improve mobility and safety. The MPO may award up to $1 million annually for a project that meets the criteria for eligibility. The cities of Bradenton and/or Palmetto must submit a formal application for Congestion Management funds, which is then reviewed and evaluated by staff and the MPO's advisory committees. Eligible projects are prioritized and compete annually to be included in the MPO's annual Transportation Improvement Program (TIP). The focus of the program is generally on project implementation (construction) rather than funding planning or design activities, and projects tend to compare more favorably in the evaluation when they including local matching funds to complete a project.

Transportation Enhancements

The Transportation Enhancement program is a federal funding program that addresses bicycle and pedestrian facilities, aesthetics, corridor accessibility and other similar treatments. The Florida Department of Transportation has recently revised its process for allocating projects for Enhancements program funding to make it a regional competitive process. This is a reflection of the relative scarcity of dollars and makes it a grant program rather than a formula program. The revenue estimates for this program assumes a distribution of $400,000-$600,000 to the Sarasota/Manatee MPO per year for planning, designing and constructing local and regional enhancement projects.

Mobility Fee Concept

SB 360 authorized a study of "mobility fees" based on vehicle miles traveled as a funding strategy for local governments instead of conventional road impact fees. The notion is a mobility fee based on VMT could provide a financial incentive for development that reduces VMT, while generating revenue for multimodal transportation projects, including transit operating costs, which a conventional impact fee is prohibited from funding. The Center for Urban Transportation Research (CUTR) has completed

the study and provided it to the Florida Legislature for consideration. It essentially examines mobility fees as an alternative form of roadway impact fees and recommends a countywide or regional approach. There is no clear sense of how the Legislature will react to the report and funding needs of local government. In the meantime, a number of communities have already begun moving forward on the mobility fee concept, and this section presents a possible approach for consideration by the two cities.

This concept is similar to the state's proportionate fair share requirement in that it assigns future development a pro rata share of the cost of needed mobility improvements to achieve a target multimodal quality of service standard. However, a mobility fee is different from proportionate fair share in the way it is calculated. This approach is currently being pursued in several local jurisdictions,, including Tarpon Springs, Kissimmee and Alachua County. This is how it would work within the Downtown Mobility Study area for Bradenton and Palmetto:

The first step is to estimate the future number of trips expected to be generated within the district (or downtown study area). This is based on an estimate from the Institute of Transportation Engineers (ITE) using the Trip Generation report for all future infill and likely redevelopment. This establishes a "trip bank" that serves as a basis for identifying any individual development's proportion of the improvement cost.

The total cost of needed mobility improvements in the study area has been estimated within this study. The key question here is what other sources of funds (e.g., sales tax, gas tax, general revenue, farebox, etc.) may be used for some improvements, and which projects remain unfunded. For instance, the Downtown Mobility Study area includes several CRAs; one possible option is that the mobility fee would only be used to cover the cost of enhanced transit service operating costs and one or more of the CRAs could fund selected other roadway and multimodal improvements. So among the first steps is to determine what the mobility fee would seek to fund. For transit operating costs, a recommended approach would be to consider a 10-year operating cost for the enhanced transit service plus any necessary supportive capital facilities as a basis for the fee.

Once it has been determined which improvements will be factored into the costs, the total new trips are divided by the cost to determine a per trip fee. For example, the recommended mobility improvements in Bradenton are estimated to be just over $33 million for roadway, bicycle and transit (includes five years of operating) costs. Development associated with the Downtown by Design plan has the potential over time of generating an additional 100,000 trips per day, dividing those trips by the estimated $33 million of improvement costs would generate a potential mobility fee of about $330 per daily trip. A similar approach would be taken for improvements in Palmetto with a different result. That City has a different cost total and also may not experience the same level of future development.

The mobility would likely replace transportation impact fee revenues in the downtown study area, through either a comparable reduction in impact fees or a replacement altogether. While details certainly need to be resolved, this approach provides for a more streamlined development review and approval process. Essentially, development within the study area would need to meet a three-part test for approval: 1) submittal of a site plan consistent with the Downtown by Design plan or other adopted design standards in place to promote a pedestrian-and transit-oriented urban environment; 2) accommodation of multimodal on-site requirements, such as bicycle parking, sidewalks

of minimum dimensions, transit shelters and related features; and 3) payment of the up-front mobility fee.

Grants

There is a wide array of potential grant funding sources for the Downtown Mobility Study. With grants, it is largely about telling an effective story and linking the project(s) seeking funding with other goals and mission statements of the funding organization and related groups. Grants may come from government or non-profit/foundation sources. Some grants are targeted toward specific actions, such as public health or energy independence, while others are more general. Many of the Downtown Mobility Study recommendations could fall within these areas, as public health and energy efficiency are central elements of the project.

Of particular note, are grants from the Florida Department of Transportation for public transportation and safety. While funds are limited, FDOT does provide grant funding in two main categories: transit service development and congested corridor service. The service development grants typically expire after a three-year period, but can be useful to cover the capital and operating costs of a new start-up service as ridership builds. The route is either continued with local funding or is eliminated after the trial period. Congested corridor grants have been used in the Tampa Bay area for years to fund the inter-county express bus service on the Courtney Campbell Causeway, Howard Frankland Bridge and Gandy Bridge linking Pinellas and Hillsborough Counties. Congested corridor grants recognize that roadway capacity solutions are only part of the solution, and managing demand through use of transit is an important element of regional mobility. FDOT also provides grants to address a known safety problem, such as speeding in the school zone on Manatee Avenue, if an appropriate capital or operational project solution can be identified. Enhanced crossings at mid-block locations or intersections, pedestrian signals, etc. may be eligible projects. These typically go through the MPO process, but the Manatee County Community Traffic Safety Team, supported by FDOT, may also be a useful avenue to address and respond to known safety concerns.

MONITORING PROGRAM

Establishing benchmarks and targets is an effective way to measure progress toward plan implementation. The Downtown Mobility Study is a multi-year, multi-phase effort aimed at improving overall mobility and accessibility in the downtown areas, consistent with plans to better frame the downtown core as a live-work-play destination. With the concerns expressed by FDOT related to the efficacy of the Manatee Avenue and 6th Avenue (SR 64) lane reductions to enhance pedestrian comfort and convenience, it makes sense to take an approach in partnership with FDOT that first tests this concept for a trial period and then monitor conditions over time to determine the strategy's effectiveness and whether other impacts emerge. The trial should take place during the peak season and perhaps again in the off-peak season to assess the degree of changes within greater numbers of seasonal visitors to the area.

Precedents

In its lane reduction strategy for Main Street (SR 331) in downtown Gainesville, the City of Gainesville first tested the concept of reducing the four-lane undivided roadway into a two-lane divided road using traffic cones to simulate the new roadway width. This occurred for a two week period, and results indicated that motorists managed the change reasonably well and extended queues did not occur. The project – a 12 block section from Depot Avenue to 8th Avenue – is now under construction

by FDOT as part of a resurfacing project. FDOT continues to maintain the road. Alachua County has programmed a similar strategy from 8th Avenue north to 16th Avenue.

Similarly, the City of Orlando undertook a lane reduction or road diet strategy for Edgewater Drive (SR 424) and the Smith Street/Princeton Street (SR 438) one-way pair, both in the College Park neighborhood just north of downtown. Orlando undertook a before/after study of the proposed changes, documenting such variables as roadway level of service and delay, safety (crashes), pedestrian and bicycle use, and other factors. After the projects were completed earlier this decade, Orlando documented the changes and determined that the changes improved safety and multimodal mobility without creating unacceptable delays. Orlando took control of Edgewater Drive as part of the project, but the Princeton/Smith one-way pair remains under the state's jurisdiction.

Recommended Monitoring Approach

Ideally, the monitoring program would be a joint effort of the City of Bradenton and City of Palmetto, and it should address all aspects of the Downtown Mobility Study to define outcomes of this planning effort, not merely the results of the recommended modifications to Manatee Avenue and 6th Avenue in Bradenton. The recommended approach is for the cities to submit a biannual report to the Sarasota/Manatee MPO and Florida Department of Transportation every two years to document progress toward achieving the mobility goals outlined in this study. This report would document transportation system conditions over time using the performance measures defined previously and expanded to address specific implementation activities and accomplishments. The report would fit within the MPO's established Congestion Management Process, and should include three main categories of reporting as related to the downtown study area:

- Local Government Mobility Strategy Actions (Cities or Manatee County, MPO)
  - Transportation Demand Management policies and programs
  - Transportation System Management (e.g., intersection improvements, Advanced Traffic System Management (ATMS) implementation)
  - Street connections
  - Transit service changes/improvements
  - Funding allocations/developer commitments
  - Parking changes/strategies
- Land Development Activity
  - Summary of approved development plans/projects
    - Type and scale of land use
    - Development order agreements for transportation
    - Developer-financed mitigation
  - Constructed developments
    - Multimodal infrastructure
    - Access management / circulation improvements
  - City- or County-initiated land use actions
    - Zoning changes/variances

- Land use changes
- Land Development Code revisions

- Transportation Characteristics/Patterns
  - For Manatee & 6th Avenue modifications:
    - Turning movement counts at key locations – volume comparisons
    - Intersection delay
    - Travel time
    - Back of queue analysis
  - Selected mid-block counts
    - Volume comparisons
    - Duration of congestion (peak spreading)
  - Pedestrian and bicycle counts (e.g., on Green Bridge, Manatee Avenue, 8th Avenue – as projects occur)
  - Transit ridership for routes serving downtown
  - Carpool and vanpool activity

The recommended process for the monitoring report is for the cities to submit the report every two years to the MPO and FDOT, and the agencies provide comments based on their review. The biannual report and related review comments are intended to be advisory, and provide an opportunity for the cities and FDOT to assess changes in conditions and determine whether additional measures may be needed or other strategies can be implemented. It is suggested that the MPO schedule a joint coordination meeting to address the report findings and agency review comments. This provides a basis for next steps and agreement on strategies for subsequent two-year reporting period. Important changes in the plan should be addressed through the Comprehensive Plan Evaluation and Appraisal Reports of the two cities, the MPO LRTP and Congestion Management Process, not solely as a result of the biannual report.

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

The Bradenton/Palmetto Downtown Mobility Study represents a two-year effort to imagine, analyze, plan and build consensus for viable mobility strategies that achieve an effective balance between competing regional and local travel needs in the downtown areas of both cities. The goal has always been to define a long-term vision and strategic blueprint for mobility that supports the redevelopment and revitalization goals of both cities to make their downtown areas inviting, attractive and economically sustainable destinations that benefit the entire community and region. The outcome of this extensive planning process is a plan that provides a balanced set of recommendations intended improve livability, personal mobility and access, while also serving regional and through traffic needs.

It is important to set a proper context for this study. This is a downtown area with a reasonably well-defined grid network in both cities. It is not some kind of a suburban activity center, where higher speed mobility is an appropriate strategy for solving transportation problems. Downtowns thrive on diversity and high levels of access – not the ideal setting for moving automobile traffic efficiently. In a downtown setting, the performance of the transportation system should be based more on proximity and connectivity. New state laws reinforce this notion of dense urban downtowns having a different standard for transportation performance. That said, management of through traffic is a real issue deserving attention. Passing through the middle of downtown Bradenton, SR 64 is an emergency evacuation route, and a prime connection between Anna Maria Island, much of Manatee County and I-75. Similarly, US 41 and US 301 traverse both Palmetto and Bradenton, linking the Sarasota/Bradenton International Airport with Port Manatee, US 19, I-75 and I-275.

This is not an idealistic or grand vision plan with mere hopes of becoming reality. Rather, from the input of many agency and public stakeholders, along with extensive and thorough technical analysis, it is a mobility plan that is firmly grounded in the achievable. Initial ideas imagined the "what if" possibilities to tame traffic and create walkable downtown districts, while moving traffic efficiently and captivating large numbers of people willing to ride transit, ride their bikes and stroll to their destinations. From those initial ideas, the project moved quickly into a process of defining workable, realistic and financially attainable solutions that helped create a great destination while ensuring safe, convenient and balanced transportation options.

Conversion of the SR 64 one-way pairs into two-way streets was initially considered, but rejected in the short term planning horizon due to high volumes and no viable alternatives to direct traffic elsewhere. In in-town bypass in Bradenton using 8th Avenue or MLK, Jr. Avenue was also considered and rejected due to neighborhood impacts and lack of available right-of-way. Lane reductions on Manatee Avenue and 6th Avenue (SR 64), as well as 14th Street in Bradenton and 8th Avenue in Palmetto were also considered. These strategies would make the roads more pedestrian friendly and support quality redevelopment, but consensus was not reached for including them in the recommended package of short-term solutions, and they have been deferred to a long-range strategy.

Enabling such "road diets" for improved livability and redevelopment to occur means dealing with regional traffic. In the long term, the study recommends creation of a "Regional US 41" through a grade separated interchange at Haben Boulevard. This may also include flyover interchanges and reduced access on the Bradenton side of the river as well. However, there are substantially more community impacts south of the river, and loss of access could be a problem for emergency access to the hospital and the vitality of downtown in general. Thus, an option to the "Regional 41" is the

construction of a third bridge across the Manatee River, such as connecting Ellenton-Gillette Road to 27th Street East. Funding of this new bridge would likely have to come from tolls, and it certainly has environmental impacts. There was general support from Bradenton stakeholders for this third bridge, along with support to widen 27th Street East to provide a connection south to SR 70 and 44th Avenue. A more detailed analysis through the Project Development and Environmental process would be needed to evaluate the Haben Boulevard grade separation and its impacts on the existing interchange of US 301 and US 41. This study may also look into the trade-offs of a new bridge.

There are three "signature" projects in the short-term recommendations. First is the relatively minimal road diet or lane reduction on Manatee and 6th Avenue through downtown Bradenton. This improves pedestrian accessibility, reduces a major barrier between the downtown core and adjacent commercial and residential areas to better unify downtown, and, with strategic improvements to MLK, Jr. Avenue and other surrounding locations, maintains traffic flow for non-local traffic. Two roundabouts at Manatee Avenue and 15th Street, and MLK, Jr. Avenue and 14th Street support this recommendation in the mid-term horizon, but are not essential to its construction.

The second signature project is the modification of the Green Bridge/Tamiami Trail to enhance the multimodal environment for this designated Scenic Highway. By relocating the existing barrier and other minor modifications, the Green Bridge can become an outstanding bicycle and pedestrian connector between the two cities.

The third major project is the construction of a Transit Mall for Manatee County Area Transit on 13th Street West in downtown Bradenton. Funded with a federal grant, the project entails conversion of the existing roadway to allow both waiting buses and cars to share the road with a much-enhanced pedestrian environment that improves north-south connectivity. This provides a dedicated transit staging / transfer area that is controlled and policed by MCAT. A downtown transit circulator route would provide improved transit connectivity between local origins and destinations to this transfer point. In the longer term, Bus Rapid Transit linkages to Sarasota and express bus or even passenger rail service to Tampa and St. Petersburg will help anchor Palmetto and Bradenton as highly accessible and economically vital destinations.

The outcomes of this recommended plan result in improved mobility and access for the downtown areas without sacrificing the mobility of through travelers and regional needs. Even with the lane reductions on Manatee Avenue and 6th Avenue, average delay changes by only 15 seconds and the peak congestion period lasts less than an hour with 2013 traffic, which is only a minor increase from current conditions. Historically, traffic on these sections has remained constant and unlike most downtowns cores the sections of Manatee and 6th Avenue in the downtown core of Bradenton are not congested today. Using current traffic levels the duration of congestion with the lane reduction would be less than 15 minutes, occurring during one or two cycle lengths at the most. The plan is a win-win for personal mobility and economic development in Manatee County, and represents many hours of hard work by the community stakeholders and their representatives to develop a cohesive transportation strategy that supports the visions of both communities and the region.

APPENDIX A

Downtown Transit Service Concepts

Bradenton and Palmetto Downtown Mobility Study

August 7, 2008

Prepared By:

RENAISSANCE PLANNING GROUP

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INTRODUCTION

In conjunction with the recommendations being developed for the Bradenton and Palmetto Mobility Study several downtown transit scenarios are being presented to determine their feasibility. Concepts for each downtown are being developed. For Bradenton, there is a Transit Mall concept proposed in conjunction with the downtown circulator. Each concept addresses local, downtown connectivity, increasing local mobility and the financial implications.

The following concept is based on the following preliminary goals;

1) Decrease the local downtown traffic trips that occur by automobile;
2) Increase mobility options for the downtown residents;
3) Increase connectivity for potential consumers;
4) Reduce the parking demand within the immediate proximity of businesses;
5) Increase connectivity across major corridors that dissect the downtown community;
6) Increase regional connectivity options for downtown residents, retailers and employment centers.

Key aspects for both concepts are:

Wait Time – Passenger would not have to wait more than 15min between bus arrivals.

Choice of Travel Direction – Passenger should be able to travel in either direction of the route.

Passenger Information – *Choice riders* use immediately available information to make mode decisions. Passenger information of bus schedule and arrivals will be critical to promoting use. Real-time information would provide even better information and increase the sense of reliability.

Marketing – The success of the services will depend significantly on the marketing, such as joint marketing with businesses and partnerships. Branding, visibility, conveying information, etc. are all factors of good transit marketing. The route should be marketed as a product, not an infrastructure mode choice.

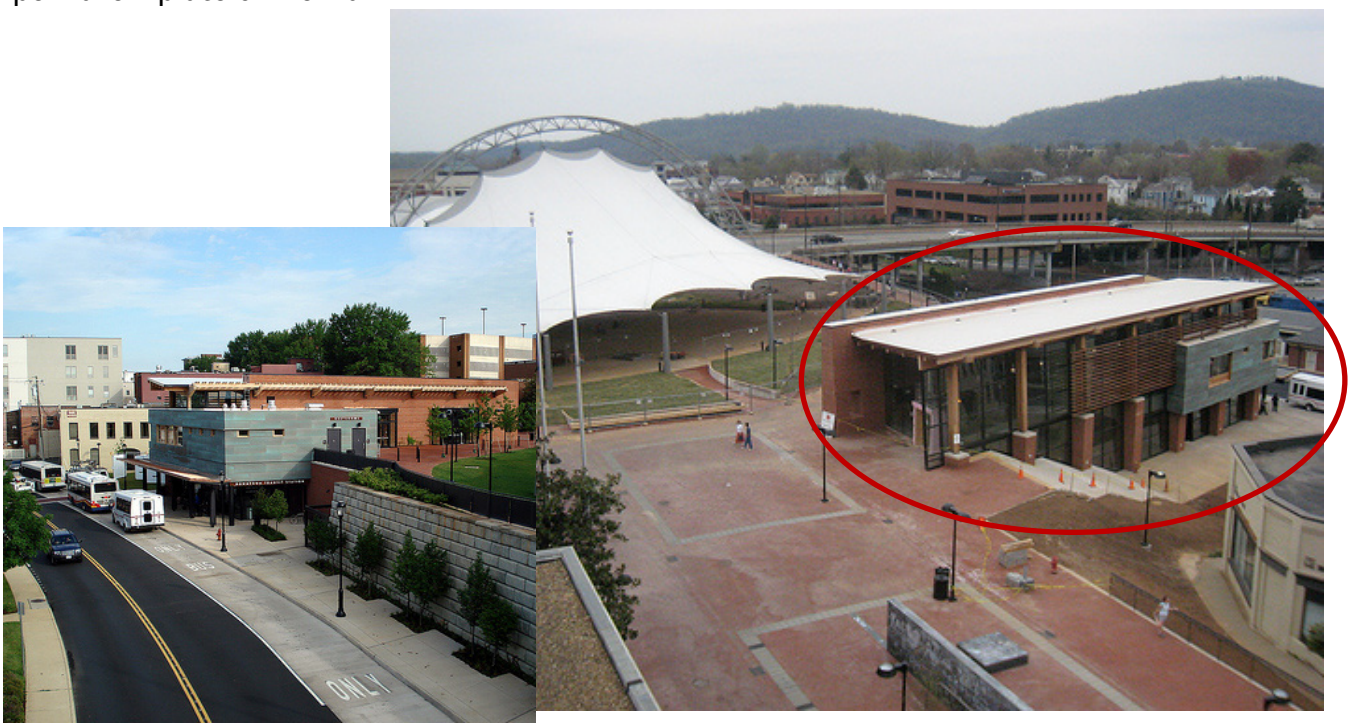
Amenities – Passenger amenities are more important with service arriving every 5 min or greater. Choice riders will expect comfort, convenience and distractions. A most effective amenity would be one that is blended with other uses, such as a coffee shop or urban common

IMPORTANCE OF ESTABLISHING TRANSIT SERVICE AND TRANSIT CENTER DOWNTOWN

Transit service and transit facilities in a downtown area provide vital activity centers making a downtown a focused destination. When well designed, supported by connections and incorporated into the downtown sense of place, a transit center can become a critical anchor.

Bradenton and Palmetto are unique in that a downtown transit facility benefits greatly from the intersection of countywide transit routes. The intersecting transit routes connecting residential areas, beaches and the two downtowns create a natural need for a transit center. More importantly the intersection of routes guarantees pedestrian activity and local, downtown patron use.

To be successful a transit centers should be designed to have a place in the downtown setting. In many examples, it is most successful when designed for the highest expected and integrated uses. A facility should be designed to be more than a bus station. It should be designed to complement the downtown uses and provide additional mixed uses, for transit users and downtown patrons. A facility should also be designed in context of the downtown area surrounding the station and the area should reflect support for the transit facility. It should provide connectivity and a sense of integration with the other buildings and uses. In Charlottesville Virginia the main transit center for the city transit system is located on its national recognized pedestrian mall. Its context and surrounding land uses were taken into account when designed. As a result it has created a permanent place on the mall.



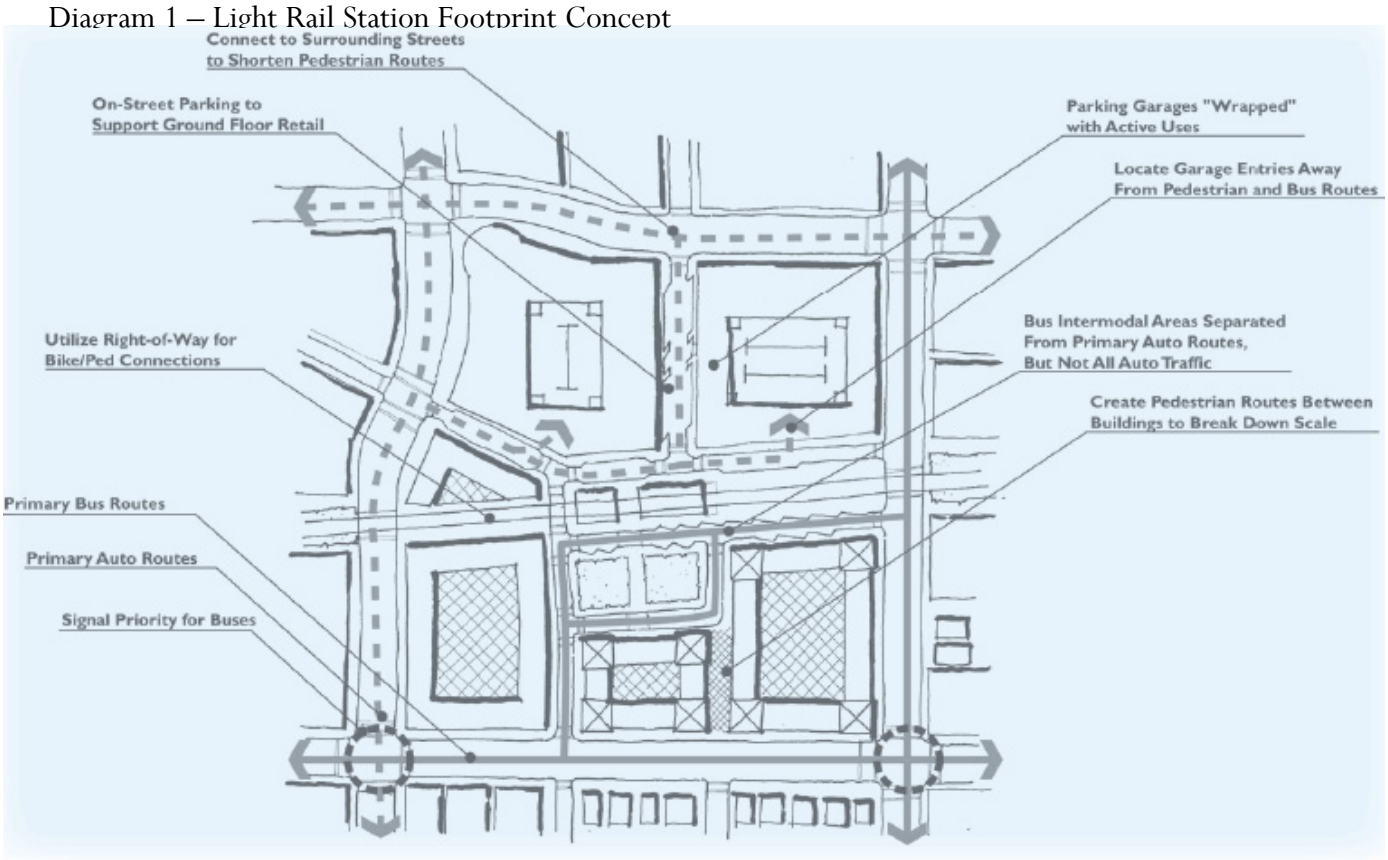
LIGHT RAIL STATION CONSIDERATIONS

With the prospect of TBARTA providing rail service along the current railroad corridor both Palmetto and Bradenton should consider the impacts of a light rail station being developed in the downtown areas. Light rail stations range in size and service dynamics, from suburban park-n-ride designs to urban Transit Oriented Development based stations. For both Bradenton and Palmetto the light rail stations should focus on serving its urban area and only include some park-n-ride amenities.

Key Considerations for Light Rail Stations

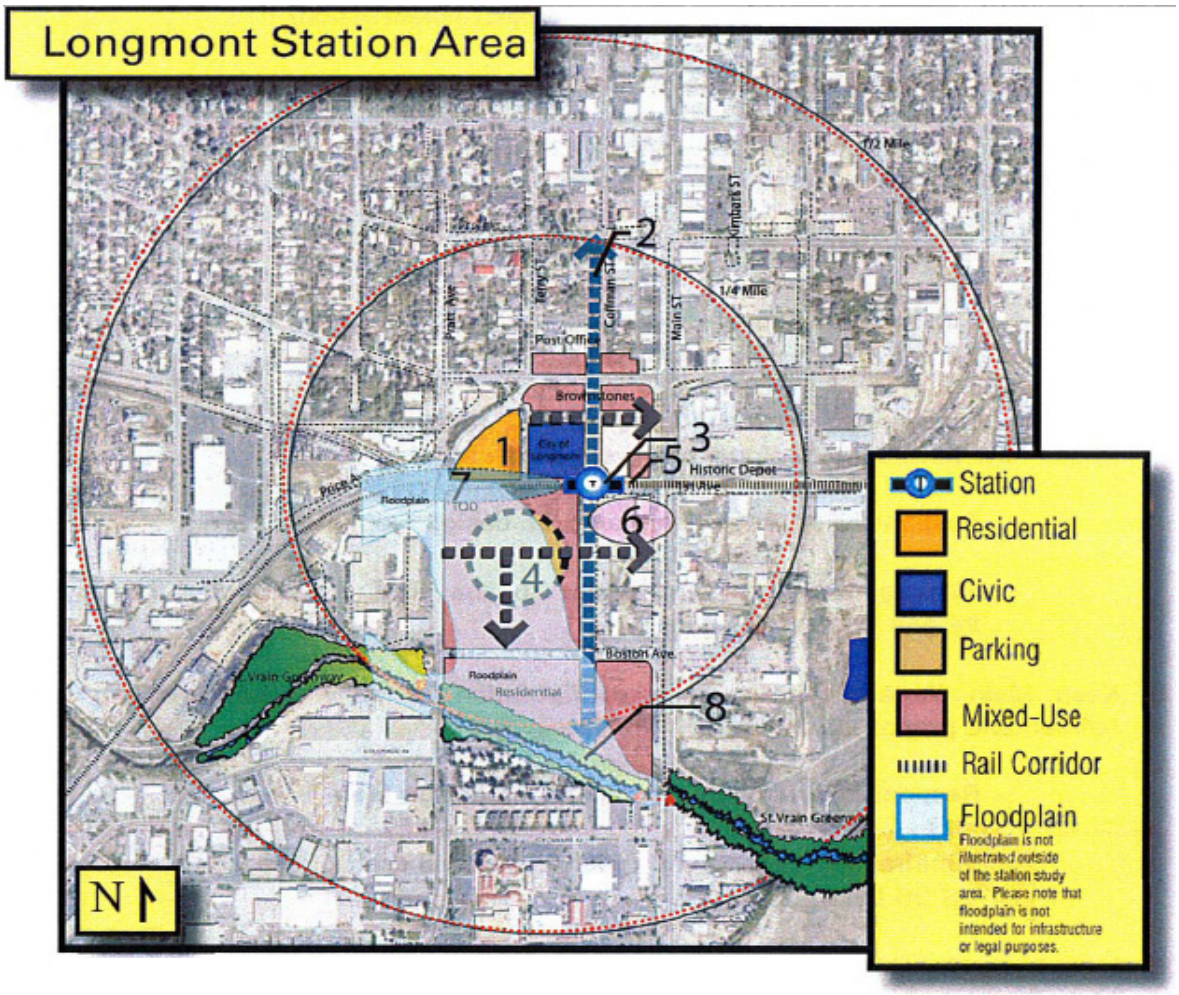
- Design of station must reflect community vision and character
- The station location must be designed for the "station block," which is designing to include the area surrounding the station to allow for supportive uses and strong connectivity.
- Evaluate infrastructure needs to support station, such as parking and traffic impacts.
- Emphasis land uses along corridors leading to the station creating an activity corridor.
- Consider impacts of local transit feeder system(s) serving the station's immediate land uses.
- A station should be designed to be more than a transportation infrastructure, it should be designed to be one of the community's activity centers with mixed use, civic space and residential.

Diagram 1 – Light Rail Station Footprint Concept



The diagrams shown in this document identify how a typical footprint of an urban based light rail station would be configured. Diagram 1 is a concept of a general urban light rail station footprint. Diagram 2 shows a rail station concept for Denver's light rail station at Longmont showing how RTD plans to incorporate residential, mixed use and civic uses into the station area design. Similar to the Denver diagram, the Santa Clara diagram (Diagram3) shows a proposed light rail station footprint for a stop location along BART's rail line. While both of these examples are denser when compared to Bradenton or Palmetto, the diagrams represent the importance of establishing supportive land uses and transit supportive corridors connecting the stations to the activity centers.

Diagram 2 – RTD Station Concept



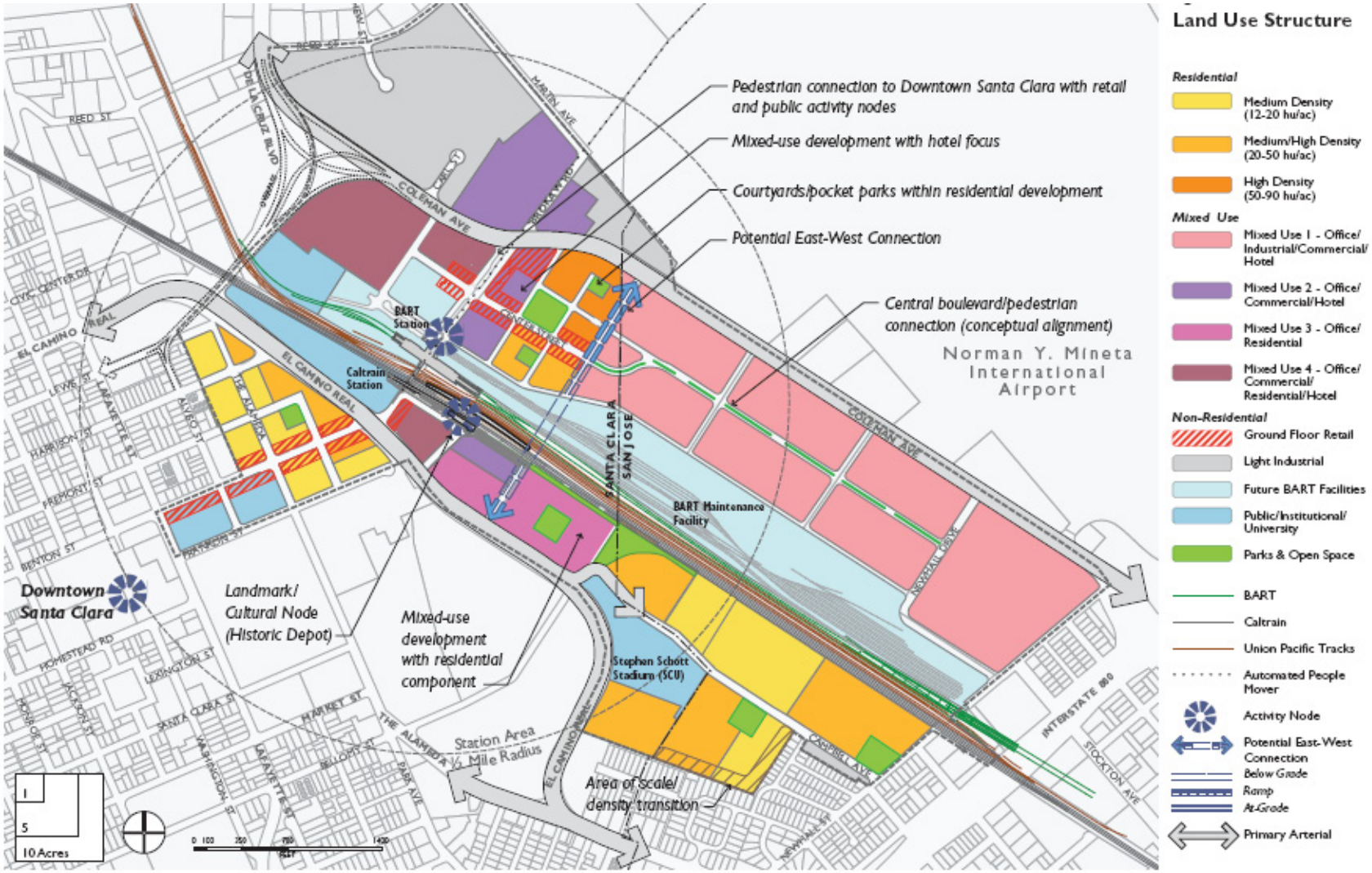


Diagram 3 – Santa Clara Light Rail Station

SERVICE RECOMMENDATIONS

BRADENTON DOWNTOWN TRANSIT SERVICE

The following information is Renaissance Planning Group's initial recommendation of the service design for a downtown circulator service. This includes service hours, number of buses, frequency, route alignment options, potential stop locations and targeted activity centers. A route map is attached.

BRADENTON DOWNTWON CIRCULATOR SERVICE DESIGN

ALTERNATIVE 1

Number of Buses – Four (Two sets of two buses travel in opposite directions)
Estimated Route Distance – 7 miles
Complete Route Travel Time – 30 min
Hours of Operations – 7:00 am to 7:00 pm
Frequency – Bus Service Every 15 min (7 min perceived frequency)

Alternative 1A – No Infrastructure Changes

- This alternative is based on no changes being made to the transportation infrastructure, specifically not changing Manatee Ave and 6th Ave to two ways streets.
- Due to the one way nature of the Manatee Ave and 6th Ave the circulator must travel in a crossing pattern to avoid the one-way road network.
- Based on current infrastructure there is no possible corridor north of Manatee Ave to allow for bi-directional travel East and West.

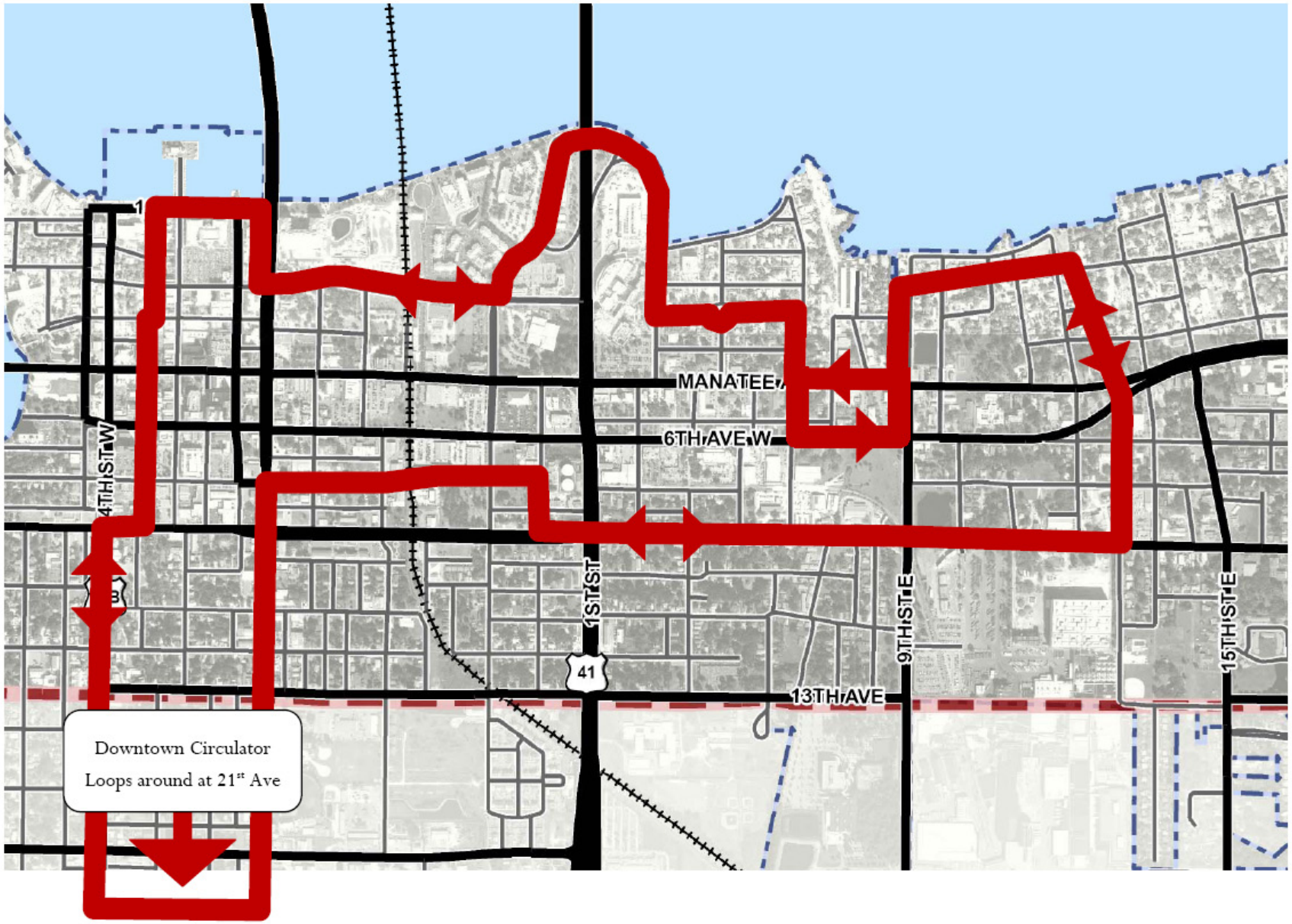
Alternative 1B – With Infrastructure Changes (Grid Extensions)

- This alternative is based on completing part of the downtown road network grid. This includes extending 8th Ave between 3rd St W and 1st St, extending 8th Ave between 6th St E and 9th St E, and extending 3rd Ave E between 6th St E and 7th St E.
- Due to the one way nature of the Manatee Ave and 6th Ave this alternative will not travel on those corridors.

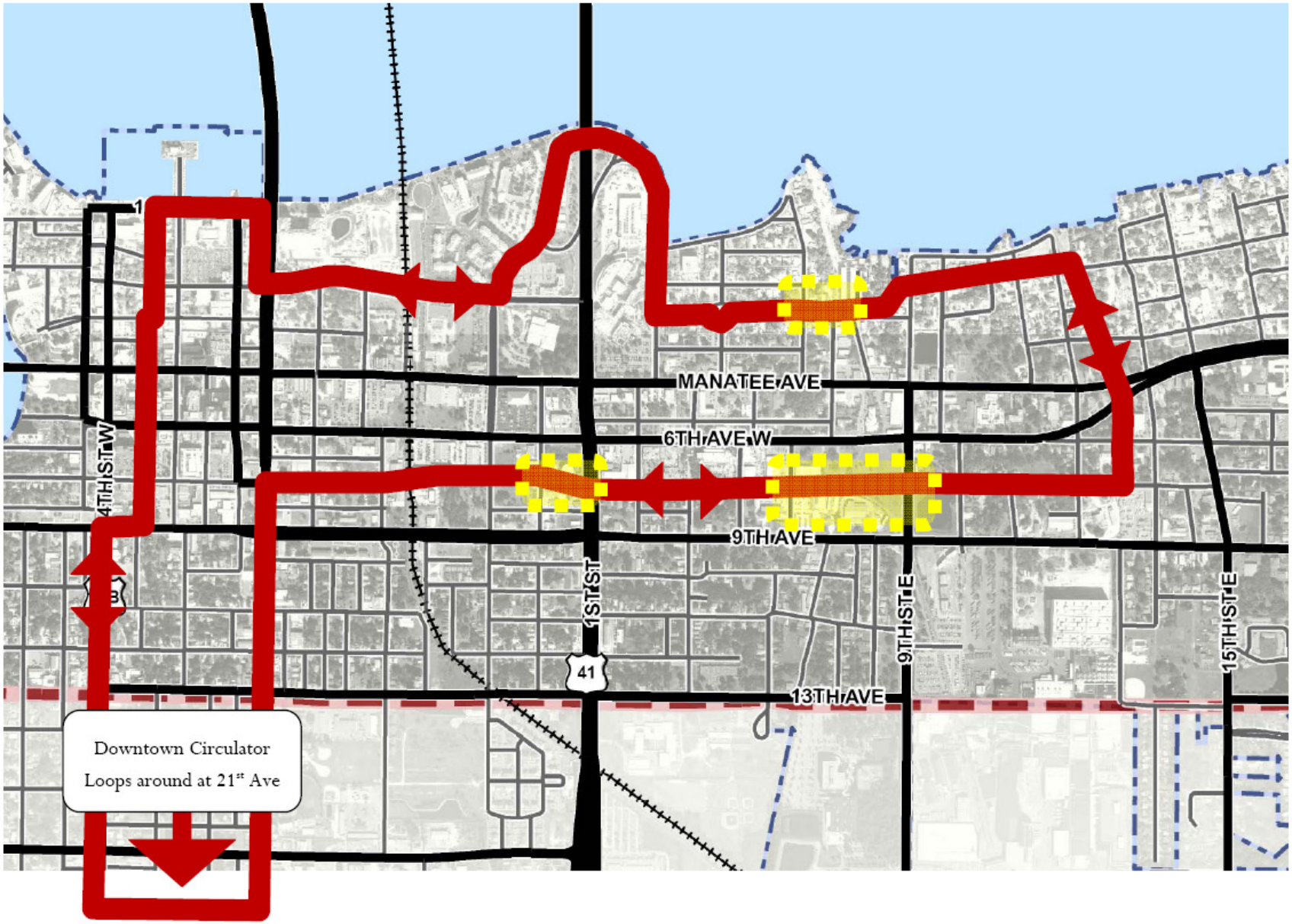
Alternative 1C – With Infrastructure Changes (Two Way Conversion)

- This alternative is based on converting Manatee Ave and 6th Ave to two-way pairs
- This does not include completing the downtown grid network.

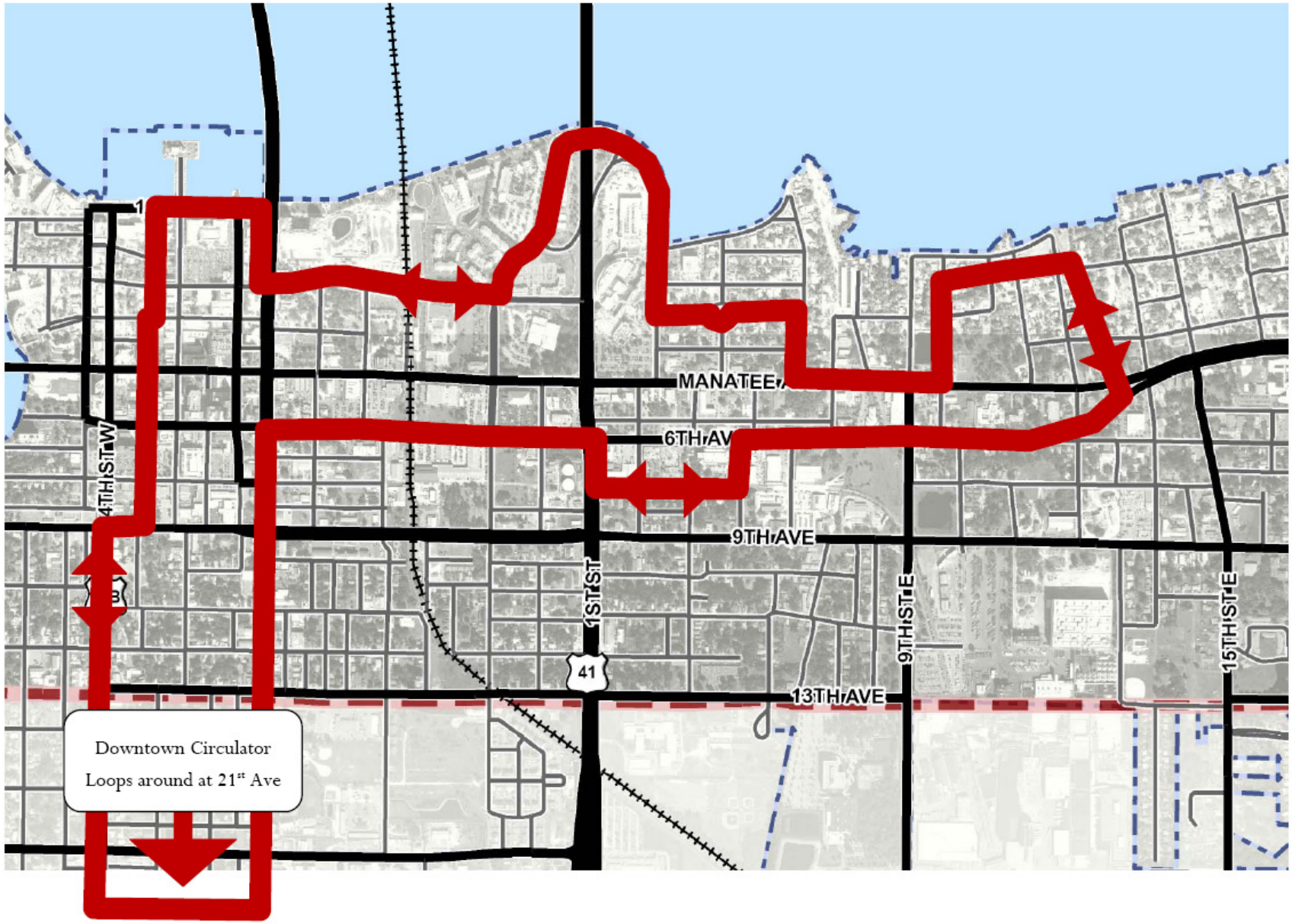
BRADENTON DOWNTOWN CIRCULATOR ALTERNATIVE #1A - NO INFRASTRUCTURE CHANGES



BRADENTON DOWNTOWN CIRCULATOR ALTERNATIVE #1B – WITH INFRASTRUCTURE CHANGES (GRID EXTENSIONS)



BRADENTON DOWNTOWN CIRCULATOR ALTERNATIVE #1C – WITH INFRASTRUCTURE CHANGES (TWO WAY CONVERSION)



Alternative 2

Number of Buses – Three (All three buses travel one direction)
Estimated Route Distance – 7 miles
Complete Route Travel Time – 30 min
Hours of Operations – 7:00 am to 7:00 pm
Frequency – Bus Service Every 10 min

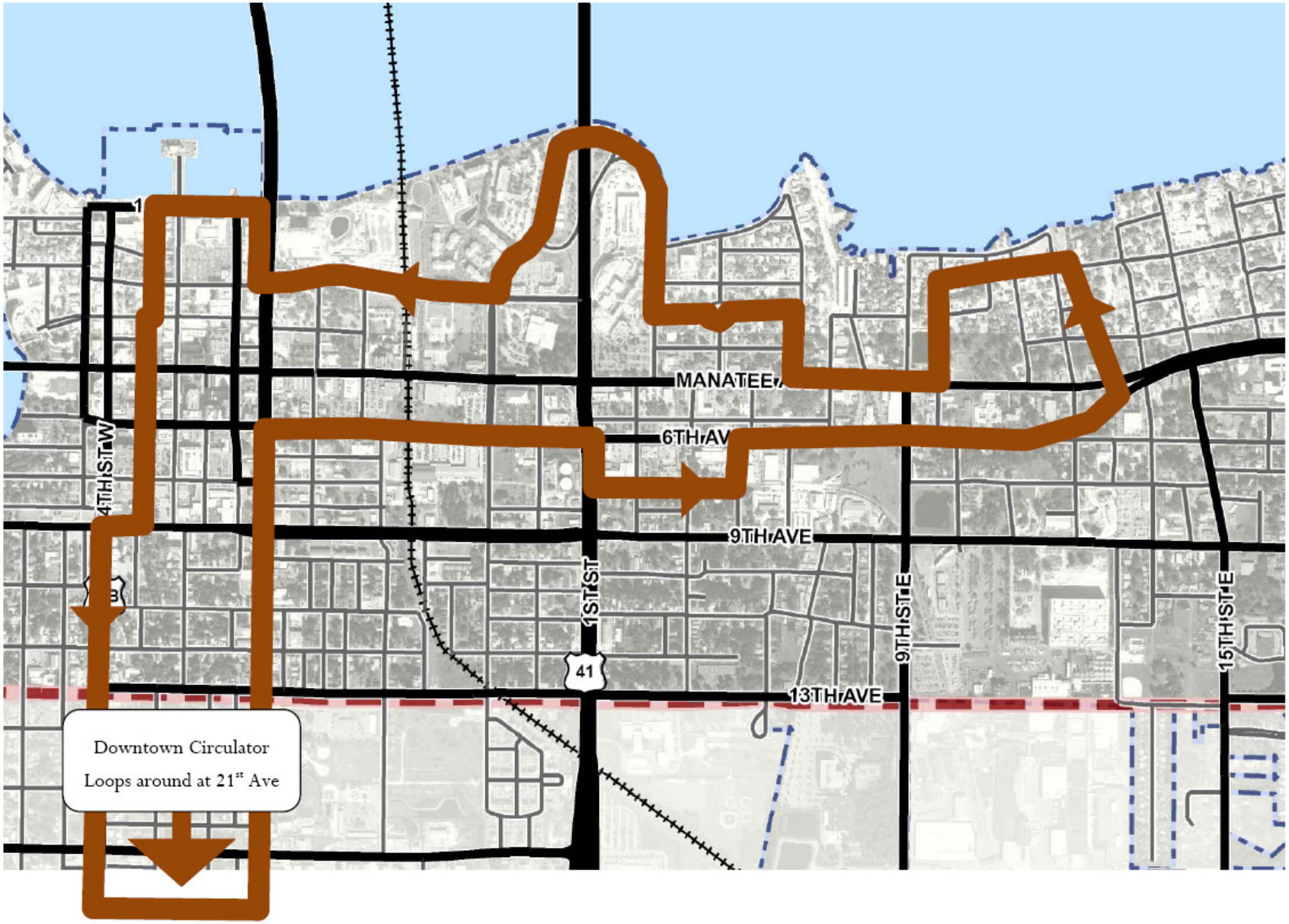
Alternative 2A – No Infrastructure Changes

- This alternative is based on no changes being made to the transportation infrastructure, specifically not changing Manatee Ave and 6th Ave to two ways streets.
- Due to the one way nature of the Manatee Ave and 6th Ave the circulator must travel in one direction if it is to travel on either corridor.
- Based on current infrastructure there is no possible corridor north of Manatee Ave to allow for bi-directional travel East and West.

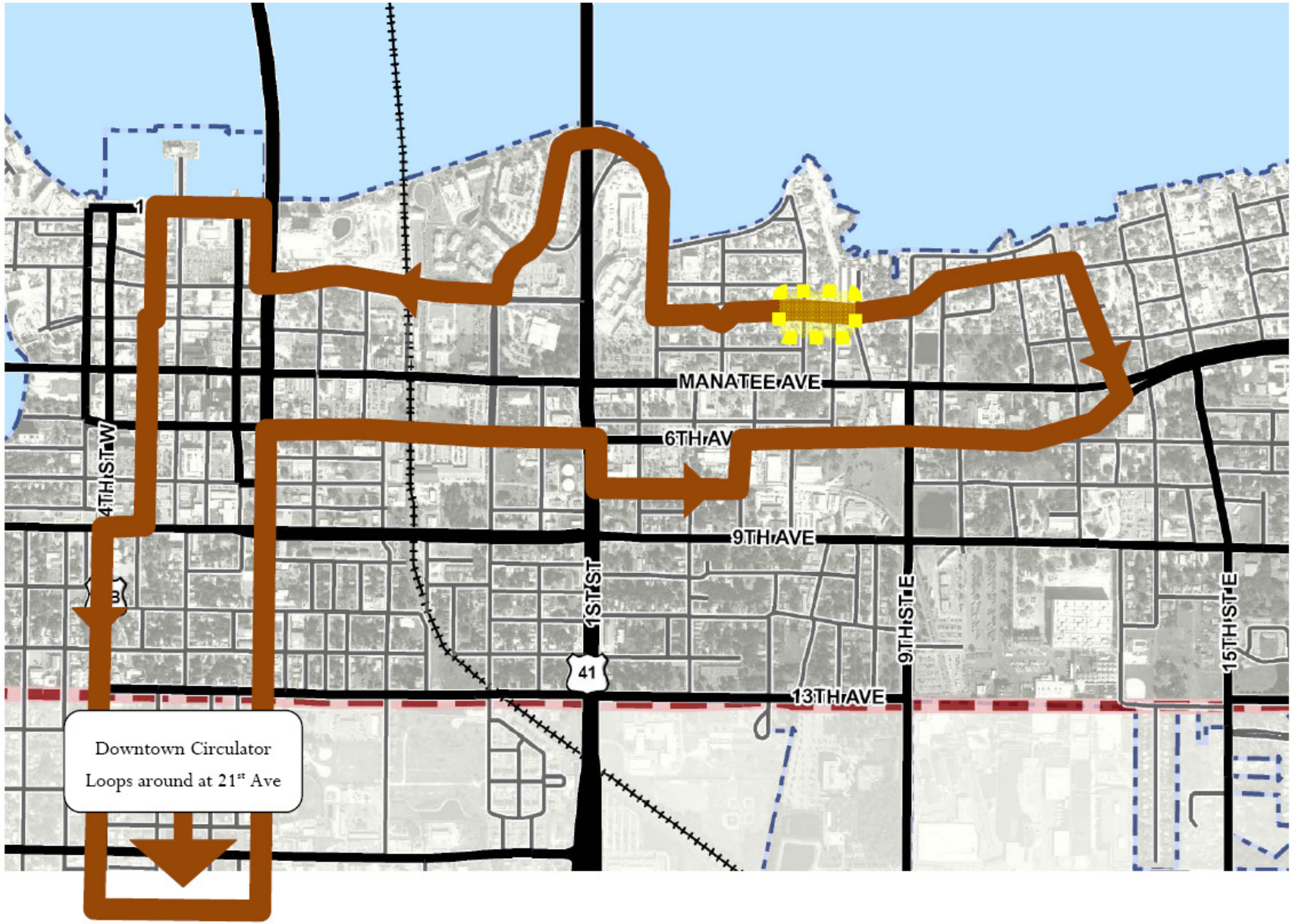
Alternative 2B – With Infrastructure Changes (Grid Extensions)

- This alternative is based on completing part of the downtown road network grid. Extending 3rd Ave E between 6th St E and 7th St E.
- Due to the one way nature of the Manatee Ave and 6th Ave this alternative could travel on those corridors, but would be less efficient for bus operation.

BRADENTON DOWNTOWN CIRCULATOR ALTERNATIVE #2A – NO ROADWAY CHANGES



BRADENTON DOWNTOWN CIRCULATOR ALTERNATIVE #2B – WITH INFRASTRUCTURE CHANGES (GRID EXTENSIONS)



An alternative night service could be explored which provides more specific service to those areas that remain active after normal business hours. This type of service could typically operate at a third of the cost of the recommended route. Additionally, security concerns should be addressed during the planning process.

This recommendation does not include service provided by MCAT. It assumes the downtown circulator service will target some of the existing riders, but mainly target the residents, workers and visitors who travel within the immediate downtown area. Therefore, some route overlap occurs.

BRADENTON DOWNTOWN CIRCULATOR FINANCIAL ANALYSIS

The following financial information is based on the fiscal operation information provided in the most recent MCAT TDP. Capital cost estimates are based on the use of hybrid electric buses.

Financial information regarding the operational cost of hybrid electric bus is not consistent among those transit systems which operate such vehicles. This is most likely due to the fact that operational costs are associated with the system as a whole and not specifically to types of service and vehicles. A more detailed analysis will have to be conducted to determine the full fiscal impact. The Transportation Research Board is currently funding a study that could provide some insight into the expected operating expenses.

BRADENTON DOWNTOWN CIRCULATOR OPERATING EXPENSES

Operating expense are based on the most recent information provided by MCAT in the FY 2008 Transit Development Plan

Alternative 1

Cost Per Revenue Hour – $67.54
Estimated Daily Revenue Hours – 48 hours
Estimated Daily Cost – $3,242
Estimated Annual Cost – $248,007 Per Bus ($992,028 total)
Based on six days of operation and no service on six major holidays (based on MCAT service)

Alternative 2

Cost Per Revenue Hour – $67.54
Estimated Daily Revenue Hours – 36 hours
Estimated Daily Cost – $2,431
Estimated Annual Cost – $248,007 Per Bus ($744,021 total)
Based on six days of operation and no service on six major holidays (based on MCAT service)

BRADENTON DOWNTOWN CIRCULATOR CAPITAL EXPENSES

Capital planning for a downtown circulator system includes the cost for signage, amenities and transit vehicles. Research into the cost associated with hybrid vehicles is inconsistent at this time. The Transportation research Board is funding a study to help provide some direction for cost expectations and operational performance. In general, capital costs for hybrid vehicles are expected to be 15% to 20% more than a standard diesel bus.

1) Bus Stop (Signage Only) - $150 Per Stop
   - 50% of the stop locations can service users with only signage. This percentage could increase with better frequency, but even with frequent service choice customers will seek some amenities that provide protection from the weather.
2) Bus Stop (Shelter Amenities) - $25,000 Per Stop
   - Shelter amenities include a protective shelter that is expected to be a custom design. The shelters would include lighting and benches. Innovative funding approaches could be taken to implement shelters, such as advertising or business sponsorships. Local regulations regarding advertising in the Right-of-Way could affect these options. Solar powered lighting has become a very cheap alternative to connecting the shelters to the main power supply.
3) Hybrid Electric Bus - $420,000 Per Bus
   - This price is based on information provided by other transit systems that have been actively implementing hybrid buses. One transit systems stated they have seen a significant drop in the cost of hybrids (more in-line with the cost of a standard bus) as the market has become more competitive.
4) Marketing Campaign - $100,000
   - A clear marketing plan would better define funding needs and revenues opportunities. Since marketing approaches will have a significant impact on the business community, there is a greater potential for partnerships that would help minimize the over marketing cost.
5) *Optional* – Real-time Passenger Information Systems - $200,000

Even though the downtown circulator system is small in design, research has shown a significant increase in ridership can be gained by online trip planning and real-time bus arrival information, regardless of system size. This type of information provides a sense of reliability and dependability that foster greater potential transit use. The technology also provides another means for local business partnerships (such as automated voice enunciator that could also highlight nearby retail locations.

TRANSIT MALL

Transit Mall Characteristics

- Dedicated transit corridor
- Transit oriented design guidelines
- Retail emphasizing transit, pedestrian and bicycle
- Predominate transit amenities and shelters

The goal of the project would be to reduce the speed of vehicle travel, create a walkable retail and residential destination, provide alternative means of transportation to and around the downtown, provide transit with a travel advantage over automobiles, and enhance the character of the corridor. Various land use regulations should be explored to ensure that new development emphasizes the corridor, promoting pedestrian activity and transit use.
Note: Transit Malls have the most criticism and opposition associated with the type of transit vehicles used. Typical diesel buses create high levels of engine noise and emit undesirable exhaust fumes. To negate these issues the use of hybrid electric buses should be considered.

Examples of Transit/Pedestrian Malls

Charlottesville Virginia Pedestrian Mall

Denver Colorado Transit Mall

Long Beach Los Angeles Transit Mall

Santa Rose California Transit Mall

Transit Mall Recommendations

13th St Corridor Transit Mall

A potential Transit Mall corridor is along 13th Street W between 9th Avenue W and 4th Ave W. This concept would include the designation of a dedicated transit right-of-way, significant transit station location investment and the construction of a multi-use transfer facility at 13th St W and 8th Ave W.

Pros: This concept corridor would serve the major areas of the downtown, the Downtown Riverwalk, the Courthouse Square and the Arts District Gateway. It also provides an ideal location for a transit center location along the southern side of the downtown which would provide effective transfers to the county system from/to a downtown transit circulator

Cons: It only serves a western section of downtown.

8th Ave Corridor Transit Mall

A potential Transit Mall corridor is along 8th Avenue between 14th Street and the existing railroad line at 6th Street. This concept would include the designation of a dedicated transit right-of-way, significant transit station location investment, the construction of a multi-use transfer facility at 13th St W and 8th Avenue W, and the construction of a light rail station at 6th Street and 8th Avenue.

Pros: It would provide a defined corridor between the potential light rail station and a potential location of a transit center facility connecting to MCAT's system. It would support and provide incentive for land use development along the 8th Ave and provide a connection between the southern edges of the downtown to the more retail focused areas of 6th Avenue and Manatee Avenue. It would support the operations of a proposed downtown circulator.

Cons: It does not provide a complete East to West corridor. It only serves along the southern edge of the downtown.

6th Ave Corridor Transit Mall

A potential Transit Mall corridor is along 6th Avenue between 13th Street and 1st Street. This concept would include the designation of a dedicated transit right-of-way, significant transit station location investment and construction of a light rail station.

Pros: The concept provides a complete East to West corridor. It would support the operations of a proposed downtown circulator. Continue to support the focused land development along 6th Avenue. It would help slow the traffic along 6th Avenue and potentially divert some traffic to along east to west corridors.

Cons: The concept does not connect with the light rail station or the potential location for a transit center at 14th Street and 9th Avenue.

PALMETTO DOWNTOWN TRANSIT SERVICE

The Palmetto concept is an improvement of the existing MCAT Route 13 service. The existing service provides hour service in each direction, with a 30 minute arrival alternations. The improved service would add four additional buses, two for each direction. The result would be service arriving every 5 min.

PALMETTO DOWNTOWN CIRCULATOR SERVICE DESIGN

Expand Route 13 Frequency

Number of Buses – Four (Two sets of two buses travel in opposite directions)
Estimated Route Distance – 10 miles
Complete Route Travel Time – 60 min
Hours of Operations – 7:00 am to 7:00 pm
Frequency – Bus Service Every 10 min (5 min perceived frequency)

This alternative is based on no route design changes being made to the current MCAT Route 13 service. The route serves the major destinations of Downtown Palmetto
Focus should be placed on marketing and promoting of the existing route, providing passenger information and improving customer amenities.

PALMETTO DOWNTOWN CIRCULATOR FINANCIAL ANALYSIS

The following financial information is based on the fiscal operation information provided in the most recent MCAT TDP. Capital cost estimates are based on the use of hybrid electric buses.

PALMETTO DOWNTOWN CIRCULATOR OPERATING EXPENSES

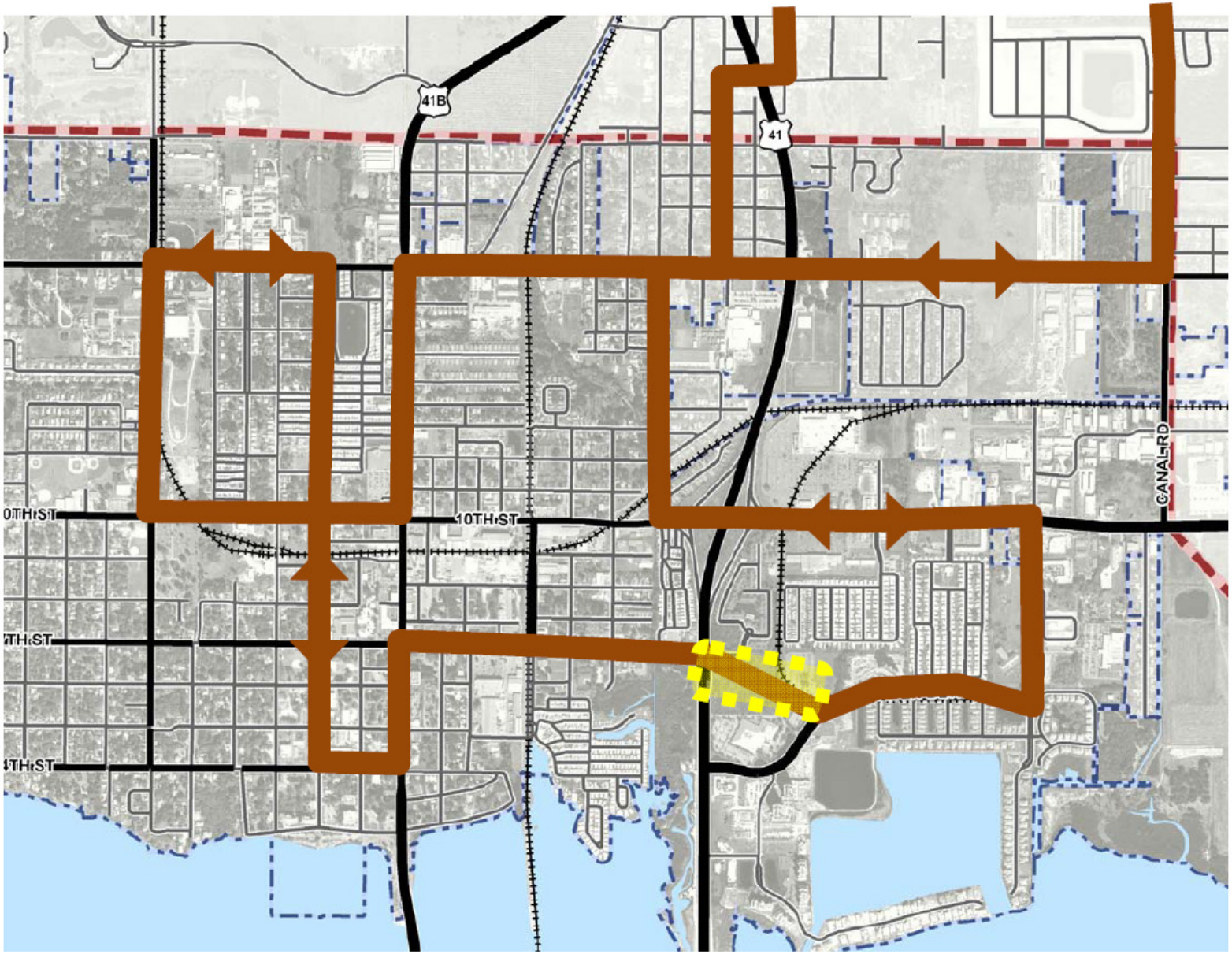
Operating expense is based on the most recent information provided by MCAT in the FY 2008 Transit Development Plan.

Expand Route 13 Frequency

Cost Per Revenue Hour – $67.54
Estimated Increased Daily Revenue Hours – 48 hours
Estimated Increased Daily Cost – $3,242
Estimated Increased Annual Cost – $248,007 Per Bus ($992,028 total)

Based on six days of operation and no service on six major holidays (based on MCAT service)

PALMETTO DOWNTOWN CIRCULATOR IMPROVEMENT – EXISTING ROUTE 13 DESIGN W/7TH STREET EXTENSION TO HABEN BLV



PALMETTO DOWNTOWN CIRCULATOR CAPITAL EXPENSES

Capital planning for a downtown circulator system includes the cost for signage, amenities and transit vehicles. Research into the cost associated with hybrid vehicles is inconsistent at this time. The Transportation research Board is funding a study to help provide some direction for cost expectations and operational performance. In general, capital costs for hybrid vehicles are expected to be 15% to 20% more than a standard diesel bus.

1) Bus Stop (Signage Only) - $150 Per Stop
   - 50% of the stop locations can service users with only signage. This percentage could increase with better frequency, but even with frequent service choice customers will seek some amenities that provide protection from the weather.
2) Bus Stop (Shelter Amenities) - $25,000 Per Stop
   - Shelter amenities include a protective shelter that is expected to be a custom design. The shelters would include lighting and benches. Innovative funding approaches could be taken to implement shelters, such as advertising or business sponsorships. Local regulations regarding advertising in the Right-of-Way could affect these options. Solar powered lighting has become a very cheap alternative to connecting the shelters to the main power supply.
3) Hybrid Electric Bus - $420,000 Per Bus
   - This price is based on information provided by other transit systems that have been actively implementing hybrid buses. One transit systems stated they have seen a significant drop in the cost of hybrids (more in-line with the cost of a standard bus) as the market has become more competitive.
4) Marketing Campaign - $100,000
   - A clear marketing plan would better define funding needs and revenues opportunities. Since marketing approaches will have a significant impact on the business community, there is a greater potential for partnerships that would help minimize the over marketing cost.
5) *Optional* – Real-time Passenger Information Systems - $200,000
   - Even though the downtown circulator system is small in design, research has shown a significant increase in ridership can be gained by online trip planning and real-time bus arrival information, regardless of system size. This type of information provides a sense of reliability and dependability that foster greater potential transit use. The technology also provides another means for local business partnerships (such as automated voice enunciator that could also highlight nearby retail locations.

POINTS OF DISCUSSION

- Downtown circulators are unique. This type of transit service is focused on attracting very specific choice ridership within a relatively small defined service area. This type of service requires unique planning outside the typical transit route analysis and planning. It must attract ridership based on local users (not residents, but those potential users who find themselves within the downtown area for any given reason) choosing to use the service, which they will weight against immediate knowledge of connectivity options; parking availability, parking cost and pedestrian access. This means the planning and implementation of a downtown circulator will require a unique approach to gain immediate downtown endorsement and wide-spread promotion for effective use.

- There is no ridership estimation tool that can project ridership for this type of route. Ridership projections for this type of service is more related to the type of promotion and marketing implemented than the actual route design, especially in those areas that good connectivity exist. The standard ¼ mile walking radius that would apply to typical route planning does not apply to this type of route. Initial community input will help develop a set of service standards that could be applied to estimating ridership of resident, employees and visitors.

- Any downtown circulator plan should include a very specific promotion and marketing component that clearly identifies strategies to communicate service use and availability.

- A mechanism should be developed that allows for continuous reevaluation and potential service alteration, but still maintains service reliability and awareness. Many downtown circulator system suffer from too many changes too quickly which result in unnecessary frustration and unreliability.

- A comprehensive analysis should include the impact of transit trips gained by providing connectivity to the larger MCAT system. MCAT has proposed the development of a new transfer facility. An additional goal of the downtown service would include the efficient connectivity with this facility to eliminate the use of an automobile completely.

- Turning radius, bus stop locations, acceleration and deceleration speeds, and average service speed are major factors for designing a downtown circulator route. No standard statistic can be used to develop these factors. This means that Bradenton must test run a bus route before anything can be finalized. This will require some coordination with MCAT to use one of these full length buses. This will require about 6 hours of a drive and bus time.

- There needs to be a clear approach to developing a downtown circulator. Too many stakeholders could create an efficient system, but inevitably a business and/or small community might not be served which could cause political complications.

NEXT STEPS

Renaissance Planning Group would like the opportunity to further develop the concept of a downtown circulator system. A final concept would include several downtown circulation alternatives, a financial component for each alternative, a ridership impact analysis for each alternative, funding options, traffic impact analysis, community promotion and relations component, and an implementation plan. A final report could be developed within six months.

Initially a select stakeholders group would be formed to develop specific target corridors, and specific target business and residential communities. This same group will help develop the downtown circulators goals and objectives, specifically dealing with connectivity and traffic impacts. As another critical step in this process a downtown group of citizens and businesses should be formed to gather their input and endorsement.

APPENDIX B

Bradenton/Palmetto Multimodal Quality of Service Data Collection Summary

							Pedestrian							Cycling				Transit		
Municipality	Roadway	From	To	Bicycle LOS	Pedestrian LOS	Transit LOS	Sidewalk (N/E)	Sidewalk (S/W)	Width	Buffer Spacing	% Protection	Crosswalk	Signal	Lane/ Shoulder	Lane Width	Condition	Parking	Frequency	Span	Obstacles
Bradenton	Manatee Ave	26th St W	22nd St W	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	Manatee Ave	22nd St W	15th St W	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	Manatee Ave	15th St W	9th St W	D	C	F	100%	100%	6'	0	25%	Yes	Yes	No	Typical	Typical	25%	1	12	No
Bradenton	Manatee Ave	9th St W	1st St E	D	C	F	100%	100%	5'	5'	35%	Yes	Yes	No	Typical	Typical	35%	1	12	No
Bradenton	Manatee Ave	1st St E	9th St E	D	C	F	100%	100%	6'	0	20%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	Manatee Ave	9th St E	15th St E	D	C	F	100%	100%	6'	0	20%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	6th Ave W	15th St W	9th St W	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	6th Ave W	9th St W	1st St E	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	6th Ave W	1st St E	9th St E	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	7th Ave W	9th St E	15th St E	D	C	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	Manatee Ave	15th St E	27th St E	D	D	F	100%	100%	5'	5'	10%	Yes	Yes	Shoulder	Typical	Typical	0%	1	12	No
Bradenton	1st St	Manatee Ave	6th Ave	D	E	F	0%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	1st St	6th Ave	9th Ave	D	E	F	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	1st St	9th Ave	13th Ave	D	E	F	100%	100%	5'	2'	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	9th St W	Manatee Ave	6th Ave	D	D	E	100%	100%	4'	0	0%	Yes	Yes	No	Typical	Typical	0%	2	13	No
Bradenton	14th St W	6th Ave	9th Ave	D	C	E	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	2	13	No
Bradenton	14th St W	9th Ave	13th Ave	D	C	E	100%	100%	4'	0	0%	Yes	Yes	No	Narrow	Typical	0%	2	13	No
Bradenton	27th ST E	Manatee Ave	Martin Luther King Ave	E	D	F	50%	100%	5'	0	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	27th St E	Martin Luther King Ave	13th Ave	E	D	F	100%	100%	4'	8'	10%	No	No	No	Typical	Typical	0%	1	13	Yes
Bradenton	26th St W	Riverview Blvd	Manatee Ave	D	B	F	100%	100%	3'	2'	20%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	26th St W	Manatee Ave	9th Ave	D	D	F	0%	100%	4'	2'	0%	Yes	Yes	No	Wide	Typical	0%	N/A	N/A	N/A
Bradenton	26th St W	9th Ave	13th Ave	D	D	F	25%	0%	4'	8'	5%	No	No	No	Wide	Typical	0%	1	12	No
Bradenton	22nd St W	Manatee Ave	9th Ave	B	B	F	100%	100%	4'	2'	15%	No	No	No	Wide	Typical	0%	N/A	N/A	N/A
Bradenton	22nd St W	9th Ave	13th Ave	B	B	F	100%	100%	4'	2'	15%	No	No	No	Wide	Typical	0%	N/A	N/A	N/A
Bradenton	15th St W	1st Ave	Manatee Ave	D	B	F	100%	100%	4'	2'	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	15th St W	Manatee Ave	6th Ave	D	B	F	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	14th St W	1st Ave	Manatee Ave	C	B	F	50%	35%	4'	2'	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Bradenton	14th St W	Manatee Ave	6th Ave	C	B	F	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	13	No
Bradenton	10th St W	1st Ave	Manatee Ave	D	A	F	100%	100%	5'	3'	40%	Yes	Yes	No	Wide	Typical	60%	N/A	N/A	N/A
Bradenton	10th St W	Manatee Ave	6th Ave	D	B	F	100%	100%	5'	0	90%	Yes	Yes	No	Wide	Typical	80%	N/A	N/A	N/A
Bradenton	10th St W	6th Ave	8th Ave	D	B	F	100%	100%	5'	0	90%	Yes	Yes	No	Wide	Typical	80%	N/A	N/A	N/A
Bradenton	1st Ave	15th St W	14th St W	C	A	F	100%	100%	6'	0	90%	yes	No	No	Typical	Typical	50%	N/A	N/A	N/A
Bradenton	1st Ave	14th St W	10th St W	C	A	F	100%	100%	6'	0	90%	Yes	No	No	Typical	Typical	100%	N/A	N/A	N/A
Bradenton	9th St W	6th Ave	9th Ave	D	C	F	100%	100%	4'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	13	No
Bradenton	9th St W	9th Ave	13th Ave	D	D	F	100%	100%	4'	2'	0%	Yes	Yes	No	Typical	Typical	0%	1	13	No
Bradenton	9th St E	Manatee Ave	7th Ave	D	B	F	100%	100%	5'	2'	0%	Yes	Yes	No	Wide	Typical	0%	1	13	No
Bradenton	9th St E	7th Ave	9th Ave	A	B	F	100%	100%	5'	2'	0%	Yes	Yes	Shoulder	Wide	Typical	0%	1	13	No
Bradenton	9th St E	9th Ave	13th Ave	A	B	F	100%	100%	5'	2'	0%	Yes	Yes	Shoulder	Wide	Typical	0%	1	13	No
Bradenton	15th St E	Manatee Ave	9th Ave	D	D	F	25%	100%	4'	4'	10%	Yes	No	No	Wide	Typical	0%	N/A	N/A	N/A
Bradenton	15th St E	9th Ave	13th Ave	E	E	F	0%	0%	0	0	0%	No	No	No	Wide	Undesirable	0%	N/A	N/A	N/A
Bradenton	9th Ave	26th St W	22nd St W	D	C	E	100%	100%	4'	2'	10%	No	No	No	Typical	Typical	0%	2	12	No
Bradenton	9th Ave	22nd St W	14th St W	D	C	E	50%	100%	4'	2'	10%	No	No	No	Typical	Typical	0%	2	12	No
Bradenton	9th Ave	14th St W	9th St W	D	C	F	100%	100%	4'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Bradenton	9th Ave	9th St W	1st St	D	C	F	100%	100%	4'	2'	0%	Yes	Yes	No	Wide	Typical	0%	N/A	N/A	N/A
Bradenton	9th Ave	1st St	9th St E	B	C	E	100%	100%	5'	2'	30%	Yes	Yes	Shoulder	Wide	Desirable	0%	2	12	No
Bradenton	9th Ave	9th St E	15th St E	D	D	F	0%	100%	4'	4'	0%	Yes	No	No	Wide	Typical	0%	1	12	Yes
Bradenton	9th Ave	15th St E	27th St E	D	D	F	0%	100%	4'	4'	0%	No	No	No	Typical	Typical	0%	1	12	Yes
Bridge	US 41	Haben Blvd	Manatee Ave	E	E	F	0%	0%	0	0	0%	Yes	Yes	Shoulder	Typical	Typical	0%	N/A	N/A	N/A
Bridge	Bus 41	4th St	Manatee Ave	E	D	E	0%	100%	5'	0	100%	Yes	Yes	Shoulder	Typical	Typical	0%	2	13	Yes
Palmetto	US 41	Memphis Rd	10th St E	D	E	F	0%	50%	6'	0	0%	Yes	Yes	Shoulder	Typical	Undesirable	0%	N/A	N/A	N/A
Palmetto	US 41	10th St E	7th St W	D	E	F	0%	0%	0	0	0%	No	No	Shoulder	Typical	Undesirable	0%	N/A	N/A	N/A
Palmetto	US 41	7th St W	Haben Blvd	D	E	F	0%	0%	0	0	0%	No	No	Shoulder	Typical	Undesirable	0%	N/A	N/A	N/A

Bradenton/Palmetto Multimodal Quality of Service Data Collection Summary

							Pedestrian							Cycling				Transit		
Municipality	Roadway	From	To	Bicycle LOS	Pedestrian LOS	Transit LOS	Sidewalk (N/E)	Sidewalk (S/W)	Width	Buffer Spacing	% Protection	Crosswalk	Signal	Lane/ Shoulder	Lane Width	Condition	Parking	Frequency	Span	Obstacles
Palmetto	8th Ave W	17th St	10th St	D	D	D	100%	100%	6'	0	0%	Yes	Yes	No	Typical	Typical	0%	3	13	No
Palmetto	8th Ave W	10th St	7th St	D	D	E	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	2	13	No
Palmetto	8th Ave W	7th St	4th St	D	D	E	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	2	13	No
Palmetto	10th St	24th Ave W	20th Ave W	B	C	E	100%	0%	6'	5'	10%	No	No	Shoulder	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	10th St	20th Ave W	14th Ave W	D	D	E	100%	0%	6'	5'	10%	No	No	Shoulder	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	10th St	14th Ave W	10th Ave W	B	C	D	100%	100%	5'	5'	0%	Yes	Yes	Lane	Typical	Desirable	0%	3	13	No
Palmetto	10th St	10th Ave W	8th Ave W	B	D	D	75%	100%	5'	0	0%	Yes	Yes	Lane	Typical	Desirable	0%	3	13	No
Palmetto	10th St	8th Ave W	US 41	C	D	F	100%	100%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	1	12	No
Palmetto	10th St	US 41	Haben Blvd	C	D	F	100%	100%	5'	2'	0%	Yes	Yes	Shoulder	Typical	Typical	0%	1	12	No
Palmetto	10th St	Haben Blvd	Canal Rd	C	E	F	0%	100%	4'	5'	0%	Yes	No	Shoulder	Typical	Typical	0%	1	12	Yes
Palmetto	24th Ave W	17th St	10th St	A	C	F	100%	5%	4'	5'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	14th Ave W	21st St	17th St	C	C	F	100%	0%	4'	10'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	14th Ave W	17th St	10th St	D	D	D	0%	100%	4'	5'	0%	No	No	No	Typical	Typical	0%	3	13	No
Palmetto	14th Ave W	10th St	7th St	D	D	F	0%	100%	4'	2'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	14th Ave W	7th St	4th St	D	D	F	0%	100%	4'	2'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	10th Ave W	17th St	10th St	B	B	F	100%	100%	4'	2'	0%	Yes	No	No	Wide	Typical	100%	N/A	N/A	N/A
Palmetto	10th Ave W	10th St	7th St	C	B	F	100%	100%	4'	2'	100%	Yes	No	No	Wide	Typical	100%	N/A	N/A	N/A
Palmetto	10th Ave W	7th St	4th St	C	B	F	100%	100%	5'	0	100%	Yes	No	No	Typical	Typical	100%	N/A	N/A	N/A
Palmetto	5th Ave W	10th St	7th St	A	C	F	0%	100%	4'	5'	10%	No	No	No	Wide	Typical	0%	N/A	N/A	N/A
Palmetto	Canal Rd	Memphis Rd	US 301	D	D	F	0%	0%	0	0	0%	No	No	No	Typical	Undesirable	0%	N/A	N/A	N/A
Palmetto	20th Ave W	10th St	7th St	B	C	F	0%	100%	4'	5'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	20th Ave W	7th St	4th St	B	C	F	0%	100%	4'	5'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	4th St	20th Ave W	14th Ave W	C	C	F	25%	0%	4'	5'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	4th St	14th Ave W	10th Ave W	C	C	F	100%	75%	4'	5'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	4th St	10th Ave W	8th Ave W	C	B	F	100%	100%	4'	5'	100%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	7th St	20th Ave W	14th Ave W	C	C	F	100%	0%	4'	2'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	7th St	14th Ave W	10th Ave W	C	C	F	100%	0%	4'	2'	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	7th St	10th Ave W	8th Ave W	B	C	F	100%	0%	4'	2'	0%	No	Yes	Shoulder	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	7th St	8th Ave W	5th Ave W	B	C	F	100%	100%	4'	2'	0%	No	Yes	Shoulder	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	7th St	5th Ave W	US 41	C	C	F	75%	75%	4'	2'	0%	No	No	No	Wide	Typical	0%	N/A	N/A	N/A
Palmetto	Haben Blvd	US 41	12th Ave E	D	D	F	25%	100%	4'	5'	0%	No	No	No	Typical	Typical	0%	1	2	No
Palmetto	Haben Blvd	10th St	12th Ave E	D	D	F	75%	75%	4'	2'	0%	Yes	No	No	Typical	Typical	0%	1	2	No
Palmetto	17th St	24th Ave W	14th Ave W	C	C	E	0%	100%	4'	2'	0%	No	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	17th St	14th Ave W	10th Ave W	D	C	D	100%	100%	4'	2'	0%	No	Yes	No	Typical	Typical	0%	3	13	No
Palmetto	17th St	10th Ave W	8th Ave W	D	D	D	0%	100%	4'	2'	0%	Yes	Yes	No	Typical	Typical	0%	3	13	No
Palmetto	17th St	8th Ave W	US 41	B	C	F	0%	100%	4'	5'	0%	Yes	Yes	Shoulder	Typical	Undesirable	0%	1	12	No
Palmetto	Memphis Rd	US 41	Canal Rd	E	E	F	25%	25%	4'	2'	0%	Yes	No	No	Typical	Undesirable	0%	1	12	Yes
Palmetto	Bus 41	21st St	17th St	E	E	F	50%	50%	5'	0	0%	Yes	Yes	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	US 41	US 19	Memphis Rd	E	D	F	0%	0%	0	0	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	US 41	21st St	Memphis Rd	E	D	F	0%	0%	0	0	0%	No	No	No	Typical	Typical	0%	N/A	N/A	N/A
Palmetto	Canal Rd	Mendoza Rd	Memphis Rd	D	D	F	0%	0%	0	0	0%	0%	0%	No	Typical	Undesirable	0%	N/A	N/A	N/A

APPENDIX C

Existing Network

HCM Unsignalized Intersection Capacity Analysis
2: 3rd Ave & US 41

12/7/2009

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	50	0	2706	1820	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	0	2941	1978	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				744		
pX, platoon unblocked	0.45					
vC, conflicting volume	2959	989	2033			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	989	2033			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	95	246	275			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	54	980	980	980	989	989	54
Volume Left	0	0	0	0	0	0	0
Volume Right	54	0	0	0	0	0	54
cSH	246	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.58	0.58	0.58	0.58	0.58	0.03
Queue Length 95th (ft)	21	0	0	0	0	0	0
Control Delay (s)	23.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	23.8	0.0			0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	302	68	243	281	115	145	900	222	133	745	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1794		1787	1776		1752	3441		1787	3543	
Flt Permitted	0.20	1.00		0.20	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	380	1794		376	1776		1752	3441		1787	3543	
Peak-hour factor, PHF	0.79	0.79	0.79	0.93	0.93	0.93	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	161	382	86	261	302	124	158	978	241	140	784	48
RTOR Reduction (vph)	0	9	0	0	16	0	0	24	0	0	5	0
Lane Group Flow (vph)	161	459	0	261	410	0	158	1195	0	140	827	0
Heavy Vehicles (%)	0%	3%	3%	1%	2%	3%	3%	2%	1%	1%	1%	1%
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	29.0	20.0		29.0	20.0		9.0	31.1		8.9	31.0	
Effective Green, g (s)	29.0	20.0		29.0	20.0		9.0	31.1		8.9	31.0	
Actuated g/C Ratio	0.32	0.22		0.32	0.22		0.10	0.34		0.10	0.34	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	262	394		259	390		173	1176		175	1207	
v/s Ratio Prot	0.06	c0.26		c0.10	0.23		0.09	c0.35		0.08	c0.23	
v/s Ratio Perm	0.14			0.22								
v/c Ratio	0.61	1.17		1.01	1.05		0.91	1.02		0.80	0.69	
Uniform Delay, d1	35.8	35.5		37.8	35.5		40.6	30.0		40.2	25.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	98.9		57.9	59.4		44.1	30.4		22.4	3.2	
Delay (s)	40.0	134.4		95.7	94.9		84.7	60.4		62.6	29.0	
Level of Service	D	F		F	F		F	E		E	C	
Approach Delay (s)		110.3			95.2			63.1			33.8	
Approach LOS		F			F			E			C	

Intersection Summary			
HCM Average Control Delay	69.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1059	101	309	949	25	118	19	669	50	63	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.5	4.5	5.5		5.5	5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	3505	1599	1736	3458		1671	1712	1599		1636	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1805	3505	1599	1736	3458		1671	1712	1599		1636	
Peak-hour factor, PHF	0.95	0.95	0.95	0.99	0.99	0.99	0.94	0.94	0.94	0.73	0.73	0.73
Adj. Flow (vph)	36	1115	106	312	959	25	126	20	712	68	86	85
RTOR Reduction (vph)	0	0	78	0	1	0	0	0	410	0	18	0
Lane Group Flow (vph)	36	1115	28	312	983	0	126	20	302	0	221	0
Heavy Vehicles (%)	0%	3%	1%	4%	4%	4%	8%	11%	1%	14%	6%	8%
Turn Type	Prot		custom	Prot			Split		custom	custom		
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases			4						2	8		
Actuated Green, G (s)	5.3	35.8	18.7	15.7	46.7		18.7	18.7	46.7		18.3	
Effective Green, g (s)	5.3	35.8	18.7	15.7	46.7		18.7	18.7	46.7		18.3	
Actuated g/C Ratio	0.05	0.33	0.17	0.14	0.42		0.17	0.17	0.42		0.17	
Clearance Time (s)	4.5	6.0	5.5	4.5	5.5		5.5	5.5	5.5		5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	87	1141	272	248	1468		284	291	679		272	
v/s Ratio Prot	0.02	c0.32		c0.18	0.28		c0.08	0.01			c0.13	
v/s Ratio Perm			0.02						0.19			
v/c Ratio	0.41	0.98	0.10	1.26	0.67		0.44	0.07	0.45		0.81	
Uniform Delay, d1	50.8	36.7	38.6	47.2	25.4		41.0	38.3	22.5		44.2	
Progression Factor	0.75	1.12	2.84	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.9	19.9	0.7	144.6	1.2		5.0	0.5	0.5		16.6	
Delay (s)	40.9	61.1	110.4	191.7	26.6		45.9	38.8	22.9		60.8	
Level of Service	D	E	F	F	C		D	D	C		E	
Approach Delay (s)		64.7			66.4			26.7			60.8	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	161	1632	1273	61	36	122
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	175	1774	1384	66	39	133
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1450				2654	725
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1450				2654	725
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	62				0	64
cM capacity (veh/h)	463				12	368

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	175	887	887	922	528	39	133
Volume Left	175	0	0	0	0	39	0
Volume Right	0	0	0	0	66	0	133
cSH	463	1700	1700	1700	1700	12	368
Volume to Capacity	0.38	0.52	0.52	0.54	0.31	3.40	0.36
Queue Length 95th (ft)	43	0	0	0	0	Err	40
Control Delay (s)	17.4	0.0	0.0	0.0	0.0	Err	20.2
Lane LOS	C					F	C
Approach Delay (s)	1.6			0.0		2293.9	
Approach LOS						F	

Intersection Summary			
Average Delay	111.2		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	66	2420	30	52	64	0	0	50	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.92	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4454		1388	1660			1574	
Flt Permitted					1.00		0.45	1.00			1.00	
Satd. Flow (perm)					4454		654	1660			1574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.89	0.89	0.89	0.73	0.73	0.73
Adj. Flow (vph)	0	0	0	70	2574	32	58	72	0	0	68	97
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	2675	0	58	72	0	0	158	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	0%	17%	3%	0%	0%	0%	0%
Parking (#/hr)					0							
Turn Type				Perm			Perm					
Protected Phases					2			4			4	
Permitted Phases				2			4					
Actuated Green, G (s)					92.9		17.1	17.1			17.1	
Effective Green, g (s)					92.9		17.1	17.1			17.1	
Actuated g/C Ratio					0.77		0.14	0.14			0.14	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					3448		93	237			224	
v/s Ratio Prot								0.04			c0.10	
v/s Ratio Perm					0.60		0.09					
v/c Ratio					0.78		0.62	0.30			0.71	
Uniform Delay, d1					7.7		48.4	46.1			49.1	
Progression Factor					0.69		0.73	0.70			1.00	
Incremental Delay, d2					1.1		11.8	0.7			9.7	
Delay (s)					6.4		47.3	33.1			58.8	
Level of Service					A		D	C			E	
Approach Delay (s)		0.0			6.4			39.4			58.8	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	1615	6	0	0	0	0	74	88	65	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91						1.00	1.00	1.00	1.00	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4569						1676	1425	1593	1676	
Flt Permitted		1.00						1.00	1.00	0.70	1.00	
Satd. Flow (perm)		4569						1676	1425	1182	1676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	1755	7	0	0	0	0	80	96	71	65	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	0	0
Lane Group Flow (vph)	0	1803	0	0	0	0	0	80	52	71	65	0
Turn Type	Perm								Perm	Perm		
Protected Phases		2						4			4	
Permitted Phases	2								4	4		
Actuated Green, G (s)		97.4						12.6	12.6	12.6	12.6	
Effective Green, g (s)		97.4						12.6	12.6	12.6	12.6	
Actuated g/C Ratio		0.81						0.10	0.10	0.10	0.10	
Clearance Time (s)		5.0						5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		3709						176	150	124	176	
v/s Ratio Prot								0.05			0.04	
v/s Ratio Perm		0.39							0.04	c0.06		
v/c Ratio		0.49						0.45	0.35	0.57	0.37	
Uniform Delay, d1		3.5						50.5	49.9	51.1	50.0	
Progression Factor		1.00						1.00	1.00	1.06	1.06	
Incremental Delay, d2		0.5						1.9	1.4	4.7	1.0	
Delay (s)		4.0						52.3	51.3	58.8	53.8	
Level of Service		A						D	D	E	D	
Approach Delay (s)		4.0			0.0			51.8			56.4	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	100	35	134	131	124	36	1163	195	68	925	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.97		1.00	0.93		1.00	0.98		1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831		1787	1726		1752	3453		1805	3561	
Flt Permitted		0.72		0.50	1.00		0.21	1.00		0.15	1.00	
Satd. Flow (perm)		1328		942	1726		383	3453		294	3561	
Peak-hour factor, PHF	0.85	0.85	0.85	0.88	0.88	0.88	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	22	118	41	152	149	141	39	1251	210	74	1005	27
RTOR Reduction (vph)	0	13	0	0	42	0	0	10	0	0	2	0
Lane Group Flow (vph)	0	168	0	152	248	0	39	1451	0	74	1030	0
Heavy Vehicles (%)	0%	0%	0%	1%	3%	1%	3%	2%	4%	0%	1%	0%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.1		19.1	19.1		67.4	67.4		58.9	58.9	
Effective Green, g (s)		19.1		19.1	19.1		67.4	67.4		58.9	58.9	
Actuated g/C Ratio		0.20		0.20	0.20		0.70	0.70		0.61	0.61	
Clearance Time (s)		5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		264		187	343		326	2424		180	2185	
v/s Ratio Prot					0.14		0.00	c0.42			0.29	
v/s Ratio Perm		0.13		c0.16			0.08			0.25		
v/c Ratio		0.64		0.81	0.72		0.12	0.60		0.41	0.47	
Uniform Delay, d1		35.3		36.7	36.0		5.8	7.3		9.6	10.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.0		22.9	7.4		0.2	1.1		6.8	0.7	
Delay (s)		40.2		59.6	43.4		6.0	8.4		16.4	10.8	
Level of Service		D		E	D		A	A		B	B	
Approach Delay (s)		40.2			49.0			8.4			11.2	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	95	78	125	132	53	127	1616	108	36	1092	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	6.0		4.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.96		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1752		1736	1761		1787	3470		1671	3491	
Flt Permitted	0.38	1.00		0.45	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	717	1752		827	1761		1787	3470		1671	3491	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	91	108	89	156	165	66	134	1701	114	38	1162	38
RTOR Reduction (vph)	0	28	0	0	14	0	0	3	0	0	1	0
Lane Group Flow (vph)	91	169	0	156	217	0	134	1812	0	38	1199	0
Heavy Vehicles (%)	0%	2%	0%	4%	1%	9%	1%	3%	4%	8%	3%	0%
Turn Type	D.Pm			D.Pm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)	25.3	25.3		25.3	25.3		13.6	77.0		10.7	74.1	
Effective Green, g (s)	25.3	25.3		25.3	25.3		13.6	77.0		10.7	74.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.11	0.60		0.08	0.57	
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	6.0		4.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	141	344		162	345		188	2071		139	2005	
v/s Ratio Prot		0.10			0.12		c0.07	c0.52		0.02	0.34	
v/s Ratio Perm	0.13			c0.19								
v/c Ratio	0.65	0.49		0.96	0.63		0.71	0.88		0.27	0.60	
Uniform Delay, d1	47.7	46.1		51.4	47.6		55.8	21.9		55.5	17.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	1.1		59.3	3.6		12.0	5.5		1.1	1.3	
Delay (s)	57.4	47.2		110.7	51.1		67.9	27.5		56.6	19.1	
Level of Service	E	D		F	D		E	C		E	B	
Approach Delay (s)		50.5			75.1			30.3			20.3	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	33.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	129.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	106	68	129	100	21	61	867	156	13	737	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1736		1770	1734		1719	3464		1467	3498	
Flt Permitted	0.49	1.00		0.49	1.00		0.17	1.00		0.24	1.00	
Satd. Flow (perm)	918	1736		916	1734		299	3464		373	3498	
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	219	126	81	145	112	24	64	903	162	14	801	123
RTOR Reduction (vph)	0	28	0	0	10	0	0	12	0	0	11	0
Lane Group Flow (vph)	219	179	0	145	126	0	64	1053	0	14	913	0
Heavy Vehicles (%)	2%	3%	3%	2%	7%	5%	5%	2%	1%	23%	1%	2%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.9	15.0		23.1	12.6		45.5	45.5		42.1	41.1	
Effective Green, g (s)	27.9	15.0		23.1	12.6		45.5	45.5		42.1	41.1	
Actuated g/C Ratio	0.30	0.16		0.25	0.14		0.49	0.49		0.45	0.44	
Clearance Time (s)	4.0	5.0		4.0	5.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	394	280		324	235		244	1695		192	1546	
v/s Ratio Prot	c0.08	c0.10		0.05	0.07		0.02	c0.30		0.00	c0.26	
v/s Ratio Perm	0.09			0.06			0.11			0.03		
v/c Ratio	0.56	0.64		0.45	0.54		0.26	0.62		0.07	0.59	
Uniform Delay, d1	26.1	36.5		28.7	37.5		14.6	17.4		16.8	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.9		1.0	2.4		0.6	1.7		0.2	1.7	
Delay (s)	27.8	41.4		29.6	39.9		15.2	19.2		17.0	21.3	
Level of Service	C	D		C	D		B	B		B	C	
Approach Delay (s)		34.4			34.6			18.9			21.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	28	50	82	25	18	47	1392	50	12	1081	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frt	1.00	0.90			0.98			0.99			1.00	
Flt Protected	0.95	1.00			0.97			1.00			1.00	
Satd. Flow (prot)	1570	1717			1792			3551			3561	
Flt Permitted	0.67	1.00			0.75			0.83			0.92	
Satd. Flow (perm)	1102	1717			1386			2958			3290	
Peak-hour factor, PHF	0.90	0.90	0.90	0.82	0.82	0.82	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	31	56	100	30	22	51	1497	54	13	1162	27
RTOR Reduction (vph)	0	48	0	0	6	0	0	2	0	0	1	0
Lane Group Flow (vph)	37	39	0	0	146	0	0	1600	0	0	1201	0
Heavy Vehicles (%)	15%	0%	0%	1%	0%	0%	2%	1%	0%	0%	1%	0%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	15.3	15.3			15.3			76.7			63.7	
Effective Green, g (s)	15.3	15.3			15.3			76.7			63.7	
Actuated g/C Ratio	0.15	0.15			0.15			0.74			0.61	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	162	253			204			2221			2015	
v/s Ratio Prot		0.02						c0.05				
v/s Ratio Perm	0.03				c0.11			c0.48			0.36	
v/c Ratio	0.23	0.16			0.72			0.72			0.60	
Uniform Delay, d1	39.1	38.7			42.3			7.6			12.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.7	0.3			11.3			1.2			1.3	
Delay (s)	39.9	39.0			53.6			8.8			13.6	
Level of Service	D	D			D			A			B	
Approach Delay (s)		39.3			53.6			8.8			13.6	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	36	73	1	14	4	25	597	4	4	494	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	1.00
Frt	1.00	0.90			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			1.00	1.00
Satd. Flow (prot)	1787	1709			1843			3554			3538	1599
Flt Permitted	0.73	1.00			0.99			0.91			0.95	1.00
Satd. Flow (perm)	1370	1709			1833			3236			3364	1599
Peak-hour factor, PHF	0.84	0.84	0.84	0.43	0.43	0.43	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	329	43	87	2	33	9	27	642	4	5	610	319
RTOR Reduction (vph)	0	53	0	0	6	0	0	0	0	0	0	135
Lane Group Flow (vph)	329	77	0	0	38	0	0	673	0	0	615	184
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	8%	1%	0%	0%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	38.8	38.8			38.8			69.2			69.2	69.2
Effective Green, g (s)	38.8	38.8			38.8			69.2			69.2	69.2
Actuated g/C Ratio	0.32	0.32			0.32			0.58			0.58	0.58
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	443	553			593			1866			1940	922
v/s Ratio Prot		0.04										
v/s Ratio Perm	c0.24				0.02			c0.21			0.18	0.12
v/c Ratio	0.74	0.14			0.06			0.36			0.32	0.20
Uniform Delay, d1	36.2	28.8			28.1			13.6			13.2	12.2
Progression Factor	1.00	1.00			1.00			0.71			1.04	6.69
Incremental Delay, d2	6.6	0.1			0.0			0.4			0.3	0.4
Delay (s)	42.8	28.9			28.1			10.0			14.0	81.7
Level of Service	D	C			C			B			B	F
Approach Delay (s)		38.8			28.1			10.0			37.1	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	3	2344	22	16	28	0	0	156	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	5.0
Lane Util. Factor					0.91		1.00	1.00			1.00	1.00
Frt					1.00		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					4461		1624	1710			1693	1454
Flt Permitted					1.00		0.36	1.00			1.00	1.00
Satd. Flow (perm)					4461		617	1710			1693	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.68	0.68	0.68
Adj. Flow (vph)	0	0	0	3	2548	24	20	35	0	0	229	229
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	6
Lane Group Flow (vph)	0	0	0	0	2574	0	20	35	0	0	229	223
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	0%	0%	2%	2%	1%	0%
Parking (#/hr)					0							
Turn Type				Perm			Perm					Perm
Protected Phases					2			4			4	
Permitted Phases				2			4					4
Actuated Green, G (s)					87.7		22.3	22.3			22.3	22.3
Effective Green, g (s)					87.7		22.3	22.3			22.3	22.3
Actuated g/C Ratio					0.73		0.19	0.19			0.19	0.19
Clearance Time (s)					5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					3260		115	318			315	270
v/s Ratio Prot								0.02			0.14	
v/s Ratio Perm					0.58		0.03					c0.15
v/c Ratio					0.79		0.17	0.11			0.73	0.83
Uniform Delay, d1					10.3		41.1	40.6			46.0	47.0
Progression Factor					0.82		0.80	0.80			1.00	1.00
Incremental Delay, d2					0.2		0.7	0.2			8.1	18.4
Delay (s)					8.6		33.6	32.6			54.1	65.4
Level of Service					A		C	C			D	E
Approach Delay (s)		0.0			8.6			33.0			59.7	
Approach LOS		A			A			C			E	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	400	842	518	354	2188	0	0	1387	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	6.0	6.0	5.0	6.0			6.0	6.0
Lane Util. Factor				0.97	0.95	1.00	0.97	0.95			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3400	3574	1599	3467	3539			5036	1599
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3400	3574	1599	3467	3539			5036	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.98	0.98	0.98	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	430	905	557	361	2233	0	0	1491	519
RTOR Reduction (vph)	0	0	0	0	0	210	0	0	0	0	0	17
Lane Group Flow (vph)	0	0	0	430	905	347	361	2233	0	0	1491	502
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	1%	2%	0%	2%	3%	1%
Turn Type				pm+pt		custom	Prot					custom
Protected Phases				3	7		1	6			2	
Permitted Phases				7		6						6
Actuated Green, G (s)				47.3	45.3	92.7	20.8	92.7			66.9	92.7
Effective Green, g (s)				47.3	45.3	92.7	20.8	92.7			66.9	92.7
Actuated g/C Ratio				0.32	0.30	0.62	0.14	0.62			0.45	0.62
Clearance Time (s)				4.0	6.0	6.0	5.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				1072	1079	988	481	2187			2246	988
v/s Ratio Prot				0.13	c0.25		0.10	c0.63			0.30	
v/s Ratio Perm						0.22						0.31
v/c Ratio				0.40	0.84	0.35	0.75	1.02			0.66	0.51
Uniform Delay, d1				40.2	48.9	14.0	62.1	28.6			32.7	16.0
Progression Factor				1.24	1.24	3.28	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.2	4.5	0.7	6.5	24.7			1.6	1.9
Delay (s)				50.1	65.1	46.6	68.6	53.4			34.3	17.8
Level of Service				D	E	D	E	D			C	B
Approach Delay (s)		0.0			56.2			55.5			30.0	
Approach LOS		A			E			E			C	

Intersection Summary			
HCM Average Control Delay	47.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	155	1798	138	47	1473	0	0	828	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0		7.0	7.0			7.0	
Lane Util. Factor				1.00	0.91		1.00	0.95			0.95	
Frt				1.00	0.99		1.00	1.00			0.94	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1624	4569		1562	3217			3018	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1624	4569		1562	3217			3018	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.98	0.98	0.98	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	165	1913	147	48	1503	0	0	900	570
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	71	0
Lane Group Flow (vph)	0	0	0	165	2053	0	48	1503	0	0	1399	0
Heavy Vehicles (%)	2%	2%	2%	0%	1%	2%	4%	1%	0%	0%	1%	2%
Turn Type				Perm			Prot					
Protected Phases					2		3	8			4	
Permitted Phases				2								
Actuated Green, G (s)				45.0	45.0		11.0	61.0			43.0	
Effective Green, g (s)				45.0	45.0		11.0	61.0			43.0	
Actuated g/C Ratio				0.38	0.38		0.09	0.51			0.36	
Clearance Time (s)				7.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				609	1713		143	1635			1081	
v/s Ratio Prot					c0.45		0.03	c0.47			c0.46	
v/s Ratio Perm				0.10								
v/c Ratio				0.27	1.20		0.34	0.92			1.29	
Uniform Delay, d1				26.1	37.5		51.1	27.2			38.5	
Progression Factor				1.00	1.00		0.91	1.11			1.00	
Incremental Delay, d2				1.1	95.1		0.6	1.1			139.5	
Delay (s)				27.2	132.6		47.3	31.4			178.0	
Level of Service				C	F		D	C			F	
Approach Delay (s)		0.0			124.8			31.9			178.0	
Approach LOS		A			F			C			F	

Intersection Summary			
HCM Average Control Delay	112.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	46	42	78	81	120	254	1301	56	28	948	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1746		1805	1730		1787	3553		1805	3457	
Flt Permitted	0.95	1.00		0.95	1.00		0.09	1.00		0.09	1.00	
Satd. Flow (perm)	1787	1746		1805	1730		168	3553		171	3457	
Peak-hour factor, PHF	0.86	0.86	0.86	0.67	0.67	0.67	0.94	0.94	0.94	0.95	0.95	0.95
Adj. Flow (vph)	301	53	49	116	121	179	270	1384	60	29	998	305
RTOR Reduction (vph)	0	25	0	0	41	0	0	2	0	0	23	0
Lane Group Flow (vph)	301	77	0	116	259	0	270	1442	0	29	1280	0
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	1%	1%	0%	0%	1%	0%
Turn Type	Split			Split			pm+pt			pm+pt		
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	23.5	23.5		22.4	22.4		60.5	60.0		49.0	49.0	
Effective Green, g (s)	23.5	23.5		22.4	22.4		60.5	60.0		49.0	49.0	
Actuated g/C Ratio	0.18	0.18		0.17	0.17		0.46	0.45		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	311		306	294		268	1615		120	1283	
v/s Ratio Prot	c0.17	0.04		0.06	c0.15		c0.12	0.41		0.01	c0.37	
v/s Ratio Perm							c0.34			0.08		
v/c Ratio	0.95	0.25		0.38	0.88		1.01	0.89		0.24	1.00	
Uniform Delay, d1	53.6	46.7		48.6	53.5		53.1	33.0		32.8	41.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	0.4		0.8	25.1		56.9	8.0		1.0	24.6	
Delay (s)	89.8	47.1		49.4	78.6		110.0	41.0		33.8	66.1	
Level of Service	F	D		D	E		F	D		C	E	
Approach Delay (s)		79.0			70.5			51.9			65.4	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM Average Control Delay	61.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	1742	8	0	0	0	0	16	35	165	17	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91						1.00	1.00	1.00	1.00	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4616						1710	1454	1608	1710	
Flt Permitted		1.00						1.00	1.00	0.74	1.00	
Satd. Flow (perm)		4616						1710	1454	1256	1710	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.67	0.67	0.67	0.55	0.55	0.55
Adj. Flow (vph)	19	1815	8	0	0	0	0	24	52	300	31	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	27	0	0	0
Lane Group Flow (vph)	0	1842	0	0	0	0	0	24	25	300	31	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%	2%	0%	0%	1%	0%	2%
Turn Type	Perm								Perm	Perm		
Protected Phases		2						4			4	
Permitted Phases	2								4	4		
Actuated Green, G (s)		68.3						43.7	43.7	43.7	43.7	
Effective Green, g (s)		68.3						43.7	43.7	43.7	43.7	
Actuated g/C Ratio		0.57						0.36	0.36	0.36	0.36	
Clearance Time (s)		4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2627						623	529	457	623	
v/s Ratio Prot								0.01			0.02	
v/s Ratio Perm		0.40							0.02	c0.24		
v/c Ratio		0.70						0.04	0.05	0.66	0.05	
Uniform Delay, d1		18.5						24.6	24.7	31.9	24.7	
Progression Factor		0.94						1.00	1.00	0.91	0.93	
Incremental Delay, d2		1.4						0.0	0.0	3.1	0.0	
Delay (s)		18.8						24.6	24.7	32.0	22.9	
Level of Service		B						C	C	C	C	
Approach Delay (s)		18.8			0.0			24.7			31.2	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	24	2504	15	17	27	0	0	14	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0			6.0	
Lane Util. Factor					0.91			1.00			1.00	
Frt					1.00			1.00			0.91	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					4604			1678			1563	
Flt Permitted					1.00			0.84			1.00	
Satd. Flow (perm)					4604			1437			1563	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.58	0.58	0.58	0.49	0.49	0.49
Adj. Flow (vph)	0	0	0	27	2782	17	29	47	0	0	29	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	2826	0	0	76	0	0	75	0
Heavy Vehicles (%)	2%	2%	2%	29%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm			Perm					
Protected Phases					2			4			4	
Permitted Phases				2			4					
Actuated Green, G (s)					96.4			11.6			11.6	
Effective Green, g (s)					96.4			11.6			11.6	
Actuated g/C Ratio					0.80			0.10			0.10	
Clearance Time (s)					6.0			6.0			6.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					3699			139			151	
v/s Ratio Prot											0.05	
v/s Ratio Perm					0.61			c0.05				
v/c Ratio					0.76			0.55			0.49	
Uniform Delay, d1					6.0			51.7			51.4	
Progression Factor					2.06			1.00			1.00	
Incremental Delay, d2					1.0			4.3			2.5	
Delay (s)					13.4			56.0			53.9	
Level of Service					B			E			D	
Approach Delay (s)		0.0			13.4			56.0			53.9	
Approach LOS		A			B			E			D	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1597	8	0	0	0	0	8	31	43	34	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.91						1.00			1.00	
Frt		1.00						0.89			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		4572						1525			1527	
Flt Permitted		1.00						1.00			0.79	
Satd. Flow (perm)		4572						1525			1245	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.65	0.65	0.65	0.71	0.71	0.71
Adj. Flow (vph)	25	1736	9	0	0	0	0	12	48	61	48	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	0	1770	0	0	0	0	0	18	0	0	109	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	16%	0%	0%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		93.2						15.8			15.8	
Effective Green, g (s)		93.2						15.8			15.8	
Actuated g/C Ratio		0.77						0.13			0.13	
Clearance Time (s)		6.0						6.0			6.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		3522						199			163	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.39									c0.09	
v/c Ratio		0.50						0.09			0.67	
Uniform Delay, d1		5.2						46.3			50.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.5						0.2			9.9	
Delay (s)		5.7						46.5			60.1	
Level of Service		A						D			E	
Approach Delay (s)		5.7			0.0			46.5			60.1	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1478	33	0	0	0	0	101	113	37	221	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.93		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3173						1581		1624	1629	
Flt Permitted		1.00						1.00		0.34	1.00	
Satd. Flow (perm)		3173						1581		590	1629	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.75	0.75	0.75
Adj. Flow (vph)	33	1607	36	0	0	0	0	119	133	49	295	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	1675	0	0	0	0	0	218	0	49	295	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	2%	0%	1%	0%	0%	5%	0%
Turn Type	custom									Perm		
Protected Phases		2						4!			4!	
Permitted Phases	4!									4!		
Actuated Green, G (s)		85.7						26.3		26.3	26.3	
Effective Green, g (s)		85.7						26.3		26.3	26.3	
Actuated g/C Ratio		0.71						0.22		0.22	0.22	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		2266						347		129	357	
v/s Ratio Prot								0.14			c0.18	
v/s Ratio Perm		0.53								0.08		
v/c Ratio		0.74						0.63		0.38	0.83	
Uniform Delay, d1		10.4						42.4		39.9	44.7	
Progression Factor		0.90						1.00		1.12	1.15	
Incremental Delay, d2		1.9						3.6		1.4	11.5	
Delay (s)		11.2						46.0		46.0	62.9	
Level of Service		B						D		D	E	
Approach Delay (s)		11.2			0.0			46.0			60.5	
Approach LOS		B			A			D			E	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	50	25	582	25	25	25	164	549	25	204	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00		0.97	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.92			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1770		3433	1723			1851	1583	1770	1832	
Flt Permitted	0.72	1.00		0.42	1.00			0.94	1.00	0.62	1.00	
Satd. Flow (perm)	1345	1770		1525	1723			1748	1583	1147	1832	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	54	27	633	27	27	27	178	597	27	222	27
RTOR Reduction (vph)	0	12	0	0	19	0	0	0	219	0	3	0
Lane Group Flow (vph)	27	69	0	633	35	0	0	205	378	27	246	0
Turn Type	Perm			pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			2			2	
Permitted Phases	4			8			2		2	2		
Actuated Green, G (s)	11.3	11.3		44.9	44.9			95.1	95.1	95.1	95.1	
Effective Green, g (s)	11.3	11.3		44.9	44.9			95.1	95.1	95.1	95.1	
Actuated g/C Ratio	0.08	0.08		0.30	0.30			0.63	0.63	0.63	0.63	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	101	133		820	516			1108	1004	727	1161	
v/s Ratio Prot		0.04		c0.15	0.02						0.13	
v/s Ratio Perm	0.02			c0.08				0.12	c0.24	0.02		
v/c Ratio	0.27	0.52		0.77	0.07			0.19	0.38	0.04	0.21	
Uniform Delay, d1	65.4	66.7		45.3	37.6			11.4	13.2	10.3	11.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	3.4		4.5	0.1			0.4	1.1	0.1	0.4	
Delay (s)	66.9	70.1		49.9	37.6			11.8	14.3	10.4	12.0	
Level of Service	E	E		D	D			B	B	B	B	
Approach Delay (s)		69.3			48.9			13.6			11.9	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	212	2334	0	75	69	0	0	29	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.94	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4599		1624	1676			1575	
Flt Permitted					1.00		0.72	1.00			1.00	
Satd. Flow (perm)					4599		1230	1676			1575	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.92	0.68	0.92	0.68	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	252	2779	0	110	75	0	0	32	26
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	3031	0	110	75	0	0	53	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%	2%
Turn Type				Perm			Perm					
Protected Phases					2			4			4	
Permitted Phases				2			4					
Actuated Green, G (s)					94.6		15.4	15.4			15.4	
Effective Green, g (s)					94.6		15.4	15.4			15.4	
Actuated g/C Ratio					0.79		0.13	0.13			0.13	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					3626		158	215			202	
v/s Ratio Prot								0.04			0.03	
v/s Ratio Perm					0.66		c0.09					
v/c Ratio					0.84		0.70	0.35			0.26	
Uniform Delay, d1					7.9		50.1	47.7			47.2	
Progression Factor					0.63		1.13	1.13			1.00	
Incremental Delay, d2					1.7		11.2	0.9			0.7	
Delay (s)					6.6		67.6	54.6			47.9	
Level of Service					A		E	D			D	
Approach Delay (s)		0.0			6.6			62.3			47.9	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	1448	18	2391	0	0	0	0	0	54	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	5.0	4.0						5.0	4.0
Lane Util. Factor			0.88	1.00	0.95						1.00	1.00
Frt			0.85	1.00	1.00						1.00	0.85
Flt Protected			1.00	0.95	1.00						1.00	1.00
Satd. Flow (prot)			2814	1805	3574						1863	1583
Flt Permitted			1.00	0.95	1.00						1.00	1.00
Satd. Flow (perm)			2814	1805	3574						1863	1583
Peak-hour factor, PHF	0.92	0.96	0.96	0.84	0.84	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1508	21	2846	0	0	0	0	0	59	243
RTOR Reduction (vph)	0	0	243	5	0	0	0	0	0	0	0	33
Lane Group Flow (vph)	0	0	1265	16	2846	0	0	0	0	0	59	210
Heavy Vehicles (%)	2%	2%	1%	0%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type			custom	Prot								custom
Protected Phases				1	6						4	
Permitted Phases			2									6
Actuated Green, G (s)			95.4	3.2	103.6						7.4	103.6
Effective Green, g (s)			95.4	3.2	103.6						7.4	103.6
Actuated g/C Ratio			0.80	0.03	0.86						0.06	0.86
Clearance Time (s)			4.0	5.0	4.0						5.0	4.0
Vehicle Extension (s)			3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)			2237	48	3086						115	1367
v/s Ratio Prot				0.01	c0.80						c0.03	
v/s Ratio Perm			0.45									0.13
v/c Ratio			0.57	0.34	0.92						0.51	0.15
Uniform Delay, d1			4.6	57.4	5.5						54.6	1.3
Progression Factor			1.00	0.73	1.61						1.00	1.00
Incremental Delay, d2			1.0	2.3	3.5						3.8	0.2
Delay (s)			5.6	44.4	12.3						58.4	1.5
Level of Service			A	D	B						E	A
Approach Delay (s)		5.6			12.5			0.0			12.6	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	697	1220	25	0	0	0	0	859	69	190	786	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95						0.95		1.00	0.95	
Frt	1.00	1.00						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1608	3174						3176		1608	3217	
Flt Permitted	0.95	1.00						1.00		0.11	1.00	
Satd. Flow (perm)	1608	3174						3176		178	3217	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95	0.89	0.89	0.89
Adj. Flow (vph)	726	1271	26	0	0	0	0	904	73	213	883	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	726	1296	0	0	0	0	0	972	0	213	883	0
Heavy Vehicles (%)	1%	2%	4%	2%	2%	2%	2%	1%	3%	1%	1%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						4		3	8	
Permitted Phases										8		
Actuated Green, G (s)	57.0	57.0						31.0		49.0	49.0	
Effective Green, g (s)	57.0	57.0						31.0		49.0	49.0	
Actuated g/C Ratio	0.48	0.48						0.26		0.41	0.41	
Clearance Time (s)	7.0	7.0						7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	764	1508						820		204	1314	
v/s Ratio Prot	c0.45	0.41						c0.31		c0.10	0.27	
v/s Ratio Perm										0.33		
v/c Ratio	0.95	0.86						1.19		1.04	0.67	
Uniform Delay, d1	30.1	27.9						44.5		32.8	28.9	
Progression Factor	0.60	0.58						1.14		1.97	0.85	
Incremental Delay, d2	20.2	5.7						94.5		31.6	0.3	
Delay (s)	38.1	21.8						145.2		96.2	24.9	
Level of Service	D	C						F		F	C	
Approach Delay (s)		27.7			0.0			145.2			38.8	
Approach LOS		C			A			F			D	

Intersection Summary			
HCM Average Control Delay	58.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	507	852	257	0	0	0	0	2035	372	200	1654	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Lane Util. Factor	0.86	0.86	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1537	4812	1583					5085	1599	3433	3471	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1537	4812	1583					5085	1599	3433	3471	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Adj. Flow (vph)	583	979	295	0	0	0	0	2188	400	213	1760	0
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	379	1183	280	0	0	0	0	2188	379	213	1760	0
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	1%	2%	4%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	45.2	45.2	45.2					74.7	74.7	14.6	93.8	
Effective Green, g (s)	45.2	45.2	45.2					74.7	74.7	14.6	93.8	
Actuated g/C Ratio	0.30	0.30	0.30					0.49	0.49	0.10	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	460	1440	474					2516	791	332	2156	
v/s Ratio Prot								c0.43		0.06	c0.51	
v/s Ratio Perm	c0.25	0.25	0.18						0.24			
v/c Ratio	0.82	0.82	0.59					0.87	0.48	0.64	0.82	
Uniform Delay, d1	49.2	49.2	45.0					33.8	25.3	65.7	22.0	
Progression Factor	1.00	1.00	1.00					0.77	0.50	1.00	1.00	
Incremental Delay, d2	11.4	3.9	2.0					3.0	1.4	4.2	3.6	
Delay (s)	60.6	53.1	47.0					28.9	14.0	69.9	25.5	
Level of Service	E	D	D					C	B	E	C	
Approach Delay (s)		53.6			0.0			26.6			30.3	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1711	75	0	0	0	0	211	234	10	129	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91	1.00					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5083	1599					3505	1482	1805	3034	
Flt Permitted		1.00	1.00					1.00	1.00	0.58	1.00	
Satd. Flow (perm)		5083	1599					3505	1482	1108	3034	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	33	1901	83	0	0	0	0	274	304	12	150	0
RTOR Reduction (vph)	0	0	33	0	0	0	0	0	24	0	0	0
Lane Group Flow (vph)	0	1934	50	0	0	0	0	274	280	12	150	0
Heavy Vehicles (%)	0%	2%	1%	2%	2%	2%	0%	3%	9%	0%	19%	0%
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		45.6	45.6					19.4	19.4	19.4	19.4	
Effective Green, g (s)		45.6	45.6					19.4	19.4	19.4	19.4	
Actuated g/C Ratio		0.61	0.61					0.26	0.26	0.26	0.26	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		3090	972					907	383	287	785	
v/s Ratio Prot								0.08			0.05	
v/s Ratio Perm		0.38	0.03						c0.19	0.01		
v/c Ratio		0.63	0.05					0.30	0.73	0.04	0.19	
Uniform Delay, d1		9.3	6.0					22.4	25.4	20.8	21.7	
Progression Factor		1.00	1.00					0.79	0.82	0.83	0.75	
Incremental Delay, d2		0.4	0.0					0.8	11.4	0.2	0.5	
Delay (s)		9.7	6.0					18.5	32.2	17.6	16.7	
Level of Service		A	A					B	C	B	B	
Approach Delay (s)		9.5			0.0			25.7			16.7	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	1386	209	255	1868	63	257	66	110	133	60	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.0		4.5	5.5	5.5	4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3539	1599	1787	3558		3467	1900	1583	1770	1792	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	3539	1599	1787	3558		3467	1900	1583	1770	1792	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.97	0.97	0.97	0.90	0.90	0.90
Adj. Flow (vph)	15	1490	225	280	2053	69	265	68	113	148	67	16
RTOR Reduction (vph)	0	0	59	0	1	0	0	0	99	0	4	0
Lane Group Flow (vph)	15	1490	166	280	2121	0	265	68	14	148	79	0
Heavy Vehicles (%)	0%	2%	1%	1%	1%	0%	1%	0%	2%	2%	2%	7%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	4.8	88.0	88.0	32.0	115.7		19.0	22.8	22.8	17.2	21.5	
Effective Green, g (s)	4.8	88.0	88.0	32.0	115.7		19.0	22.8	22.8	17.2	21.5	
Actuated g/C Ratio	0.03	0.49	0.49	0.18	0.64		0.11	0.13	0.13	0.10	0.12	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.0		4.5	5.5	5.5	4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	48	1730	782	318	2287		366	241	201	169	214	
v/s Ratio Prot	0.01	0.42		c0.16	c0.60		c0.08	c0.04		c0.08	0.04	
v/s Ratio Perm			0.10						0.01			
v/c Ratio	0.31	0.86	0.21	0.88	0.93		0.72	0.28	0.07	0.88	0.37	
Uniform Delay, d1	86.0	40.6	26.2	72.1	28.4		78.0	71.2	69.3	80.3	73.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	4.7	0.1	23.5	7.2		6.9	0.6	0.2	36.1	4.8	
Delay (s)	89.7	45.3	26.4	95.6	35.6		84.9	71.8	69.4	116.5	77.8	
Level of Service	F	D	C	F	D		F	E	E	F	E	
Approach Delay (s)		43.2			42.6			79.0			102.6	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	49.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	366	43	99	240	91	21	529	53	122	434	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1849		1805	1900	1583	1805	1874		1770	1845	
Flt Permitted	0.37	1.00		0.16	1.00	1.00	0.23	1.00		0.17	1.00	
Satd. Flow (perm)	704	1849		304	1900	1583	430	1874		310	1845	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.97	0.97	0.97	0.88	0.88	0.88
Adj. Flow (vph)	207	389	46	111	270	102	22	545	55	139	493	39
RTOR Reduction (vph)	0	4	0	0	0	74	0	3	0	0	2	0
Lane Group Flow (vph)	207	431	0	111	270	28	22	597	0	139	530	0
Heavy Vehicles (%)	0%	1%	2%	0%	0%	2%	0%	0%	0%	2%	2%	0%
Turn Type	pm+pt			pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	47.3	33.7		44.9	32.5	32.5	53.0	47.1		61.8	51.5	
Effective Green, g (s)	47.3	33.7		44.9	32.5	32.5	53.0	47.1		61.8	51.5	
Actuated g/C Ratio	0.39	0.28		0.37	0.27	0.27	0.44	0.39		0.52	0.43	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	402	519		269	515	429	258	736		285	792	
v/s Ratio Prot	c0.06	c0.23		0.04	0.14		0.00	c0.32		c0.04	0.29	
v/s Ratio Perm	0.14			0.11		0.02	0.03			0.21		
v/c Ratio	0.51	0.83		0.41	0.52	0.06	0.09	0.81		0.49	0.67	
Uniform Delay, d1	25.7	40.5		27.4	37.2	32.5	35.6	32.5		40.8	27.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.48	0.63	
Incremental Delay, d2	1.1	10.9		1.0	1.0	0.1	0.1	9.4		1.3	4.4	
Delay (s)	26.8	51.4		28.4	38.1	32.5	35.7	41.9		21.0	21.6	
Level of Service	C	D		C	D	C	D	D		C	C	
Approach Delay (s)		43.4			34.7			41.7			21.5	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	178	259	210	86	213	91	116	2138	30	72	1716	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		6.0	6.0		4.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.86	1.00	1.00	0.91	1.00
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3301		1805	3358		1736	6408	1568	1687	4988	1568
Flt Permitted	0.95	1.00		0.47	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3301		900	3358		1736	6408	1568	1687	4988	1568
Peak-hour factor, PHF	0.96	0.96	0.96	0.77	0.77	0.77	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	185	270	219	112	277	118	122	2251	32	77	1826	67
RTOR Reduction (vph)	0	105	0	0	34	0	0	0	6	0	0	13
Lane Group Flow (vph)	185	384	0	112	361	0	122	2251	26	77	1826	54
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	4%	2%	3%	7%	4%	3%
Turn Type	Prot			Perm			Prot		Perm	Prot		Perm
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases				4					6			2
Actuated Green, G (s)	17.9	46.4		24.0	24.0		14.8	72.1	72.1	16.5	73.8	73.8
Effective Green, g (s)	17.9	46.4		24.0	24.0		14.8	72.1	72.1	16.5	73.8	73.8
Actuated g/C Ratio	0.12	0.31		0.16	0.16		0.10	0.48	0.48	0.11	0.49	0.49
Clearance Time (s)	4.5	6.0		6.0	6.0		4.5	5.5	5.5	4.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	1014		143	534		170	3060	749	184	2438	766
v/s Ratio Prot	c0.10	0.12			0.11		0.07	c0.35		0.05	c0.37	
v/s Ratio Perm				c0.12					0.02			0.03
v/c Ratio	0.88	0.38		0.78	0.68		0.72	0.74	0.03	0.42	0.75	0.07
Uniform Delay, d1	65.5	41.0		61.0	59.8		66.1	31.8	21.0	62.8	31.1	20.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.83	0.73	0.84
Incremental Delay, d2	32.1	0.2		23.8	3.4		13.5	1.6	0.1	0.9	1.3	0.1
Delay (s)	97.6	41.2		84.8	63.2		79.6	33.4	21.0	52.8	23.9	17.2
Level of Service	F	D		F	E		E	C	C	D	C	B
Approach Delay (s)		56.7			68.0			35.6			24.8	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	361	35	45	319	19	50	693	92	11	747	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.99		1.00	0.99			0.98			0.99	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1837		1770	1866			3499			3531	
Flt Permitted		0.70		0.29	1.00			0.82			0.94	
Satd. Flow (perm)		1286		536	1866			2870			3315	
Peak-hour factor, PHF	0.93	0.93	0.93	0.80	0.80	0.80	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	28	388	38	56	399	24	51	707	94	12	821	58
RTOR Reduction (vph)	0	2	0	0	1	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	452	0	56	422	0	0	846	0	0	888	0
Heavy Vehicles (%)	4%	2%	0%	2%	1%	0%	0%	1%	3%	9%	1%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		48.0		48.0	48.0			93.0			93.0	
Effective Green, g (s)		48.0		48.0	48.0			93.0			93.0	
Actuated g/C Ratio		0.32		0.32	0.32			0.62			0.62	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		409		170	593			1768			2042	
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.35		0.10				c0.29			0.27	
v/c Ratio		1.11		0.33	0.71			0.48			0.43	
Uniform Delay, d1		51.5		39.2	45.4			15.8			15.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		76.0		5.1	7.1			0.9			0.7	
Delay (s)		127.5		44.4	52.5			16.7			15.9	
Level of Service		F		D	D			B			B	
Approach Delay (s)		127.5			51.5			16.7			15.9	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	459	71	2001	609	72	1607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1599	3539	1599	1805	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1599	3539	1599	1805	3471
Peak-hour factor, PHF	0.87	0.87	0.96	0.96	0.91	0.91
Adj. Flow (vph)	528	82	2084	634	79	1766
RTOR Reduction (vph)	0	31	0	241	0	0
Lane Group Flow (vph)	528	51	2084	393	79	1766
Heavy Vehicles (%)	2%	1%	2%	1%	0%	4%
Turn Type		custom		Perm	Prot	
Protected Phases	3		2		1	2
Permitted Phases		2		2		1
Actuated Green, G (s)	27.8	90.4	90.4	90.4	10.8	101.2
Effective Green, g (s)	27.8	90.4	90.4	90.4	10.8	101.2
Actuated g/C Ratio	0.19	0.62	0.62	0.62	0.07	0.69
Clearance Time (s)	5.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	654	990	2191	990	134	2549
v/s Ratio Prot	c0.15		c0.59		0.04	c0.43
v/s Ratio Perm		0.03		0.25		0.08
v/c Ratio	0.81	0.05	0.95	0.40	0.59	0.69
Uniform Delay, d1	56.5	10.9	25.8	14.0	65.5	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.1	10.7	1.2	6.5	0.8
Delay (s)	63.8	11.0	36.5	15.2	71.9	14.1
Level of Service	E	B	D	B	E	B
Approach Delay (s)	56.7		31.5			16.5
Approach LOS	E		C			B

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	309	52	43	270	18	43	469	93	19	135	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1845	1615	1719	3543		1612	3374	1553	1203	3471	1524
Flt Permitted	0.56	1.00	1.00	0.34	1.00		0.65	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1063	1845	1615	621	3543		1109	3374	1553	574	3471	1524
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88	0.87	0.87	0.87
Adj. Flow (vph)	84	364	61	47	297	20	49	533	106	22	155	36
RTOR Reduction (vph)	0	0	44	0	9	0	0	0	46	0	0	16
Lane Group Flow (vph)	84	364	17	47	308	0	49	533	60	22	155	20
Heavy Vehicles (%)	0%	3%	0%	5%	1%	0%	12%	7%	4%	50%	4%	6%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	20.9	20.9	20.9	20.9	20.9		42.1	42.1	42.1	42.1	42.1	42.1
Effective Green, g (s)	20.9	20.9	20.9	20.9	20.9		42.1	42.1	42.1	42.1	42.1	42.1
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28		0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	514	450	173	987		623	1894	872	322	1948	855
v/s Ratio Prot		c0.20			0.09			c0.16			0.04	
v/s Ratio Perm	0.08		0.01	0.08			0.04		0.04	0.04		0.01
v/c Ratio	0.28	0.71	0.04	0.27	0.31		0.08	0.28	0.07	0.07	0.08	0.02
Uniform Delay, d1	21.2	24.3	19.7	21.1	21.4		7.5	8.6	7.5	7.5	7.6	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.61	1.64	2.69
Incremental Delay, d2	0.5	4.4	0.0	0.9	0.2		0.2	0.4	0.2	0.4	0.1	0.1
Delay (s)	21.7	28.7	19.8	22.0	21.5		7.8	8.9	7.7	12.5	12.4	19.7
Level of Service	C	C	B	C	C		A	A	A	B	B	B
Approach Delay (s)		26.5			21.6			8.7			13.7	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	108	1428	5	251	18	0	0	16	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		0.95	0.95			1.00	
Frt					1.00		1.00	1.00			0.96	
Flt Protected					1.00		0.95	0.96			1.00	
Satd. Flow (prot)					5036		1681	1687			1814	
Flt Permitted					1.00		0.95	0.96			1.00	
Satd. Flow (perm)					5036		1681	1687			1814	
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.97	0.97	0.65	0.65	0.65	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	111	1472	5	386	28	0	0	20	10
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	0	1587	0	205	209	0	0	20	0
Heavy Vehicles (%)	0%	0%	0%	23%	1%	20%	2%	6%	0%	0%	0%	0%
Turn Type				Perm			Split					
Protected Phases					8		2	2			6	
Permitted Phases				8								
Actuated Green, G (s)					31.2		25.8	25.8			3.0	
Effective Green, g (s)					31.2		25.8	25.8			3.0	
Actuated g/C Ratio					0.42		0.34	0.34			0.04	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2095		578	580			73	
v/s Ratio Prot							0.12	c0.12			c0.01	
v/s Ratio Perm					0.32							
v/c Ratio					0.76		0.35	0.36			0.28	
Uniform Delay, d1					18.7		18.4	18.4			35.0	
Progression Factor					1.00		0.65	0.65			1.00	
Incremental Delay, d2					1.6		1.7	1.7			2.1	
Delay (s)					20.3		13.6	13.7			37.0	
Level of Service					C		B	B			D	
Approach Delay (s)		0.0			20.3			13.6			37.0	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations										
Volume (vph)	0	1038	0	384	840	0	0	0	137	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	5.0				5.0	5.0
Lane Util. Factor		0.95		1.00	0.95				1.00	1.00
Frt		1.00		1.00	1.00				1.00	0.85
Flt Protected		1.00		0.95	1.00				0.95	1.00
Satd. Flow (prot)		3539		1770	3539				1770	1583
Flt Permitted		1.00		0.95	1.00				0.95	1.00
Satd. Flow (perm)		3539		1770	3539				1770	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.92	0.92	0.87	0.87
Adj. Flow (vph)	0	1221	0	396	866	0	0	0	157	74
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	1221	0	396	866	0	0	0	157	54
Turn Type				Prot						custom
Protected Phases		6		5	2				8	
Permitted Phases										2
Actuated Green, G (s)		55.0		23.5	83.0				20.0	83.0
Effective Green, g (s)		55.0		23.5	83.0				20.0	83.0
Actuated g/C Ratio		0.49		0.21	0.73				0.18	0.73
Clearance Time (s)		5.0		4.5	5.0				5.0	5.0
Vehicle Extension (s)		3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)		1723		368	2599				313	1163
v/s Ratio Prot		c0.34		c0.22	0.24				c0.09	
v/s Ratio Perm										0.03
v/c Ratio		0.71		1.08	0.33				0.50	0.05
Uniform Delay, d1		22.7		44.8	5.3				42.0	4.1
Progression Factor		1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2		1.4		68.7	0.3				1.3	0.1
Delay (s)		24.1		113.5	5.6				43.3	4.2
Level of Service		C		F	A				D	A
Approach Delay (s)		24.1			39.5		0.0		30.8	
Approach LOS		C			D		A		C	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	931	0	0	1120	0	123	0	425	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			4.5		5.5		4.0			
Lane Util. Factor	1.00	0.95			0.95		1.00		1.00			
Frt	1.00	1.00			1.00		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	1787	3539			3505		1770		1583			
Flt Permitted	0.24	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	451	3539			3505		1770		1583			
Peak-hour factor, PHF	0.88	0.88	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	122	1058	0	0	1179	0	134	0	462	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	1058	0	0	1179	0	134	0	462	0	0	0
Heavy Vehicles (%)	1%	2%	2%	2%	3%	1%	2%	2%	2%	2%	2%	2%
Turn Type	custom						Prot		Free			
Protected Phases	1	6			2		4!					
Permitted Phases	4!								Free			
Actuated Green, G (s)	50.9	55.3			44.6		43.7		110.0			
Effective Green, g (s)	50.9	55.3			44.6		43.7		110.0			
Actuated g/C Ratio	0.46	0.50			0.41		0.40		1.00			
Clearance Time (s)	4.5	5.5			4.5		5.5					
Vehicle Extension (s)	3.0	3.0			3.0		3.0					
Lane Grp Cap (vph)	296	1779			1421		703		1583			
v/s Ratio Prot	0.03	c0.30			c0.34		0.08					
v/s Ratio Perm	c0.16								0.29			
v/c Ratio	0.41	0.59			0.83		0.19		0.29			
Uniform Delay, d1	21.8	19.4			29.3		21.6		0.0			
Progression Factor	1.00	1.00			1.70		1.00		1.00			
Incremental Delay, d2	0.9	0.5			3.3		0.6		0.5			
Delay (s)	22.7	19.9			53.2		22.2		0.5			
Level of Service	C	B			D		C		A			
Approach Delay (s)		20.2			53.2			5.4			0.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	0	384	0	0	173
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	417	0	0	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			266			
pX, platoon unblocked						
vC, conflicting volume	417				417	417
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	417				417	417
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	70
cM capacity (veh/h)	1142				592	635

Direction, Lane #	SB 1	SE 1
Volume Total	417	188
Volume Left	0	0
Volume Right	0	188
cSH	1700	635
Volume to Capacity	0.25	0.30
Queue Length 95th (ft)	0	31
Control Delay (s)	0.0	13.0
Lane LOS		B
Approach Delay (s)	0.0	13.0
Approach LOS		B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

Arterial Level of Service: NB 10th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	12.3	29.4	41.7	0.05	4.7	F
Manatee Ave	IV	30	18.2	31.8	50.0	0.10	7.3	E
Total	IV		30.5	61.2	91.7	0.16	6.1	F

Arterial Level of Service: SB 10th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	9.5	59.5	69.0	0.04	2.2	F
6th Ave	IV	30	18.2	27.3	45.5	0.10	8.0	E
Total	IV		27.7	86.8	114.5	0.14	4.5	F

Arterial Level of Service: NB 12th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	18.1	34.5	52.6	0.10	6.9	F
Total	IV		18.1	34.5	52.6	0.10	6.9	F

Arterial Level of Service: SB 12th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	9.9	63.2	73.1	0.04	2.1	F
6th Ave	IV	30	18.1	55.8	73.9	0.10	4.9	F
Total	IV		28.0	119.0	147.0	0.14	3.5	F

Arterial Level of Service: NB 13th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	12.9	18.5	31.4	0.06	6.5	F
Manatee Ave	IV	30	18.2	65.5	83.7	0.10	4.3	F
Total	IV		31.1	84.0	115.1	0.16	4.9	F

Arterial Level of Service: SB 13th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	11.5	58.2	69.7	0.05	2.6	F
6th Ave	IV	30	18.2	68.9	87.1	0.10	4.2	F
Total	IV		29.7	127.1	156.8	0.15	3.5	F

Arterial Level of Service: NB 14th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	31.9	16.6	48.5	0.25	18.7	C
	III	30	10.9	12.8	23.7	0.08	11.7	E
6th Ave	III	30	10.8	43.3	54.1	0.08	5.1	F
Manatee Ave	III	30	14.3	56.2	70.5	0.10	5.2	F
Total	III		67.9	128.9	196.8	0.51	9.3	F

Arterial Level of Service: SB 14th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	18.3	66.2	84.5	0.10	4.3	F
	IV	30	13.8	12.7	26.5	0.08	10.4	D
9th Ave	IV	30	13.9	15.9	29.8	0.08	9.3	D
Total	IV		46.0	94.8	140.8	0.26	6.5	F

Arterial Level of Service: EB 17th St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	6.8	41.1	47.9	0.04	3.3	F
US 41	III	30	92.4	41.7	134.1	0.77	20.7	C
Total	III		99.2	82.8	182.0	0.81	16.1	D

Arterial Level of Service: WB 17th St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 41	III	30	17.1	51.2	68.3	0.12	6.4	F
BUS 41	III	30	92.4	42.2	134.6	0.77	20.6	C
Total	III		109.5	93.4	202.9	0.89	15.8	D

Arterial Level of Service: NB 26th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	III	30	121.9	72.2	194.1	1.02	18.8	C
Total	III		121.9	72.2	194.1	1.02	18.8	C

Arterial Level of Service: SB 26th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	III	30	20.3	73.3	93.6	0.15	5.8	F
Total	III		20.3	73.3	93.6	0.15	5.8	F

Arterial Level of Service: EB 6th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	15.6	12.4	28.0	0.11	14.2	D
13th St W	III	30	9.0	6.3	15.3	0.06	13.6	E
	III	30	7.3	4.3	11.6	0.05	14.6	D
10th St W	III	30	13.4	18.5	31.9	0.09	10.7	E
BUS 41	III	30	7.3	22.3	29.6	0.05	5.7	F
US 41	III	30	63.3	54.5	117.8	0.50	15.2	D
9th St E	III	30	63.6	10.0	73.6	0.50	24.5	B
Total	III		179.5	128.3	307.8	1.36	15.9	D

Arterial Level of Service: EB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	121.9	122.5	244.4	1.02	15.0	D
BUS 41	III	30	31.4	55.2	86.6	0.25	10.3	E
US 41	III	30	63.1	28.5	91.6	0.50	19.5	C
9th St E	III	30	63.4	31.4	94.8	0.50	18.9	C
Total	III		279.8	237.6	517.4	2.26	15.7	D

Arterial Level of Service: WB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th St E	III	30	32.8	20.2	53.0	0.26	17.5	D
US 41	III	30	63.4	59.9	123.3	0.50	14.6	D
BUS 41	III	30	63.1	42.4	105.5	0.50	17.0	D
14th St W	III	30	31.4	53.0	84.4	0.25	10.5	E
Total	III		190.7	175.5	366.2	1.50	14.8	D

Arterial Level of Service: NB 9th St E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	IV	30	19.2	10.2	29.4	0.13	15.7	C
6th Ave	IV	30	23.1	20.5	43.6	0.15	12.7	D
Manatee Ave	IV	30	16.4	14.1	30.5	0.09	10.7	D
Total	IV		58.7	44.8	103.5	0.37	13.0	D

Arterial Level of Service: SB 9th St E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	17.9	25.7	43.6	0.10	8.2	E
6th Ave	IV	30	16.4	18.9	35.3	0.09	9.3	D
9th Ave	IV	30	23.1	14.9	38.0	0.15	14.6	C
Total	IV		57.4	59.5	116.9	0.34	10.6	D

Arterial Level of Service: NB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	27.9	40.0	67.9	0.22	11.6	E
8th	III	30	11.4	10.3	21.7	0.07	12.2	E
6th Ave	III	30	11.3	137.1	148.4	0.08	1.9	F
Manatee Ave	III	30	14.3	32.0	46.3	0.10	7.9	F
3rd Ave	III	30	17.6	39.1	56.7	0.13	8.3	F
5th St	III	30	148.6	10.1	158.7	1.24	28.1	B
7th St	III	30	23.1	9.4	32.5	0.17	19.1	C
US 301	III	30	31.8	60.6	92.4	0.25	9.7	F
17th St	III	30	64.8	18.7	83.5	0.51	22.0	C
Total	III		350.8	357.3	708.1	2.78	14.1	D

Arterial Level of Service: SB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
17th St	III	30	17.5	22.8	40.3	0.13	11.7	E
US 301	III	30	64.8	29.1	93.9	0.51	19.6	C
7th St	III	30	31.8	12.0	43.8	0.25	20.5	C
	III	30	23.1	14.4	37.5	0.17	16.6	D
3rd Ave	III	30	148.6	55.7	204.3	1.24	21.8	C
Manatee Ave	III	30	17.6	162.6	180.2	0.13	2.6	F
6th Ave	III	30	14.3	25.2	39.5	0.10	9.2	F
	III	30	11.3	14.3	25.6	0.08	11.3	E
9th Ave	III	30	11.4	21.6	33.0	0.07	8.0	F
Total	III		340.4	357.7	698.1	2.69	13.9	E

Arterial Level of Service: NB Haben Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 301	III	30	99.0	37.6	136.6	0.82	21.7	C
Total	III		99.0	37.6	136.6	0.82	21.7	C

Arterial Level of Service: WB Haben Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 301	III	30	13.6	62.6	76.2	0.10	4.6	F
US 41	III	30	99.0	66.4	165.4	0.82	17.9	D
Total	III		112.6	129.0	241.6	0.92	13.7	E

Arterial Level of Service: EB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
26th St W	III	30	34.0	49.1	83.1	0.27	11.6	E
6th Ave	III	30	85.4	2.0	87.4	0.71	29.3	B
Total	III		119.4	51.1	170.5	0.98	20.7	C

Arterial Level of Service: WB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th St E	III	30	14.2	21.3	35.5	0.10	10.2	E
US 41	III	30	63.5	66.0	129.5	0.50	13.9	E
BUS 41	III	30	63.4	128.8	192.2	0.50	9.3	F
10th St W	III	30	7.3	9.4	16.7	0.05	10.2	E
12th St W	III	30	13.4	7.1	20.5	0.09	16.7	D
13th St W	III	30	7.3	14.8	22.1	0.05	7.7	F
	III	30	9.0	7.4	16.4	0.06	12.7	E
	III	30	6.6	13.8	20.4	0.04	7.6	F
26th St W	III	30	85.4	37.2	122.6	0.71	20.9	C
Total	III		270.1	305.8	575.9	2.10	13.1	E

Arterial Level of Service: EB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	6.7	130.2	136.9	0.04	1.1	F
	III	30	70.2	25.6	95.8	0.58	22.0	C
US 41 NB	III	30	10.0	20.5	30.5	0.06	7.6	F
Haben Blvd	III	30	68.3	76.0	144.3	0.57	14.2	D
Total	III		155.2	252.3	407.5	1.26	11.1	E

Arterial Level of Service: WB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	65.2	30.2	95.4	0.51	19.4	C
US 41 NB	III	30	68.3	54.0	122.3	0.57	16.7	D
US 41 SB	III	30	10.0	5.7	15.7	0.06	14.8	D
BUS 41	III	30	70.2	92.2	162.4	0.58	13.0	E
Total	III		213.7	182.1	395.8	1.73	15.7	D

Arterial Level of Service: NB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.5	34.5	52.0	0.13	9.0	F
6th Ave	III	30	20.6	29.9	50.5	0.15	11.0	E
Manatee Ave	III	30	12.9	53.5	66.4	0.09	5.0	F
Haben Blvd	III	30	183.1	37.4	220.5	1.53	24.9	B
Total	III		234.1	155.3	389.4	1.90	17.6	D

Arterial Level of Service: SB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	94.7	13.0	107.7	0.79	26.4	B
Manatee Ave	III	30	183.1	36.0	219.1	1.53	25.1	B
6th Ave	III	30	12.9	26.5	39.4	0.09	8.4	F
9th Ave	III	30	20.6	25.3	45.9	0.15	12.1	E
Total	III		311.3	100.8	412.1	2.56	22.4	C

Arterial Level of Service: NB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.5	15.5	33.0	0.13	14.2	D
6th Ave	III	30	10.7	7.4	18.1	0.08	15.1	D
Manatee Ave	III	30	7.3	40.2	47.5	0.05	3.5	F
Haben Blvd	III	30	80.3	156.6	236.9	0.67	10.2	E
US 301	III	30	16.5	26.4	42.9	0.12	9.8	F
Total	III		132.3	246.1	378.4	1.04	9.9	F

Arterial Level of Service: SB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	66.2	14.2	80.4	0.52	23.4	C
Manatee Ave	III	30	80.3	55.0	135.3	0.67	17.8	D
6th Ave	III	30	7.3	20.4	27.7	0.05	6.1	F
9th Ave	III	30	10.7	118.6	129.3	0.08	2.1	F
Total	III		164.5	208.2	372.7	1.31	12.7	E

APPENDIX D: SYNCHRO FUTURE NETWORK

Future Network

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	50	0	2706	1820	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	0	2941	1978	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				744		
pX, platoon unblocked	0.45					
vC, conflicting volume	2959	989	2033			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	989	2033			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	95	246	275			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	54	980	980	980	989	989	54
Volume Left	0	0	0	0	0	0	0
Volume Right	54	0	0	0	0	0	54
cSH	246	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.58	0.58	0.58	0.58	0.58	0.03
Queue Length 95th (ft)	21	0	0	0	0	0	0
Control Delay (s)	23.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	23.8	0.0			0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	302	68	243	281	115	145	900	222	133	745	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1794		1787	1776		1752	3441		1787	3543	
Flt Permitted	0.20	1.00		0.20	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	380	1794		376	1776		1752	3441		1787	3543	
Peak-hour factor, PHF	0.79	0.79	0.79	0.93	0.93	0.93	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	161	382	86	261	302	124	158	978	241	140	784	48
RTOR Reduction (vph)	0	9	0	0	16	0	0	24	0	0	5	0
Lane Group Flow (vph)	161	459	0	261	410	0	158	1195	0	140	827	0
Heavy Vehicles (%)	0%	3%	3%	1%	2%	3%	3%	2%	1%	1%	1%	1%
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	29.0	20.0		29.0	20.0		9.0	31.1		8.9	31.0	
Effective Green, g (s)	29.0	20.0		29.0	20.0		9.0	31.1		8.9	31.0	
Actuated g/C Ratio	0.32	0.22		0.32	0.22		0.10	0.34		0.10	0.34	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	262	394		259	390		173	1176		175	1207	
v/s Ratio Prot	0.06	c0.26		c0.10	0.23		0.09	c0.35		0.08	c0.23	
v/s Ratio Perm	0.14			0.22								
v/c Ratio	0.61	1.17		1.01	1.05		0.91	1.02		0.80	0.69	
Uniform Delay, d1	35.8	35.5		37.8	35.5		40.6	30.0		40.2	25.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	98.9		57.9	59.4		44.1	30.4		22.4	3.2	
Delay (s)	40.0	134.4		95.7	94.9		84.7	60.4		62.6	29.0	
Level of Service	D	F		F	F		F	E		E	C	
Approach Delay (s)		110.3			95.2			63.1			33.8	
Approach LOS		F			F			E			C	

Intersection Summary			
HCM Average Control Delay	69.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1059	101	309	949	25	118	19	669	50	63	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.5	4.5	5.5		5.5	5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1805	3505	1599	1736	3458		1671	1712	1599		1636	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1805	3505	1599	1736	3458		1671	1712	1599		1636	
Peak-hour factor, PHF	0.95	0.95	0.95	0.99	0.99	0.99	0.94	0.94	0.94	0.73	0.73	0.73
Adj. Flow (vph)	36	1115	106	312	959	25	126	20	712	68	86	85
RTOR Reduction (vph)	0	0	78	0	1	0	0	0	410	0	18	0
Lane Group Flow (vph)	36	1115	28	312	983	0	126	20	302	0	221	0
Heavy Vehicles (%)	0%	3%	1%	4%	4%	4%	8%	11%	1%	14%	6%	8%
Turn Type	Prot		custom	Prot			Split		custom	custom		
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases			4						2	8		
Actuated Green, G (s)	5.3	35.8	18.7	15.7	46.7		18.7	18.7	46.7		18.3	
Effective Green, g (s)	5.3	35.8	18.7	15.7	46.7		18.7	18.7	46.7		18.3	
Actuated g/C Ratio	0.05	0.33	0.17	0.14	0.42		0.17	0.17	0.42		0.17	
Clearance Time (s)	4.5	6.0	5.5	4.5	5.5		5.5	5.5	5.5		5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	87	1141	272	248	1468		284	291	679		272	
v/s Ratio Prot	0.02	c0.32		c0.18	0.28		c0.08	0.01			c0.13	
v/s Ratio Perm			0.02						0.19			
v/c Ratio	0.41	0.98	0.10	1.26	0.67		0.44	0.07	0.45		0.81	
Uniform Delay, d1	50.8	36.7	38.6	47.2	25.4		41.0	38.3	22.5		44.2	
Progression Factor	0.75	1.12	2.84	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.9	19.9	0.7	144.6	1.2		5.0	0.5	0.5		16.6	
Delay (s)	40.9	61.1	110.4	191.7	26.6		45.9	38.8	22.9		60.8	
Level of Service	D	E	F	F	C		D	D	C		E	
Approach Delay (s)		64.7			66.4			26.7			60.8	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	161	1632	1273	61	36	122
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	175	1774	1384	66	39	133
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1450				2654	725
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1450				2654	725
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	62				0	64
cM capacity (veh/h)	463				12	368

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	175	887	887	922	528	39	133
Volume Left	175	0	0	0	0	39	0
Volume Right	0	0	0	0	66	0	133
cSH	463	1700	1700	1700	1700	12	368
Volume to Capacity	0.38	0.52	0.52	0.54	0.31	3.40	0.36
Queue Length 95th (ft)	43	0	0	0	0	Err	40
Control Delay (s)	17.4	0.0	0.0	0.0	0.0	Err	20.2
Lane LOS	C					F	C
Approach Delay (s)	1.6			0.0		2293.9	
Approach LOS						F	

Intersection Summary			
Average Delay	111.2		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	66	2420	30	52	64	0	0	50	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.95		1.00	1.00			1.00	
Frt					1.00		1.00	1.00			0.92	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3046		1388	1660			1574	
Flt Permitted					1.00		0.45	1.00			1.00	
Satd. Flow (perm)					3046		654	1660			1574	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.89	0.89	0.89	0.73	0.73	0.73
Adj. Flow (vph)	0	0	0	70	2574	32	58	72	0	0	68	97
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	2675	0	58	72	0	0	158	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	0%	17%	3%	0%	0%	0%	0%
Parking (#/hr)					0							
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					92.9		17.1	17.1			17.1	
Effective Green, g (s)					92.9		17.1	17.1			17.1	
Actuated g/C Ratio					0.77		0.14	0.14			0.14	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2358		93	237			224	
v/s Ratio Prot					c0.88			0.04			c0.10	
v/s Ratio Perm							0.09					
v/c Ratio					1.13		0.62	0.30			0.71	
Uniform Delay, d1					13.6		48.4	46.1			49.1	
Progression Factor					0.74		0.62	0.61			1.00	
Incremental Delay, d2					61.1		11.5	0.7			9.7	
Delay (s)					71.1		41.4	28.6			58.8	
Level of Service					E		D	C			E	
Approach Delay (s)		0.0			71.1			34.3			58.8	
Approach LOS		A			E			C			E	

Intersection Summary			
HCM Average Control Delay	68.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	1615	6	0	0	0	0	74	88	65	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95						1.00	1.00	1.00	1.00	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3180						1676	1425	1593	1676	
Flt Permitted		1.00						1.00	1.00	0.70	1.00	
Satd. Flow (perm)		3180						1676	1425	1182	1676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	1755	7	0	0	0	0	80	96	71	65	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	0	0
Lane Group Flow (vph)	0	1803	0	0	0	0	0	80	52	71	65	0
Turn Type	Perm								Perm	Perm		
Protected Phases		2						4			4	
Permitted Phases	2								4	4		
Actuated Green, G (s)		97.4						12.6	12.6	12.6	12.6	
Effective Green, g (s)		97.4						12.6	12.6	12.6	12.6	
Actuated g/C Ratio		0.81						0.10	0.10	0.10	0.10	
Clearance Time (s)		5.0						5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2581						176	150	124	176	
v/s Ratio Prot								0.05			0.04	
v/s Ratio Perm		0.57							0.04	c0.06		
v/c Ratio		0.70						0.45	0.35	0.57	0.37	
Uniform Delay, d1		4.9						50.5	49.9	51.1	50.0	
Progression Factor		1.00						1.00	1.00	1.15	1.15	
Incremental Delay, d2		1.6						1.9	1.4	3.3	0.7	
Delay (s)		6.5						52.3	51.3	62.0	58.4	
Level of Service		A						D	D	E	E	
Approach Delay (s)		6.5			0.0			51.8			60.3	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	100	35	134	131	124	36	1163	195	68	925	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.97		1.00	0.93		1.00	0.98		1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831		1787	1726		1752	3453		1805	3561	
Flt Permitted		0.72		0.50	1.00		0.21	1.00		0.15	1.00	
Satd. Flow (perm)		1328		942	1726		383	3453		294	3561	
Peak-hour factor, PHF	0.85	0.85	0.85	0.88	0.88	0.88	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	22	118	41	152	149	141	39	1251	210	74	1005	27
RTOR Reduction (vph)	0	13	0	0	42	0	0	10	0	0	2	0
Lane Group Flow (vph)	0	168	0	152	248	0	39	1451	0	74	1030	0
Heavy Vehicles (%)	0%	0%	0%	1%	3%	1%	3%	2%	4%	0%	1%	0%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.1		19.1	19.1		67.4	67.4		58.9	58.9	
Effective Green, g (s)		19.1		19.1	19.1		67.4	67.4		58.9	58.9	
Actuated g/C Ratio		0.20		0.20	0.20		0.70	0.70		0.61	0.61	
Clearance Time (s)		5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		264		187	343		326	2424		180	2185	
v/s Ratio Prot					0.14		0.00	c0.42			0.29	
v/s Ratio Perm		0.13		c0.16			0.08			0.25		
v/c Ratio		0.64		0.81	0.72		0.12	0.60		0.41	0.47	
Uniform Delay, d1		35.3		36.7	36.0		5.8	7.3		9.6	10.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.0		22.9	7.4		0.2	1.1		6.8	0.7	
Delay (s)		40.2		59.6	43.4		6.0	8.4		16.4	10.8	
Level of Service		D		E	D		A	A		B	B	
Approach Delay (s)		40.2			49.0			8.4			11.2	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	95	78	125	132	53	127	1616	108	36	1092	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	6.0		4.5	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.96		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1752		1736	1761		1787	3470		1671	3491	
Flt Permitted	0.38	1.00		0.45	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	717	1752		827	1761		1787	3470		1671	3491	
Peak-hour factor, PHF	0.88	0.88	0.88	0.80	0.80	0.80	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	91	108	89	156	165	66	134	1701	114	38	1162	38
RTOR Reduction (vph)	0	28	0	0	14	0	0	3	0	0	1	0
Lane Group Flow (vph)	91	169	0	156	217	0	134	1812	0	38	1199	0
Heavy Vehicles (%)	0%	2%	0%	4%	1%	9%	1%	3%	4%	8%	3%	0%
Turn Type	D.Pm			D.Pm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)	25.3	25.3		25.3	25.3		13.6	77.0		10.7	74.1	
Effective Green, g (s)	25.3	25.3		25.3	25.3		13.6	77.0		10.7	74.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.11	0.60		0.08	0.57	
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	6.0		4.5	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	141	344		162	345		188	2071		139	2005	
v/s Ratio Prot		0.10			0.12		c0.07	c0.52		0.02	0.34	
v/s Ratio Perm	0.13			c0.19								
v/c Ratio	0.65	0.49		0.96	0.63		0.71	0.88		0.27	0.60	
Uniform Delay, d1	47.7	46.1		51.4	47.6		55.8	21.9		55.5	17.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	1.1		59.3	3.6		12.0	5.5		1.1	1.3	
Delay (s)	57.4	47.2		110.7	51.1		67.9	27.5		56.6	19.1	
Level of Service	E	D		F	D		E	C		E	B	
Approach Delay (s)		50.5			75.1			30.3			20.3	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	33.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	129.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	106	68	129	100	21	61	867	156	13	737	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1736		1770	1734		1719	3464		1467	3498	
Flt Permitted	0.49	1.00		0.49	1.00		0.17	1.00		0.24	1.00	
Satd. Flow (perm)	918	1736		916	1734		299	3464		373	3498	
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	219	126	81	145	112	24	64	903	162	14	801	123
RTOR Reduction (vph)	0	28	0	0	10	0	0	12	0	0	11	0
Lane Group Flow (vph)	219	179	0	145	126	0	64	1053	0	14	913	0
Heavy Vehicles (%)	2%	3%	3%	2%	7%	5%	5%	2%	1%	23%	1%	2%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.9	15.0		23.1	12.6		45.5	45.5		42.1	41.1	
Effective Green, g (s)	27.9	15.0		23.1	12.6		45.5	45.5		42.1	41.1	
Actuated g/C Ratio	0.30	0.16		0.25	0.14		0.49	0.49		0.45	0.44	
Clearance Time (s)	4.0	5.0		4.0	5.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	394	280		324	235		244	1695		192	1546	
v/s Ratio Prot	c0.08	c0.10		0.05	0.07		0.02	c0.30		0.00	c0.26	
v/s Ratio Perm	0.09			0.06			0.11			0.03		
v/c Ratio	0.56	0.64		0.45	0.54		0.26	0.62		0.07	0.59	
Uniform Delay, d1	26.1	36.5		28.7	37.5		14.6	17.4		16.8	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	4.9		1.0	2.4		0.6	1.7		0.2	1.7	
Delay (s)	27.8	41.4		29.6	39.9		15.2	19.2		17.0	21.3	
Level of Service	C	D		C	D		B	B		B	C	
Approach Delay (s)		34.4			34.6			18.9			21.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	28	50	82	25	18	47	1392	50	12	1081	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	
Frt	1.00	0.90			0.98			0.99			1.00	
Flt Protected	0.95	1.00			0.97			1.00			1.00	
Satd. Flow (prot)	1570	1717			1792			3551			3561	
Flt Permitted	0.67	1.00			0.75			0.83			0.92	
Satd. Flow (perm)	1102	1717			1386			2958			3290	
Peak-hour factor, PHF	0.90	0.90	0.90	0.82	0.82	0.82	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	31	56	100	30	22	51	1497	54	13	1162	27
RTOR Reduction (vph)	0	48	0	0	6	0	0	2	0	0	1	0
Lane Group Flow (vph)	37	39	0	0	146	0	0	1600	0	0	1201	0
Heavy Vehicles (%)	15%	0%	0%	1%	0%	0%	2%	1%	0%	0%	1%	0%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	15.3	15.3			15.3			76.7			63.7	
Effective Green, g (s)	15.3	15.3			15.3			76.7			63.7	
Actuated g/C Ratio	0.15	0.15			0.15			0.74			0.61	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	162	253			204			2221			2015	
v/s Ratio Prot		0.02						c0.05				
v/s Ratio Perm	0.03				c0.11			c0.48			0.36	
v/c Ratio	0.23	0.16			0.72			0.72			0.60	
Uniform Delay, d1	39.1	38.7			42.3			7.6			12.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.7	0.3			11.3			1.2			1.3	
Delay (s)	39.9	39.0			53.6			8.8			13.6	
Level of Service	D	D			D			A			B	
Approach Delay (s)		39.3			53.6			8.8			13.6	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	36	73	1	14	4	25	597	4	4	494	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	1.00			1.00			0.95			0.95	1.00
Frt	1.00	0.90			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			1.00	1.00
Satd. Flow (prot)	1787	1709			1843			3554			3538	1599
Flt Permitted	0.73	1.00			0.99			0.91			0.95	1.00
Satd. Flow (perm)	1370	1709			1833			3236			3364	1599
Peak-hour factor, PHF	0.84	0.84	0.84	0.43	0.43	0.43	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	329	43	87	2	33	9	27	642	4	5	610	319
RTOR Reduction (vph)	0	53	0	0	6	0	0	0	0	0	0	135
Lane Group Flow (vph)	329	77	0	0	38	0	0	673	0	0	615	184
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	8%	1%	0%	0%	2%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		2
Actuated Green, G (s)	38.8	38.8			38.8			69.2			69.2	69.2
Effective Green, g (s)	38.8	38.8			38.8			69.2			69.2	69.2
Actuated g/C Ratio	0.32	0.32			0.32			0.58			0.58	0.58
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	443	553			593			1866			1940	922
v/s Ratio Prot		0.04										
v/s Ratio Perm	c0.24				0.02			c0.21			0.18	0.12
v/c Ratio	0.74	0.14			0.06			0.36			0.32	0.20
Uniform Delay, d1	36.2	28.8			28.1			13.6			13.2	12.2
Progression Factor	1.00	1.00			1.00			0.71			1.04	6.69
Incremental Delay, d2	6.6	0.1			0.0			0.4			0.3	0.4
Delay (s)	42.8	28.9			28.1			10.0			14.0	81.7
Level of Service	D	C			C			B			B	F
Approach Delay (s)		38.8			28.1			10.0			37.1	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	3	2344	22	16	28	0	0	156	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor					0.95	1.00	1.00	1.00			1.00	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3056	1425	1624	1710			1693	1454
Flt Permitted					1.00	1.00	0.36	1.00			1.00	1.00
Satd. Flow (perm)					3056	1425	617	1710			1693	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.68	0.68	0.68
Adj. Flow (vph)	0	0	0	3	2548	24	20	35	0	0	229	229
RTOR Reduction (vph)	0	0	0	0	0	5	0	0	0	0	0	6
Lane Group Flow (vph)	0	0	0	0	2551	19	20	35	0	0	229	223
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	0%	0%	2%	2%	1%	0%
Parking (#/hr)					0							
Turn Type				Perm		Perm	Perm					Perm
Protected Phases					2			4			4	
Permitted Phases				2		2	4					4
Actuated Green, G (s)					87.7	87.7	22.3	22.3			22.3	22.3
Effective Green, g (s)					87.7	87.7	22.3	22.3			22.3	22.3
Actuated g/C Ratio					0.73	0.73	0.19	0.19			0.19	0.19
Clearance Time (s)					5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2233	1041	115	318			315	270
v/s Ratio Prot								0.02			0.14	
v/s Ratio Perm					0.83	0.01	0.03					c0.15
v/c Ratio					1.14	0.02	0.17	0.11			0.73	0.83
Uniform Delay, d1					16.2	4.4	41.1	40.6			46.0	47.0
Progression Factor					1.07	0.30	0.67	0.69			1.00	1.00
Incremental Delay, d2					64.7	0.0	0.7	0.1			8.1	18.4
Delay (s)					81.9	1.3	28.3	28.0			54.1	65.4
Level of Service					F	A	C	C			D	E
Approach Delay (s)		0.0			81.2			28.1			59.7	
Approach LOS		A			F			C			E	

Intersection Summary			
HCM Average Control Delay	77.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	400	842	518	354	2188	0	0	1387	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	6.0	6.0	5.0	6.0			6.0	6.0
Lane Util. Factor				0.97	0.95	1.00	0.97	0.95			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3400	3574	1599	3467	3539			5036	1599
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3400	3574	1599	3467	3539			5036	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.98	0.98	0.98	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	430	905	557	361	2233	0	0	1491	519
RTOR Reduction (vph)	0	0	0	0	0	210	0	0	0	0	0	17
Lane Group Flow (vph)	0	0	0	430	905	347	361	2233	0	0	1491	502
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	1%	2%	0%	2%	3%	1%
Turn Type				pm+pt		custom	Prot					custom
Protected Phases				3	7		1	6			2	
Permitted Phases				7		6						6
Actuated Green, G (s)				47.3	45.3	92.7	20.8	92.7			66.9	92.7
Effective Green, g (s)				47.3	45.3	92.7	20.8	92.7			66.9	92.7
Actuated g/C Ratio				0.32	0.30	0.62	0.14	0.62			0.45	0.62
Clearance Time (s)				4.0	6.0	6.0	5.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				1072	1079	988	481	2187			2246	988
v/s Ratio Prot				0.13	c0.25		0.10	c0.63			0.30	
v/s Ratio Perm						0.22						0.31
v/c Ratio				0.40	0.84	0.35	0.75	1.02			0.66	0.51
Uniform Delay, d1				40.2	48.9	14.0	62.1	28.6			32.7	16.0
Progression Factor				1.24	1.24	3.28	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.2	4.5	0.7	6.5	24.7			1.6	1.9
Delay (s)				50.1	65.1	46.6	68.6	53.4			34.3	17.8
Level of Service				D	E	D	E	D			C	B
Approach Delay (s)		0.0			56.2			55.5			30.0	
Approach LOS		A			E			E			C	

Intersection Summary			
HCM Average Control Delay	47.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	155	1798	138	47	1473	0	0	828	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0	7.0	7.0	7.0			7.0	
Lane Util. Factor				1.00	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1624	3217	1425	1562	3217			3018	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1624	3217	1425	1562	3217			3018	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.98	0.98	0.98	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	165	1913	147	48	1503	0	0	900	570
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	0	0	71	0
Lane Group Flow (vph)	0	0	0	165	1913	135	48	1503	0	0	1399	0
Heavy Vehicles (%)	2%	2%	2%	0%	1%	2%	4%	1%	0%	0%	1%	2%
Turn Type				Perm		Perm	Prot					
Protected Phases					2		3	8			4	
Permitted Phases				2		2						
Actuated Green, G (s)				45.0	45.0	45.0	11.0	61.0			43.0	
Effective Green, g (s)				45.0	45.0	45.0	11.0	61.0			43.0	
Actuated g/C Ratio				0.38	0.38	0.38	0.09	0.51			0.36	
Clearance Time (s)				7.0	7.0	7.0	7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				609	1206	534	143	1635			1081	
v/s Ratio Prot					c0.59		0.03	c0.47			c0.46	
v/s Ratio Perm				0.10		0.09						
v/c Ratio				0.27	1.59	0.25	0.34	0.92			1.29	
Uniform Delay, d1				26.1	37.5	25.9	51.1	27.2			38.5	
Progression Factor				1.00	1.00	1.00	0.92	1.11			1.00	
Incremental Delay, d2				1.1	267.8	1.1	0.6	1.1			139.5	
Delay (s)				27.2	305.3	27.0	47.6	31.3			178.0	
Level of Service				C	F	C	D	C			F	
Approach Delay (s)		0.0			266.3			31.8			178.0	
Approach LOS		A			F			C			F	

Intersection Summary			
HCM Average Control Delay	172.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	122.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	46	42	78	81	120	254	1301	56	28	948	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1746		1805	1730		1787	3553		1805	3457	
Flt Permitted	0.95	1.00		0.95	1.00		0.09	1.00		0.09	1.00	
Satd. Flow (perm)	1787	1746		1805	1730		168	3553		171	3457	
Peak-hour factor, PHF	0.86	0.86	0.86	0.67	0.67	0.67	0.94	0.94	0.94	0.95	0.95	0.95
Adj. Flow (vph)	301	53	49	116	121	179	270	1384	60	29	998	305
RTOR Reduction (vph)	0	25	0	0	41	0	0	2	0	0	23	0
Lane Group Flow (vph)	301	77	0	116	259	0	270	1442	0	29	1280	0
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	1%	1%	0%	0%	1%	0%
Turn Type	Split			Split			pm+pt			pm+pt		
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	23.5	23.5		22.4	22.4		60.5	60.0		49.0	49.0	
Effective Green, g (s)	23.5	23.5		22.4	22.4		60.5	60.0		49.0	49.0	
Actuated g/C Ratio	0.18	0.18		0.17	0.17		0.46	0.45		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	311		306	294		268	1615		120	1283	
v/s Ratio Prot	c0.17	0.04		0.06	c0.15		c0.12	0.41		0.01	c0.37	
v/s Ratio Perm							c0.34			0.08		
v/c Ratio	0.95	0.25		0.38	0.88		1.01	0.89		0.24	1.00	
Uniform Delay, d1	53.6	46.7		48.6	53.5		53.1	33.0		32.8	41.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	0.4		0.8	25.1		56.9	8.0		1.0	24.6	
Delay (s)	89.8	47.1		49.4	78.6		110.0	41.0		33.8	66.1	
Level of Service	F	D		D	E		F	D		C	E	
Approach Delay (s)		79.0			70.5			51.9			65.4	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM Average Control Delay	61.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	1742	8	0	0	0	0	16	35	165	17	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95						1.00	1.00	1.00	1.00	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3213						1710	1454	1608	1710	
Flt Permitted		1.00						1.00	1.00	0.74	1.00	
Satd. Flow (perm)		3213						1710	1454	1256	1710	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.67	0.67	0.67	0.55	0.55	0.55
Adj. Flow (vph)	19	1815	8	0	0	0	0	24	52	300	31	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	34	0	0	0
Lane Group Flow (vph)	0	1842	0	0	0	0	0	24	18	300	31	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%	2%	0%	0%	1%	0%	2%
Turn Type	Perm								Perm	Perm		
Protected Phases		2						4			4	
Permitted Phases	2								4	4		
Actuated Green, G (s)		87.9						24.1	24.1	24.1	24.1	
Effective Green, g (s)		87.9						24.1	24.1	24.1	24.1	
Actuated g/C Ratio		0.73						0.20	0.20	0.20	0.20	
Clearance Time (s)		4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2354						343	292	252	343	
v/s Ratio Prot								0.01			0.02	
v/s Ratio Perm		0.57							0.01	c0.24		
v/c Ratio		0.78						0.07	0.06	1.19	0.09	
Uniform Delay, d1		10.1						38.9	38.8	48.0	39.0	
Progression Factor		1.02						1.00	1.00	0.40	0.49	
Incremental Delay, d2		2.0						0.1	0.1	116.0	0.1	
Delay (s)		12.2						39.0	38.9	135.1	19.3	
Level of Service		B						D	D	F	B	
Approach Delay (s)		12.2			0.0			38.9			124.3	
Approach LOS		B			A			D			F	

Intersection Summary			
HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	24	2504	15	17	27	0	0	14	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0			6.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					1.00			1.00			0.91	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					3204			1678			1563	
Flt Permitted					1.00			0.84			1.00	
Satd. Flow (perm)					3204			1437			1563	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.58	0.58	0.58	0.49	0.49	0.49
Adj. Flow (vph)	0	0	0	27	2782	17	29	47	0	0	29	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	2826	0	0	76	0	0	75	0
Heavy Vehicles (%)	2%	2%	2%	29%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Perm			Perm					
Protected Phases					2			4			4	
Permitted Phases				2			4					
Actuated Green, G (s)					96.4			11.6			11.6	
Effective Green, g (s)					96.4			11.6			11.6	
Actuated g/C Ratio					0.80			0.10			0.10	
Clearance Time (s)					6.0			6.0			6.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					2574			139			151	
v/s Ratio Prot											0.05	
v/s Ratio Perm					0.88			c0.05				
v/c Ratio					1.10			0.55			0.49	
Uniform Delay, d1					11.8			51.7			51.4	
Progression Factor					1.68			1.00			1.00	
Incremental Delay, d2					44.7			4.3			2.5	
Delay (s)					64.5			56.0			53.9	
Level of Service					E			E			D	
Approach Delay (s)		0.0			64.5			56.0			53.9	
Approach LOS		A			E			E			D	

Intersection Summary			
HCM Average Control Delay	64.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1597	8	0	0	0	0	8	31	43	34	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.89			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3182						1525			1527	
Flt Permitted		1.00						1.00			0.79	
Satd. Flow (perm)		3182						1525			1245	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.65	0.65	0.65	0.71	0.71	0.71
Adj. Flow (vph)	25	1736	9	0	0	0	0	12	48	61	48	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	0	1770	0	0	0	0	0	18	0	0	109	0
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	0%	0%	16%	0%	0%
Turn Type	Perm									Perm		
Protected Phases		2						4			4	
Permitted Phases	2									4		
Actuated Green, G (s)		93.7						15.3			15.3	
Effective Green, g (s)		93.7						15.3			15.3	
Actuated g/C Ratio		0.77						0.13			0.13	
Clearance Time (s)		6.0						6.0			6.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2464						193			157	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.56									c0.09	
v/c Ratio		0.72						0.09			0.69	
Uniform Delay, d1		6.9						46.7			50.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.8						0.2			12.5	
Delay (s)		8.8						46.9			63.1	
Level of Service		A						D			E	
Approach Delay (s)		8.8			0.0			46.9			63.1	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1478	33	0	0	0	0	101	113	37	221	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.93		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3173						1581		1624	1629	
Flt Permitted		1.00						1.00		0.34	1.00	
Satd. Flow (perm)		3173						1581		590	1629	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.75	0.75	0.75
Adj. Flow (vph)	33	1607	36	0	0	0	0	119	133	49	295	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	1675	0	0	0	0	0	218	0	49	295	0
Heavy Vehicles (%)	3%	2%	0%	2%	2%	2%	0%	1%	0%	0%	5%	0%
Turn Type	custom									Perm		
Protected Phases		2						4!			4!	
Permitted Phases	4!									4!		
Actuated Green, G (s)		85.7						26.3		26.3	26.3	
Effective Green, g (s)		85.7						26.3		26.3	26.3	
Actuated g/C Ratio		0.71						0.22		0.22	0.22	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		2266						347		129	357	
v/s Ratio Prot								0.14			c0.18	
v/s Ratio Perm		0.53								0.08		
v/c Ratio		0.74						0.63		0.38	0.83	
Uniform Delay, d1		10.4						42.4		39.9	44.7	
Progression Factor		1.00						1.00		0.98	0.98	
Incremental Delay, d2		2.2						3.6		1.9	14.3	
Delay (s)		12.6						46.0		41.1	58.3	
Level of Service		B						D		D	E	
Approach Delay (s)		12.6			0.0			46.0			55.9	
Approach LOS		B			A			D			E	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	50	25	582	25	25	25	164	549	25	204	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00		0.97	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.92			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1770		3433	1723			1851	1583	1770	1832	
Flt Permitted	0.72	1.00		0.42	1.00			0.94	1.00	0.62	1.00	
Satd. Flow (perm)	1345	1770		1525	1723			1748	1583	1147	1832	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	54	27	633	27	27	27	178	597	27	222	27
RTOR Reduction (vph)	0	12	0	0	19	0	0	0	219	0	3	0
Lane Group Flow (vph)	27	69	0	633	35	0	0	205	378	27	246	0
Turn Type	Perm			pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			2			2	
Permitted Phases	4			8			2		2	2		
Actuated Green, G (s)	11.3	11.3		44.9	44.9			95.1	95.1	95.1	95.1	
Effective Green, g (s)	11.3	11.3		44.9	44.9			95.1	95.1	95.1	95.1	
Actuated g/C Ratio	0.08	0.08		0.30	0.30			0.63	0.63	0.63	0.63	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	101	133		820	516			1108	1004	727	1161	
v/s Ratio Prot		0.04		c0.15	0.02						0.13	
v/s Ratio Perm	0.02			c0.08				0.12	c0.24	0.02		
v/c Ratio	0.27	0.52		0.77	0.07			0.19	0.38	0.04	0.21	
Uniform Delay, d1	65.4	66.7		45.3	37.6			11.4	13.2	10.3	11.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	3.4		4.5	0.1			0.4	1.1	0.1	0.4	
Delay (s)	66.9	70.1		49.9	37.6			11.8	14.3	10.4	12.0	
Level of Service	E	E		D	D			B	B	B	B	
Approach Delay (s)		69.3			48.9			13.6			11.9	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	212	2334	0	75	69	0	0	29	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor				1.00	0.95		1.00	1.00			1.00	
Frt				1.00	1.00		1.00	1.00			0.94	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1593	3217		1624	1676			1575	
Flt Permitted				0.95	1.00		0.72	1.00			1.00	
Satd. Flow (perm)				1593	3217		1230	1676			1575	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.92	0.68	0.92	0.68	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	252	2779	0	110	75	0	0	32	26
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	252	2779	0	110	75	0	0	53	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%	2%
Turn Type				Perm			Perm					
Protected Phases					2			4			4	
Permitted Phases				2			4					
Actuated Green, G (s)				94.6	94.6		15.4	15.4			15.4	
Effective Green, g (s)				94.6	94.6		15.4	15.4			15.4	
Actuated g/C Ratio				0.79	0.79		0.13	0.13			0.13	
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				1256	2536		158	215			202	
v/s Ratio Prot					c0.86			0.04			0.03	
v/s Ratio Perm				0.16			c0.09					
v/c Ratio				0.20	1.10		0.70	0.35			0.26	
Uniform Delay, d1				3.2	12.7		50.1	47.7			47.2	
Progression Factor				1.30	0.81		1.15	1.14			1.00	
Incremental Delay, d2				0.0	43.8		11.2	0.9			0.7	
Delay (s)				4.2	54.2		68.7	55.4			47.9	
Level of Service				A	D		E	E			D	
Approach Delay (s)		0.0			50.0			63.4			47.9	
Approach LOS		A			D			E			D	

Intersection Summary			
HCM Average Control Delay	50.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	1448	0	2391	0	0	0	0	0	0	224
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.96	0.96	0.84	0.84	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1508	0	2846	0	0	0	0	0	0	243
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					226							
pX, platoon unblocked	0.22						0.22	0.22		0.22	0.22	0.22
vC, conflicting volume	2846			0			1667	2846	0	2846	2846	1423
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2304			0			0	2304	0	2304	2304	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			0	100	100	100	100	0
cM capacity (veh/h)	47			1636			0	8	1084	5	8	239

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	754	754	1423	1423	243
Volume Left	0	0	0	0	0
Volume Right	754	754	0	0	243
cSH	1700	1700	1700	1700	239
Volume to Capacity	0.44	0.44	0.84	0.84	1.02
Queue Length 95th (ft)	0	0	0	0	246
Control Delay (s)	0.0	0.0	0.0	0.0	107.2
Lane LOS					F
Approach Delay (s)	0.0		0.0		107.2
Approach LOS					F

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	697	1220	25	0	0	0	0	859	69	190	786	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95						0.95		1.00	0.95	
Frt	1.00	1.00						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1608	3174						3176		1608	3217	
Flt Permitted	0.95	1.00						1.00		0.11	1.00	
Satd. Flow (perm)	1608	3174						3176		178	3217	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95	0.89	0.89	0.89
Adj. Flow (vph)	726	1271	26	0	0	0	0	904	73	213	883	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	726	1296	0	0	0	0	0	972	0	213	883	0
Heavy Vehicles (%)	1%	2%	4%	2%	2%	2%	2%	1%	3%	1%	1%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						4		3	8	
Permitted Phases										8		
Actuated Green, G (s)	57.0	57.0						31.0		49.0	49.0	
Effective Green, g (s)	57.0	57.0						31.0		49.0	49.0	
Actuated g/C Ratio	0.48	0.48						0.26		0.41	0.41	
Clearance Time (s)	7.0	7.0						7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	764	1508						820		204	1314	
v/s Ratio Prot	c0.45	0.41						c0.31		c0.10	0.27	
v/s Ratio Perm										0.33		
v/c Ratio	0.95	0.86						1.19		1.04	0.67	
Uniform Delay, d1	30.1	27.9						44.5		32.8	28.9	
Progression Factor	0.73	0.73						1.14		1.97	0.85	
Incremental Delay, d2	15.1	3.8						94.5		31.6	0.3	
Delay (s)	37.0	24.2						145.2		96.2	24.9	
Level of Service	D	C						F		F	C	
Approach Delay (s)		28.8			0.0			145.2			38.8	
Approach LOS		C			A			F			D	

Intersection Summary			
HCM Average Control Delay	59.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	122.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	507	852	257	0	0	0	0	2035	372	200	1654	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Lane Util. Factor	0.86	0.86	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1537	4812	1583					5085	1599	3433	3471	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1537	4812	1583					5085	1599	3433	3471	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Adj. Flow (vph)	583	979	295	0	0	0	0	2188	400	213	1760	0
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	379	1183	280	0	0	0	0	2188	379	213	1760	0
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	1%	2%	4%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	45.2	45.2	45.2					74.7	74.7	14.6	93.8	
Effective Green, g (s)	45.2	45.2	45.2					74.7	74.7	14.6	93.8	
Actuated g/C Ratio	0.30	0.30	0.30					0.49	0.49	0.10	0.62	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	460	1440	474					2516	791	332	2156	
v/s Ratio Prot								c0.43		0.06	c0.51	
v/s Ratio Perm	c0.25	0.25	0.18						0.24			
v/c Ratio	0.82	0.82	0.59					0.87	0.48	0.64	0.82	
Uniform Delay, d1	49.2	49.2	45.0					33.8	25.3	65.7	22.0	
Progression Factor	1.00	1.00	1.00					0.77	0.50	1.00	1.00	
Incremental Delay, d2	11.4	3.9	2.0					3.0	1.4	4.2	3.6	
Delay (s)	60.6	53.1	47.0					28.9	14.0	69.9	25.5	
Level of Service	E	D	D					C	B	E	C	
Approach Delay (s)		53.6			0.0			26.6			30.3	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1711	75	0	0	0	0	211	234	10	129	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91	1.00					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5083	1599					3505	1482	1805	3034	
Flt Permitted		1.00	1.00					1.00	1.00	0.58	1.00	
Satd. Flow (perm)		5083	1599					3505	1482	1108	3034	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	33	1901	83	0	0	0	0	274	304	12	150	0
RTOR Reduction (vph)	0	0	33	0	0	0	0	0	24	0	0	0
Lane Group Flow (vph)	0	1934	50	0	0	0	0	274	280	12	150	0
Heavy Vehicles (%)	0%	2%	1%	2%	2%	2%	0%	3%	9%	0%	19%	0%
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		45.6	45.6					19.4	19.4	19.4	19.4	
Effective Green, g (s)		45.6	45.6					19.4	19.4	19.4	19.4	
Actuated g/C Ratio		0.61	0.61					0.26	0.26	0.26	0.26	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		3090	972					907	383	287	785	
v/s Ratio Prot								0.08			0.05	
v/s Ratio Perm		0.38	0.03						c0.19	0.01		
v/c Ratio		0.63	0.05					0.30	0.73	0.04	0.19	
Uniform Delay, d1		9.3	6.0					22.4	25.4	20.8	21.7	
Progression Factor		1.00	1.00					0.79	0.82	0.83	0.75	
Incremental Delay, d2		0.4	0.0					0.8	11.4	0.2	0.5	
Delay (s)		9.7	6.0					18.5	32.2	17.6	16.7	
Level of Service		A	A					B	C	B	B	
Approach Delay (s)		9.5			0.0			25.7			16.7	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	1386	209	255	1868	63	257	66	110	133	60	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.0		4.5	5.5	5.5	4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3539	1599	1787	3558		3467	1900	1583	1770	1792	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	3539	1599	1787	3558		3467	1900	1583	1770	1792	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.97	0.97	0.97	0.90	0.90	0.90
Adj. Flow (vph)	15	1490	225	280	2053	69	265	68	113	148	67	16
RTOR Reduction (vph)	0	0	59	0	1	0	0	0	99	0	4	0
Lane Group Flow (vph)	15	1490	166	280	2121	0	265	68	14	148	79	0
Heavy Vehicles (%)	0%	2%	1%	1%	1%	0%	1%	0%	2%	2%	2%	7%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	4.8	88.0	88.0	32.0	115.7		19.0	22.8	22.8	17.2	21.5	
Effective Green, g (s)	4.8	88.0	88.0	32.0	115.7		19.0	22.8	22.8	17.2	21.5	
Actuated g/C Ratio	0.03	0.49	0.49	0.18	0.64		0.11	0.13	0.13	0.10	0.12	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.0		4.5	5.5	5.5	4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	48	1730	782	318	2287		366	241	201	169	214	
v/s Ratio Prot	0.01	0.42		c0.16	c0.60		c0.08	c0.04		c0.08	0.04	
v/s Ratio Perm			0.10						0.01			
v/c Ratio	0.31	0.86	0.21	0.88	0.93		0.72	0.28	0.07	0.88	0.37	
Uniform Delay, d1	86.0	40.6	26.2	72.1	28.4		78.0	71.2	69.3	80.3	73.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	4.7	0.1	23.5	7.2		6.9	0.6	0.2	36.1	4.8	
Delay (s)	89.7	45.3	26.4	95.6	35.6		84.9	71.8	69.4	116.5	77.8	
Level of Service	F	D	C	F	D		F	E	E	F	E	
Approach Delay (s)		43.2			42.6			79.0			102.6	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	49.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	366	43	99	240	91	21	529	53	122	434	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1849		1805	1900	1583	1805	1874		1770	1845	
Flt Permitted	0.37	1.00		0.16	1.00	1.00	0.23	1.00		0.17	1.00	
Satd. Flow (perm)	704	1849		304	1900	1583	430	1874		310	1845	
Peak-hour factor, PHF	0.94	0.94	0.94	0.89	0.89	0.89	0.97	0.97	0.97	0.88	0.88	0.88
Adj. Flow (vph)	207	389	46	111	270	102	22	545	55	139	493	39
RTOR Reduction (vph)	0	4	0	0	0	74	0	3	0	0	2	0
Lane Group Flow (vph)	207	431	0	111	270	28	22	597	0	139	530	0
Heavy Vehicles (%)	0%	1%	2%	0%	0%	2%	0%	0%	0%	2%	2%	0%
Turn Type	pm+pt			pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4	6			2		
Actuated Green, G (s)	47.3	33.7		44.9	32.5	32.5	53.0	47.1		61.8	51.5	
Effective Green, g (s)	47.3	33.7		44.9	32.5	32.5	53.0	47.1		61.8	51.5	
Actuated g/C Ratio	0.39	0.28		0.37	0.27	0.27	0.44	0.39		0.52	0.43	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	402	519		269	515	429	258	736		285	792	
v/s Ratio Prot	c0.06	c0.23		0.04	0.14		0.00	c0.32		c0.04	0.29	
v/s Ratio Perm	0.14			0.11		0.02	0.03			0.21		
v/c Ratio	0.51	0.83		0.41	0.52	0.06	0.09	0.81		0.49	0.67	
Uniform Delay, d1	25.7	40.5		27.4	37.2	32.5	35.6	32.5		40.8	27.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.48	0.63	
Incremental Delay, d2	1.1	10.9		1.0	1.0	0.1	0.1	9.4		1.3	4.4	
Delay (s)	26.8	51.4		28.4	38.1	32.5	35.7	41.9		21.0	21.6	
Level of Service	C	D		C	D	C	D	D		C	C	
Approach Delay (s)		43.4			34.7			41.7			21.5	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	178	259	210	86	213	91	116	2138	30	72	1716	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		6.0	6.0		4.5	5.5	5.5	4.5	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.86	1.00	1.00	0.91	1.00
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3301		1805	3358		1736	6408	1568	1687	4988	1568
Flt Permitted	0.95	1.00		0.47	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3301		900	3358		1736	6408	1568	1687	4988	1568
Peak-hour factor, PHF	0.96	0.96	0.96	0.77	0.77	0.77	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	185	270	219	112	277	118	122	2251	32	77	1826	67
RTOR Reduction (vph)	0	105	0	0	34	0	0	0	6	0	0	13
Lane Group Flow (vph)	185	384	0	112	361	0	122	2251	26	77	1826	54
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	4%	2%	3%	7%	4%	3%
Turn Type	Prot			Perm			Prot		Perm	Prot		Perm
Protected Phases	3	8			4		1	6		5	2	
Permitted Phases				4					6			2
Actuated Green, G (s)	17.9	46.4		24.0	24.0		14.8	72.1	72.1	16.5	73.8	73.8
Effective Green, g (s)	17.9	46.4		24.0	24.0		14.8	72.1	72.1	16.5	73.8	73.8
Actuated g/C Ratio	0.12	0.31		0.16	0.16		0.10	0.48	0.48	0.11	0.49	0.49
Clearance Time (s)	4.5	6.0		6.0	6.0		4.5	5.5	5.5	4.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	1014		143	534		170	3060	749	184	2438	766
v/s Ratio Prot	c0.10	0.12			0.11		0.07	c0.35		0.05	c0.37	
v/s Ratio Perm				c0.12					0.02			0.03
v/c Ratio	0.88	0.38		0.78	0.68		0.72	0.74	0.03	0.42	0.75	0.07
Uniform Delay, d1	65.5	41.0		61.0	59.8		66.1	31.8	21.0	62.8	31.1	20.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.83	0.73	0.84
Incremental Delay, d2	32.1	0.2		23.8	3.4		13.5	1.6	0.1	0.9	1.3	0.1
Delay (s)	97.6	41.2		84.8	63.2		79.6	33.4	21.0	52.8	23.9	17.2
Level of Service	F	D		F	E		E	C	C	D	C	B
Approach Delay (s)		56.7			68.0			35.6			24.8	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	361	35	45	319	19	50	693	92	11	747	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.99		1.00	0.99			0.98			0.99	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1837		1770	1866			3499			3531	
Flt Permitted		0.70		0.29	1.00			0.82			0.94	
Satd. Flow (perm)		1286		536	1866			2870			3315	
Peak-hour factor, PHF	0.93	0.93	0.93	0.80	0.80	0.80	0.98	0.98	0.98	0.91	0.91	0.91
Adj. Flow (vph)	28	388	38	56	399	24	51	707	94	12	821	58
RTOR Reduction (vph)	0	2	0	0	1	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	452	0	56	422	0	0	846	0	0	888	0
Heavy Vehicles (%)	4%	2%	0%	2%	1%	0%	0%	1%	3%	9%	1%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		48.0		48.0	48.0			93.0			93.0	
Effective Green, g (s)		48.0		48.0	48.0			93.0			93.0	
Actuated g/C Ratio		0.32		0.32	0.32			0.62			0.62	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		409		170	593			1768			2042	
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.35		0.10				c0.29			0.27	
v/c Ratio		1.11		0.33	0.71			0.48			0.43	
Uniform Delay, d1		51.5		39.2	45.4			15.8			15.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		76.0		5.1	7.1			0.9			0.7	
Delay (s)		127.5		44.4	52.5			16.7			15.9	
Level of Service		F		D	D			B			B	
Approach Delay (s)		127.5			51.5			16.7			15.9	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	459	71	2001	609	72	1607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1599	3539	1599	1805	3471
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1599	3539	1599	1805	3471
Peak-hour factor, PHF	0.87	0.87	0.96	0.96	0.91	0.91
Adj. Flow (vph)	528	82	2084	634	79	1766
RTOR Reduction (vph)	0	31	0	241	0	0
Lane Group Flow (vph)	528	51	2084	393	79	1766
Heavy Vehicles (%)	2%	1%	2%	1%	0%	4%
Turn Type		custom		Perm	Prot	
Protected Phases	3		2		1	2
Permitted Phases		2		2		1
Actuated Green, G (s)	27.8	90.4	90.4	90.4	10.8	101.2
Effective Green, g (s)	27.8	90.4	90.4	90.4	10.8	101.2
Actuated g/C Ratio	0.19	0.62	0.62	0.62	0.07	0.69
Clearance Time (s)	5.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	654	990	2191	990	134	2549
v/s Ratio Prot	c0.15		c0.59		0.04	c0.43
v/s Ratio Perm		0.03		0.25		0.08
v/c Ratio	0.81	0.05	0.95	0.40	0.59	0.69
Uniform Delay, d1	56.5	10.9	25.8	14.0	65.5	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.1	10.7	1.2	6.5	0.8
Delay (s)	63.8	11.0	36.5	15.2	71.9	14.1
Level of Service	E	B	D	B	E	B
Approach Delay (s)	56.7		31.5			16.5
Approach LOS	E		C			B

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	309	52	43	270	18	43	469	93	19	135	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1845	1615	1719	3543		1612	3374	1553	1203	3471	1524
Flt Permitted	0.56	1.00	1.00	0.34	1.00		0.65	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1063	1845	1615	621	3543		1109	3374	1553	574	3471	1524
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.88	0.88	0.88	0.87	0.87	0.87
Adj. Flow (vph)	84	364	61	47	297	20	49	533	106	22	155	36
RTOR Reduction (vph)	0	0	44	0	9	0	0	0	46	0	0	16
Lane Group Flow (vph)	84	364	17	47	308	0	49	533	60	22	155	20
Heavy Vehicles (%)	0%	3%	0%	5%	1%	0%	12%	7%	4%	50%	4%	6%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	20.9	20.9	20.9	20.9	20.9		42.1	42.1	42.1	42.1	42.1	42.1
Effective Green, g (s)	20.9	20.9	20.9	20.9	20.9		42.1	42.1	42.1	42.1	42.1	42.1
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28		0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	514	450	173	987		623	1894	872	322	1948	855
v/s Ratio Prot		c0.20			0.09			c0.16			0.04	
v/s Ratio Perm	0.08		0.01	0.08			0.04		0.04	0.04		0.01
v/c Ratio	0.28	0.71	0.04	0.27	0.31		0.08	0.28	0.07	0.07	0.08	0.02
Uniform Delay, d1	21.2	24.3	19.7	21.1	21.4		7.5	8.6	7.5	7.5	7.6	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.61	1.64	2.69
Incremental Delay, d2	0.5	4.4	0.0	0.9	0.2		0.2	0.4	0.2	0.4	0.1	0.1
Delay (s)	21.7	28.7	19.8	22.0	21.5		7.8	8.9	7.7	12.5	12.4	19.7
Level of Service	C	C	B	C	C		A	A	A	B	B	B
Approach Delay (s)		26.5			21.6			8.7			13.7	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	108	1428	5	251	18	0	0	16	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		0.95	0.95			1.00	
Frt					1.00		1.00	1.00			0.96	
Flt Protected					1.00		0.95	0.96			1.00	
Satd. Flow (prot)					5036		1681	1687			1814	
Flt Permitted					1.00		0.95	0.96			1.00	
Satd. Flow (perm)					5036		1681	1687			1814	
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.97	0.97	0.65	0.65	0.65	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	111	1472	5	386	28	0	0	20	10
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	0	1587	0	205	209	0	0	20	0
Heavy Vehicles (%)	0%	0%	0%	23%	1%	20%	2%	6%	0%	0%	0%	0%
Turn Type				Perm			Split					
Protected Phases					8		2	2			6	
Permitted Phases				8								
Actuated Green, G (s)					31.2		25.8	25.8			3.0	
Effective Green, g (s)					31.2		25.8	25.8			3.0	
Actuated g/C Ratio					0.42		0.34	0.34			0.04	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2095		578	580			73	
v/s Ratio Prot							0.12	c0.12			c0.01	
v/s Ratio Perm					0.32							
v/c Ratio					0.76		0.35	0.36			0.28	
Uniform Delay, d1					18.7		18.4	18.4			35.0	
Progression Factor					1.00		0.65	0.65			1.00	
Incremental Delay, d2					1.6		1.7	1.7			2.1	
Delay (s)					20.3		13.6	13.7			37.0	
Level of Service					C		B	B			D	
Approach Delay (s)		0.0			20.3			13.6			37.0	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations										
Volume (vph)	0	1038	0	384	840	0	0	0	137	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	5.0				5.0	5.0
Lane Util. Factor		0.95		1.00	0.95				1.00	1.00
Frt		1.00		1.00	1.00				1.00	0.85
Flt Protected		1.00		0.95	1.00				0.95	1.00
Satd. Flow (prot)		3539		1770	3539				1770	1583
Flt Permitted		1.00		0.95	1.00				0.95	1.00
Satd. Flow (perm)		3539		1770	3539				1770	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.92	0.92	0.87	0.87
Adj. Flow (vph)	0	1221	0	396	866	0	0	0	157	74
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	1221	0	396	866	0	0	0	157	54
Turn Type				Prot						custom
Protected Phases		6		5	2				8	
Permitted Phases										2
Actuated Green, G (s)		55.0		23.5	83.0				20.0	83.0
Effective Green, g (s)		55.0		23.5	83.0				20.0	83.0
Actuated g/C Ratio		0.49		0.21	0.73				0.18	0.73
Clearance Time (s)		5.0		4.5	5.0				5.0	5.0
Vehicle Extension (s)		3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)		1723		368	2599				313	1163
v/s Ratio Prot		c0.34		c0.22	0.24				c0.09	
v/s Ratio Perm										0.03
v/c Ratio		0.71		1.08	0.33				0.50	0.05
Uniform Delay, d1		22.7		44.8	5.3				42.0	4.1
Progression Factor		1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2		1.4		68.7	0.3				1.3	0.1
Delay (s)		24.1		113.5	5.6				43.3	4.2
Level of Service		C		F	A				D	A
Approach Delay (s)		24.1			39.5		0.0		30.8	
Approach LOS		C			D		A		C	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	931	0	0	1120	0	123	0	425	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5			4.5		5.5		4.0			
Lane Util. Factor	1.00	0.95			0.95		1.00		1.00			
Frt	1.00	1.00			1.00		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	1787	3539			3505		1770		1583			
Flt Permitted	0.24	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	451	3539			3505		1770		1583			
Peak-hour factor, PHF	0.88	0.88	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	122	1058	0	0	1179	0	134	0	462	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	1058	0	0	1179	0	134	0	462	0	0	0
Heavy Vehicles (%)	1%	2%	2%	2%	3%	1%	2%	2%	2%	2%	2%	2%
Turn Type	custom						Prot		Free			
Protected Phases	1	6			2		4!					
Permitted Phases	4!								Free			
Actuated Green, G (s)	50.9	55.3			44.6		43.7		110.0			
Effective Green, g (s)	50.9	55.3			44.6		43.7		110.0			
Actuated g/C Ratio	0.46	0.50			0.41		0.40		1.00			
Clearance Time (s)	4.5	5.5			4.5		5.5					
Vehicle Extension (s)	3.0	3.0			3.0		3.0					
Lane Grp Cap (vph)	296	1779			1421		703		1583			
v/s Ratio Prot	0.03	c0.30			c0.34		0.08					
v/s Ratio Perm	c0.16								0.29			
v/c Ratio	0.41	0.59			0.83		0.19		0.29			
Uniform Delay, d1	21.8	19.4			29.3		21.6		0.0			
Progression Factor	1.00	1.00			1.70		1.00		1.00			
Incremental Delay, d2	0.9	0.5			3.3		0.6		0.5			
Delay (s)	22.7	19.9			53.2		22.2		0.5			
Level of Service	C	B			D		C		A			
Approach Delay (s)		20.2			53.2			5.4			0.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	0	384	0	0	173
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	417	0	0	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			266			
pX, platoon unblocked						
vC, conflicting volume	417				417	417
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	417				417	417
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	70
cM capacity (veh/h)	1142				592	635

Direction, Lane #	SB 1	SE 1
Volume Total	417	188
Volume Left	0	0
Volume Right	0	188
cSH	1700	635
Volume to Capacity	0.25	0.30
Queue Length 95th (ft)	0	31
Control Delay (s)	0.0	13.0
Lane LOS		B
Approach Delay (s)	0.0	13.0
Approach LOS		B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

Arterial Level of Service: NB 10th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	12.3	41.2	53.5	0.05	3.6	F
Manatee Ave	IV	30	18.2	27.3	45.5	0.10	8.0	E
Total	IV		30.5	68.5	99.0	0.16	5.6	F

Arterial Level of Service: SB 10th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	9.5	59.5	69.0	0.04	2.2	F
6th Ave	IV	30	18.2	20.6	38.8	0.10	9.4	D
Total	IV		27.7	80.1	107.8	0.14	4.8	F

Arterial Level of Service: NB 12th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	18.1	30.1	48.2	0.10	7.5	E
Total	IV		18.1	30.1	48.2	0.10	7.5	E

Arterial Level of Service: SB 12th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	9.9	63.2	73.1	0.04	2.1	F
6th Ave	IV	30	18.1	59.1	77.2	0.10	4.7	F
Total	IV		28.0	122.3	150.3	0.14	3.4	F

Arterial Level of Service: NB 13th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	12.9	19.1	32.0	0.06	6.4	F
Manatee Ave	IV	30	18.2	65.5	83.7	0.10	4.3	F
Total	IV		31.1	84.6	115.7	0.16	4.9	F

Arterial Level of Service: SB 13th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	11.5	58.2	69.7	0.05	2.6	F
6th Ave	IV	30	18.2	71.8	90.0	0.10	4.0	F
Total	IV		29.7	130.0	159.7	0.15	3.4	F

Arterial Level of Service: NB 14th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	31.9	16.6	48.5	0.25	18.7	C
	III	30	10.9	12.8	23.7	0.08	11.7	E
6th Ave	III	30	10.8	43.3	54.1	0.08	5.1	F
Manatee Ave	III	30	14.3	57.1	71.4	0.10	5.1	F
Total	III		67.9	129.8	197.7	0.51	9.2	F

Arterial Level of Service: SB 14th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
6th Ave	IV	30	18.3	62.6	80.9	0.10	4.5	F
	IV	30	13.8	12.7	26.5	0.08	10.4	D
9th Ave	IV	30	13.9	15.9	29.8	0.08	9.3	D
Total	IV		46.0	91.2	137.2	0.26	6.7	F

Arterial Level of Service: EB 17th St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	6.8	41.1	47.9	0.04	3.3	F
US 41	III	30	92.4	41.7	134.1	0.77	20.7	C
Total	III		99.2	82.8	182.0	0.81	16.1	D

Arterial Level of Service: WB 17th St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 41	III	30	17.1	51.2	68.3	0.12	6.4	F
BUS 41	III	30	92.4	42.2	134.6	0.77	20.6	C
Total	III		109.5	93.4	202.9	0.89	15.8	D

Arterial Level of Service: NB 26th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	III	30	121.9	72.2	194.1	1.02	18.8	C
Total	III		121.9	72.2	194.1	1.02	18.8	C

Arterial Level of Service: SB 26th St W

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	III	30	20.3	73.3	93.6	0.15	5.8	F
Total	III		20.3	73.3	93.6	0.15	5.8	F

Arterial Level of Service: EB 6th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	15.6	13.9	29.5	0.11	13.5	E
13th St W	III	30	9.0	9.7	18.7	0.06	11.2	E
	III	30	7.3	7.3	14.6	0.05	11.6	E
10th St W	III	30	13.4	12.3	25.7	0.09	13.3	E
BUS 41	III	30	7.3	24.7	32.0	0.05	5.3	F
US 41	III	30	63.3	54.5	117.8	0.50	15.2	D
9th St E	III	30	63.6	10.0	73.6	0.50	24.5	B
Total	III		179.5	132.4	311.9	1.36	15.7	D

Arterial Level of Service: EB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	121.9	122.5	244.4	1.02	15.0	D
BUS 41	III	30	31.4	55.2	86.6	0.25	10.3	E
US 41	III	30	63.1	28.5	91.6	0.50	19.5	C
9th St E	III	30	63.4	31.4	94.8	0.50	18.9	C
Total	III		279.8	237.6	517.4	2.26	15.7	D

Arterial Level of Service: WB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th St E	III	30	32.8	20.2	53.0	0.26	17.5	D
US 41	III	30	63.4	59.9	123.3	0.50	14.6	D
BUS 41	III	30	63.1	42.4	105.5	0.50	17.0	D
14th St W	III	30	31.4	53.0	84.4	0.25	10.5	E
Total	III		190.7	175.5	366.2	1.50	14.8	D

Arterial Level of Service: NB 9th St E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	IV	30	19.2	10.2	29.4	0.13	15.7	C
6th Ave	IV	30	23.1	20.5	43.6	0.15	12.7	D
Manatee Ave	IV	30	16.4	14.1	30.5	0.09	10.7	D
Total	IV		58.7	44.8	103.5	0.37	13.0	D

Arterial Level of Service: SB 9th St E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Manatee Ave	IV	30	17.9	25.7	43.6	0.10	8.2	E
6th Ave	IV	30	16.4	18.9	35.3	0.09	9.3	D
9th Ave	IV	30	23.1	14.9	38.0	0.15	14.6	C
Total	IV		57.4	59.5	116.9	0.34	10.6	D

Arterial Level of Service: NB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	27.9	40.0	67.9	0.22	11.6	E
8th	III	30	11.4	10.3	21.7	0.07	12.2	E
6th Ave	III	30	11.3	137.1	148.4	0.08	1.9	F
Manatee Ave	III	30	14.3	31.8	46.1	0.10	7.9	F
3rd Ave	III	30	17.6	39.1	56.7	0.13	8.3	F
5th St	III	30	148.6	10.1	158.7	1.24	28.1	B
7th St	III	30	23.1	9.4	32.5	0.17	19.1	C
US 301	III	30	31.8	60.6	92.4	0.25	9.7	F
17th St	III	30	64.8	18.7	83.5	0.51	22.0	C
Total	III		350.8	357.1	707.9	2.78	14.1	D

Arterial Level of Service: SB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
17th St	III	30	17.5	22.8	40.3	0.13	11.7	E
US 301	III	30	64.8	29.1	93.9	0.51	19.6	C
7th St	III	30	31.8	12.0	43.8	0.25	20.5	C
	III	30	23.1	14.4	37.5	0.17	16.6	D
3rd Ave	III	30	148.6	55.7	204.3	1.24	21.8	C
Manatee Ave	III	30	17.6	162.6	180.2	0.13	2.6	F
6th Ave	III	30	14.3	25.2	39.5	0.10	9.2	F
	III	30	11.3	14.3	25.6	0.08	11.3	E
9th Ave	III	30	11.4	21.6	33.0	0.07	8.0	F
Total	III		340.4	357.7	698.1	2.69	13.9	E

Arterial Level of Service: NB Haben Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 301	III	30	99.0	37.6	136.6	0.82	21.7	C
Total	III		99.0	37.6	136.6	0.82	21.7	C

Arterial Level of Service: WB Haben Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 301	III	30	13.6	62.6	76.2	0.10	4.6	F
US 41	III	30	99.0	66.4	165.4	0.82	17.9	D
Total	III		112.6	129.0	241.6	0.92	13.7	E

Arterial Level of Service: EB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
26th St W	III	30	34.0	49.1	83.1	0.27	11.6	E
Total	III		34.0	49.1	83.1	0.27	11.6	E

Arterial Level of Service: WB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th St E	III	30	14.2	21.3	35.5	0.10	10.2	E
US 41	III	30	63.5	66.0	129.5	0.50	13.9	E
BUS 41	III	30	63.4	296.7	360.1	0.50	5.0	F
10th St W	III	30	7.3	84.2	91.5	0.05	1.9	F
12th St W	III	30	13.4	75.2	88.6	0.09	3.9	F
13th St W	III	30	7.3	65.5	72.8	0.05	2.3	F
	III	30	9.0	57.5	66.5	0.06	3.1	F
26th St W	III	30	90.5	37.2	127.7	0.75	21.3	C
Total	III		268.6	703.6	972.2	2.10	7.8	F

Arterial Level of Service: EB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	6.7	130.2	136.9	0.04	1.1	F
	III	30	70.2	25.6	95.8	0.58	22.0	C
US 41 NB	III	30	10.0	20.5	30.5	0.06	7.6	F
Haben Blvd	III	30	68.3	76.0	144.3	0.57	14.2	D
Total	III		155.2	252.3	407.5	1.26	11.1	E

Arterial Level of Service: WB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	65.2	30.2	95.4	0.51	19.4	C
US 41 NB	III	30	68.3	54.0	122.3	0.57	16.7	D
US 41 SB	III	30	10.0	5.7	15.7	0.06	14.8	D
BUS 41	III	30	70.2	92.2	162.4	0.58	13.0	E
Total	III		213.7	182.1	395.8	1.73	15.7	D

Arterial Level of Service: NB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.5	34.5	52.0	0.13	9.0	F
6th Ave	III	30	20.6	29.9	50.5	0.15	11.0	E
Manatee Ave	III	30	12.9	53.5	66.4	0.09	5.0	F
Haben Blvd	III	30	183.1	37.4	220.5	1.53	24.9	B
Total	III		234.1	155.3	389.4	1.90	17.6	D

Arterial Level of Service: SB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	94.7	13.0	107.7	0.79	26.4	B
Manatee Ave	III	30	183.1	36.0	219.1	1.53	25.1	B
6th Ave	III	30	12.9	26.5	39.4	0.09	8.4	F
9th Ave	III	30	20.6	25.3	45.9	0.15	12.1	E
Total	III		311.3	100.8	412.1	2.56	22.4	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				373		
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1084	1622			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	354	78	293	334	135	156	977	244	146	834	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00	1.00	0.14	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	442	1863	1583	516	1863	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	182	448	99	315	359	145	171	1074	268	155	887	54
RTOR Reduction (vph)	0	0	60	0	0	111	0	0	100	0	0	24
Lane Group Flow (vph)	182	448	39	315	359	34	171	1074	168	155	887	30
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	43.7	29.9	29.9	39.9	28.0	28.0	14.0	41.9	41.9	12.3	40.2	40.2
Effective Green, g (s)	43.7	29.9	29.9	39.9	28.0	28.0	14.0	41.9	41.9	12.3	40.2	40.2
Actuated g/C Ratio	0.36	0.25	0.25	0.33	0.23	0.23	0.12	0.35	0.35	0.10	0.34	0.34
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	314	464	394	461	435	369	207	1236	553	181	1186	530
v/s Ratio Prot	0.07	c0.24		c0.07	0.19		0.10	c0.30		0.09	c0.25	
v/s Ratio Perm	0.14		0.02	0.16		0.02			0.11			0.02
v/c Ratio	0.58	0.97	0.10	0.68	0.83	0.09	0.83	0.87	0.30	0.86	0.75	0.06
Uniform Delay, d1	41.8	44.5	34.7	48.5	43.7	36.0	51.8	36.5	28.4	53.0	35.4	27.0
Progression Factor	0.82	0.80	0.55	0.49	0.68	0.38	0.62	0.47	0.25	1.13	1.44	2.24
Incremental Delay, d2	2.1	28.4	0.1	3.9	11.4	0.1	14.9	5.3	0.9	23.9	3.2	0.1
Delay (s)	36.3	64.1	19.1	27.6	41.3	13.7	46.9	22.3	8.1	83.6	54.2	60.6
Level of Service	D	E	B	C	D	B	D	C	A	F	D	E
Approach Delay (s)		51.1			31.1			22.6			58.7	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	1309	125	400	1233	31	163	27	983	50	64	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	1583	1770	3526		1770	1863	1583		1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3539	1583	1770	3526		1770	1863	1583		1750	
Peak-hour factor, PHF	0.95	0.95	0.95	0.98	0.98	0.98	0.93	0.93	0.93	0.77	0.77	0.77
Adj. Flow (vph)	45	1378	132	408	1258	32	175	29	1057	65	83	79
RTOR Reduction (vph)	0	0	71	0	1	0	0	0	370	0	16	0
Lane Group Flow (vph)	45	1378	61	408	1289	0	175	29	687	0	211	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	6.0	34.0	34.0	19.0	47.0		27.0	27.0	27.0		16.0	
Effective Green, g (s)	6.0	34.0	34.0	19.0	47.0		27.0	27.0	27.0		16.0	
Actuated g/C Ratio	0.05	0.28	0.28	0.16	0.39		0.22	0.22	0.22		0.13	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0		6.0	
Lane Grp Cap (vph)	89	1003	449	280	1381		398	419	356		233	
v/s Ratio Prot	0.03	c0.39		c0.23	0.37		0.10	0.02			c0.12	
v/s Ratio Perm			0.04						c0.43			
v/c Ratio	0.51	1.37	0.14	1.46	0.93		0.44	0.07	1.93		0.91	
Uniform Delay, d1	55.6	43.0	32.1	50.5	35.0		40.0	36.6	46.5		51.3	
Progression Factor	0.97	0.85	0.65	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	11.6	172.0	0.4	224.5	12.8		3.5	0.3	428.1		39.1	
Delay (s)	65.7	208.4	21.1	275.0	47.8		43.5	36.9	474.6		90.3	
Level of Service	E	F	C	F	D		D	D	F		F	
Approach Delay (s)		188.4			102.4			404.7			90.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	210.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	121.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	169	1715	1347	65	38	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	1864	1464	71	41	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		701				
pX, platoon unblocked					0.73	
vC, conflicting volume	1535				2799	767
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1535				2724	767
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	57				0	59
cM capacity (veh/h)	429				7	345

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	184	932	932	976	559	41	141
Volume Left	184	0	0	0	0	41	0
Volume Right	0	0	0	0	71	0	141
cSH	429	1700	1700	1700	1700	7	345
Volume to Capacity	0.43	0.55	0.55	0.57	0.33	5.98	0.41
Queue Length 95th (ft)	52	0	0	0	0	Err	48
Control Delay (s)	19.5	0.0	0.0	0.0	0.0	Err	22.5
Lane LOS	C					F	C
Approach Delay (s)	1.7			0.0		2279.1	
Approach LOS						F	

Intersection Summary			
Average Delay	111.5		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	163	32	41	202	46	51	120	35	90	144	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1817		1770	1811		1770	1800		1770	1744	
Flt Permitted	0.59	1.00		0.63	1.00		0.59	1.00		0.65	1.00	
Satd. Flow (perm)	1105	1817		1165	1811		1102	1800		1212	1744	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	177	35	45	220	50	55	130	38	98	157	116
RTOR Reduction (vph)	0	16	0	0	18	0	0	24	0	0	59	0
Lane Group Flow (vph)	68	196	0	45	252	0	55	144	0	98	214	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		17.0	17.0		17.0	17.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	393	646		414	644		416	680		458	659	
v/s Ratio Prot		0.11			c0.14			0.08			c0.12	
v/s Ratio Perm	0.06			0.04			0.05			0.08		
v/c Ratio	0.17	0.30		0.11	0.39		0.13	0.21		0.21	0.32	
Uniform Delay, d1	10.0	10.5		9.7	10.9		9.2	9.5		9.5	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.2		0.5	1.8		0.7	0.7		1.1	1.3	
Delay (s)	10.9	11.7		10.2	12.6		9.8	10.2		10.5	11.2	
Level of Service	B	B		B	B		A	B		B	B	
Approach Delay (s)		11.5			12.3			10.1			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	153	25	0	4	52	1008	10	2	1885	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.48	0.48	0.48	0.89	0.89	0.89	0.84	0.84	0.84
Hourly flow rate (vph)	1	0	174	52	0	8	58	1133	11	2	2244	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											686	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2947	3516	1129	2556	3517	572	2257			1144		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2930	3680	534	2415	3681	572	2021			1144		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	100	53	0	100	98	72			100		
cM capacity (veh/h)	4	3	372	5	3	463	211			607		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	175	60	625	578	2	1496	761
Volume Left	1	52	58	0	2	0	0
Volume Right	174	8	0	11	0	0	13
cSH	231	6	211	1700	607	1700	1700
Volume to Capacity	0.76	9.71	0.28	0.34	0.00	0.88	0.45
Queue Length 95th (ft)	133	Err	27	0	0	0	0
Control Delay (s)	56.9	Err	13.4	0.0	11.0	0.0	0.0
Lane LOS	F	F	B		B		
Approach Delay (s)	56.9	Err	7.0		0.0		
Approach LOS	F	F					

Intersection Summary			
Average Delay	168.4		
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Right Turn Channelized						
Volume (veh/h)	1060	707	0	1413	804	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1152	768	0	1536	874	0
Approach Volume (veh/h)	1921			1536	874	
Crossing Volume (veh/h)	0			874	1152	
High Capacity (veh/h)	1385			690	549	
High v/c (veh/h)	1.39			2.23	1.59	
Low Capacity (veh/h)	1161			541	420	
Low v/c (veh/h)	1.65			2.84	2.08	

Intersection Summary			
Maximum v/c High	2.23		
Maximum v/c Low	2.84		
Intersection Capacity Utilization	124.8%	ICU Level of Service	H

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	140	49	153	147	141	40	1274	212	75	1007	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1848	1583	1770	1726		1770	3539	1583	1770	3525	
Flt Permitted		0.88	1.00	0.30	1.00		0.10	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1634	1583	564	1726		189	3539	1583	214	3525	
Peak-hour factor, PHF	0.85	0.85	0.85	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	165	58	176	169	162	43	1385	230	82	1095	30
RTOR Reduction (vph)	0	0	49	0	29	0	0	0	66	0	2	0
Lane Group Flow (vph)	0	197	9	176	302	0	43	1385	164	82	1123	0
Turn Type	Perm		Perm	pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		18.0	18.0	34.0	34.0		59.0	59.0	59.0	59.0	59.0	
Effective Green, g (s)		18.0	18.0	34.0	34.0		59.0	59.0	59.0	59.0	59.0	
Actuated g/C Ratio		0.15	0.15	0.28	0.28		0.49	0.49	0.49	0.49	0.49	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Grp Cap (vph)		245	237	260	489		212	1740	778	222	1733	
v/s Ratio Prot				0.06	c0.18		0.02	c0.39		0.03	c0.32	
v/s Ratio Perm		c0.12	0.01	0.14			0.08		0.10	0.15		
v/c Ratio		0.80	0.04	0.68	0.62		0.20	0.80	0.21	0.37	0.65	
Uniform Delay, d1		49.3	43.6	35.0	37.4		20.0	25.5	17.3	35.8	22.8	
Progression Factor		1.00	1.00	0.99	0.99		1.00	1.00	1.00	0.32	0.24	
Incremental Delay, d2		23.8	0.3	13.3	5.8		2.1	3.9	0.6	3.4	1.4	
Delay (s)		73.0	43.9	48.0	42.8		22.1	29.3	17.9	14.8	6.8	
Level of Service		E	D	D	D		C	C	B	B	A	
Approach Delay (s)		66.4			44.6			27.6			7.3	
Approach LOS		E			D			C			A	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	2	0	0	68	120	1605	24	0	1976	162
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.68	0.68	0.68	0.88	0.88	0.88	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	4	0	0	100	136	1824	27	0	2501	205
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								633				
pX, platoon unblocked	0.47	0.47		0.47	0.47	0.47				0.47		
vC, conflicting volume	3786	4625	1251	3351	4803	912	2706			1851		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4667	6448	1251	3745	6825	0	2706			563		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	80	8			100		
cM capacity (veh/h)	0	0	164	0	0	511	148			474		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	4	100	136	912	912	27	1251	1251	205
Volume Left	0	0	136	0	0	0	0	0	0
Volume Right	4	100	0	0	0	27	0	0	205
cSH	164	511	148	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.20	0.92	0.54	0.54	0.02	0.74	0.74	0.12
Queue Length 95th (ft)	2	18	161	0	0	0	0	0	0
Control Delay (s)	27.5	13.7	112.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	F						
Approach Delay (s)	27.5	13.7	7.7				0.0		
Approach LOS	D	B							

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	712	60	297	716	29	6	6	343	15	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.66	0.66	0.66	0.69	0.69	0.69
Hourly flow rate (vph)	12	742	62	341	823	33	9	9	520	22	14	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		696			839							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	856			804			1921	2337	402	2442	2352	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	554			804			1769	2244	402	2364	2260	66
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			58			33	56	13	0	29	97
cM capacity (veh/h)	887			816			13	21	598	1	20	863

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	383	433	753	445	9	529	58
Volume Left	12	0	341	0	9	0	22
Volume Right	0	62	0	33	0	520	22
cSH	887	1700	816	1700	13	405	2
Volume to Capacity	0.01	0.25	0.42	0.26	0.67	1.31	23.26
Queue Length 95th (ft)	1	0	52	0	40	595	Err
Control Delay (s)	0.5	0.0	9.5	0.0	492.2	182.3	Err
Lane LOS	A		A		F	F	F
Approach Delay (s)	0.2		6.0		187.6		Err
Approach LOS					F		F

Intersection Summary			
Average Delay	263.5		
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	345	63	6	23	226	12	15	5	10	62	11	281
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.57	0.57	0.57	0.80	0.80	0.80
Hourly flow rate (vph)	397	72	7	30	297	16	26	9	18	78	14	351
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		686										
pX, platoon unblocked												
vC, conflicting volume	313			79			1585	1243	76	1253	1238	305
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313			79			1585	1243	76	1253	1238	305
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	68			98			15	92	98	25	88	52
cM capacity (veh/h)	1247			1519			31	117	985	103	117	735

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	397	79	30	313	53	78	365
Volume Left	397	0	30	0	26	78	0
Volume Right	0	7	0	16	18	0	351
cSH	1247	1700	1519	1700	56	103	613
Volume to Capacity	0.32	0.05	0.02	0.18	0.94	0.75	0.60
Queue Length 95th (ft)	35	0	2	0	106	101	98
Control Delay (s)	9.2	0.0	7.4	0.0	221.1	107.1	19.1
Lane LOS	A		A		F	F	C
Approach Delay (s)	7.7		0.7		221.1	34.5	
Approach LOS					F	D	

Intersection Summary			
Average Delay	23.4		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	106	87	177	188	75	152	1930	129	42	1278	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1737		1770	1783		1770	3539	1583	1770	3539	1583
Flt Permitted	0.25	1.00		0.33	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	457	1737		612	1783		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.78	0.78	0.78	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	102	122	100	227	241	96	160	2032	136	45	1360	46
RTOR Reduction (vph)	0	25	0	0	12	0	0	0	41	0	0	21
Lane Group Flow (vph)	102	197	0	227	325	0	160	2032	95	45	1360	25
Turn Type	pm+pt			pm+pt			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	24.3	16.3		27.7	18.0		16.0	65.9	65.9	3.2	53.1	53.1
Effective Green, g (s)	24.3	16.3		27.7	18.0		16.0	65.9	65.9	3.2	53.1	53.1
Actuated g/C Ratio	0.20	0.14		0.23	0.15		0.13	0.55	0.55	0.03	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	181	238		237	269		238	1958	876	48	1578	706
v/s Ratio Prot	0.04	0.11		c0.08	c0.18		c0.09	c0.57		0.03	0.38	
v/s Ratio Perm	0.08			0.15					0.06			0.02
v/c Ratio	0.56	0.83		0.96	1.21		0.67	1.04	0.11	0.94	0.86	0.04
Uniform Delay, d1	50.3	50.0		48.2	50.5		49.1	26.6	12.6	57.9	29.7	18.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	20.5		46.2	123.4		7.3	30.9	0.2	105.3	6.4	0.1
Delay (s)	54.3	70.5		94.4	173.9		56.3	57.5	12.9	163.1	36.1	18.7
Level of Service	D	E		F	F		E	E	B	F	D	B
Approach Delay (s)		65.4			141.9			54.8			39.5	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	61.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	232	133	83	143	110	24	65	965	175	13	852	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1755		1770	1813		1770	3458		1770	3468	
Flt Permitted	0.53	1.00		0.28	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	990	1755		521	1813		1770	3458		1770	3468	
Peak-hour factor, PHF	0.85	0.85	0.85	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91
Adj. Flow (vph)	273	156	98	162	125	27	68	1005	182	14	936	146
RTOR Reduction (vph)	0	18	0	0	7	0	0	12	0	0	10	0
Lane Group Flow (vph)	273	236	0	162	145	0	68	1175	0	14	1072	0
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	33.8	19.2		24.0	14.3		12.4	65.5		1.6	54.7	
Effective Green, g (s)	33.8	19.2		24.0	14.3		12.4	65.5		1.6	54.7	
Actuated g/C Ratio	0.28	0.16		0.20	0.12		0.10	0.55		0.01	0.46	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	374	281		205	216		183	1887		24	1581	
v/s Ratio Prot	c0.09	c0.13		0.06	0.08		c0.04	c0.34		0.01	c0.31	
v/s Ratio Perm	0.12			0.09								
v/c Ratio	0.73	0.84		0.79	0.67		0.37	0.62		0.58	0.68	
Uniform Delay, d1	40.5	48.9		50.6	50.6		50.2	18.7		58.9	25.7	
Progression Factor	1.00	1.00		1.00	1.00		0.54	0.66		1.00	1.00	
Incremental Delay, d2	7.0	19.1		18.4	7.9		0.8	1.0		31.3	2.4	
Delay (s)	47.5	68.0		69.0	58.5		28.1	13.3		90.2	28.1	
Level of Service	D	E		E	E		C	B		F	C	
Approach Delay (s)		57.4			64.0			14.1			28.9	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	513	108	31	564	41	224	178	88	52	60	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.95		1.00	0.95	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817			1842		1770	1770		1770	1761	
Flt Permitted		0.96			0.94		0.69	1.00		0.43	1.00	
Satd. Flow (perm)		1740			1742		1287	1770		809	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	558	117	34	613	45	243	193	96	57	65	37
RTOR Reduction (vph)	0	6	0	0	2	0	0	15	0	0	17	0
Lane Group Flow (vph)	0	698	0	0	690	0	243	274	0	57	85	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		70.0			70.0		38.0	38.0		38.0	38.0	
Effective Green, g (s)		70.0			70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio		0.58			0.58		0.32	0.32		0.32	0.32	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		1015			1016		408	561		256	558	
v/s Ratio Prot								0.15			0.05	
v/s Ratio Perm		c0.40			0.40		c0.19			0.07		
v/c Ratio		0.69			0.68		0.60	0.49		0.22	0.15	
Uniform Delay, d1		17.4			17.2		34.5	33.1		30.1	29.4	
Progression Factor		1.00			0.24		1.00	1.00		0.91	0.88	
Incremental Delay, d2		3.8			3.1		6.3	3.0		2.0	0.6	
Delay (s)		21.2			7.2		40.8	36.2		29.3	26.6	
Level of Service		C			A		D	D		C	C	
Approach Delay (s)		21.2			7.2			38.3			27.5	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	108	16	39	73	62	5	105	21	74	440	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.95			0.98			1.00	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		1814			1753			1819			1843	
Flt Permitted		0.89			0.91			0.98			0.93	
Satd. Flow (perm)		1635			1608			1789			1731	
Peak-hour factor, PHF	0.81	0.81	0.81	0.82	0.82	0.82	0.72	0.72	0.72	0.83	0.83	0.83
Adj. Flow (vph)	57	133	20	48	89	76	7	146	29	89	530	18
RTOR Reduction (vph)	0	6	0	0	32	0	0	11	0	0	2	0
Lane Group Flow (vph)	0	204	0	0	181	0	0	171	0	0	635	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0			18.0			36.0			36.0	
Effective Green, g (s)		18.0			18.0			36.0			36.0	
Actuated g/C Ratio		0.29			0.29			0.58			0.58	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		475			467			1039			1005	
v/s Ratio Prot												
v/s Ratio Perm		c0.12			0.11			0.10			c0.37	
v/c Ratio		0.43			0.39			0.16			0.63	
Uniform Delay, d1		17.8			17.6			6.0			8.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			2.4			0.3			3.0	
Delay (s)		20.6			20.0			6.4			11.6	
Level of Service		C			C			A			B	
Approach Delay (s)		20.6			20.0			6.4			11.6	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	357	43	111	548	19	109
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.67	0.76	0.76	0.81	0.81
Hourly flow rate (vph)	533	64	146	721	23	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				466		
pX, platoon unblocked					0.97	
vC, conflicting volume			597		1578	565
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			597		1580	565
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		76	74
cM capacity (veh/h)			980		99	524

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	597	146	721	158
Volume Left	0	146	0	23
Volume Right	64	0	0	135
cSH	1700	980	1700	616
Volume to Capacity	0.35	0.15	0.42	0.26
Queue Length 95th (ft)	0	13	0	25
Control Delay (s)	0.0	9.3	0.0	19.8
Lane LOS		A		C
Approach Delay (s)	0.0	1.6		19.8
Approach LOS				C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	23	98	40	1	14	12	6	37	3	68	353	27
Peak Hour Factor	0.89	0.89	0.89	0.75	0.75	0.75	0.89	0.89	0.89	0.86	0.86	0.86
Hourly flow rate (vph)	26	110	45	1	19	16	7	42	3	79	410	31

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	181	36	52	521
Volume Left (vph)	26	1	7	79
Volume Right (vph)	45	16	3	31
Hadj (s)	-0.09	-0.23	0.02	0.03
Departure Headway (s)	5.3	5.4	5.2	4.6
Degree Utilization, x	0.26	0.05	0.07	0.67
Capacity (veh/h)	624	582	640	761
Control Delay (s)	10.1	8.7	8.6	16.2
Approach Delay (s)	10.1	8.7	8.6	16.2
Approach LOS	B	A	A	C

Intersection Summary			
Delay	14.0		
HCM Level of Service	B		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	467	1110	299	266	1822	0	0	1993	602
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	5.0	6.0			6.0	6.0
Lane Util. Factor				0.97	0.95	1.00	0.97	0.95			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433	3539	1583	3433	3539			5085	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3433	3539	1583	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	537	1276	344	292	2002	0	0	2265	684
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	8
Lane Group Flow (vph)	0	0	0	537	1276	338	292	2002	0	0	2265	676
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				30.0	30.0	30.0	12.0	58.0			41.0	41.0
Effective Green, g (s)				30.0	30.0	30.0	12.0	58.0			41.0	41.0
Actuated g/C Ratio				0.30	0.30	0.30	0.12	0.58			0.41	0.41
Clearance Time (s)				6.0	6.0	6.0	5.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				1030	1062	475	412	2053			2085	649
v/s Ratio Prot					c0.36		0.09	c0.57			c0.45	
v/s Ratio Perm				0.16		0.21						0.43
v/c Ratio				0.52	1.20	0.71	0.71	0.98			1.09	1.04
Uniform Delay, d1				29.0	35.0	31.1	42.3	20.3			29.5	29.5
Progression Factor				1.00	1.00	1.00	0.78	0.51			1.00	1.00
Incremental Delay, d2				0.5	99.9	5.0	4.1	12.1			47.7	46.8
Delay (s)				29.5	134.9	36.1	37.3	22.5			77.2	76.3
Level of Service				C	F	D	D	C			E	E
Approach Delay (s)		0.0			92.9			24.4			77.0	
Approach LOS		A			F			C			E	

Intersection Summary			
HCM Average Control Delay	65.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	170	1453	84	113	966	0	0	970	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0		7.0	7.0			7.0	
Lane Util. Factor				1.00	0.91		1.00	0.95			0.95	
Frt				1.00	0.99		1.00	1.00			0.96	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	5044		1770	3539			3390	
Flt Permitted				0.95	1.00		0.09	1.00			1.00	
Satd. Flow (perm)				1770	5044		172	3539			3390	
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.87	0.87	0.87	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	187	1597	92	130	1110	0	0	1000	392
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	187	1683	0	130	1110	0	0	1391	0
Turn Type				Perm			Perm					
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				35.0	35.0		51.0	51.0			51.0	
Effective Green, g (s)				35.0	35.0		51.0	51.0			51.0	
Actuated g/C Ratio				0.35	0.35		0.51	0.51			0.51	
Clearance Time (s)				7.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				620	1765		88	1805			1729	
v/s Ratio Prot					c0.33			0.31			0.41	
v/s Ratio Perm				0.11			c0.76					
v/c Ratio				0.30	0.95		1.48	0.61			0.80	
Uniform Delay, d1				23.6	31.7		24.5	17.5			20.4	
Progression Factor				0.77	0.84		1.07	1.06			0.41	
Incremental Delay, d2				0.0	1.6		257.3	1.3			1.0	
Delay (s)				18.1	28.4		283.3	19.8			9.4	
Level of Service				B	C		F	B			A	
Approach Delay (s)		0.0			27.3			47.4			9.4	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	18	19	43	133	39	27	948	118	18	1335	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0		6.0	5.0		6.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1720		1770	1799		1770	3480		1770	3391	
Flt Permitted	0.39	1.00		0.73	1.00		0.08	1.00		0.11	1.00	
Satd. Flow (perm)	727	1720		1358	1799		151	3480		205	3391	
Peak-hour factor, PHF	0.85	0.85	0.85	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	33	21	22	56	173	51	30	1065	133	19	1405	545
RTOR Reduction (vph)	0	18	0	0	11	0	0	10	0	0	41	0
Lane Group Flow (vph)	33	25	0	56	213	0	30	1188	0	19	1909	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.1	16.0		20.5	16.2		53.2	53.2		54.2	54.2	
Effective Green, g (s)	20.1	16.0		20.5	16.2		53.2	53.2		54.2	54.2	
Actuated g/C Ratio	0.20	0.16		0.20	0.16		0.53	0.53		0.54	0.54	
Clearance Time (s)	4.5	6.0		4.5	6.0		6.0	5.0		6.0	5.0	
Lane Grp Cap (vph)	189	275		296	291		145	1851		189	1838	
v/s Ratio Prot	0.01	0.01		c0.01	c0.12		0.01	c0.34		0.01	c0.56	
v/s Ratio Perm	0.03			0.03			0.10			0.05		
v/c Ratio	0.17	0.09		0.19	0.73		0.21	0.64		0.10	1.04	
Uniform Delay, d1	37.9	35.8		33.0	39.8		41.5	16.6		14.2	22.9	
Progression Factor	1.00	1.00		1.00	1.00		0.32	0.35		1.00	1.00	
Incremental Delay, d2	2.0	0.6		1.4	15.0		2.5	1.3		1.1	31.8	
Delay (s)	39.9	36.4		34.4	54.9		15.8	7.2		15.3	54.7	
Level of Service	D	D		C	D		B	A		B	D	
Approach Delay (s)		37.9			50.8			7.4			54.3	
Approach LOS		D			D			A			D	

Intersection Summary			
HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1084	1622			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1009	23	0	0	0	0	70	130	43	259	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.91		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3522						1699		1770	1863	
Flt Permitted		1.00						1.00		0.48	1.00	
Satd. Flow (perm)		3522						1699		886	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1097	25	0	0	0	0	76	141	47	282	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	67	0	0	0	0
Lane Group Flow (vph)	0	1158	0	0	0	0	0	150	0	47	282	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		66.0						26.0		26.0	26.0	
Effective Green, g (s)		66.0						26.0		26.0	26.0	
Actuated g/C Ratio		0.66						0.26		0.26	0.26	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		2325						442		230	484	
v/s Ratio Prot								0.09			c0.15	
v/s Ratio Perm		0.33								0.05		
v/c Ratio		0.50						0.34		0.20	0.58	
Uniform Delay, d1		8.6						30.0		28.9	32.3	
Progression Factor		1.00						1.00		0.86	0.86	
Incremental Delay, d2		0.8						2.1		2.0	5.0	
Delay (s)		9.4						32.1		26.8	32.6	
Level of Service		A						C		C	C	
Approach Delay (s)		9.4			0.0			32.1			31.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	245	1604	53	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	1.00	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			1770	3362	1770	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			1770	3362	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	266	1743	58	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	266	1743	58	0
Parking (#/hr)				0		
Turn Type			Perm			
Protected Phases				8		
Permitted Phases			8		2	
Actuated Green, G (s)			71.0	71.0	21.0	
Effective Green, g (s)			71.0	71.0	21.0	
Actuated g/C Ratio			0.71	0.71	0.21	
Clearance Time (s)			4.0	4.0	4.0	
Lane Grp Cap (vph)			1257	2387	372	
v/s Ratio Prot				c0.52		
v/s Ratio Perm			0.15		c0.03	
v/c Ratio			0.21	0.73	0.16	
Uniform Delay, d1			4.9	8.7	32.3	
Progression Factor			1.31	1.62	0.87	
Incremental Delay, d2			0.1	0.6	0.8	
Delay (s)			6.6	14.8	28.8	
Level of Service			A	B	C	
Approach Delay (s)	0.0			13.7	28.8	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	296	861	20	0	0	0	0	613	175	179	890	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95						0.95		1.00	0.95	
Frt	1.00	1.00						0.97		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	3527						3421		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.16	1.00	
Satd. Flow (perm)	1770	3527						3421		301	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	312	906	21	0	0	0	0	757	216	188	937	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	312	925	0	0	0	0	0	949	0	188	937	0
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)	34.1	34.1						34.9		51.9	51.9	
Effective Green, g (s)	34.1	34.1						34.9		51.9	51.9	
Actuated g/C Ratio	0.34	0.34						0.35		0.52	0.52	
Clearance Time (s)	7.0	7.0						7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	604	1203						1194		303	1837	
v/s Ratio Prot		c0.26						c0.28		c0.06	0.26	
v/s Ratio Perm	0.18									0.26		
v/c Ratio	0.52	0.77						0.79		0.62	0.51	
Uniform Delay, d1	26.4	29.4						29.3		30.6	15.7	
Progression Factor	0.77	0.80						0.84		0.93	1.06	
Incremental Delay, d2	0.7	2.7						4.1		2.6	0.7	
Delay (s)	21.0	26.3						28.7		31.2	17.4	
Level of Service	C	C						C		C	B	
Approach Delay (s)		24.9			0.0			28.7			19.7	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	564	206	0	0	0	0	1635	318	230	2231	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Lane Util. Factor	0.86	0.86	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1522	4773	1583					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1522	4773	1583					5085	1583	3433	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	313	594	217	0	0	0	0	1879	366	258	2507	0
RTOR Reduction (vph)	0	0	4	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	219	688	213	0	0	0	0	1879	344	258	2507	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	21.2	21.2	21.2					51.0	51.0	11.3	66.8	
Effective Green, g (s)	21.2	21.2	21.2					51.0	51.0	11.3	66.8	
Actuated g/C Ratio	0.21	0.21	0.21					0.51	0.51	0.11	0.67	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	323	1012	336					2593	807	388	2364	
v/s Ratio Prot								0.37		0.08	c0.71	
v/s Ratio Perm	0.14	0.14	0.13						0.22			
v/c Ratio	0.68	0.68	0.63					0.72	0.43	0.66	1.06	
Uniform Delay, d1	36.3	36.3	35.9					19.0	15.3	42.5	16.6	
Progression Factor	0.90	0.89	0.89					0.64	0.69	1.20	0.84	
Incremental Delay, d2	4.1	1.3	2.9					1.4	1.3	1.2	30.4	
Delay (s)	36.7	33.5	34.9					13.6	11.8	52.2	44.3	
Level of Service	D	C	C					B	B	D	D	
Approach Delay (s)		34.4			0.0			13.4			45.0	
Approach LOS		C			A			B			D	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1205	44	0	0	0	0	134	113	9	247	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91	1.00					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5078	1583					3539	1583	1770	3539	
Flt Permitted		1.00	1.00					1.00	1.00	0.65	1.00	
Satd. Flow (perm)		5078	1583					3539	1583	1211	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	36	1268	46	0	0	0	0	161	136	10	268	0
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	20	0	0	0
Lane Group Flow (vph)	0	1304	22	0	0	0	0	161	116	10	268	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		29.0	29.0					21.0	21.0	21.0	21.0	
Effective Green, g (s)		29.0	29.0					21.0	21.0	21.0	21.0	
Actuated g/C Ratio		0.48	0.48					0.35	0.35	0.35	0.35	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		2454	765					1239	554	424	1239	
v/s Ratio Prot								0.05			c0.08	
v/s Ratio Perm		0.26	0.01						0.07	0.01		
v/c Ratio		0.53	0.03					0.13	0.21	0.02	0.22	
Uniform Delay, d1		10.8	8.1					13.3	13.7	12.8	13.7	
Progression Factor		1.00	1.00					0.75	0.68	0.99	0.99	
Incremental Delay, d2		0.8	0.1					0.2	0.8	0.1	0.2	
Delay (s)		11.6	8.2					10.2	10.2	12.7	13.8	
Level of Service		B	A					B	B	B	B	
Approach Delay (s)		11.5			0.0			10.2			13.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1560	211	250	1785	15	225	30	183	301	136	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.0	5.0	5.5	5.0		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3535		3433	1863	1583	1770	1851	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3535		3433	1863	1583	1770	1851	
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.83	0.83	0.83	0.72	0.72	0.72
Adj. Flow (vph)	9	1677	227	281	2006	17	271	36	220	418	189	8
RTOR Reduction (vph)	0	0	93	0	0	0	0	0	196	0	1	0
Lane Group Flow (vph)	9	1677	134	281	2023	0	271	36	24	418	196	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	4.0	61.0	61.0	21.3	78.3		17.1	16.7	16.7	31.5	31.1	
Effective Green, g (s)	4.0	61.0	61.0	21.3	78.3		17.1	16.7	16.7	31.5	31.1	
Actuated g/C Ratio	0.03	0.41	0.41	0.14	0.52		0.11	0.11	0.11	0.21	0.21	
Clearance Time (s)	5.5	5.0	5.0	5.5	5.0		4.5	4.5	4.5	4.5	4.5	
Lane Grp Cap (vph)	47	1439	644	251	1845		391	207	176	372	384	
v/s Ratio Prot	0.01	c0.47		0.16	c0.57		0.08	0.02		c0.24	c0.11	
v/s Ratio Perm			0.08						0.02			
v/c Ratio	0.19	1.17	0.21	1.12	1.10		0.69	0.17	0.14	1.12	0.51	
Uniform Delay, d1	71.4	44.5	28.9	64.4	35.8		63.9	60.4	60.2	59.2	52.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.9	82.4	0.7	92.7	52.5		9.7	1.8	1.6	84.6	4.8	
Delay (s)	80.3	126.9	29.6	157.1	88.3		73.6	62.2	61.8	143.8	57.5	
Level of Service	F	F	C	F	F		E	E	E	F	E	
Approach Delay (s)		115.1			96.7			67.9			116.2	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	102.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	241	743	92	53	537	100	199	246	79	108	466	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1795		1770	1843	
Flt Permitted	0.17	1.00	1.00	0.16	1.00	1.00	0.28	1.00		0.39	1.00	
Satd. Flow (perm)	313	3539	1583	299	3539	1583	521	1795		725	1843	
Peak-hour factor, PHF	0.75	0.75	0.75	0.82	0.82	0.82	0.81	0.81	0.81	0.97	0.97	0.97
Adj. Flow (vph)	321	991	123	65	655	122	246	304	98	111	480	37
RTOR Reduction (vph)	0	0	58	0	0	64	0	11	0	0	3	0
Lane Group Flow (vph)	321	991	65	65	655	58	246	391	0	111	514	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	36.7	29.0	29.0	28.5	24.9	24.9	47.2	42.9		49.6	44.1	
Effective Green, g (s)	36.7	29.0	29.0	28.5	24.9	24.9	47.2	42.9		49.6	44.1	
Actuated g/C Ratio	0.37	0.29	0.29	0.28	0.25	0.25	0.47	0.43		0.50	0.44	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	227	1026	459	138	881	394	300	770		417	813	
v/s Ratio Prot	c0.11	0.28		0.02	0.19		c0.04	0.22		0.01	0.28	
v/s Ratio Perm	c0.41		0.04	0.12		0.04	c0.35			0.12		
v/c Ratio	1.41	0.97	0.14	0.47	0.74	0.15	0.82	0.51		0.27	0.63	
Uniform Delay, d1	27.9	35.0	26.3	28.6	34.6	29.3	33.8	20.8		21.6	21.7	
Progression Factor	1.00	1.00	1.00	0.88	0.96	0.90	1.00	1.00		0.06	0.42	
Incremental Delay, d2	210.3	20.1	0.1	0.2	0.3	0.0	16.2	2.4		0.3	3.3	
Delay (s)	238.2	55.1	26.4	25.4	33.5	26.3	50.0	23.2		1.7	12.4	
Level of Service	F	E	C	C	C	C	D	C		A	B	
Approach Delay (s)		93.6			31.9			33.4			10.5	
Approach LOS		F			C			C			B	

Intersection Summary			
HCM Average Control Delay	53.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	323	317	75	180	61	342	1739	46	26	2107	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0		4.5	5.5		4.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.86		1.00	0.91	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3276		1770	3405		1770	6383		1770	5012	
Flt Permitted	0.51	1.00		0.24	1.00		0.09	1.00		0.09	1.00	
Satd. Flow (perm)	948	3276		441	3405		162	6383		165	5012	
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.86	0.86	0.86	0.87	0.87	0.87
Adj. Flow (vph)	322	404	396	86	207	70	398	2022	53	30	2422	256
RTOR Reduction (vph)	0	138	0	0	32	0	0	4	0	0	14	0
Lane Group Flow (vph)	322	662	0	86	245	0	398	2071	0	30	2664	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.5	17.8		20.7	16.9		56.4	55.4		47.6	47.6	
Effective Green, g (s)	22.5	17.8		20.7	16.9		56.4	55.4		47.6	47.6	
Actuated g/C Ratio	0.22	0.18		0.21	0.17		0.56	0.55		0.48	0.48	
Clearance Time (s)	4.5	6.0		4.5	6.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	583		142	575		257	3536		119	2386	
v/s Ratio Prot	c0.06	0.20		0.02	0.07		c0.16	0.32		0.01	c0.53	
v/s Ratio Perm	c0.23			0.10			c0.72			0.11		
v/c Ratio	1.28	1.14		0.61	0.43		1.55	0.59		0.25	1.12	
Uniform Delay, d1	38.1	41.1		34.6	37.2		40.9	14.7		16.5	26.2	
Progression Factor	0.97	1.06		1.00	1.00		1.00	1.00		0.35	0.49	
Incremental Delay, d2	139.1	71.5		7.1	0.5		265.3	0.7		0.1	53.1	
Delay (s)	176.0	115.2		41.7	37.7		306.2	15.4		5.9	66.0	
Level of Service	F	F		D	D		F	B		A	E	
Approach Delay (s)		132.6			38.7			62.2			65.3	
Approach LOS		F			D			E			E	

Intersection Summary			
HCM Average Control Delay	74.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	25	994	63	41	702	21	344	468	123	11	575	31
Peak Hour Factor	0.92	0.92	0.92	0.83	0.92	0.83	0.92	0.80	0.80	0.93	0.93	0.92
Hourly flow rate (vph)	27	1080	68	49	763	25	374	585	154	12	618	34
Approach Volume (veh/h)		1176			838			1113			664	
Crossing Volume (veh/h)		680			986			1119			1186	
High Capacity (veh/h)		808			630			564			534	
High v/c (veh/h)		1.46			1.33			1.97			1.24	
Low Capacity (veh/h)		644			489			433			407	
Low v/c (veh/h)		1.83			1.71			2.57			1.63	

Intersection Summary			
Maximum v/c High	1.97		
Maximum v/c Low	2.57		
Intersection Capacity Utilization	110.1%	ICU Level of Service	H

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	709	109	2448	757	89	1958
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	3433	1583	3539	1583	120	3539
Peak-hour factor, PHF	0.87	0.87	0.96	0.96	0.91	0.91
Adj. Flow (vph)	815	125	2550	789	98	2152
RTOR Reduction (vph)	0	105	0	347	0	0
Lane Group Flow (vph)	815	20	2550	442	98	2152
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.0	16.0	56.0	56.0	72.0	72.0
Effective Green, g (s)	16.0	16.0	56.0	56.0	72.0	72.0
Actuated g/C Ratio	0.16	0.16	0.56	0.56	0.72	0.72
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	549	253	1982	886	251	2548
v/s Ratio Prot	c0.24		c0.72		0.04	c0.61
v/s Ratio Perm		0.01		0.28	0.24	
v/c Ratio	1.48	0.08	1.29	0.50	0.39	0.84
Uniform Delay, d1	42.0	35.7	22.0	13.4	21.9	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	227.7	0.6	132.9	2.0	4.5	3.6
Delay (s)	269.7	36.3	154.9	15.4	26.4	13.7
Level of Service	F	D	F	B	C	B
Approach Delay (s)	238.6		122.0			14.2
Approach LOS	F		F			B

Intersection Summary			
HCM Average Control Delay	101.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	189	34	44	304	17	67	240	81	3	224	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583		1851	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.50	1.00	1.00		0.94	1.00	0.60	1.00	1.00	0.56	1.00	1.00
Satd. Flow (perm)	933	1863	1583		1747	1583	1110	3539	1583	1039	3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.95	0.95	0.95	0.75	0.75	0.75	0.89	0.89	0.89
Adj. Flow (vph)	34	222	40	46	320	18	89	320	108	3	252	66
RTOR Reduction (vph)	0	0	21	0	0	9	0	0	72	0	0	44
Lane Group Flow (vph)	34	222	19	0	366	9	89	320	36	3	252	22
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0		28.0	28.0	20.0	20.0	20.0	20.0	20.0	20.0
Effective Green, g (s)	28.0	28.0	28.0		28.0	28.0	20.0	20.0	20.0	20.0	20.0	20.0
Actuated g/C Ratio	0.47	0.47	0.47		0.47	0.47	0.33	0.33	0.33	0.33	0.33	0.33
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	435	869	739		815	739	370	1180	528	346	1180	528
v/s Ratio Prot		0.12						c0.09			0.07	
v/s Ratio Perm	0.04		0.01		c0.21	0.01	0.08		0.02	0.00		0.01
v/c Ratio	0.08	0.26	0.03		0.45	0.01	0.24	0.27	0.07	0.01	0.21	0.04
Uniform Delay, d1	8.9	9.7	8.6		10.8	8.6	14.5	14.7	13.6	13.4	14.4	13.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.41	0.37	0.10
Incremental Delay, d2	0.4	0.7	0.1		1.8	0.0	1.5	0.6	0.2	0.0	0.4	0.1
Delay (s)	9.2	10.4	8.7		12.6	8.6	16.0	15.2	13.9	5.6	5.8	1.5
Level of Service	A	B	A		B	A	B	B	B	A	A	A
Approach Delay (s)		10.0			12.4			15.1			4.9	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	241	1991	0	134	0	0	0	17	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		0.95	0.95			1.00	
Frt					1.00		1.00	1.00			0.95	
Flt Protected					0.99		0.95	0.95			1.00	
Satd. Flow (prot)					5058		1681	1681			1767	
Flt Permitted					0.99		0.95	0.95			1.00	
Satd. Flow (perm)					5058		1681	1681			1767	
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.92	0.87	0.92	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	277	2289	0	154	0	0	0	18	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	0	2566	0	77	77	0	0	19	0
Turn Type				Perm			Split					
Protected Phases					8		2	2			6	
Permitted Phases				8								
Actuated Green, G (s)					75.0		20.0	20.0			10.0	
Effective Green, g (s)					75.0		20.0	20.0			10.0	
Actuated g/C Ratio					0.62		0.17	0.17			0.08	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)					3161		280	280			147	
v/s Ratio Prot							c0.05	0.05			c0.01	
v/s Ratio Perm					0.51							
v/c Ratio					0.81		0.28	0.28			0.13	
Uniform Delay, d1					17.1		43.7	43.7			51.0	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					2.4		2.4	2.4			1.8	
Delay (s)					19.5		46.1	46.1			52.8	
Level of Service					B		D	D			D	
Approach Delay (s)		0.0			19.5			46.1			52.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations										
Volume (vph)	0	1087	0	457	1051	0	0	0	168	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0				6.0	6.0
Lane Util. Factor		0.95		1.00	0.95				1.00	1.00
Frt		1.00		1.00	1.00				1.00	0.85
Flt Protected		1.00		0.95	1.00				0.95	1.00
Satd. Flow (prot)		3539		1770	3539				1770	1583
Flt Permitted		1.00		0.07	1.00				0.95	1.00
Satd. Flow (perm)		3539		138	3539				1770	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.95	0.95	0.95	0.31	0.31	0.87	0.87
Adj. Flow (vph)	0	1294	0	481	1106	0	0	0	193	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	74
Lane Group Flow (vph)	0	1294	0	481	1106	0	0	0	193	17
Turn Type				pm+pt						Perm
Protected Phases		4		3	8				6	
Permitted Phases				8						6
Actuated Green, G (s)		48.0		86.0	86.0				22.0	22.0
Effective Green, g (s)		48.0		86.0	86.0				22.0	22.0
Actuated g/C Ratio		0.40		0.72	0.72				0.18	0.18
Clearance Time (s)		6.0		6.0	6.0				6.0	6.0
Lane Grp Cap (vph)		1416		534	2536				325	290
v/s Ratio Prot		0.37		c0.24	0.31				c0.11	
v/s Ratio Perm				c0.41						0.01
v/c Ratio		0.91		0.90	0.44				0.59	0.06
Uniform Delay, d1		34.0		35.4	7.0				44.9	40.4
Progression Factor		1.11		1.63	0.28				1.00	1.00
Incremental Delay, d2		10.1		8.5	0.2				7.8	0.4
Delay (s)		47.9		66.3	2.2				52.7	40.8
Level of Service		D		E	A				D	D
Approach Delay (s)		47.9			21.6		0.0		48.9	
Approach LOS		D			C		A		D	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	1177	0	0	1381	394	151	0	525	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1770		1583			
Flt Permitted	0.07	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	138	3539			3539	1583	1770		1583			
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91	0.50	0.50	0.50
Adj. Flow (vph)	139	1338	0	0	1454	415	166	0	577	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	179	0	0	20	0	0	0
Lane Group Flow (vph)	139	1338	0	0	1454	236	166	0	557	0	0	0
Turn Type	pm+pt					Perm	Prot		custom			
Protected Phases	7	4			8		5					
Permitted Phases	4					8			2			
Actuated Green, G (s)	62.0	62.0			48.0	48.0	46.0		46.0			
Effective Green, g (s)	62.0	62.0			48.0	48.0	46.0		46.0			
Actuated g/C Ratio	0.52	0.52			0.40	0.40	0.38		0.38			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0		6.0			
Lane Grp Cap (vph)	180	1828			1416	633	679		607			
v/s Ratio Prot	0.05	c0.38			c0.41		0.09					
v/s Ratio Perm	0.35					0.15			c0.35			
v/c Ratio	0.77	0.73			1.03	0.37	0.24		0.92			
Uniform Delay, d1	50.4	22.5			36.0	25.4	25.2		35.2			
Progression Factor	0.66	0.68			0.50	0.06	1.00		1.00			
Incremental Delay, d2	16.7	1.5			27.4	1.2	0.9		21.0			
Delay (s)	50.0	16.9			45.5	2.9	26.0		56.2			
Level of Service	D	B			D	A	C		E			
Approach Delay (s)		20.0			36.0			49.4			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	0	457	0	0	199
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	497	0	0	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			266			
pX, platoon unblocked						
vC, conflicting volume	497				497	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497				497	497
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	62
cM capacity (veh/h)	1067				533	573

Direction, Lane #	SB 1	SE 1
Volume Total	497	216
Volume Left	0	0
Volume Right	0	216
cSH	1700	573
Volume to Capacity	0.29	0.38
Queue Length 95th (ft)	0	44
Control Delay (s)	0.0	15.0
Lane LOS		C
Approach Delay (s)	0.0	15.0
Approach LOS		C

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Arterial Level of Service: EB 6th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	8.1	9.5	17.6	0.05	10.7	E
BUS 41	III	30	17.0	27.4	44.4	0.13	10.3	E
US 41	III	30	32.9	34.6	67.5	0.26	13.8	E
	III	30	32.9	11.8	44.7	0.26	20.8	C
Total	III		90.9	83.3	174.2	0.70	14.4	D

Arterial Level of Service: EB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	17.2	56.9	74.1	0.13	6.2	F
US 41	III	30	33.1	92.1	125.2	0.26	7.5	F
	III	30	32.7	10.7	43.4	0.26	21.3	C
Total	III		83.0	159.7	242.7	0.65	9.6	F

Arterial Level of Service: WB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	32.8	13.0	45.8	0.26	20.3	C
US 41	III	30	32.7	35.8	68.5	0.26	13.5	E
BUS 41	III	30	33.1	34.8	67.9	0.26	13.8	E
Total	III		98.6	83.6	182.2	0.78	15.3	D

Arterial Level of Service: NB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.7	22.2	39.9	0.13	11.9	E
6th Ave	III	30	11.4	29.6	41.0	0.08	7.1	F
Manatee Ave	III	30	7.5	20.1	27.6	0.05	6.3	F
3rd Ave	III	30	10.5	7.2	17.7	0.07	13.8	E
7th St	III	30	86.9	29.8	116.7	0.72	22.3	C
10th St	III	30	17.3	22.8	40.1	0.13	11.6	E
17th St	III	30	33.0	11.9	44.9	0.26	20.8	C
Total	III		184.3	143.6	327.9	1.44	15.8	D

Arterial Level of Service: SB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
17th St	III	30	17.5	26.2	43.7	0.13	10.8	E
10th St	III	30	33.0	55.2	88.2	0.26	10.6	E
7th St	III	30	17.3	6.8	24.1	0.13	19.3	C
3rd Ave	III	30	86.9	54.2	141.1	0.72	18.5	C
Manatee Ave	III	30	10.5	9.6	20.1	0.07	12.1	E
6th Ave	III	30	7.5	18.5	26.0	0.05	6.7	F
9th Ave	III	30	11.4	12.2	23.6	0.08	12.3	E
Total	III		184.1	182.7	366.8	1.44	14.1	D

Arterial Level of Service: EB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
26th St W	III	30	34.0	122.4	156.4	0.27	6.2	F
Total	III		34.0	122.4	156.4	0.27	6.2	F

Arterial Level of Service: WB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	14.2	19.8	34.0	0.10	10.6	E
US 41	III	30	32.9	132.6	165.5	0.26	5.6	F
BUS 41	III	30	32.6	29.1	61.7	0.26	15.0	D
14th St W	III	30	17.4	15.3	32.7	0.13	14.3	D
26th St W	III	30	42.6	86.8	129.4	0.34	9.3	F
Total	III		139.7	283.6	423.3	1.08	9.2	F

Arterial Level of Service: EB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	36.9	48.3	85.2	0.29	12.3	E
US 41	III	30	10.0	17.1	27.1	0.06	8.6	F
Haben Blvd	III	30	37.1	203.2	240.3	0.29	4.4	F
Total	III		84.0	268.6	352.6	0.65	6.6	F

Arterial Level of Service: WB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	49.3	48.2	97.5	0.39	14.3	D
US 41	III	30	37.1	47.4	84.5	0.29	12.4	E
	III	30	10.0	2.2	12.2	0.06	19.0	C
Total	III		96.4	97.8	194.2	0.74	13.8	E

Arterial Level of Service: NB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.5	14.1	31.6	0.13	14.9	D
6th Ave	III	30	10.7	14.2	24.9	0.08	11.0	E
Manatee Ave	III	30	7.3	24.1	31.4	0.05	5.4	F
Haben Blvd	III	30	80.3	156.6	236.9	0.67	10.2	E
US 301	III	30	16.5	26.4	42.9	0.12	9.8	F
Total	III		132.3	235.4	367.7	1.04	10.2	E

Arterial Level of Service: SB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	66.2	14.2	80.4	0.52	23.4	C
Manatee Ave	III	30	80.3	77.3	157.6	0.67	15.3	D
6th Ave	III	30	7.3	47.0	54.3	0.05	3.1	F
9th Ave	III	30	10.7	41.1	51.8	0.08	5.3	F
Total	III		164.5	179.6	344.1	1.31	13.7	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				373		
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1084	1622			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	354	78	293	334	135	156	977	244	146	834	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00	1.00	0.14	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	442	1863	1583	516	1863	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	182	448	99	315	359	145	171	1074	268	155	887	54
RTOR Reduction (vph)	0	0	60	0	0	111	0	0	100	0	0	24
Lane Group Flow (vph)	182	448	39	315	359	34	171	1074	168	155	887	30
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	43.7	29.9	29.9	39.9	28.0	28.0	14.0	41.9	41.9	12.3	40.2	40.2
Effective Green, g (s)	43.7	29.9	29.9	39.9	28.0	28.0	14.0	41.9	41.9	12.3	40.2	40.2
Actuated g/C Ratio	0.36	0.25	0.25	0.33	0.23	0.23	0.12	0.35	0.35	0.10	0.34	0.34
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	314	464	394	461	435	369	207	1236	553	181	1186	530
v/s Ratio Prot	0.07	c0.24		c0.07	0.19		0.10	c0.30		0.09	c0.25	
v/s Ratio Perm	0.14		0.02	0.16		0.02			0.11			0.02
v/c Ratio	0.58	0.97	0.10	0.68	0.83	0.09	0.83	0.87	0.30	0.86	0.75	0.06
Uniform Delay, d1	41.8	44.5	34.7	48.5	43.7	36.0	51.8	36.5	28.4	53.0	35.4	27.0
Progression Factor	0.82	0.80	0.55	0.49	0.68	0.38	0.62	0.47	0.25	1.13	1.44	2.24
Incremental Delay, d2	2.1	28.4	0.1	3.9	11.4	0.1	14.9	5.3	0.9	23.9	3.2	0.1
Delay (s)	36.3	64.1	19.1	27.4	41.2	13.8	46.9	22.3	8.1	83.7	54.2	60.6
Level of Service	D	E	B	C	D	B	D	C	A	F	D	E
Approach Delay (s)		51.1			31.0			22.6			58.7	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	1309	125	400	1233	31	163	27	983	50	64	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	1583	1770	3526		1770	1863	1583		1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3539	1583	1770	3526		1770	1863	1583		1750	
Peak-hour factor, PHF	0.95	0.95	0.95	0.98	0.98	0.98	0.93	0.93	0.93	0.77	0.77	0.77
Adj. Flow (vph)	45	1378	132	408	1258	32	175	29	1057	65	83	79
RTOR Reduction (vph)	0	0	71	0	1	0	0	0	370	0	16	0
Lane Group Flow (vph)	45	1378	61	408	1289	0	175	29	687	0	211	0
Turn Type	Prot		Perm	Prot			Split		Prot	Split		
Protected Phases	7	4		3	8		2	2	2	6	6	
Permitted Phases			4									
Actuated Green, G (s)	6.0	34.0	34.0	19.0	47.0		27.0	27.0	27.0		16.0	
Effective Green, g (s)	6.0	34.0	34.0	19.0	47.0		27.0	27.0	27.0		16.0	
Actuated g/C Ratio	0.05	0.28	0.28	0.16	0.39		0.22	0.22	0.22		0.13	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0		6.0	
Lane Grp Cap (vph)	89	1003	449	280	1381		398	419	356		233	
v/s Ratio Prot	0.03	c0.39		c0.23	0.37		0.10	0.02	c0.43		c0.12	
v/s Ratio Perm			0.04									
v/c Ratio	0.51	1.37	0.14	1.46	0.93		0.44	0.07	1.93		0.91	
Uniform Delay, d1	55.6	43.0	32.1	50.5	35.0		40.0	36.6	46.5		51.3	
Progression Factor	0.97	0.85	0.65	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	11.6	172.0	0.4	224.5	12.8		3.5	0.3	428.1		39.1	
Delay (s)	65.7	208.4	21.1	275.0	47.8		43.5	36.9	474.6		90.3	
Level of Service	E	F	C	F	D		D	D	F		F	
Approach Delay (s)		188.4			102.4			404.7			90.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	210.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	121.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	169	1715	1347	65	38	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	184	1864	1464	71	41	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		701				
pX, platoon unblocked					0.73	
vC, conflicting volume	1535				2799	767
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1535				2724	767
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	57				0	59
cM capacity (veh/h)	429				7	345

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	184	932	932	976	559	41	141
Volume Left	184	0	0	0	0	41	0
Volume Right	0	0	0	0	71	0	141
cSH	429	1700	1700	1700	1700	7	345
Volume to Capacity	0.43	0.55	0.55	0.57	0.33	5.98	0.41
Queue Length 95th (ft)	52	0	0	0	0	Err	48
Control Delay (s)	19.5	0.0	0.0	0.0	0.0	Err	22.5
Lane LOS	C					F	C
Approach Delay (s)	1.7			0.0		2279.1	
Approach LOS						F	

Intersection Summary			
Average Delay	111.5		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	163	32	41	202	46	51	120	35	90	144	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1817		1770	1811		1770	1800		1770	1744	
Flt Permitted	0.59	1.00		0.63	1.00		0.59	1.00		0.65	1.00	
Satd. Flow (perm)	1105	1817		1165	1811		1102	1800		1212	1744	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	177	35	45	220	50	55	130	38	98	157	116
RTOR Reduction (vph)	0	16	0	0	18	0	0	24	0	0	59	0
Lane Group Flow (vph)	68	196	0	45	252	0	55	144	0	98	214	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		17.0	17.0		17.0	17.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	393	646		414	644		416	680		458	659	
v/s Ratio Prot		0.11			c0.14			0.08			c0.12	
v/s Ratio Perm	0.06			0.04			0.05			0.08		
v/c Ratio	0.17	0.30		0.11	0.39		0.13	0.21		0.21	0.32	
Uniform Delay, d1	10.0	10.5		9.7	10.9		9.2	9.5		9.5	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.2		0.5	1.8		0.7	0.7		1.1	1.3	
Delay (s)	10.9	11.7		10.2	12.6		9.8	10.2		10.5	11.2	
Level of Service	B	B		B	B		A	B		B	B	
Approach Delay (s)		11.5			12.3			10.1			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	153	25	0	4	52	1008	10	2	1885	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.48	0.48	0.48	0.89	0.89	0.89	0.84	0.84	0.84
Hourly flow rate (vph)	1	0	174	52	0	8	58	1133	11	2	2244	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											686	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2947	3516	1129	2556	3517	572	2257			1144		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2930	3680	534	2415	3681	572	2021			1144		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	100	53	0	100	98	72			100		
cM capacity (veh/h)	4	3	372	5	3	463	211			607		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	175	60	625	578	2	1496	761
Volume Left	1	52	58	0	2	0	0
Volume Right	174	8	0	11	0	0	13
cSH	231	6	211	1700	607	1700	1700
Volume to Capacity	0.76	9.71	0.28	0.34	0.00	0.88	0.45
Queue Length 95th (ft)	133	Err	27	0	0	0	0
Control Delay (s)	56.9	Err	13.4	0.0	11.0	0.0	0.0
Lane LOS	F	F	B		B		
Approach Delay (s)	56.9	Err	7.0		0.0		
Approach LOS	F	F					

Intersection Summary			
Average Delay	168.4		
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Right Turn Channelized						
Volume (veh/h)	1060	707	0	1413	804	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1152	768	0	1536	874	0
Approach Volume (veh/h)	1921			1536	874	
Crossing Volume (veh/h)	0			874	1152	
High Capacity (veh/h)	1385			690	549	
High v/c (veh/h)	1.39			2.23	1.59	
Low Capacity (veh/h)	1161			541	420	
Low v/c (veh/h)	1.65			2.84	2.08	

Intersection Summary			
Maximum v/c High	2.23		
Maximum v/c Low	2.84		
Intersection Capacity Utilization	124.8%	ICU Level of Service	H

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	140	49	153	147	141	40	1274	212	75	1007	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1848	1583	1770	1726		1770	3539	1583	1770	3525	
Flt Permitted		0.88	1.00	0.30	1.00		0.10	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1634	1583	564	1726		189	3539	1583	214	3525	
Peak-hour factor, PHF	0.85	0.85	0.85	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	165	58	176	169	162	43	1385	230	82	1095	30
RTOR Reduction (vph)	0	0	49	0	29	0	0	0	85	0	2	0
Lane Group Flow (vph)	0	197	9	176	302	0	43	1385	145	82	1123	0
Turn Type	Perm		Perm	pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		18.0	18.0	34.0	34.0		59.0	59.0	59.0	59.0	59.0	
Effective Green, g (s)		18.0	18.0	34.0	34.0		59.0	59.0	59.0	59.0	59.0	
Actuated g/C Ratio		0.15	0.15	0.28	0.28		0.49	0.49	0.49	0.49	0.49	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Grp Cap (vph)		245	237	260	489		212	1740	778	222	1733	
v/s Ratio Prot				0.06	c0.18		0.02	c0.39		0.03	c0.32	
v/s Ratio Perm		c0.12	0.01	0.14			0.08		0.09	0.15		
v/c Ratio		0.80	0.04	0.68	0.62		0.20	0.80	0.19	0.37	0.65	
Uniform Delay, d1		49.3	43.6	35.0	37.4		20.0	25.5	17.1	35.8	22.8	
Progression Factor		1.00	1.00	0.95	0.94		1.00	1.00	1.00	0.32	0.24	
Incremental Delay, d2		23.8	0.3	13.2	5.7		2.1	3.9	0.5	3.4	1.4	
Delay (s)		73.0	43.9	46.4	40.9		22.1	29.3	17.6	14.8	6.8	
Level of Service		E	D	D	D		C	C	B	B	A	
Approach Delay (s)		66.4			42.8			27.5			7.3	
Approach LOS		E			D			C			A	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	2	0	0	68	120	1605	24	0	1976	162
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.68	0.68	0.68	0.88	0.88	0.88	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	4	0	0	100	136	1824	27	0	2501	205
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								633				
pX, platoon unblocked	0.47	0.47		0.47	0.47	0.47				0.47		
vC, conflicting volume	3786	4625	1251	3351	4803	912	2706			1851		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4667	6448	1251	3745	6825	0	2706			563		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	80	8			100		
cM capacity (veh/h)	0	0	164	0	0	511	148			474		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	4	100	136	912	912	27	1251	1251	205
Volume Left	0	0	136	0	0	0	0	0	0
Volume Right	4	100	0	0	0	27	0	0	205
cSH	164	511	148	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.20	0.92	0.54	0.54	0.02	0.74	0.74	0.12
Queue Length 95th (ft)	2	18	161	0	0	0	0	0	0
Control Delay (s)	27.5	13.7	112.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	F						
Approach Delay (s)	27.5	13.7	7.7				0.0		
Approach LOS	D	B							

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	712	60	297	716	29	6	6	343	15	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.66	0.66	0.66	0.69	0.69	0.69
Hourly flow rate (vph)	12	742	62	341	823	33	9	9	520	22	14	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		696			839							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	856			804			1921	2337	402	2442	2352	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	554			804			1769	2244	402	2364	2260	66
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			58			33	56	13	0	29	97
cM capacity (veh/h)	887			816			13	21	598	1	20	863

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	383	433	753	445	9	529	58
Volume Left	12	0	341	0	9	0	22
Volume Right	0	62	0	33	0	520	22
cSH	887	1700	816	1700	13	405	2
Volume to Capacity	0.01	0.25	0.42	0.26	0.67	1.31	23.26
Queue Length 95th (ft)	1	0	52	0	40	595	Err
Control Delay (s)	0.5	0.0	9.5	0.0	492.2	182.3	Err
Lane LOS	A		A		F	F	F
Approach Delay (s)	0.2		6.0		187.6		Err
Approach LOS					F		F

Intersection Summary			
Average Delay	263.5		
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	345	63	6	23	226	12	15	5	10	62	11	281
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.57	0.57	0.57	0.80	0.80	0.80
Hourly flow rate (vph)	397	72	7	30	297	16	26	9	18	78	14	351
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		686										
pX, platoon unblocked												
vC, conflicting volume	313			79			1585	1243	76	1253	1238	305
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313			79			1585	1243	76	1253	1238	305
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	68			98			15	92	98	25	88	52
cM capacity (veh/h)	1247			1519			31	117	985	103	117	735

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	397	79	30	313	53	78	365
Volume Left	397	0	30	0	26	78	0
Volume Right	0	7	0	16	18	0	351
cSH	1247	1700	1519	1700	56	103	613
Volume to Capacity	0.32	0.05	0.02	0.18	0.94	0.75	0.60
Queue Length 95th (ft)	35	0	2	0	106	101	98
Control Delay (s)	9.2	0.0	7.4	0.0	221.1	107.1	19.1
Lane LOS	A		A		F	F	C
Approach Delay (s)	7.7		0.7		221.1	34.5	
Approach LOS					F	D	

Intersection Summary			
Average Delay	23.4		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	106	87	177	188	75	152	1930	129	42	1278	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1737		1770	1783		1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00		0.34	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	452	1737		637	1783		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.78	0.78	0.78	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	102	122	100	227	241	96	160	2032	136	45	1360	46
RTOR Reduction (vph)	0	25	0	0	12	0	0	0	42	0	0	21
Lane Group Flow (vph)	102	197	0	227	325	0	160	2032	94	45	1360	25
Turn Type	pm+pt			pm+pt			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	24.9	16.5		30.1	19.1		16.1	65.3	65.3	3.2	52.4	52.4
Effective Green, g (s)	24.9	16.5		30.1	19.1		16.1	65.3	65.3	3.2	52.4	52.4
Actuated g/C Ratio	0.21	0.14		0.25	0.16		0.13	0.54	0.54	0.03	0.44	0.44
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	239		264	284		237	1926	861	47	1545	691
v/s Ratio Prot	0.04	0.11		c0.08	c0.18		c0.09	c0.57		0.03	0.38	
v/s Ratio Perm	0.08			0.14					0.06			0.02
v/c Ratio	0.55	0.82		0.86	1.15		0.68	1.06	0.11	0.96	0.88	0.04
Uniform Delay, d1	50.4	50.3		46.6	50.4		49.5	27.4	13.3	58.3	30.9	19.3
Progression Factor	1.28	1.02		1.00	1.00		1.07	1.18	1.34	1.00	1.00	1.00
Incremental Delay, d2	2.4	15.1		23.2	98.5		7.4	36.8	0.3	114.0	7.5	0.1
Delay (s)	66.9	66.6		69.9	148.9		60.4	69.0	18.0	172.3	38.4	19.4
Level of Service	E	E		E	F		E	E	B	F	D	B
Approach Delay (s)		66.7			117.1			65.5			42.0	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM Average Control Delay	64.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	232	133	83	143	110	24	65	965	175	13	852	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1755		1770	1813		1770	3458		1770	3468	
Flt Permitted	0.53	1.00		0.28	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	990	1755		521	1813		1770	3458		1770	3468	
Peak-hour factor, PHF	0.85	0.85	0.85	0.88	0.88	0.88	0.96	0.96	0.96	0.91	0.91	0.91
Adj. Flow (vph)	273	156	98	162	125	27	68	1005	182	14	936	146
RTOR Reduction (vph)	0	18	0	0	7	0	0	12	0	0	10	0
Lane Group Flow (vph)	273	236	0	162	145	0	68	1175	0	14	1072	0
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	33.8	19.2		24.0	14.3		12.4	65.5		1.6	54.7	
Effective Green, g (s)	33.8	19.2		24.0	14.3		12.4	65.5		1.6	54.7	
Actuated g/C Ratio	0.28	0.16		0.20	0.12		0.10	0.55		0.01	0.46	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	374	281		205	216		183	1887		24	1581	
v/s Ratio Prot	c0.09	c0.13		0.06	0.08		c0.04	c0.34		0.01	c0.31	
v/s Ratio Perm	0.12			0.09								
v/c Ratio	0.73	0.84		0.79	0.67		0.37	0.62		0.58	0.68	
Uniform Delay, d1	40.5	48.9		50.6	50.6		50.2	18.7		58.9	25.7	
Progression Factor	1.00	1.00		0.40	1.15		0.54	0.66		1.00	1.00	
Incremental Delay, d2	7.0	19.1		9.5	3.9		0.8	1.0		31.3	2.4	
Delay (s)	47.5	68.0		29.9	62.2		28.1	13.3		90.2	28.1	
Level of Service	D	E		C	E		C	B		F	C	
Approach Delay (s)		57.4			45.5			14.1			28.9	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	513	108	31	564	41	224	178	88	52	60	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.95		1.00	0.95	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817			1842		1770	1770		1770	1761	
Flt Permitted		0.96			0.94		0.69	1.00		0.43	1.00	
Satd. Flow (perm)		1740			1742		1287	1770		809	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	558	117	34	613	45	243	193	96	57	65	37
RTOR Reduction (vph)	0	6	0	0	2	0	0	15	0	0	17	0
Lane Group Flow (vph)	0	698	0	0	690	0	243	274	0	57	85	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		70.0			70.0		38.0	38.0		38.0	38.0	
Effective Green, g (s)		70.0			70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio		0.58			0.58		0.32	0.32		0.32	0.32	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		1015			1016		408	561		256	558	
v/s Ratio Prot								0.15			0.05	
v/s Ratio Perm		c0.40			0.40		c0.19			0.07		
v/c Ratio		0.69			0.68		0.60	0.49		0.22	0.15	
Uniform Delay, d1		17.4			17.2		34.5	33.1		30.1	29.4	
Progression Factor		1.00			0.24		1.00	1.00		0.91	0.88	
Incremental Delay, d2		3.8			3.1		6.3	3.0		2.0	0.6	
Delay (s)		21.2			7.2		40.8	36.2		29.3	26.6	
Level of Service		C			A		D	D		C	C	
Approach Delay (s)		21.2			7.2			38.3			27.5	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	108	16	39	73	62	5	105	21	74	440	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.95			0.98			1.00	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		1814			1753			1819			1843	
Flt Permitted		0.89			0.91			0.98			0.93	
Satd. Flow (perm)		1635			1608			1789			1731	
Peak-hour factor, PHF	0.81	0.81	0.81	0.82	0.82	0.82	0.72	0.72	0.72	0.83	0.83	0.83
Adj. Flow (vph)	57	133	20	48	89	76	7	146	29	89	530	18
RTOR Reduction (vph)	0	6	0	0	32	0	0	11	0	0	2	0
Lane Group Flow (vph)	0	204	0	0	181	0	0	171	0	0	635	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0			18.0			36.0			36.0	
Effective Green, g (s)		18.0			18.0			36.0			36.0	
Actuated g/C Ratio		0.29			0.29			0.58			0.58	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		475			467			1039			1005	
v/s Ratio Prot												
v/s Ratio Perm		c0.12			0.11			0.10			c0.37	
v/c Ratio		0.43			0.39			0.16			0.63	
Uniform Delay, d1		17.8			17.6			6.0			8.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			2.4			0.3			3.0	
Delay (s)		20.6			20.0			6.4			11.6	
Level of Service		C			C			A			B	
Approach Delay (s)		20.6			20.0			6.4			11.6	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	357	43	111	548	19	109
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.67	0.76	0.76	0.81	0.81
Hourly flow rate (vph)	533	64	146	721	23	135
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				466		
pX, platoon unblocked					0.97	
vC, conflicting volume			597		1578	565
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			597		1580	565
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		76	74
cM capacity (veh/h)			980		99	524

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	597	146	721	158
Volume Left	0	146	0	23
Volume Right	64	0	0	135
cSH	1700	980	1700	616
Volume to Capacity	0.35	0.15	0.42	0.26
Queue Length 95th (ft)	0	13	0	25
Control Delay (s)	0.0	9.3	0.0	19.8
Lane LOS		A		C
Approach Delay (s)	0.0	1.6		19.8
Approach LOS				C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	23	98	40	1	14	12	6	37	3	68	353	27
Peak Hour Factor	0.89	0.89	0.89	0.75	0.75	0.75	0.89	0.89	0.89	0.86	0.86	0.86
Hourly flow rate (vph)	26	110	45	1	19	16	7	42	3	79	410	31

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	181	36	52	521
Volume Left (vph)	26	1	7	79
Volume Right (vph)	45	16	3	31
Hadj (s)	-0.09	-0.23	0.02	0.03
Departure Headway (s)	5.3	5.4	5.2	4.6
Degree Utilization, x	0.26	0.05	0.07	0.67
Capacity (veh/h)	624	582	640	761
Control Delay (s)	10.1	8.7	8.6	16.2
Approach Delay (s)	10.1	8.7	8.6	16.2
Approach LOS	B	A	A	C

Intersection Summary			
Delay	14.0		
HCM Level of Service	B		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	467	1110	299	266	1822	0	0	1993	602
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	5.0	6.0			6.0	6.0
Lane Util. Factor				0.97	0.95	1.00	0.97	0.95			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3433	3539	1583	3433	3539			5085	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3433	3539	1583	3433	3539			5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	537	1276	344	292	2002	0	0	2265	684
RTOR Reduction (vph)	0	0	0	0	0	5	0	0	0	0	0	3
Lane Group Flow (vph)	0	0	0	537	1276	339	292	2002	0	0	2265	681
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				39.0	39.0	39.0	9.0	65.0			51.0	51.0
Effective Green, g (s)				39.0	39.0	39.0	9.0	65.0			51.0	51.0
Actuated g/C Ratio				0.34	0.34	0.34	0.08	0.56			0.44	0.44
Clearance Time (s)				6.0	6.0	6.0	5.0	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				1154	1190	532	266	1983			2236	696
v/s Ratio Prot					c0.36		0.09	c0.57			0.45	
v/s Ratio Perm				0.16		0.21						0.43
v/c Ratio				0.47	1.07	0.64	1.10	1.01			1.01	0.98
Uniform Delay, d1				30.3	38.5	32.5	53.5	25.5			32.5	31.9
Progression Factor				1.00	1.00	1.00	0.90	0.75			1.00	1.00
Incremental Delay, d2				0.3	47.8	2.5	77.2	20.1			22.3	29.1
Delay (s)				30.6	86.3	35.0	125.3	39.1			54.8	61.1
Level of Service				C	F	D	F	D			D	E
Approach Delay (s)		0.0			64.2			50.1			56.3	
Approach LOS		A			E			D			E	

Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	170	1453	84	113	966	0	0	970	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	7.0		7.0	7.0			7.0	
Lane Util. Factor				1.00	0.91		1.00	0.95			0.95	
Frt				1.00	0.99		1.00	1.00			0.96	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	5044		1770	3539			3390	
Flt Permitted				0.95	1.00		0.12	1.00			1.00	
Satd. Flow (perm)				1770	5044		217	3539			3390	
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.87	0.87	0.87	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	187	1597	92	130	1110	0	0	1000	392
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	187	1683	0	130	1110	0	0	1392	0
Turn Type				Perm			Perm					
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				35.0	35.0		67.0	67.0			67.0	
Effective Green, g (s)				35.0	35.0		67.0	67.0			67.0	
Actuated g/C Ratio				0.30	0.30		0.58	0.58			0.58	
Clearance Time (s)				7.0	7.0		7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				534	1522		125	2044			1958	
v/s Ratio Prot					c0.33			0.31			0.41	
v/s Ratio Perm				0.11			c0.60					
v/c Ratio				0.35	1.11		1.04	0.54			0.71	
Uniform Delay, d1				31.6	40.5		24.5	15.1			17.6	
Progression Factor				0.79	0.86		0.60	0.51			0.18	
Incremental Delay, d2				0.0	48.8		83.7	0.8			0.9	
Delay (s)				25.1	83.5		98.4	8.6			4.1	
Level of Service				C	F		F	A			A	
Approach Delay (s)		0.0			77.7			18.0			4.1	
Approach LOS		A			E			B			A	

Intersection Summary			
HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	18	19	43	133	39	27	948	118	18	1335	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0		6.0	5.0		6.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1720		1770	1799		1770	3480		1770	3391	
Flt Permitted	0.30	1.00		0.73	1.00		0.06	1.00		0.14	1.00	
Satd. Flow (perm)	561	1720		1358	1799		113	3480		268	3391	
Peak-hour factor, PHF	0.85	0.85	0.85	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	33	21	22	56	173	51	30	1065	133	19	1405	545
RTOR Reduction (vph)	0	19	0	0	9	0	0	8	0	0	35	0
Lane Group Flow (vph)	33	24	0	56	215	0	30	1190	0	19	1915	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.3	16.0		20.3	16.0		70.2	70.2		70.2	70.2	
Effective Green, g (s)	20.3	16.0		20.3	16.0		70.2	70.2		70.2	70.2	
Actuated g/C Ratio	0.18	0.14		0.18	0.14		0.61	0.61		0.61	0.61	
Clearance Time (s)	4.5	6.0		4.5	6.0		6.0	5.0		6.0	5.0	
Lane Grp Cap (vph)	143	237		253	248		126	2106		214	2052	
v/s Ratio Prot	c0.01	0.01		0.01	c0.12		0.01	c0.34		0.00	c0.56	
v/s Ratio Perm	0.03			0.03			0.14			0.05		
v/c Ratio	0.23	0.10		0.22	0.86		0.24	0.56		0.09	0.93	
Uniform Delay, d1	40.5	43.7		40.8	48.9		39.4	13.7		12.1	20.8	
Progression Factor	1.00	1.00		1.00	1.00		0.20	0.12		1.00	1.00	
Incremental Delay, d2	3.7	0.9		2.0	30.8		3.6	0.9		0.8	9.3	
Delay (s)	44.3	44.6		42.8	79.8		11.5	2.6		12.9	30.1	
Level of Service	D	D		D	E		B	A		B	C	
Approach Delay (s)		44.4			72.4			2.8			30.0	
Approach LOS		D			E			A			C	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1084	1622			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1009	23	0	0	0	0	70	130	43	259	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						1.00		1.00	1.00	
Frt		1.00						0.91		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3522						1699		1770	1863	
Flt Permitted		1.00						1.00		0.53	1.00	
Satd. Flow (perm)		3522						1699		982	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1097	25	0	0	0	0	76	141	47	282	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	56	0	0	0	0
Lane Group Flow (vph)	0	1159	0	0	0	0	0	161	0	47	282	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		67.0						41.0		41.0	41.0	
Effective Green, g (s)		67.0						41.0		41.0	41.0	
Actuated g/C Ratio		0.58						0.35		0.35	0.35	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		2034						601		347	658	
v/s Ratio Prot								0.09			c0.15	
v/s Ratio Perm		0.33								0.05		
v/c Ratio		0.57						0.27		0.14	0.43	
Uniform Delay, d1		15.4						26.8		25.5	28.6	
Progression Factor		1.00						1.00		0.49	0.50	
Incremental Delay, d2		1.2						1.1		0.8	2.0	
Delay (s)		16.6						27.9		13.4	16.3	
Level of Service		B						C		B	B	
Approach Delay (s)		16.6			0.0			27.9			15.9	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	245	1604	53	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	1.00	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			1770	3362	1770	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			1770	3362	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	266	1743	58	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	266	1743	58	0
Parking (#/hr)				0		
Turn Type			Perm			
Protected Phases				8		
Permitted Phases			8		2	
Actuated Green, G (s)			89.0	89.0	19.0	
Effective Green, g (s)			89.0	89.0	19.0	
Actuated g/C Ratio			0.77	0.77	0.16	
Clearance Time (s)			4.0	4.0	4.0	
Lane Grp Cap (vph)			1358	2579	290	
v/s Ratio Prot				c0.52		
v/s Ratio Perm			0.15		c0.03	
v/c Ratio			0.20	0.68	0.20	
Uniform Delay, d1			3.7	6.5	41.9	
Progression Factor			0.40	0.93	0.95	
Incremental Delay, d2			0.0	0.1	1.4	
Delay (s)			1.5	6.2	41.2	
Level of Service			A	A	D	
Approach Delay (s)	0.0			5.6	41.2	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	296	861	20	0	0	0	0	613	175	179	890	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95						0.95		1.00	0.95	
Frt	1.00	1.00						0.97		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	3527						3421		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.17	1.00	
Satd. Flow (perm)	1770	3527						3421		313	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	312	906	21	0	0	0	0	757	216	188	937	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	22	0	0	0	0
Lane Group Flow (vph)	312	926	0	0	0	0	0	951	0	188	937	0
Turn Type	Perm									pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Actuated Green, G (s)	36.3	36.3						43.7		65.7	65.7	
Effective Green, g (s)	36.3	36.3						43.7		65.7	65.7	
Actuated g/C Ratio	0.31	0.31						0.38		0.57	0.57	
Clearance Time (s)	7.0	7.0						7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	554	1104						1289		366	2004	
v/s Ratio Prot		c0.26						c0.28		0.07	c0.26	
v/s Ratio Perm	0.18									0.22		
v/c Ratio	0.56	0.84						0.74		0.51	0.47	
Uniform Delay, d1	33.2	37.1						31.2		31.6	14.8	
Progression Factor	0.80	0.82						1.00		0.68	0.52	
Incremental Delay, d2	1.1	5.0						3.4		0.9	0.6	
Delay (s)	27.7	35.5						34.6		22.6	8.3	
Level of Service	C	D						C		C	A	
Approach Delay (s)		33.5			0.0			34.6			10.7	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	564	206	0	0	0	0	1635	318	230	2231	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Lane Util. Factor	0.86	0.86	1.00					0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1522	4773	1583					5085	1583	3433	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1522	4773	1583					5085	1583	3433	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.87	0.87	0.87	0.89	0.89	0.89
Adj. Flow (vph)	313	594	217	0	0	0	0	1879	366	258	2507	0
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	14	0	0	0
Lane Group Flow (vph)	219	688	209	0	0	0	0	1879	352	258	2507	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	18.0	18.0	18.0					68.4	68.4	13.1	86.0	
Effective Green, g (s)	18.0	18.0	18.0					68.4	68.4	13.1	86.0	
Actuated g/C Ratio	0.16	0.16	0.16					0.59	0.59	0.11	0.74	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	236	741	246					2998	933	388	2624	
v/s Ratio Prot								0.37		0.08	c0.71	
v/s Ratio Perm	0.14	0.14	0.13						0.22			
v/c Ratio	0.93	0.93	0.85					0.63	0.38	0.66	0.96	
Uniform Delay, d1	48.4	48.4	47.7					15.5	12.6	49.3	13.3	
Progression Factor	0.65	0.66	0.63					0.42	0.40	1.11	1.12	
Incremental Delay, d2	29.5	12.9	16.2					0.8	0.9	1.7	4.8	
Delay (s)	61.1	44.9	46.3					7.2	6.0	56.5	19.7	
Level of Service	E	D	D					A	A	E	B	
Approach Delay (s)		48.3			0.0			7.0			23.1	
Approach LOS		D			A			A			C	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1205	44	0	0	0	0	134	113	9	247	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91	1.00					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5078	1583					3539	1583	1770	3539	
Flt Permitted		1.00	1.00					1.00	1.00	0.65	1.00	
Satd. Flow (perm)		5078	1583					3539	1583	1211	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	36	1268	46	0	0	0	0	161	136	10	268	0
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	20	0	0	0
Lane Group Flow (vph)	0	1304	22	0	0	0	0	161	116	10	268	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		29.0	29.0					21.0	21.0	21.0	21.0	
Effective Green, g (s)		29.0	29.0					21.0	21.0	21.0	21.0	
Actuated g/C Ratio		0.48	0.48					0.35	0.35	0.35	0.35	
Clearance Time (s)		5.0	5.0					5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		2454	765					1239	554	424	1239	
v/s Ratio Prot								0.05			c0.08	
v/s Ratio Perm		0.26	0.01						0.07	0.01		
v/c Ratio		0.53	0.03					0.13	0.21	0.02	0.22	
Uniform Delay, d1		10.8	8.1					13.3	13.7	12.8	13.7	
Progression Factor		1.00	1.00					0.75	0.68	0.99	0.99	
Incremental Delay, d2		0.8	0.1					0.2	0.8	0.1	0.2	
Delay (s)		11.6	8.2					10.2	10.2	12.7	13.8	
Level of Service		B	A					B	B	B	B	
Approach Delay (s)		11.5			0.0			10.2			13.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1560	211	250	1785	15	225	30	183	301	136	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.0	5.0	5.5	5.0		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3535		3433	1863	1583	1770	1851	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3535		3433	1863	1583	1770	1851	
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.83	0.83	0.83	0.72	0.72	0.72
Adj. Flow (vph)	9	1677	227	281	2006	17	271	36	220	418	189	8
RTOR Reduction (vph)	0	0	93	0	0	0	0	0	196	0	1	0
Lane Group Flow (vph)	9	1677	134	281	2023	0	271	36	24	418	196	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	4.0	61.0	61.0	21.3	78.3		17.1	16.7	16.7	31.5	31.1	
Effective Green, g (s)	4.0	61.0	61.0	21.3	78.3		17.1	16.7	16.7	31.5	31.1	
Actuated g/C Ratio	0.03	0.41	0.41	0.14	0.52		0.11	0.11	0.11	0.21	0.21	
Clearance Time (s)	5.5	5.0	5.0	5.5	5.0		4.5	4.5	4.5	4.5	4.5	
Lane Grp Cap (vph)	47	1439	644	251	1845		391	207	176	372	384	
v/s Ratio Prot	0.01	c0.47		0.16	c0.57		0.08	0.02		c0.24	c0.11	
v/s Ratio Perm			0.08						0.02			
v/c Ratio	0.19	1.17	0.21	1.12	1.10		0.69	0.17	0.14	1.12	0.51	
Uniform Delay, d1	71.4	44.5	28.9	64.4	35.8		63.9	60.4	60.2	59.2	52.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.9	82.4	0.7	92.7	52.5		9.7	1.8	1.6	84.6	4.8	
Delay (s)	80.3	126.9	29.6	157.1	88.3		73.6	62.2	61.8	143.8	57.5	
Level of Service	F	F	C	F	F		E	E	E	F	E	
Approach Delay (s)		115.1			96.7			67.9			116.2	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	102.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	241	743	92	53	537	100	199	246	79	108	466	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1795		1770	1843	
Flt Permitted	0.20	1.00	1.00	0.25	1.00	1.00	0.15	1.00		0.42	1.00	
Satd. Flow (perm)	374	3539	1583	472	3539	1583	284	1795		790	1843	
Peak-hour factor, PHF	0.75	0.75	0.75	0.82	0.82	0.82	0.81	0.81	0.81	0.97	0.97	0.97
Adj. Flow (vph)	321	991	123	65	655	122	246	304	98	111	480	37
RTOR Reduction (vph)	0	0	50	0	0	76	0	10	0	0	3	0
Lane Group Flow (vph)	321	991	73	65	655	46	246	392	0	111	514	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	39.2	39.2	39.2	24.3	23.8	23.8	58.4	47.1		46.8	40.0	
Effective Green, g (s)	39.2	39.2	39.2	24.3	23.8	23.8	58.4	47.1		46.8	40.0	
Actuated g/C Ratio	0.34	0.34	0.34	0.21	0.21	0.21	0.50	0.41		0.40	0.34	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	359	1196	535	143	726	325	321	729		376	636	
v/s Ratio Prot	c0.15	0.28		0.02	c0.19		c0.09	0.22		0.02	0.28	
v/s Ratio Perm	0.15		0.05	0.08		0.03	c0.29			0.10		
v/c Ratio	0.89	0.83	0.14	0.45	0.90	0.14	0.77	0.54		0.30	0.81	
Uniform Delay, d1	32.4	35.3	26.6	43.5	45.0	37.7	22.0	26.2		22.3	34.5	
Progression Factor	1.00	1.00	1.00	1.11	1.11	1.41	1.00	1.00		0.53	0.50	
Incremental Delay, d2	23.4	4.9	0.1	0.2	1.7	0.0	10.4	2.8		0.4	9.6	
Delay (s)	55.8	40.2	26.8	48.3	51.5	53.2	32.5	29.0		12.2	26.8	
Level of Service	E	D	C	D	D	D	C	C		B	C	
Approach Delay (s)		42.5			51.5			30.3			24.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	323	317	75	180	61	342	1739	46	26	2107	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		4.5	6.0		4.5	5.5		4.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.86		1.00	0.91	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3276		1770	3405		1770	6383		1770	5012	
Flt Permitted	0.37	1.00		0.25	1.00		0.07	1.00		0.08	1.00	
Satd. Flow (perm)	697	3276		466	3405		135	6383		150	5012	
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.86	0.86	0.86	0.87	0.87	0.87
Adj. Flow (vph)	322	404	396	86	207	70	398	2022	53	30	2422	256
RTOR Reduction (vph)	0	153	0	0	28	0	0	3	0	0	11	0
Lane Group Flow (vph)	322	647	0	86	249	0	398	2072	0	30	2667	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.0	22.3		20.2	16.0		74.5	66.6		52.1	49.7	
Effective Green, g (s)	31.0	22.3		20.2	16.0		74.5	66.6		52.1	49.7	
Actuated g/C Ratio	0.27	0.19		0.17	0.14		0.64	0.57		0.45	0.43	
Clearance Time (s)	4.5	6.0		4.5	6.0		4.5	5.5		4.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	283	630		128	470		359	3665		101	2147	
v/s Ratio Prot	c0.10	0.20		0.02	0.07		c0.18	0.32		0.01	c0.53	
v/s Ratio Perm	c0.20			0.09			0.53			0.13		
v/c Ratio	1.14	1.03		0.67	0.53		1.11	0.57		0.30	1.24	
Uniform Delay, d1	40.6	46.9		43.7	46.5		44.4	15.6		34.1	33.2	
Progression Factor	0.80	0.78		1.00	1.00		1.00	1.00		0.51	0.90	
Incremental Delay, d2	86.3	35.6		13.0	1.1		80.1	0.6		0.5	110.3	
Delay (s)	118.7	72.1		56.7	47.6		124.5	16.2		17.9	140.2	
Level of Service	F	E		E	D		F	B		B	F	
Approach Delay (s)		85.5			49.7			33.6			138.8	
Approach LOS		F			D			C			F	

Intersection Summary			
HCM Average Control Delay	86.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	25	994	63	41	702	21	344	468	123	11	575	31
Peak Hour Factor	0.92	0.92	0.92	0.83	0.92	0.83	0.92	0.80	0.80	0.93	0.93	0.92
Hourly flow rate (vph)	27	1080	68	49	763	25	374	585	154	12	618	34
Approach Volume (veh/h)		1176			838			1113			664	
Crossing Volume (veh/h)		680			986			1119			1186	
High Capacity (veh/h)		808			630			564			534	
High v/c (veh/h)		1.46			1.33			1.97			1.24	
Low Capacity (veh/h)		644			489			433			407	
Low v/c (veh/h)		1.83			1.71			2.57			1.63	

Intersection Summary			
Maximum v/c High	1.97		
Maximum v/c Low	2.57		
Intersection Capacity Utilization	110.1%	ICU Level of Service	H

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	709	109	2448	757	89	1958
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	3433	1583	3539	1583	120	3539
Peak-hour factor, PHF	0.87	0.87	0.96	0.96	0.91	0.91
Adj. Flow (vph)	815	125	2550	789	98	2152
RTOR Reduction (vph)	0	105	0	347	0	0
Lane Group Flow (vph)	815	20	2550	442	98	2152
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	16.0	16.0	56.0	56.0	72.0	72.0
Effective Green, g (s)	16.0	16.0	56.0	56.0	72.0	72.0
Actuated g/C Ratio	0.16	0.16	0.56	0.56	0.72	0.72
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	549	253	1982	886	251	2548
v/s Ratio Prot	c0.24		c0.72		0.04	c0.61
v/s Ratio Perm		0.01		0.28	0.24	
v/c Ratio	1.48	0.08	1.29	0.50	0.39	0.84
Uniform Delay, d1	42.0	35.7	22.0	13.4	21.9	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	227.7	0.6	132.9	2.0	4.5	3.6
Delay (s)	269.7	36.3	154.9	15.4	26.4	13.7
Level of Service	F	D	F	B	C	B
Approach Delay (s)	238.6		122.0			14.2
Approach LOS	F		F			B

Intersection Summary			
HCM Average Control Delay	101.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	189	34	44	304	17	67	240	81	3	224	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583		1851	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.50	1.00	1.00		0.94	1.00	0.60	1.00	1.00	0.56	1.00	1.00
Satd. Flow (perm)	933	1863	1583		1747	1583	1110	3539	1583	1039	3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.95	0.95	0.95	0.75	0.75	0.75	0.89	0.89	0.89
Adj. Flow (vph)	34	222	40	46	320	18	89	320	108	3	252	66
RTOR Reduction (vph)	0	0	21	0	0	9	0	0	72	0	0	44
Lane Group Flow (vph)	34	222	19	0	366	9	89	320	36	3	252	22
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0		28.0	28.0	20.0	20.0	20.0	20.0	20.0	20.0
Effective Green, g (s)	28.0	28.0	28.0		28.0	28.0	20.0	20.0	20.0	20.0	20.0	20.0
Actuated g/C Ratio	0.47	0.47	0.47		0.47	0.47	0.33	0.33	0.33	0.33	0.33	0.33
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	435	869	739		815	739	370	1180	528	346	1180	528
v/s Ratio Prot		0.12						c0.09			0.07	
v/s Ratio Perm	0.04		0.01		c0.21	0.01	0.08		0.02	0.00		0.01
v/c Ratio	0.08	0.26	0.03		0.45	0.01	0.24	0.27	0.07	0.01	0.21	0.04
Uniform Delay, d1	8.9	9.7	8.6		10.8	8.6	14.5	14.7	13.6	13.4	14.4	13.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.41	0.37	0.10
Incremental Delay, d2	0.4	0.7	0.1		1.8	0.0	1.5	0.6	0.2	0.0	0.4	0.1
Delay (s)	9.2	10.4	8.7		12.6	8.6	16.0	15.2	13.9	5.6	5.8	1.5
Level of Service	A	B	A		B	A	B	B	B	A	A	A
Approach Delay (s)		10.0			12.4			15.1			4.9	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	241	1991	0	134	0	0	0	17	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0			5.0	
Lane Util. Factor					0.91		0.95	0.95			1.00	
Frt					1.00		1.00	1.00			0.95	
Flt Protected					0.99		0.95	0.95			1.00	
Satd. Flow (prot)					5058		1681	1681			1767	
Flt Permitted					0.99		0.95	0.95			1.00	
Satd. Flow (perm)					5058		1681	1681			1767	
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.92	0.87	0.92	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	277	2289	0	154	0	0	0	18	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	0	2566	0	77	77	0	0	19	0
Turn Type				Perm			Split					
Protected Phases					8		2	2			6	
Permitted Phases				8								
Actuated Green, G (s)					75.0		20.0	20.0			10.0	
Effective Green, g (s)					75.0		20.0	20.0			10.0	
Actuated g/C Ratio					0.62		0.17	0.17			0.08	
Clearance Time (s)					5.0		5.0	5.0			5.0	
Lane Grp Cap (vph)					3161		280	280			147	
v/s Ratio Prot							c0.05	0.05			c0.01	
v/s Ratio Perm					0.51							
v/c Ratio					0.81		0.28	0.28			0.13	
Uniform Delay, d1					17.1		43.7	43.7			51.0	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					2.4		2.4	2.4			1.8	
Delay (s)					19.5		46.1	46.1			52.8	
Level of Service					B		D	D			D	
Approach Delay (s)		0.0			19.5			46.1			52.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL	SWR
Lane Configurations										
Volume (vph)	0	1087	0	457	1051	0	0	0	168	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0				6.0	6.0
Lane Util. Factor		0.95		1.00	0.95				1.00	1.00
Frt		1.00		1.00	1.00				1.00	0.85
Flt Protected		1.00		0.95	1.00				0.95	1.00
Satd. Flow (prot)		3539		1770	3539				1770	1583
Flt Permitted		1.00		0.07	1.00				0.95	1.00
Satd. Flow (perm)		3539		138	3539				1770	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.95	0.95	0.95	0.31	0.31	0.87	0.87
Adj. Flow (vph)	0	1294	0	481	1106	0	0	0	193	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	74
Lane Group Flow (vph)	0	1294	0	481	1106	0	0	0	193	17
Turn Type				pm+pt						Perm
Protected Phases		4		3	8				6	
Permitted Phases				8						6
Actuated Green, G (s)		48.0		86.0	86.0				22.0	22.0
Effective Green, g (s)		48.0		86.0	86.0				22.0	22.0
Actuated g/C Ratio		0.40		0.72	0.72				0.18	0.18
Clearance Time (s)		6.0		6.0	6.0				6.0	6.0
Lane Grp Cap (vph)		1416		534	2536				325	290
v/s Ratio Prot		0.37		c0.24	0.31				c0.11	
v/s Ratio Perm				c0.41						0.01
v/c Ratio		0.91		0.90	0.44				0.59	0.06
Uniform Delay, d1		34.0		35.4	7.0				44.9	40.4
Progression Factor		1.11		1.63	0.28				1.19	2.35
Incremental Delay, d2		10.1		8.5	0.2				4.4	0.2
Delay (s)		47.9		66.3	2.2				57.9	95.4
Level of Service		D		E	A				E	F
Approach Delay (s)		47.9			21.6		0.0		69.9	
Approach LOS		D			C		A		E	

Intersection Summary			
HCM Average Control Delay	36.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	1177	0	0	1381	394	151	0	525	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1770		1583			
Flt Permitted	0.07	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	138	3539			3539	1583	1770		1583			
Peak-hour factor, PHF	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91	0.50	0.50	0.50
Adj. Flow (vph)	139	1338	0	0	1454	415	166	0	577	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	179	0	0	20	0	0	0
Lane Group Flow (vph)	139	1338	0	0	1454	236	166	0	557	0	0	0
Turn Type	pm+pt					Perm	Prot		custom			
Protected Phases	7	4			8		5					
Permitted Phases	4					8			2			
Actuated Green, G (s)	62.0	62.0			48.0	48.0	46.0		46.0			
Effective Green, g (s)	62.0	62.0			48.0	48.0	46.0		46.0			
Actuated g/C Ratio	0.52	0.52			0.40	0.40	0.38		0.38			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0		6.0			
Lane Grp Cap (vph)	180	1828			1416	633	679		607			
v/s Ratio Prot	0.05	c0.38			c0.41		0.09					
v/s Ratio Perm	0.35					0.15			c0.35			
v/c Ratio	0.77	0.73			1.03	0.37	0.24		0.92			
Uniform Delay, d1	50.4	22.5			36.0	25.4	25.2		35.2			
Progression Factor	0.66	0.68			0.50	0.06	1.00		1.00			
Incremental Delay, d2	16.7	1.5			27.4	1.2	0.9		21.0			
Delay (s)	50.0	16.9			45.5	2.9	26.0		56.2			
Level of Service	D	B			D	A	C		E			
Approach Delay (s)		20.0			36.0			49.4			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	0	457	0	0	199
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	497	0	0	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			266			
pX, platoon unblocked						
vC, conflicting volume	497				497	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497				497	497
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	62
cM capacity (veh/h)	1067				533	573

Direction, Lane #	SB 1	SE 1
Volume Total	497	216
Volume Left	0	0
Volume Right	0	216
cSH	1700	573
Volume to Capacity	0.29	0.38
Queue Length 95th (ft)	0	44
Control Delay (s)	0.0	15.0
Lane LOS		C
Approach Delay (s)	0.0	15.0
Approach LOS		C

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Arterial Level of Service: EB 6th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
14th St W	III	30	8.1	16.8	24.9	0.05	7.6	F
BUS 41	III	30	17.0	37.0	54.0	0.13	8.5	F
US 41	III	30	32.9	47.7	80.6	0.26	11.6	E
	III	30	32.9	11.8	44.7	0.26	20.8	C
Total	III		90.9	113.3	204.2	0.70	12.3	E

Arterial Level of Service: EB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
BUS 41	III	30	17.2	42.9	60.1	0.13	7.7	F
US 41	III	30	33.1	60.2	93.3	0.26	10.1	E
	III	30	32.7	10.7	43.4	0.26	21.3	C
Total	III		83.0	113.8	196.8	0.65	11.8	E

Arterial Level of Service: WB 9th Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	32.8	13.0	45.8	0.26	20.3	C
US 41	III	30	32.7	45.7	78.4	0.26	11.8	E
BUS 41	III	30	33.1	54.0	87.1	0.26	10.8	E
Total	III		98.6	112.7	211.3	0.78	13.2	E

Arterial Level of Service: NB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.7	27.8	45.5	0.13	10.4	E
6th Ave	III	30	11.4	34.5	45.9	0.08	6.3	F
Manatee Ave	III	30	7.5	8.7	16.2	0.05	10.8	E
3rd Ave	III	30	10.5	2.6	13.1	0.07	18.6	C
7th St	III	30	86.9	29.8	116.7	0.72	22.3	C
10th St	III	30	17.3	22.8	40.1	0.13	11.6	E
17th St	III	30	33.0	11.9	44.9	0.26	20.8	C
Total	III		184.3	138.1	322.4	1.44	16.1	D

Arterial Level of Service: SB BUS 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
17th St	III	30	17.5	26.2	43.7	0.13	10.8	E
10th St	III	30	33.0	55.2	88.2	0.26	10.6	E
7th St	III	30	17.3	6.8	24.1	0.13	19.3	C
3rd Ave	III	30	86.9	29.8	116.7	0.72	22.3	C
Manatee Ave	III	30	10.5	4.2	14.7	0.07	16.6	D
6th Ave	III	30	7.5	8.6	16.1	0.05	10.8	E
9th Ave	III	30	11.4	26.7	38.1	0.08	7.6	F
Total	III		184.1	157.5	341.6	1.44	15.2	D

Arterial Level of Service: EB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
26th St W	III	30	34.0	122.4	156.4	0.27	6.2	F
Total	III		34.0	122.4	156.4	0.27	6.2	F

Arterial Level of Service: WB Manatee Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	14.2	19.8	34.0	0.10	10.6	E
US 41	III	30	32.9	85.2	118.1	0.26	7.9	F
BUS 41	III	30	32.6	82.1	114.7	0.26	8.0	F
14th St W	III	30	17.4	6.4	23.8	0.13	19.6	C
26th St W	III	30	42.6	86.8	129.4	0.34	9.3	F
Total	III		139.7	280.3	420.0	1.08	9.3	F

Arterial Level of Service: EB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	III	30	36.9	48.3	85.2	0.29	12.3	E
US 41	III	30	10.0	17.1	27.1	0.06	8.6	F
Haben Blvd	III	30	37.1	203.2	240.3	0.29	4.4	F
Total	III		84.0	268.6	352.6	0.65	6.6	F

Arterial Level of Service: WB US 301

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	49.3	48.2	97.5	0.39	14.3	D
US 41	III	30	37.1	47.4	84.5	0.29	12.4	E
	III	30	10.0	2.2	12.2	0.06	19.0	C
Total	III		96.4	97.8	194.2	0.74	13.8	E

Arterial Level of Service: NB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
9th Ave	III	30	17.5	15.5	33.0	0.13	14.2	D
6th Ave	III	30	10.7	7.4	18.1	0.08	15.1	D
Manatee Ave	III	30	7.3	40.2	47.5	0.05	3.5	F
Haben Blvd	III	30	80.3	156.6	236.9	0.67	10.2	E
US 301	III	30	16.5	26.4	42.9	0.12	9.8	F
Total	III		132.3	246.1	378.4	1.04	9.9	F

Arterial Level of Service: SB US 41

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haben Blvd	III	30	66.2	14.2	80.4	0.52	23.4	C
Manatee Ave	III	30	80.3	55.0	135.3	0.67	17.8	D
6th Ave	III	30	7.3	20.4	27.7	0.05	6.1	F
9th Ave	III	30	10.7	118.6	129.3	0.08	2.1	F
Total	III		164.5	208.2	372.7	1.31	12.7	E

APPENDIX E: UNIT COST ASSUMPTIONS FOR PROJECT COSTS

ELEMENTS	COSTS ASSUMPTIONS	DESCRIPTIONS
Pedestrian enhancement*	572,000	per mile
Decorative Streetlight	2,500	per
Trees with grate	2,000	per
Benches	1,800	per
Trash cans	1,000	per
Bicycle racks	1,200	per
Widen sidewalk	23,555	ft width per mile
Enhanced Crosswalk**	13,080	per intersection
Stamped crosswalk	66	per linear foot
Signage	300	per sign
Multi-use Trail	39,600	ft width per mile
(Re)construct 2 lane with 5' sidewalk curb and gutter	5,110,285	per mile
On-street parking	207,345	per mile (per side)
Reconstruct 3 lane with center turn lane, 5' sidewalk and curb and gutter	5,317,630	per mile
Widen from 2 lane undivided to 4 lane divided	5,428,616	per mile
Widen from 3 lane undivided to 4 lane divided	4,622,380	per mile
9th Ave ROW	11.3	per square foot
Mill resurface and stripe bike lane	1,023,754	per mile
15th St W ROW	12.7	per square foot
Bicycle lane pavement markings and signage	6,200	per mile
Bicycle thermoplastic pavement markers	2,700	per mile
Bicycle lane signage	3,500	per mile
Roundabout	331,608	per
West Roundabout ROW	20	per square foot
4 lane intersection signalization	331,608	per intersection
Add 300' right turn lane	277,225	per lane
Add 300' left turn lane	123,020	per lane
Add outside lane	4,702,498	per mile
Add continuous center turn lane	2,471,664	per mile
Mill resurface 4 lane and stripe bike lane	1,057,669	per mile
***Streetlights and trees alternate 60' o.c., benches, trash cans and bike racks every 120'**		
****180 linear feet of crosswalk and 4 signs per intersection**		

APPENDIX F

Community Workshop

To review existing conditions and identify ways to improve both mobility and livability in downtown Bradenton and Palmetto.

We want your input! The cities of Palmetto and Bradenton have embarked on a Downtown Mobility Study and you are invited to participate in a community workshop to identify strategies for improving mobility in the downtown areas. The cities are facing escalating traffic congestion and need to find the right balance between local mobility and regional access. Both communities have completed ambitious redevelopment plans and downtown master plans to improve the livability, economic vitality and pedestrian-friendly character of their downtowns. Transportation accessibility and personal mobility are essential to realizing the cities' community development objectives.

Please join us in this collaborative effort to enhance the mobility and accessibility of downtown Palmetto and Bradenton. Refreshments will be provided.

Join us for a community workshop on

THURSDAY,
MAY 8, 2008

5:30 – 7:30pm

Central Bradenton Library
1301 Barcarrota Blvd. West

For more information contact:
Laura Logue 941-708-6300
laura.logue@cityofbradenton.com

For more information:
www.downtownmobility.com

BRADENTON / PALMETTO DOWNTOWN MOBILITY STUDY
Community Workshop No. 1 – Worksheet

Survey #	22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		Enter a 1 in the corresponding cell																					
I live in…																							
Bradenton	8			1	1			1	1		1									1	1	1	
Palmetto	10	1	1			1						1	1		1	1	1	1					1
Manatee County	2									1				1									
Sarasota County	1																		1				
Other	1						1																
I work in…																							
Bradenton	14	1	1	1	1	1		1	1	1	1	1			1			1	1	1			
Palmetto	1								1														
Manatee County	1																						1
Sarasota County	1															1							
Other	5						1						1				1				1	1	
Existing Conditions Assessment																							
		Enter the value circled on the survey																					
The study recommendations should focus on….	6.35	10	x	3	10	5	2	x	7	4	1	5	10	6	9	5	2	10	8	2	10	8	10
The main corridors of Manatee Avenue…	7.06	4	x	9	3	5	10	x	8	10	8	8	x	7	9	5	8	10	5	9	x	6	3
The bicycle and pedestrian connections …	7.55	6	9	8	3	6	10	x	5	9	9	10	10	6	9	10	3	10	8	8	x	8	4
The availability and frequency…	7.30	6	9	6	6	6	8	x	8	5	8	10	8	5	9	10	8	6	5	9	x	8	6
There is insufficient or poorly located …	6.30	3	9	6	10	6	5	x	4	2	8	10	5	5	10	5	5	5	10	4	x	8	6
Comments:		More parking at city center & auditorium area for events	We need to work on traffic flow along with pedestrian and bike travel				Improved transit is needed even without increases in density	Look at sharing CSX tracks to put in a Palmetto/Brad light rail; at each end of rail line, have a "trolley" type loop line for just downtowns on a continuous loop													I have described traffic changes to go N. into downtown w/o crossing Manatee Ave (one-way west-bound)	Need bikeway from 15th St w to Braden River using combo of low-volume streets with defined bike lane if road is wide enough; go back to using bikes on Riverwalk or at least on 3rd Ave from 9th St W to the road that goes past Manatee Mem. Hospital. Then use side streets out to about 28th St E, there's only 1 place the prevents it a single unbuilt lot: buy it. May need path along SR 64 for a couple blocks til Braden River. Maybe consider the boat ramps park as a terminus (or just east of Braden R. at Carlton Arms stoplight).	
Potential Downtown Transportation Strategies																							
		Enter the value circled on the survey																					
Convert Manatee Avenue and 6th Avenue…	6.75	1	x	8	8	7	8	9	6	x	10	10	x	1	x	7	x	8	7	10	x	7	1
Convert 14th Street in Bradenton into a two-lane…	6.80	1	x	8	5	7	5	x	7	x	10	10	x	1	x	10	x	9	3	10	x	8	8
Install roundabouts to keep traffic flowing…	5.31	1	x	5	2	1	9	x	6	x	10	6	3	5	x	10	x	5	6	7	x	8	1
Make each of the bridges over…	2.88	7	x	5	3	1	1	2	1	x	5	1	2	1	x	1	x	2	5	3	x	8	1
The study should consider flyovers…	5.40	7	x	5	8	7	1	2	3	x	5	7	x	7	x	6	x	5	10	1	x	x	7
Make 7th Street as an east-west…	6.47	3	x	8	7	7	10	x	5	x	6	8	8	1	x	9	x	9	7	5	x	x	4
Improve east-west connectivity…	6.20	7	x	7	8	7	1	x	6	x	10	8	1	1	x	9	x	10	7	8	x	x	3
Comments:																					See survey for additional comments	Connect Brad & Palmetto with trolley & or ferry. Re: bicycles, N of Manatee Ave are the kind of destinations cyclists would be interested in with addition of Manatee Village Historical Park cyclists would be encouraged to make an outing with appropriate destinations & a pleasant way to get there. Buses are ugly, confined; where possible, use an "open" nice-looking trolley, would especially be in keeping with Old Manatee & Old Main	

APPENDIX G

Bradenton/Palmetto Downtown Mobility Study

Community Workshop

Provide your input on the proposed mobility alternatives and results of the alternatives analyses for continued development of the recommendations.

Thanks for your feedback at the first workshop – we would like to hear more! You are invited to participate in the second community workshop for the Bradenton/Palmetto Downtown Mobility Study, the objective of which is to get your comments and ideas on the proposed mobility alternatives and results of the alternatives analyses. The proposed alternatives can be viewed at www.downtownmobility.com (refer to the Products and Maps page and download the presentation).

This workshop will focus on presenting alternatives for roadway, bicycle/pedestrian and transit scenarios and is intended to allow participants to review/refine strategies and discuss potential implications for the communities.

Please join us as we come one step closer to developing the recommended strategies for the Bradenton/Palmetto Downtown Mobility Master Plan. Refreshments will be provided.

Join us for a community workshop on

TUESDAY,
AUGUST 19, 2008

5:00pm – 7:00pm
**Presentation at 5:30 pm*

Palmetto Branch Library
923 6th Street West

For more information contact: Laura Logue : 941-708-6300 • laura.logue@cityofbradenton.com

Bradenton / Palmetto Downtown Mobility Study
Community Workshop No. 2

Survey #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
I live in …….	64																																																																		
Bradenton	51		1	1	1	1	1	1					1	1	1			1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1			1		1		1
Palmetto	5								1								1																																							1					1		1	
Manatee County	4	1							1		1					1																																																
Sarasota County	2																							1																																			1				
Other	2											1																																													1					
I work in …….	55																																																																
Bradenton	43					1				1			1	1	1	1		1		1	1		1		1	1			1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1	1	1		1	
Palmetto	5		1		1		1																								1																										1								
Manatee County	4	1							1		1												1																																										
Sarasota County	1																							1																																									
Other	2																1					1																																											
Rank the following near-term strategies (1 - least supportive to 5 - most supportive)																																																																		
1] Rank the following near-term roadway strategies																																																																		
Manatee Avenue	2	5	3	1	3	1		1	5	3	3	1	5	1	1	3	2	1		2	1	1	1	5		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			2		2							
6th Avenue	1	5	3		3	2			5	3		1	5	1	1	3	2			2	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					1							
14th Street	2		3		5	1			3	3	4	1	5	3	1	3	2			2	1	3	1			1	1		1	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					2							
8th Avenue in Palmetto	2	5	3		5	1			5	1	3	1	5	1	1	5	4			2	1	2	1		1	1	1		1		1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1								
2) Replace one lane of traffic on Manatee Avenue and 6th Avenue with on-street parking, wider sidewalks and other amenities while keeping it as a one-way pair	1.647058824	5	2	1	5			1	5	1	3	1	3	1	1	3	1	1	1	2	1	1	1	5	1			1	1	1			1		1			1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		2	2	2	2	2	2			2	3
1 - hate this ideas	34			1				1		1		1		1	1		1	1	1		1	1	1		1				1	1	1			1		1			1	1	1	1	1	1	1	1	1	1		1	1	1	1	1												
2 - Not the best option	9		1																	1																																				1	1	1	1	1	1			1	
3 - I'm on the fence	6					1	1				1		1			1																																																1
4 - Like the idea	0																																																																
5 - Love it	4	1			1				1															1																																									
3) Create additional capacity (continuous 4 lanes) on 9th Avenue/Martin Luther King, Jr. with a connection to 15th Street West	1.278688525	5	1	1	3			1	4	4	1	1	4	1	1	1	1	1		1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 - hate this ideas	57		1	1		1	1	1			1	1		1	1	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 - Not the best option	0																																																																	
3 - I'm on the fence	2				1																			1																																									
4 - Like the idea	3								1	1			1																																																			
5 - Love it	1	1																																																															
4) Construct a roundabout at Manatee Ave. and 15th St. W and connect 15th Street W to 9th Avenue	1.305084746	5	2	1	3			1	5	3			2	1	1	2	2	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
1 - hate this ideas	50			1				1						1	1			1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
2 - Not the best option	4		1										1			1	1																																																
3 - I'm on the fence	4				1		1			1														1																																									
4 - Like the idea	0																																																																
5 - Love it	2	1							1																																																							
5) Reduce 14th Street in Bradenton and 8th Avenue in Palmetto (Business 41) to a 2 lane road with a center turn lane, on-street parking and enhanced pedestrian amenities	1.479166667	5	2	2	3			1	5	1			4	3	1	2	2	1	1	1	1	1	2	4	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1									
1 - hate this ideas	37							1		1					1			1	1	1	1	1			1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1									
2 - Not the best option	5		1	1												1	1						1																																									
3 - I'm on the fence	3				1		1							1																																																		
4 - Like the idea	2												1											1																																									
5 - Love it	2	1							1																																																						
Rank the following long-term strategies (1 - least supportive to 5 - most supportive)																																																																	
6) Reconnect the grid street network along 8th Avenue, 15th Street and 3rd Avenue in Bradenton, and 7th Street and 10th Avenue in Palmetto	2.411764706	3	1	3	2			1	4	3			4	2	1	2	3	1	1	1	1	2	1	3	1				3	3							3		3				3	3	3	3	3	3	3		3		3		3									
1 - hate this ideas	9		1					1							1			1	1	1	1		1		1																																								
2 - Not the best option	4				1									1		1						1																																										
3 - I'm on the fence	20	1		1			1			1							1							1					1	1							1		1				1	1	1	1	1	1	1		1		1		1									
4 - Like the idea	2								1				1																																																		
5 - Love it	0																																																																
7) Convert US 41/US 301 to a controlled access regional road with an urban interchange in Bradenton and overpasses at Manatee Avenue, Haben Boulevard, 7th Street and 17th Street	2.545454545	5	1	2	3			1	5	3			4	2	1	3	3	1	1	2	1	2	1	3	1				3	3							3		3				3	3	3	3	3	3	3		3				3									
1 - hate this ideas	8		1					1							1			1	1		1		1		1																																								
2 - Not the best option	4			1										1						1		1																																										
3 - I'm on the fence	19				1		1			1						1	1							1					1	1							1		1				1	1	1	1	1	1	1		1				1									
4 - Like the idea	1												1																																																		
5 - Love it	2	1							1																																																						
8) Construct a roundabout at 9th Street and 9th Avenue and a new road connection from 9th Street E to Manatee Avenue on the east	1.288135593	5	1	2	3			1	5	2			2	1	1	1	3	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
1 - hate this ideas	52		1			1	1							1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
2 - Not the best option	3			1						1			1																																																			
3 - I'm on the fence	3				1												1							1																																								
4 - Like the idea	0																																																																
5 - Love it	2	1							1																																																						
9) Widen 15th Street W to 4 lanes from 9th Avenue/MLK, Jr to Manatee Avenue	1.355932203	5	1	2	3			1	1	4			4	1	1	1	5	1	1	1	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
1 - hate this ideas	52		1					1	1					1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
2 - Not the best option	1			1																																																												
3 - I'm on the fence	2				1		1																																																								
4 - Like the idea	2									1			1																																																		
5 - Love it	3	1															1							1																																							

Rank the following transit Strategies (1 - least supportive to 5 - most supportive)

10) How do you feel about a downtown hybrid electric circulator operating every 10-15 minutes as an option for expanding transportation choices and helping reduce the number of vehicles in the downtown area?	2.763157895	5	5	2	4			1	5	4	3	3	3	1	1	3	3		1	1	1	5	1	3	1				3	3			1					3	3				3	3	3	3	3	3	3	3	3	3	3		3
1 - hate this ideas	9							1							1	1				1	1	1		1		1									1																						
2 - Not the best option	1			1																																																				
3 - I'm on the fence	23						1				1	1	1			1	1							1					1	1									1	1				1	1	1	1	1	1	1	1	1	1	1		1
4 - Like the idea	3				1	1				1																																														
5 - Love it	4	1	1						1													1																																
11) Would you support a re-allocation of local and state/federal funds to enable an increase in MCAT bus service frequency to 30 minutes or better on routes serving downtown (Routes 1, 2, 3, 4, 9, 13 and 99)	2.947368421	5	5	3	4			1	5	4	4	3	2	2	1	3	5		1	1	1	4	1	5	1				3	3						3	3	3				3	3	3	3	3	3	3	3	3	3	3		3
1 - hate this ideas	7							1								1				1	1	1		1		1																														
2 - Not the best option	2												1	1																																								
3 - I'm on the fence	21			1			1					1				1														1	1							1	1	1				1	1	1	1	1	1	1	1	1	1	1		1
4 - Like the idea	5				1	1				1	1											1																																
5 - Love it	5	1	1						1								1						1																														
12) A potential Transit Mall corridor is along 13th Street W between 8th Avenue W and 6th Ave W. This concept would include the creation of a dedicated transit right-of-way and construction of a multi-use transfer facility at 13th St W and 8th Ave W.	2.973684211	5	5	3	5			1	5	4	4	4	4	2	2	3	5		1	2	1	1	1	3	1				3	3						3	3	3				3	3	3	3	3	3	3	3	3	3	3		3
1 - hate this ideas	6							1												1		1	1	1		1																														
2 - Not the best option	3													1	1					1																																			
3 - I'm on the fence	22			1		1	1									1								1					1	1							1	1	1				1	1	1	1	1	1	1	1	1	1	1		1
4 - Like the idea	4									1	1	1	1																																										
5 - Love it	5	1	1		1				1							1																																					
12a) Which option do you prefer?	18																																																						
13th Street W converted to a bus and pedestrian only corridor, linking the Riverwalk with 14th Street	9	1	1		1				1									1			1	1	1		1																															
13th Street W maintains one southbound lane of vehicle traffic	4					1					1		1			1																																							
13th Street W maintains one northbound lane of vehicle traffic	5			1				1		1			1	1																																								
13) Are you supportive of a long-term strategy to bring passenger rail service (via TBARTA) to Bradenton and Palmetto, connecting to Tampa and St. Petersburg?	3.254901961	5	5	3	5			1	5	4	4	5	5	2	2	3	1		1	2	1	5	1	3	1	4	3	5	3	5	4	3	2	5	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
1 - hate this ideas	6							1										1		1		1		1		1																														
2 - Not the best option	4													1	1					1														1																					
3 - I'm on the fence	25			1			1										1								1			1		1			1					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4 - Like the idea	5									1	1															1					1					1																				
5 - Love it	13	1	1		1	1			1			1	1									1						1		1				1	1																					1

Bradenton / Palmetto Downtown Mobility Study
Community Workshop No. 2

Survey #		65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
I live in	62																																																																	
Bradenton	51			1		1	1			1	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1
Palmetto	7	1	1		1			1	1																					1															1																				
Manatee County	4											1					1																																								1					1		
Sarasota County	0																																																														
Other	0																																																														
I work in	24																																																														
Bradenton	12		1	1	1			1	1									1	1											1							1									1										1	1								
Palmetto	5					1	1										1																						1																		1							
Manatee County	2																																					1					1																				
Sarasota County	0																																																														
Other	5																																		1	1				1	1			1																					
Rank the following near-term strategies (1 - least supportive to 5 - most supportive)																																																																	
1] Rank the following near-term roadway strategies																																																																	
Manatee Avenue	2			1								3	4	3			1		2												1	1			1	1				1	1		1	1											2		1				3	4	3			
6th Avenue	2			1								3	4	3			1		1												1	1			1	1				1	1		1	1											1		1				3	4	3			
14th Street	3			1								3	4	4			1		2												5	1				1				1			1	5											2		1				4	4	3			
8th Avenue in Palmetto	3		2									4	4	3			1		2												5	1				1				1			1	5											2		1				3	4	4			
2) Replace one lane of traffic on Manatee Avenue and 6th Avenue with on-street parking, wider sidewalks and other amenities while keeping it as a one-way pair	2		3	1	2	3		1	2	2		3	2	3			5	1		2								1			1	2			1	3	1	1																													
1 - hate this ideas	13			1				1										1										1			1				1		1	1	1		1			1			1									1										
2 - Not the best option	10				1				1	1			1							1												1												1											1							1			1
3 - I'm on the fence	8		1			1						1		1																						1				1																					1		1		
4 - Like the idea	1																																																									1					
5 - Love it	1																1																																															
3) Create additional capacity (continuous 4 lanes) on 9th Avenue/Martin Luther King, Jr. with a connection to 15th Street West	1.108108108	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	1																									
1 - hate this ideas	60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 - Not the best option	0																																																																
3 - I'm on the fence	4																																		1	1				1	1																									
4 - Like the idea	0																																																															
5 - Love it	0																																																															
4) Construct a roundabout at Manatee Ave. and 15th St. W and connect 15th Street W to 9th Avenue	1.121212121	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	1																												
1 - hate this ideas	52	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1
2 - Not the best option	0																																																																
3 - I'm on the fence	4																																		1	1				1	1																									
4 - Like the idea	0																																																															
5 - Love it	0																																																															
5) Reduce 14th Street in Bradenton and 8th Avenue in Palmetto (Business 41) to a 2 lane road with a center turn lane, on-street parking and enhanced pedestrian amenities	2.166666667			1								3	2	3					3											3	1	2			3	3	1	1																												
1 - hate this ideas	6			1																											1						1	1	1					1	1											1									
2 - Not the best option	4												1																			1											1																		1			
3 - I'm on the fence	12											1		1					1											1					1	1				1	1				1										1					1		1		
4 - Like the idea	0																																																														
5 - Love it	0																																																															
Rank the following long-term strategies (1 - least supportive to 5 - most supportive)																																																																	
6) Reconnect the grid street network along 8th Avenue, 15th Street and 3rd Avenue in Bradenton, and 7th Street and 10th Avenue in Palmetto	2.25					3	3					3	3	4				1												1	1			3	3	1	1																												
1 - hate this ideas	9																	1												1	1					1	1	1					1	1												1									
2 - Not the best option	0																																																															
3 - I'm on the fence	10					1	1					1	1																						1	1				1	1																					1	1		
4 - Like the idea	2													1																																												1					
5 - Love it	0																																																															
7) Convert US 41/US 301 to a controlled access regional road with an urban interchange in Bradenton and overpasses at Manatee Avenue, Haben Boulevard, 7th Street and 17th Street	2.3											2	3	4				3													1	2			3	3	1	1																												
1 - hate this ideas	6																														1						1	1	1					1																	1				
2 - Not the best option	4											1																				1											1																				1		
3 - I'm on the fence	8												1					1																	1	1				1	1															1					1			
4 - Like the idea	1													1																																																		
5 - Love it	0																																																															
8) Construct a roundabout at 9th Street and 9th Avenue and a new road connection from 9th Street E to Manatee Avenue on the east	1.125	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	3	3	1	1																												
1 - hate this ideas	50	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1			1	1	1			1	1	1		1	1	1	1	1	1	1	1	1	1	1				1	1	1		1
2 - Not the best option	0																																																															
3 - I'm on the fence	4																																		1	1				1	1																									
4 - Like the idea	0																																																															
5 - Love it	0																																																															
9) Widen 15th Street W to 4 lanes from 9th Avenue/MLK, Jr to Manatee Avenue	1.258064516	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1		1	1	1		5	1	1	1	3	3	1	1																												
1 - hate this ideas	46	1	1	1	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1		1	1	1			1	1	1			1	1	1			1	1			1	1	1		1	1	1	1	1	1	1				1	1	1		1
2 - Not the best option	0																																																															
3 - I'm on the fence	4																																		1	1				1	1																									
4 - Like the idea	0																																																															
5 - Love it	2																														1													1																					
Rank the following transit Strategies (1 - least supportive to 5 - most supportive)																																																																	
10) How do you feel about a downtown hybrid electric circulator operating every 10-15 minutes as an option for expanding transportation choices and helping reduce the number of vehicles in the downtown area?	2.166666667							1			1	3	2	2			3		1													1			5	5	1	1																												
1 - hate this ideas	10							1			1								1													1					1	1	1					1											1										1
2 - Not the best option	4												1	1																																														1	1			
3 - I'm on the fence	4											1					1																																								1				1		
4 - Like the idea	0																																																															
5 - Love it	4																																		1	1				1	1																									
11) Would you support a re-allocation of local and state/federal funds to enable an increase in MCAT bus service frequency to 30 minutes or better on routes serving downtown (Routes 1, 2, 3, 4, 9, 13 and 99)	2.636363636							2				4	1	2			1	3													5	4			3	3	1																												
1 - hate this ideas	5												1				1																				1																					1						
2 - Not the best option	3							1						1																																												1					
3 - I'm on the fence	6																	1																	1	1				1	1															1							
4 - Like the idea	4											1																				1											1																				1		

5 - Love it	2																													1													1																						
12) A potential Transit Mall corridor is along 13th Street W between 8th Avenue W and 6th Ave W. This concept would include the creation of a dedicated transit right-of-way and construction of a multi-use transfer facility at 13th St W and 8th Ave W.	2.75											3	2	2			3														5				3	3		1																												
1 - hate this ideas	2																																					1	1																										
2 - Not the best option	4												1	1																																													1	1			
3 - I'm on the fence	8											1					1																		1	1				1	1																	1					1		
4 - Like the idea	0																																																																
5 - Love it	2																													1													1																						
12a) Which option do you prefer?	0																																																																
13th Street W converted to a bus and pedestrian only corridor, linking the Riverwalk with 14th Street	8													1			1	1													1													1													1	1			1				
13th Street W maintains one southbound lane of vehicle traffic	4											1	1																																																	1	1		
13th Street W maintains one northbound lane of vehicle traffic	0																																																																
13) Are you supportive of a long-term strategy to bring passenger rail service (via TBARTA) to Bradenton and Palmetto, connecting to Tampa and St. Petersburg?	2.833333333			4								1	3	1			3	2	3												5	5			3	3	1																												
1 - hate this ideas	5											1		1																							1																								1		1		
2 - Not the best option	2																	1																																							1								
3 - I'm on the fence	10												1				1		1																1	1				1	1															1		1				1			
4 - Like the idea	1			1																																																													
5 - Love it	4																													1	1											1	1																						

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