A G E N D A
ORMOND BEACH PLANNING BOARD
Regular Meeting

September 12, 2013 **7:00 PM**

City Commission Chambers
22 South Beach Street
Ormond Beach, FL

PURSUANT TO SECTION 286.0105, FLORIDA STATUTES, IF ANY PERSON DECIDES TO `APPEAL ANY DECISION MADE BY THE PLANNING BOARD WITH RESPECT TO ANY MATTER CONSIDERED AT THIS PUBLIC MEETING, THAT PERSON WILL NEED A RECORD OF THE PROCEEDINGS AND FOR SUCH PURPOSE, SAID PERSON MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDING IS MADE, INCLUDING THE TESTIMONY AND EVIDENCE UPON WHICH THE APPEAL IS TO BE BASED.

PERSONS WITH A DISABILITY, SUCH AS A VISION, HEARING OR SPEECH IMPAIRMENT, OR PERSONS NEEDING OTHER TYPES OF ASSISTANCE, AND WHO WISH TO ATTEND CITY COMMISSION MEETINGS OR ANY OTHER BOARD OR COMMITTEE MEETING MAY CONTACT THE CITY CLERK IN WRITING, OR MAY CALL 677-0311 FOR INFORMATION REGARDING AVAILABLE AIDS AND SERVICES.

I. ROLL CALL

II. INVOCATION

III. PLEDGE OF ALLEGIANCE

IV. NOTICE REGARDING ADJOURNMENT

THE PLANNING BOARD WILL NOT HEAR NEW ITEMS AFTER 10:00 PM UNLESS AUTHORIZED BY A MAJORITY VOTE OF THE BOARD MEMBERS PRESENT. ITEMS WHICH HAVE NOT BEEN HEARD BEFORE 10:00 PM MAY BE CONTINUED TO THE FOLLOWING THURSDAY OR TO THE NEXT REGULAR MEETING, AS DETERMINED BY AFFIRMATIVE VOTE OF THE MAJORITY OF THE BOARD MEMBERS PRESENT (PER PLANNING BOARD RULES OF PROCEDURE, SECTION 2.7).

V. APPROVAL OF THE MINUTES: August 8, 2013.

VI. PLANNING DIRECTOR'S REPORT

A. Wireless Primer and Status Report on Consultant

VII. PUBLIC HEARINGS

A. <u>SE 13-108: Special Exception for Outdoor Music, 790 South Atlantic Avenue, Dimitri's Bar Deck & Grill</u>

This is a request submitted by Dimitri Bourtzakis (applicant), of Dimitri's Bar Deck & Grill, for a Special Exception to authorize an outdoor activity use. The requested outdoor activity is to allow outside live music under certain conditions at 790 South Atlantic Avenue. The subject property is zoned B-7 (Highway Tourist Commercial).

B. LDC 13-111: Land Development Code Amendment, Section 1-20, Codes and standards adopted by reference

This is an administrative request to amend Chapter 1, General Administration, Article II, Administration and Enforcement, Section 1-20, Codes and standards adopted by reference, to add the following documents as adopted by reference: (1) "Low Impact Development Manual for the City of Ormond Beach", (2) "Ormond Beach Downtown Design Guidelines", and (3) "Ormond Beach Multi-Modal Strategy".

C. LUPA 13-106: Small-Scale Land Use Map Amendment, 260 Williamson Boulevard (United States Post Office)

This is an administrative request to change the existing Future Land Use designation of an ±8.06-acre property located at 260 Williamson Boulevard from the existing land use designation of Volusia County "Urban Medium Intensity" to City of Ormond Beach "Low Intensity Commercial" as the result of an annexation.

D. PBD 13-107: Zoning Map Amendment, 260 Williamson Boulevard (United States Post Office)

This is an administrative request to amend the City's Official Zoning Map for an ±8.06 acre parcel of land from the existing zoning classification of Volusia County BPUD (Business Planned Unit Development) to City of Ormond Beach PBD (Planned Business Development).

VIII. OTHER BUSINESS

IX. MEMBER COMMENTS

X. ADJOURNMENT

M I N U T E S

ORMOND BEACH PLANNING BOARD

Regular Meeting

August 8, 2013 7:00 PM

City Commission Chambers
22 South Beach Street
Ormond Beach, FL 32174

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I. ROLL CALL

Members Present	Staff Present
Pat Behnke	Steven Spraker, AICP, Senior Planner
Harold Briley	Shawn Finley, P.E., Civil Engineer
Rita Press	Meggan Znorowski, Recording Technician
Al Jorczak	
Doug Wigley (excused)	
Doug Thomas (excused)	
Lewis Heaster (excused)	

II. INVOCATION

Mr. Briley led the invocation.

III. PLEDGE OF ALLEGIANCE

IV. NOTICE REGARDING ADJOURNMENT

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V. MINUTES

A. July 13, 2013

Mr. Jorczak moved to approve the minutes. Ms. Press seconded the motion. **Mr. Briley called for any objections, hearing none the minutes were unanimously approved.**

VI. PLANNING DIRECTOR'S REPORT

None.

VII. PUBLIC HEARINGS

A. PBD 13-076: Nova Shopppes. 2nd Planned Business Development Amendment, 175 South Nova Road

Mr. Steven Spraker, Senior Planner stated this is an application for a second amendment to the Planned Business Development (PBD) to allow the operation of a permanent cosmetics use. Mr. Spraker explained the location, orientation, and characteristics of the property, presented the staff report, and stated staff is recommending approval.

Mr. Paul Holub, applicant and landlord for Nova Shoppes, stated the tenant in question has been there for quite some time and is a great tenant. Mr. Holub continued that there are specific use clauses in his leases which control what a tenant can and cannot do on top of the rules and regulations of the City. Mr. Holub explained that what he intends to do is do an amendment to the tenant's lease to make the specifics of this PBD amendment part of her use clause so that is in force; therefore there is not only the City's enforcement, but also him, as landlord, who will not allow a tattoo parlor on his properties.

Ms. Behnke asked if the tenant was currently operating at this location.

Mr. Holub responded that she was operating at a previous site in Ormond before moving into 175 South Nova Road.

Ms. Behnke asked how long she has been at this location.

Mr. Holub replied approximately 14 months.

Ms. Behnke asked what authorization she was working under.

Mr. Holub answered that they did not know until code enforcement came that it was not allowed. Mr. Holub explained that it is not just a permanent cosmetic operation, they also do facials and weight loss. Mr. Holub continued that once informed the use was not permitted, the applicant ceased that type of work, and they made application to change the definition in the Land Development Code, which did not work, that led them to be before the Board with this application.

Mr. Jorczak asked if there is a state inspection for this type of facility.

Mr. Holub responded that he did not know the answer to that, but as a landlord he does routine inspections.

Dee Morgan, 18 Pinetrail Circle, thanked staff for the presentation and packet. Ms. Morgan stated that when she moved to this location that she could do permanent cosmetics which encompasses scar relaxation and scar cover, but that permanent makeup was not included in the permanent cosmetics use. Ms. Morgan explained that most people think they are the same thing, but it isn't. Ms. Morgan continued that permanent cosmetics is the umbrella for tattoo removal, scar relaxation, permanent makeup, and permanent makeup correction. Ms. Morgan explained that 90 percent of what she does is either medical or correction of other people's work. Ms. Morgan stated that people

putting tattoo ink into faces creates a problem which is very hard to fix. Ms. Morgan explained that women who have breast cancer and have awful scars and no areola can be fixed to look good and the women then feel good, and she can make a new areola that makes them feel like women again, which is important. Ms. Morgan stated she would like to do permanent makeup at this location. Ms. Morgan explained that currently she has another location that she is doing permanent makeup, but it is not a place that most of her clients would go because it is a tattoo place. Ms. Morgan stated the ladies in the audience are typical of her clientele. Ms. Morgan explained that permanent makeup is usually for people who cannot put on makeup or are allergic to regular makeup. Ms. Morgan stated that even though Mr. Holub stated she was cited by code enforcement, they had only just moved in when she found out that she could not do permanent makeup. Ms. Morgan explained that since she has been in business in this area, approximately since 2006, she was permitted to do permanent makeup, but since then the state has changed the definition to put tattoos and permanent makeup together. Ms. Morgan stated she knows why it was done because of the exam for blood borne pathogens, and pass the Health Department's inspections. However, she does not have any idea how to do a tattoo, has never done one. Ms. Morgan continued that the only thing she has ever done is permanent makeup and permanent makeup correction. Ms. Morgan stated she has 8 diplomas, and is a certified nurse's assistant.

Mr. Jorczak asked if there is a periodic health inspection that is done.

Ms. Morgan replied yes, annually.

Ms. Behnke asked how eyelashes are created by permanent makeup.

Ms. Morgan responded they are created with pigments in wisp formations which really end up looking like eyelashes. Ms. Morgan explained that people that have burns and no eyelashes, eyebrows, or lips, she is able to actually make them lips, eyelashes, and eyebrows.

Ms. Press stated her concern is that permanent makeup is separated from tattooing, and that is being done in this case.

Ms. Behnke asked that if the Board approves this amendment, does it open up this option for everyone.

Mr. Spraker responded that one of the purposes of the planned developments is to allow uses or negotiate development standards. Mr. Spraker explained that in the report staff listed other projects that allowed uses that were not otherwise allowed in the district, they have to go through a public hearing process, notifications, and review by the Planning Board and City Commission. Mr. Spraker stated someone could very well apply, but the conditions for tattoo parlor and their use at that time. Mr. Spraker explained that there is a heavy cost and scrutiny by staff to get where the applicant is at this point.

Ms. Behnke asked if anyone else applying for this use would have to go through the same process as this applicant.

Mr. Spraker responded that they would either need to find a location that works in the B-5 zoning district or they would need to go through the PBD process.

Mr. Jorczak moved to approve PBD 13-076 as submitted. Ms. Press seconded the motion. Vote was called, and the motion unanimously approved.

B. <u>LUPA 13-087: Large Scale Comprehensive Plan Land Use Map Amendment, 1298 West Granada Boulevard</u>

Mr. Spraker stated this is a request for the property located at 1298 West Granada Boulevard, which is currently in the process of being annexed. Mr. Spraker explained the logistics, location, history, and orientation of the property, presented the staff report, and stated staff is recommending approval.

Ms. Press asked if any of the Chelsea Place residents were notified at this stage.

Mr. Spraker responded that they will be notified with the actual site development. However, these meetings were advertised in the news paper.

Mr. Jorczak inquired as to the entrance and exits along the frontage of the property.

Mr. Spraker replied that they are still working on site access, but the frontage is over 500 linear feet. Mr. Spraker explained that they are working with Lowe's to try to get cross-access, which would give access to the traffic light.

Mr. Glen Storch stated this is proper planning because it is coming into the City because it is an enclave, and this parcel should not be 8 units per acre multifamily, but it's great because Ferber Company and they are sensitive to how communities actually look when they are done. This will be a win-win for everyone as the residential will have a conservation area that will abut it with no vertical structures, and the commercial area is where it should be, and that is along Granada Boulevard.

Mr. Jorczak asked if the conservation area would be permanent.

Mr. Storch responded yes, it will have a permanent conservation easement over it, with the specific exceptions for stormwater and the like.

Ms. Behnke moved to approve LUPA 13-087 as submitted. Ms. Press seconded the motion. Vote was called, and the motion unanimously approved.

C. <u>LDC 13:094: LDC Amendment- Low Impact Development stormwater</u>

Mr. Shawn Finley, Civil Engineer, City of Ormond Beach stated this is an LDC amendment to adopt the Low Impact Development (LID) manual by way of two resolutions. Mr. Finley presented the staff report, and stated staff is recommending approval.

Ms. Press asked how this process will work.

Mr. Finley responded that as with any good project process, the key is a good pre-application meeting so that staff can sit down with the applicant and explore the possibilities. Mr. Finley explained that chances are that when a property owner and their consultants come to the city they will have in their mind what they need to accomplish with that project, and it is at that time that the City should suggest the different options available to them. Mr. Finley stated this becomes a tool in the box that the City can offer rather than a potential developer asking for relaxation of code.

Ms. Press stated she is hopeful that there will be an environmental center at Central Park which would be an example of how to utilize these concepts.

Mr. Finley stated that what we find attractive may need to be altered in order to accomplish some developments.

Mr. Jorczak asked how the formulas were established for use in the LID document.

Mr. Finley responded that staff reviewed how different agencies were handling these issues. Mr. Finley explained that they are not state wide requirements; they are unique to Ormond Beach because the City's standard is a 25-year storm. Mr. Finley explained that LID expands the amount of time from the moment the drop of rain hits a roof, to inlets and ponds, and eventually leaving the site. Mr. Finley continued that by using these calculations, they create better way of proving that the created site closely mirrors the pre-development site.

Mr. Jorczak inquired if staff created the formulas.

Mr. Finley replied that staff created the formulas and modified some of the most basic engineering stormwater formulas.

Mr. Jorczak stated he noticed that staff relied on rainfall averages from the water department.

Mr. Finley answered that what staff wanted was a value unique and specific to Ormond Beach; in this area the 25-year storm is 9" in 24 hours. Mr. Finley explained that is a great place to start, and is the standard developed by the United States Soil Conservation Service. The debate staff has was do you design for the 25-year storm or the 83 out of 85 storms that actually hit every year. Mr. Finley continued that this discussion was had with St. Johns River Water Management District (SJRWMD).

Mr. Jorczak asked if there is one location that measures rainfall, and if so, where is that location.

Mr. Finley replied that it is located at the wastewater treatment facility off of Wilmette Avenue.

Mr. Jorczak stated there could be a discrepancy with rainfall because it could rain at the Wilmette location and not elsewhere in the City.

Mr. Finley responded that is why it is backed up with 13 years of data, and it can continue to be revisited on an annual or biannual basis.

Mr. Jorczak asked since this is not mandatory, what would happen if a homeowner who has a shell driveway decided to pave it with impervious material, such as, would they have to submit a hydrology report and the like to obtain the permit.

Mr. Finley stated that the threshold is 1,000 square feet for parcels under 1 acre. Should they surpass that threshold, they have to provide calculations and treatment for the portion of the site they are affecting. Mr. Finley continued that if they can show they are only affecting half of the site, then that is the portion they have to provide treatment for.

Mr. Jorczak stated the standards contained in the LID are specific with respect to calculations of the surface areas involved on a property, percolation, and water disbursal. Mr. Jorczak asked if most of the driveway permits coming to the City just being done through standard stormwater review.

Mr. Spraker responded that the purpose of this document was for commercial sites. Mr. Spraker explained that it can be applied to residential, the City will not require residential sites to do thousands of dollars worth of studies for a driveway for a single family lot.

Ms. Behnke asked if it was mandatory to utilize elements from the LID such as rain gardens, or if they could continue to use standard stormwater practices.

Mr. Finley responded that is correct; the LID is only an alternative available that a developer may or may not choose to utilize.

Ms. Behnke stated she thinks it is an excellent option, and there are a lot of advantages to it, and cannot find a disadvantage.

Mr. Goss stated that years ago he saw someone on North Beach Street with a new home that was installing a driveway and had to install a pond in their front yard. Mr. Goss explained that may have not had to have been done because if the soils were correct, they could have done the driveway in impervious concrete, and disconnected the downspouts and treated 20-25% efficiency there, and done swales and had a smaller pond; rather than the big pond that looked like it should have been at a commercial property. Mr. Goss continued that it gives the developer an alternative, but people that are redeveloping will run it both ways to see what gives them the best results and look for the best price. Mr. Goss explained the LID is a work in progress; staff has sent years putting this manual together, testing it, reviewing, testing, and having it reviewed by outside agencies; now it is time to put it to action, staff can learn from it, and constantly make it better. Mr. Goss stated this is on the cutting edge of thought even though this concept has been around for 30 years.

Mr. Jorczak stated the basic parameters established in the LID are excellent. Mr. Jorczak asked if the state is receptive to these ideas for use in the right of way of state roadways.

Mr. Finley responded no. Mr. Finley explained that the key is finding the proper locations to do these things, and along state highways is not the right place because the City does not have jurisdiction over the right-of-ways. Therefore the regulatory agency can determine when and how they do it. Mr. Finley continued that a correct place to do something like this for roadway treatment would be to take a location where there is an established master plan, and the developer and design professional puts together a profile for that right-of-way that shows the roadway, the area that provides treatment, the area provided for utilities, and the area for the actual development.

Ms. Press stated that it may be time to have a workshop and invite developers and suppliers to explain the manual. Ms. Press continued that Ormond Crossings would be a perfect community for LID to be implemented.

Mr. Briley stated he likes it because it is an alternative and is out-of-the-box thinking.

Mr. Jorczak moved to approve LDC 13:094 as submitted. Ms. Press seconded the motion. Vote was called, and the motion unanimously approved.

D. LUPA 13-092: Small Scale Land Use Map Amendment, 1535 North US Highway 1

Mr. Spraker stated this is an application based on annexation from Volusia County Commercial to City of Ormond Beach Low Intensity Commercial zoning. Mr. Spraker explained the location, orientation, and characteristic of the property, presented the staff report, and stated staff is recommending approval.

Mr. Jorczak moved to approve LUPA 13-092 as submitted. Ms. Behnke seconded the motion. Vote was called, and the motion unanimously approved.

E. RZ 13-093: Zoning Map Amendment, 1535 North US Highway 1

Mr. Spraker stated this is the accompanying zoning map amendment. Mr. Spraker explained that the Low Impact Commercial has a series of eligible zoning districts, and the surrounding uses are B-7, and staff believes that B-7 is appropriate. Mr. Spraker presented the staff report, and stated staff is recommending approval.

Ms. Press moved to approve RZ 13-093 as submitted. Mr. Jorczak seconded the motion. Vote was called, and the motion unanimously approved.

F. PBD 13-057: 250 Williamson Blvd. Planned Business Development Rezoning

Mr. Spraker stated that at the last Planning Board meeting, the subject property underwent a land use amendment; there was an error with the advertising, which meant the planned business development rezoning could not be heard. Mr. Spraker presented the staff report, and stated staff is recommending approval.

Ms. Press asked what the benefit is of just accepting businesses with a PBD zoning when they are annexed.

Mr. Spraker responded that the benefit is how annexations are perceived. Mr. Spraker explained that by allowing them the PBD they have the ability to rebuild should the building be destroyed, where if they were assigned the B-8 zoning designation, they would be unable to do so, which would cause other business owners to not want to annex into the city. Mr. Spraker continued that this property was reviewed and does meet or exceed city code; making a property non-conforming through this process leads to re-financing issues as well as other issues.

Ms. Behnke asked if this business comes in as non-conforming does that mean another similar business cannot locate at this property.

Mr. Spraker replied that the goal by giving them the PBD designation is to make them conforming instead of the B-8 zoning, which is the designation that would make them non-conforming. Mr. Spraker explained that as long as the new business would take over within 6 months of the first business closing, they could continue the use indefinitely.

Ms. Behnke stated the city also gets the benefit of taxes.

Mr. Jorczak moved to approve PBD 13-057 as submitted. Ms. Press seconded the motion. Vote was called, and the motion unanimously approved.

VIII. OTHER BUSINESS

None.

IX. MEMBER COMMENTS

None.

X. ADJOURNMENT

The meeting was adjourned at 9:14 p.m.

Respectfully submitted,

_____

Ric Goss, AICP, Planning Director

ATTEST:

_____

Harold Briley, Vice Chair

Minutes transcribed by Meggan Znorowski.

CITY OF ORMOND BEACH

FLORIDA

PLANNING **MEMORANDUM**

TO: Chairman Thomas and Planning Board

FROM: Ric Goss, Planning Director

DATE: September 12, 2013

SUBJECT: Wireless Primer and Status Report on Consultant

CC: Joyce A. Shanahan, City Manager

In June, I provided a draft of the Wireless Primer as requested. I have not heard much from the members except for a few emails. Consequently, I have finalized the document and it is attached for your use. In the meantime, the Department prepared a Request for Proposals to obtain an expert to assist staff in reviewing future wireless applications. The scope of work included:

- Review all pending and future applications filed with the City for Wireless Telecommunications Facilities;
- Assist and advise the City in the analysis of these applications, including attending meetings, if required, with City officials and/or Applicants as requested by the City;
- Review and verify radio frequency reports and determine coverage needs and saturation;
- Recommend in writing to the City whether a particular application should be approved, disapproved or held pending further information, action or due to extenuating circumstances and set forth in writing the reasons for such determination; and
- Review and recommend proposed wireless changes to the city's ordinance based upon technology, where appropriate or required by relevant case law or federal regulations.

Additional responsibilities may include:

- Communicating directly with the applicant to carry out City's mandate and facilitate efficient review (e.g., requesting correspondence from applicant during initial phase review);
- Coordinating and processing wireless telecommunications applications in accordance with the Planning Board's monthly schedule and presenting findings to the Board, when requested by the City;
- Maintaining a working knowledge of the number and location of wireless telecommunications facilities in the City and their current and future cumulative impacts so as to counsel appropriate measures.

Supplemental tasks may include:

- Pre-application meetings and on-line virtual site walks with City staff and applicant, when requested by the City; and

- Reporting on the condition of existing wireless telecommunications facilities during the course of review and communication directly with the City for correction, if in violation;

Evaluation criteria that were used included:

- Past experience with local governments in wireless systems assistance in Florida
- Familiarity with Florida and Federal Communications Commission Regulations for Wireless Telecommunication Facilities.
- No current representation of carriers or tower companies which have wireless telecommunication facilities in Ormond Beach.
- At least 5 years experience providing similar consultant services
- Respondent must be or have on staff as an associate an RF Engineer.

As a result, Pallan Associates has been hired to be our consultant and expert for all future wireless applications. The contract is a one year contract with automatic one year renewals. The applicant for the wireless facility is required to pay for the review cost.

Misconceptions
About Regulating Towers and Wireless Facilities

By Lawrence (Rusty) Monroe
and
Richard (Dick) Comi
Founders of The Center for Municipal Solutions

Striking a Balance! That's what the goal of local government should be as regards regulating the *number, siting, construction and modification* of towers and wireless facilities in a community. The balance that is struck should be between the (provable) needs of the carriers (not their best wishes or desires) and the needs and public interest of the community. It's really about i) protecting the nature and character of the community; ii) assuring that what is built is safe; and iii) what is built is what was actually permitted. The fact of the matter is that in any individual community only local the government can assure that this balance is struck. However, in attempting to strike this balance, local officials are often forced to deal with a number of misconceptions, some of which are simply erroneous assumptions, while others are misrepresentations, some made knowingly and some unknowingly. This white paper is intended to dispel these misconceptions and enable local officials to make truly informed policy decisions based on fact(s), not assumptions or representations.

The following are assertions, statements and beliefs that reflect common misconceptions related to regulating the siting of towers and wireless facilities, along with a synoptic discussion of each. The points made reflect the author's experience assisting and advising more than 500 communities in 20 states across the nation and having handled countless numbers of applications for them. Each one has been proven in the real world to be a misconception, normally based on a lack of familiarity and experience with the matter, i.e. a true understanding of all that's involved, including the options or alternatives available (i.e. regulatory, technical and quasi-technical alternatives) and the feasibility or permissibility of each. *With the right knowledge a community can create a situation where the proper balance is struck and everyone wins - the applicant, the residents, the business community and the local officials.*

Everyone involved in an application process should get what they need in a timely manner, i.e. the applicant, the elected officials and the public, while the community is assured that the facility is safe, is built as it was permitted and everyone is protected from unnecessarily visually obtrusive facilities that can change the nature and character of the community . . permanently.

Misconceptions about the Regulation of Towers and Wireless Facilities

You can't be in complete control of the issue of towers and wireless facilities

Not everyone involved in or affected by a wireless application can get what they need

Local governments are a hindrance and bottleneck to the expansion of service

Regulation is inherently bad, harms the industry and is anti-free enterprise

Expert assistance costs the community

The Company wouldn't spend the money on a new site if it weren't truly needed

A community is obligated to permit an applicant the means to achieve its 'desires' or 'objectives', as opposed to its 'needs'

The carrier must have a tower on which to locate

Fewer tall towers (that permit co-location) are better than more facilities of a lower height

The carrier's primary issue or concern is cost

Local governments must permit carriers to fill a gap in service from a single location, meaning they will need a tower to give them the needed height to do so

A tower has to look like a tower

You can't "shrink" a tower

A wireless facility simply can't be "invisible" or unrecognizable to the public

Multiple sites are more visually intrusive and objectionable than a single taller tower

Multiple carriers must have at least 6' of vertical separation on a tower between their arrays

A carrier must have true 'line-of-site' for its antennas to work

The antennas must always be above the tree line to work

You can't 'capture' an existing grandfathered tower under a new ordinance/regulations

An applicant must be permitted to use the least costly and/or most cost effective means

A community cannot deny a permit based merely on the 'appearance' of the facility

The size of a gap in service (hole) simply can't be reduced without a new facility

Height is the primary determiner of the quality/clarity of the signal

The FCC preempted addressing the issue of RF (NIER) emissions

Co-locations don't have the issues and concerns that towers involve

Professional Engineers' certifications should be assumed to be correct and doesn't need to be checked or verified

A (really good) new or revised ordinance is costly

The Propagation studies submitted always prove the need for the facility

Propagation studies submitted always prove the need for the height

Propagation studies can be made to show whatever the applicant wants

Companies always prefer to co-locate on an existing facility

Companies always do a thorough search for co-location possibilities

A community can't prohibit towers

A community must grant a permit for any site that is proven to be needed by every carrier

A community can't review an applicant's RF emissions calculations

A community can't deny a permit because of non-compliance with the FCC's RF emissions standards

RF emissions are to be calculated only for the applicant's facilities

A community cannot be in control of the issue without regulations actually in place

The application process must be adversarial

The information required in the application is burdensome to provide

Regulations slows expansion of the service and makes it cost prohibitive

Experts can't generate more Non-Tax revenue for leasing municipally-owned space to a carrier

Expert assistance costs the community

The lion's share of wireless facilities are in place today

You can't be in complete control of the issue of towers and wireless facilities [TOP]

First, being in control does not mean that there is an inherently adversarial relationship with applicants. In fact, being in control can often change what may have been an adversarial situation. Being in control is conceptually as simple as having the right regulations in place and the right people to administer them, i.e. professionals who *truly* know and understand both sides of the issue and how to achieve the needs of both sides. However, very few local ordinances are drafted by someone who truly knows and understands the industry, what is feasible and what is not, as well as the correct answers to all of the "misconceptions" listed below. As well intended as the drafters of most wireless ordinances may be, without such knowledge an ordinance seldom does what's intended or desired, or it falls short of what can be done, or it can be done in a much simpler and less costly manner for all involved in the process, including the applicant. In short, protecting the nature and character of the community and the safety of the public and permitting the applicant what it needs are not mutually exclusive. In fact, there should be an inherent mutual interest of balance between the needs of the applicant and the community/public interest.

Not everyone involved in or affected by a wireless application can get what they need [TOP]

Contrary to popular belief, all parties can 'win' in the sense that everyone gets what they need. The carrier can get what it needs by having an expeditious review of its application and the related decision as regards its permit; the public can get expanded and more reliable service, often without a new tower and as often without creating a visually obtrusive facility at all; and the local officials get what they need in the context of improved economic development opportunities with a minimum of new, visually obtrusive towers and wireless facilities that would otherwise likely be the case. All of this can happen much faster than is often the case without the right regulations in place.

Local governments are a hindrance and bottleneck to the expansion of service [TOP]

In the experience of the author, nothing could be further from the truth. Communities with well crafted regulations, coupled with qualified people to process and analyze the applications can actually *facilitate* and

expedite the application process. However, the legislation won't work without people possessing the requisite knowledge and experience and who truly understand the issues and options involved (including the economic and technological feasibility of the options, and the reason for the policies adopted) and these people can't do the job without the right regulations in place.

Regulation is inherently bad, harms the industry and is anti-free enterprise [TOP]

Regulation on the local level, when crafted correctly, can and should have the opposite effect of this misconception. Local governments are in a position to actually facilitate and expedite the application process. A classic example recently occurred in a community in Alabama where Verizon received permits for 4 of 5 different co-locations a mere 30 days after submittal of the applications; the 4th was permitted in 45 days. From the industry's perspective, it doesn't get much better than this.

An application review should be able to be completed within 2 weeks of the submittal of the application and the applicant should know at that point if there are any issues to be resolved and whether or not the recommendation will be positive. Again, everyone should win: the safety of the public is protected, the nature and character of the community is protected, wireless service is expanded and the carrier starts to generate about $3,000/day/site. *What more could anyone reasonably want?*

Expert assistance costs the community [TOP]

Not true! To wit, the services of the author's organization have never cost a community anything, since under their model ordinance the applicant is required to provide the Community with the money up-front by way of an escrow deposit to pay for the community's needed expert assistance. The escrow is under the control of the Community, not the applicant. This is only fair, since most communities do not have the expertise in-house to perform the type review and analysis needed, e.g. RF propagation analysis, structural analysis, RF radiation emissions, and the need to have this done is precipitated by the applicant who will be the financial beneficiary of the permit . . . that is normally granted into perpetuity.

The Company wouldn't spend the money on a new site if it weren't truly needed [TOP]

While this sounds like a reasonable assumption, it's not always true. Why? Because applicants don't normally have the incentive to devote the time and resources to exploring alternatives, such as adjusting existing sites, since often it's easier (and sometimes less costly) to put up a new facility than to redesign an existing facility. This does not make them bad people. It merely makes them human by looking for the easiest and least costly option. The community can (unilaterally) create the incentive legislatively by making it a requirement to first examine what can be done to adjust existing sites and prove that adjusting them won't eliminate the gap in service or at least shrink the gap. Examples of what can be done include, but are not limited to, increasing the ERP (wattage) of the antenna output, eliminating or reducing the down-tilt in antenna panels in the direction of the problem area and/or moving the antenna array higher, if it's on an existing tower and there is room to move up on the tower. While these adjustments won't always eliminate or mitigate the need for a new site, they often can. Remember that reducing the size of a gap in service inherently decreases the height that would otherwise be needed.

A community is obligated to permit an applicant the means to achieve its 'desires' or 'objectives', as opposed to its 'needs' [TOP]

This should be true, but only when *desires* and *objectives* coincide with true *needs*, such as being able to provide "functionally reliable" service. Notably, "functional reliability", not necessarily the signal strength claimed to be needed by the applicant, should be the test as regards meeting the applicant's needs, It's important to know (and understand) exactly what the carrier's *needs* are, as opposed to its desires or objectives. If one doesn't know exactly what the problem is and what's causing it, as well as all the options for remedying the problem, the local officials simply can not make informed decisions. Instead, they're relegated to simply relying on the applicant's assertions and what little they know about the cause and the possible solutions to the problem.

Desires are normally couched in terms of the Company's 'objectives', which sounds good, but under the law at (47 U.S.C. 332(c)) a company's desires or objectives are not the test. The test is the actual, provable needs of the Company, i.e. to provide "functionally reliable" service *primarily within that community* and *not an adjacent community.*

An example of *needs* versus *desires* and *objectives* happened in a North Carolina county recently when the applicant requested a 300' tower for a gap in a sparsely populated rural area along a major highway. Upon review of the application, it was discovered that the carrier *already had sufficient signal* to provide 'Rural In-Vehicle' signal strength throughout the majority of the alleged gap in service. As it turned out, the applicant was requesting a 300' tower so it could provide the equivalent of 'Urban In-Building' signal strength at the extremities of the area, even though it was to serve a "Rural In-Vehicle" market. Once this was discovered, the Company agreed that it could fill the few relatively small gaps in service that actually existed by co-locating on existing structures. Result: no new tower. The key was in knowing what propagation studies to request, being able to analyze the propagation studies, knowing and understanding the difference between the applicant's desires and its true needs, and knowing what would enable the applicant to fulfill its real need, i.e. to provide Rural In-Vehicle coverage for the relatively small area not already covered.

As the preceding shows, the effects of not understanding the difference between a carrier's legitimate, provable *needs* and its *objectives/desires*, and how they should be treated, are significant and can mean the difference between the construction of a new tower and being able to co-locate on an existing facility of some type, with the facilities often being unrecognizable by the average person. Result: No 300' tower and no physical or visual impact on the community, but with improved and expanded service.

The carrier must have a tower on which to locate [TOP]

While historically, due to a lack of wireless infrastructure, a tower has often been needed, today significantly fewer new towers are needed. Theoretically, almost anything that can support the structural load of an antenna array and its associated cabling and is of sufficient height can serve in lieu of a tower.

The effects of buying into this misconception can be seen when traveling any interstate highway. How many towers do you see that have only 1 or 2 carriers attached and within a 1/2 mile or so there's another identical situation? Assuming that either tower needs to actually exist, there should only be one tower, not two or more.

Fewer tall towers (that permit co-location) are better than more facilities of a lower height [TOP]

While this sounds logical, it isn't always necessarily true. It depends upon i) the community and its desires; ii) the size of the area to be served from a given facility; and iii) the topography of the area involved. This is an argument most often heard from tower companies who are primarily concerned with the issues of maximizing their resource (space on the tower) and *cost, convenience* and the *time* needed to get the permit so it can start leasing space on the tower. Again, this doesn't make them bad people. It simply makes them good employees. It's simply that their interests should be balanced by the public interest of the community in which they're locating. Notably, unless the community chooses to grant them status, tower companies should have no standing before a community, i.e. as an applicant. This is because under federal law they are no different than the owner of anything else that could be attached to, such as a building, utility pole, an electric transmission tower, billboard, church steeple, etc. Towers simply represent one option for carriers and usually the least desirable from the community's perspective. Only the carrier and the public have "needs" under the federal law.

The carrier's primary issue or concern is cost [TOP]

Time is the primary issue for the applicant, since, on average, nationally, each carrier at each site will generate about $3,000 per day and each month they are not in operation means at least $90,000 - $100,000 in revenue that will never be realized. In many areas (including in some heavy traffic rural areas and small communities) the revenue per carrier per day per site is several times the national average of $3,000/day. Is it any wonder that time is their primary issue and that cost, as long as it's not prohibitive, is less of a concern?

Local governments must permit carriers to fill a gap in service from a single location, meaning they will need a tower to give them the needed height to do so [TOP]

Local governments are not obligated by law to permit a carrier to fill a gap in service from a single site, e.g. a tower. The issues here are cost and convenience . . . to the applicant. Applicable federal law does not address the issue of cost or convenience when permitting a wireless facility, nor does it require local governments to do so, as long as they do not act unreasonably, discriminate among functionally equivalent service providers, or act in a manner that would have the effect of being prohibitive.

Instead, if deemed an appropriate policy to adopt by the local legislative body, with the proper regulations in place local officials can require that the gap be filled from multiple facilities co-located on existing structures such as existing towers, buildings, utility poles, etc.. More and more in urban areas utility poles can be used where even experts who did not know the facility was there could easily pass it by without noticing it.

The argument often heard is, "Which would you rather have - a single tower on which others can co-locate, thereby reducing the number of needed towers in the future, or a bunch of wireless facilities around the community?" That's a loaded question that is intended to take advantage of local officials. The answer should be, "That's not the *only* option. We don't want any more new towers than are absolutely necessary and the need for which can be definitively proven." In short, in many instances there are alternatives to towers. In most communities a new tower should be the exception.

A tower has to look like a tower [TOP]

Sounds reasonable, but it's not axiomatic. Towers can be disguised in any number of ways . . . discounting those so-called "trees" that don't fool anyone. In fact, there are companies that specialize in disguising towers. However, some of the more ingenious examples include a nice, neat new little farm with a new 20' x 30' pole barn (that houses the electronics), on the end of which is a silo that contains the antenna array(s) and is surrounded by (maintenance free) white PVC board fencing. How about co-locating on high-tension electric towers that are often taller than many wireless towers, but already exist and where the antennas would be virtually invisible? What about the possibility of using a disguised tower as a landmark unique to that community in the right circumstances? In one community they had it disguised as clock tower.

You can't "shrink" a tower [TOP]

This is simply not true. In a number of instances it is possible to significantly reduce the requested height of a tower. Why? Because many times carriers no longer need the 6' to 10' of vertical space between antenna arrays. (This was originally needed for reasons of frequency isolation so they don't interfere with each other.) With technological, more and more they can actually be located at *the same height* on the tower. If someone questions this, take them to any building with multiple carriers co-located on the roof and ask them to show you the vertical separation. There is none. Often they are even within inches of each other, horizontally.

A wireless facility simply can't be "invisible" or unrecognizable to the public [TOP]

Not true. Just a few examples include attaching to utility poles (it looks like just another transformer on the

pole, which no one even pays attention to anyway); facilities co-located on buildings that are painted to match the color of the building almost exactly (be sure the cabling is also painted to match if it runs up the exterior); disguising as a silo or actually building a pole barn and silo as discussed previously. Cell sites have even been mounted on the face of cliffs and disguised to look like a part of the rock. Many cell sites should be virtually unrecognizable by the layperson as a cell site.

Multiple sites are more visually intrusive and objectionable than a single taller tower [TOP]

This need not be true and in many instances should not be. As previously discussed, there are normally a number of alternative options, none of which would normally even be recognized as a cell site by the layperson. Assuming the multiple sites involved towers (if it could be proven there were no co-location options), the question should be asked, *which is more visually intrusive and has a greater impact on the nature and character of the community*; a single tower that is 100', 200' or in some instances 300' above the trees, or several (e.g. 3) towers each of which only protrudes above the trees about 20' and that still accommodate multiple carriers?

Multiple carriers must have at least 6' of vertical separation on a tower between their arrays [TOP]

This used to be true, because the separation was needed for what is known as frequency isolation to prevent interference or conflict with another carrier's service. However, today in most instances they do not need vertical separation. For proof, look at any rooftop that has multiple carriers located on it. They're normally all at the same height and often with only inches between them horizontally.

A carrier must have true 'line-of-site' for its antennas to work [TOP]

To the layperson, the term 'line-of-site' is a bit misleading. If this were literally true, one could not use the service inside a building. Actually, the issue involves a combination of factors, including a combination of signal strength, height in relation to nearby solid obstructions, the effective radiated power (electrical power stated in terms of watts) and the desired service area from that site.

One does not literally have to be able to see the antenna in order to use the service. There can be numerous types of 'obstructions' and the service will work just fine. It's really more a matter of cost and convenience for the carrier, rather than functionality and reliability. However, from a practical perspective an antenna mounted at a height of 30' in the middle of downtown will probably not have much of a reach, since the signal normally won't go through 2 or more buildings and still be functional.

The antennas must always be above the tree line to work [TOP]

This misconception is related to the preceding one. While traditionally this has been the case, it isn't always anymore, especially with the advent of 'micro-cellular' deployment related to 3G technology and service. The proof of the matter is that in urban areas more and more carriers are locating on structures *lower than the surrounding trees and buildings*, e.g. on utility poles, the facia or eave of buildings, billboards, etc.. The issue normally is how far the signal will travel and whether the local officials want to permit the gap in service to be filled from a single (taller) site or whether they want to require multiple, but visually less obtrusive sites.

You can't 'capture' an existing grandfathered tower under a new ordinance/regulations [TOP]

This is done regularly, but requires the right language in the ordinance or regulations. They key is for the local ordinance or regulations to require an application and a permit for any *modification* of an existing facility, such as the changeout of equipment or the addition of a carrier's facilities that are new to that tower. Thus, when the tower or any of the facilities associated with it is modified, the tower becomes subject to the new regulations.

An applicant must be permitted to use the least costly and/or most cost effective means [TOP]

The 1996 Telecommunications Act is completely silent on the matter of cost, though some states have preemptory regulations that deal with this issue. The fact is that there is no such requirement placed on communities by federal law, other than the implicit test of 'reasonableness'.

As regards the issue of cost, applicants are often heard (mis)representing that permitting costs will affect service rates in the community. This simply is not true, as the rates are set nationally, not even regionally, much less by state and community.

A community cannot deny a permit based merely on the 'appearance' of the facility [TOP]

The 1996 Telecommunications Act does not prohibit this. By expressly protecting local authority over the location/siting, construction and modification of wireless facilities, the 1996 Telecommunications Act inherently or implicitly allows for denial based on egregious situations where such authority is not preempted by State law or regulation, for example where the facility would change or negatively and unnecessarily impact the nature and character of a community. However, there should be a well-established written record documenting the matter.

The size of a gap in service (hole) simply can't be reduced without a new facility [TOP]

Given the extent of the deployment of wireless facilities today, the size of a gap in service can sometimes actually be *reduced by adjusting the facilities on the existing adjacent sites.* In the vast majority of instances, reducing the size of a gap in service inherently reduces the height needed to fill that gap, i.e. from a single taller facility. If the need for significant height is eliminated, the probability of being able to co-locate on an

existing structure or building is significantly increased.

Height is the primary determiner of the quality/clarity of the signal [TOP]

Other than as regards the 'reach' of the signal (the distance from the facility that the signal will work), in most instances signal quality is not solely an issue of height. The more height, the farther the signal will reach, normally. However, the height of a tower is only a factor up to a point. Beyond that it's normally an issue of 'leaseable' space on the tower for the tower owner. In other words, it's a revenue issue for the tower owner, who is the one party to the process that under federal law (and good local regulation) has *no standing*, because it has no need under the law. Again, only the carrier, the community and the public have a need, not a tower company. Towers are merely one means of a carrier having its needs met, but certainly not the only option in many instances.

An example of a situation that most have experienced is when you're using your cell phone and you can see the tower down the road in the distance, but the party on the other end of the call cannot hear you or only hears every other word. This is often because the cell phone (powered by only 6/10 of 1 watt) will simply not reach the tower, even though the tower can be seen. In such instances it's normally a safe assumption that the tower is taller than it needs to be.

The FCC preempted addressing the issue of RF (NIER) emissions [TOP]

The FCC only preempted the actual *establishment* of the standards/requirements and prohibits denial of a permit based on RF Emissions if the applicant meets the FCC's requirements. However, local governments retain the right to determine compliance with the FCC's regulations as part of the application process. If this were not true, how could they deny an application based on failing to meet the FCC's requirements, since they wouldn't know?

Co-locations don't have the issues and concerns that towers involve [TOP]

This is simply not true and is a dangerous misconception. The *number* of issues does not normally differ between a new tower and a co-location. The difference is the form the issues take, not the number of issues.

For example, it might appear to be a 'no brainer' if the applicant wanted to co-locate on an existing tower that was grandfathered, i.e. it was permitted prior to the adoption of the current or proposed new regulations. However, how does one know that the tower was designed and constructed to structurally accommodate the new load, or that it will not create a safety hazard, since its structural adequacy has never been reviewed, much less proven?

There should be a written record established proving that the tower, as designed and constructed, can support the additional ice and/or wind load, *most of which comes form the cabling, not the antennas, themselves* (including accounting for the foundation as a factor of the type of soil and the type and size of the tower). This should be done both to protect the community and to avert an assertion of disparate treatment from future applicants. For co-locations on towers there is still the issue of structural adequacy, as well as the issue of the *inspection history* of that tower, as required by ANSI TIA/EIA 222F 1996. Has it been inspected when and as required (different types of towers have different inspection requirements and intervals between inspections)? Is there a record of this? The issue normally involves the effect of rust or loose fittings or attachments.

Even when attaching to buildings there are structural issues and questions as relate to the location of the attachment, what it's to be attached to, whether or not it will extend above the roof line, whether it will create substantial additional ice and/or wind load and, whether the roof will support the equipment shelter that houses the electronics if it's proposed to be placed on the roof, etc.?

Of course, there are a number of visual issues related to co-locations, often more than with a new tower, since camouflage or concealment should be prime goals. Examples of some very basic concerns include: Will the facilities be painted to match the color of the facility being attached to (including any exposed cabling)? Will the antennas extend above the roof line or can they be mounted on the fascia and be virtually undetectable? Can an antenna array be used that will accommodate more than a single carrier on the same array?

There are other safety issues such as *electrical grounding* and *bonding*, and issues involving the adequacy and appropriateness of the proposed *means of attachment* and the *security* of the facility. As regards the means of attachment, for example, most people are unaware that there are different types of welding requirements for attachment to different types of water tanks. Certain types of welds are prohibited. With respect to security, most people are not aware that a rooftop, even with a locked door for access, is normally deemed to be accessible by the public, thus creating several issues and concerns involving the rf radiation from the antennas. In almost all instances, warnings and barricades should be placed to prevent people from getting too close to the antennas. If this were not the case, why does OSHA require wireless maintenance workers to wear radiation detection badges?

Professional Engineers' certifications should be assumed to be correct and doesn't need to be checked or verified [TOP]

This can be a dangerous assumption. Professional Engineers are human and are not infallible. They make mistakes, like everyone else. As Ronald Regan said, the best and most prudent policy is to "trust . . . but verify", especially when it shouldn't cost the community anything. In the author's experience, about 25% of all documents signed and stamped by Professional Engineer have problems, are not complete and/or contain outright incorrect information. They also often make assumptions that are not warranted or rely on unverified information provided to them.

A (really good) new or revised ordinance is costly [TOP]

The correct response is a resounding, "Not true"! There are good ordinances available throughout the nation that can be customized or individualized, that are a matter of public information and that can be obtained merely by requesting them. The author's model ordinance is probably in place or has been used as a model in more communities than any other wireless ordinance in the nation and it costs nothing, as it is provided at no charge to clients.

The Propagation studies submitted always prove the need for the facility [TOP]

Not true! Propagation studies do not always prove the need for the facility. What they show is simply a gap in service, which may or may not require a new facility to fill. This can't be determined until the propagation studies are analyzed by those experienced with rf propagation analysis, including knowing the parameters that were used in their calculation/production and the appropriateness of the signal strength and the Effective Radiated Power (ERP) of the antennas, i.e. their wattage. Seldom do carriers design for the maximum ERP for which the equipment is designed.

Propagation studies submitted always prove the need for the height [TOP]

Not true! In fact, many times the propagation studies initially submitted do not prove that the height requested is the lowest height that will work, especially as regards new towers. The test should be "the minimum height needed (for that carrier) to provide "functionally reliable" service in an unserved area . . . that is primarily within the community".

It should be remembered that tower companies, not the carriers, own the majority of the towers. The primary asset or resource of tower companies is space on the tower and, understandably, they want to maximize their resource, i.e. space to lease. Therefore, tower companies have *no incentive to mitigate the height* of the facility. They are in the business of obtaining the maximum height they can get approved. Remember, tower companies have *no specific standing and no protections under Section 704 of the 1996 Telecommunications Act*, because they have no need under federal law. It is the carrier that has the need, not the tower company, and the carrier's current needs can often be satisfied with a significantly lower height than that requested by the tower owner.

Propagation studies can be made to show whatever the applicant wants [TOP]

True. The results are totally dependent upon the parameters or modeling information that is programmed into the computer. Garbage in - Garbage out! This is why it's critical to have the propagation studies reviewed by those experienced in the analysis of them, since most other issues stem from and depend upon what the propagation studies show. Far too frequently the propagation studies submitted reflect the 'desires' of the Company, as opposed to the actual 'needs'. In other words, the outcome was pre-determined and the studies were designed to reflect this pre-determined outcome. IN essence they become "self-fulfilling prophecies".

Companies always prefer to co-locate on an existing facility [TOP]

Historically, they do if 1) there is one that is conveniently located (i.e. one that they don't have to look too hard for); 2) they can lease space for a nominal amount; and 3) if it meets their 'desires' or 'objectives'. However, they will normally not do so (of their own volition) if a co-location site only meets their actual 'needs' as opposed to their 'objectives'.

Companies always do a thorough search for co-location possibilities [TOP]

This is simply not true, to wit the preceding discussion.

A community can't prohibit towers [TOP]

There is nothing in the federal law that prohibits such a policy, unless it can be proven that such a policy in that community creates an *effective prohibition* on the deployment of the service. However, there are many other ways to deal with the matter that are less likely to engender animosity and potential litigation. One relatively simple approach is to adopt a policy that places a new tower as the last, worst case option and requires the applicant to prove, dispositively, the need for a new tower, i.e. that there are no possibilities to co-locate on an existing structure of some kind.

A community must grant a permit for any site that is proven to be needed by every carrier [TOP]

Depending upon the situation, including the federal circuit in which a community is located, this may not be true. Albermarle County, Virginia is one example of a situation where the Federal Circuit Court of Appeals ruled that the community was not obligated to grant a permit for a new facility for the applicant (in this case a tower). The Court said that the federal law only requires that service be available by one carrier in a community, but not necessarily by each and every carrier.

A community can't review an applicant's RF emissions calculations [TOP]

This is simply not true. While only the FCC may establish the numerical parameters that must be complied with, local verification of compliance is not prohibited and, in fact, is presumed by the FCC, since the FCC only addresses this if there is complaint. The question then becomes, how does the average person know to even suspect if a site is not in compliance with RF emissions standards? They don't. To facilitate this task, the FCC issued a handbook for local officials explaining just how this should be done. As this is normally one of the two biggest concerns of the public (along with the visual obtrusiveness and appearance of the facility), it's an

issue that communities would be well advised to address and have *verified*. A review of the RF (i.e. NIER) emissions should be conducted by an individual experienced with the regulations, the technology being employed and the physics of RF propagation.

A community can't deny a permit because of non-compliance with the FCC's RF emissions standards [TOP]

This is simply not true! Non-compliance with any federal regulations, and refusal or inability to bring a facility into compliance, is grounds for denial of the application. See previous discussion.

RF emissions are to be calculated only for the applicant's facilities [TOP]

This is not true. RF emissions are to be calculated *cumulatively*, i.e. to show the effects of *all* wireless service facilities at the location. Seldom does a single carrier's facility cause an RF emissions problem. Rather, it is normally the *cumulative* effect of multiple facilities that causes problems.

A community cannot be in control of the issue without regulations actually in place [TOP]

This, also, is not true. A community can adopt an interim *application process*, i.e. pending the adoption of the new regulations or ordinance, whereby applications are permitted during the drafting of the new ordinance or regulations, but which states that *any permit granted for such applications will be granted under and subject to the new ordinance or regulations once it is in place.* This is one example of creating a win-win situation. This should prevent litigation based on a claim of an unreasonable delay, as applications will be processed, but the permit will be issued under the new regulations, and should serve to get the applicant what it needs, while at the same time protecting the community. The carrier is not delayed by a moratorium and the community is protected, since if a permit is granted it will be granted under the new regulations. The key is not to delay in the crafting and adoption of the new regulations. Normally 90 days should be sufficient time.

The application process must be adversarial [TOP]

The application process should not be inherently adversarial, especially if both parties have individuals who truly understand and are sensitive to the issues and the needs of the other party. The other key is to have a well drafted ordinance or set of regulations that addresses the needs of both parties and the public, and that has clear, well defined requirements and procedures that are not unduly burdensome or time consuming.

The information required in the application is burdensome to provide [TOP]

This is not (or should not) be true. Applicants normally have the information necessary to prove the need for what they're requesting, that it's designed to be safe, and to prove that it's the least visually intrusive possible. They have this for their own business purposes. It should simply be a matter of compiling it in the manner required in the regulations and providing it in an application.

Regulations slows expansion of the service and makes it cost prohibitive [TOP]

Well-drafted local regulations can, and have been proven to, actually *facilitate* and *speed up* the process, especially if administered by those who truly know and understand the issues and the options. Issues can be quickly sorted through, focusing on those issues that are potentially problematic - plus, in many instances, alternatives and options can be suggested that will meet the applicant's needs and still protect the community and its interests. Actually, the industry has acknowledged numerous times that it would rather work under good regulations than work through a poorly designed process, no specific process or a process with an ambiguous process and requirements. Any of these situations can result in an effort not unlike trying to "nail J-ello to the wall", that it results in a continuously moving target and unnecessary delays. Put another way, if you don't know where you're going, how do you know when you get there?

Recently in Westchester County, New York, an industry representative stated the following in an interview with the New York Times as printed in the Westchester County edition of the NY Times on July 11, 2004:

"Ms. Dunleavy described the process as "longer and more drawn out" in the county than in other, similar areas. It takes an average of about 18 months to get a cellular site approved . . ."

This simply should not be. There's no reason for an application to take an average of 18 months.

Experts can't generate more Non-Tax revenue for leasing municipally-owned space to a carrier [TOP]

With respect to negotiating leases for the use of municipal facilities or property, the authors' experience has been that, on average, they have been able to negotiate at least double the amount of revenue that was originally proposed, resulting in between 200% to 300% more than originally proposed over the term of the lease. How much should a community be getting for the use of municipal property or facilities? Depending upon the specifics of the market, they should expect between $1,500 to $4,000 per month per carrier based on the industry's average, per site revenue-generating capability.

Expert assistance costs the community [TOP]

Not true! To wit, services provided by the author's organization, The Center for Municipal Solutions (CMS), have never cost a community anything. How? Because under their model ordinance the applicant is required to provide the local government with the money up-front vis-Ö-vis an escrow deposit that is under the control of the community.

The lion's share of wireless facilities are in place today [TOP]

Nothing could be further from the truth. The industry has acknowledged that with the current deployment of 3G (3rd Generation) technology and service, it will need two (2) to three (3) times as many sites as it currently has, nationwide. This is several hundred thousand more new wireless sites and facilities in the next 3 - 5 years. Is your community prepared to deal with this situation? The bad news is that this is an example of another un-funded responsibility placed on local government. The good news is that it doesn't have to cost the community anything if it is handled correctly, and just as importantly it doesn't need to be (and shouldn't be) a contentious or adversarial situation. All parties to the process (the community, the public and the applicant) can get what they need, including the community and the public, as well as the applicant.

We serve as a clearing house for information. If you have a question or if you would like other information, please fill out our form. Filling it out completely will allow us to provide the best solutions for your situation.

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In 1997, 38,650 cell sites existed;

In 2012, 285,561 cell sites and growing

2013

Part 1 - A Primer on Wireless in Ormond Beach

"Yesterday, Today and Tomorrows' Technology"

Wireless penetration in the US reaches 101% in 2012

In 2012, 35.8% of US households were wireless only

In 1997, 56.7 billion minutes of use;

In 2012, 2.3 trillion minutes of use

In 2002, no text messaging existed

In 2012, 2.27 trillion messages were transmitted

City of Ormond Beach

Planning Department

1/15/2013

Part 1 – A Primer on Wireless in Ormond Beach

"Yesterday, Today and Tomorrows' Technology"

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The opinions, findings and conclusions expressed in this document are those of the Planning Department and not necessarily those of the City Commission of Ormond Beach. This document was prepared in response to a request by the Planning Board

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1.0 Introduction

Over the past few years, Ormond Beach has received several requests to construct macrocell towers (150± feet high) to support a growing market for wireless telecommunication applications. Towers assist in the wireless transmission of voice and data which includes cellular, personal communications services (PCS), paging, wireless internet services and mobile radio. These services operate from wireless networks that are dependent on antennas and related equipment to transmit from a sender to one or more receivers. Such services are viewed as a public utility that benefits the community and its economic growth and vitality and yet locations for wireless are becoming increasingly difficult to locate in the City.

Wireless technology has substantially changed since 1997 when the City's current Telecommunication Ordinance was adopted. An increasing number of cell phones with text and voice capability have been pushing capacity limits. Now, with the proliferation of smart phones and other mobile devices requiring wireless broadband, the network is reaching a point where the subscriber can no longer rely on service being available when it is needed. Today and into the future, the City faces capacity issues which are different than coverage issues. Part 1 is a working paper on the past, current state and future of wireless technology facing Ormond Beach. Part 2, if needed, will depend on Planning Board direction regarding the regulation of wireless cell technology.

Consequently, the purposes of this primer are to acquaint the City's Planning Board with:

1. The Telecommunication Act of 1996, particularly Section 704 (Section 2);
2. How the technology has evolved (Section 3);
3. Common definitions and terms used in the industry and in this paper (Section 3);
4. The current number of towers and antennas that exist in and around the City today (Section 4);
5. Wireless facility location process (Section 5);
6. How wireless works today and future wireless technologies (Section 6);
7. Coverage and capacity in Ormond Beach (Section 7);
8. Key thoughts for consideration and deliberation (Section 8); and
9. Future direction (Section 9)

The challenge facing Ormond Beach is to provide adequate numbers of cell sites to improve network capacity while at the same time addressing the issues and concerns of property owners. Wireless communication services providers are not treated as public utilities or franchises under the Telecommunications Act, but rather as competitors in an open market. This free market approach is intended to result in the best communication service for the least cost; however it will also result in an increase in the number of wireless cell sites. The question fronting Ormond Beach is what shall these wireless cell sites look like in the future?

Co-location of equipment on existing structures is the most preferable option to construction of new towers in the City's Land Development Code but it is difficult from the City's perspective to ensure co-location is occurring since the city is obliged to rely on service providers or tower builders to confirm no space is available or the existing tower is inadequate to their needs. However, co-location for carriers is good for the bottom line. A single tower used by just one tenant costs roughly $316,000 to build and maintain over a 10-year period. As renters, wireless service providers pay about $195,000 over that 10-year period, cutting their costs by more than a third, hence the growth of towers and tower builders.[1]

[1] Investors.Com, Industry Snapshot – Towering Demand for Wireless. Brian Deagon. November 26, 2012

2.0 Section 704 of the Telecommunication Act of 1996

The Telecommunications Act of 1996 mandated localities provide maximum wireless communication **coverage** but provided latitude in formulating plans and policies which address issues associated with wireless technology development. Section 704 of the Act preserves local zoning authority over the placement, construction and modification of personal wireless service facilities with some limitations or protections from regulation by local governments.

2.1 Protected and Non-Protected Services - Services that are protected and not protected by the 1996 Telecommunications Act are provided in **Table 1** below:

Table 1 – Section 704 Protected and Non-Protected Services[2]	
Protected	**Not Protected**
Commercial Mobile Radio Services	Broadcast Systems (radio and television)
Unlicensed Wireless Services	Public Service and Emergency Systems (Volusia County Dispatch services for City Police)
Common Carrier Wireless Services	Wireless Cable Systems
Cellular	Private Dispatch Systems (taxi, HAM radio operators)
PCS	Tower Builders
Enhanced Specialized Mobile Radio	
Specialized Mobile Radio	
Paging	

This same section also sets forth the following limitations on Ormond Beach:

1. The City can't discriminate among carriers of "functionally equivalent" services. For example, if cellular carriers already have facilities in the area, additional or new carriers of similar services - such as PCS - can't be prohibited, but should be allowed under' the same rules that govern existing services. Similarly, if three PCS carriers are operating in an area, a fourth can't be excluded by the local authority simply because they feel that three carriers are sufficient. It should be noted that Cellular, PCS, ESMR and Paging are treated in essentially the same way by the Act, and should receive the same treatment by Ormond Beach.

2. The City can't reject all wireless communications services (i.e. facilities) completely, nor have the effect of prohibiting wireless services, for example by enacting excessively restrictive zoning ordinances.

3. The City must act on any request for authorization to place, construct, or modify wireless service facilities within a reasonable period of time after the request is filed.

4. The City shall put any decision to deny wireless service facilities into writing, supported by substantial evidence contained in the written record,

5. The City can't reject a request for wireless facilities based on health concerns if the facilities meet the FCC's regulations concerning radio frequency (RF) emissions. In other words, local rules can't be more stringent that Federal rules. Ormond Beach can require that carriers demonstrate compliance.

[2] Telecommunications Act of 1996, Section 704 (a) (7) (B)

The law also provides for review in the courts or by the FCC of any decision by a local zoning authority that is inconsistent with Section 704. Limitations 2 and 3 above are why the Courts have rejected open ended moratoria on antenna towers but generally allowed limited moratoria as long as the time limit is considered "reasonable." While not in the 11th District Court of Appeals (DCA), Limitation 5 was interpreted by the 4th DCA, on appeal, in *AT&T Wireless PCS vs.* City *Council* of *the* City of *Virginia Beach* to mean that health concerns could not be a reason for rejecting wireless facilities, but that the mention of such concerns by residents as part of the record was not fatal to the City's decision.[3]

It is also within the purview of Ormond Beach to regulate the manner in which cell sites are located and constructed in order to protect the public. Safety features are physical hazards that can be mitigated. The following are safety issues related to wireless facilities.

2.2 Radio Frequency Emissions - At high levels, certain kinds of radio frequency radiation (RFR) are known to be associated with environmental health risk factors. However, the level of power at which wireless technologies operate is relatively low and is not the type normally associated with health risks. The Telecommunications Act prohibits denial of the placement of telecommunication facilities solely on the basis of radio frequency emissions, as long specific standards are met. The Act states: "*No State or local government or instrumentality thereof may regulate the placement, construction and modification of personal wireless service facilities on the basis of environmental effects of radio frequency emission to the extent that such facilities comply with the Commission's regulations concerning such emissions*."[4] Because the FCC does not review each cell site, it is incumbent upon City to assure that RFR standards are met. At a minimum, this should involve certification by the carrier and concurrence of the responsible person in the City for communications that the proposed cell site meets the FCC guidelines.

2.3 Structural Hazards - Structural hazards associated with wireless facilities include potential collapse of antenna mounts and equipment or falling of debris from the structure. Tower structures are constructed to Florida Building Code Standards and must withstand hurricane force winds up to 130 mph in the Ormond Beach area. Structures are also designed to collapse into themselves if there is a failure. In response to potential hazards, Ormond Beach has designated "fall zones" around the base of the tower. These are generally expressed as distance-to-height ratios. The original basis for setbacks was to prevent damage from ice or other falling debris from the antenna platform. The monopole is manufactured to collapse in several sections, rather than to drop lengthwise, like a tree.

It is important to note here that Section 704 applicability is to carriers of personal wireless services, not tower companies, unless they are officially a co-applicant with a carrier.[5] Consequently, the City has the obligation and flexibility to craft a policy that addresses limitations on location, numbers, heights, and visibility while understanding that the very same resident and business who do not want a tower beside them also demands better service for personal and business use.

[3] AT&T Wireless v City Council of Virginia Beach, Virginia, US 4th DCA, FindLaw
[4] Telecommunication Act of 1996, Section 704, (a) (7) (II) (iv)
[5] A Workshop Presentation on Section 6409 (a) by The Center for Municipal Solutions, 2012 L. S. Monroe

3.0 Evolving Technology and Related Terms

3.1 Technology Evolution –The evolution of telecommunication technology began as first generation analog (800 Megahertz (MHz)). Then it was second generation digital (1900 MHz), third generation digital (2400 MHz), fourth generation digital (700 MHz) and fifth digital generation of wireless deployment. Unlike 1G and 2G which launched cellular and PCS wireless service providing initial wireless coverage; 3G through 5G deployments will be focused on compressing more data in existing and future bandwidths. Why? Smart phones consume 24 times more data than conventional phones; tablets can use up to 120 times more bandwidth. Fourth generation network technology (the platform for smart-phones) emphasizes improving network capacity and maximizing the use of bandwidth for faster and more efficient transfers of data. Fifth generation wireless will enable faster data transfers such as streaming mobile video, VoLTE and credit card transactions and other similar functions. Unlike previous generations of wireless deployment, LTE, 4G and 5G will require even more sites but these sites will require different network architecture than macrocell towers.[6] The drivers for this transition from macrocell towers only to a HetNet are the ongoing growth in data traffic demands, lack of available spectrum and operating/capital costs savings through small cell deployment.

Most cellular network architectures in the country and in Ormond Beach are based on macrocells with a centralized base station which was and still is designed to give wide area coverage to a relative small number of subscribers. A macrocell can support a couple hundred simultaneous calls, so scaling on the radio side can be achieved by adding more macrocells or filling in the gaps with microcells and even picocells to support a higher density of subscribers. Increasing site densities can solve some of the problems but site acquisition is a major problem and has always been a huge expense and challenge for carriers. Ormond Beach like many communities attempt to control cell site locations and their visual impact. Adding more base stations and macrocell towers will not be enough to support the increased demand for high speed data. LTE based networks are being designed to deliver higher speeds (1000 mega bits per second (Mbps) on the downlink and 50 Mbps on the uplink) and achieving these speeds in practice is not possible using the current macrocell tower cellular architectures.[7] **Table 2** below depicts demand for wireless communication technology is increasing at exponential rates since 1997.[8] In fact, wireless penetration in the United States (# of cell phones/population) is at 101% in 2012!

Table 2 – Wireless Statistics 1997-2012

Topic	1997	2002	2007	2012
Subscribers (000's)	48.7M	134.6M	243.4M	321.7M
Cell Sites (000's)	38,650	131,350	210,360	285,561
Minutes of Use (000's)	56.71B	552.00B	1.96T	2.32T
Text Messages (000's)	N/A	N/A	240.8B	2.27T
Wireless only Households	N/A	N/A	10.5%	35.8%
Wireless Penetration	18.3%	47.4	81.3%	101%

The first generation (1G) cellular systems in the US were called *Advanced Mobile Phone Service (AMPS)* and they divided geographic regions into sections referred to as cells for the purpose of maximizing the capacity of a limited number of transmission frequencies. Each connection or conversation requires a dedicated frequency,

[6] Analysis of Wireless Telecommunications, Trends and Policies, Albemarle County, Virginia, pages 3-5 & 11. August 2012 Draft

[7] Femtocells - Enabling 4G, Mobilitie LLC White Paper, Bud Noel, Vice President

[8] CTIA Semi-Annual Mid-Year 2012 Survey

and the total number of available frequencies is approximately 1,000. Cellular systems allocate a set number of frequencies for each cell to support more than 1,000 simultaneous conversations. Equipment limitations can reduce this number significantly. Two cells can utilize the same frequency for different conversations as long as the cells are not adjacent to each other. There are also analog systems which operate in the United States. They are the *Extended Advanced Mobile Phone System (EAMPS)* which has currently replaced AMPS as the US standard, and *Narrowband AMPS* which has three times as many voice channels as EAMPS with no loss of signal quality. All three are analog systems and are considered backward compatible - designed for older phones to work on the newer systems. [9]

3.2 Terms[10] - The following definitions are used in this paper:

- ***AWS (*Advanced Wireless Services)** - is a wireless telecommunication spectrum band used for mobile phones.
- ***AGL (Above Ground Level)*** – height above ground as measured from the ground to the top of the structure.
- ***Antenna*** – an exterior apparatus designed for telephonic, radio, or television communications through sending and/or receiving electromagnetic waves.
- ***Bandwidth*** – range of signal frequencies that a medium responds without excessive attenuation (loss of signal strength).
- ***Base stations*** – a wireless service provider's electronic equipment used to transmit and receive radio signals, usually mounted within a facility including, but not limited to: cabinets, backup generators, shelters, pedestals or other similar enclosures generally used to contain electronic equipment for said purpose.
- ***Broadband*** – high speed Internet access technology, delivering access hundreds of times faster than dial-up.
- **Capacity -** means providing sufficient bandwidth to satisfy subscribers' communication needs.
- ***CDMA*** - Code Division Multiple Access refers to 3G digital cellular technologies that use spread-spectrum techniques. Unlike competing systems such as GSM that use time-division multiplexing (TDM), CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum. Individual conversations are encoded with pseudo-random digital sequence. CDMA is a military technology first used during World War II by the Allies to foil attempts at jamming transmissions. The Allies decided to transmit over several frequencies, instead of one, making it difficult for the Germans to intercept the complete signal. Qualcomm Inc. created communications chips form, CDMA technology that allowed the company sole access to the classified information. Once the information became public, Qualcomm claimed patents for the technology and became the first to commercialize CDMA. (Verizon, Sprint Nextel, MetroPCS and US Cellular use CDMA).
- ***Cellular Communication*** – communication via low power transmitters to service geographical areas or cells. Cellular systems in the United States operate in the 824-849 MHz frequency bands.
- ***Co-location*** – sharing space on a structure to support multiple carriers.
- **Coverage** - means providing connectivity at all desired locations within a specified area from a cellular network. Coverage should not be confused with capacity.
- ***DAS (*distributed antenna system)** – a network with spatially separated nodes connected to a common source via a transport medium that provides wireless service within a geographic area.
- **DBm** – a power ratio in decibels of measurement in relation to one milliwatt.
- **Femtocell** – a wireless access point that improves cellular reception inside a home or office building
- **GSM (Global System Mobile Communications)** - one of the leading digital cellular systems. GSM uses narrowband TDMA, which allows eight simultaneous, calls on the same radio frequency. GSM, first

[9] Fauquier County 2010-2030 Comprehensive Plan, The Plan for Commercial Wireless Facilities
[10] Whatis.techtarget.com/definitions/

introduced in 1991, is available in over 100 countries and has become the de facto standard in Europe and Asia. Uniform standard for 2G digital systems. (AT&T and T-Mobile use the GSM standard)

- **HetNet –** Heterogeneous Network integrating macro, micro and femtocell technologies at a network level.
- ***Internet*** - a electronic medium by which information may be uploaded or downloaded whereby it may be reviewed, manipulated and/or used for personal and commercial applications. This technology is typically sent via a wire Local Exchange Carrier (LEC) network. However, the technology is for adaptable-to-wireless networks.
- Macrocell – the largest and most powerful type of mobile phone cell.
- ***Mini/Micro Cell*** – small structure, not greater than 80' AGL, used to fill 'holes' in coverage or improve capacity. Range is typically a ½ square mile.
- ***MHz –*** measurement of radio frequency radiation. One MHz = One million cycles per second.
- ***MC*** - Microwave is a medium of communication licensed by the Federal Communication Commission (FCC) as services used to transmit and receive compressed voice and data. These systems typically are direct point-to-point transmissions in which large amounts of information may be sent over a longer distance versus a short broadcast. Typically, this technology is digital.
- ***MW Link (*****Microwave Link)** – digital service licensed by the FCC to transmit and receive compressed voice data. Microwave systems are used to transmit large amounts of data, from point to point, over greater distances than traditional broadcast systems.
- ***Paging*** - Wireless medium of communication via the transmission of data designed for messaging services. This technology has evolved from single (receive-only) radio tones to two-way transmission and receiving of alphanumeric messaging.
- ***Propagation*** – physical principle of energy emitted through broadcasting a frequency as it relates to transmission, power, ASML, antenna gain and transport loss.
- ***PCS*** - Personal Communications Service is a term used to describe the set of digital cellular technologies currently deployed in the United States. PCS technologies include Code Division Multiple Access (CDMA), Global System Mobile Communication (GSM), and North American Time Division Multiple Access (TDMA), also known as IS-136. Two of the most distinguishing features of PCS systems are that they operate digitally at the 1850 - 1900 MHz frequency range.
- ***Picocell –*** a small mobile base station that improves in-building cellular coverage. Range is 650 square feet.
- ***TDMA (*****Time Division Multiple Access)** - a technology designed to provide digital wireless service using time division multiplexing (TDM). TDMA works by dividing a radio frequency into time slots and then allocating slots to multiple calls. This allows a single frequency to support multiple, simultaneous data channels. TDMA is used by the GSM digital cellular system.
- ***Self-Supporting Structure*** – a free-standing monopole or lattice tower that requires no additional support.
- ***SMRS (*****Short for Specialized Mobile Radio Service) -** a two-way radio used to transmit and receive signals. This technology allows a basic two-way radio to designate a specific Narrowband channel to broadcast and receive, thus creating a 'secure' channel for communication.
- ***Topographic Study*** – how terrain, other land forms and natural features impact the transmission and receipt of radio waves.
- ***Tower Types –*** Lattice (steel and either square or triangular shape); Monopole (single tubular mast); Guyed Tower (tubular or lattice with guyed wires); monopine (monopole that uses steel pine branches to disguise the pole and antennas.
- **VoLTE –** Voice-over-LTE is a systems approach that enables integration with the suite of applications that are or will be available on LTE.
- ***Wireless Internet*** – provision of internet services through specialized devices over a wireless network.

4.0 Existing Wireless Structures, Mounted Antennae and Carriers in City

Table 3 depicts thirteen constructed tower types in the Ormond Beach immediate area.[11] Sites are identified by a Registration Number, Structure Owner or Carrier, Latitude/Longitude Coordinates, AGL, and Tower Type. Co-location opportunities exist on several of these sites

Table 3 – Registered Tower Locations in Ormond Beach

Registration #	Owner	Height above AGL in meters & feet	Location	Structure Type	Carrier
1011716	Orlando SMSA Limited Partnership	79.9 (283 feet)	Latitude: 29-15-18.1N Longitude: 081-09-01.0W (2341 W. Granada)	Lattice Tower	AT&T Verizon
1020470	American Towers, LLC	97.2 meters (318 feet)	Latitude: 29-15-32.1N Longitude: 081-07-04.5W 1687 W. Granada	Lattice Tower	Verizon
1029742	Orlando SMSA Limited Partnership	81.4 meters (267 feet)	Latitude: 29-17-07.0N Longitude: 081-04-01.4W 123 N. Orchard Street	Lattice Tower	AT&T Verizon
1048033	ARK Communications Network	48.8 meters (160 feet)	Latitude: 29-15-16.0N Longitude: 081-13-47.0W Old Kings Road	Monopine Tower	T-Mobile
1061168	SBA Towers IV, LLC	91.5 meters (299 feet)	Latitude: 29-15-33.7N Longitude: 081-07-51.6W Tymber Creek Road	Guyed wire Tower	Verizon
1062834 1062835 1062836 1062837	Wings Communication (WELE)	61.9 meters (203 feet)	Latitude: 29-16-10.0N Longitude: 081-04-53.0W West of Nova (MHP)	Guyed Wire 4 Towers –	Verizon
1224686	City of Ormond Beach	21.3 meters (69.8 feet	Latitude: 29-18-03.3N Longitude: 081-06-39.5W Airport	Whip Tower	Verizon
1266912	State of Florida	91.4 meters 300 feet)	Latitude: 29-20-12.1N Longitude: 081-07-48.4W (SR40 & I95 Ramp)	Monopole Tower	Public
1285123	Capital Telecom	48.8 meters (160 feet)	Latitude: 29-16-00.6N Longitude: 081-03-21.1W (610 S. Yonge Street)	Monopine Tower	AT&T
1258112	Global Tower LLC	37.8 meters (124 feet)	Latitude: 29.31792 Longitude: 81.1066 (1203 US 1 N.)	Monopole Tower	Verizon

Table 4 depicts the major carriers and the different frequencies provided in Ormond Beach. AT&T and Verizon own the 850 MHz and recently obtained the 700 MHz spectrum. Sprint PCS, MetroPCS and T-Mobile purchased the Advanced Wireless System (AWS) which uses the 1700 or 1900 MHz spectrum. Higher frequencies are a disadvantage for coverage but are an advantage for capacity

Table 4 - Existing Carriers and Frequencies in Ormond Beach

	2G	3G	4G	3G Technology	4G Technology
AT&T	850 and 1900 MHz Sunsets in 1/2017	850 and 1900 MHz	1700 AWS	GSM	LTE
Verizon	850 and 1900 MHz	850 and 1900 MHz	1700 AWS	CDMA	LTE
T-Mobile	1900 MHz	1700 AWS	No LTE	GSM	LTE (2013)
Sprint/Nextel	1900 MHz	1900 MHz	1900 AWS	CDMA	WiMax (2010) LTE (2013)
MetroPCS	850 and 1900 MHz	1700 AWS	1700 AWS	CDMA	LTE

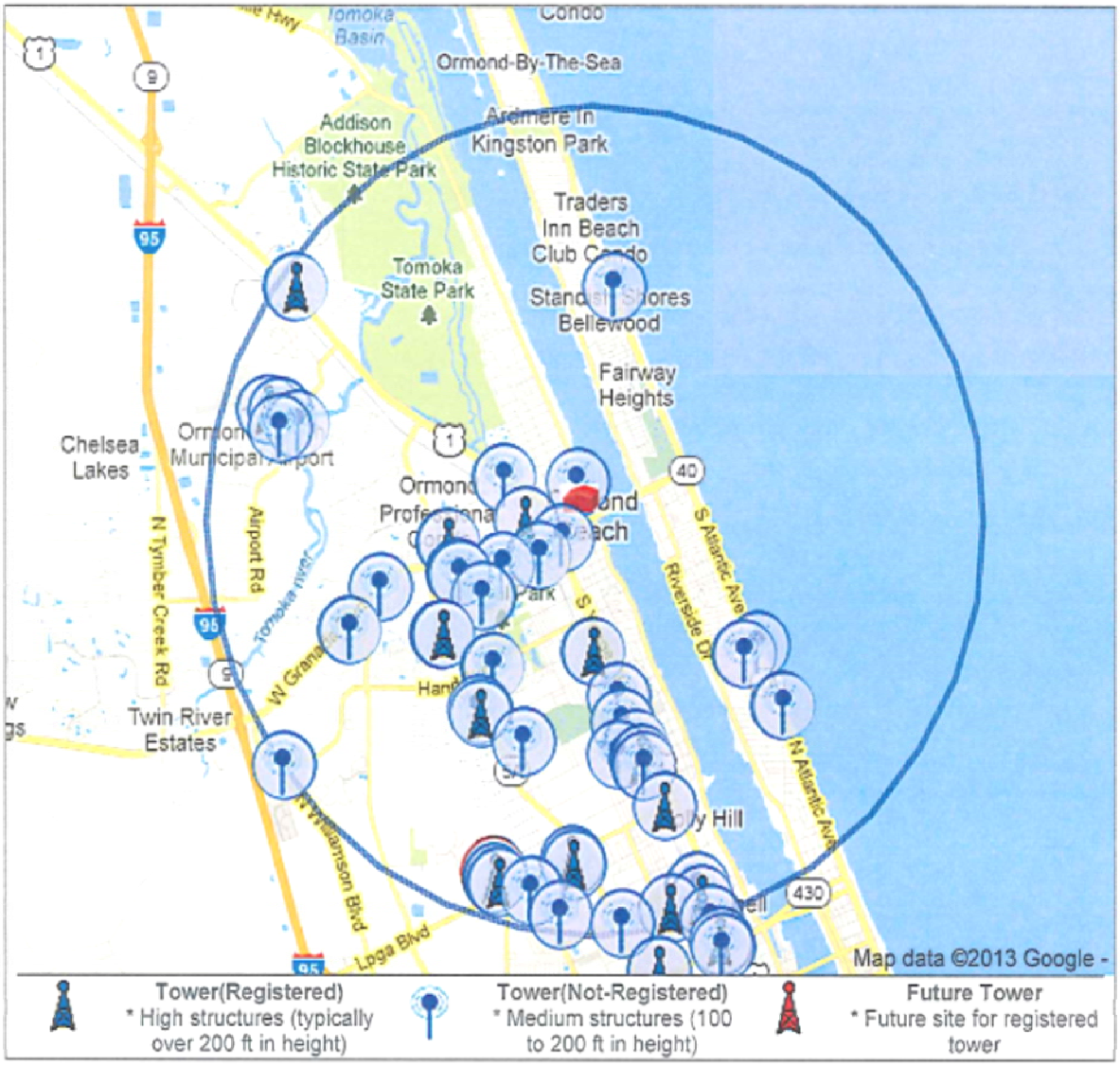
An

[11] *Antenna Structure Registration (ASR) Report for Ormond Beach*, 2013 Federal Communication Commission

internet query was performed to locate tower structures and antennae that are within 4 miles of City Hall. **Map 1** depicts 53 towers - 21 are Registered (>200 feet in height) and 32 Non-Registered (100 to 200 feet in height). Not all the towers or antennas are tall or devoted to voice and data transmission. Many are classified as towers but they are whips and provide mobile radio communications. The towers are primarily located along major road corridors of SR 40, Nova, US 1, LPGA (11th Street) and ISB. [12]

Map 1- Tower Location

- Tower Structures - (22 S Beach St, Ormond Beach, FL 32174)

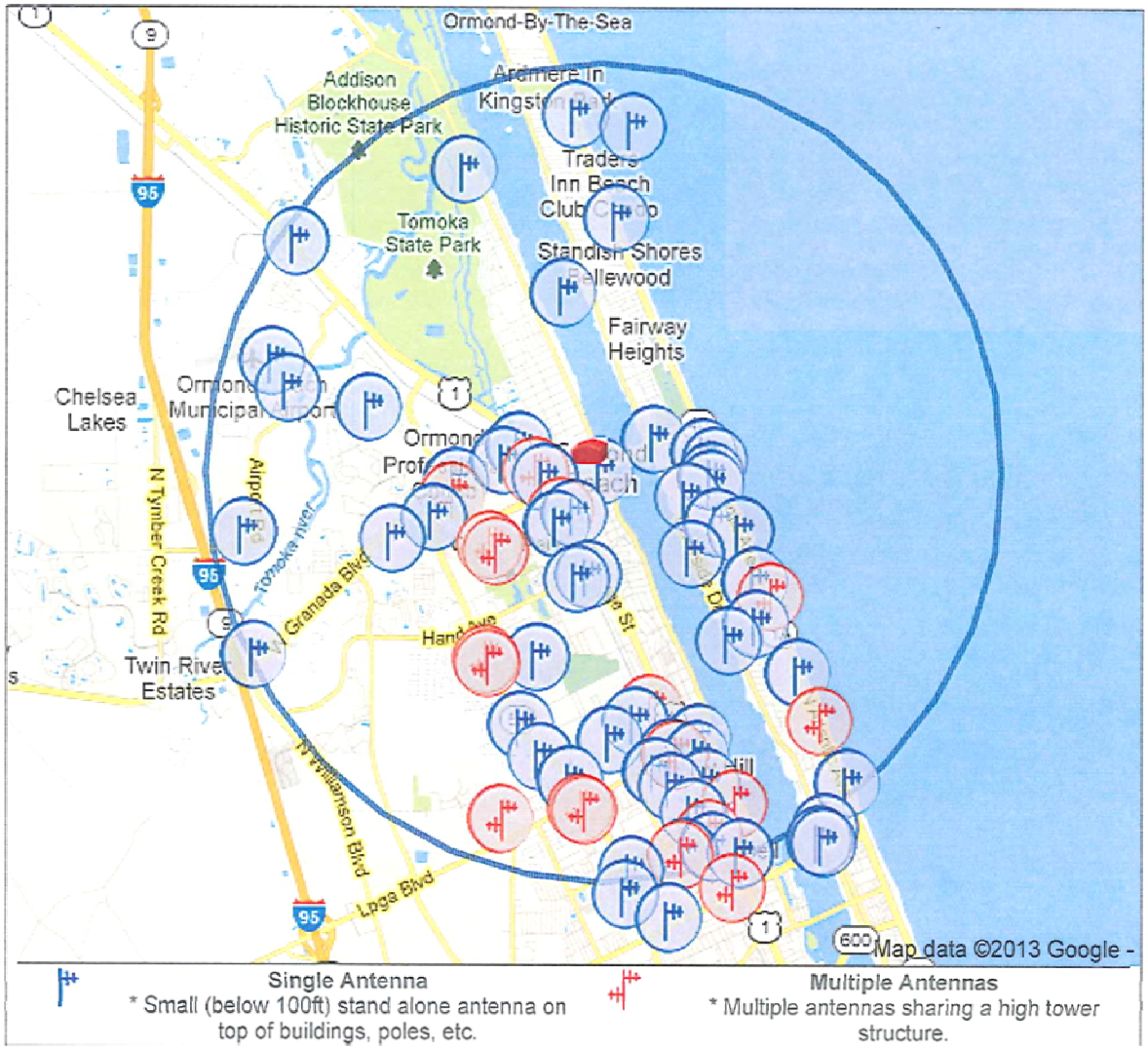


Map 2 depicts 150 antennae - 18 have multiple antennae's sharing a high tower location and 57 single antennae locations which are located on buildings, poles and other tall structures such as Air Traffic Control towers. Ormond Beach has a number of single antennae locations along A1A, US1 and SR40.[13]

[12] Antenna Search Report for Ormond Beach, February 18, 2013.
[13] Ibid

Map 2 – Antenna Locations

- Antenna Sites - (22 S Beach St, Ormond Beach, FL 32174)



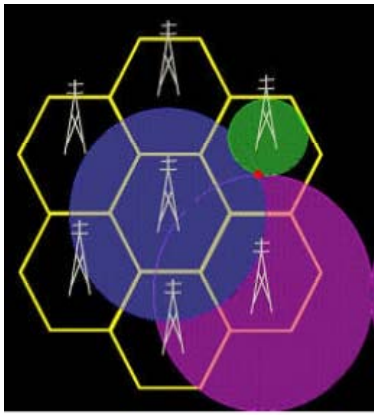
In summary, the location of towers and antennas in and around Ormond Beach depend on carriers and their different frequencies which can carry different distances. Verizon and AT&T use the 800MHz frequency range and can broadcast their signals more than twice the distance of T-Mobile and Sprint/Nextel which uses 1900 MHz frequencies. So why don't all the carriers use 800 MHz? Spectrum licenses are limited and when they are gone, other frequencies have to be used. The 800 MHz has better penetration capabilities than 1900 MHz, so cell signals in buildings may be stronger with 800 MHz compared to 1900 MHz. Another factor is the technology. CDMA technology (Verizon, Sprint Nextel, MetroPCS and US Cellular) has the ability to broadcast farther distances than GSM (T-Mobile and AT&T). Of course, all of this is in pursuit of the best reception signal strength which is measured in dBm's. Signal strength can range from -50 to -100+ dBm. On the lower range, the signal is perfect. One is probably standing at the cell site. On the higher dBm end, there is basically no usable service. Ranges between -60 to -70 is considered extremely good; -80 to -85 typical; -90 to -95 signal is getting weak; -95 to -98 calls are dropping; and from -98 to -100, service is considered bad and it's hard to stay connected. AT&T converts the reception signal strength to a number between 0-5 bars - 5 bars means excellent reception and 0 bars means almost no reception.

5.0 The Process of locating Wireless Facilities

Radio Frequency (RF) engineers develop grid systems by placing circles on a map which are then overlaid with hexagonal cells. Each hexagon equals a proposed base station coverage area. The hexagon center is supposed to be the best location for a base station. The propagation pattern emanating from the base station is circular in form and the size of the circle is typically affected by the height of the antennae, land cover (horizontal obstructions) and the number of customers (capacity).

The illustration in **Figure 1** depicts this grid pattern with a tower symbol in the exact center of the hexagon. The circular colors depict large, medium and small coverage areas depending on the elevation of the towers, capacity of the base station (network architecture), and the character of the land uses around the tower. In Ormond Beach, topography (hills) or tall buildings are not factors that would affect coverage or capacity. What is important to note here is that the grid pattern is different for each carrier and is maintained by each individual service provider's engineering department. Geographic coverage and number of subscribers that can be supported are also limited based upon the number of base station sites that exist in a grid network. Each carrier is different but a single carrier can only process or turn over a certain number of calls per minute, and at any particular time only a certain number of calls can occur simultaneously which was referred to as network capacity by Telecom recently at a neighborhood meeting for a proposed tower.

Figure 1 – Typical Grid Pattern



The City's permanent population, along with its temporary population which increases in the winter months, combined with tourism places excessive demand on the existing system's network capacity. When the network capacity reaches its limit, a customer will frequently experience interruptions in service. As the wireless network reaches design network capacity, it causes the service area to shrink, further complicating coverage objectives. Network capacity can only be increased by shifting channels from an adjacent site, or the provider must add additional base stations with additional infrastructure.[14]

Rusty Monroe, co-founder of the Center for Municipal Solutions, states, "There are 3 primary technologies employed by wireless service. They are SMRS, Cellular and PCS. Each of these services operates using different frequency ranges. SMRS and Cellular operate in the 700 to 950 MHz range while PCS operates in the 1800-1900

[14] Analysis of Wireless Telecommunications Trends and Policies, Albemarle County, Virginia, page 10. August 2012 Draft

MHz range. The nature of frequency propagation is such that the higher up on the frequency band a service operates, the less distance the signal will travel. The net effect is that SMRS and Cellular service should be useable at twice the distance of PCS, because it is only ½ the frequency."[15] As the wireless carriers migrate to 3G and 4G, towers may not be needed due to new technologies used to provide service.

Table 4 illustrates two different propagation prediction models that numerically calculated cell towers radiuses, cell phone handoff allowance radiuses, and the search area of both the 850 MHZ and 1900 MHZ frequencies. The lower the operating frequencies (850 MHz or <) the shorter the potential handoff zone radiuses. Keep in mind; these coverage radiuses do not take into consideration the network architecture or the number of subscribers accessing a limited number of frequencies.

Table 4- Cell Phone Radiuses by Height by Frequency[16]						
Okumura-Hata Formula for 850 MHz						
Antenna Mounted Height	50	80	100	115	115	180
Cell Site Radius (miles)	2.53	3.20	3.60	3.88	4.50	5.00
Cell Phone Handoff Radius (miles)	0.51	0.64	0.72	0.78	0.90	1.00
COST 231 for 1900 MHZ						
Antenna Height	50	80	100	115	150	180
Cell Site Radius (miles)	1.33	1.64	1.82	1.95	2.23	2.45
Cell Phone Handoff	1.07	1.31	1.46	1.56	1.79	1.96
Search Area (miles)	0.27	0.33	0.36	0.39	0.45	0.49

Typical locations used for siting cell sites include:

5.1 Public Property - Governmental sites within the City that may be appropriate for locating commercial wireless communications facilities include selected fire stations, the airport, water tanks, school property, FDOT owned land and other public facilities. These facilities are often large enough to allow sufficient separation from surrounding residential uses or are located adjacent to industrial land use. Even on these sites, steps must be taken to minimize impacts on surrounding properties.

5.2 Buildings - Antennas can be mounted on the roofs of buildings. While most buildings in the City are less than 35' tall, there are some taller structures that could be used for co-location opportunities provided that the antenna(e) are not visible from the road or are camouflaged with radio frequency transparent materials. The City has a number of single antennae on taller buildings located on South Atlantic as can be seen on Map 2.

5.3 Houses of Worship - Several large churches in the City present a wireless provider with the potential for locating towers because of the land area size within residentially zoned areas and the fact that much of the increased demand is in residential areas and homeowners do not like having cell towers adjacent to them. The church community may welcome this type of proposal, because it would provide additional revenue.

5.4 Private Land - Although the use of existing facilities is preferred to the construction of new ground-mounted facilities, opportunities exist for the development of freestanding camouflaged towers on private land.

[15]" Understanding Wireless Telecommunications and the Key Issues Related to the Siting of Wireless Facilities," by L.S. (Rusty) Monroe, The Center for Municipal Solutions.

[16] "A Litigator's Guide to Historical Cell Phone Location Evidence - Centroids & Working Range," John Minor CSA, CCE, CSE

6.0 Future Cell Sites for Ormond Beach?

Wireless telecommunications service coverage is not static. Most wireless communications service providers (PCS, cellular, ESMR) have already established their initial networks of cell sites. Wireless is here to stay and the future predicts service enhancements that must meet a growing demand from residential areas.

Initially, in the 1990's facilities were established primarily along highways and other major transportation corridors like SR 40 and US1 - the focus of "mobile" communications. This phase is called a "coverage" phase which required personal wireless service carriers to spread their signal everywhere using macrocell towers in an attempt to reach new subscribers.

As usage patterns evolved, networks expanded to provide wireless service where people work and live. Wireless is now in the "capacity" phase adding facilities to fill gaps in their coverage and increase capacity in high demand areas. Capacity is the amount of radio traffic, or number of calls, a wireless system can handle simultaneously. A single site is limited to the number of channels that can handle calls. The wireless network reaches design capacity as more customers in an area subscribe to the service, use their devices more often, or as mobile devices become more technologically advanced and more data is transmitted - as in video or wireless internet services. A service carrier may seek to increase network capacity by:

Option 1: Sectoring which reconfigures existing antennas or adds more directional antennas, if possible;
Option 2: Creating microcell zones where only one base station is needed;
Option 3: Adding additional frequencies, or
Option 4: Splitting cells into smaller microcells while reusing the frequency pattern of the larger cell system.

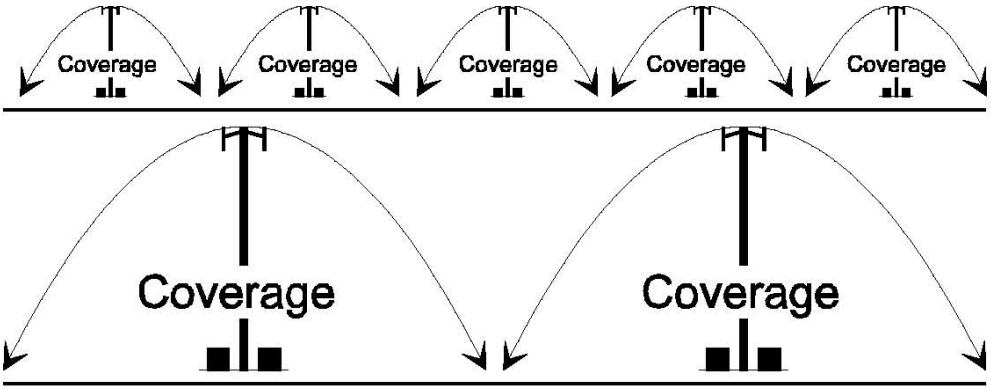
Option one is used first and the changes are not apparent to the City. Option 2 requires many new antenna sites. The third option is seldom used because it requires obtaining additional frequencies (licenses), which are very expensive or may not be available. Because the number and range of available frequencies are the main limiting factors for wireless network capacity, capacity needs are most often addressed through option four, adding new sites and "reusing" the allocated frequencies in smaller geographic areas. In reviewing the major carriers' service provision claims, Ormond Beach has good coverage but more capacity is needed.

Entry into residential areas will be the carrier's final phase with emphasis placed on eliminating land lines in customer homes. It is this final phase that will bring personal wireless service sites into residential areas of the City where they have traditionally not been located. [17] While there has been Wireless studies' regarding impact on residential property value, the studies seem to support the premise that wireless facilities if located appropriately will have neutral or positive effects on property values. The studies that are available on the internet have been prepared by the wireless industry in support of locating wireless facilities in residential areas.

Figure 2 depicts the current Land Development Code of Ormond Beach which favors greater height but fewer towers rather than more towers at lower heights. This philosophy dovetails well with current personal communication service carrier's desire to achieve the most coverage from the fewest sites since this is less expensive for carriers in the beginning phase of service provision. However, as the City approaches the "capacity" phase of personal communication service deployment, there are alternatives to macrocell towers beyond what exists today. It is worth nothing than many cities are looking at not permitting towers at all.

[17] Wireless Communication Master Plan, Wichita-Sedgwick County Metropolitan Planning Department, pages 13-14. August 2000

Figure 2 – Typical Tower Coverage by Height

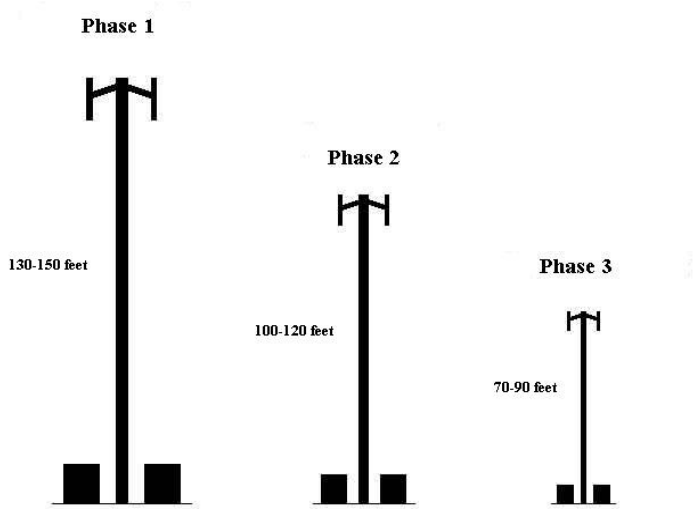


Cell site coverage and enhanced capacity follows essentially three phases of deployment:

1. Phase 1 – there are 12 tower types today in the City and they provide coverage for cellular.
2. Phase 2 – as demand increases, each carrier will need to add several sites in order to add capacity; and
3. Phase 3 – it is likely that there will have to be many more sites for each carrier upon entry into the residential areas. For each succeeding phase however, tower heights should be reduced as depicted below.

In California, technology exists where upper antennas are clipped on telephone poles and voice and data transmission boxes are placed at seven to eight feet high on telephone poles. If heights are reduced as call cells are split and higher frequencies are used, the introduction of smaller microcell tower sites at 70 feet or less as **Figure 3** suggests can be effectively camouflaged and should integrate well into residential areas where tree coverage exists. A better strategy for the City may be to get the towers lower and accept more of them. In the late 1980's, California did exactly this and over 50% of all wireless towers are less than 50 feet AGL.[18]

Figure 3 – Tower Size by Phase of Deployment

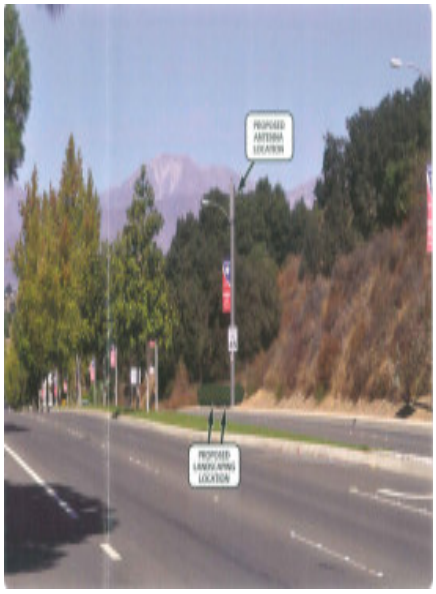


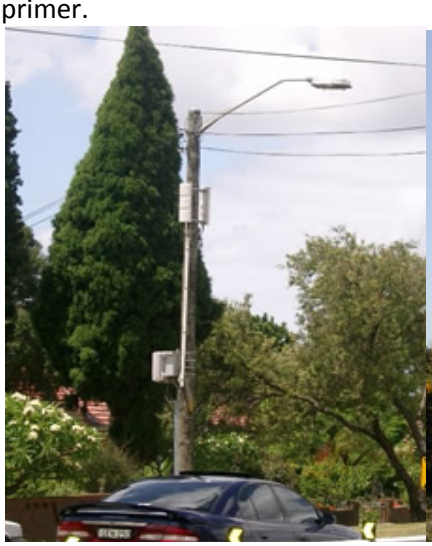
[18] Plan Wireless, "The Trouble with "Towers" > "Towers" Aren't Necessary.

Wireless conferences and numerous articles in the news and on the internet indicates service providers are developing new business models and new technologies with infrastructure requirements that were not thought of when the City's LDC was initially approved or even amended in 2007 after the introduction of the iphone. Many of these new technologies do not involve towers and are less objectionable because entry into residential neighborhoods is a must if the technology is to continue to grow. An example of this new technology is the location of boxes and antennas at much lower heights – generally less than 20 feet. In wireless vernacular, it is called a Distributed Antenna System Network or DAS Network for short.

A DAS Network spatially separates antenna nodes connected to a common source via a transport medium that provides wireless service within a geographic area or structure. DAS antenna elevations are generally at or below the clutter level and node installations are compact. DAS consists of fiber-optic cable network connecting a series of comparatively small radio antennas attached to streetlight poles which in turn is connected to the service provider's main base station which is a tower. Much of this is located in the public rights-of-way. In fact, during the research which led to the preparation of this paper, the City of Tamarac, Florida received an application to provide DAS which led to the City Manager signing an administrative order dated December 19, 2012 declaring zoning in progress and prohibiting the issuance of permits for personal wireless service facilities in all residential areas and in the public-rights of way. Tamarac in 2013 banned deployment of these antennae systems from the residential neighborhoods because of aesthetics. However the DAS has been deployed in North Lauderdale and Lauderhill.

In 2011, Alcatel-Lucent released lightRadio, a boxy 2-inch cellular antenna and base station system that represent a growing trend towards shrinking traditional cellular towers while boosting network capacities with additional cellular antenna systems. Microcell, picocell, femtocell and more recently DAS have been used in an effort to appease communities opposed to traditional macrocell towers. These smaller antenna systems face less opposition through the permitting approval process and are quicker to set up in order to service the explosive growth in cell phones and mobile data usage. Of course, DAS is just one technology and it may not be economically viable given the low density of the City's urban neighborhoods however the City has the zoning power under the Telecommunication Act concerning time, place and manner. Micro-cell sites at heights lower than 80 feet AGL is available and would be less objectionable in residential areas. Microcell antennas tend to cover roughly a mile in diameter. It takes roughly three to six microcells to get the same coverage of a traditional macrocell tower, which has about a 6 to 10 mile range. This system has not been commercially deployed as of the preparation of this primer.





Microcells have increased in popularity over the past five years and can sometimes be found stationed on top of lamp posts, a highway sign, or a flagpole about 20 feet high. The pictures depicted to the left and below best illustrate DAS and microcell technology. These alternatives to tall macrocell towers, in terms of visibility and function, fit better in the built urban environment while improving capacity for PCS subscribers. Unlike tall tower networks, which have a lower capacity over a larger area, DAS and microcell networks depicted in the pictures on this page and the previous page deliver a high capacity at a short distance. When it comes to cell density, for every one tall tower or macrocell, there could be anywhere from five to 25 microcells (# depends on microcell height) covering the same area, increasing capacity per usage. These microcells are also located outside providing better street level coverage in an urban environment, as well as better building penetration. Macrocell towers costs several hundred thousand dollars and at least a year to build and operate. Microcell sites and DAS are low enough in visibility that the same permitting and approval process that is required for macrotowers would not be required since there would be less community opposition because existing structures are used for the antennas. Consequently, time to market, which is important to carriers, is faster. [19]

Nomura Group's analyst Stuart Jeffrey predicts that small cells will make up 90% of total cell tower deployments by 2015. AT&T recently won approval from Palo Alto, California city officials for a significant DAS test project throughout the city however there are resident concerns regarding the intrusive nature and overall aesthetics of the distributed antennae system. Juan Santiago, head of Powerwave Technologies product management stated that small cell deployment is a huge opportunity coming. He is quoted as saying, "No one wants a giant cell tower in their backyard."[20] Unlike femtocells, microcells and pico cells can be engineered to provide greater capacity outdoors, work well in managing bandwidth, and can supplement macro cell coverage. These small cells can be deployed in arrays, be extremely directional, and deliver capacity in areas that are either unreachable by macrocell towers or politically constrained by community or city opposition. Heterogeneous networks (HetNet) are another developing technology to address coverage and capacity needs for next-generation networks. Hetnet combines both existing macrocell sites with microcell sites utilizing the same core equipment such as a base station. The point to be stressed is that there are current (DAS and microcell) and developing technologies (HetNet) that are either a replacement or a supplement to macrocell tower sites. These alternative technologies did not exist in 2007 when the iphone debuted. The City's Telecommunication Ordinance was developed in 1997 solely to address the 1996 Telecommunication Act's mandate to maximize coverage. The best technology for coverage at that time was macrocell towers. It is now 2013 and LTE and 5G exist to address the growing usage of electronic devices and the issue is capacity. The post-macrocell era is not coming, it is already here.

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[19] My DailyFinance, "The Incredible, Shrinking Cellphone Tower: Alcatel-Lucent Offers an Alternative," by Dawn Kawamoto, March 2011

[20] The Spectrum Crunch," Itsy-bitsy teeny cell towers are coming." David Goldman@CNNMoneyTech April 2012.

7.0 Coverage and/or Capacity in Ormond Beach

Why is it important for Ormond Beach to have a citywide radio frequency coverage analysis completed? It is important because wireless carriers use coverage data to:[21]

1. Schedule capital programming to expand the network for maximum Return on Investment;
2. Provide resolution to customer reported complaints on coverage quality;
3. Marketing to subscribers as to what mobile and fixed service is available;

To date, Ormond Beach must take at face value the submitted propagation analyses used to support cell site heights and location – both issues which are zoning related and reserved to the city to regulate. Without the ability of the City to have access to an independent spatial analysis and map display of coverage and capacity data, the City is at the mercy of the carriers and tower builders. Consequently, the assessment needs to compare the measurements of existing wireless coverage with an in-depth qualification process for properties within poor capacity areas. The consultant must be a specialist in wireless systems and proficient in propagation coverage and capacity design, to perform extensive test activity to measure existing commercial wireless coverage and capacity within the City. This drive test should include RSSI (Received Signal Strength Indicator) coverage measurements for AT&T, Sprint-Nextel, T-Mobile and Verizon.

A report that should include the following:

- Inventory List of Existing Facilities and carriers located on each site;
- A narrative explaining each carriers coverage throughout the city;
- An outline indicating current coverage gaps or capacity issues;
- A Conclusion/Summary of all carriers coverage needs; and
- Maps of existing sites, reliable coverage and each carrier's individual plots.

In the absence of a propagation study, staff has attempted to provide coverage maps using the concept of crowdsourcing. Crowdsourcing is the practice of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, especially from an online community, rather than through traditional employees or suppliers.[22] Open Signal, Roots Metric and Sensorly are cell coverage crowdsourcing websites that take advantage of subscribers individual Smartphone's capability to collect and analyze data using apps designed to report accurate and unbiased mobile performance data which in turn is used to construct coverage maps. Maps were developed for AT&T (2G, 3G, & 4G), Verizon (2G, 3G & 4G), T-Mobile (2 G & 3G), Sprint (2 G & 3G) and Metro PCS (2G & 3G). Caution is emphasized regarding crowdsourcing. Crowdsourcing of information for development of coverage maps is accurate but it does not represent the universe of users with Android or iOS devices.

In addition to the crowdsourcing coverage maps, Volusia County Sheriff's Department during May and June of 2012 drove all the state, county and local roads in Volusia County using four notebooks, one for each carrier, testing data rates using air cards. Signal coverage proved to be unreliable indicator of usability. Exhibit G maps

[21] "Processing RF Propagation Coverage Data for Optimized Display and Analysis in a Web-based Application," Jeremy Peters. MapInfo Corporation.

[22] Wikipedia, the Free Encyclopedia.

depict AT&T, Sprint, Verizon and T-Mobile data rates. Dark green is the best rates; yellow-red is poor and black is no coverage.

Individual carrier coverage maps that are online were considered for use however there were so many exceptions, exclusions, and reservations concerning service and quality of service that the coverage maps were considered unreliable for the purposes of this paper. Coverage should not be confused with capacity. Coverage is not capacity and vice versa. Bandwidth frequencies cannot be reused at existing cell sites. So the only alternative available is to construct additional cell sites. However, each cell site must process now not only voice but increased amounts of data as depicted in Table 1 of this report. More cell sites will be needed to increase capacity but the future cellular networks will need thousands more smaller cell sites (called microcells and picocells) which are much lower to the ground to manage the increased amount of data transmission. The City is not knowledgeable of the capacity of the base stations so the maps will change. Only through a propagation analysis can the maps be truly accurate to reflect coverage and capacity.

8.0 Key Thoughts

- Section 704 of the Telecommunications Act preserves local zoning authority over time, place and manner (i.e., location, height and numbers of personal wireless service facilities) with some limitations or protections from regulation by the City of Ormond Beach.
- The City's Telecommunication Tower Ordinance predates the iphone and was written to address the latest technology at the time which was maximum coverage through the use of macrocell towers.
- Tower builders are in the business of building towers and making money on leasing space and it is less expensive for the individual carriers to co-locate rather than develop individual cell sites.
- Tower builders are not included in the definition of Personal Wireless Services and therefore are not protected by Section 704 of the Act; consequently the city has greater discretion regarding time, place and manner restrictions governing cell site placement, heights, and numbers.
- Fourth generation network technology (the platform for smart-phones) emphasizes improving network capacity and maximizing the use of bandwidth for faster and more efficient transfers of data.
- Fifth generation wireless will bring faster data transfers and additional wireless services such as using the phone for credit card transactions and other similar functions. Unlike previous generations of wireless deployment, 5G will require even more sites but these sites do not need to be on macrocell towers.
- Small cell technologies will be more important to carriers than macrocell towers in future LTE network deployments.
- Within a four mile radius of City Hall, there are 53 towers and 150 antennas for wireless transmission of voice and data that includes cellular and personal communications services (PCS) as well as paging, wireless internet services and mobile radio.
- Coverage should not be confused with capacity.
- Ormond Beach is in the capacity phase of wireless deployment due to demand.
- Cell splitting into smaller microcells which reuses the frequency pattern of the larger cell system is the choice of most providers.
- The benefits of dividing networks into smaller "cells" go far beyond esthetics. Smaller cells mean vastly higher capacity for calls and data traffic. Instead of having all phones within a mile or two connect to the same cell tower, the traffic could be divided between several smaller cells, so there's less competition for the cell tower's attention.
- The next expansion stage for wireless facing Ormond Beach in the near future is residential service.
- When heights are reduced as call cells are split and higher frequencies are used, smaller but more cell sites can be effectively camouflaged and should integrate well into residential areas where tree coverage exists.
- Each cell not only processes voice but increased amounts of data as depicted in Table 1 of this report. More cell sites will be needed to increase capacity but the future cellular networks will need thousands more smaller cell sites (called microcells and picocells) which are much lower to the ground to manage the increased amount of data transmission. Distributed Antenna System (DAS) Network is one technology that exists and was not contemplated in 1997 and it is employed on existing street light or telephone poles in Florida.

9.0 *Where do we go from here?*

Prior to the Telecommunication Act of 1996, traditional land lines delivered over ancient copper infrastructure was ***the*** technology. Subsequent to Congress passing the Telecommunications Act of 1996, the transition from land lines to internet based services began. In 2012 37% of all households were wireless only and this trend continues unabated. Within the next decade land lines will go the way of ice manufacturing. As demonstrated in this paper, the technology is rapidly changing due to the introduction of 4G and 5G. PCS service requires higher frequencies and more cell sites due to 3G, 4G and 5G service. The large increase in usage requires service providers to seek new wireless technologies to boost signal strength and reuse frequency – all in an effort to increase transmission capacity and reduce time to market.

It would be worth the Planning Board's time and energy upon reading, discussing and understanding this technology, to request staff to invite representatives for a presentation on the future of wireless from the individual carriers as well as representatives from the Personal Communication Industry Association (PCIA) which is the Wireless Infrastructure Association. This primer should be sufficient to prepare each Board member to actively engage the wireless industry representatives regarding why certain wireless technology is deployed in Ormond Beach. Upon the completion of those presentations and depending on policy direction from the Planning Board, Part 2 to this paper may be prepared. Part 2 would consider the issues identified in this paper, the individual carrier's future directions regarding cell technology as expressed at the workshops, and the Planning Board's policy directions to staff - all of which would result in alternatives from which amendments to the city's wireless technology ordinance would be proposed.

The City of Ormond Beach adopted amendments to the Land Development Code by Ordinance 97-6 in April, 1997 to ensure the siting of telecommunication towers and antennas would comply with federal law. The City's regulations addressed the state of technology at the time. Three more amendments were adopted in 2007 and 2012 concerning camouflaging of towers, setbacks, and professional assistance in reviewing propagation studies. On the latter amendment, staff struggles to find an RF engineer close by to perform municipal reviews. The main focus of the City's current ordinance then and now remains on towers because the prevailing business model involves tower builders applying and siting towers where one or more service providers would lease space to provide voice and data service to subscribers over a large area of the City. While in theory co-location is a priority, there is no independent way for the City to ensure co-location occurs. The city will need a consultant whose clients are principally municipal (RF Engineer and Legal) to assist staff in preparing a defensible wireless plan for incorporation into the Comprehensive Plan as well as an ordinance that uses time, place and manner restrictions that reflect a technology best suited for the city's urban environment.

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Exhibit A

1996 Telecommunication Act

SUMMARY OF SECTION 704 OF THE TELECOMMUNICATIONS ACT OF 1996
The following is a summary of key provisions. The text of Section 704 is reproduced in its entirety as an attachment to this summary.

1. Local Zoning Authority Preserved
Section 704(a) of the 1996 Act amends Section 332(c) of the Communications Act ("Mobile Services") by adding a new paragraph (7). It preserves the authority of state and local governments over decisions regarding the placement, construction, and modification of personal wireless service facilities, except as provided in the new paragraph (7).

2. Exceptions

a. States and Localities May Not Take Discriminatory or Prohibiting Actions

Section 704(a) of the 1996 Act states that the regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof shall not unreasonably discriminate among providers of functionally equivalent services and shall not prohibit or have the effect of prohibiting the provision of personal wireless services. 47 U.S.C. §332(c)(7)(B)(i).

Review: Any person that is adversely affected by a state or local government's action or failure to act that is inconsistent with Section 332(c)(7) may seek expedited review in the courts. 47 U.S.C. §332(c)(7)(B)(v).

b. Procedures for Ruling on Requests to Place, Construct or Modify Personal Wireless Service Facilities

Section 704(a) also requires a State or local government to act upon a request for authorization to place, construct, or modify personal wireless service facilities within a reasonable time. Any decision to deny a request must be made in writing and be supported by substantial evidence contained in a written record. 47 U.S.C. §332(c)(7)(B)(ii), (iii).

c. Regulations Based On Environmental Effects of RF Emissions Preempted

Section 704(a) of the 1996 Act expressly preempts state and local government regulation of the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the FCC's regulations concerning such emissions. 47 U.S.C. §332(c)(7)(B)(iv).

Review: Parties may seek relief from the FCC if they are adversely affected by a state or local government's final action or failure to act that is inconsistent with this provision. 47 U.S.C. § 332(c)(7)(B)(v).

3. Federal Guidelines Concerning RF Emissions

Section 704(b) requires the FCC to prescribe and make effective new rules regarding the environmental effects of radio frequency emissions, which are under consideration in ET Docket 93-62, within 180 days of enactment of the 1996 Act.

NOTE: The pendency of this proceeding before the FCC does not affect the rules which currently are in effect governing the environmental effects of radio frequency emissions. Section 704(b) gives preemptive effect to these existing rules. See related attachments to the Fact Sheet.

4. Use of Federal or State Government Property

a. Federal Property

Section 704(c) of the 1996 Act requires the President (or his designee) to prescribe procedures by which the federal government may make available on a fair, reasonable and nondiscriminatory basis, property, rights-of-way and easements under their control, for the placement of new spectrum-based telecommunications services.

b. State Property

With respect to facilities siting on state property, Section 704(c) of the 1996 Act requires the FCC to provide technical support to States to encourage them to make property, rights-of-way and easements under their jurisdiction available for the placement of new spectrum-based telecommunications services.

NOTE: Information concerning technical support for tower siting which the FCC is making available to state and local governments is attached to the Fact Sheet.

5. Definitions

"Personal wireless services" include commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services. 47 U.S.C. §332(c)(7)(C)(i).

"Commercial mobile services" are defined in Section 332 of the Communications Act and the FCC's rules, and include cellular telephone services regulated under Part 22 of the FCC's rules, SMR services regulated under Part 90 of the FCC's rules, and PCS regulated under Part 24 of the FCC's rules. 47 C.F.R. §20.9.

"Unlicensed wireless services" are defined as the offering of telecommunications services using duly authorized devices which do not require individual licenses; direct-to-home satellite services are excluded from this definition. 47 U.S.C. §332(c)(7)(C)(iii).

COMPLETE TEXT OF SEC. 704 OF THE TELECOMMUNICATIONS ACT OF 1996

SEC. 704. FACILITIES SITING; RADIO FREQUENCY EMISSION STANDARDS.

(a) NATIONAL WIRELESS TELECOMMUNICATIONS SITING POLICY- Section 332(c) (47 U.S.C. 332(c)) is amended by adding at the end the following new paragraph:

`(7) PRESERVATION OF LOCAL ZONING AUTHORITY-

`(A) GENERAL AUTHORITY- Except as provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities.

`(B) LIMITATIONS-

`(i) The regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof--

`(I) shall not unreasonably discriminate among providers of functionally equivalent services; and

`(II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services.

`(ii) A State or local government or instrumentality thereof shall act on any request for authorization to place, construct, or modify personal wireless service facilities within a reasonable period of time after the request is duly filed with such government or instrumentality, taking into account the nature and scope of such request.

`(iii) Any decision by a State or local government or place,

construct, or modify personal wireless service facilities shall be in writing and supported by substantial evidence contained in a written record.

`(iv) No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions.

`(v) Any person adversely affected by any final action or failure to act by a State or local government or any instrumentality thereof that is inconsistent with this subparagraph may, within 30 days after such action or failure to act, commence an action in any

court of competent jurisdiction. The court shall hear and decide such action on an expedited basis. Any person adversely affected by an act or failure to act by a State or local government or any instrumentality thereof that is inconsistent with clause (iv) may petition the Commission for relief.

`(C) DEFINITIONS- For purposes of this paragraph--

`(i) the term `personal wireless services' means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services;

`(ii) the term `personal wireless service facilities' means facilities for the provision of personal wireless services; and

`(iii) the term `unlicensed wireless service' means the offering of telecommunications services using duly authorized devices which do not require individual licenses, but does not mean the provision of direct-to-home satellite services (as defined in section 303(v)).'.

(b) RADIO FREQUENCY EMISSIONS- Within 180 days after the enactment of this Act, the Commission shall complete action in ET Docket 93-62 to prescribe and make effective rules regarding the environmental effects of radio frequency emissions.

(c) AVAILABILITY OF PROPERTY- Within 180 days of the enactment of this Act, the President or his designee shall prescribe procedures by which Federal departments and agencies may make available on a fair, nondiscriminatory basis, property, rights-of-way, and easements under their control for the placement of new telecommunications services that are dependent, in whole or in part, upon the utilization of Federal spectrum rights for the transmission or reception of such services. These procedures may establish a presumption that requests for the use of property, rights-of-way, and easements by duly authorized providers should be granted absent unavoidable direct conflict with the department or agency's mission, or the current or planned use of the property, rights-of-way, and easements in question. Reasonable fees may be charged to providers of such telecommunications services for use of property, rights-of-way, and easements. The Commission shall provide technical support to States to encourage them to make property, rights-of-way, and easements under their jurisdiction available for such purposes.

SUMMARY OF SECTION 704 OF THE TELECOMMUNICATIONS ACT OF 1996
The following is a summary of key provisions. The text of Section 704 is reproduced in its entirety as an attachment to this summary.

1. Local Zoning Authority Preserved
Section 704(a) of the 1996 Act amends Section 332(c) of the Communications Act ("Mobile Services") by adding a new paragraph (7). It preserves the authority of state and local governments over decisions regarding the placement, construction, and modification of personal wireless service facilities, except as provided in the new paragraph (7).

2. Exceptions

a. States and Localities May Not Take Discriminatory or Prohibiting Actions

Section 704(a) of the 1996 Act states that the regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof shall not unreasonably discriminate among providers of functionally equivalent services and shall not prohibit or have the effect of prohibiting the provision of personal wireless services. 47 U.S.C. §332(c)(7)(B)(i).

Review: Any person that is adversely affected by a state or local government's action or failure to act that is inconsistent with Section 332(c)(7) may seek expedited review in the courts. 47 U.S.C. §332(c)(7)(B)(v).

b. Procedures for Ruling on Requests to Place, Construct or Modify Personal Wireless Service Facilities

Section 704(a) also requires a State or local government to act upon a request for authorization to place, construct, or modify personal wireless service facilities within a reasonable time. Any decision to deny a request must be made in writing and be supported by substantial evidence contained in a written record. 47 U.S.C. §332(c)(7)(B)(ii), (iii).

c. Regulations Based On Environmental Effects of RF Emissions Preempted

Section 704(a) of the 1996 Act expressly preempts state and local government regulation of the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the FCC's regulations concerning such emissions. 47 U.S.C. §332(c)(7)(B)(iv).

Review: Parties may seek relief from the FCC if they are adversely affected by a state or local government's final action or failure to act that is inconsistent with this provision. 47 U.S.C. § 332(c)(7)(B)(v).

3. Federal Guidelines Concerning RF Emissions

Section 704(b) requires the FCC to prescribe and make effective new rules regarding the environmental effects of radio frequency emissions, which are under consideration in ET Docket 93-62, within 180 days of enactment of the 1996 Act.

NOTE: The pendency of this proceeding before the FCC does not affect the rules which currently are in effect governing the environmental effects of radio frequency emissions. Section 704(b) gives preemptive effect to these existing rules. See related attachments to the Fact Sheet.

4. Use of Federal or State Government Property

a. Federal Property

Section 704(c) of the 1996 Act requires the President (or his designee) to prescribe procedures by which the federal government may make available on a fair, reasonable and nondiscriminatory basis, property, rights-of-way and easements under their control, for the placement of new spectrum-based telecommunications services.

b. State Property

With respect to facilities siting on state property, Section 704(c) of the 1996 Act requires the FCC to provide technical support to States to encourage them to make property, rights-of-way and easements under their jurisdiction available for the placement of new spectrum-based telecommunications services.

NOTE: Information concerning technical support for tower siting which the FCC is making available to state and local governments is attached to the Fact Sheet.

5. Definitions

"Personal wireless services" include commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services. 47 U.S.C. §332(c)(7)(C)(i).

"Commercial mobile services" are defined in Section 332 of the Communications Act and the FCC's rules, and include cellular telephone services regulated under Part 22 of the FCC's rules, SMR services regulated under Part 90 of the FCC's rules, and PCS regulated under Part 24 of the FCC's rules. 47 C.F.R. §20.9.

"Unlicensed wireless services" are defined as the offering of telecommunications services using duly authorized devices which do not require individual licenses; direct-to-home satellite services are excluded from this definition. 47 U.S.C. §332(c)(7)(C)(iii).

COMPLETE TEXT OF SEC. 704 OF THE TELECOMMUNICATIONS ACT OF 1996

SEC. 704. FACILITIES SITING; RADIO FREQUENCY EMISSION STANDARDS.

(a) NATIONAL WIRELESS TELECOMMUNICATIONS SITING POLICY- Section 332(c) (47 U.S.C. 332(c)) is amended by adding at the end the following new paragraph:

`(7) PRESERVATION OF LOCAL ZONING AUTHORITY-

`(A) GENERAL AUTHORITY- Except as provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities.

`(B) LIMITATIONS-

`(i) The regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof--

`(I) shall not unreasonably discriminate among providers of functionally equivalent services; and

`(II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services.

`(ii) A State or local government or instrumentality thereof shall act on any request for authorization to place, construct, or modify personal wireless service facilities within a reasonable period of time after the request is duly filed with such government or instrumentality, taking into account the nature and scope of such request.

`(iii) Any decision by a State or local government or place,

construct, or modify personal wireless service facilities shall be in writing and supported by substantial evidence contained in a written record.

`(iv) No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions.

`(v) Any person adversely affected by any final action or failure to act by a State or local government or any instrumentality thereof that is inconsistent with this subparagraph may, within 30 days after such action or failure to act, commence an action in any

court of competent jurisdiction. The court shall hear and decide such action on an expedited basis. Any person adversely affected by an act or failure to act by a State or local government or any instrumentality thereof that is inconsistent with clause (iv) may petition the Commission for relief.

`(C) DEFINITIONS- For purposes of this paragraph--

`(i) the term `personal wireless services' means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services;

`(ii) the term `personal wireless service facilities' means facilities for the provision of personal wireless services; and

`(iii) the term `unlicensed wireless service' means the offering of telecommunications services using duly authorized devices which do not require individual licenses, but does not mean the provision of direct-to-home satellite services (as defined in section 303(v)).'.

(b) RADIO FREQUENCY EMISSIONS- Within 180 days after the enactment of this Act, the Commission shall complete action in ET Docket 93-62 to prescribe and make effective rules regarding the environmental effects of radio frequency emissions.

(c) AVAILABILITY OF PROPERTY- Within 180 days of the enactment of this Act, the President or his designee shall prescribe procedures by which Federal departments and agencies may make available on a fair, nondiscriminatory basis, property, rights-of-way, and easements under their control for the placement of new telecommunications services that are dependent, in whole or in part, upon the utilization of Federal spectrum rights for the transmission or reception of such services. These procedures may establish a presumption that requests for the use of property, rights-of-way, and easements by duly authorized providers should be granted absent unavoidable direct conflict with the department or agency's mission, or the current or planned use of the property, rights-of-way, and easements in question. Reasonable fees may be charged to providers of such telecommunications services for use of property, rights-of-way, and easements. The Commission shall provide technical support to States to encourage them to make property, rights-of-way, and easements under their jurisdiction available for such purposes.

Exhibit B

ASR Tower Registration

ASR Registration Search

Registration Search Results

Displayed Results

PA = Pending Application(s)

Specified Search

Structure State = **FLORIDA**
City like **ormond beach**
Structure Zipcode like **32174**
Structure County = **VOLUSIA**

	Registration Number	Status	File Number	Owner Name	Latitude/Longitude	Structure City/State	Overall Height Above Ground (AGL)
1	1003605	Terminated	A0273995	American Tower LP	29-21-12.0N 081-08-14.0W	ORMOND BEACH, FL	48.2
2	1011716	Constructed	A0791346	ORLANDO SMSA LIMITED PARTNERSHIP	29-15-18.1N 081-09-01.0W	Ormond Beach, FL	79.9
3	1015832	Cancelled	A0018927	APT TAMPA ORLANDO INC	29-18-10.0N 081-07-57.0W	ORMOND BEACH, FL	30.4
4	1020470	Constructed	A0601472	American Towers, LLC.	29-15-32.1N 081-07-04.5W	ORMOND BEACH, FL	97.2
5	1020890	Terminated	A0024928	OPM USA INC	29-15-33.0N 081-06-51.0W	ORMOND BEACH, FL	97.5
6	1029742	Constructed	A0791371	ORLANDO SMSA LIMITED PARTNERSHIP	29-17-07.0N 081-04-01.4W	ORMOND BEACH, FL	81.4
7	1041718	Dismantled	A0451314	Bright House Networks, LLC	29-16-30.0N 081-04-27.0W	ORMOND BEACH, FL	110.3
8	1048033	Granted	A0056516	ARK COMMUNICATIONS NETWORK	29-15-16.0N 081-13-47.0W	ORMOND BEACH, FL	152.4
9	1056806	Terminated	A0198100	American Tower Limited Partnership	29-21-11.0N 081-08-12.0W	ORMOND BEACH, FL	48.8
10	1061168	Constructed	A0817270	SBA Towers IV, LLC	29-15-33.7N 081-07-51.6W	Ormond Beach, FL	98.1

ASR Registration Search

Registration Search Results

Displayed Results

PA = Pending Application(s)

Specified Search

Structure State = **FLORIDA**
City like **ormond beach**
Structure Zipcode like **32174**
Structure County = **VOLUSIA**

	Registration Number	Status	File Number	Owner Name	Latitude/Longitude	Structure City/State	Overall Height Above Ground (AGL)
11	1062834	Constructed	A0073410	WINGS COMMUNICATIONS INC DBA = WELE RADIO	29-16-10.0N 081-04-53.0W	ORMOND BEACH, FL	61.9
12	1062835	Constructed	A0073411	WINGS COMMUNICATIONS INC DBA = WELE RADIO	29-16-10.0N 081-04-53.0W	ORMOND BEACH, FL	61.9
13	1062836	Constructed	A0073412	WINGS COMMUNICATIONS INC DBA = WELE RADIO	29-16-10.0N 081-04-53.0W	ORMOND BEACH, FL	61.9
14	1062837	Constructed	A0073413	WINGS COMMUNICATIONS INC DBA = WELE RADIO	29-16-10.0N 081-04-53.0W	ORMOND BEACH, FL	61.9
15	1210022	Granted	A0115745	MEMORIAL HOSPITAL - ORMOND BEACH	29-16-55.9N 081-04-49.2W	ORMOND BEACH, FL	57.0
16	1224686	Constructed	A0258559	City of Ormond Beach, Florida	29-18-03.3N 081-06-39.5W	ORMOND BEACH, FL	9.4
17	1236750	Granted	A0296359	City of Ormond Beach	29-18-17.0N 081-07-01.0W	Ormond Beach, FL	21.3
18	1266912	Granted	A0618781	Florida, State of	29-20-12.1N 081-07-48.4W	Ormond Beach, FL	48.7
19	1285123	Granted	A0780365	Capital Telecom	29-16-00.6N 081-03-21.1W	Ormond Beach, FL	48.8

CLOSE WINDOW

Exhibit C

FCC Registered Cell Phone and Antenna Towers in Ormond Beach

City-Data.com FORUM

FCC Registered Cell Phone and Antenna Towers in Ormond Beach, Florida

Ads by Google

CLEAR® Official Website
CLEAR 4G Unlimited Data Plans - Get CLEAR For $34.99. Order Today!
www.clear.com

AT&T® Official Site
Shop Phones for Under $1! Free Overnight Shipping on Select Orders
att.com/wireless

Cellular Tower Regulatory
FAA/FCC Analysis and Filing
Our Experts Save You $ and Risk!
www.wirelessapplications.com

Boost Your Cell Reception
Improve Your Signal at Home.
Works with All Major Carriers.
www.surecall.com

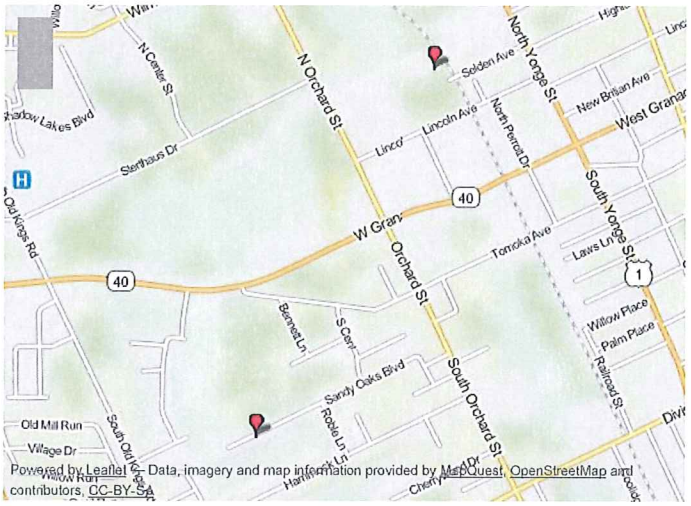
Virgin Mobile® 4G
Get Virgin Mobile Plans $35/Month
w/4G Speeds! Shop For Phones Now.
www.virginmobileusa.com/4G

Cell Phone Reverse Lookup
1. Enter Phone Number 2. Find Owner
3. Full Address & Info Details Now
Hexum.com

Back to: Ormond Beach, FL, Florida, Florida forum, All US cities.

Cell Phone, Antenna

FCC Registered Cell Phone Towers in Ormond Beach, FL



Note: Not all towers must be registered in the FCC database, so the above map may not list all the towers in the area.

Full list of 2 FCC Registered Cell Phone Towers in Ormond Beach, FL:

123 N. Orchard Street (Lat: 29.285250 Lon: -81.067000), Structure height: 80.8 m, Call Sign: KNKA703
Assigned Frequencies: 880.020 MHz, 880.020 MHz, 880.020 MHz, 891.510 MHz, 891.510 MHz, 891.510 MHz, 835.020 MHz, 835.020 MHz, 835.020 MHz, 846.510 MHz, 846.510 MHz, 846.510 MHz
Grant Date: 11/06/2007, Expiration Date: 10/01/2017
Registrant: At&t Mobility LLC, 1120 20th Street, Nw, Suite 1000, Washington, DC 20036, Phone: (202) 457-2055, Fax: (202) 457-3074, Email: mg7268@att.com

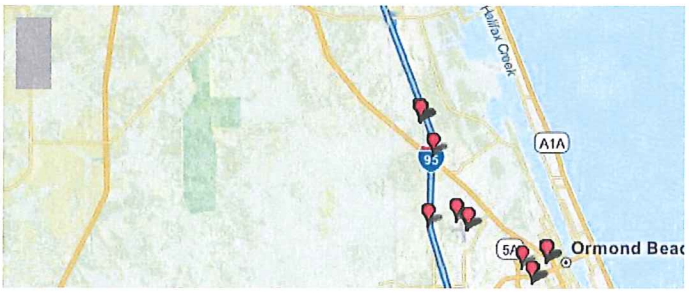
Ormond Beach 125 Bennet Lane (Lat: 29.274139 Lon: -81.073111), Structure height: 106.7 m, Call Sign: KNKA528
Assigned Frequencies: 869.040 MHz, 869.040 MHz, 890.010 MHz, 890.010 MHz, 824.040 MHz, 824.040 MHz, 845.010 MHz, 845.010 MHz
Grant Date: 11/06/2007, Expiration Date: 10/01/2017, Certifier: David C Jatlow
Registrant: At&t Mobility LLC, 1120 20th Street, Nw, Suite 1000, Washington, DC 20036, Phone: (202) 457-2055, Fax: (202) 457-3074, Email: mg7268@att.com

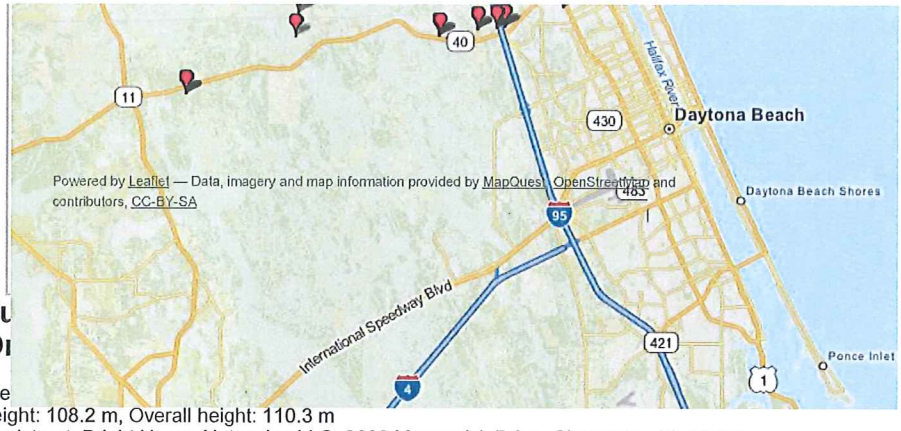
Cell Phone, Antenna

Jump to a detailed profile or search site with Google™ Custom Search
City, County or Zip Code
Search

Business Search
14 Million Businesses in 12,000 Categories
Find:
Near: Ormond Beach, FL
Search

FCC Registered Antenna Towers in Ormond Beach, FL





Fu
Or

Ste
height: 108.2 m, Overall height: 110.3 m
Registrant: Bright House Networks, LLC, 2600 Mccormick Drive, Clearwater, FL 33759, Phone: (727) 791-7730, Email: chris.feathers@mybrighthouse.com

KELLYE E ABERNATHY, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m
Registrant: Cingular Wireless LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

KELLYE E ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 78.6 m
Registrant: Cingular Wireless LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

KELLYE E ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Cingular Wireless LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

SIGNATURE ON FILE, Ormond Beach Municipal Airport (Lat: 29.300944 Lon: -81.111444), Type: Tower, Structure height: 9.4 m, Overall height: 9.4 m
Registrant: Hoyle, Tanner & Associates, Inc., 3452 Lake Lynda Dr., Suite 151, Orlando, FL 32817, Phone: (407) 380-1919, Email: htafl@magicnet.net

WILLIAM A TRESSLER, 875 Sterthaus Ave (Lat: 29.282194 Lon: -81.080333), Type: Bant, Structure height: 45.7 m, Overall height: 57 m, Licensee ID: L00212312
Registrant: Memorial Hospital - Ormond Beach, 875 Sterthaus Ave, Ormond Beach, FL 32174, Phone: (904) 676-6017

Lawrence C Miller, 1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m, Licensee ID: L00008376
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

Vincent R Clawson, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00000959
Registrant: Bellsouth Mobility Inc, 5201 Congress Ave., Boca Raton, FL 33487, Phone: (561) 995-3500

Lawrence C Miller, 1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m, Licensee ID: L00008376
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255000 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

Douglas I Brandon, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m
Registrant: At&t Wireless Services, Inc., 1150 Connecticut Avenue, Nw, 4th Fl, Washington, DC 20036, Phone: (202) 223-9222, Email: esther.hilliard@attws.com

DWANE L RIGG, 6 Miles N.W Of City (Lat: 29.353056 Lon: -81.136667), Type: Tower, Structure height: 42.7 m, Overall height: 48.8 m, Licensee ID: L00131936
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

Steven O Vondran, 1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m
Registrant: American Tower, LP, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 936-9400

DWANE L RIGG, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m, Licensee ID: L00131936
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

DWANE L RIGG, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m
Registrant: GA

TOM LIPPS, Ormond Beach Municipal Airport (Lat: 29.300917 Lon: -81.110972), Type: Tower, Structure height: 7.6 m, Overall height: 9.4 m
Registrant: Hoyle, Tanner & Associates, Inc, 3452 Lake Lynda Dr Suite 151, Orlando, FL 32817, Phone: (407) 380-1919, Email: rholliday@hta-fl.com

A C NEWBERRY, 1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m, Licensee ID: L00008376
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

APRIL C NEWBERRY, 1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m, Licensee ID: L00131936
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

APRIL C NEWBERRY, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m, Licensee ID: L00131936
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

APRIL C NEWBERRY, 6 Miles N.W Of City (Lat: 29.353056 Lon: -81.136667), Type: Tower, Structure height: 42.7 m, Overall height: 48.8 m, Licensee ID: L00131936
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

APRIL C NEWBERRY, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m, Licensee ID: L00131936
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

APRIL C NEWBERRY, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m, Licensee ID: L00131936
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

APRIL C NEWBERRY, 6 Miles N.W Of City (Lat: 29.353056 Lon: -81.136667), Type: Tower, Structure height: 42.7 m, Overall height: 48.8 m
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

Tosha N Taylor, 1687 W Tranada Blvd (Ormond Beach / 002703) (Lat: 29.259167 Lon: -81.117861), Type: Tower, Structure height: 92.1 m, Overall height: 95.7 m
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205,

Atlanta, GA 30339, Phone: (770) 953-9400

Bridget B Breen, 1687 W Tranada Blvd (Ormond Beach / 002703) (Lat: 29.259167 Lon: -81.117861), Type: Tower, Structure height: 92.1 m, Overall height: 95.7 m
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255000 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

Bridget B Breen, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

Bridget B Breen, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Tower Limited Partnership, 3200 Cobb Galleria Pkwy Suite 205, Atlanta, GA 30339, Phone: (770) 953-9400

Tom Lipps, Ormond Beach Municipal Airport (Lat: 29.300917 Lon: -81.110972), Type: Tower, Structure height: 7.6 m, Overall height: 9.4 m
Registrant: Hoyle, Tanner & Associates, Inc, 3452 Lake Lynda Dr Suite 151, Orlando, FL 32817, Phone: (407) 380-1919, Email: rholliday@hta-fl.com

Harold Heaster, Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower, Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Keller And Heckman LLP, 1001 G Street, Nw, Suite 500 West, Washington, DC 20001, Phone: (202) 434-4124, Email: morrone@khlaw.com

Bridget B Breen, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m, Licensee ID: L00131936
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

Bridget B Breen, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

Bridget B Breen, 405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

Bridget B Breen, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Tower LP, 829 Pickens Industrial Drive, Ste 3, Marietta, GA 30062, Phone: (770) 919-9003

Harole Heaster, Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower, Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Keller And Heckman LLP, 1001 G Street, Nw, Suite 500 West, Washington, DC 20001, Phone: (202) 434-4124, Email: morrone@khlaw.com

Harold Heaster, Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower,

Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Keller And Heckman LLP, 1001 G Street, Nw, Suite 500 West, Washington, DC 20001, Phone: (202) 434-4124, Email: morrone@khlaw.com

Tom Lipps, Ormond Beach Municipal Airport (Lat: 29.304722 Lon: -81.116944), Type: Bant, Structure height: 18.2 m, Overall height: 21.3 m
Registrant: City Of Ormond Beach, 22 S. Beach Street, Ormond Beach, FL 32175-0277, Phone: (386) 676-3224, Email: tlipps@ormondbeach.org

Bridget B Carter, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m, Licensee ID: L00008376
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

Kellye E Abernathy, Sr 40 2 Mi W Of I-95 (Lat: 29.255000 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2022

Bridget B Carter, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Towers (Delaware), Inc., 829 Pickens Industrial Dr., Suite 3, Marietta, GA 30062, Phone: (770) 970-2050

Lewis Heaster, Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower, Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Keller And Heckman LLP, 1001 G Street, Nw, Suite 500 West, Washington, DC 20001, Phone: (202) 434-4124, Email: morrone@khlaw.com

Steve Miron, 121 Bennett Ln (Lat: 29.275000 Lon: -81.074167), Type: Tower, Structure height: 108.2 m, Overall height: 110.3 m, Licensee ID: L00555808
Registrant: Bright House Networks, LLC, 5000 Campuswood Drive, E. Syracuse, NY 13057, Phone: (315) 438-4100, Email: sam@advancenewhouse.com

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 78.6 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2349

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 78.6 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2349

B B Carter, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m, Licensee ID: L00008376
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 78.6 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2092

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2092

KELLYE ABERNATHY, Sr 40 2 Mi W Of I-95 (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 78.6 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2092, Email: kellye.e.abernathy@cingular.com

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252,

Phone: (972) 733-2092, Email: kellye.e.abernathy@cingular.com

David C Jatlow, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m
Registrant: At&t Wireless Services, Inc., 1150 Connecticut Avenue, Nw, 4th Fl, Washington, DC 20036, Phone: (202) 223-9222, Email: esther.hilliard@attws.com

B B CARTER, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Towers, Inc., 3200 Cobb Galleria Pkwy., Suite 205, Atlanta, GA 30339, Phone: (770) 308-1986, Email: bridget.carter@americantower.com

DAVID C JATLOW, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m
Registrant: Cingular Wireless LLC, 17330 Preston Road, Suite 100a, Dallas, TX 75252, Phone: (972) 733-2092

B B CARTER, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Towers, Inc., 900 Circle 75 Parkway, Suite 300, Atlanta, GA 30339, Phone: (770) 308-1986, Email: bridget.carter@americantower.com

B B CARTER, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Towers, Inc., 900 Circle 75 Parkway, Suite 300, Atlanta, GA 30339, Phone: (770) 308-1986, Email: bridget.carter@americantower.com

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: Cingular Wireless LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

KELLYE ABERNATHY, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: Cingular Wireless LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

KELLYE E ABERNATHY, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m, Licensee ID: L00000732
Registrant: New Cingular Wireless Services, Inc., 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

Muayyad Mustafa, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 80 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

Muayyad Mustafa, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 80 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

MUAYYAD MUSTAFA, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

MUAYYAD MUSTAFA, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms: A-3, Plano, TX 75024, Phone: (469) 229-7422, Email: kellye.e.abernathy@cingular.com

Muayyad Mustafa, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 80 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

Muayyad Mustafa, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower,

Structure height: 77.7 m, Overall height: 81.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

Muayyad Mustafa, 4901 W. Granada (Lat: 29.227222 Lon: -81.290000), Type: Tower, Structure height: 88.4 m, Overall height: 88.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

Michael P Goggin, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

B Carter, 1687 West Granada Blvd (Ormond Beach / 002703) (Lat: 29.258917 Lon: -81.117917), Type: Tower, Structure height: 92.1 m, Overall height: 97.2 m
Registrant: American Towers, Inc., 1898 Leland Drive, Marietta, GA 30067, Phone: (678) 265-6770

Lewis M Heaster, Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower, Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Lewis Towers, Inc., 700 W. Granada Blvd. Suite 203, Ormond Beach, FL 32174, Phone: (386) 673-6262, Email: lheaster@bellsouth.net

Elizabeth Birriel, Se Quadrant Of I-10 And Us1 Interchange (Lat: 29.336694 Lon: -81.130111), Type: Tower, Structure height: 48.7 m, Overall height: 48.7 m, Licensee ID: L00001437
Registrant: State Of Florida, 605 Suwannee St. Ms 90, Tallahassee, FL 32399-0450, Phone: (850) 410-5600

Rick Suarez, 4901 W. Granada (Lat: 29.227333 Lon: -81.290139), Type: Tower, Structure height: 85.6 m, Overall height: 87.8 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

Rick Suarez, 4901 W. Granada (Lat: 29.227333 Lon: -81.290139), Type: Tower, Structure height: 85.6 m, Overall height: 87.8 m, Licensee ID: L00000732
Registrant: New Cingular Wireless Pcs, LLC, 5601 Legacy Drive, Ms-A3, Plano, TX 75024, Phone: (469) 229-7422, Email: ka8805@att.com

RICK SUAREZ, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 80 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

RICK SUAREZ, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

RICK SUAREZ, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 80 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

RICK SUAREZ, 123 N. Orchid Street (Lat: 29.285278 Lon: -81.067056), Type: Tower, Structure height: 77.7 m, Overall height: 81.4 m, Licensee ID: L00001084
Registrant: Orlando Smsa Limited Partnership, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

RICK SUAREZ, 4901 W. Granada (Lat: 29.227333 Lon: -81.290139), Type: Tower, Structure height: 85.6 m, Overall height: 87.8 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

Rick Suarez, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 79.9 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

Rick Suarez, 2341 W. Granada Blvd (Lat: 29.255028 Lon: -81.150278), Type: Tower, Structure height: 78.6 m, Overall height: 79.9 m
Registrant: At&t Mobility LLC, 5601 Legacy Drive, Ms:a-3, Plano, TX 75024, Phone: (469) 229-7471, Email: lg5201@att.com

Sr 40 2 Mi W Of I-95 (Lat: 29.255000 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Bellsouth Mobility Inc, 100 Technology Park Ste 100, Lake Mary, FL 32746, Phone: (407) 325-0022

Sr 40 2 Mi W Of I-95 (Lat: 29.255000 Lon: -81.150278), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Bellsouth Mobility Inc, 500 Technology Park, Lake Mary, FL 32746, Phone: (407) 325-0022

6.4 Mi Wsw (Lat: 29.266111 Lon: -81.228333), Type: Tower, Structure height: 92 m, Overall height: 92 m
Registrant: Communication Educational Association, 1485 Us 1 S, Saint Augustine, FL 32086, Phone: (904) 829-9200

I-95 & Tymber Lake Rd (Lat: 29.302778 Lon: -81.132500), Type: Tower, Structure height: 28.9 m, Overall height: 30.4 m
Registrant: Apt Tampa Orlando Inc, 8410 W Bryn Mawr Ste 1100, Chicago, IL 60631, Phone: (773) 399-8846, Email: kirl@aerial1.com

1687 W Tranada Blvd (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m
Registrant: Opm Usa Inc, 325 Interstate Boulevard, Sarasota, FL 34240, Phone: (941) 379-4455

Ormond Beach (Lat: 29.259167 Lon: -81.114167), Type: Tower, Structure height: 97.5 m, Overall height: 97.5 m
Registrant: Opm Usa Inc, 325 Interstate Boulevard, Sarasota, FL 34240, Phone: (941) 379-4455

123 N. Orchid Street (Lat: 29.285278 Lon: -81.066944), Type: Tower, Structure height: 76.2 m, Overall height: 80.8 m
Registrant: Bellsouth Mobility Inc, 1101 Greenwood Blvd., Lake Mary, FL 32746, Phone: (407) 325-0022

121 Bennett Ln (Lat: 29.275000 Lon: -81.074167), Type: Tower, Structure height: 108.2 m, Overall height: 110.3 m
Registrant: Time Warner Entertainment Advance Newhouse Partnership, 2251 Lucien Way Ste 320, Maitland, FL 32751, Phone: (407) 660-5524

Tomoka Road (Lat: 29.254444 Lon: -81.229722), Type: Tower, Structure height: 151.5 m, Overall height: 152.4 m
Registrant: Ark Communications Network, 106 Tate Court, Orlando, FL 32828, Phone: (407) 273-5515

6 Miles N.W Of City (Lat: 29.353056 Lon: -81.136667), Type: Tower, Structure height: 42.7 m, Overall height: 48.8 m
Registrant: Opm-Usa(2726), 325 Interstate Blvd, Sarasota, FL 34240, Phone: (941) 379-4455, Email: dwane@opm-usa.com

Off Tymber Creek Rd (Lat: 29.258056 Lon: -81.129167), Type: Tower, Structure height: 90.5 m, Overall height: 91.5 m
Registrant: Lewis Towers Inc, 15 Moss Point Dr, Ormond Beach, FL 32174, Phone: (904) 673-4066, Email: heasterh@aol.com

Twr 1 - 0.5 Km W Of Nova Rd In Mobile Home Park (Lat: 29.269167 Lon: -81.081667), Type: 4ta1, Structure height: 61.9 m, Overall height: 61.9 m
Registrant: Wings Communications Inc Dba , 432 S Nova Rd, Ormond Beach, FL 32174, Phone: (904) 677-4122

Twr 2 - 0.5 Km W Of Nova Rd In Mobile Home Park (Lat: 29.269167 Lon: -81.081667), Type: 4ta2, Structure height: 61.9 m, Overall height: 61.9 m

Registrant: Wings Communications Inc Dba , 432 S Nova Rd, Ormond Beach, FL 32174, Phone: (904) 677-4122

Twr 3 - 0.5 Km W Of Nova Rd In Mobile Home Park (Lat: 29.269167 Lon: -81.081667), Type: 4ta3, Structure height: 61.9 m, Overall height: 61.9 m
Registrant: Wings Communications Inc Dba , 432 S Nova Rd, Ormond Beach, FL 32174, Phone: (904) 677-4122

Twr 4 - 0.5 Km W Of Nova Rd In Mobile Home Park (Lat: 29.269167 Lon: -81.081667), Type: 4ta4, Structure height: 61.9 m, Overall height: 61.9 m
Registrant: Wings Communications Inc Dba , 432 S Nova Rd, Ormond Beach, FL 32174, Phone: (904) 677-4122

405 Lincoln (Lat: 29.353333 Lon: -81.137222), Type: Tower, Structure height: 48.2 m, Overall height: 48.2 m
Registrant: Opm Usa Inc, 325 Interstate Blvd, Sarasota, FL 34240, Phone: (941) 379-4455, Email: fla site@aol.com

Cell Phone, Antenna

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Exhibit D

Tower Structure Locations

CenturyLink® Prism™ TV
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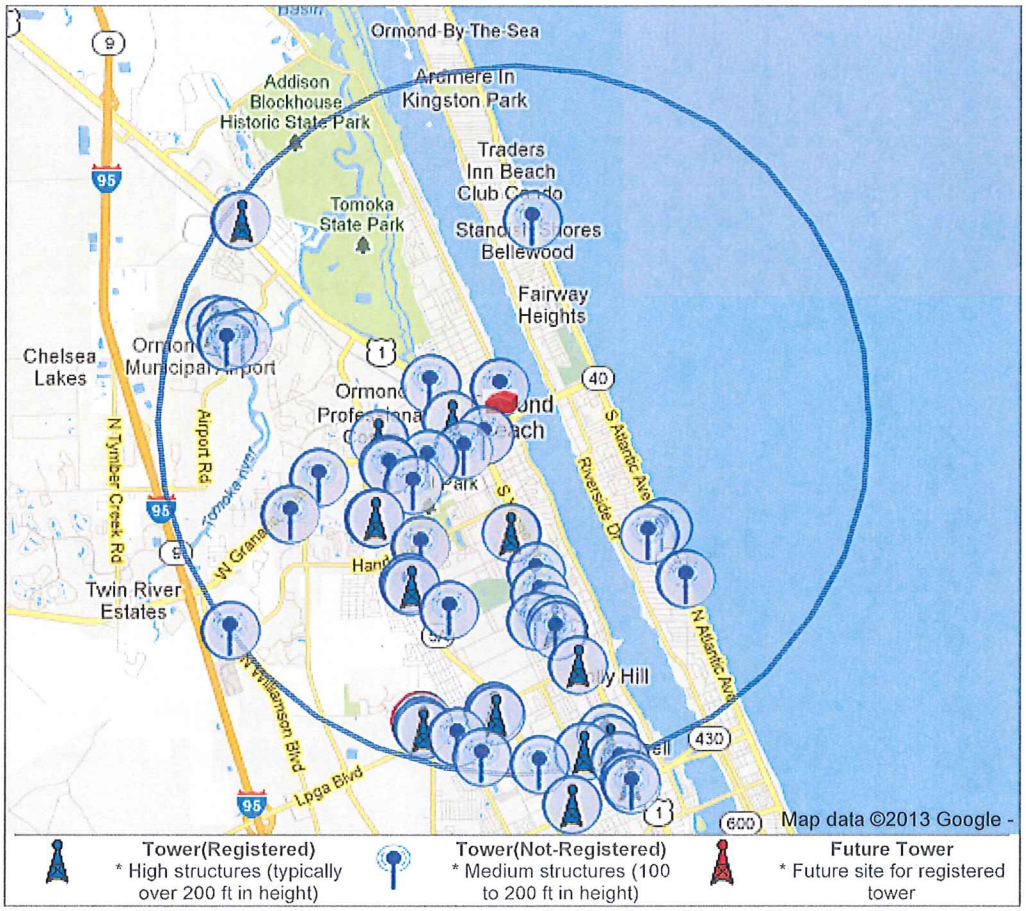
See what real customers are saying about Prism™ TV »

CenturyLink prism
Details
REPLA

- **Tower Structures - (22 S Beach St, Ormond Beach, FL 32174)**



Tower Search Results!

Alert! 53 Towers (21 Registered,32 Not Registered) found within 4.00 miles of **22 S Beach St, Ormond Beach, FL 32174**.

Info! The NEAREST Tower is .38 miles away and is owned by **Volusia County School Board**.

Alert! One New Tower Application found within 4.00 miles of **22 S Beach St, Ormond Beach, FL 32174**.

Tower Type	ID Num	Site Owner	Height	Dist
Registered	(1)	Orlando Smsa Limited Partnership	267 feet	.73 miles
	(2)	Capital Telecom	160 feet	1.15 miles
	(3)	Memorial Hospital - Ormond Beach	187 feet	1.57 miles
	(4)	Wings Communications Inc Dba = Wele Radio	203 feet	1.90 miles
	(5)	Wings Communications Inc Dba = Wele Radio	203 feet	1.90 miles
	(6)	Wings Communications Inc Dba = Wele Radio	203 feet	1.90 miles
	(7)	Wings Communications Inc Dba = Wele Radio	203 feet	1.90 miles
	(8)	Verizon Wireless Personal Communications Lp	200 feet	2.07 miles
	(9)	Public Radio, Inc.	373 feet	2.14 miles

	(10)	Spectrasite Communications, Llc. Through American Towers, Llc.	216 feet	2.60 miles
	(11)	Orlando Smsa Limited Partnership	263 feet	2.97 miles
	(12)	Sba Towers, Inc	272 feet	3.00 miles
	(13)	Global Tower, Llc	350 feet	3.22 miles
	(14)	Black Crow Media, Llc	196 feet	3.29 miles
	(15)	Black Crow Media, Llc	196 feet	3.31 miles
	(16)	American Towers, Llc.	315 feet	3.47 miles
	(17)	Pinnacle Towers Llc	320 feet	3.48 miles
	(18)	City Of Ormond Beach, Florida	31 feet	3.61 miles
	(19)	Verizon Wireless Personal Communications Lp	124 feet	3.80 miles
	(20)	New Cingular Wireless Services, Inc.	310 feet	3.88 miles
	(21)	Spectrasite Communications, Llc. Through American Towers, Llc.	192 feet	3.96 miles
Not Registered	(1)	Volusia County School Board	350 feet	.38 miles
	(2)	Blank	211 feet	.38 miles
	(3)	Mcfayden Bc Ltd. Partnership	349 feet	.67 miles
	(4)	Bellsouth Mobility Inc	254 feet	1.04 miles
	(5)	Gloria Bell Byrd	349 feet	1.07 miles
	(6)	Time Warner Entertainment Advance	362 feet	1.35 miles
	(7)	T-mobile	155 feet	1.51 miles
	(8)	T-mobile	150 feet	1.53 miles
	(9)	Ormond Communicaitons, Inc.	352 feet	1.56 miles
	(10)	Thomas H. Moffit Jr	193 feet	1.68 miles
	(11)	Wireless Vision, Llc	170 feet	1.77 miles
	(12)	Volusia County School Board	90 feet	1.96 miles
	(13)	Midchael A & Cynthia L Kulisky	372 feet	1.99 miles
	(14)	Ocean Ritz Of Daytona Condominium	220 feet	2.04 miles
	(15)	Joy C. Byron	344 feet	2.05 miles
	(16)	Primeco Personal Communications Lp	128 feet	2.06 miles
	(17)	Agape Of Central Florida, Inc.	347 feet	2.06 miles
	(18)	Blank	163 feet	2.06 miles
	(19)	American Tower Lp	372 feet	2.19 miles
	(20)	Capital Telecom, Llc	160 feet	2.34 miles
	(21)	T-mobile Usa Inc.	232 feet	2.56 miles
	(22)	Capital Telecom Acquisition, Llc	160 feet	2.79 miles
	(23)	Towercom Iii, Llc	148 feet	3.29 miles
	(24)	Volusia County School Board	60 feet	3.29 miles
	(25)	Johnson Communications Corp.	300 feet	3.37 miles
	(26)	Ormond Beach Municipal Airport	51 feet	3.44 miles
	(27)	Holly Hill Radio Partners	325 feet	3.45 miles
	(28)	Ormond Beach Municipal Airport	25 feet	3.48 miles
	(29)	Blank	300 feet	3.51 miles
	(30)	Media Star Communication	182 feet	3.67 miles
	(31)	Crown Castle	160 feet	3.93 miles
	(32)	Emergency Mamagement And Communications	190 feet	3.95 miles
Future	(1)	Black Crow Broadcasting, Inc.	350 feet	3.24 miles

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Exhibit E

Antenna Site Locations

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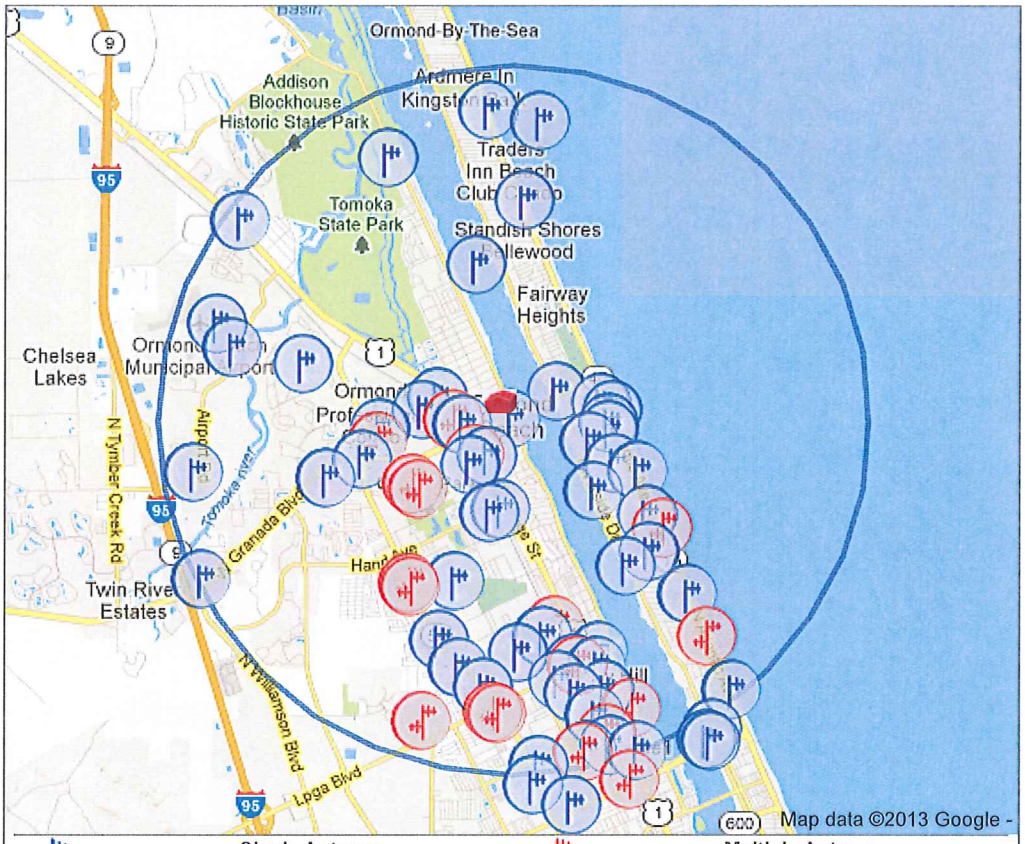
- **Antenna Sites - (22 S Beach St, Ormond Beach, FL 32174)**



Single Antenna
* Small (below 100ft) stand alone antenna on top of buildings, poles, etc.

Multiple Antennas
* Multiple antennas sharing a high tower structure.

Antenna Search Results!

Alert! 150 Antennas found within 4.00 miles of **22 S Beach St, Ormond Beach, FL 32174**.

Site Type	Site Num	Antenna Owner	Height	Dist
Multiple	(1)	County Of Volusia	300 feet	.71 miles
		Nextel License Holdings 1, Inc.	265 feet	.73 miles
		Volusia, County Of	267 feet	.73 miles
		Clearwire Spectrum Holdings Iii Llc	267 feet	.73 miles
	(2)	Halifax Tile & Floor Covering Inc	NA	1.31 miles
		Paging Network Of America, Inc.	351 feet	1.31 miles
		Paging Network Of America, Inc.	351 feet	1.31 miles
	(3)	Arch Wireless License Co., Llc	362 feet	1.34 miles
		Paging Network Of America, Inc	361 feet	1.34 miles
		Mci Worldcom Network Services Inc	353 feet	1.33 miles
		Arch Wireless License Co., Llc	362 feet	1.34 miles
	(4)	Metrocall Usa, Inc.	NA	2.05 miles
		Paging Network Of America, Inc., Debtor-in-possession	243 feet	2.05 miles
	(5)	Holly Hill Rhf Housing Inc Dba Bishops Glen	NA	2.13 miles
		Master Craft Plumbing Contr Inc	NA	2.13 miles
		Clearwire Spectrum Holdings Iii Llc	373 feet	2.14 miles
		Metrocall Usa Inc	371 feet	2.13 miles
		Arch Wireless License Co., Llc	NA	2.13 miles
		Arch Wireless License Co., Llc	371 feet	2.13 miles

	(6)	Nextel License Holdings 1, Inc.	213 feet	2.60 miles
		Nextel License Holdings 1, Inc.	213 feet	2.60 miles
	(7)	H. Scott Wetmore	NA	2.99 miles
		H. Scott Wetmore	NA	2.99 miles
		Mc Queen, Lawrence	98 feet	2.99 miles
		Arch Wireless License Co., Llc	NA	2.99 miles
		Metrocall Usa Inc	NA	2.99 miles
		Arch Communications Enterprises Llc	300 feet	2.99 miles
		Ams Spectrum Holdings, Llc	197 feet	2.99 miles
		J.e.r. Beepers, Inc.	270 feet	2.99 miles
		Skytel Spectrum Llc	NA	2.99 miles
		Porta-phone Paging Licensee Corporation	NA	2.99 miles
		Daytona Beach, City Of	NA	2.99 miles
		Trs Wireless, Inc.	270 feet	2.99 miles
		All Florida Paging, Inc.	NA	2.99 miles
		Simor, Inc.	NA	2.99 miles
		Simor, Inc.	NA	2.99 miles
		Associated Communications Group, Inc.	NA	2.99 miles
		Simor, Inc.	NA	2.99 miles
		Skytel Spectrum Llc	NA	2.99 miles
		Simor, Incorporated	NA	2.99 miles
		Trs Wireless, Inc.	344 feet	2.99 miles
	(8)	Southern Stone Communications, Llc	350 feet	3.22 miles
		Bizcom Usa, Inc.	NA	3.24 miles
	(9)	Ams Spectrum Holdings, Llc	299 feet	3.37 miles
		Nextel License Holdings 3, Inc.	NA	3.37 miles
		Pagemart Ii Inc	299 feet	3.37 miles
		Nextel License Holdings 1, Inc.	NA	3.37 miles
		Pagemart Ii Inc	299 feet	3.37 miles
		Ferran Services & Contracting Inc	NA	3.37 miles
		State Of Florida, Fish & Wildlife Conservation Commission	305 feet	3.37 miles
		Trs Wireless, Inc.	302 feet	3.37 miles
		Johnson, Bruce E	NA	3.37 miles
		New Age Wireless Corp.	302 feet	3.37 miles
		Rhea, Bruce A	299 feet	3.37 miles
		Rogers, Kenneth E	NA	3.37 miles
		Florida Mobile Telecom,inc.	NA	3.37 miles
		Ams Spectrum Holdings, Llc	299 feet	3.37 miles
		Valentin, Harry	NA	3.37 miles
		Nextel License Holdings 3, Inc.	NA	3.37 miles
		Nextel License Holdings 1, Inc.	299 feet	3.37 miles
		Nextel License Holdings 3, Inc.	NA	3.37 miles
		Nextel License Holdings 3, Inc.	NA	3.37 miles
	(10)	Daves Communications Inc	315 feet	3.47 miles
		Arch Wireless License Co., Llc	NA	3.47 miles
		Metrocall Usa, Inc.	313 feet	3.47 miles
		Nextel License Holdings 3 Inc Dba Nextel Communications	NA	3.47 miles
		Usa Mobility Wireless, Inc.	348 feet	3.47 miles
		Arch Wireless License Co., Llc	NA	3.47 miles
	(11)	Ormond Beach Memorial Hospital	180 feet	1.61 miles
		Ormond Beach Memorial Hospital	NA	1.61 miles
	(12)	Landau Enterprises Inc Dba Fryers Towing Service	43 feet	3.22 miles
		Landau Enterprises Inc	43 feet	3.22 miles
	(13)	Volusia, County Of	310 feet	3.88 miles
		Volusia, County Of	314 feet	3.90 miles
		Flaschberger, Susan L	295 feet	3.89 miles
		Volusia, County Of	314 feet	3.90 miles
		Orlando Smsa Limited Partnership	311 feet	3.88 miles
		New Cingular Wireless Pcs, Llc	311 feet	3.88 miles
		Volusia, County Of	315 feet	3.90 miles
		Volusia, County Of	299 feet	3.90 miles
		County Of Volusia	280 feet	3.90 miles
	(14)	New Cingular Wireless Pcs, Llc	205 feet	2.04 miles
		Orlando Smsa Limited Partnership	205 feet	2.04 miles
	(15)	Ormond Beach, City Of	190 feet	.57 miles
		Ormond Beach, City Of	180 feet	.57 miles
		Ormond Beach, City Of	180 feet	.57 miles
	(16)	Tower Cloud, Inc.	200 feet	2.07 miles
		Clearwire Spectrum Holdings Iii Llc	200 feet	2.07 miles
	(17)	Orlando Smsa Limited Partnership	263 feet	2.97 miles
		Clearwire Spectrum Holdings Iii Llc	274 feet	2.97 miles
	(18)	Advanced Satellite Inc	207 feet	3.13 miles
		Advanced Satellite Inc	207 feet	3.13 miles
Single	(19)	Lewis Towers, Inc.	NA	2.74 miles
	(20)	Usa Mobility Wireless, Inc.	320 feet	3.48 miles
	(21)	Nextel License Holdings 1, Inc.	210 feet	3.96 miles
	(22)	Taco Bell	NA	.06 miles

(23)	C & C Enterprises Inc	59 feet	.48 miles
(24)	Ormond Heritage Condo Assn	NA	.58 miles
(25)	Pruett & Associates	59 feet	.61 miles
(26)	Cemex Construction Materials Florida, Llc	NA	.67 miles
(27)	First United Methodist Church	NA	.91 miles
(28)	Florida East Coast Railway Co.	72 feet	.91 miles
(29)	Florida East Coast Railway Co.	10 feet	.92 miles
(30)	Florida Power & Light Company	56 feet	.97 miles
(31)	Ocean Inn Inc Dba Quality Inn & Suites	NA	1.04 miles
(32)	Columbia Medical Center	39 feet	1.11 miles
(33)	Volusia, County Of	NA	1.11 miles
(34)	Maverick Condominium Association	NA	1.15 miles
(35)	Ormond Beach, City Of	95 feet	1.16 miles
(36)	Casa Del Mar	NA	1.25 miles
(37)	Coral Beach Motel	NA	1.52 miles
(38)	Willow Pond	NA	1.55 miles
(39)	Rio Bravo Restaurant Dba Innovative Restaurant Concepts Inc	NA	1.64 miles
(40)	Riviera Country Club	NA	1.77 miles
(41)	Tarmac America Inc	105 feet	1.83 miles
(42)	Georgian Inn Beach Club Condominium Asso Inc Dba Georgian Inn Beach Club	NA	1.96 miles
(43)	School Board Of Volusia County Fl	39 feet	2.07 miles
(44)	Cemex Inc	NA	2.21 miles
(45)	Tomoka Elementary School	NA	2.26 miles
(46)	Kuhn S Auto Service Inc Dba Franks + Moye S Used Auto Parts	NA	2.36 miles
(47)	Pelican Bay Country Club Of Daytona Beach Inc	10 feet	2.38 miles
(48)	Eddy Corporation Dba Mcdonalds	NA	2.51 miles
(49)	R & R Industries Inc	NA	2.54 miles
(50)	Florida East Coast Railway Co.	20 feet	2.58 miles
(51)	Bills Commercial Air Conditioning Inc	NA	2.59 miles
(52)	Beachside Electronics Inc Dba Coastal Communications	190 feet	2.66 miles
(53)	Holly Hill, City Of	33 feet	2.67 miles
(54)	Holly Hill, City Of	72 feet	2.69 miles
(55)	Holly Hill, City Of	NA	2.86 miles
(56)	D & W Paving Inc	NA	2.94 miles
(57)	Volusia, County Of	NA	3.05 miles
(58)	Florida Dep-recreation And Parks	103 feet	3.06 miles
(59)	Widmaier Oil Co	NA	3.14 miles
(60)	Volusia, County Of	30 feet	3.17 miles
(61)	Riverbend Investment Group, Inc.	NA	3.38 miles
(62)	Cunningham Oil Co	299 feet	3.45 miles
(63)	News Journal Corp	200 feet	3.51 miles
(64)	Ormond Beach, City Of	13 feet	3.59 miles
(65)	Volusia, County Of	NA	3.63 miles
(66)	Communications Service Company	138 feet	3.71 miles
(67)	Kasim Inc Dba Super 8 Motel Daytona	NA	3.73 miles
(68)	Pine Trail Elementary School	33 feet	3.78 miles
(69)	Labor, James M	95 feet	3.88 miles
(70)	Triester Diplomatic Towers Associates	NA	3.95 miles
(71)	Parsons Transportation Group Inc	98 feet	3.98 miles
(72)	Florida, State Of	322 feet	4.00 miles
(73)	Ormond Beach, City Of	26 feet	1.06 miles
(74)	Renda Broadcasting Corp. Of Nevada	40 feet	1.81 miles
(75)	Clearwire Spectrum Holdings Iii Llc	126 feet	2.24 miles
(76)	Tower Cloud, Inc.	124 feet	3.80 miles

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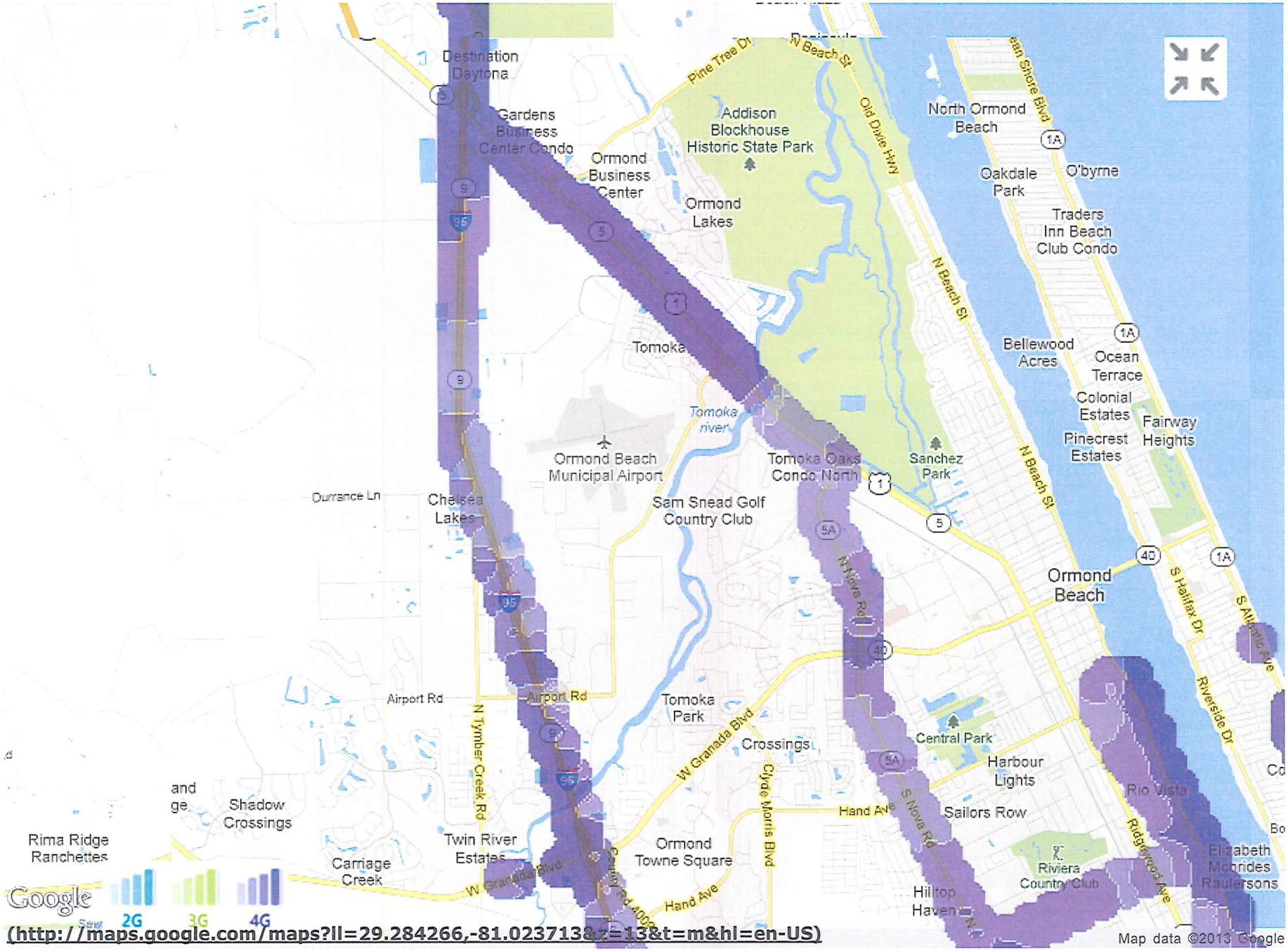
AdChoices

Exhibit F

Sensorly Coverage Maps for Carriers



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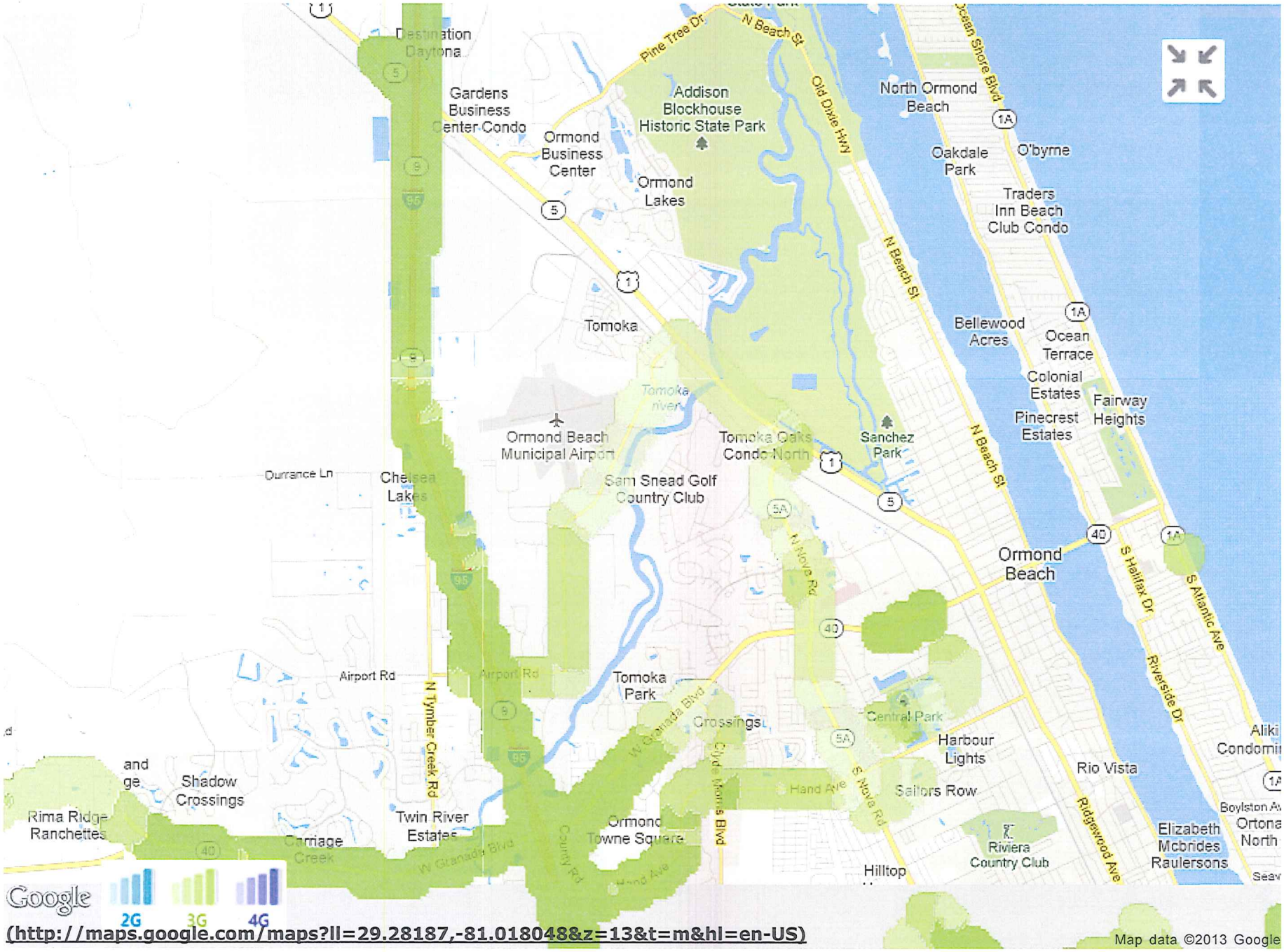

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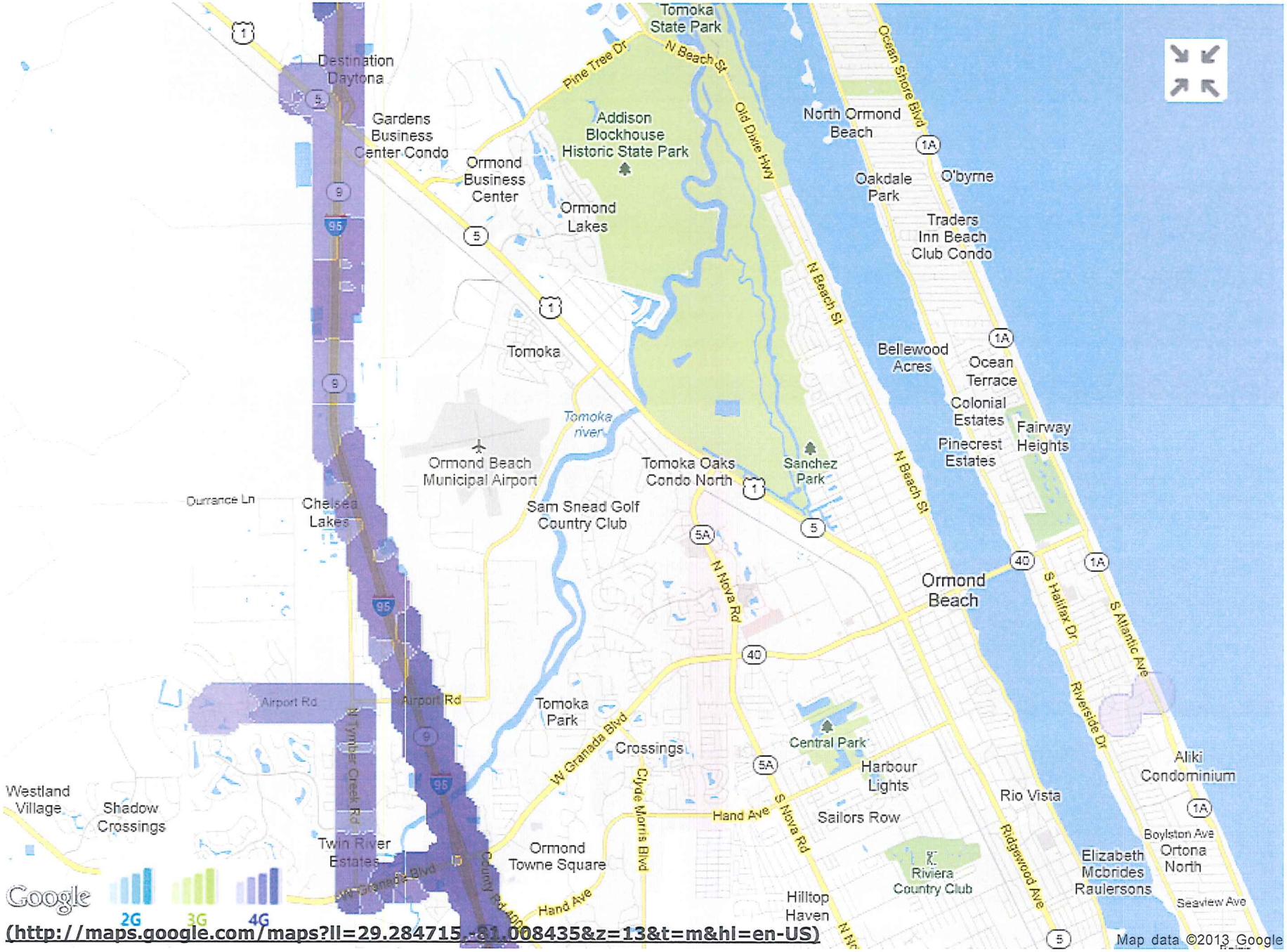

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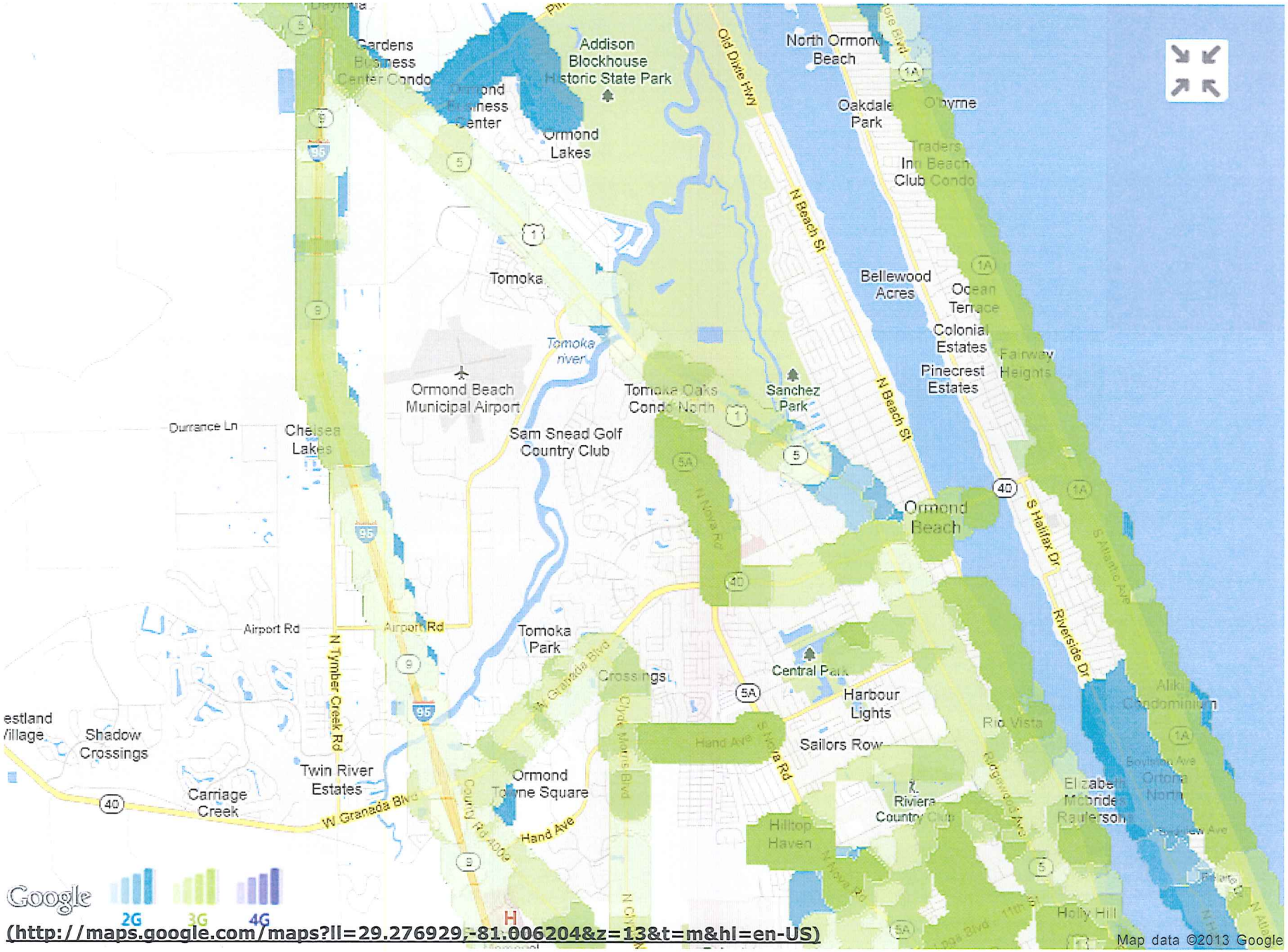

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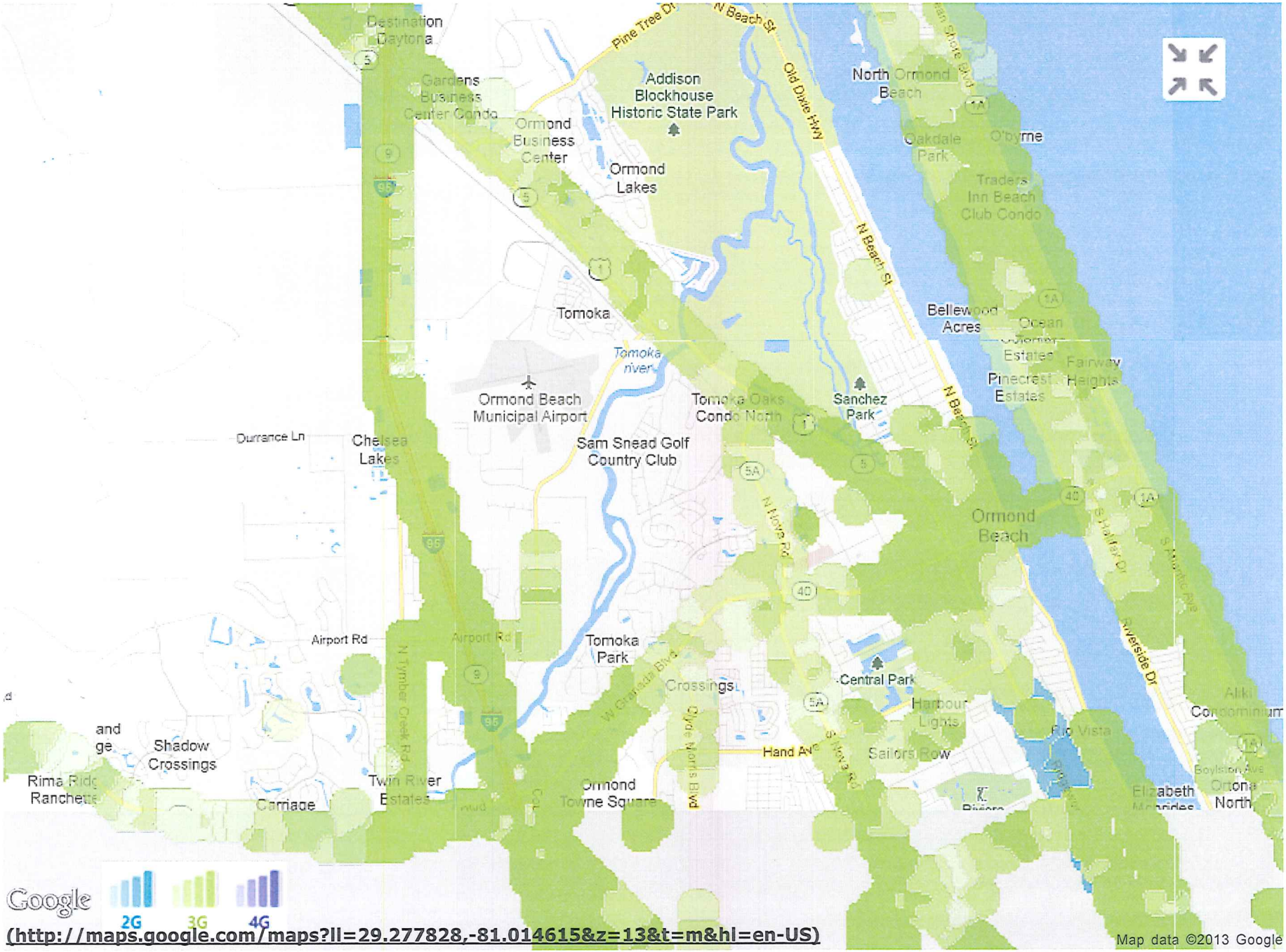

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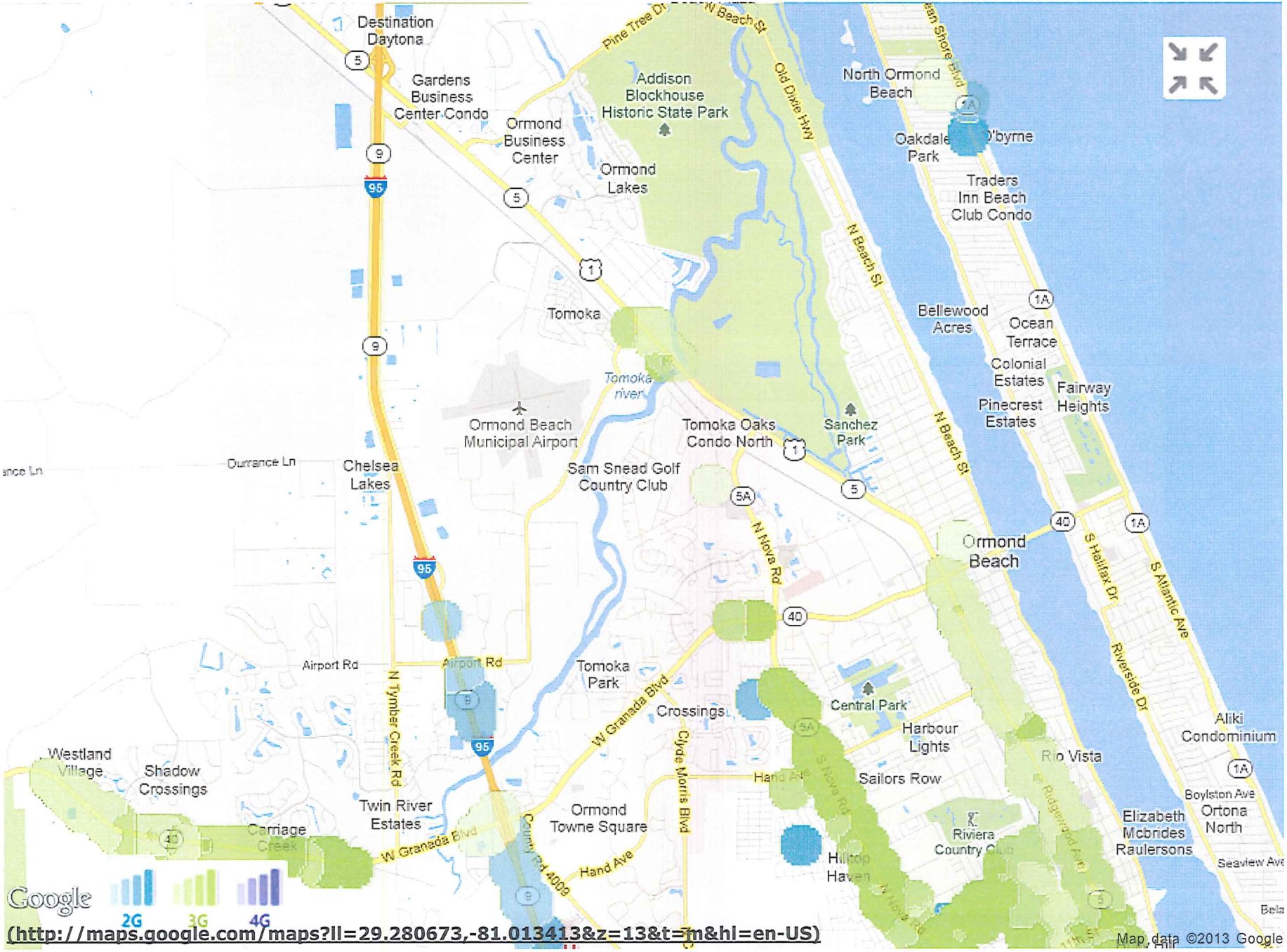

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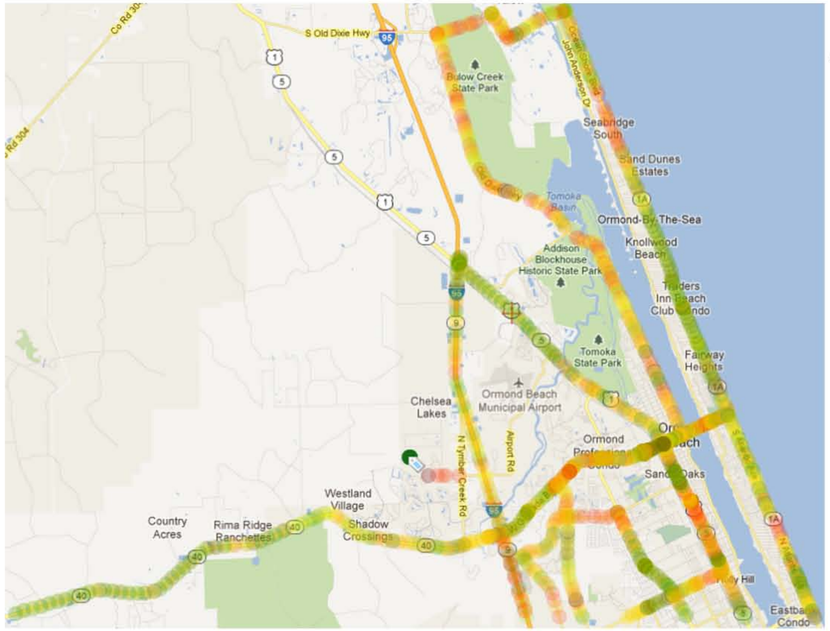
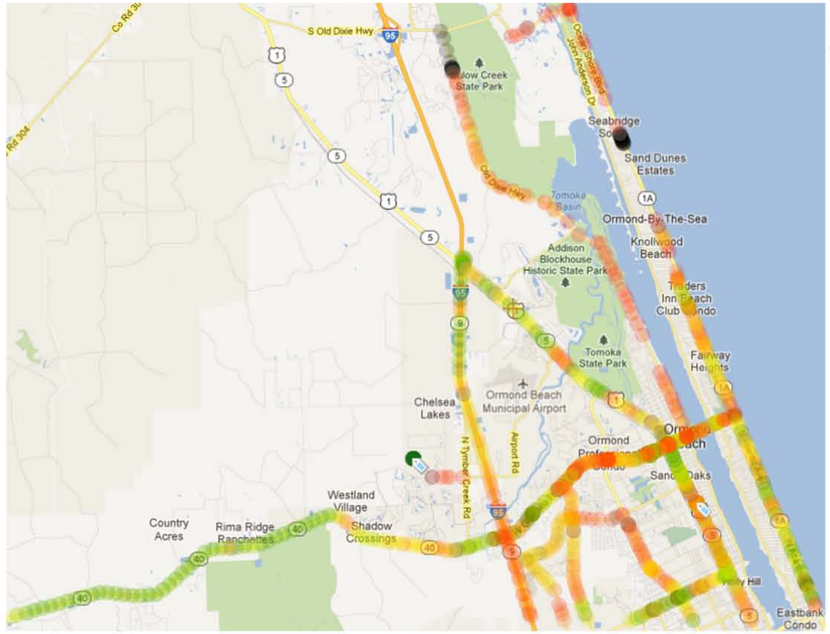
Exhibit G

Air Card Data Rate Maps



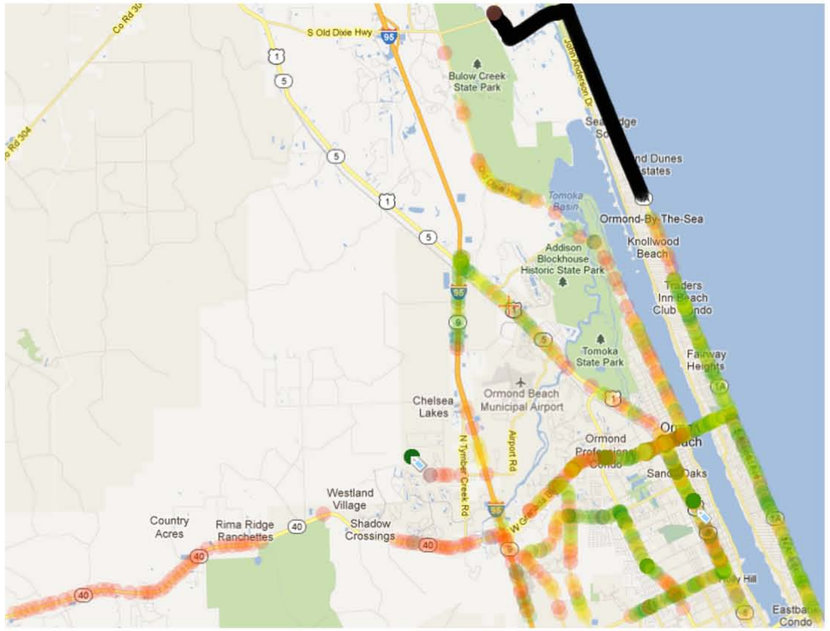
AT&T

Avg. UL	199.38 Kbps
Avg. DL	833.99 Kbps
Peak UL	1017.19 Kbps
Peak DL	8.12 Mbps



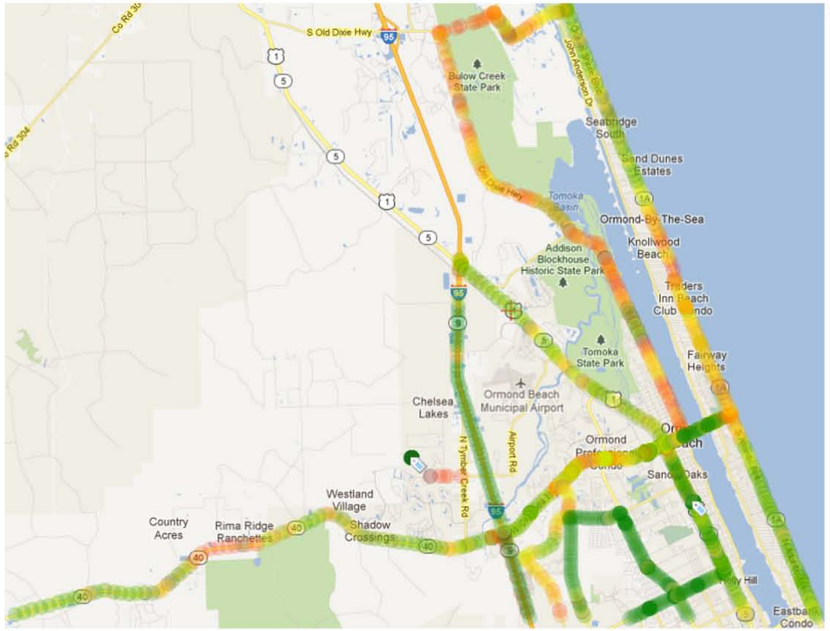
Sprint

Avg. UL	192.21 Kbps
Avg. DL	917.58 Kbps
Peak UL	1017.19 Kbps
Peak DL	8.12 Mbps



T-Mobile

Avg. UL	281.65 Kbps
Avg. DL	807.95 Kbps
Peak UL	1.11 Mbps
Peak DL	8.12 Mbps



Verizon

Avg. UL	318.2 Kbps
Avg. DL	2.99 Mbps
Peak UL	1017.19 Kbps
Peak DL	63.58 Mbps

NE

STAFF REPORT

City of Ormond Beach
Department of Planning

DATE: September 4, 2013

SUBJECT: 790 South Atlantic Avenue, Special Exception for Outdoor Activity

APPLICANT: Dimitri Bourtzakis, of Dimitri's Bar Deck & Grill

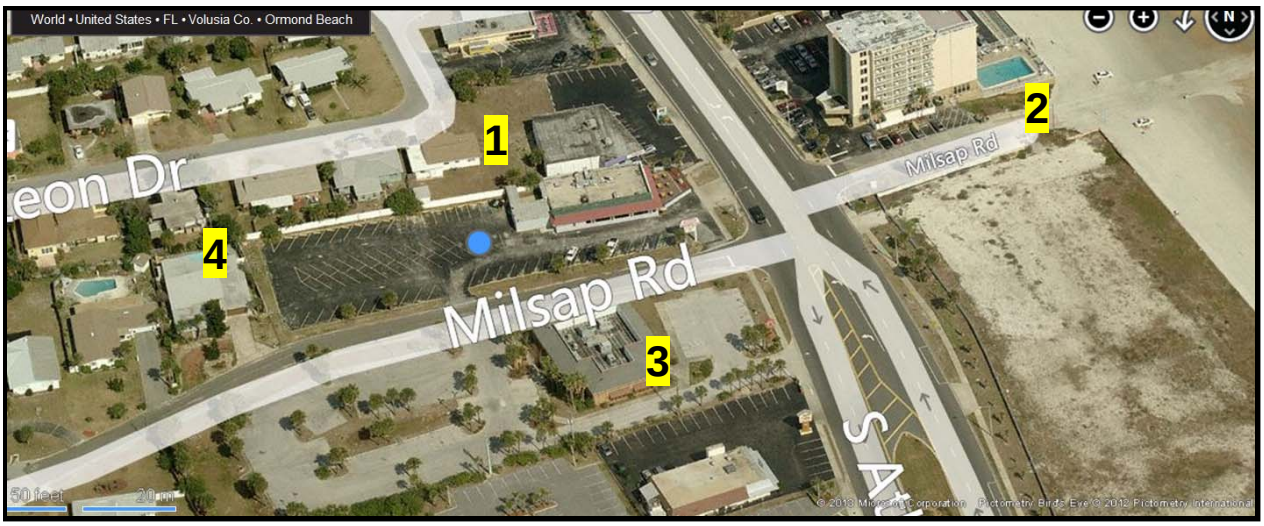
NUMBER: SE 13-108

PROJECT PLANNER: Steven Spraker, AICP, Senior Planner

INTRODUCTION: This is a request submitted by Dimitri Bourtzakis (applicant), of Dimitri's Bar Deck & Grill, for a Special Exception to authorize an outdoor activity use. The requested outdoor activity is to allow outside live music under certain conditions at 790 South Atlantic Avenue. The subject property is zoned B-7 (Highway Tourist Commercial).

BACKGROUND: The property at 790 South Atlantic Avenue is Dimitri's Bar Deck & Grill. The Special Exception application seeks to allow outdoor music. In 2011, the property added a deck over the existing building. Below is a site aerial illustrating the surrounding area and a table summarizing the surrounding land uses.

Site Aerial: Surrounding Uses



Surrounding Uses with Land Use and Zoning Designations:

		Use	Future Land Use Designation	Zoning
North	1	Gift Shop & Residential	"Tourist Commercial" and Low Density Residential	B-7 (Highway Tourist Commercial) and R-3 (Single-Family Medium Density)
South	2	Transient lodging and oceanfront park	"Tourist Commercial"	B-6 (Oceanfront Tourist Commercial)
East	3	Restaurant	"Tourist Commercial"	B-7 (Highway Tourist Commercial)
West	4	Residential	Low Density Residential	R-3 (Single-Family Medium Density)

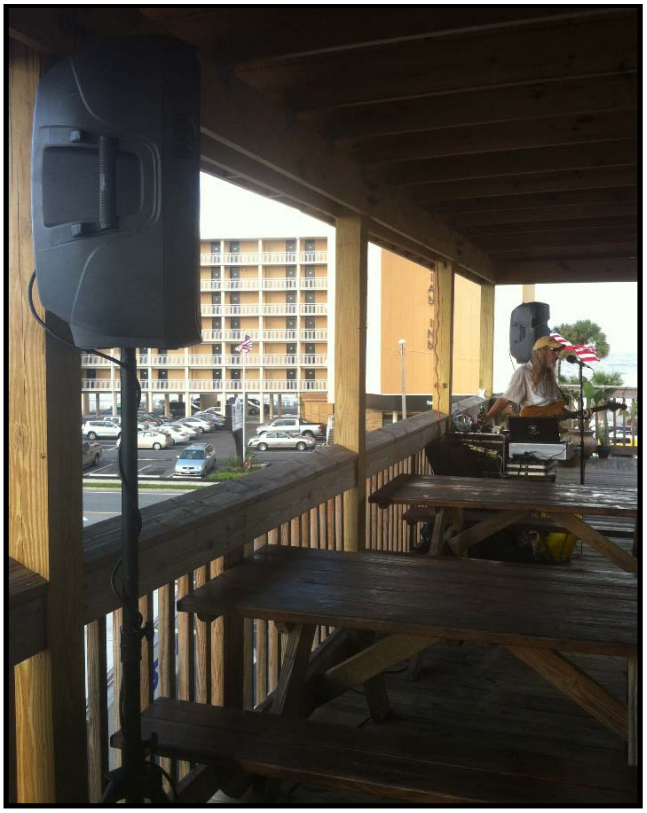
PROJECT DESCRIPTION: The applicant is requesting the ability to have outdoor live entertainment on the second floor deck with the following conditions:

1. Hours of live music: Monday to Sunday – 11am to 10 pm; and
2. Ability to have karaoke outside;

In the attached e-mail (see EXHIBIT 3), the applicant states, "As time goes by, and money allows I continue to upgrade my property with some hefty projects in the forefront such as repaving the parking lot, re-staining the deck, dumbwaiter installation, new seating, upgraded turtle friendly lighting, outdoor fans, and heat fixtures and much more. These additions come with great costs, but continue to generate monies into the community." The applicant continues, "In listening to our guests, they would like a coastal, Caribbean, acoustic ambient music and we insist that it be played at reasonable hours, weekend afternoons and early evening with live acts not to play past 10pm. Our guests have been asking us for this since we constructed the deck!"

Proposed location of outdoor music - Aerial

Proposed location of outdoor music –sound test picture



Speakers pointed to South Atlantic Avenue

ANALYSIS: There are multiple Land Development Code sections related to the outdoor music under the outdoor activity zoning category. Section 1-22 of the Land Development Code defines outdoor activity as "the display of merchandise offered for sale or any activity, such as live entertainment, outside the building walls of a completely enclosed building." Within the B-7 zoning district outdoor activity is regulated as a Special Exception with review/recommendation by the Planning Board and a final decision by the City Commission. The Special Exception requires review of the criteria of the following Land Development Code Sections:

1. Section 2-57.O.1, Outdoor Activity (applies to specific use);

2. Section 2-56: General criteria and Special Exception review criteria (applies to all Special Exception requests);

3. Section 1-15.E: Planned Developments and Special Exceptions (Planning Board criteria for all Special Exceptions); and

4. Section 1-18.E: Criteria for Issuance of Development Order (City Commission criteria for all Special Exceptions).

As part of the review and the Special Exception criteria, the applicant was required to perform a sound test simulating the outdoor music request. The sound test required notification to all property owners within 600 feet of the property fourteen days prior to the event. On Monday, August 26, 2013, a sound test was conducted at 6:15 pm.

The results of the test were as follows:

Sound test reading locations

Section 14-30.(d) of the Code of Ordinances provides the limits for emitting of sound:

(d) *Maximum permissible sound levels by use occupancy.* No person shall operate or cause to operate any source of sound from any occupancy in such a manner as to create a sound level which exceeds the limits set forth for the use occupancy category in Table 1, more than ten (10) per cent of any measurement period, which shall not be less than ten (10) minutes when measured at or beyond the property boundary of the land use from which the sound emanates.

TABLE 1

Use Occupancy Category	Time	Sound Level Limit dBA
Residential	7:00 a.m.-10:00 p.m.	60
	10:00 p.m.-7:00 a.m.	55
Commercial or tourist	7:00 a.m.-10:00 p.m.	65
	10:00 p.m.-7:00 a.m.	60
Manufacturing	At all times	75

Staff observations of the sound test are as follows:

1. There was one performer with two speakers setup facing South Atlantic Avenue.
2. The decibel readings at the residential properties were within acceptable decibel limits.
3. Along the residential property boundary there was not a noticeable decibel difference with the music playing versus when no music was playing.
4. There were air conditioning units running that caused the decibel readings to be elevated.
5. At the interface of 246 Ponce De Leon Drive, the music could be heard but did not exceed the 65 decibel limit.
6. At the intersection of South Atlantic Avenue and Milsap Road, the decibel readings were higher than 65 decibels based on the roadway traffic. The music could be heard.
7. Several residents stated that they have heard music previously and stated that they believed the source to be Riptides restaurant.

This request for outdoor music is different from the two other outdoor music Special Exceptions (Rivergrille and Caffeine's) based on several location conditions. The first condition is the interface of commercial and residential uses. The single-family uses abut the restaurant and there is no distance from the property line to the residential

uses. A second condition is the elevated deck that is higher than any other structure in the immediate neighborhood. A final condition is the location of the property in close proximity to the beach. As stated in previous applications, weather conditions can impact how sound travels and may impact this site.

Recommended staff conditions:

1. With previous outdoor music applications staff has recommended that the following condition be added:

   > If within any one (1) year period, there are two (2) demonstrated code violations of the outdoor music exceeding the time limitation or the maximum decibel levels, defined in the Code of Ordinances, as proven through the Special Master code enforcement system, the right to play any outside music under the PBD development order shall be automatically revoked without further action of the City Commission. Upon the issuance of a second notice of code enforcement violation by either a Neighborhood Improvement Officer or Police Officer the ability to have the outdoor music shall be suspended until the finding of the Special Master hearings are complete. If the Special Master determines that a second violation has occurred, the ability to have outdoor music shall thereafter be deemed to have been revoked. If the Special Master determines that no violation occurred, the applicant shall be permitted to resume outdoor music.

   Staff would recommend, if approved, that this application contain the same condition.

2. Staff would also recommend that application be restricted to no outside karaoke music as this type of music would increase the decibel impact and be harder to control. The applicant has indicated a desire to maintain the ability to perform karaoke outside.

3. Finally, staff would recommend that no more than two performers be permitted with no base allowed to the music.

Letter of objection:

Staff has received a letter from Ms. Theone Wilkenson, owner of the duplex at 242 and 246 Benjamin Drive, which is attached in EXHIBIT 4. In the letter, Ms. Wilkenson makes the following points regarding the special exception application:

1. The impact of quality of life that will be affected by allowing live music from a night- club type business will be substantial.

2. There have been past events where music was played in violation of the City zoning regulations and what guarantees exist to ensure that the music is maintained a low decibel level.

3. Music on an open roof top deck carries and one sound test cannot be accurate based on changing environmental conditions.

4. No objections to the restaurant business, but the music on the open deck will adversely impact the residences and property owners in this area.

The application is required to be reviewed based on the criteria listed below:

Section 2-57.O.1, Outdoor Activity Criteria:

Section 2-57.O.1 of the Land Development Code outlines the criteria for outdoor activity:

O-

1. **OUTDOOR ACTIVITY**

   1. **If located adjacent to a residential use, appropriate screening and buffering shall be provided to minimize noise and glare impact to the maximum extent feasible.**

      The subject property is zoned B-7 (Highway Tourist Commercial) and abuts properties that are zoned for single family residential uses. The building is setback approximately 10 feet from the side property line. The application seeks to allow outdoor music within the decibel limits established by the Land Development Code. Staff believes that outdoor music could be operated in a manner not to exceed the decibels as measured at the property line with management of the music. There also exists the potential that mis-management of the music can have a potential negative impact on the surrounding residential use and additional code or police enforcement of the Development Order if approved.

   2. **A site plan displaying the area for activity and pedestrian movement shall be required.**

      The area sought for outdoor music is on the north side of the deck with the speakers pointed towards South Atlantic Avenue.

   3. **Outdoor music shall provide a sound study demonstrating compliance with the adopted maximum decibel levels.**

      A sound test was conducted on August 26, 2013 in association with the neighborhood meeting (see EXHIBIT 2). The music at the time of the sound test was in compliance with the adopted maximum decibel limits allowed by the Code of Ordinance. As stated above, staff believes that the application for outdoor music is possible with the proper management of the use, but also acknowledges violations can have potential impacts to residential uses.

Section 2-56: Special Exception Criteria

Section 2-56 of the Land Development Code outlines the general criteria for all Special Exception approvals:

A. ***Off-street parking loading and service areas shall be provided and located such that there is no adverse impact on adjoining properties, beyond that generally experienced in the district.***

The proposed application of outdoor music does not propose to impact the parking or service areas and no adverse impacts are expected based on parking.

B. ***Required yards, screening or buffering, and landscaping shall be consistent with the district in general, the specific needs of the abutting land uses, Chapter 3, Article 1, and other applicable provisions of this Code.***

The requested outdoor activity for music is not impacting any landscaping or modifying the existing buffers along property boundaries.

C. ***Size, location, or number of conditional or Special Exceptions in an area shall be limited so as to maintain the overall character of the district in which said conditional or Special Exceptions are located.***

There have been no other applications for outdoor activity (music) in this corridor of South Atlantic Avenue.

D. ***Hours of operation may be limited and the City may require additional information on structural design and site arrangement, to assure the compatibility of the development with existing and proposed uses in the surrounding area.***

If there is a desire to approve the application, the Planning Board and City Commission have broad abilities to limit the hours of operation of the proposed music if there is a belief that the use will have an adverse impact to residential uses. The applicant has requested the ability to have outdoor music from Monday to Sunday from 11:00 am to 10:00 pm. The applicant has stated that the music would typically be from 4pm to 10pm on weekends, but they would like the ability to have music during holidays and special events during the year.

The applicant is requesting the ability to conduct karaoke outside. Staff is recommending that karaoke only be permitted inside the building.

E. ***The Special Exception shall not generate hazardous waste or require use of hazardous materials in its operation without use of City-approved mitigative techniques.***

This Special Exception request for outdoor activity of music will not generate hazardous waste.

F. ***All development proposed as a Special Exception within or adjacent to a historic district shall be reviewed based on applicable criteria stated herein for residential, commercial or mixed use development and shall also comply with appearance and design guidelines for historic structures.***

The request for outdoor activity of music does not propose any new construction and will not impact the appearance or design of buildings as it relates to historic structures.

G. ***Outdoor lighting shall have no spillover onto adjacent property or rights-of-way beyond the building site property line and the lumens shall not exceed two (2) foot-candles at the property line.***

The site lighting plan is not proposed for amendment and the application is solely for the outdoor activity of music.

Section 1-15.E: Planning Board Criteria and Section 1-18.E: City Commission Criteria

Sections 1-15.E. and 1-18.E of the Land Development Code establish the Planning Board and City Commission Development Order criteria. The Land Development Code states that the following criteria shall be considered:

1. The proposed development conforms to the standards and requirements of this Code and will not create undue crowding beyond the conditions normally permitted in the zoning district, or adversely affect the public health, safety, welfare or quality of life.

The Land Development Code does not prohibit outdoor activity. Within the B-7 zoning district, the outdoor activity use is allowed through a Special Exception with the criteria focusing on impacts to residential uses and the provision of an exhibit demonstrating the limits of the activity. Based on the location to residential uses staff can envision two scenarios with outdoor music. The first scenario is that the outdoor music is properly management by a business owner that has significantly invested into their property and there are no impacts to residential uses. The second scenario is that the outdoor music is not managed and music is either too loud or played too late in the night. As with past applications for outdoor music, staff is recommending the inclusion of the enforcement provision that two proven violations would result in the loss of the ability to have outdoor music. The key consideration in the Special Exception for outdoor activity application is the ability to enforce the sound limits of the Land Development Code.

2. The proposed development is consistent with the Comprehensive Plan.

The site has a Future Land Use designation of "General Commercial", which is consistent with the proposed use. The Future Land Use Element states that the "Commercial" land use category is designed, "To provide for the sales of retail goods and services, high density multi-family, professional offices and services, and

restaurants, depending on the range of population to be served and the availability of transit." The application is consistent with the adopted Comprehensive Plan.

3. **The proposed development will not adversely impact environmentally sensitive lands or natural resources, including but not limited to waterbodies, wetlands, xeric communities, wildlife habitats, endangered or threatened plants and animal species or species of special concern, wellfields, and individual wells.**

   The proposed application for outdoor activity of music will not adversely impact environmentally sensitive lands or natural resources and is an existing developed site.

4. **The proposed use will not substantially or permanently depreciate the value of surrounding property; create a nuisance; or deprive adjoining properties of adequate light and air; create excessive noise, odor, glare, or visual impacts on the neighborhood and adjoining properties.**

   As stated previously, staff can envision two scenarios with outdoor music. The first scenario is that the outdoor music is properly managed by a business owner that has significantly invested into their property and there are no impacts to residential uses. The second scenario is that the outdoor music is not managed and music is either too loud or played too late in the night. **If properly managed** by the person in charge on site, the proposed application for outdoor activity of music should not substantially or permanently depreciate the value of surrounding property if the standards for acceptable sound decibel limits in the Code of Ordinances are not exceeded. As with any application for outdoor music, there is a risk that the management of the restaurant could violate the decibel limits established by the Land Development Code.

   If the Board's recommendation is to approve the Special Exception, staff recommends that the enforcement provision of the River Grille Development Order be included in the Development Order for Dimitri's Bar Deck & Grill. The condition is listed below:

   > "If within any one (1) year period, there are two (2) demonstrated code violations of the outdoor music exceeding the time limitation or the maximum decibel levels, defined in the Code of Ordinances, as proven through the Special Master code enforcement system, the right to play any outside music under the PBD development order shall be automatically revoked without further action of the City Commission. Upon the issuance of a second notice of code enforcement violation by either a Neighborhood Improvement Officer or Police Officer the ability to have the outdoor music shall be suspended until the finding of the Special Master hearings are complete. If the Special Master determines that a second violation has occurred, the ability to have outdoor music shall thereafter be deemed to have been revoked. If the Special Master determines that no violation occurred, the applicant shall be permitted to resume outdoor music."

The applicant has stated that the music volume shall be properly managed in accordance with the Code of Ordinance standards and there would be no impacts on adjoining properties. If managed incorrectly, the burden of enforcement would be placed upon the City Neighborhood Improvement and Police Departments.

5. **There are adequate public facilities to serve the development, including but not limited to roads, sidewalks, bike paths, potable water, wastewater treatment, drainage, fire and police safety, parks and recreation facilities, schools, and playgrounds.**

   Public facilities currently serve the site and there would be no impact to the existing infrastructure as the result of this application.

6. **Ingress and egress to the property and traffic patterns are designed to protect and promote motorized vehicle and pedestrian/bicycle safety and convenience, allow for desirable traffic flow and control, and provide adequate access in case of fire or catastrophe. This finding shall be based on a traffic report where available, prepared by a qualified traffic consultant, engineer or planner which details the anticipated or projected effect of the project on adjacent roads and the impact on public safety.**

   The request for outdoor activity of music will not impact ingress or egress or any aspect of site access.

7. **The proposed development is functional in the use of space and aesthetically acceptable.**

   There is no development proposed with the outdoor activity of music.

8. **The proposed development provides for the safety of occupants and visitors.**

   The requested application of outdoor activity of music will not impact the safety of occupants and visitors.

9. **The proposed use of materials and architectural features will not adversely impact the neighborhood and aesthetics of the area.**

   There is no new building development for the outdoor activity and this criterion is not applicable.

10. **The testimony provided at public hearings.**

    This application has not been reviewed in a public forum and no testimony has been provided.

CONCLUSION:

Line of Reason supporting the Special Exception: The Land Development Code establishes outdoor activity as a Special Exception in the B-7 zoning district with specific criteria. The criterion analyzes the impacts of an application to residential uses and requires a location plan. If the outdoor music is properly executed and time limits followed, there should be no impact to residential uses. The applicant has invested in the subject property over the years and sought to improve and expand the restaurant use. All work on-site has obtained proper permits and the applicant has stated to City staff that they would not violate the Code of Ordinance decibel limits.

If the sound limits of the Code of Ordinances are violated, residences in the surrounding areas could be adversely impacted. Staff recommends a condition be added to include the River Grille Development Order provision that if there are violations as proven through the Special Master process, there would be a risk to lose the ability to provide outdoor live music. Staff also recommends that karaoke be limited to inside the enclosed building and not on the second floor deck.

Line of Reason against the Special Exception: The outdoor activity of music would adversely impact the overall community character of the site and should not be permitted. The letter provided by Ms. Wilkenson outlines the concerns of a property owner in the immediate area and past violations of the decibel limits established by the Code of Ordinances. This line of reasoning would focus on criteria number four of the Development Order criteria, discussing the lowering of property values and creating a nuisance. It is possible that allowing outdoor activity could create additional impacts if the conditions are not followed and require additional code enforcement to ensure that the required sound levels are being complied with.

RECOMMENDATION: It is expected that the application will be reviewed by the City Commission on October 15, 2013. It is recommended that the Planning Board **APPROVE** the application for the outdoor activity of music at Dimitri's Bar Deck & Grill located at 790 South Atlantic Avenue with the following conditions:

1. Applicant's request: Hours of live music between Monday through Sunday, 11:00 am -10:00 pm.
2. Staff recommendation: No karaoke is allowed on the second floor roof deck and shall be limited to inside the building. Applicant request: Allow karaoke on the second floor roof deck.
3. Staff recommendation: If within any one (1) year period, there are two (2) demonstrated code violations of the outdoor music exceeding the time limitation or the maximum decibel levels, defined in the Code of Ordinances, as proven through the Special Master code enforcement system, the right to play any outside music under the PBD development order shall be automatically revoked without further action of the City Commission. Upon the issuance of a second notice of code enforcement violation by either a Neighborhood Improvement Officer or Police Officer the ability to have the outdoor music shall be suspended until the finding of the Special Master hearings are complete. If the Special Master determines that a second violation has occurred, the ability to have

outdoor music shall thereafter be deemed to have been revoked. If the Special Master determines that no violation occurred, the applicant shall be permitted to resume outdoor music.

4. Staff recommendation: no more than two performers be permitted with no base allowed to the music.

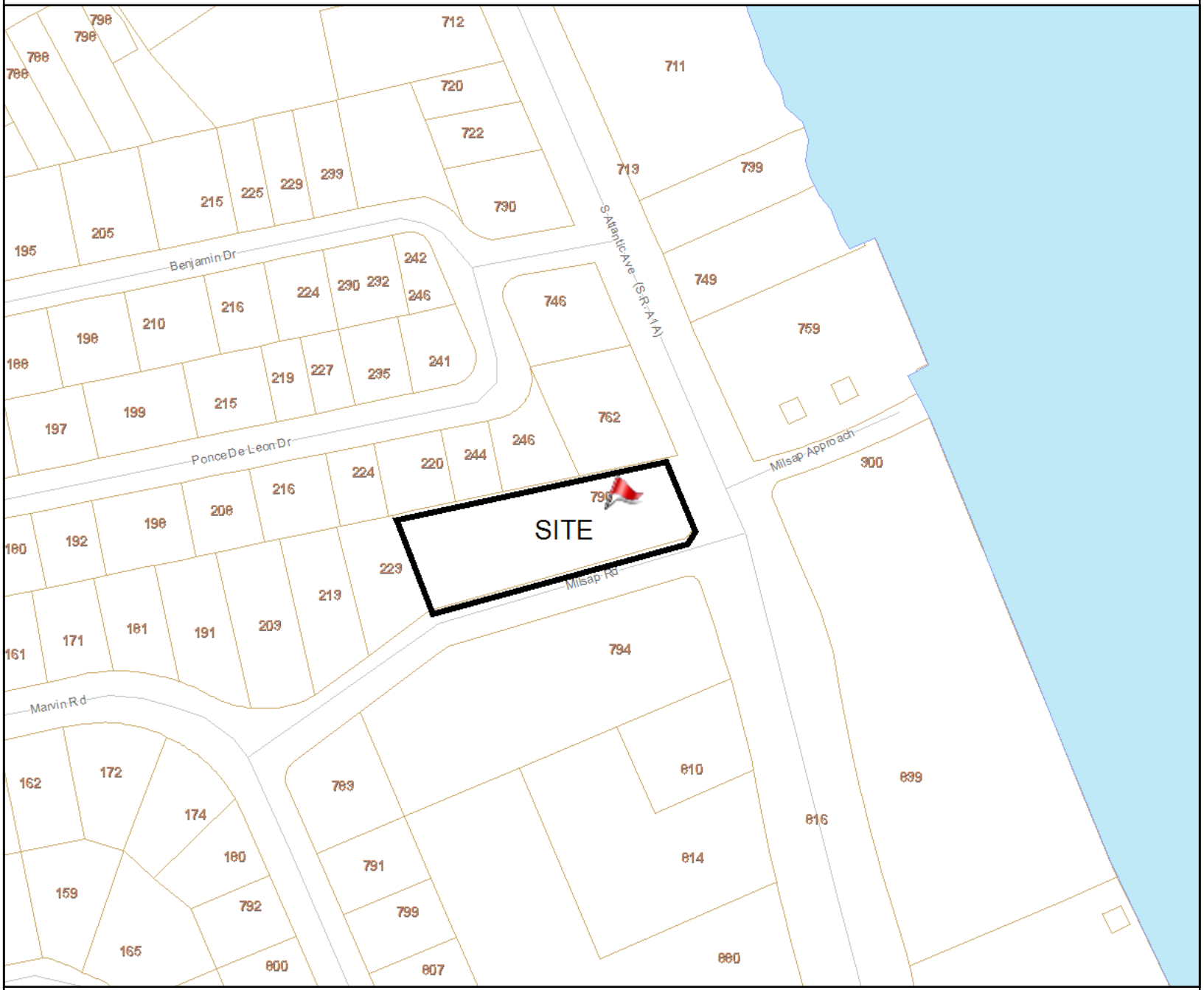
Exhibits:

1. Maps/Pictures.
2. Sound test decibel readings.
3. Dimitri Bourtzakis e-mail.
4. Ms. Wilkenson letter.

EXHIBIT 1

Map and Pictures

790 South Atlantic Avenue Location Map



Address Points

Traffic Signals

Airport and Railroad

AIRPORT

RAILROAD

City Streets

DIRT

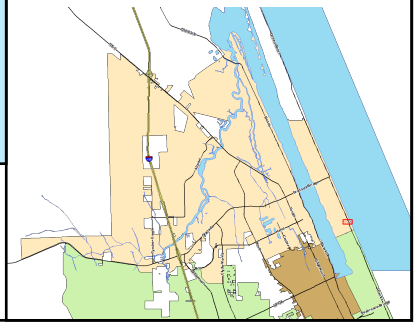
MAJOR

PAVED

Water Features

Property Lines

178 ft



GIS data is provided on an "as is" basis. The accuracy or reliability of the data is not guaranteed or warranted in any way. The City of Ormond Beach specifically disclaims any warranty either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular use. The entire risk as to quality and performance of the data is with the end user. In no event will the City, its staff or it's representatives be liable for any direct, indirect, incidental, special, consequential, or other damages, including loss of profit, arising out of the use of this data even if the City has been advised of the possibility of such damages.

790 South Atlantic Avenue location map

Location of outdoor music
Ponce De Leon Dr
Ponce De Leon Dr
A1A
State Hwy
Map
Traffic
A1A
Dimitri's Bar Deck and Grill
A1A
S Atlantic Ave
Milsap Rd
Milsap Rd
Milsap Rd

Speaker location
Speaker location

EXHIBIT 2

Sound test decibel readings

Decibel measures from neighborhood meeting on August 26, 2013 at 790 South Atlantic Avenue

Decibels (dbs) – with music playing

Decibels (dbs) – without music playing

EXHIBIT 3

Dimitri Bourtzakis e-mail

Spraker, Steven

From: Dimitri B [dimitrigyro@gmail.com]
Sent: Wednesday, August 28, 2013 11:55 AM
To: Spraker, Steven
Subject: Dimitri's

August 27, 2013

Dear City of Ormond Beach Commisioners;

My name is Dimitri Bourtzakis and I am the sole proprietor for Dimitri's Bar Deck and Grill. As a business owner and a tax payer in this community I provide jobs for many. With my recent additions to the restaurant, I have provided work for local engineers, architects, contractors, plumbers, electricians, etc. and have contributed to the job market with the operation of this business. As time goes by, and money allows I continue to upgrade my property with some hefty projects in the forefront such as repaving the parking lot, re-staining the deck, dumbwaiter installation, new seating, upgraded turtle friendly lighting, outdoor fans, and heat fixtures and much more. These additions come with great costs, but continue to generate monies into the community.

I make my living by serving the community food and entertainment and try to maintain a clean and respectable business and like any other business owner have a goal of keeping my doors filled with happy patrons. With the addition of the deck, the deck bathrooms and the shade structure, I continue to put money into the business for the comfort of our guests, providing all who come with a beautiful view of Ormond Beach's best features, the Atlantic Ocean and the Andy Romano Park! I believe that I have built something wonderful for this community and with the help of my customers, would like to continue to upgrade to make it a local landmark!

I am hoping that you will allow me to grow my business by providing live outdoor entertainment to our guests of the community. In listening to our guests, they would like a coastal, Caribbean, acoustic ambient music and we insist that it be played at reasonable hours, weekend afternoons and early evening with live acts not to play past 10pm. Our guests have been asking us for this since we constructed the deck!!

I thank you for your consideration and hope that we can proceed. If you have any questions you can contact me personally, Dimitri Bourtzakis, 386-295-8847.

Best Regards;

Dimitri Bourtzakis

EXHIBIT 4

Ms. Wilkenson letter

September 3, 2013

To: Steven Spraker, Senior Planner/ Engineering

Troy Kent, City Commissioner, Zone 2

Ormond Beach City Planning Board- Doug Thomas

Joanne Naumann, Neighborhood Improvement Manager

Re Dimitri's Bar, Deck & Grill
Location: 790 S. Atlantic Ave. & Milsap Road, Ormond Beach, Fl

I am writing this letter as an **objection** to an exemption/variance for Dimitri's Bar & Grill to have live music on their open roof-top deck.

The impact of quality of life that will be affected by allowing live music from a night-club type business will be substantial. The quiet and serenity of residential neighborhoods in proximity of this night-club type business should be paramount when addressing such a variance.

On August 26, 2013, there was a neighborhood meeting concerning the request for open roof top music, and Decibel testing was done by Mr. Spraker, City of Ormond Beach Engineering. I could not attend this meeting, however, my Tenant; Mr. Marquardt was there, along with other residences in the area. The testing was done with a one-man guitar playing and only 12 people in attendance. This meeting only lasted 15-20 minutes, as a rain storm coming cut the meeting short. Decibel testing was not done on the north side of the source of music.

I own the duplex located at 242 and 246 Benjamin Drive, (across the street, north of Dimitri's Bar & Grill), and this is a rental unit. In fact, many of the surrounding residences in this area are renters, and they had no knowledge of the requested exemption, and were not sent a letter. Only owners of the property were given notices, and many owners are out of town. In fact, Mr. Kouzoudjian, who owns 246 Ponce de Leon, lives in Canada, and his tenant had no knowledge that a meeting was held or that an exemption will be requested. The roof top of Dimitri's Bar & Grill is practically on top of this property.

Back in 2012, this Bar, Deck & Grill was in violation of the zoning laws, as music was coming from the roof top approximately four different occasions. My tenants had complained of the loud music coming from the roof top. I personally went down to the Zoning Department and was told that Dimitri's was not to have music of any type on the roof top; that they were approved for an observation tower. At the time, Dimitri's Management said that they had rented the roof top and didn't know people were up there with loud music.

On July 12, 2012, (Thursday evening) my tenant called the police, as the music coming from the roof top of Dimitri's Bar & Grill was so loud, that she could hear it with the windows closed and the air-condition on. She had to turn up her television to hear it in her own residence. The police were called at 9:20 pm., and the music was stopped at 9:45 pm. What would make me believe that they would keep the music down to a low level of 60 to 65 decibels?

This is an **open roof top deck**; and music on an open roof top carries, especially when you get 30-40 people, up there singing along, the noise will increase. It is obvious that it will be very difficult to control the music level on this open roof top. There are other conditions that will affect the noise level such as environmental influences, as the wind direction, air pressure, and temperature. The best amplifier of sound is heat. The decibels readings taken on August 26, 2013 cannot really be that accurate from day to day when you have to consider the environmental conditions.

I do not have a problem with Dimitri's Bar & Grill, as it was originally zoned for, and I am not anti-business. But when the business now wants to have music on an open roof top it will definitely impact the quality of life of the residences in the area

Why would the City of Ormond Beach experiment with citizens' lives and their quality of life in a residential area to accommodate a private enterprise? I bought this property in Ormond over 20 years ago because Ormond is noted to have good zoning laws. If this variance is approved, there will be other business' asking for this same kind variance too. Do you want Ormond's beachside residential area to be like Daytona's?

I strong urge you to deny this outdoor music activity, as this is unacceptable and will adversely impact the residences and property owners and residences in the area.

Thank you for your consideration in this matter

Theone Wilkenson
Email: theone1947@yahoo.com
Phone cell (386)717-2970
Or (850) 937-6985

STAFF REPORT

City of Ormond Beach
Department of Planning

DATE: September 3, 2013

SUBJECT: LDC Amendment – Section 1-20, Codes and standards adopted by reference

APPLICANT: Administrative

NUMBER: LDC 13-111

PROJECT PLANNER: Steven Spraker, AICP, Senior Planner

INTRODUCTION: This is an administrative request to amend Chapter 1, General Administration, Article II, Administration and Enforcement, Section 1-20, Codes and standards adopted by reference, to add the following documents as adopted by reference: (1) "Low Impact Development Manual for the City of Ormond Beach", (2) "Ormond Beach Downtown Design Guidelines", and (3) "Ormond Beach Multi-Modal Strategy".

BACKGROUND: Section 1-20, Codes and standards adopted by reference, of the Land Development adopts regulations by reference and currently includes the following documents:

1. State building code.
2. Standard fire prevention code.
3. City's standard details.
4. Transportation impact assessment guidelines.

City staff is currently processing a Land Development Code amendment for Low Impact Development and desire to adopt by reference the "Low Impact Development Manual for the City of Ormond Beach". In the preparation of this amendment it was noted that two other documents, "Ormond Beach Downtown Design Guidelines", and "Ormond Beach Multi-Modal Strategy" should also be adopted by reference. The Downtown Design Guidelines were part of the form based code adopted with Ordinance 2010-051 and the Multi-Modal Strategy was a part of Ordinance 2013-002.

LDC AMENDMENT: Below is the proposed amendment to Chapter 1, General Administration, Article II, Administration and enforcement, Section 1-20:

(d) Transportation impact assessment guidelines. … *no change to existing text.*

(e) Low Impact Development Manual for the City of Ormond Beach. The Low Impact Development Manual as published by the city planning department, is adopted.

(f) Ormond Beach Downtown Design Guidelines. The Downtown Design Guidelines as published by the city planning department, is adopted.

(g) Ormond Beach Multi-Modal Strategy. The Multi-Modal Strategy as published by the city planning department, is adopted.

ANALYSIS: The three documents (provided electronically as an exhibit to this report) are designed to provide additional information regarding each subject that would be too large to include in the Land Development Code. Adopting the document also allows City staff to modify the document as needed to incorporate updates. The purpose of each document is discussed below:

1. Low Impact Development Manual for the City of Ormond Beach. This document is 104 pages and provides the theory, methodology, treatment techniques (LID toolbox), and details for plan preparation for use Low Impact Development stormwater management.
2. Ormond Beach Downtown Design Guidelines. This document is 17 pages and provides architectural design guidelines regarding scale, setbacks, building facades, windows, doors, roofs and signage for buildings being developed or redeveloped in the Downtown Overlay District.
3. Ormond Beach Multi-Modal Strategy. This document is 32 pages and provides the foundation for the mobility fee within Sections 1-26 and 1-32 of the Ormond Beach Land Development Code. The document includes strategies to implement the roadway, transit, bicycle, and land use vision plans. The document also includes transit demand management strategies and strategies to implement multi-modal transportation systems.

CONCLUSION: There are certain criteria that must be evaluated before adoption of an amendment according to the LDC, the Planning Board must consider the following criteria when making their recommendation.

1. The proposed development conforms to the standards and requirements of this Code and will not create undue crowding beyond the conditions normally permitted in the zoning district, or adversely affect the public health, safety, welfare or quality of life.

No specific development is proposed. The intent of the proposed amendment is to incorporate three documents by reference that provides the foundation of low impact development, downtown design guidelines, and multi-model transportation. The proposed amendment will not adversely affect public

health, safety, welfare or quality of life and will provide a needed service to Ormond Beach residents.

2. **The proposed development is consistent with the Comprehensive Plan.**

   The proposed Land Development Code amendment is consistent with the Comprehensive Plan. These three documents assist to implement Goals, Objectives and Policies related to stormwater, downtown redevelopment, and transportation.

3. **The proposed development will not adversely impact environmentally sensitive lands or natural resources, including but not limited to waterbodies, wetlands, xeric communities, wildlife habitats, endangered or threatened plants and animal species or species of special concern, wellfields, and individual wells.**

   No development is proposed and this criterion is not applicable.

4. **The proposed use will not substantially or permanently depreciate the value of surrounding property; create a nuisance; or deprive adjoining properties of adequate light and air; create excessive noise, odor, glare, or visual impacts on the neighborhood and adjoining properties**.

   No development is proposed and this criterion is not applicable.

5. **There are adequate public facilities to serve the development, including but not limited to roads, sidewalks, bike paths, potable water, wastewater treatment, drainage, fire and police safety, parks and recreation facilities, schools, and playgrounds.**

   No development is proposed and this criterion is not applicable.

6. **Ingress and egress to the property and traffic patterns are designed to protect and promote motorized vehicle and pedestrian/bicycle safety and convenience, allow for desirable traffic flow and control, and provide adequate access in case of fire or catastrophe. This finding shall be based on a traffic report where available, prepared by a qualified traffic consultant, engineer or planner which details the anticipated or projected effect of the project on adjacent roads and the impact on public safety.**

   No development is proposed and this criterion is not applicable.

7. **The proposed development is functional in the use of space and aesthetically acceptable.**

   No development is proposed and this criterion is not applicable.

8. **The proposed development provides for the safety of occupants and visitors**.

No development is proposed and this criterion is not applicable.

9. **The proposed use of materials and architectural features will not adversely impact the neighborhood and aesthetics of the area.**

   No development is proposed and this criterion is not applicable.

10. **The testimony provided at public hearings**.

    There has not been a public hearing at this time. The comments from the Planning Board meeting will be incorporated into the City Commission packet.

RECOMMENDATION:

It is expected that the amendment will be reviewed by the City Commission on October 1, 2013 (1st reading) and October 15, 2013 (2nd reading). It is recommended that the Planning Board **APPROVE** LDC 13-111, to to amend Chapter 1, General Administration, Article II, Administration and enforcement, Section 1-20, Codes and standards adopted by reference, to add the following documents as adopted by reference: (1) "Low Impact Development Manual for the City of Ormond Beach", (2) "Ormond Beach Downtown Design Guidelines", and (3) "Ormond Beach Multi-Modal Strategy" as follows:

Chapter 1, General Administration, Article II, Administration and enforcement, Section 1-20:

(d) Transportation impact assessment guidelines. … *no change to existing text.*

(e) Low Impact Development Manual for the City of Ormond Beach. The Low Impact Development Manual as published by the city planning department, is adopted.

(f) Ormond Beach Downtown Design Guidelines. The Downtown Design Guidelines as published by the city planning department, is adopted.

(g) Ormond Beach Multi-Modal Strategy. The Multi-Modal Strategy as published by the city planning department, is adopted.

Exhibits:

1. Low Impact Development Manual for the City of Ormond Beach.
2. Ormond Beach Downtown Design Guidelines.
3. Ormond Beach Multi-Modal Strategy.

Exhibits:

1. Low Impact Development Manual for the City of Ormond Beach.
2. Ormond Beach Downtown Design Guidelines.
3. Ormond Beach Multi-Modal Strategy.

City of Ormond Beach

Low Impact Development Design Manual

City of Ormond Beach

Planning Department

1sr Edition - 2013

City of Ormond Beach
Low Impact Development Manual

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Section 2 **Fundamentals and Calculations**
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Section 4 **Plan Requirements for LID**
Section 5 **Appendices**
Appendix A – Definitions
Appendix B – Declaration of Covenants – Maintenance Schedules & Inspection Forms
Appendix C – Standard Details

Section 1
Introduction to Low Impact Development in the City of Ormond Beach

Section 1.0: Administration

This manual has been prepared to aid developers, development design professionals, contractors, property managers, and City review and administrative personnel to implement successful Low Impact Development (LID) projects within the City of Ormond Beach. Specific reference is made to this manual, and authorization is made for its implementation in Chapter 3, Article 2, Section 3-18: Surface Water Control, of the Land Development Code for the City of Ormond Beach Florida.

Section 1.1: Introduction to Low Impact Development

The discipline of Stormwater Management has, by nature, been a component of Public Works and Land Development that has experienced a constant state of evolution since its earliest implementation. Early man realized that by controlling irrigation individuals and societies could provide for increased agricultural success and consistency. As populations became more urban and development lead to areas of greater intensity, the need for methods of flood control to protect population and property became the focus of stormwater management; recent trends in stormwater management have centered on methods that prevent pollution from runoff, and protect natural resources, specifically downstream water bodies and wetland systems.

These recent shifts in stormwater management techniques, placing a greater emphasis upon pollution abatement have also lead to greater research in methods and a higher level of critique in measurement of the success of specific practices and the overall stormwater management systems that have become commonplace and accepted in design. Many of these studies have shown that the performance of these systems have not met the efficiencies in pollutant removal that was anticipated and expected from them. The result of these advanced studies have made it apparent that revisions to the way developers approach stormwater management and the way jurisdictions regulate these systems require more complex systems that more closely mimic nature in their provision for environmental protection, flood control, and that can, in many instances, bring a return to our beginnings with the use of collected runoff for irrigation of the green areas incorporated into our sites.

This manual is intended to be a dynamic document for use by the City of Ormond Beach and those who develop sites within the City. As technology and research provide greater insight and solutions for the development of stormwater management techniques that mimic nature both in treatment quality and runoff control, additions and modifications can and should be made to this handbook. That being said, this manual is not intended to replace the rules and ordinances of the City of Ormond Beach, County of Volusia, St. Johns River Water Management District, or other jurisdictional agencies that may govern stormwater management on any given site within the limits of the City. Utilization of Low Impact Design (LID) techniques often requires taking steps that are beyond the minimum design standards; as such, there are no specific requirements that mandate the use of LID on any given development or redevelopment site. Those interested in

applying the principles of Low Impact Development (LID) into their site design are taking steps that are beyond those expected of sites utilizing traditional best management practices.

Section 1.2: Low Impact Development

Low Impact Development (LID) is a term that represents stormwater management and the comprehensive approach to land development required to mimic the inherent nature of a site's hydrology and the interface of the subject property with the lands, waters, and natural systems downstream from the property.

In order to achieve the ultimate goal of improving upon the efficiency of traditional stormwater management, the LID approach decentralizes the traditional "bottom of the hill" method of treatment and attenuation and manages the process at the source of runoff through the use of the small scale treatment techniques; connected in what is often referred to as a "Treatment Train".

These multiple elements are referred to as Integrated Management Practices (IMPs) and provide for a system that does not simply collect and convey runoff but rather provides for and encourages the infiltration, filtration, storage, evaporation, of runoff detaining it close to the source. When incorporating Integrated Management Practices into site development the project design professional should utilize the following principles of Low Impact Development that can guide the project design and achieve a successful sustainable site.

1. Conservation of natural resources and site characteristics that provide natural functions associated with controlling, filtering, conveying, and storing stormwater
2. Minimization and disconnection of impervious surfaces.
3. Use of distributed small scale controls to route flows, control discharge, and mimic the site's pre-development hydrology to the maximum possible extent.
4. Maintain the pre-development travel time (time of concentration) by routing flows and controlling discharge in the post development condition.
5. Direct runoff to natural and created landscape areas that are conducive to infiltration.
6. Provide a program of public information to the property owners, employees, and residents / tenants.

When using this handbook, it should be apparent that utilizing LID techniques in the design of a site requires the design professional to apply the techniques of Low Impact Design beginning in the early stages development starting with site selection and conceptual layout, continuing through site design, construction of the system and ultimately operation and maintenance of the site. **Low Impact Design is not an off the shelf approach that can be applied from one site to another. Existing site conditions for a project, both new construction and re-development of an existing site will dictate the selection, arrangement, and sizing of IMPs best suited for a given site. Not every site is conducive to the use of LID and the specific elements associated with its use.** It is the intention of this handbook to provide a guide for

users as they utilize of the techniques associated with LID and develop projects that minimize the impact made by the project from the property in its natural state.

Section 1.3: Outline of this Manual

The purpose of this manual is to provide the toolbox for those designing stormwater systems using Low Impact Development Techniques within the City of Ormond Beach. However, this manual is intended to be used not only by the Engineers and Planners responsible for site development design but also the property developer / owner, City of Ormond Beach regulation officials, site contractors as well as those responsible for the operation of the site upon completion including maintenance staff, residents, and others associated with the site.

This organization of this handbook is divided into the following four divisions:

- **Section 1 – The introduction to the using Low Impact Development and its techniques for development in the City of Ormond Beach.**
  This section provides starts the discussion, introducing LID in the context of Land Development within Ormond Beach.

- **Section 2 – Presentation of Low Impact Design theory, methodology, and how it is implementated into a project.**
  This section will examine the design process and the evaluation of a site with focus on specific LID practices and how these LID principles can be incorporated into specific projects. It will discuss acceptable techniques for LID as well as advantages and concessions that can be made when developers and design professionals use LID in their planned project. A brief overview of the stormwater criteria that will be applied to project electing to include LID techniques in their design will also be addressed.

- **Section 3 – LID Toolbox**
  This section considers the technical elements of Low Impact Design. It is in this section that specific treatment techniques will be described in greater detail and presented with design aids including equations, photos and design details that can be incorporated into the plans for development of the site.

- **Section 4 – Plan Preparation**
  This section outlines the requirements for plans that implement Low Impact Development for site design and construction. Included in this section are the requirements unique to the preparation of stormwater management plans and calculations as well as discussion of the necessary operation and maintenance documents and instructions to ensure the success of the implementing LID into a proposed development within the City of Ormond Beach.

- **Section 5 –Appendices To This Manual**

This section includes definitions for technical terms associated with Low Impact Development, technical references, and other resources that may assist with the incorporation of Low Impact Development into the design of project sites.

Section 2
Fundamentals and Calculations

Section 2.1: Use of Low Impact Development

This section will serve to introduce the user of this handbook to the use of Low Impact Development. A brief discussion of the principles serving as the basis for the use of LID in site design will be followed by the steps necessary to select and evaluate the effectiveness of integrating IMPs into a site for development or redevelopment. This section will conclude with the methodology used for calculating runoff and storage requirements for sites that elect to incorporate LID into their sites.

Section 2.2: Hydrologic Cycle and Low Impact Development

It is most commonly stated that the primary goal of Low Impact Development is to best mimic the existing site hydrology. One way of evaluating the effectiveness of a system to achieve this goal is to examine the hydrologic budget on a given site. The hydrologic budget is a description of the amount of water flowing in and out of an area along different paths at a given time period. During development, the grading and compaction of a site, construction of buildings, addition of pavement and other impervious surfaces has a direct impact on the hydrologic budget by decreasing rates of infiltration, evaporation, transpiration, and subsurface flow. This cycle is also affected by the reduction of the availability of natural storage and increasing runoff. Figure 2.1a below illustrates the hydrologic cycle and shows the effect of urbanization on this cycle at a specific site.

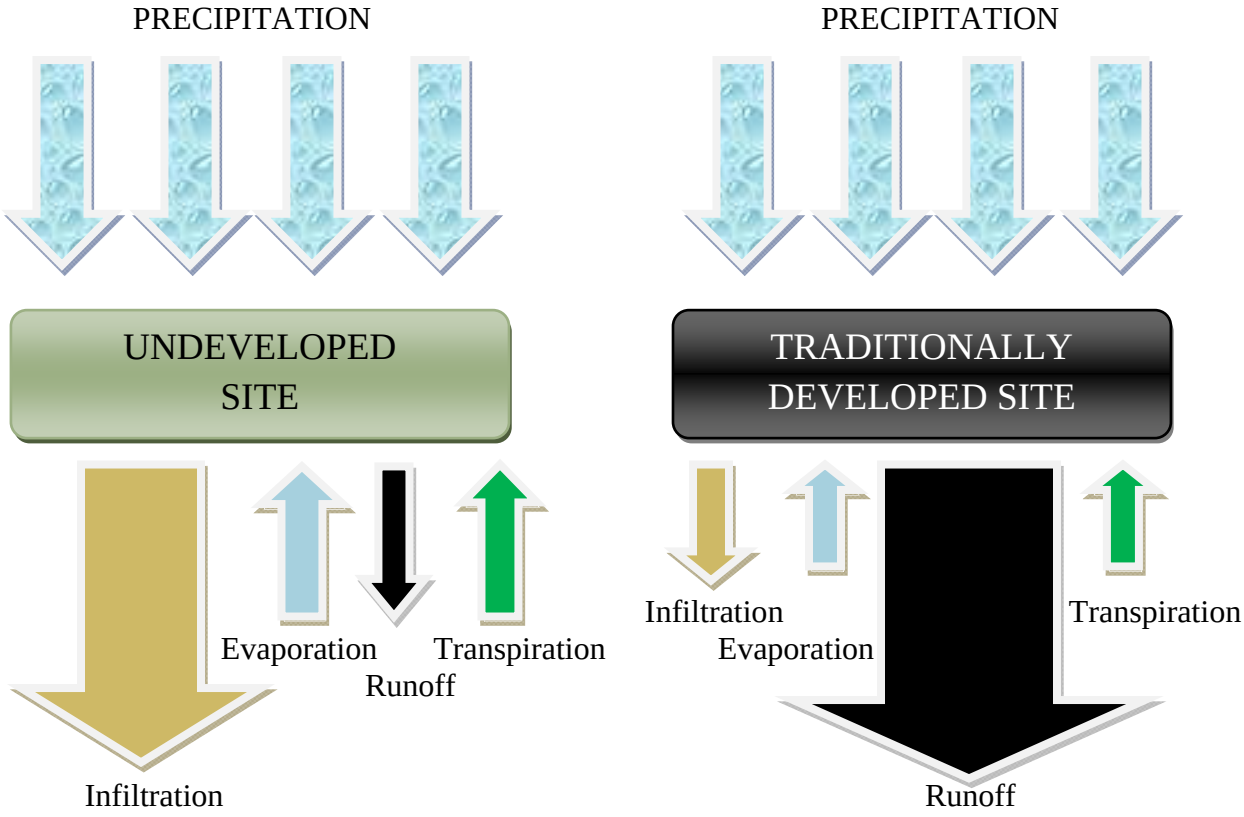


Figure 2.1a: Change to Hydrologic Cycle with Development of Site

The above graphic serves as an exaggeration of what becomes of precipitation once it reaches a site, the following table shows the general magnitude of the effect that increasing the impervious area on a site has on runoff, infiltration, and evaporation / transpiration.

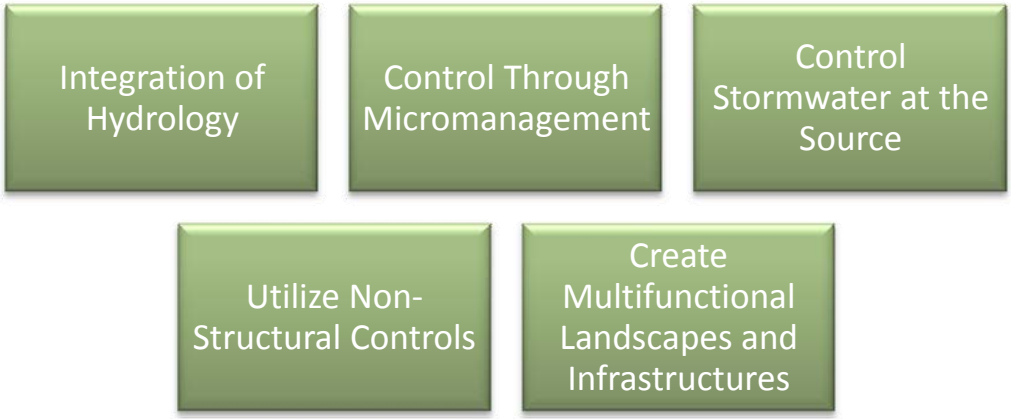
Impervious Surface	Runoff	Infiltration	Evapo-transpiration
0% (Natural Ground)	10%	50%	40%
10% – 20%	20%	45%	35%
35% - 50%	30%	35%	35%
75% - 100%	55%	15%	30%

Section 2.3: Site Planning

While the overall goal of integrating LID in the planning and design of a site is to create a developed site that mimics the hydrology of the property prior to development, there are numerous positive improvements that individually can benefit a site and, in aggregate, can contribute to the overall success found by integrating the practice of LID. These benefits include, but are in no way limited to:

- The Reduction of Impervious Surfaces
- Encouragement of Open Spaces
- Protection of Significant Vegetation
- Reduction of Infrastructure costs
- Reduction in Non-point Source Pollution
- Applicable to Greenfield, Brownfield, and Urban Development
- Non-Stormwater benefits including increased aesthetics, quality of life, water conservation, increased property values.

In their manual, *Low –Impact Development Design Strategies*, Prince George's County Maryland outlined five fundamental concepts common to LID. These concepts, listed below, provide for a simple yet effective guideline for the site planner / engineer to follow when developing a plan successfully integrating LID into a site.



Concept 1- Integration of Hydrology

The traditional approach to stormwater management is to rapidly and efficiently convey runoff and drain the site. LID revises this approach in an attempt to bring the site closer to one that mimics the natural hydrologic function of the water balance effectively reducing off-site runoff and ensure ground water recharge. By introducing the Integrated Management Practices, (IMP), associated with LID to the planning and design of a site, elements are added that assist to store, infiltrate, evaporate and detain runoff. In order to effectively integrate hydrology, and in turn, LID, the planning process should commence with the identification and preservation of hydrologic sensitive areas including flood plains, wetland, water bodies and their buffers, and highly permeable soils. By identifying these areas, the development envelope can be established, allowing for the development of a site that most efficiently maintains the pre-development hydrology of the site in order to get the best yield from the site.

Concept 2- Control Through Micromanagement

A key change in approach from traditional stormwater design to LID use, is the use of micromanagement techniques wherein a change in perspective is employed dividing the site in to multiple smaller sub-basins that are controlled by smaller treatment techniques distributing control and treatment throughout the site. Utilizing control through micromanagement can allow for the use of a greater variety of treatment methods which can make use of the natural site characteristics including infiltration and depressional storage and in doing so, provides for redundancy in treatment and flow control establishing the concept of the "Treatment Train".

Concept 3 –Control Stormwater at the Source

A second benefit of dividing the site into smaller sub-basins is the ability to control stormwater at the source. This concept, which goes hand-in-hand with Concept 2, allows for the design to take advantage of multiple techniques being integrated into the plan that can encourage recharge of groundwater and create a timed discharge from the site more consistent with the naturally occurring hydrology. A key benefit that accompanies this concept can be a reduction in infrastructure costs. With increased distances from the collection point to the treatment measure come increased costs; reducing the distances from the source of runoff, or incorporating control measures at the source can result in the reduction of costs by reducing or eliminating structural conveyance measures.

Concept 4: Utilize Non-Structural Controls

Building upon Concept 3, by relying on simpler more organic means of stormwater control rather than the traditional end of pipe method that has been customary, the site can take advantage of systems that rely on soil, vegetation, gravel rather than concrete and steel. Although traditional treatment methods are needed to be employed in addition to LID IMPs, Integrating them into the site design can create a system that in addition to being more aesthetically appealing, can also by using shallow depths and gentle slopes reduce safety concerns. Employing multiple IMPs may actual provide a technical advantage over a single traditional design in redundancy where one of the control elements can fail without the overall site control failing.

Concept 5: Create Multifunctional Landscapes and Infrastructures
LID is best expressed by this concept, which illustrates the utilitarian nature of the strategy where the landscape elements become multifunctional allowing for detention, retention, filtration and runoff depending on the individual element and its implementation. In LID the landscape / stormwater elements are common to each other making further use of the open space elements and controlling the runoff at the source.

Section 2.3: Site Evaluation and Integrated Management Practice Selection.
When implementing a plan for using LID in the City of Ormond Beach, the steps are grouped into three categories of activities each with its own milestone, and response from the City acknowledging compliance. The three steps of LID are: Planning, Design, and Implementation.

Planning
Successful Low Impact Development begins with a carefully thought out and planned design for the use of LID and the IMPs on a specific site. Because no two sites are the same, and no matter how similar they may seem, no two uses are identical the design phase begins with a carefully executed site assessment. This assessment is critical in order to ensure that the correct IMPs are selected and sized to meet the needs of an individual site. When performing this assessment, it is important for the project team to complete a due diligence of the property, or properties. The first step in the due diligence / planning process is for the project design team to identify jurisdictional regulations affecting the property including zoning requirements that regulate density and geometry of the development, specify technical standards for development, and define hydrologic and resource conservation areas on the project site.

This site analysis continues with a defining of the development envelope. In doing this, the project designer will locate and identify protected areas, setbacks, easements, site topography, existing drainage patterns, soils hydrology, and vegetation. Identification of these features allow for a mapping of the site that allows for the development of a conceptual / preliminary plan for development of the site.

It should be emphasized at this point that although the use of LID in site design can provide many alternatives to traditional site design, it does not relieve the developer from developmental standards within the City of Ormond Beach. Zoning criteria, landscape standards, and traditional site design standards and details are important considerations that should be addressed. With that in mind, an important element of the planning stage is the Pre-Application Meeting with City staff. Because typical conventional regulations for zoning and stormwater control are often inflexible and do not allow development to conform to the natural hydrology of the site, this meeting can allow the developer and design professionals the opportunity to include representatives from the City in the project team. Upon the development of a conceptual plan for the site, the developer can schedule a meeting with staff to discuss the plan and goals for the site. It is at this meeting that City staff can discuss methods of meeting these goals as well as propose alternatives that can assist the project design team create an acceptable path to the ultimate goal of a successfully developed project. This meeting or when necessary series of meetings will initiate the working relationship between the City and Developer for the project. Upon successful completion of the pre-application phase of the project, City staff will provide to the

developer a written confirmation outlining the ways that it is understood LID will be integrated into the site design.

Design

Upon completion of the conceptual plan and following a successful pre-application meeting, the design portion of the project begins in earnest. When designing a site with the intention of incorporating LID, the most important factor in the process is the use of drainage hydrology as a defining design element. By using hydrology as the framework for the overall design, the project design team can create a site that maintains the essential hydrologic functions of the site while affording the project to make maximum use of the site. A project can achieve this when hydrologically functional landscape elements, distribution of micromanagement techniques, a minimization of impacts, and the reduction of effective impervious areas are considered in the development of a plan and are being used in order to maintain infiltration capacity, storage, and the longer time of concentration typically associated with undeveloped properties.

In assembling a design for a site employing LID techniques, an iterative effort is often required which takes modifying the design and adjusting the location of IMPs based upon various factor included prevalent soils types, existing drainage patterns, runoff sources, and vegetation. Once the framework for the site has been established, it is up to the project engineer to fully integrate LID minimizing directly connected impervious areas, modifying and increasing drainage flow paths, and completing the comparison between predevelopment and post development hydrology. Examples of techniques that can be employed top accomplish these tasks are shown below:

Minimization of Directly Connected Impervious Areas

- Disconnection of roof drains
- Directing flows to vegetated areas
- Breaking up flow directions from large paved surfaces
- Encouraging sheet flow through vegetated areas.
- Selectively located impervious areas in order to encourage drainage towards natural systems, vegetated buffers, resource areas, or soils with high infiltration ability.

Modifying and Increasing Drainage Flow Paths

- Maximization of overland sheet flow
- Increasing flow paths
- Maximization of the use of open swale systems
- Augmentation of site and lot vegetation.

Once the project design team has completed design for a site, they will submit it to the City for review and to ensure that the LID compliance has been met. In their review, City staff will take into consideration the use of LID IMPs; once the design has been finalized and found acceptable by the City, a development order will be issued approving the plan that notes the use of LID in the project, and the future requirements placed upon the site due to the use of LID.

Implementation

In the use of LID, planning and design are only the beginning in implementing LID within a successful project; equally as important is the implementation of the design. Implementation in

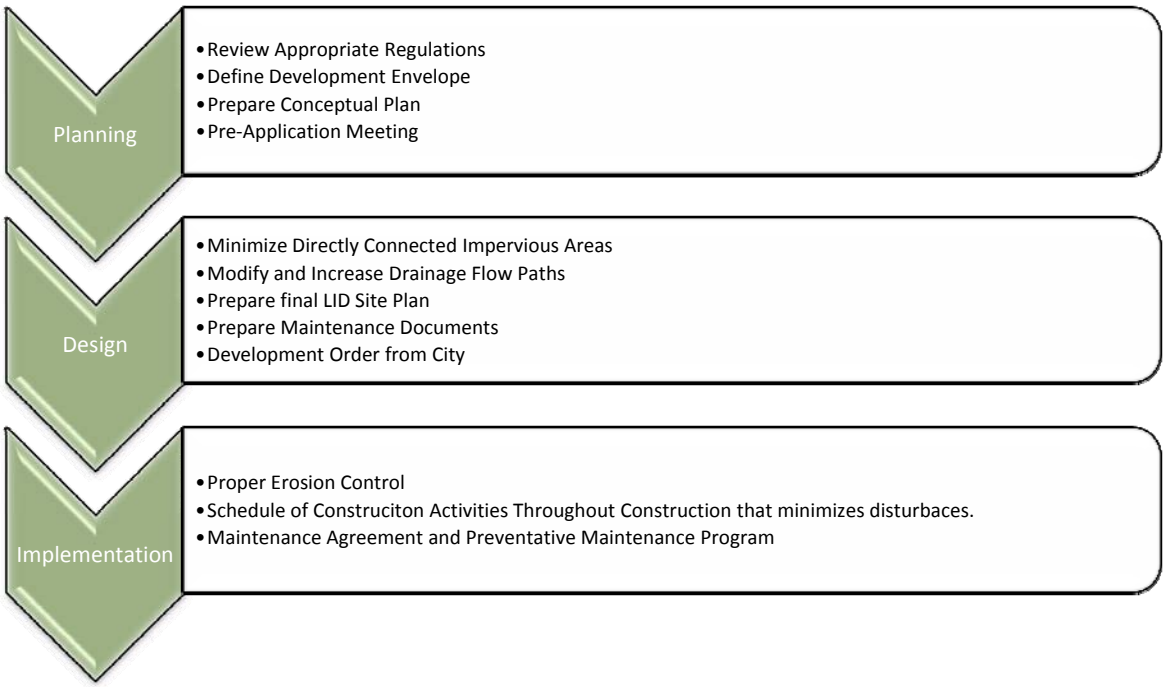
itself takes on two important activities, construction of the plan, and maintenance of the system and control devices.

Implementation begins in the planning and design stages in the development of a plan for construction including its phasing and scheduling that considers the site topography, soils, and vegetation. In preparation of this plan, the design professional should take every effort to ensure that soil disturbance and exposure are minimized throughout the process, natural drainage is maintained throughout the process to the greatest extent possible, and that proper devices are implemented to reduce and eliminate erosion and control sediment discharge.

During construction it is important for the contractor and the City to work together to monitor the progress of the project and ensure not only that the proper devices have been installed, but that these devices are maintained throughout the project and replaced when necessary. In all projects, erosion control should be treated as a dynamic element of the construction process; in projects that implement LID this is even more so. It is important for the entire team to identify changing needs of a project and add to or modify the original plan as the project progresses. The second important element of construction is to ensure that the scheduling of operations is respected and thought is used in the clearing and disturbance of the property. Proper scheduling can not only reduce sediment erosion, but reduce compaction of areas intended to provide infiltration. It is important to take an approach of selective clearing and temporary stabilization rather than mass clearing that remains un-stabilized until the project has been finalized.

The final element of implementation relates to the operation and maintenance of the site upon final acceptance of the system. The long term success of a site implementing LID requires a plan for inspection and maintenance of the system by a responsible maintenance entity. A maintenance plan should be prepared in the design stage of the project that provides a schedule for inspection of the IMPs included in the system as well as those items required to be performed in a preventative maintenance program. A maintenance agreement establishing the responsible entity for the maintenance system should be recorded at the time of project approval. Standard forms for the maintenance agreement and typical maintenance responsibilities are provided in Appendix ‘B’ of this manual.

The three steps discussed above are summarized in Figure 2.3a below.



Section 2.4: Alternative Stormwater Facility Sizing Calculations

As touched upon in previous sections, the goal of implementing LID IMPs into a site design is the development of a site such that the post development condition mimics the pre-development hydrology for the site. Section Three of this manual summarizes many of the IMP options best suited for use on projects located in the City of Ormond Beach while Section Four provides guidance into the preparation of a LID Plan for a site. In order to evaluate the effectiveness of the LID planned for a site, the project engineer should submit calculations for

Project Name:	LID Office Park				
Designer	O.B. Liddesign				
Date:	9/11/2012				
Draiange Basin	North	South	East	West	
	Enter Basin Info	Enter Basin Info	Enter Basin Info	Enter Basin Info	Enter Basin Info
Basin Area	0.5	0.65	0.45	1.2	
			Pre-Development		
Time of Concentration (Tc)	40	30	35	45	
Runoff (cfs)	3.5	2.5	1.5	5.2	
			Post Development		
Time of Concentration (Tc)	35	30	40	35	
Runoff (cfs)	4.5	4	2.8	7	
			Integrated Management Practices (IMPs)		
	Select IMPs implemented in each respective draiange basin, worksheet will calculate runoff reduction per IMP.				
Bioretention	1.5	1.2	1.1	1.1	
Rain gardens					
Rainwater Harvesting					
Cisterns					
Downspout Disconnection		0.5	0.3	0.3	
Filter Strips					
Grassed Swales / Channels			1		
Green Roofs					
Infiltration Trenches					
Level Spreaders					
Pervious Pavement					
Reforestation / Revegetation					
Total Runoff Reduction (cfs)	1.5	1.7	2.4	2.9	
Net Runoff	3	2.3	0.4	4.1	
Stormwater Requirements Satisfied	YES	YES	YES	YES	

Note: On all sheets, cells shaded green are to be provided by project designer; cells shaded blue are calculated by this worksheet.

City of Ormond Beach
Site Stormwater Calculator

Site Summary
Page 1

the discharge from the site showing that requirement for net decrease in runoff from the site has been met. In order to assist the project engineer a spreadsheet has been developed and is available for use by the project engineer. This spreadsheet provides for an alternative means of calculation for those site that employ LID in addressing their stormwater concerns; in instances where the project has been designed with LID and the designers seek credit for runoff reduction from their use, the summary sheet from this spreadsheet should be submitted for review with the project design. This single page provides a simplification of the calculations and shows on quick review that requirements have been met.

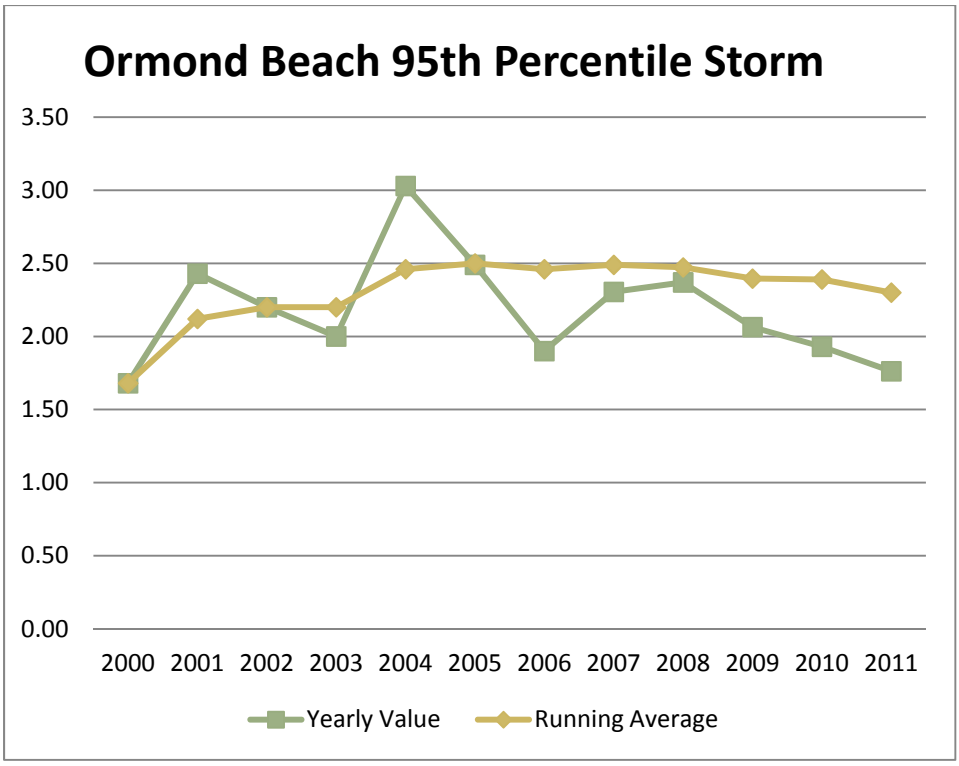
A copy of the site summary page for an example project is provided at right. This spreadsheet shows at a glance the pre-development and post development runoff from the respective basins on a site as well as the runoff reduction credit provided when individual or multiple IMPs are employed on a site. Based on the rational method for runoff, this spreadsheet calculates the time of concentration and runoff for the onsite sub-basins. One difference that sets this method of calculations apart from those customarily used is that this calculator basis the runoff site and makes its comparison based upon the 95th Percentile rainfall amount for Ormond Beach. Discussion regarding the 95th Percentile rainfall event is covered in Section 2.5 of this manual.

Section 2.5: Establishment of 95th Percentile Rainfall Event

Common practice, specifically within the State of Florida and permitting through its Water Management Districts, has been to design stormwater facilities to control the runoff from significant rainfall events; notably the 25 year – 24 hour rainfall event and the 100 year rainfall event. Theoretically designing for flood control, designing to reduce runoff generated for storms that have the potential of occurring with a four percent (25 Year) storm or one percent (100 year storm) of occurring in any given year. For Ormond Beach, the 25 Year and 100 Year storms are 9 inches in twenty four hours and 11 inches in twenty four hours respectively. There is a movement, closely tied to the use of LID measures in addressing stormwater concerns, which drives stormwater management systems to be designed in order to address those storms likely to occur with regularity for an area. This alternative means of calculating stormwater discharge uses the 95th Percentile storm event as the benchmark upon which to calculate sizing needs. In 2007, Congress passed the Energy Independence and Security Act of 2007(EISA) Section 438 of this legislation established strict regulations for the development and redevelopment of federal projects. This act requires that projects exceeding 5,000 square feet in foot print size maintain or restore the predevelopment rate, flow, and volume of the pre-development hydrology to the maximum extent possible. Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance” signed by the President on October 5, 2009, set this in motion. Among other options provided for with regards to stormwater runoff, this legislation provides site designers to design, construct, and maintain runoff from all events less than or equal to the 95th Percentile Storm. In this context the 95th Percentile Storm represents the rainfall quantity in a specific event (24 hour period) that ninety five percent of the storms occurring are

less than or equal to, essentially all storms other than those outlying two to three rain events that occur each year.

Results of daily rainfall have been obtained from the City of Ormond Beach Utility Department and the 95th Percentile Storm for each year has been calculated. The Table 2.3a shows the results of calculating the 95th Percentile storm from this rainfall data taken at the City of Ormond Beach Wastewater Facility from the year 2000 to present. When calculating a site specific value of this nature it is preferable to base it on as much data as preferable, and in the case of the 95th percentile storm value; sources have indicated that thirty years worth of data should be analyzed, however although it is preferable as shown in this table and the corresponding chart, enough data has been analyzed that the value for this number shows a convergence. It is recommended and planned to re-evaluate this value on an annual basis, making adjustments as may be dictated, **however for purposes of calculating runoff and sizing required IMPs, the value for the 95th Percentile storm should be taken as 2.30 inches.**



Year	95th Percentile Storm (in.)	Running Avg. (in.)
2000	1.68	1.68
2001	2.43	2.12
2002	2.20	2.20
2003	2.00	2.20
2004	3.03	2.46
2005	2.49	2.50
2006	1.90	2.46
2007	2.31	2.49
2008	2.37	2.47
2009	2.06	2.40
2010	1.93	2.39
2011	1.76	2.30

Form the years 2000 through 2011, an average of 87 rainfall events have occurred, calculating runoff and designing the LID stormwater system to meet this (95th percentile value) means that runoff will not occur from sites for 83 (of the 87) events per year.

Section 3
Integrated Management Practices (IMP)

3.0 Introduction to Integrated Management Practices

As discussed in Section 2, key to the successful implementation of LID into a site design is the proper selection of the Integrated Management Practices (IMP). Rather than referring to treatment methods as Best Management Practices (BMPs) which is used more prevalently in conventional development, the treatment techniques used in Low Impact Development are typically referred to as Integrated Management Practices. This term is used in that the techniques are truly integrated throughout the project serving the purpose of storm water management and adding a landscape amenity to the LID design. When developing a LID plan, IMPs are the "tools" the project designer has available that when selected and implemented properly work together to manage storm water runoff from a site.

In their manual, *Low-Impact Development Design Strategies, an Integrated Design Approach,* Prince George County, Maryland outline six steps for IMP selection and design. These six steps are as follows

Step 1: Define hydrologic control required.

This step establishes the sizing requirements for the stormwater management system based upon applicable design parameters specifically these include volume, flow rate, frequency and duration, water quality parameters. These quantifiable values set the size and degree of control based upon the overall project size and scope.

Step 2: Evaluate site constraints.

Hand in hand with Step 1, this step establishes the foundation for the selection and sizing of IMP methods utilized in the LID plan for a site. Physical characteristics that should be considered include property size, shape, slope, soils type(s), water table depth, location of buildings and other impervious surfaces, wetlands and other water features. Although in many regards, these factors can provide challenges to the project designer / engineer to efficiently meet requirements, the basic principles of LID encourage one to mimic predevelopment conditions and integrate controls within the natural environment. It is in this regard that the opportunities of a site are fully defined.

Step 3: Screen for candidate practices.

In this step the project designer takes the knowledge of the site gained in the previous steps, and selects those IMPs that can best be integrated in the site to fully meet the requirements of the proposed development. It should again be stressed that no two sites are identical and that plans utilizing LID cannot simply be taken off the shelf and applied to the project at hand. An understanding of the hydrologic controls and site constraints can allow the designer to select the controls that

Step 4: Evaluate candidate IMPs in various configurations.

Once potential IMPs have been selected the site engineer will work to integrate the controls in the available locations evaluating which arrangement yields meets the control requirements on the site with the highest efficiency and in a manner contributing to the site's aesthetics while considering budgetary constraints.

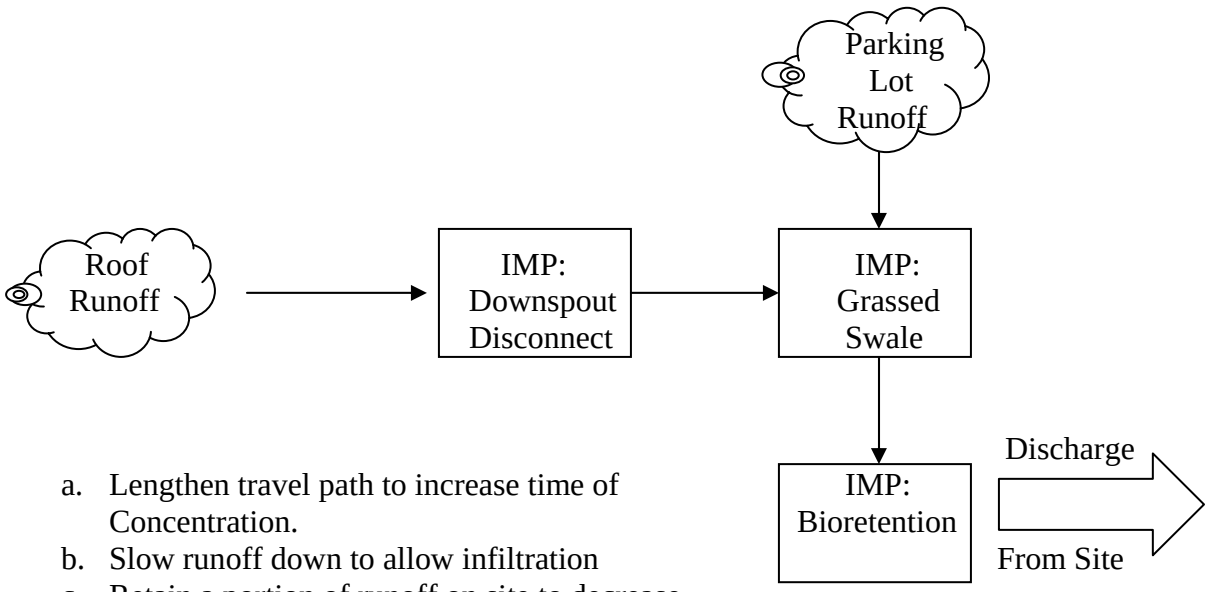
Step 5: Select preferred configuration and design.

The final step in the iterative process, it is here where the final details of the plan are worked out and the ultimate size and configuration of the IMPs are specified.

Step 6: Supplement with conventional controls, if necessary.

Although the project team may begin the process with full intention of designing the site using solely IMPs, there may be times when conventional stormwater treatment methods may be included either due to necessity, or because these techniques are most applicable to the site conditions previously identified. These "bottom of the hill" controls will usually select and sized along with the IMP methods in order to meet the regulatory requirements that must be met by the site.

As discussed above, implementing LID usually requires the arrangement of multiple components that may be IMPs or conventional stormwater techniques to accomplish the management goals of the site. This linking of techniques is commonly referred to as a treatment train. The treatment train effectively is a series of complementary stormwater practices or techniques that when linked together create a system that mimics the pre-development hydrology of the site. IMPs often do not replace the need for typical "bottom of the hill" stormwater management practices and devices such as the traditional wet detention or dry retention facility. What can be gained from the integration of LID techniques however is the creation of a system that is more efficient to the site, adds to the aesthetic of the site, and reduces the burden of downstream properties and waterways? The following schematic drawing shows a typical treatment train for a small office project.



a. Lengthen travel path to increase time of Concentration.
b. Slow runoff down to allow infiltration
c. Retain a portion of runoff on site to decrease volume of runoff.

Figure 3.0.1: Typical Treatment Train Example

The above treatment train example shows the use of three IMPs applied in series to create a treatment system. This system is designed with two objectives in mind, ensuring that runoff meets water quality requirements before its discharge from the project, and more specifically to

LID, aiming to more accurately mimic the pre-development behavior of the site from the perspective of discharge rate and timing.

This remainder of this section is devoted to the introduction of various LID practices that can be incorporated into a plan. For the professional experienced in the use of LID, these IMPs become a virtual "Toolbox" that is virtually unlimited in the use of That being said, it is by no means an all encompassing list; this section, more than any other portion of this guide is intended to be a dynamic document that can be added to as new technologies are introduced and tested. The IMPs provided are those that are best suited for and are most widely applied for use within Ormond Beach. The City always encourages the design community and individual project developers to propose new and innovative practices that can be used with specific plans and throughout the community.

Projects providing creative solutions to the issue of stormwater management are ones that can not only benefit specific properties developed, but could also potentially add to the toolbox of resources available within the City of Ormond Beach.

A number of Integrated Management Practices are well suited for use within the City of Ormond Beach. This section will touch on selected practices that can be integrated into LID plans for sites within the City. These select practices discussed in the remainder of this section are:

3.1: Bioretention
3.2: Rain gardens
3.3: Rainwater Harvesting / Cisterns
3.4: Downspout Disconnection
3.5: Vegetated Filter Strips
3.6: Grassed Swales / Channels
3.7: Infiltration Trenches
3.8: Level Spreaders
3.9: Permeable Pavers / Pervious Pavement
3.10: Soil Reforestation / Revegetation

As previously stated with regards to this manual, the above list, and the practices described in the following is by no means a final definitive list of integrated management practices for use within the City of Ormond Beach. Successful implementation of LID requires creativity from all members of the development team, which includes both sides of the table both the developer's and reviewer's. The developer is encouraged to search for tools which although they may be unique, can provide benefits to the specific project and City as a whole. It is anticipated that future revisions of this manual will list additional IMPs, proposed by developers and engineers that can add to the resources of the Ormond Beach Development Community.

3.1 Bioretention

Bioretention is the use of shallow depressional areas that employ conditioned soil and carefully selected variety of plant materials that include trees, shrubs, and other herbaceous vegetation. They are designed to specifically detain stormwater runoff in the engineered soil mix, allowing for t evaporation, transpiration prior to infiltration into the surrounding soils or conveyance through an underdrain system downstream to other treatment techniques and eventual discharge from the site. Bioretention is arguably the most widely studied and promoted IMP, first being widely developed for use by Prince George County, Maryland in the 1990's; this technique may be applied to either commercial development or in a residential situations. Bioretention benefits a site by allowing for a continuation of the pre-development hydrology on a site, and can provide measurable reductions in post-construction runoff rates, volumes, and pollutant loads all while serving as an attractive landscape amenity to a site.

Bioretention for Commercial Applications

Bioretention is well suited to a variety of commercial applications; tree wells and shrub pits can be incorporated in tight locations or into sidewalk plans, linear bioretention area features can be incorporated into roadways wither in the median or outside the shoulders, and islands designed into a parking lot can be designed as bioretention either as a stand-alone treatment practice or as an element in the treatment train serving a site. When incorporating bioretention into a site, as with any LID IMP, a change of design approach is required on the part of the project design professional to incorporate the IMP into the site. In the case of parking lot bioretention areas, traditional elements such as curbs, inlets and culverts are replaced by depressed islands, flush grades, and level spreaders. This section will touch on the elements needed to evaluate the applicability of incorporating bioretention into a site as well as the planning, selection, and sizing of the key elements required with bioretention.

When utilized in residential development, smaller depressional areas where the catchment areas is a single lot, or parts of multiple lots the bioretention cell is often referred to as rain garden. In commercial applications, the bioretention basins or cells are typically integrated into the treatment train for the overall system in a manner that allow for the site to be divided into drainage basins that drain into basins that are sized and spaced to provide the required treatment and storage while contributing to the aesthetics of the site. This section will deal primarily with the use of Bioretention in non-residential applications; Section 3.2 will address rain gardens, the application of bioretention in residential development. Because the relationship is so close between these two sections, certain elements detailed in this section will apply to rain gardens, and certain elements related to bioretention in general will be covered in Section 3.2.

Planning and Design

Bioretention is a very adaptive treatment method that can be used to manage stormwater runoff on a wide variety of sites in a number of environments including residential, commercial, and institutional developments and can be found in urban, suburban, and rural areas. Best suited for small impervious or disturbed pervious areas some of the criteria that should be kept in mind when selecting a site and planning the design of a biorention area. These planning criteria are summarized below.

- Contributing Basin — With optimal native soils and in an ideal situation, contiguous bioretention areas can be designed that handle the runoff from basins that can be as large as five acres in size. Ideally however, basins contributing to runoff to a bioretention area should be greater than 2,500 square feet and less than two acres in area. Larger basins should be managed by multiple bioretention facilities.
- Facility Size — As a rule of thumb, for planning purposes, bioretention areas can generally be expected to be five to ten percent of the size of the contributing basin.
- Soils — Bioretention areas can generally be designed without underdrains when native soils have infiltration rates of 0.5 inches per hour or greater, when infiltration rates do not exceed 0.5 inches per hour underdrains should be incorporated into the design.
- High Water Table — Sufficient depth should be planned for the planting / volume storage bed, with this in mind, a minimum depth of four feet is recommended from the bottom of the bioretention area to the seasonal high groundwater level or restrictive soils. This depth can be reduced to two feet however additional elements may need to be incorporated into design to avoid reduction in the performance of this IMP.
- Distance to Features — To prevent damage to building foundations and contamination of groundwater, a water proof liner should be incorporated into design unless the following dimensions can be maintained: 10 feet to building foundations, 10 feet to property lines, 100 feet to private water supply wells, 100 to septic systems, 100 feet to surface waters.
- Recovery Time — The system should recover the volume of the critical storm within a period of time not exceeding 72 hours.
- Critical / Design Storm — As with the design of other Integrated Management Practices, bioretention facilities should be designed to with respect to the 95th percentile storm as discussed and detailed in Section 2.5 of the Low Impact Design Manual for the City of Ormond Beach.

Components of Bioretention

A bioretention area can be broken into a number of component elements, these elements are noted in Figure 3.1a which shows, schematically a sectional view typical of a bioretention facility. These components are further described as follows.

Bioretention Component 'A' - Pre-Treatment Area

An optional component to bioretention it is recommended to incorporate this into design, especially in areas where a significant volume of suspended material or debris is anticipated such as parking lots and other commercial areas. Pre-Treatment may occur through use of vegetated buffer strips, stabilized inlets, sediment traps, or a simple grass buffer strip. Elements should be incorporated that limit inlet velocities and reduce the tendency of erosion.

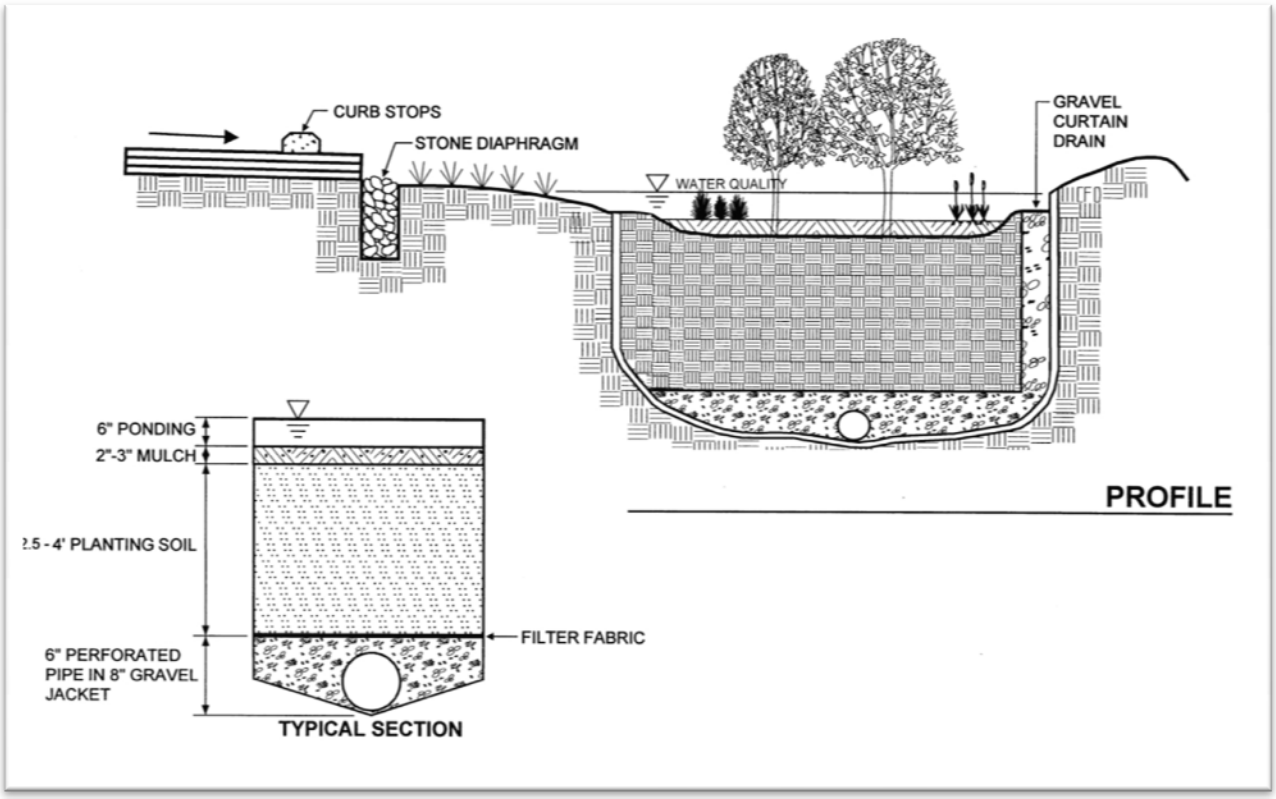


Figure 3.1a: Bioretention Area Sectional View

Bioretention Component 'B' – Ponding Area

This area provides temporary surface storage of runoff allowing sediment to settle and the physical operations of evaporation, transpiration, and infiltration involved to occur. Depths should be limited to between six and twelve inches, to ensure a proper functioning of the IMP, and to maintain safety and aesthetics of design. Ponded water should recover in less than 72 hours.

Bioretention Component 'C' – Organic Mulch Layer

As a top layer, bioretention areas should provide a layer of organic mulch on the bottom of the practice. This layer should be approximately two - three inches deep and cover

the surface of the basin bottom to the expected high water line; avoid allowing the mulch depth to exceed four inches as the soil aeration may experience a reduction. The mulch selected preferably should consist of either shredded hardwood mulch, or when possible, compost or leaf mulch. Avoid using pine bark mulch or pine straw as these materials do not readily compost. This component provides a first layer of filtration for runoff pollutants, and also serves the bioretention area by stabilizing the underlying soil reducing erosion and maintaining soil moisture. The mulch also serves a cultivator for biological activities, allows for the decomposition of organic material and promotes the adsorption of heavy metals.

Bioretention Component 'D' – Plant Material

Proper plant material selection for use in a bioretention area is an important element in the design process when creating an LID plan for a site and detailing the bioretention area employed. The design professional should select and specify native plant species that can be installed in the practice that can tolerate periods of drought and inundation.
Plant material is the key element in the transpiration process and allows for the absorption of stormwater directed to the bioretention area. The root system of the plant material also plays multiple roles within the process occurring in the bioretention area. The development of a healthy root system creates pathways for infiltration of runoff, while an established root system reinforces long term performance of the subsurface infiltration. Finally the root system can serve as a host for bacteria communities further establishing healthy soil and promoting the water quality benefits desired by the practice.

Depending on the individual plan and location for a bioretention facility, the proper selection of plant material can also play a key role in not only the future aesthetics of the site, but can also aid in the establishment serve of habitats for animal and insect communities. Section 3.2: Rain Gardens provides a list of recommended plant material for use in bioretention facilities proposed in Ormond Beach. Timing of the planting of materials may vary depending on the plant selection but as a guide, trees and shrubs should be planted from mid-April to early June or mid-September to mid-November. Planting dates may vary based upon rainfall / drought conditions with extended periods permitted during period where a regular water source is available, and a shortening of the planting period in years of drought.

Bioretention Component 'E' – Planting Soil / Volume Storage Bed.

Below the Organic Mulch Layer lies the Planting Soil which serves the bioretention area by providing water and nutrients to the plant material included as Component 'D'. This layer enhances biological activity, enhances root growth, adsorbs nutrients, and importantly provides for storage of stormwater within the voids of the soil particles included in this layer. The clay content of the soil in this layer should be very low, and consist of a well mixed blend of topsoil, compost, and sand.

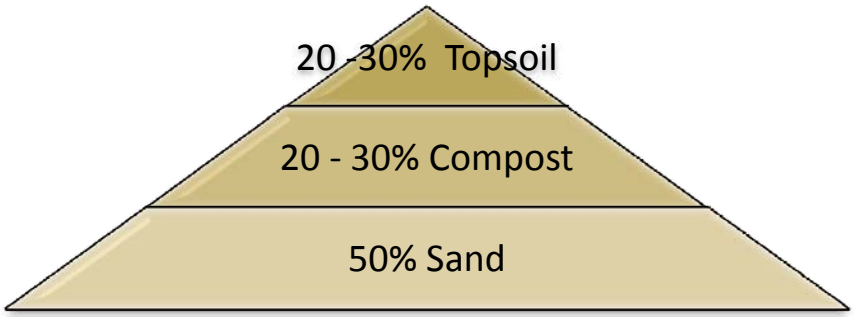


Figure 3.1b: Soil Mix Profile for Bioretention and Rain Gardens

It is recommended, in order to take maximum advantage of the storage capabilities of this layer that the bottom of this layer should be fully above the water with a minimum overall depth of two to three feet. In some cases in may be advantageous to include a subsurface storage/infiltration bed; when used ensure that it consists of a base of clean gravel six inches thick with significant void space. The entire infiltration bed should be enveloped in engineered filter fabric (geotextile).

Bioretention Component 'F' – Recovery and Discharge

A final component that is an important contributor to the success of the bioretention system is the condition of recovery. The recovery of the system is greatly dependent on the in-situ or native soils; for optimal performance, the soil should exhibit an infiltration rate of greater than or equal to 0.5 inches per hour. In cases where infiltration is less than 0.5 inches per hour, incorporation of an underdrain is required with the plan to ensure that the system meets the requirement of recovery within seventy two hours. Typically the designer should design the underdrain system of small diameter (six to twelve inch) perforated pipes in a clean gravel trench wrapped in geotextile. Where underdrains are included, they should be connected in series to additional IMP methods to complete the treatment train. As with any stormwater pipe element, a method of cleaning and inspecting the pipes should be included in the design.

In each of these components, accommodations for the larger storm events should be considered. In addition to percolation, accommodation should be made in the bioretention system to allow for positive overflow. This allows for runoff to bypass the bioretention area under large storm event conditions or when the surface or subsurface storage capacity is exceeded. This overflow can be an achieved by means of inlets, weirs, and risers or other types of diversion structures connected to an underdrain system.

Sizing and Placement

The initial sizing of a bioretention area begins with the infiltration testing of the native soils at the proposed location of the bioretention facility. The results of the infiltration testing will enable the design professional to determine if bioretention is possible on the site and, based upon infiltration rates and restrictive layers, the necessity of underdrains. Once this evaluation has been complete, the sizing of the bioretention area becomes a two step process Initial Sizing and Verification of that volume reductions are being met. The initial sizing of a bioretention facility

and its dimensions should be calculated using Darcy's Law to provide sufficient storage to reduce runoff from the 95th Percentile Storm; see Section 2.5 for establishment of 95th Percentile Storm for Ormond Beach. This equation varies depending on the inclusion of underdrains in the system and is as follows:

Bioretention with Underdrains:

$$\boldsymbol{A_{bio}} = (\boldsymbol{RR_v})(\boldsymbol{d_{bio}}) \div [(\boldsymbol{k_{bio}})(\boldsymbol{h_{bio}} + \boldsymbol{d_{bio}})(\boldsymbol{t_{drain}})] \qquad \text{Equation 3.1a}$$

Where:

$\boldsymbol{A_{bio}}$ = surface area of bioretention area (ft^2)

$\boldsymbol{RR_v}$ = stormwater runoff volume generated by target runoff reduction rainfall event (ft^3) – 95th percentile rainfall event

$\boldsymbol{d_{bio}}$= depth of the bioretention area planting bed (ft); for initial calculations use 36 inches (or more), unless a shallow water table is found on the development site.

$\boldsymbol{k_{bio}}$ = coefficient of permeability of bioretention area planting bed (ft/day); use 0.5 ft/day for the engineered soil mix specified above

$\boldsymbol{h_{bio}}$ = average height of ponded water above bioretention area (ft); use 50% of maximum ponding depth

$\boldsymbol{t_{drain}}$=design bioretention time (days); although the requirement calls for the recovery of the system in 72 hours or less, it is recommended that for preliminary sizing design a shorter period of time is utilized in order to incorporate a safety factor.

Where infiltration rates do not require the inclusion of underdrains in the design of the bioretention system, the following modification of Darcy's Law can be used to calculations the dimensions of the bioretention system.

$$\boldsymbol{A_{bio}} = (\boldsymbol{RR_v})(\boldsymbol{d_{bio}}) \div [(\boldsymbol{i_{soil}})(\boldsymbol{h_{bio}} + \boldsymbol{d_{bio}})(\boldsymbol{t_{drain}})] \qquad \text{Equation 3.1b}$$

In this equation all values are the same as in equation 3.1a other than the replacement of $\boldsymbol{k_{bio}}$ with $\boldsymbol{i_{soil}}$; in this equation,

$\boldsymbol{i_{soil}}$ = infiltration rate of underlying native soils (ft/day) or coefficient of permeability of bioretention area planting bed (ft/day), or use $\boldsymbol{k_{bio}}$ = 0.5 ft/day for the engineered soil mix specified above, whichever is less.

For non-underdrained systems, the runoff volume can be considered removed , for systems including underdrains, the bioretention cell should be considered a detention device that allows the calculated volume to discharge to surface water over time $\boldsymbol{t_{drain}}$.

Verification that the volume reduction occurs can be calculated by looking at the three volume components: surface storage volume, soil storage volume, and infiltration bed volume. The calculations for this volume are given by the following series of equations:

$$V_{bio} = V_{surface} + V_{soil} + V_{sub}$$ Equation 3.1c

Where;

V_{bio} = Total Bioretention Volume (ft^3)

$V_{surface}$ = Surface Storage Volume (ft^3)
= Average Bed Area (ft^2) x Maximum Design Depth (ft)

V_{soil} = Soil Storage Volume (ft^3)
= Infiltration Area (ft^3) x Depth of Amended Soil (ft) x Void Ratio of Amended Soil

V_{sub} = Subsurface storage/Infiltration bed Volume (ft^3)
= Infiltration Area (ft^3) x Depth of underdrain material (ft) x Void Ratio of storage material

High Water Table Option

When confronted with a site with a high water table, an option proposed in Sarasota County's LID Manual is a possibility. This option allows for implementing bioretention in areas where a high seasonal high water level is present and sufficient separation is not attainable. This option shown in Figure 3.1c separates the planting soil layer into two layers, a planting soil filter bed and a nutrient adsorption layer.

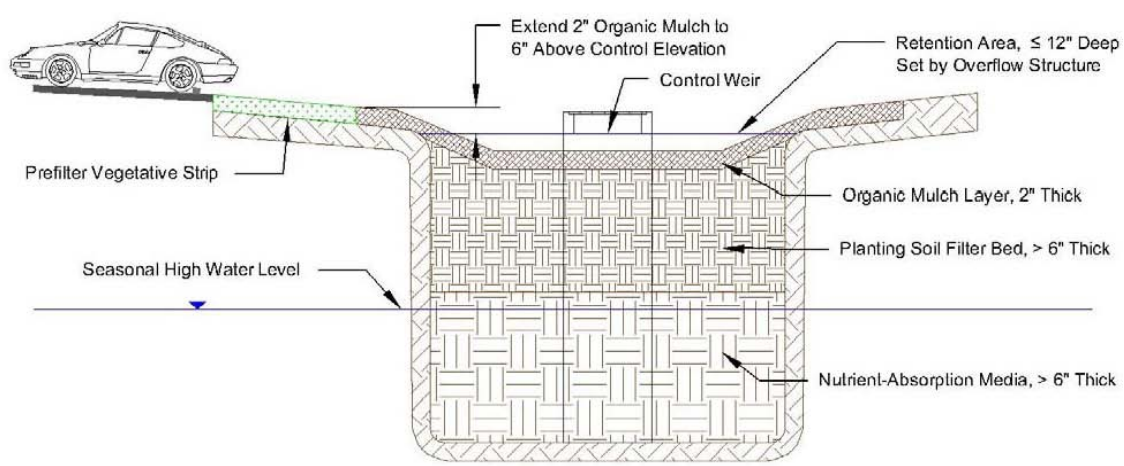


Figure 3.1c: Shallow Bioretention Area

In this scheme for a shallow bioretention area, the planting soil bed a minimum of six inches below the season high water level with the nutrient adsorption layer filled to just above the season high. The remainder of the excavated areas is then backfilled as the planting soil filter bed, this area should be a minimum of six inches thick. Properties of the soils found in each layer are given below.

Comparison of Soils Planting Soil Filter Bed / Nutrient Adsorption Media

Planting Soil Filter Bed

- Layer should be at least six inches thick,
- Bed material should be sandy loam, loamy sand, or loam texture,
- Clay content should be between 3% and 5%,
- Soil pH should be between 5.5 and 6.5,
- Organic matter content should be between 3% and 10% by volume,
  Carbon to nitrogen ratio of at least 50%.

Nutrient Adsorption Layer

- Layer should be at least six inches thick,,
- Unit weight should be greater than 80 pounds per cubic foot when dry,
- Greater than 15% but less than 30% of the particles passing the #200 sieve,
- The media water holding capacity should be at least 35% as measured by porosity,
- At the specified unit weight noted above the vertical permeability must be at least 0.03inches per hour but less than 0.25 inches per hour,
- The media must have an organic content of at least 5% by volume. This organic content should be in the form of hardwood chips evenly distributed throughout the layer,
- The media pH should be between 6.5 and 8.0,
- The concentration of the soluble salts should be less than 3.5 g (KCl)/L,
- The sorption capacity if the sand should exceed 0.005 mg OP/mg media,
- The residual moisture content should exceed 50% of the porosity.

Construction Guidelines

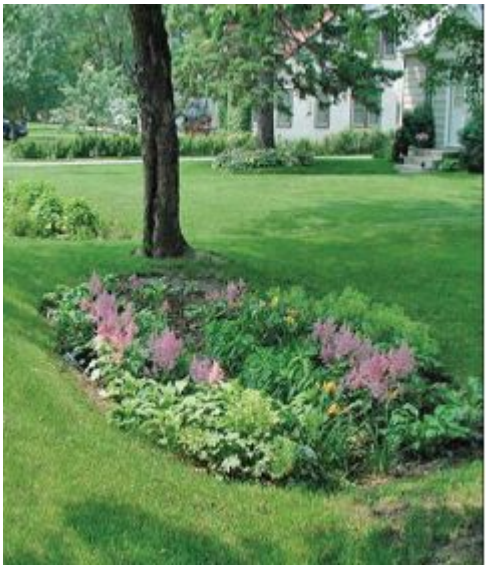
To ensure that a bioretention system functions as planned upon completion of site development, it is important to follow certain guidelines when constructing a bioretention cell and working around a bioretention cell on a site. The following steps are ones which should be followed in addition to the minimum construction guidelines and erosion control measures set forth by the standard notes and details of the City of Ormond Beach.

1. Complete site grading, minimizing impact and compaction at the location of the proposed bioretention cell(s). All inflow conveyance measures should be completed (curb cuts, flumes, etc.) as well as pre-treatment devices such as filter strips, swales, etc. Protection should be installed to prevent drainage and sediment to entering the area of the bioretention construction.
2. Prepare the Subgrade
    a. Avoid compaction or excessive construction traffic in the bioretention area footprint.
    b. Initial excavation of the bioretention cell can be performed during site rough grading but should not occur closer than one foot from the final bottom elevation. Final excavation should not occur until all areas in the drainage basin have been stabilized.

   c. Scarify underlying soils to a minimum depth of six inches in areas erosion of subgrade has caused accumulation of fine particles and areas of surface ponding in the bottom of the bioretention area.
   d. Finalize excavation to design line, and grade. Fill and lightly re-grade any erosion damaged areas. Level the bottom of all bioretention areas.
3. Stabilize grading of the basin except for the footprint area of the bioretention cell.
4. Installation of Bioretention
   a. Excavate bioretention area to proposed invert depth and scarify existing soil surfaces. Do not compact soils.
   b. Notify the engineer of record to inspect the condition of the subgrade. prior to installation of bioretention upon completion of subgrade preparation.
   c. Install subsurface storage/infiltration bed as well as underdrain system if called for in design.
   d. Backfill bioretention area with amended soil as shown on plans and specification, it is recommended that the amended soil by overfilled to allow for settling, place amended soils in lifts not exceeding 18 inches in depth lightly compacting by means of light hand tamping. Do not over compact, keeping equipment movement over the soil to a minimum.
   e. Complete final grading to achieve proposed design elevations, allow tolerance for mulch layer and / or topsoil as specified on plans.
   f. Presoak the planting soil at least 24 hours prior to planting of vegetation.
   g. Plant trees and shrubs.
   h. Install two-three inches of shredded hardwood mulch or compost evenly as shown on the plans.
   i. Install sediment control devices to protect bioretention area during remainder of construction period and while vegetation is being established.
   j. Upon full establishment of vegetation, notify project designer for to inspect bioretention area. Upon satisfactory review, remove sediment control devices.
5. Mulch and install additional erosion controls as necessary.

As with all IMPs, proper functioning is reliant upon the treatment facility being properly constructed and properly maintained. Additional details for construction and maintenance and inspection forms are provided as an appendix to this manual.

3.2 Rain Gardens



As discussed in Section 3.1, bioretention can be an effective way of implementing LID principles into a development. When applied to residential conditions, the IMPs that provide bioretention for a site are referred to as rain gardens. Rain gardens can prove to be an attractive alternative to traditional stormwater in residential developed properties. As with bioretention used in commercial applications, the use of bioretention in the form of a rain garden in a residential application can provide the treatment required for a site by trapping and removing suspended solids and absorbing pollutants into the plants and soil included in the rain garden; at the same time, volume reduction is achieved through the storage provided and percolation of water into the soil. Rain gardens also provide the additional benefit to the homeowner of water conservation in that rain gardens typically do not require irrigation once established. Care should be taken in sizing the rain garden, placement of the rain garden on the site, and selection of plants for use within the rain garden.

The most critical decision in employing a rain garden for use on a residential property is location and placement on the lot. Rain gardens should be located such that 100% of the runoff from the property, both impervious and pervious areas of the rain garden. Rain gardens can be placed in close proximity to the house, or at a more considerable distance from the house. Some important factors that should be considered when specifying rain garden locations on a lot include:

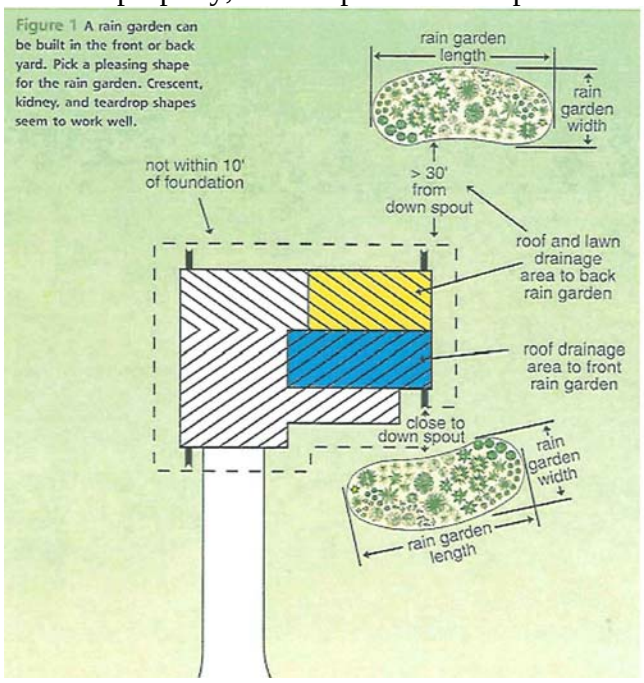


Figure 3.2a: General Location Considerations of Rain Gardens

- Ensure that the rain garden is properly sized
- Do not place rain gardens closer than ten feet to the building.
- Locate rain gardens in natural low spots, if possible.
- Place rain gardens in locations that allow for drainage to easily travel to rain garden as well as allowing for overflow of runoff downstream during periods of extreme rainfall.
- Avoid creating trip hazards and impeding the functional use of the property

Once the location for the rain garden has been identified, the design of the rain garden should be considered. When designing a rain garden, one should consider size, shape, soil, and plant selection. When sizing a rain garden, the critical dimension to ensure ongoing functionality is the depth of the rain garden. Although the depth can vary from system to system (including those on the same site), rain gardens should ideally remain 6" – 8" in depth and under no circumstance should they exceed 12" in depth in order to ensure that water does not pond for periods of time greater than 24 hours in order to reduce the incidence of mosquito breeding and reduce safety hazards. Rain gardens should be sized such that they are capable of storing 1" of runoff from the basin area; the surface area of the rain garden this translates to a basin that is approximately 10% of the basin area. While not affecting the functionality of the rain garden, shape of the garden basin is another important factor. Largely a matter of preference, rain gardens can be laid out with straight banks and geometric angles, however freeform, "natural" shapes are generally preferred and provide an aesthetic to the rain garden that works well with the plant selection.

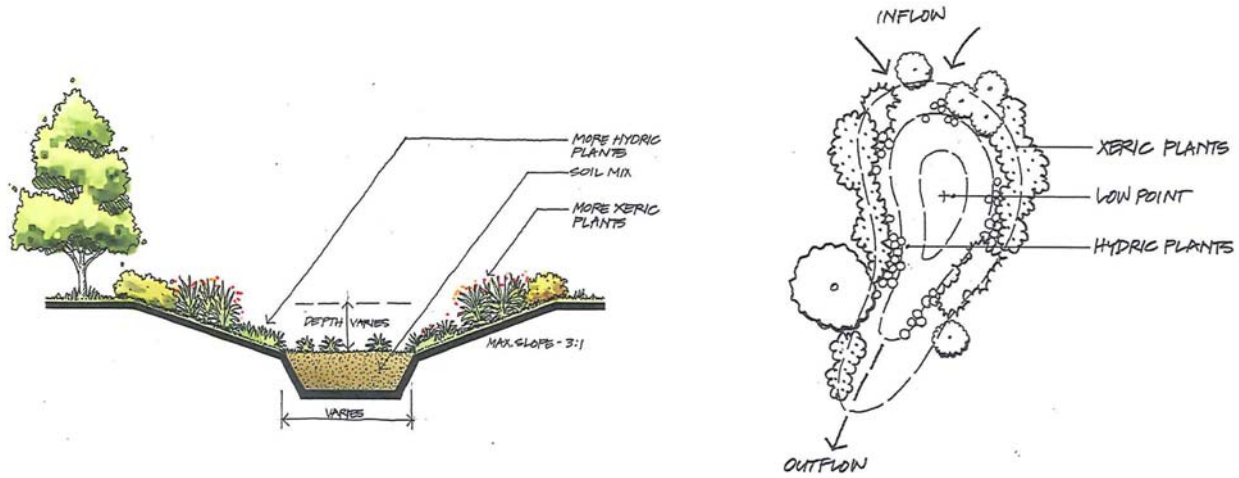


Figure 3.2b: Common Rain Garden Details

Proper soils are an important factor in the successful functioning of rain gardens as well as all implementations of bioretention. The bottom of the rain garden should be over excavated and the soil replaced with a thoroughly blended mix of sand (50%), topsoil (20%-30%) and compost (20%-30%) as previously shown in section 3.1 Bioretention.

Lastly, plant selection is critical to the functioning and aesthetic of a successful rain garden. Native plants should be selected that meet the preferences of the homeowner with more Xeric species (drought resistant) being placed towards to outer limits of the rain garden, and more hydric (water resistant) plants place interior to the rain garden, nearer the basin low point. Selection should consider variety and compatibility, a compiled list of plants that have proven to work well in Florida rain gardens is provided in the lists that follow.

Rain Garden / Bioretention Plant Selection List

Wildflowers, Ferns, Grasses, and Sedges:

- *Asclepias incarnata,* Swamp Milkweed
- *Canna flaccida,* Golden canna
- *Pontederia cordata,* Pickerel Weed
- *Eupatorium coelestinum,* Blue mistflower
- *Helenium pinnatifidum,* Everglades daisy
- *Lobelia glandulosa,* Glades lobelia
- *Sabatia* spp., Marsh pinks
- *Acrostichum danaefolium,* Leather fern
- *Osmunda regalis* var. *spectabilis,* Royal fern
- *Thelypteris palustris,* Marsh fern
- *Woodwardia virginica,* Virginia chain fern
- *Muhlenbergia capillaris,* Gulf muhly grass
- *Aster carolinianus,* Climbing aster
- *Asclepias tuberosa,* Butterfly weed
- *Iris virginica,* Blue flag iris
- *Coreopsis lanceolata,* Tickseed
- *Spartina bakeri,* Cordgrass
- *Muhlenbergia capillaries,* Muhly grass
- *Osmunda cinnamomea,* Cinnamon Fern
- *Chasmanthium latifolium,* River Oats
- *Osmunda regalis,* Royal Fern
- *Hibiscus coccineus,* Scarlet Hibiscus
- *Rudbeckia hirta,* Rudbeckia
- *Veronia gigantea,* Ironweed
- *Solidago sp.,* Goldenrod

Trees and Shrubs:

- *Acer rubrum* var. *trilobum,* Red maple
- *Annona glabra,* Pond apple
- *Betula nigra,* River birch
- *Cephalanthus occidentalis,* buttonbush
- *Chrysobalanus icaco,* Cocoplum
- *Gordonia lasianthus,* Loblolly bay
- *Hibiscus grandiflorus* Swamp Hibiscus
- *Ilex cassine,* Dahoon holly
- *Ilex glabra,* Galberry
- *Ilex vomitoria,* Yaupon Holly
- *Itea virginica,* Virginia Willow
- *Magnolia virginiana,* Sweetbay magnolia
- *Myrica cerifera,* Wax myrtle
- *Myrsine floridana,* Myrsine
- *Nyssa sylatica,* Black gum
- *Pinus palustris,* Longleaf pine
- *Sabal palmetto,* Cabbage palm
- *Sabal minor,* Dwarf palmetto
- *Salix caroliniana,* Coastal plain willow
- *Sambucus canadensis,* American elderberry
- *Serenoa repens,* Saw palmetto
- *Styrax americana,* snowbell
- *Taxodium ascendens,* Pond cypress
- *Taxodium distichum,* Bald cypress
- *Viburnum obovatum,* Walter's Viburnum

Section 3.3 Rainwater Harvesting / Cisterns

One IMP that is tied closely to water conservation is rainwater harvesting. Low in cost, and typically sized to store a pre-determined volume of runoff, rain barrels (small scale) and cisterns (large scale) captured the runoff from building downspouts and store it for release at a controlled rate. The release of water can either be used for irrigation of site landscaping, for infiltration into the soil or in some instances, cisterns that can store adequate volumes can be incorporated into "gray water " systems for homes or commercial buildings providing water for the flushing of toilets or other like applications.

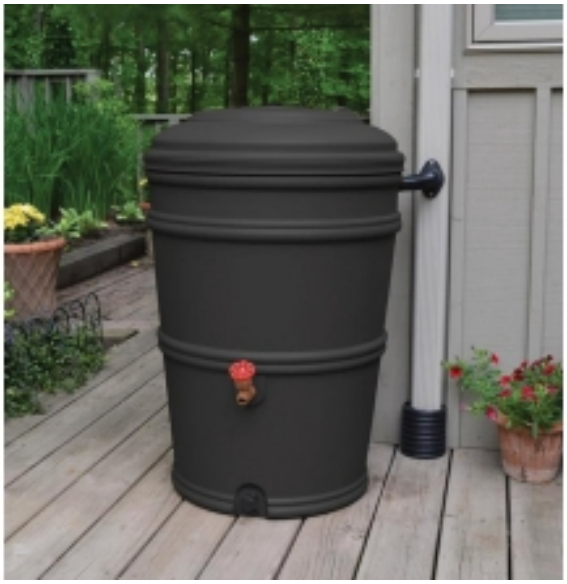


Figure 3.3a: Rain Barrel

Cisterns and rain barrels are found in a variety of sizes ranging from 40 gallon rain barrels to cisterns that can store volumes in excess of 1,000 gallons; these devices can be incorporated the aesthetics of a site through architectural measures, or by incorporation into the landscape plan for a site.

Certain design considerations should be accounted for when employing rainwater harvesting measures, these include:

- Sizing and selection of the rainwater harvesting devices based upon intended use and roof runoff area to be directed to the container.
- Prevention of mosquito breeding.
- Proper filtration to prevent clogging from leaves and other debris.
- Valves and controls to direct water as dictated by use.
- Direction of overflow in instances of storm events that exceed capacity of rain barrel or cistern.
- Accommodation of maintenance.

Figure 3.3b: Above Grade Cistern

Closely related to rainwater harvesting, Cisterns are essentially large scale rain barrels that area available in a variety of sizes and styles. Traditionally underground storage, many above ground options have become available in recent years that can be both utilitarian and function as an architectural element. These tanks collect runoff from connected downs pouts and provide retention volume storage; the stored water can then be reused for irrigation and/or other gray water uses. The size of cisterns is greatly affected by the size of the roof area directed to the

storage system, given the impervious nature of roof tops, large volume cisterns may be required to fully take advantage of the benefits that cisterns may provide. Typically, a good rule of thumb for cistern storage is provided in the following equation:

$$(A) \times (R) \times (600 \text{ gallons}) / 1000 = (G)$$

Where: A = (catchment area of building)
R = (inches of rain)
G = (total amount of collected rainwater

Simply stated, 1" of rainfall on a 1,000 square foot roof, would provide 600 gallons of rain water that will be available for use. In Ormond Beach, where annual rainfall totals exceed 50 inches per year, a moderate sized commercial building of 5,000 s.f. could yield 150,000 gallons of reuse water per year.

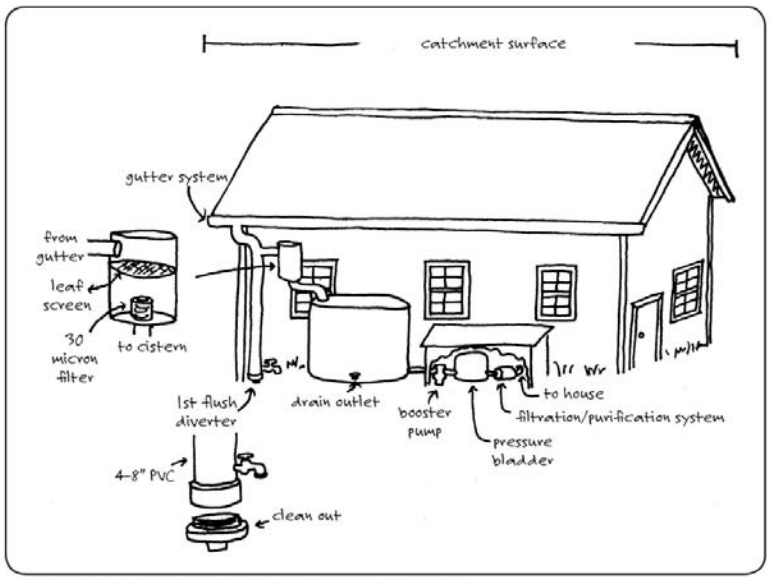


FIG. 8.2. Typical components of a whole-house rainwater harvesting system.

Figure 3.3c: Schematic View of Rainwater Harvesting System

Section 3.4 Downspout Disconnect

A fundamental element to most IMPs, disconnect of runoff from the source to the receiving body allows for the integration of other practices. Specific to this section, the disconnect of roof runoff can allow for the reduction of discahrge peak rate and volume by directing flow to other IMPs. By creating opportunities in the design of a site, typically providing landscaped areas or other pervious surfaces adjacent to buildings, this simple element can help spread flow encouraging infiltration and result in measurable reductions in stormwater runof rates, volumes, and pollutant loads.

Reduction in peak flows can also be achieved by directing runoff from other impervious areas to vegetated surfaces. Directing runoff from driveways and parking lots towards spillways that outfall to vegetated swales or bioretention basins rather than directing flow to catch basins connected to underground culverts. This technique can aid by breaking up flows, encouraging sheet flow through vegetated areas, and incrase infiltration and the time of oncentration of runoff prior to discharge to final treatment elements or from the site.

When integrating disconnection into an LID Plan for a site, certain considerations should be made:

- Limit the contributing impervious area to each downspout or impervious area discharge point, typically consider a pervious receiving area twice the area of the contributing source.
- Allow sufficient flow path across pervious element to encourage infiltration and take advantage of ability to increase concentration time.
- Provide for sufficient Width to Length Ratio to allow for spreading across element.
- Limit flow length of impervious surface discharging to prevent increased velocities and the possible chanelization of runoff and erosion.
- Keep Slopes of pervious surface minimal.
- Be aware of hydrologic soils groups for the location where the downspout is directed; runoff reduction is generally fairly predictable in Type ‘A’ and ‘B’ soils, however in Type ‘C’ and ‘D’ soils, alternmative runoff reduction techniques may need to be employed such as ammending soil, rainwater harvesting, aeration of soil.

An element that should find its way into any LID Plan to a lesser or greater degree, Disconnection can benefit a site in many reagrds, most notably its ability to drive the site towards a hydrology closer to pre-development condition.; benefit can also be measured in the cost savings that can result in lesser infrastructure costs, as well as increased pollutant removal efficiencies.

Design Factors

When considering, and including disconnection in an LID plan, certain design factors should be considered. Some factors that should be considered in the design of a site and the recommended limits of these parameters are provided in the table that follows:

Design Factor	Recommended Parameter Limits
Maximum Impervious (Rooftop) Area Treated per disconnect	1,000 square feet per disconnect
Longest Flowpath	75 Feet
Disconnection Length	Equal to the longest flow path (minimum recommende = 40 feet
Disconnection Slope	1% - 2%
Distance to Extend From Buildings or Foundations	Extend downspouts 5 feet away from building.

Included with the appendix to this manual is a recommended maintenance schedule and inspection form for sites utilizing downspout disconnection,

3.5 Vegetated Filter Strips

A vegetated filter strip, or filter strip, is a band of uniformly graded, densly vegetated ground planted between a pollution source and downstream water bodies, conveyance devices, or IMPs; the typical vegetation for this technique is turf grass. Turf grass must be grown in a sandy material to be used for this purpose. Filter Strips typically function by slowing runoff, trapping sediment and pollution and, in cases where soil is condusive, infiltration of runoff into the ground. Filter strips are typically used as one component in a treatment train and may be used either as a pre-treatment measure prior to flowing into a IMP, or can also be used as an final outet device. Filter Strips are dependent upon runoff exhibiting sheet flow while flowing across the strip, and require the vegetative element of the strip to be maintained in a healthy condition to ensure proper performance of the filter strip. The figure below shows schematically plan and section views illustrating the fundamental design of a Vegetative Filter Strip.

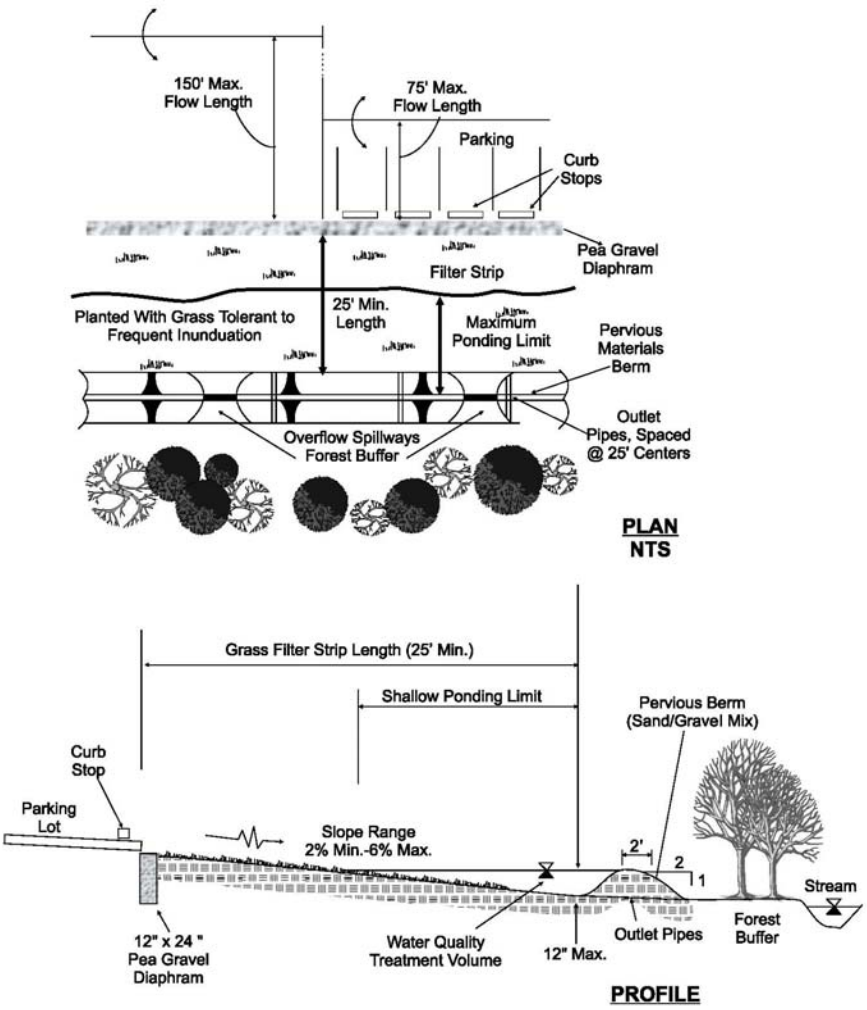


Figure 4-5. Typical filter strip (CRC, 1996).

When considering use of vegtative filter strips in a LID plan for a site, the following items should be considered in the planning and design.

- Allow storm runoff to enter vegetative filter strip as sheet flow rather than concentrated; level spreading devices are often effective to assist in maintaining uniform sheet flow characteristics at the adjacent edge of the filter strip.
- Contributing areas should have a flow length of less than or equal to 150' for pervious areas, 75' per impervious areas with a ratio of drainage area to filter strip not exceeding 6:1.
- Optional (permeable) berm at downstream end of filter strip can increase effectiveness over simple vegetative strip. Berm can provide for temporary storage and increase the residence time to that of a wider filter strip.
- Excessive compaction of vegetative filter strip should be avoided; in instances where filter strips are constructed in areas that have been excessively compacted, measured should be taken to be addressed the compromised soil infiltration rate such as tiling the soil and planting trees and shrubs.
- Plant material must be tolerant of inundation by surface water.
- Minimize lateral slope (Less than 1%), slope across the vegetative filter strip should be between 0.5% (minimum) and 3% (maximum).

When used properly vegetative filter strips can contribute to the creation of an attractively landscaped site that can be an important element in the treatment train in a planned LID scheme for a site. See appendix for maintenance direction and recommended maintenance schedule.

3.6 Grassed Swales / Channels

One traditional stormwater device that can easily integrated into an LID plan as an IMP is the use of grassed swales or channel. One of the most widely and longest used drainage device, the traditional drainage ditch can be integrated into a system providing an alternative to systems that use catch basins for collection and culverts to convey runoff to a treatment further downstream.

Grassed swales can be implemented in a variety of commercial, residential, and public use situations. In their simplest form, grassed swales provide little more treatment benefit to the system than simply that of pre-treatment; the greatest benefit provided to a site by the use of grassed swales however is the ability to reduce peak runoff rates and discharge volumes from a site through their ability to increase travel time (time of concentration) and allow for percolation of runoff into the bottom of the swale. Typically vegetated with densely spaced turf grass, the treatment ability, and ability to infiltrate runoff can be increased through the use of additional plant species and soil amendments where the swale then becomes more like a vegetated filter strip or a bioretention system. In addition to the ability of grassed swales to help restore and maintain the pre-development hydrology of a site, grassed swales add the benefit of requiring relatively low investment in the construction cost for this IMP as well as minimal long term maintenance costs for the developer / property owner.

Design Criteria

Grassed swales can typically be integrated into a system without involving complex design, there are however certain criteria that should be followed in order for the swale to operate effectively; these are provided below.

- Bottom channel width should be between 4 and 8 feet wide, with a shape that is generally trapezoidal or parabolic in nature.
- Channel side slopes should be a minimum of 4H : 1 V or flatter in order to allow for mowing and aid in maintenance, under no circumstance should slope exceed 3H : 1V;
- The contributing area to each swale (or segment) should be limited;
- Longitudinal slope of the channel should not exceed 4% and ideally should be between 1% and 2%;
- The dimensions of the channel should provide for a non-erosive velocity during the 2 year and 10 year storm events;
- The 10 year storm event should be contained while maintaining freeboard;
- Best suited for Hydrologic Soil Group A or B, however swales located on C and D soils can be improved through the use of soils amendments;
- A depth to water table of 2’ should be maintained;
- Grass channel should be generally aligned and parallel to the contributing drainage area;

In addition, the hydraulic capacity should be verified using Manning's Equation:

$$\boldsymbol{V} = \left[\left(\frac{\mathbf{1.49}}{\boldsymbol{n}}\right)\boldsymbol{D}^{2/3}\boldsymbol{s}^{1/2}\right]$$ Equation 3.6a: Manning's Equation

Where: *V* = flow velocity (ft./sec.)
n = roughness coefficient (0.2, or as appropriate)
D = flow depth (ft.) (NOTE: *D* approximates hydraulic radius for shallow flows)
s = channel slope (ft./ft.)

To solve for the design treatment flow, insert the velocity into the following equation

Q = V(WD) Equation 3.6b: Continuity Equation

Where: *Q* = design Treatment Volume flow (cfs)
V = design flow velocity (ft./sec.)
W = channel width (ft.)
D = flow depth (ft.)
(NOTE: channel width (*W*) x depth (*D*) approximates the cross sectional flow area for shallow flows.)

Combining Equations 3.1 and 3.2, and re-writing them provides a solution for the minimum width:

$$\boldsymbol{W} = {(\boldsymbol{nQ})}\Big/{\mathbf{1.49}\boldsymbol{D}^{5/3}\boldsymbol{s}^{1/2}}$$ Equation 3.6c: Minimum Width

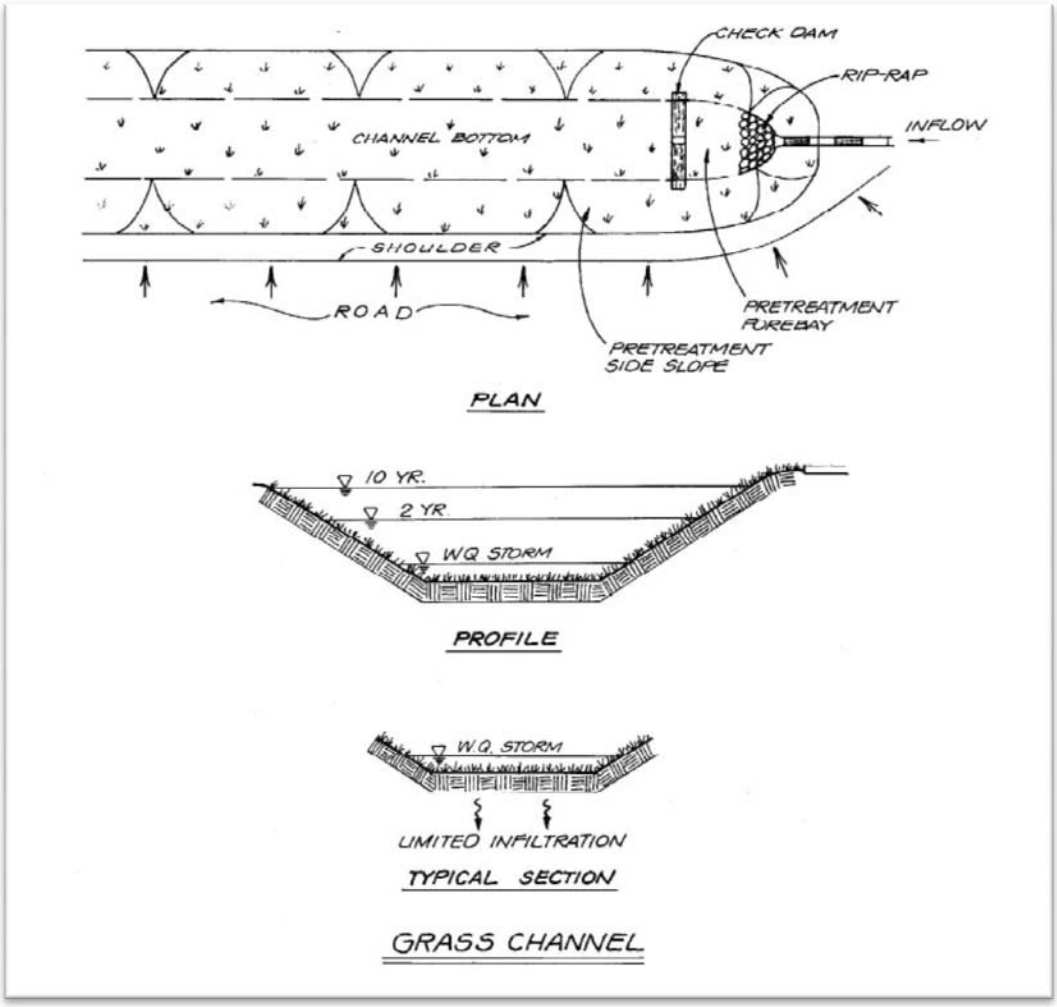
Finally solving Equation 3.6b for the corresponding velocity provides:

V = Q / WD Equation 3.6d: Corresponding Velocity

Additionally, the hydraulic residence time in the swale should be a minimum of 9 minutes prior to discharge to the next treatment facility downstream; the following equation can be used to calculate the minimum swale length needed to achieve a nine minute residence time for a given cross section;

L = 540V Equation 3.5: Grass Channel Length for Hydraulic Residence Time of 9 minutes (540 seconds)

Where: L = minimum swale length (ft.)
V = flow velocity (ft./sec.)

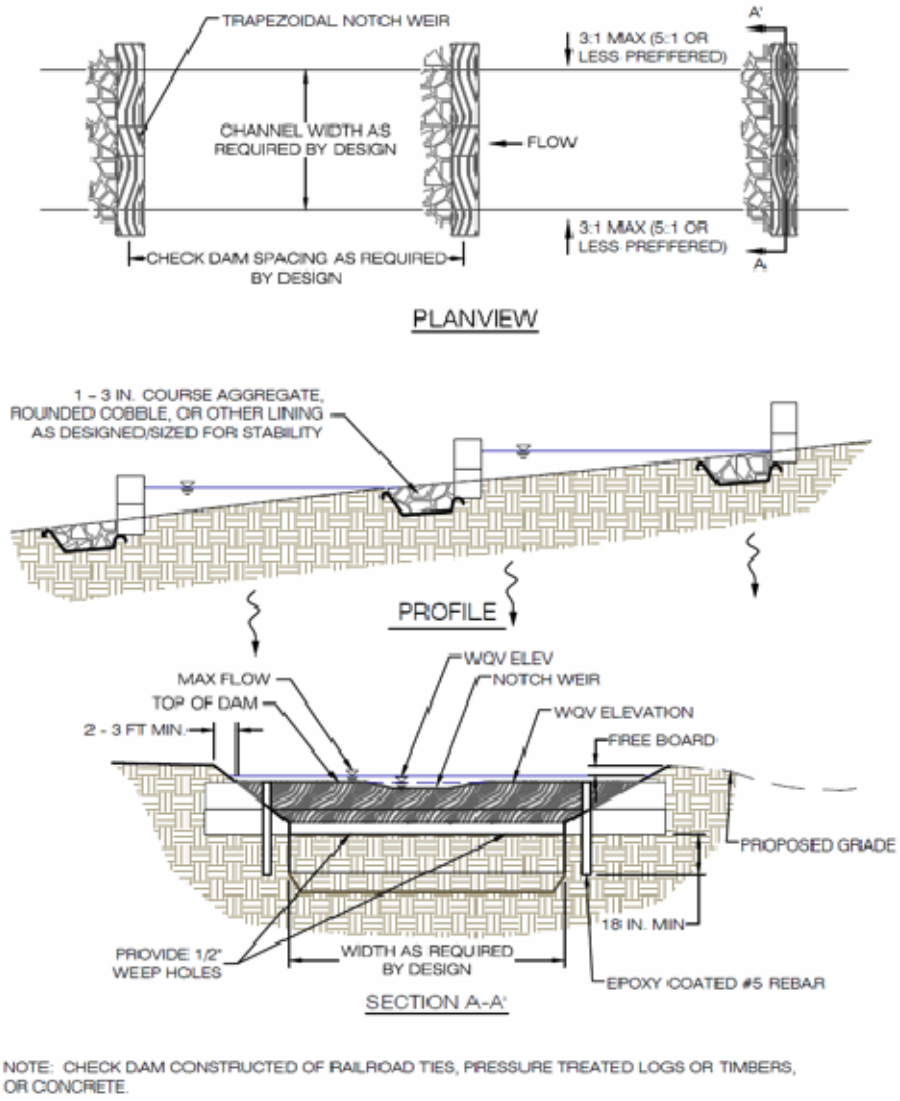


Check Dams

One of the most commonly used features that can be included with a grass swale to increase pre-treatment ability is the use of check dams. Check dams can assist by breaking up slopes, increasing hydraulic residence time in the channel, and breaking the swale into multiple segments. When including check dams in a grassed channel, check dams should be spaced as needed to increase residence time or provided any additional volume attenuation. Additional considerations that should be factor into designs that use check dams include:

- Maximum desired check dam height is 12”;
- Check dams should be spaced so that the ponding in a segment does not reach the toe of slope of the upstream check;
- Check dams should create individual channel segment that are minimum of 25 to 40 feet in length;
- Grass check dams should be easily mowable (slopes less than 4:1).

The following graphic shows a schematic plan and profile view of a grass channel that includes check dams.



NOTE: CHECK DAM CONSTRUCTED OF RAILROAD TIES, PRESSURE TREATED LOGS OR TIMBERS, OR CONCRETE.

As with all IMPs, proper functioning is reliant upon the treatment facility being properly constructed and properly maintained. Additional details for construction and maintenance and inspection forms are provided as an appendix to this manual.

3.7 Infiltration Trenches

Infiltration trenches are Integrated Management Practices that are shallow excavations typically filled with stone designed to intercept and temporarily store stormwater runoff in the stone reservoir allowing it to infiltrate into the surrounding soils and underlying native soils over a period of time typically a few days. Infiltration trenches are effective IMPs in that they serve three important functions:

- Removal sediments and their attached pollutants by infiltration through the subsurface soils;
- Reduces runoff volumes by infiltration into the subsurface soils;
- Delays runoff peaks by providing detention storage and reducing flow velocities.

When used as processes in the treatment train, infiltration trenches conform well to a variety of situations and as such and adapt well to use in urban drainage areas. Extreme care should be taken by the owner / maintenance entity to avoid clogging of the surface layer of infiltration trenches; as such it is key to include elements of pretreatment in the design and application of infiltration trenches. Typically these pretreatment devices may include vegetative filter strips or grassed swales to reduce large sedimentation from clogging the infiltration trench. Infiltration trenches are best suited for use in where smaller basins contribute runoff to the IMP; it is recommended that drainage areas should be limited to areas between 2,500 square feet and two acres in size.

When considering the use of an infiltration trench, as with any infiltration type IMP, a detailed analysis of the subsurface soils should be made. Infiltration trenches should only be used where the material is hydraulically conducive specifically those areas where the soils belong to either hydrologic group ‘A’ or ‘B’, having a permeability greater than 0.5 inches per hour. This IMP should be avoided in areas where the permeability of the soil is less than 0.25 inches per hour. Additional considerations include not including Infiltration Trenches in locations with a high water table, potential salinity hazard areas, with heavy clay soils, steep slopes, non-engineered fill, and in areas adjacent to building foundations. Infiltration trenches are generally well suited for smaller areas where the engineer needs to work the practice into a more restrictive area; on sites where larger areas area available, infiltration basins that substitute the aggregate backfill with engineered soil may prove to be a good option when including in the stormwater management plan.

Design Considerations

When including infiltration trenches in an LID plan for a site a number of considerations should be made to ensure that the infiltration trench operates properly without failure. In all instances, some nature of pretreatment should occur upstream of all infiltration practices.

Additional parameters that should be noted when designing an infiltration trench are found in Table 3.7.1 below.

Table 3.7.1: Key Parameters for Infiltration Trench Sizing and Design	
Volume Required	The Infiltration Trench should be adequately sized to contain the runoff from the 95th Percentile Storm for Ormond Beach. See Section 2.5 for establishment of 95th Percentile Storm.
Soil Permeability (Underlying)	>0.25 - 0.50 inches per hour. Generally limit use to locations where soils belonging to Hydrologic Type 'A' and 'B' are present.
Depth of Infiltration Trench	Broader, shallower trenches perform more efficiently by distributing the storm runoff over a larger surface area. The recommended range is to keep the depth between 36 and 60inches in order to practically construct without burdening too large a portion of the site. Shallower (18 inch deep) trenches can be used in areas of higher water tables, however the surface area would increase proportionately in these IMPs.
Recovery Time	Empty within three days
Backfill Aggregate	Clean aggregate > 1 ½", < 3" surrounded by engineered filter fabric.
Area Required	Although detailed design should be based upon the contributing drainage area, and the infiltration rate of the soils at the location of the infiltration trench. A good rule of thumb is that the infiltration trench has a surface area roughly 5% of the contributing basin.
Minimum Depth to Water Table	Two Feet
Slope	Limit to Flatter Areas with slopes < 5%
Outflow Structure	An overflow device should be installed that allows for system bypass to avoid erosive conditions.
Observation Well	Must be provided for monitoring. 4" PVC on footplate, capped flush with ground surface. See detail.

An infiltration trench can be sized through the use of the following equation:

$$A_{in} = (RR_v)\left\{(n)(d_{in}) + \left[(i_{soil})(t_{fill}) \div 12\right]\right\}$$

Where:

A_{in} = surface area of the infiltration trench (ft^2)

RR_v = stormwater runoff generated by 95th percentile rainfall event (ft)

n = porosity of fill media (generally use 0.32 for washed stone)

d_{in} = depth of stone reservoir (ft)

i_{soil} = infiltration rate of underlying native soils (ft/day)

t_{fill} = average time for the stone reservoir to fill (hours) – use 2 hours

The center for watershed protection provides the following plan for integrating a typical infiltration trench into the design for a small commercial site.

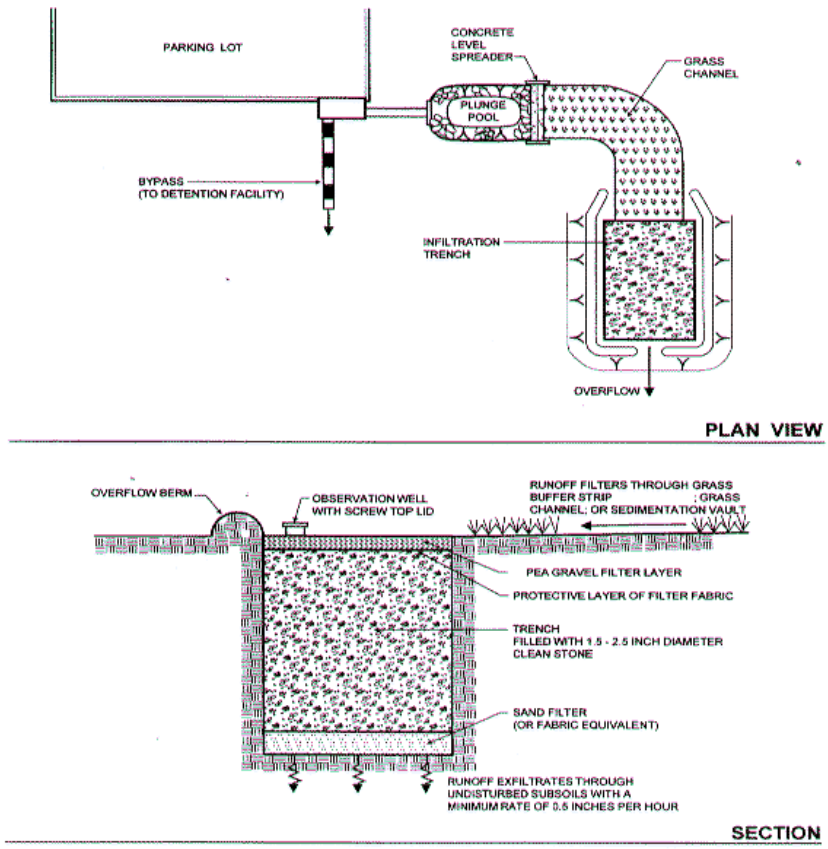


Figure 3.7.2: Schematic of Infiltration Trench

Observation Well

An observation well should be installed in each location that includes some nature of infiltration practice. A detail for an observation well is shown at right which shows the observation well consisting of a perforated pvc pipe (4" – 6" in diameter) that extends to the bottom of the infiltration trench. This observation well can be used to observe the rate of drawdown within the trench following a storm event. It should be installed along the centerline of the trench, flush with the elevation of the surface of the infiltration trench. Ideally, a visible floating marker should be installed within the observation well and the top should be capped to prevent tempering and vandalism.

Maintenance Requirements

Regular prescribed maintenance is very important for proper operation of an infiltration trench to ensure that measureable stormwater management benefits are achieved over time. A maintenance schedule and inspection form for use on projects incorporating infiltration basins is included in the appendix to this manual.

3.8 Level Spreaders

Level spreaders promote infiltration and improve water quality by evenly distributing flows over stabilized, vegetative surfaces. Benefits that can be gained through the use of level spreaders include better infiltration, higher times of concentration, and increased treatment ability. Additional benefits include the ability to disperse concentrated storm water flows, and reduce erosion. Level spreaders can be used at both as the first element in a treatment train, and at the discharge point from the system.

Examples of level spreaders are shown in the following graphics:

Simple level spreader; a level spreader like that shown in figure 3.9a can be used to promote sheet flow at the upstream end of a vegetative filter strip, bioretention area, or swale

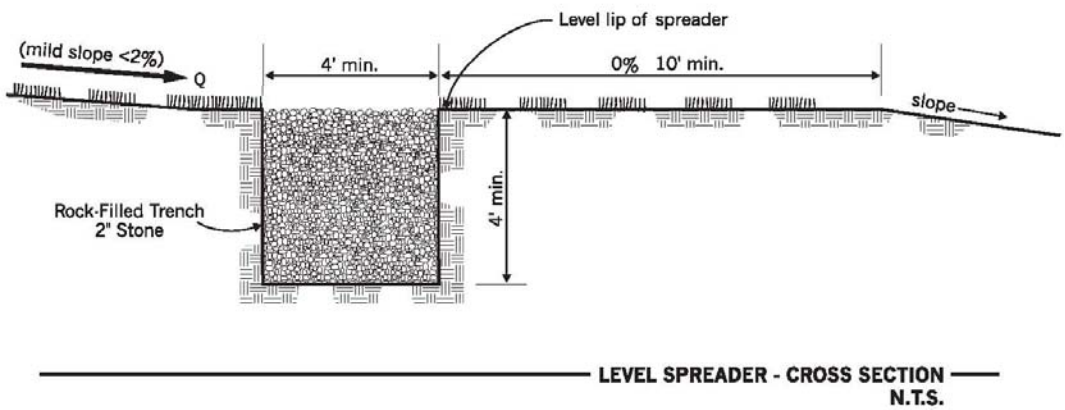


Figure 3.9a : Simple Level Spreader

Level spreaders with perforated pipes can also assist in dispersing flow across a distance and avoid point discharge.

Design considerations that should be incorporated when using level spreaders include the following:

- Incorporate as many outfalls as possible to avoid concentrating stormwater
- Avoid easily erodible soils, keep slopes downstream of level spreader below 8%.
- Provide sufficient distance after level spreader (minimum recommended = 15 feet).
- Level spreaders should be constructed on compacted soil
- Length and size of level spreaders are typically based on flow rates.
- Flow bypass should be incorporated into design to avoid adverse effects of extreme storm events.
- Erosion control should be provided at immediate downstream side of level spreader.

As stated above, the size of a level spreader is typically a function of the calculated flow rate with a minimum spreader size large enough to handle the discharge rate without restriction. For estimating the size required to handle flow some rules of thumb are:

COVER:	GRASS OR THICK VEGETATION	FORESTED WITH LITTLE OR NO GROUND COVER
LENGTH:	13 lineal feet of spreader for every one cubic feet per second (cfs) of flow	100 lineal feet of spreader for every one cfs flow
SLOPE:	Slopes of eight percent or less from level spreader to toe of slope	Slopes of six percent or less from level spreader to toe of slope. For slopes up to 15 percent for forested areas and grass or thick cover, install level spreaders in series. Use above recommended lengths.

For further refinement of level spreader sizing use the following equation:

$$L = Q_p / Q_l$$

Where:
L = Length of level spreader pipe (ft.)
Q_p =design inflow for level spreader (cfs)
Q_l = level spreader discharge per length (cfs/ft)

AND

$$Q_L = Q_O \times N$$

Where:
Q_L = Level Spreader discharge per length (cfs/ft)
Q_O = perforation discharge rate (cfs)
N = Number of Perforations per length of pipe, based on pipe diameter (#/ft)

AND $Q_O = C_d \times A \times \sqrt{2gH}$

Where: Q_O = perforated discharge rate (cfs)
C_d = Coefficient of discharge (typically 0.60)
A = Cross sectional area of one perforation (ft^2)
g = acceleration due to gravity, 32.2 ft/sec^2
H = Head, average height of water above perforation (ft)

3.9 Permeable Pavers / Pervious Pavement

One type of structural IMPs that consistently is the subject of attention is the use of alternative materials in the construction of parking lots, driveways, and roadways. Traditional pavement (asphalt or concrete) is mostly impervious in nature; as a result, virtually all rainfall that falls on the surface becomes runoff. Pervious differs from traditional pavement in that it lacks most of the fine material found in conventionally prepared materials. As a result, systems that utilize pervious pavement systems temporarily store all or a portion of the water quantity before allowing it to infiltrate into the surrounding parent soil or in certain cases be conveyed into the storm drain system through an under drain manifold system rather than displacing the water as runoff.

When included in an LID plan for a site, pervious pavement can be a valuable part of the treatment train. Operating at the front of end of the overall system, permeable pavement can benefit a site by reducing runoff by infiltration through the pavement section which in many cases includes an aggregate layer below the pavement surface. Permeable pavement can also provide limited treatment benefit to the system, acting similarly to a sand filter, the pavement filters the water by forcing it to pass through different aggregate sizes as well as filter fabric. The ability or efficiency of the pavement with regards to infiltration and filtration is largely dependent upon the overall permeability of the pavement section which includes the permeability of the underlying soil. Because of this, there is an advantage to utilizing permeable pavement in locations where the native soil is Hydrologic Group 'A' or 'B', and although some compaction is necessary, to limit the compaction of the pavement base. For this reason, permeable pavement is best suited for the following applications:

- Parking Spaces Within Parking Lots
- Low Intensity Drive Aisles
- Sidewalks, Walkways, and Trails
- Residential Driveways
- Low Traffic Street

In general, the structural devices that comprises pervious pavement falls into one of two categories; pervious paving, and pervious pavers each of which will be discussed in detail below.

Pervious Pavement

The most widely used type of permeable pavement in Florida has been pervious concrete which is similar in form to conventional concrete in structure and form consisting of an open graded surface course bound together by Portland cement. The typical thickness varies from four inches for sidewalks and bike paths and up to six to eight inches f or traffic bearing areas such as parking lots, driveways, and low impact roadways. This pavement has a

permeability that is many times greater than the underlying soils due to the high void ratio (15% - 25% compared to 3% - 5% for conventional concrete) allowing rainwater to pass directly through . Typically, a base layer is not required in order for structural support, it may be deemed beneficial by the designer to include a base consisting of aggregate in order to increase the stormwater storage capacity. Similar to pervious concrete, porous asphalt which consist of an open surface course bound by asphaltic cement, the thickness of which is typically recommended between three and seven inches, and like pervious cement has a void ration of 15% to 25%. Given the uncertainty of the porous asphalt to maintain its structure during warmer summer months in Florida its use is not recommended for projects within the City of Ormond Beach.

Permeable Pavers

The second category of permeable pavement is that of permeable pavers. Permeable pavers in turn fall in to one of two general types interlocking concrete pavers and grid pavers. Permeable interlocking pavers are paver blocks that are installed in a way that permits runoff to pass through regularly spaced openings into an underlying stone reservoir. The spaces between pavers account for 8% to 20% of the surface area of the pavement, with the voids filled by pea gravel. This type of pavement is well suited for parking spaces, residential driveways, and accent areas in other traffic ways such as entrances to commercial properties and residential developments.

The second type of permeable pavers is that of grid pavers. The traditional grid paver being concrete grid paver (turf block) which are pre-cast concrete grids that are filled with gravel, top soil, or turf. Having a void ratio of between 20% and 50%, the media used to fill the voids has a tremendous impact on the overall permeability of the paved area. These grids are usually set in a pea gravel bedding layer (typically one to two inches in depth) with an underlying stone reservoir layer. Recent advances have also introduced plastic reinforcing grids pavers. Similar in principle to concrete grid pavers, the flexible interlocking units usually contain openings that allow for void ratios that can exceed 90% which allows rainfall and stormwater to flow through the grid system. Given the high void

ratio, the fill material plays an even larger role in influencing the behavior of runoff and the permeability of the grid pavement system. Interlocking grid paver systems are most commonly used in areas of parking, specifically in areas of overflow parking for uses such as churches and recreational and educational facilities., it can also be used in areas of required secondary access to a development or for emergency access drives on properties.

Design Considerations

Permeable surfaces are well suited to many different development types, however there are a number of considerations that should be evaluated in order to determine the appropriateness of use in a given situation, at a specific location, and to determine which type of permeable surface best applies to the development. Above and beyond all criteria, permeable surfaces should only be used in situations where they replace traditional impervious paving surfaces. They are not suited to, and should not be as considered for use as devices that specifically receive runoff generated elsewhere on site. Permeable surfaces do not by nature have the strength that traditional paved surfaces do, as such the use of permeable surfaces should be limited to low traffic areas, and use should be avoided in areas of heavy regular truck traffic or where sharp turning movements are expected. Additional considerations include:

- Slopes should be kept shallow (less than five percent),
- Avoid use in areas where the water table is close to the surface (keep seasonal high water level greater than 24 inches below surface),
- The pavement system should be designed to completely drain within 24 hours; this can be achieved by insuring that infiltration rates exceed 0.5 inches per hour, or by designing the system to include an under drain where needed,
- The surface infiltration rate of a site should be a minimum of 1.5 inches per hour at time of construction, with periodic testing by a registered professional engineer occurring to show continued compliance.
- An appropriate aggregate base should be include in the design to meet the storage and structural needs of the pervious pavement area,
- Adequate distance should be maintained from building foundations, property lines, wells, septic systems, and stormwater facilities.

In order to insure proper operation of the pervious pavement area, testing locations should be installed with the pervious pavement. An example of the testing device that should be installed would be an embedded ring infiltrometer. At least two test locations should be installed per acre, with a maximum required number of test locations being ten per site. The locations of these, along with type and/or details for construction should be provided on the LID Plan for the site. Credit as an LID IMP, can only be provided for a site using pervious pavement surfaces if the appropriate accommodations are made for periodic testing.

Construction Considerations

A successful pervious pavement system relies upon the successful installation of the pavement by a skilled and trained contractor familiar with the installation of pervious pavement systems. This is most critical when pervious pavement is called for in the design of a site. Additionally,

the contractor should plan construction staging in order to minimize unnecessary soil compaction; keeping heavy vehicular traffic out of permeable pavement areas prior to, during, and after construction. Excavation should be limited to the area of permeable surface installation, the ground should be properly scarified, and all tree roots should be trimmed around the perimeter of the area to avoid issues with the installation of filter fabric and the stone reservoir.

Maintenance of Permeable Surfaces

Establishment of a responsible maintenance entity and establishment of a thorough maintenance schedule and directions are critical to the long term successful operation of permeable pavement surfaces. Clogging is the main source of permeable pavements not operating to design standards as smaller particles deposited by vehicular traffic, foot traffic, wind deposition, or runoff flow can become trapped in the voids between the large particles of the permeable pavement. One item that should be stated in any maintenance agreement is that in areas of pervious pavement, no impervious sealants or top layers should be placed over the permeable pavement surfaces noted on the LID Plan.

Maintenance guidance for permeale surface areas and inspection forms for use when permeable surface areas are incorporated into a plan is included in the appendices to this manual.

Additional Considerations

One additional consideration that is appropriate to mention with the discussion of permeable parking surfaces are the use of alternative planning techniques when designing paved surface areas specifically parking lots. By reducing the parking lot footprint, the self provided credit resulting from reducing the curve number can occur. Some of the techniques that can be employed to reduce the footprint of a parking facility include:

- Rethinking of Parking Design and needs; an analysis of parking needs based on a survey of actual parking requirements proven in existing sites can result in a reduction of required parking spaces for a site. Under no circumstances should the number of spaces provided exceed 110% of the parking spaces required by code. Careful analysis of parking needs can result in staff permitting plans that provide fewer spaces than otherwise dictated by code.
- Minimization of parking stall dimensions; reducing depth to eighteen feet, and including compact parking spaces where appropriate can lead to a significant reduction in the total impervious area called for on site.
- Shared parking agreements; by encouraging and creating agreements between complementary sites, peak parking needs can be met by sharing lots with adjacent sites whose peak demand occurs at offset times.

3.10 Soil Reforestation / Revegetation

In site reforestation / revegetation, the developer plants a combination of trees, plants, shrubs, and grasses to restore disturbed pervious areas to a condition that closely mimcs its native state. When integrated into a site, reforestation to establish areas on a site that can grow into mature plant communities the developer creates a device that can intercept rainfall, increase evaporation and transpiration rates slow and filter stormwater runoff, and help increase soil infiltration rates. In addition to stormwater benefits of reduced stormwater runoff rates, volumes, and pollutant loads, reforestation can also provide a habitat for plant and animal species.

A project designer / landscape architect can take many different approaches in reforestation of a a portion of a site,included in these are:

Creation of Native Plant Communities

Reforestation

Savanna Restoration

Best suited for larger preservation areas, and likely not applicable to smaller infill or urban redevelopment projects, the creation of a plan that considers the constraints placed upon the plan by the site in its native, and if disturbed, current condition is necessary for for successful utilization of soil reforestation. One approach to including soil restoration is to follow the following sequence of steps and processes.

Analysis of the Physical Conditions of the Site
Knowledge of the site's hydrology topography, hydrology, and underlying soils will help direct the ideal location for reforestation as well as the selection of comlplementary plant types to create an effective and aesthtically pleasing plan. Important resources in the conceptual planning process include the Soil Survey of Volusia County, USGS and Volusia County Topographic maps, as well as inspection of the site.

Analysis of the Vegetative Communities
A survey of the existing vegetation at the site, if not yet cleared, or of vegetation elsewhere on site and in the immeadiate vicintiy showuld be made to help create a strategy for the revegetation. Include in this survey the desirable species that thrive in the area, those invasive or undesirable species that should be eliminated in the replanting and controlled in the maintenance of the reforested area.

Map the Site
Take a pre-development survey noting the physical features of the site includign water bodies, significant slopes, specimen and historic trees, as well as adjacent uses, utilities and other features that can be an asset or present a challenge in the design and implementation of the plan.

Create a Design
Consider and balance the needs of the developer, which includes the future proposed use of the property with the environmental features that can benefit from the implementation of reforestation. Strong emphasis should be placed upon the role the reforested area has in accepting runoff from the proposed site and the watershed to which it discharges. Keep the following parameters in mind with the preparation of the plan:

- Proper Siting of the Reforested Area – As stated elsewhere, minimization of the develoment footprint is an important consideration when developing an LID Plan; in addition, a succcessful LID Plan incorporating reforestation should be of a significant size (greater than 10,000 square feet), efforts should be taken to tie multiple reforested areas on a site or more than one sites together possibly creating parks, trails, or wildlife corridors. Consideration should also be made with regards to the acceptance of runoff from a site.
- Proper Plant Selection and Placement – Reforestation / revegetation efforts should achieve 75% cover within the first year after installation. Plant selection should mimic the native vegetative communities of the site and surrounding areas, with a mix of plant species (shrub and tree) planted at approximately eight feet on center. Ideally trees plantings should be 18 – 24 inches in height with shrubs 12 – 18 inches in height planted upon establishment of groundcover.
- Consider use of interim species to ensure such as annual rye to ensure adequate stabilization of the site while slowing growing species and groundcovers are being established.
- Preserve natural topography of the site, taking additonal care to minimize the use of steep slopes.

Proper Site Development

In addition to limiting the footprint of the development, it is important to limit the compaction that occurs in areas such as those targeted for reforestation. In areas that have been disturbed, soil ammendment by adding compost or other ammendments may be beneficial in addtion to reestablishment of long term soil capacity and pollution removal. The proper steps should eb taken, through mechanical means, and the use of herbicides to prepare revegetated areas and prevent the growth of onvasive weeds by weeding prior to planting and during the first year.

Prepare and Communicate a Management and Maintenance Plan for the Reforested Area

Include requirements for weeding, mowing, irrigation, trimming and replacement of the species planned for the reforested area. A description of the reforested shoul be provieded as an attachement to the permit creating a conserved area. The maintenance of these areas should not be considered "turf management" and it should be emphasized to those responsible for maintenance of the site, specifically with these areas, that care should be taken to manage the areas in undisturbed natural states.

Maintenance guidance and an inspection form for use when reforested / revegetated areas are incorporated into a plan is included in the appendices to this manual.

Section 4
Plan Requirements for LID

Section 4.1: Plan Requirements

Chapter Four of the Land Development Code of Ormond Beach Specifies, in general terms the requirements for submittal of Site and Subdivision plans proposed for construction within the City. When a developer elects to include Low Impact Development techniques in the plan for development there are certain items specific to LID that should be included in the submittal for site plan review. In addition to those site plan items required for submittal by Chapter 4, an LID plan for the project should be submitted as well as Operation and Maintenance (O & M) documents that detail the entity responsible for inspections and maintenance of the IMPs, an inspection schedule, and maintenance requirements.

Section 4.2: LID Plan

Any project submitted for approval within the City of Ormond Beach is required to provide a site plan package that contains specific elements required of the submitted plan in order to facilitate review and ensure proper construction of the site and all required elements. For those projects that elect to employ LID, a specific LID plan is required for inclusion in this plan set. This plan will contain certain specific elements that will identify those IMPs included on the site, the portion of the site that those IMPs cover, and details for the construction of those specific IMPs. This LID plan is not simply a construction plan , in addition to providing guidance for the development of the site, this plan should also be included in the O & M Documents and be incorporated for reference in the inspection schedule and to assist in future maintenance activities.

The format of the LID plan should follow that of the other plans included in the plan set and following the following general guidelines as specified in Chapter 4 of the LDC.

1. Plan sheet should be 24”x36” in size,
2. Project Name, consistent with application should be shown on sheet,
3. North Arrow should appear on sheet,
4. Scale should be no smaller than 1” = 50’, and be both stated and graphic,
5. Date,
6. Professional seal should be included on all plans.

Additionally, the following items specific to this plan should be included on this plan or with adjacent plan sheets;

1. Each IMP should be identified by type and with a unique reference ID that can be used to refer to the IMP in O & M documents,
2. The boundaries of the drainage basins should be outlined and identified by the IMPs that service the basin,
3. Identify any structures either individually or as a group of structures that are components of the IMP,
4. Refer to any landscape elements crucial to the IMP,
5. A reduced size copy (scaled accordingly) is acceptable for inclusion in the O & M documents,
6. Provide details for any and all IMPs included in the plan.

An example is provided on the sheet that follows illustrating the elements required for inclusion on the LID Plan.

Page Left Intentionally Blank
Replace with 11”x17” LID Plan

Standard details for construction of many IMPs are provided in Appendix 'B' of this Manual, electronic versions of these details are available from the City.

Section 4.3: Operation and Maintenance Documents (O & M)

As previously discussed, the proper operation and maintenance of the IMPs is as critical to the success of a project following Low Impact Design Principles as is the design of the system and site. Those properties that incorporate LID into their sites are required to provide to the City for the review and upon satisfactory review O&M documents that include the following items:

1. LID Plan – As discussed in Section 4.2 of this manual, this plan will depict the locations of all IMPs as well as the component elements of IMPs and the portions of the property that each IMP is responsible for treating.
2. Maintenance Covenant – A -recorded document, this covenant shall establish the responsible entity for ensuring that the IMPs included in the LID plan continue to be operational and are maintained in perpetuity.
3. Maintenance Schedule – An outline that provides the intervals necessary for inspection of the individual IMPs and their component elements. Included with this will be the date for the Annual Certification of the system to the City and any other jurisdiction and any other jurisdictions that may apply.
4. Maintenance Requirements – Outline sheets that provide the maintenance entity with guidance of the maintenance and housekeeping steps necessary at prescribed intervals to ensure proper operation of the LID system on-site.
5. Record Keeping – A portion of the O&M Manual shall be devoted to recording inspections of the system as well as any modifications and maintenance activities that were required for its proper operation.
6. Inspection Forms – Copies of those forms required for certification of the site to the City and any other required entities shall be included.
7. Outreach Materials – In order for a development to successfully sustain LID techniques planned for installation, it is important for all stakeholders in a project to understand the IMPs and each individual's role with the site. Contractors should understand the proper installation methods, developers should understand the value of proper installation and maintenance of the IMPs, and future / potential property purchasers and owners should be made aware of the value that the inclusion of LID in the development of site has to the owner as well as the importance of ensuring that future maintenance and operation occurs.

Included in Appendix 'C', O&M Documents of this manual are both a sample maintenance covenant that includes all language required by the City for this document, as well as maintenance requirements for many IMPs that would be suited for use in the City of Ormond Beach. These maintenance requirement sheets have been assembled from researching the separate IMPs by City staff, and reflect the inspection and maintenance activities and intervals applicable for systems constructed within Central Florida.

The City will maintain a database of all LID properties and the ownership and responsible maintenance entity for each property. Within this database will be the submitted LID plans for each site as well as an inventory of all IMPs associated with each respective site. It is the

responsibility of the owner to ensure that notification is made to the City when ownership for a property changes, a copy of city standard form *Transfer of Maintenance Entity, LID Sites*, shall be submitted at the time of property ownership transfer or change to maintenance entity; a copy of this form is included in Appendix 'C'.

Section 4.4: Inspections

Inspection of the system in accordance with Maintenance Covenants shall be the sole responsibility of the Property Owner or Stated Maintenance Entity. Because IMPs vary in their inspection frequency, the inspection schedule shall state a certification period and designate a date range for the certification of the system. This inspection of the full system shall occur on an annual basis within one month of the beginning of the rainy season for Volusia County (March – November). It is the responsibility of the maintenance entity to submit an inspection report to the City; although this inspection of the full system is a self certification, property owners are highly encouraged to engage the services of a registered professional engineer or some other qualified professional with experience in the design in inspection of stormwater facilities to inspect the elements of the system, and make recommendations as needed to ensure that proper operation of the system is maintained.

Included in Appendix 'C', is the form *City Standard Inspection Form for Inspection of LID Sites*, which should be included in the O & M Manual as reference, and for submittal at the time of annual self certification of the system.

Section 4.5: Outreach

One additional element to O&M that should be discussed is the importance of outreach and education. Because the IMPs associated with LID require greater involvement on behalf of the stakeholders, it is important that those involved with an LID development are informed and understand the specific elements involved with the system.

For commercial properties, or those under a single maintenance entity the new ownership entity should be made aware of what comprises the LID system and it's IMPs prior to assuming ownership and maintenance responsibility; in instances where multiple entities are involved in the operation of an LID system, i.e. a residential subdivision IMPs are located on multiple lots; the HOA should take steps to educate the individual owners on their responsibilities in the overall development. Ideally, the O&M Manual should provide a guidebook to the steps that must be taken in order to successfully maintain and operate the site; the inclusion of materials that educate the stakeholders on the specific LID elements included in the site, as well as material that effectively communicates the activities necessary to operate the system are critical to the future success of a site design using the elements of LID.

Section 5
Appendices

Appendix 'A'
Definitions

The following terms are used throughout this manual, definitions applicable in the context of Low Impact Development are provided for clarification and understanding.

Artificial Drainage System: Any canal, ditch, culvert, dike, storm sewer or other man-made facility, which tends to control the flow of surface water.
Average Annual Load Reduction: An estimate of the long term average reduction in annual pollutant loading provided by a stormwater management practice; typically expressed as a percentage.
Average Annual Rainfall: The long term rainfall that occurs annually.
Base Flood: The flood having a 1 percent chance of being equaled or exceeded in any given year. The term is synonymous with "100-year flood" and "regulatory flood".
Density: The number of residential units permitted per gross acre of land as determined by City of Ormond Beach Zoning Regulations.
Base Flood Elevation (BFE): The computed elevation shown on a Flood Insurance Rate Map that indicates the water-surface elevation resulting from a flood that has a 1 percent or greater chance of being equaled or exceeded in any given year.
Cistern: A closed reservoir or tank used for stormwater harvesting
Detention: The collection and temporary storage of stormwater or surface water for subsequent discharge at a rate that is less than the rate of inflow.
Detention with Biofiltration: A landscaped depression area with a separate inlet and outlet (underdrain). Depressions are often linear and may be connected in series. Storage volume recovery of the system is through an underdrain system. Other terms applied to similar practices include biodetention, bioswales, and vegetated swale.
Development Activity or Development: Development activity or development means any of the following activities:

A. Construction, clearing, filling, excavating, grading, paving dredging, mining, drilling or otherwise significantly disturbing the soil of a site.

B. Building, installing, enlarging, replacing or substantially restoring a structure, impervious surface, or water management system, and including the long-term storage of materials.

C. Subdividing land into two or more parcels.

D. A tree or vegetation removal for which authorization is required under this Code.

E. Erection of a sign for which authorization is required under this Code.

F. Alteration of a historic property for which authorization is required under this Code.

G. Changing the use of a site so that the need for parking is increased.

H. Construction, elimination or alternation of a driveway on a public street.

Directly Connected Impervious Area (DCIA): Those impervious areas that are hydraulically connected to the conveyance system and them to the basin outlet point without flowing over pervious areas.

Drainage System, Natural: Watercourses or those wetlands which convey water to natural points of discharge or which store water.

Drainage Systems (Surface Water or Stormwater): All artificial stormwater control systems, facilities and structures including, but not limited to, basins, canals, conduits, channels, culverts, dams, impoundments, pipes, reservoirs, swales and other such works or natural features such as wetlands, creeks, rivers, and lakes that provide collection, drainage, conveyance, or other surface water management capabilities located inside publicly owned rights-of-way or easements.

Drip Line: A vertical line running through the outermost portion of the tree crown extending to the ground.

Driveway: A paved area on a site used for ingress and egress of vehicles

Drought-Tolerant (including Low-Water Use) Plant or Tree: Native plants or trees capable of surviving extended periods with little or no rainfall, as typically experienced in Central Florida.

Easement: A grant to another party by a property owner of the right to use land for a specific purpose, such as, but not limited to, drainage or placement of utility lines, protection of conservation areas, or movement of vehicles or people.

Equivalent Impervious Area (EIA): The area of a completely impervious watershed that would produce the same volume of runoff as the actual watershed.

Engineer: A person professionally licensed by the state to practice engineering.

Existing Condition: The physical condition of the site immediately before development, redevelopment, or a clearing or other impact to the site commences.

Exotic: A species introduced to Florida, purposefully or accidentally, from a natural range outside of Florida.

Filling: The depositing of any materials by any means into water, wetlands, floodplain, or upland area.

Finished Grade: The completed surface of lawns, walks, and driveways brought to grade as shown on building plans or designs relating thereto.

Floodplain: Any land area susceptible to being inundated by flood waters from any source.

Freeboard: A factor of safety, expressed in feet above a flood level which is applied for the purpose of floodplain management. Freeboard is used to compensate for the many unknown factors that could contribute to flood heights greater than those calculated for a selected flood or floodway conditions.

Grade, Finished: The final elevation of the ground surface after development.

Grade, Natural: The elevation of the ground surface in its natural state before man-made alterations.

Greenroof: A roof built to the specifications of this manual that includes at minimum vegetation, media, and a waterproof membrane. To receive water quality credit, it is specifically built with a cistern or water holding system from which irrigation is provided.

Groundwater: Water beneath the surface of the ground whether or not flowing through known and definite channels.

Hydric Soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part that favor the growth and regeneration of hydrophytic vegetation (US Department of Agriculture - Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils. In addition, soils are hydric according to the soil profile which obtains hydric characteristics of organic matter accretions at the soil surface, high organic matter content in soil surface layer, and gray soil matrix color near the surface layer (soils which undergo saturation for a sufficiently long period of time usually give distinct gray color resulting from oxidation and reduction processes).

Integrated Management Practice (IMP): A Low Impact Development practice or combination of practices that are the most effective and practicable (including technological, economic, and institutional considerations) means of controlling the predevelopment site hydrology.

Impervious Area: A hard surface area (e.g., parking lot of rooftop) that prevents or retards the entry of water into the soil, thus causing water to run off the surface in greater quantities and at an increased rate of flow.

Infiltration: The downward movement of water from the land surface into the soil.

Hydrologic and Hydraulic Engineering Analysis: An analysis performed by a professional engineer in accordance with standard engineering practices as accepted by FEMA, for the purpose of determining base flood elevations and/or floodway boundaries.

Impervious: Surface material incapable of being penetrated by moisture and preventing the percolation of water to sub-surface areas.

Littoral Zone: That portion of any lake, borrow pit, or pond measured from seasonal high water elevation in water bodies where water elevation is not controlled by structures to a depth of three feet. Littoral zones also include those areas in salt or brackish water from the mean high water to a depth of three feet.

Low Impact Development: A stormwater management approach that uses a suite of hydrologic controls (structural and non-structural) distributed throughout the site and integrated as a treatment train (i.e., in series) to replicate the natural hydrologic

functioning of the landscape which ranges in effective area from the residential lot level to the entire watershed.

National Geodetic Vertical Datum (NGVD) of 1929: A vertical control used as a reference for establishing elevations, referred to as the Sea Level Datum of 1929.

Natural Area: An area identified on an approved site plan containing natural vegetation which will remain undisturbed when the property is fully developed.

Natural Flow: The rate, volume, and direction of the surface or groundwater flow occurring under natural conditions.

North American Vertical Datum (NAVD) of 1988: A vertical control used as a reference for establishing elevations.

Nutrient-adsorption layer: A layer included in green roof and pervious pavement systems, which absorbs nutrients thereby reducing the nutrient loading from the system.

Parking Aisle (or Aisle): An area within a parking facility intended to provide ingress and egress to parking spaces.

Parking Area, Off-Street: All areas located outside of right-of-way which are designed and constructed for the circulation and parking of automobiles, motorcycles and bicycles, unless otherwise authorized by the City for other vehicles (i.e., boats, heavy equipment, etc.), and all land upon which vehicles traverse as a function of the principal uses.

Parking Bay: A parking bay is a single drive aisle with head-on access to parking spaces on one or both sides of the aisle. The parking bay is comprised of the parking stall depth and the aisle

Parking Lot: An off-street, ground level area for the temporary, transient storage of private passenger motor vehicles and such area has been approved by the City for parking, as such term is defined in this Article.

Parking Space or Stall: An area, enclosed or unenclosed, sufficient in size to store one motor vehicle and permitting the necessary ingress and egress of a motor vehicle.

Paved Area: An improved area consisting of asphaltic concrete, concrete, brick or similar material, acceptable to the City Engineer, which is intended or designated for parking, maneuvering and/or vehicular movement, and including pedestrian access ways immediately adjacent to such areas.

Pavement: That part of a street composed of vehicular travel lanes having an improved surface of asphalt, concrete, brick or other paving materials acceptable to the City Engineer.

Permeable: Soil or other material that allows the infiltration or passage of water or other liquids.

Periodically Inundated Soil: A hydric soil where presence of mucky texture, peat, muck, or mucky peat layer in the soil surface is strongly indicated. The water table will rise to the ground surface on a regular and periodic basis.

Pervious Pavement: A pavement system that allows stormwater to infiltrate into the parent soil.

Predevelopment: Conditions that exist on a site at the time of permit application.

Pretreatment: Stormwater volume and/or water quality controls applied upstream from or before capture, storage, treatment, infiltration, and/or harvesting by a subsequent stormwater management practice in a treatment train.

Rational Method: The rational method is the most widely used procedure for designing small drainage structures and is mathematically typically expressed as Q = CiA, where "Q" is the peak rate of runoff (cu. ft./sec), "C" is the runoff coefficient, "i" is the rainfall intensity (inches/hr.) and "A" is the area of the drainage basin (acres).

Receiving Bodies of Water: Any water bodies, watercourses or wetlands into which stormwater is discharged and surface waters flow.

Runoff: Water from rain, melted snow, or irrigation that flow over the land surface.

SCS Method: Soil Conservation Service curve number method for calculating stormwater runoff based on Type II (Florida Modified) storm distribution.

Storm Sewer: A sewer that carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

Surface Water Management Systems: All artificial stormwater control systems, facilities and structures including, but not limited to, basins, canals, conduits, channels, culverts, dams, impoundments, pipes, reservoirs, swales and other such works or natural features such as wetlands, creeks, rivers, and lakes that provide drainage, water storage, conveyance, treatment or other surface water management capabilities located outside publicly owned rights-of-way or easements.

Turf Grass: In horticulture, the surface layer of soil with its matted, dense vegetation, usually GRASSES grown for ornamental or recreational use. Such turf grasses include Kentucky BLUEGRASS, creeping BENT grass, fine or red fescue, and PERENNIAL ryegrass among the popular cool-season types, and Bermuda grass, zoysia grass, and St. Augustine grass among the warm-season types. Turf grasses are often grown on turf, or sod, farms. Plugs, blocks, squares, or strips are cut and transplanted to areas where they quickly establish and grow. Lawns are fine-textured turfs that are mowed regularly and closely to develop into dense, uniformly green coverings that beautify open spaces and provide sports playing surfaces (e.g., tennis lawns, golf and bowling greens, and racing turfs).

Watershed: The topographic boundary within which water drains into a particular river, stream, wetland, or body of water.

Wetlands: Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce, or persist in aquatic environments or anaerobic soil conditions.

Wet Retention: A retention/detention pond having a bottom elevation below the dry season surface water level. Storage area is measured from the wet season high water line to the top elevation.

Appendix 'B'
Declaration of Covenants - Maintenance Schedules &
Inspection Forms

DECLARATION OF COVENANTS
For Low Impact Design Storm and Surface Water Facility, and
Integrated Management Practice Maintenance

THIS DECLARATION OF COVENANTS, made this
_____ day of _____, 20___, by
_____
____
Hereinafter referred to as the Covenanter(s) to and for the benefit of the City of Ormond Beach, Florida and its successors and assigns hereinafter referred to as the City.

WITNESSETH:
WHEREAS, the City is authorized and required to regulate and control the disposition of storm and surface waters within the St. Johns River Water Management District set forth in the Land Development Code for the City of Ormond beach: and

WHEREAS, Covenanter(s) is (are) the owner(s) of a certain tract
or parcel of land more particularly described as:
_____
_____
_____
_____
_____
_____

being all or part of the land which it acquired by deed dated
_____ from
_____
_____grantors, and recorded among the Public Records for Volusia County, Florida in Official Records Book _____
Page(s) _____such property being hereinafter referred to as the "the property"; and

WHEREAS, the Covenanter(s) desires to construct certain improvements on its property which will alter the extent of storm and surface water flow conditions on both the property and adjacent lands: and

WHEREAS, in order to accommodate and regulate these anticipated changes in existing storm and surface water flow conditions, the Covenanter(s) desires to build and maintain at its expense, a stormwater management plan design in a manner consistent with the Low Impact Development techniques, presenting a plan consistent with the City of Ormond Beach's Low Impact Design Manual, more particularly described and shown on plans titled
_____
_____

and further identified under approval number _____;
and _____.
WHEREAS, the City, has reviewed and approved these plans subject to the execution of this agreement.

NOW THEREFORE, in consideration of the benefits received by the Covenanter(s), as a result of the City approval of his plans. Covenanter(s), with full authority to execute deeds, mortgages, other covenants, and all rights, title and interest in the property described above do hereby covenant with the City as
follows:
1. Covenanter(s) shall construct and perpetually maintain, at its sole expense, the above-referenced storm and surface management facility and system in strict accordance with the plan approval granted by the City.

2. Covenanter(s) shall, at its sole expense, make such changes or modifications to the storm drainage facility and system as may, in the City discretion, be determined necessary to insure that the facility and system is properly maintained and continues to operate as designed and approved.

3. The City its agents, employees and contractors shall have the perpetual right of ingress and egress over the property of the Covenanter(s) and the right to inspect at reasonable times and in reasonable manner, the storm and surface water facility and system in order to insure that the system is being properly maintained and is continuing to perform in an adequate manner.

4. The Covenanter(s) agrees that should it fail to correct any defects in the above-described facility and system within ten (10) days from the issuance of written notice, or shall fail to maintain the facility in accordance with the approved design standards and with the law and applicable executive regulation or, in the event of an emergency as determined by the (State, County, City) in its sole discretion, the (State, County, City) is authorized to enter the property to make all repairs, and to perform all maintenance, construction and reconstruction as City deems necessary. The City shall then assess the Covenanter(s) and/or all landowners served by the facility for the cost of the work, both direct and indirect, and applicable penalties. Said assessment shall be a lien against all properties served by the facility and may be placed on the property tax bills of said properties and collected as ordinary taxes by the City

5. Covenanter(s) shall indemnify, save harmless and defend the City from and against any and all claims, demands, suits, liabilities, losses, damages and payments including attorney fees claimed or made by persons not parties to this Declaration against the City that are alleged or proven to result or arise from the Covenanter(s) construction, operation, or maintenance of the storm and surface water facility and system that is the subject of this Covenant.

6. The covenants contained herein shall run with the land and the Covenanter(s) further agrees that whenever the property shall be held, sold and conveyed, it shall be subject to

the covenants, stipulations, agreements and provisions of this Declaration, which shall apply to, bind and be obligatory upon the Covenanter(s) hereto, its heirs, successors and assigns and shall bind all present and subsequent owners of the property served by the facility.

7. The Covenanter(s) shall promptly notify the City when the Covenanter(s) legally transfers any of the Covenanter(s) responsibilities for the facility. The Covenanter(s) shall supply the City with a copy of any document of transfer, executed by both parties.

8. The provisions of this Declaration shall be severable and if any phrase, clause, sentence or provisions is declared unconstitutional, or the applicability thereof to the Covenanter is held invalid, the remainder of this Covenant shall not be affected thereby.

9. The Declaration shall be recorded among the Land Records of (Governing Body) at the Covenanter(s) expense.

10. In the event that the City shall determine at its sole discretion at future time that the facility is no longer required, then the City shall at the request of the Covenanter(s) execute a release of this Declaration of Covenants which the Covenanter(s) shall record at its expenses

IN WITNESS WHEREOF, the Covenanter(s) have executed
this Declaration of Covenants as of this_____day
of_____, 20_____.
ATTEST: FOR THE COVENANTOR(S)
_____ _____
(Signature) (Signature)
_____ _____
(Printed Name) (Printed Name and Title)

STATE OF_____ :
COUNTY OF _____ :
On this_____day of_____, 20___, before me,
the undersigned officer, a Notary Public in and for the State and
County aforesaid, personally appeared _____,
who acknowledged himself to be_____,
of_____, and he as such authorized to do
so, executed the foregoing instrument for the purposes therein contained
by signing his name as_____for
said_____.
WITNESS my hand and Notaries Seal
My commission expires_____ _____
Notary Public
Seen and approved
_____
City of Ormond Beach

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type

Required Maintenance Inspetions and Activities

1	
2	
3	
4	
5	
6	
7	
8	
9	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7	8	9
January									
February									
March									
April							M		M
May									
June									
July									
August									
September									
October									
November									
December									

Legend:

X - As Needed During the Month(s) Noted
M -Monthly During the Month(s) Noted
W - Weekly During the Month(s) Noted
B - Bi-weekly During the Month(s) Noted
Y - Annualy during Month Noted
1Y During First year Only
2Y - Biennially, (Even numbered Years)

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type

Certification of System Compliance

I Certify that for the Integrated Management Practice (IMP) noted as IMP on the plans prepared for th PROJECT NAME site, I or someone under my direction have inspected and found the IMP to be operational; I have noted any deficiencies that have been corrected in the space below. To the best of my determinaiton, the required maintenance activities have been performed in order to ensure proper perfomance of the system; this schedule has been reviewed with the maintenance entity for this property,with emphasis placed upon their role in the continued success of this IMP and the LID plan for this site.

Notes / Deficienies:

Certified by:

Name(Printed) Signature

Organization Florida Registration Number

Address Date

City, State, Zip Code

Telephone Number

Note: This certification, accompanied by any relevant support data should be submitted to

LID Administrator
Planning Department
City of Ormond Beach
Room 104
Ormond Beach, Florida 32174

No later than April 30 of each year reflecting the twelve months prior to the certification, and any preparations required to prepare the site and its IMPs for the heavy reain season.

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Bioretention

Required Maintenance Inspections and Activities

1	Irrigate to promote growth, survival, and proper functioning of system.
2	Prune and Weed to maintain appearance.
3	Remove accumulated trash and debris
4	Replace mulch; inspect gravel, stone and other groundcover replacing as needed.
5	Inspect inflow area for sediment accumulation; remove any accumulated sediment and debris
6	Inspect area for erosion, and formation of ruts, gullies, and washouts; plant replacement vegetation in eroded areas.
7	Inspect for dead or dying vegetation, remove dead material and plant replacement vegetation as needed.
8	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	1	2	3	4	5	6	7	8	
January	X	M	B						
February	X	M	B						
March	X	M	B	Y	Y	Y	Y		
April	X	M	B					Y	
May	X	M	B						
June	X	M	B						
July	X	M	B						
August	X	M	B						
September	X	M	B		1Y	1Y	1Y		
October	X	M	B						
November	X	M	B						
December	X	M	B						

Legend:

X - As Needed During the Month(s) Noted
M -Monthly During the Month(s) Noted
W - Weekly During the Month(s) Noted
B - Bi-weekly During the Month(s) Noted
Y - Annually during Month Noted
1Y During First year Only
2Y - Biennially, (Even numbered Years)

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Bioretention

Certification of System Compliance

I Certify that for the Integrated Management Practice (IMP) noted as IMP on the plans prepared for th PROJECT NAME site, I or someone under my that have been corrected in the space below. To the best of my determination, the required maintenance activities have been performed in order to ensure proper performance of the system; this schedule has been reviewed with the maintenance entity for this property, with emphasis placed upon their role in the continued success of this IMP and the LID plan for this site.

Notes / Deficiencies:

Certified by:

Name(Printed) Signature

Organization Florida Registration Number

Address Date

City, State, Zip Code

Telephone Number

Note: This certification, accompanied by any relevant support data should be submitted to

LID Administrator
Planning Department
City of Ormond Beach
Room 104
Ormond Beach, Florida 32174

No later than April 30 of each year reflecting the twelve months prior to the certification, and any preparations required to prepare the site and its IMPs for the heavy rain season.

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Rain Garden

Required Maintenance Inspections and Activities

1	Irrigate to promote growth, survival, and proper functioning of system.
2	Prune and Weed to maintain appearance.
3	Remove accumulated trash and debris
4	Replace mulch; inspect gravel, stone and other groundcover replacing as needed.
5	Inspect inflow area for sediment accumulation; remove any accumulated sediment and debris
6	Inspect area for erosion, and formation of ruts, gullies, and washouts; plant replacement vegetation in eroded areas.
7	Inspect for dead or dying vegetation, remove dead material and plant replacement vegetation as needed.
8	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	1	2	3	4	5	6	7	8	
January	X	M	B						
February	X	M	B						
March	X	M	B	Y	Y	Y	Y		
April	X	M	B					Y	
May	X	M	B						
June	X	M	B						
July	X	M	B						
August	X	M	B						
September	X	M	B		1Y	1Y	1Y		
October	X	M	B						
November	X	M	B						
December	X	M	B						

Legend:

X - As Needed During the Month(s) Noted
M -Monthly During the Month(s) Noted
W - Weekly During the Month(s) Noted
B - Bi-weekly During the Month(s) Noted
Y - Annually during Month Noted
1Y During First year Only
2Y - Biennially, (Even numbered Years)

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Rain Garden

Certification of System Compliance

I Certify that for the Integrated Management Practice (IMP) noted as IMP on the plans prepared for th PROJECT NAME site, I or someone under my that have been corrected in the space below. To the best of my determination, the required maintenance activities have been performed in order to ensure proper performance of the system; this schedule has been reviewed with the maintenance entity for this property, with emphasis placed upon their role in the continued success of this IMP and the LID plan for this site.

Notes / Deficiencies:

Certified by:

Name(Printed) Signature

Organization Florida Registration Number

Address Date

City, State, Zip Code

Telephone Number

Note: This certification, accompanied by any relevant support data should be submitted to

LID Administrator
Planning Department
City of Ormond Beach
Room 104
Ormond Beach, Florida 32174

No later than April 30 of each year reflecting the twelve months prior to the certification, and any preparations required to prepare the site and its IMPs for the heavy rain season.

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Rainwater Harvest

Required Maintenance Inspections and Activities

1	Inspect storage tank screens and pretreatment devices. Clean as needed.
2	Inspect gutters and downspouts. Remove any accumulated leaves and debris.
3	Clean storage tank screens.
4	Inspect pretreatment devices for sediment accumulation. Remove trash and debris
5	Inspect storage tank for algal blooms. Treat as necessary.
6	Inspect overflow areas for erosion and the formation of ruts, gullies, and washouts. Stabilize eroded areas with appropriate vegetation as necessary.
7	If system includes pumping component; inspect pumps, electric connection, valves, solenoids, actuators, and level switches.
8	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7	8	9
January	M								
February	M								
March	M	Y	Y	Y	Y	Y	Y - X		
April	M							Y	
May	M								
June	M								
July	M								
August	M								
September	M	1Y	1Y	1Y	1Y	1Y	1Y		
October	M								
November	M								
December	M								

Legend:

X - As Needed During the Month(s) Noted
M -Monthly During the Month(s) Noted
W - Weekly During the Month(s) Noted
B - Bi-weekly During the Month(s) Noted
Y - Annually during Month Noted
1Y During First year Only
2Y - Biennially, (Even numbered Years)

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Rainwater Harvest

Certification of System Compliance

on the plans prepared for th PROJECT NAME site, I or someone under my direction have inspected and found the IMP to be operational; I have noted any deficiencies that have been corrected in the space below. To the best of my determination, the required maintenance activities have been performed in order to ensure proper performance of the system; this schedule has been reviewed with the maintenance entity for this property, with emphasis placed upon their role in the continued success of this IMP and the LID plan for this site.

Notes / Deficiencies:

Certified by:

Name(Printed) Signature

Organization Florida Registration Number

Address Date

City, State, Zip Code

Telephone Number

Note: This certification, accompanied by any relevant support data should be submitted to

LID Administrator
Planning Department
City of Ormond Beach
Room 104
Ormond Beach, Florida 32174

No later than April 30 of each year reflecting the twelve months prior to the certification, and any preparations required to prepare the site and its IMPs for the heavy rain season.

Project Name:

City of Ormond Beach LID Plan Number:

Maintenance Requirements and Schedule

Site IMP ID

Basin

IMP type Disconnect

Required Maintenance Inspections and Activities

1	Inspect and remove trash, siltation and debris from downspout outlet.
2	Inspect flow path to ensure that runoff routing is free from obstructions
3	Mow sodded areas
4	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required			
	1	2	3	4
January	M	X		
February	M	X		
March	M			
April	M		B	Y
May	M		B	
June	M		B	
July	M		B	
August	M		B	
September	M		B	
October	M		B	
November	M	X		
December	M	X		

Legend:

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M -Monthly During the Month(s) Noted
W - Weekly During the Month(s) Noted
B - Bi-weekly During the Month(s) Noted
1Y During First year Only
Y - Annually during Month Noted

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Disconnect

Certification of System Compliance

I Certify that for the Integrated Management Practice (IMP) noted as IMP on the plans prepared for the PROJECT NAME site, I or someone under my direction have inspected and found the IMP to be operational; I have noted any deficiencies that have been corrected in the space below. To the best of my determination, the required maintenance activities have been performed in order to ensure proper performance of the system; this schedule has been reviewed with the maintenance entity for this property, with emphasis placed upon their role in the continued success of this IMP and the LID plan for this site.

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Project Name:

City of Ormond Beach LID Plan Number:

Maintenance Requirements and Schedule

Site IMP ID

Basin

IMP type Vegetative Filter Strip

Required Maintenance Inspections and Activities

1	
2	
3	
4	
5	
6	
7	
8	
9	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7	8	9
January									
February									
March									
April							M		M
May									
June									
July									
August									
September									
October									
November									
December									

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1Y During First year Only
2Y - Biennially, (Even numbered Years)

Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Vegetative Filter Strip

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Project Name:

City of Ormond Beach LID Plan Number:

Maintenance Requirements and Schedule

Site IMP ID

Basin

IMP type Grassed Swales

Required Maintenance Inspections and Activities

1	Inspect swale, slopes, check dams, inlets and outlets for vegetative coverage, erosion, ponding, or dead grass.
2	Add reinforcement planting to maintain 90% turf cover.
3	Check inflow points, outlet, and at check dams for sedimentation, debris, and trash. Remove as needed.
4	Look for any bare soil or sediment sources in the contributing drainage basin, stabilize immediately.
5	Mow Grassed Swale.
6	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required					
	1	2	3	4	5	6
January			M		M	
February			M		M	
March	M	X	M	M	B	
April	M	X	B	M	B	Y
May	M	X	B	M	B	
June	M		B	M	B	
July	M		B	M	B	
August	M		B	M	B	
September	M		B	M	B	
October	M		M	M	M	
November			M		M	
December			M		M	

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Grassed Swales

Certification of System Compliance

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Infiltration Trench

Required Maintenance Inspections and Activities

1	Inspect for accumulated sediment, trash, and debris; remove as necessary.
2	Inspect area for erosion, and formation of ruts, gullies, amd washouts; plant replacement vegetation in eroded areas.
3	Irrigate to promote growth, survival, and proper functioning of system.
4	Inspect pretreatment devices for sediment accumulation. Remove accumulated trash and debris.
5	Inspect top layer of filter fabric and pea gravel for sediment accumulation. Remove and replace as necessary.
6	Inspect for damage, paying particular attention to inlets, outlets, and overflow devices; repair or replace damaged components as necessary.
7	Test infiltration rate ensuring system recovers at a rate not to exceed 72 hours. Longer recovery times indicates failure of system
8	Perform total rehabilitation of the infiltration practice removing stone or bed and excavating clean soil on the sides and bottoms of the IMP.
9	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7	8	9
January	M	M	X					U	
February	M	M	X					P	
March	M	M	X	Y	Y	Y	Y	O	
April	M	M	X					N	Y
May	M	M	X						
June	M	M	X					F	
July	M	M	X					A	
August	M	M	X					I	
September	M	M	X	1Y	1Y			L	
October	M	M	X					U	
November	M	M	X					R	
December	M	M	X					E	

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Infiltration Trench

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Project Name:

City of Ormond Beach LID Plan Number:

Maintenance Requirements and Schedule

Site IMP ID

Basin

IMP type Level Spreader

Required Maintenance Inspections and Activities

1 Inspect diverter device, clean and make repairs.
2 Inspect the level spreader for trash, debris, and sediment removing as necessary.
3 Inspect area downstream of level spreader for erosion, and formation of ruts, gullies, and washouts; plant replacement vegetation in eroded areas.
4 Inspect for stone washout from level spreader; replace as necessary.
5 Inspect for settlement of level spreader (no longer level); add stone to level.
6 Remove any weeds, or other vegetation growing on level spreader or in diversion swale.
7 Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7		
January	M	M		M					
February	M	M							
March	M	M	Y	M	Y	Y			
April	M	M					Y		
May	M	M		M					
June	M	M							
July	M	M		M					
August	M	M							
September	M	M		M	1Y	1Y			
October	M	M							
November	M	M		M					
December	M	M							

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Level Spreader

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Permeable Pavement/Pavers

Required Maintenance Inspections and Activities

1	Inspect surface for debris and sediment, remove as necessary.
2	Check surface for excessive ponding; repair as needed.
3	Inspect for dead or dying vegetation; take appropriate remedial action.
4	Vacuum Sweep permeable pavement to keep surface free of sediment
5	High pressure hose washing of surface pores
6	Inspect pavement for excessive raveling, potholes, wide cracking, spot repair areas where surface area is than ten percent of total.
7	Test permeability at installed infiltration test locations.
8	Annual Recertification /Inspection by Professional Engineer.
9	Rehabilitate failed permeable pavement system including surface course and stone reservoir layer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required								
	1	2	3	4	5	6	7	8	9
January	M	M	M	M	M				U
February	M	M	M						P
March	M	M	M			Y	2Y	Y	O
April	M	M	M	M	M				N
May	M	M	M						
June	M	M	M						F
July	M	M	M	M	M				A
August	M	M	M						I
September	M	M	M						L
October	M	M	M	M	M				U
November	M	M	M						R
December	M	M	M						E

Legend:

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Project Name:
City of Ormond Beach LID Plan Number:
Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Permeable Pavement/Pavers

Certification of System Compliance

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on the plans prepared for th PROJECT NAME site, I or someone under my
that have been corrected in the space below. To the best of my determination, the required
maintenance activities have been performed in order to ensure proper performance of the system;
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Project Name:

City of Ormond Beach LID Plan Number:

Maintenance Requirements and Schedule

Site IMP ID

Basin

IMP type Reforestation

Required Maintenance Inspections and Activities

1	Water plants to promote growth and survival
2	Inspect reforested / revegetated areas for erosion following rainfall events. Plant additional material in eroded areas.
3	Inspect reforested/revegetated areas for dead or dying vegetation. Plant replacement material as needed.
4	Inspect / prune and care for individual trees and shrubs as necessary.
5	Annual Recertification /Inspection by Professional Engineer.

Maintenance Schedule

Month	Inspection and Maintenance Activities Required				
	1	2	3	4	5
January	X(1Y)	X(1Y)			
February	X(1Y)	X(1Y)			
March	X(1Y)	X(1Y)	M	M	
April	X	B	M	B	M
May	X	B	M	B	
June	X	B	M	B	
July	X	B	M	B	
August	X	B	M	B	
September	X	B	M	B	
October	X(1Y)	X(1Y)	M	M	
November	X(1Y)	X(1Y)			
December	X(1Y)	X(1Y)			

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W - Weekly During the Month(s) Noted

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Project Name:
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Maintenance Requirements and Schedule
Site IMP ID
Basin
IMP type Reforestation

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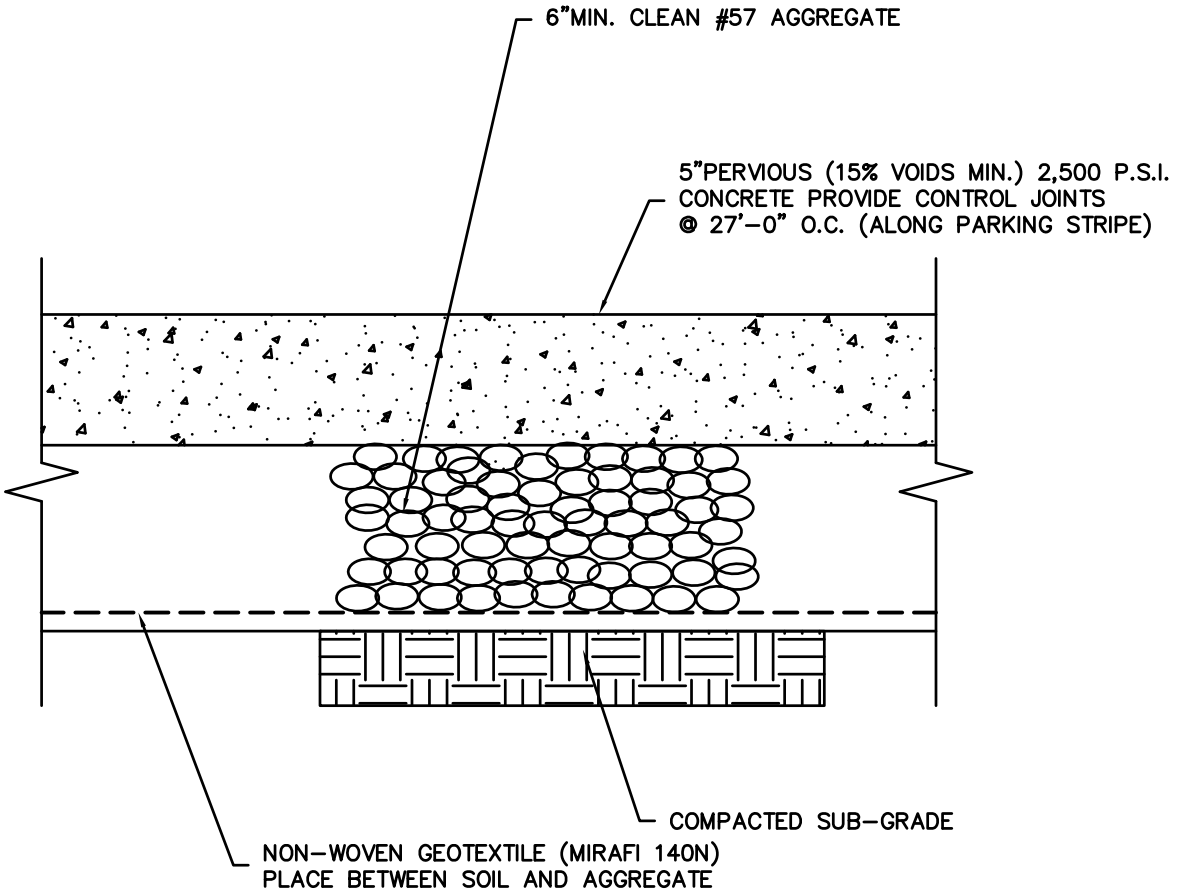
Appendix 'C'
Standard Details



PERVIOUS CONCRETE PAVEMENT SECTION

SEE SPECIFICATIONS AND SOIL REPORT FOR ADDITIONAL INFORMATION

PERVIOUS CONCRETE MAINTENANCE REQUIREMENTS

1. THE OWNER IS RESPONSIBLE FOR INSPECING THE PERVIOUS CONCRETE TO VERIFY THAT IT IS FUNCTIONING AS DESIGNED AND THAT THE VOIDS IN THE CONCRETE HAVE NOT BECOME CLOGGED WITH DEBRIS.
2. THE OWNER SHALL REQUIRE THE LANDSCAPE CONTRACTOR TO KEEP THE PERVIOUS CONCRETE FREE OF MULCH, GRASS CLIPPINGS, AND OTHER DEBRIS THAT COULD POTENTIALLY FILL THE VOIDS IN THE CONCRETE. THE LANDSCAPE CONTRACTOR SHALL ALSO POWER BLOW THE AREA AFTER EVERY MOWING.
3. THE OWNER SHALL PRESSURE WASH THE PERVIOUS AREA AS NEEDED TO RESTORETHE PERMEABILITY AT LEAST ONCE A YEAR.

CITY OF ORMOND BEACH FLORIDA

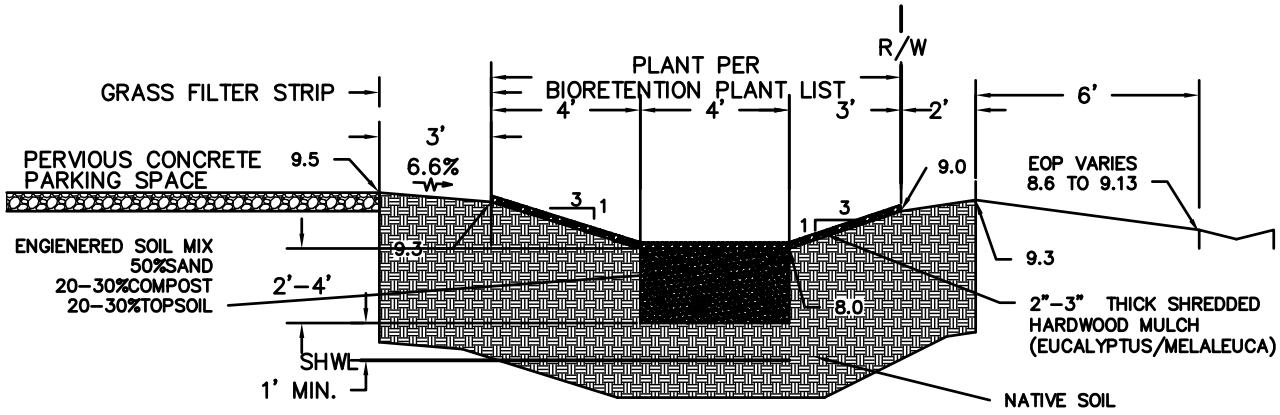
LOW IMPACT DEVELOPMENT (LID)
CONSTRUCTION DETAIL

PERVIOUS CONCRETE PAVEMENT

INDEX

LID-1

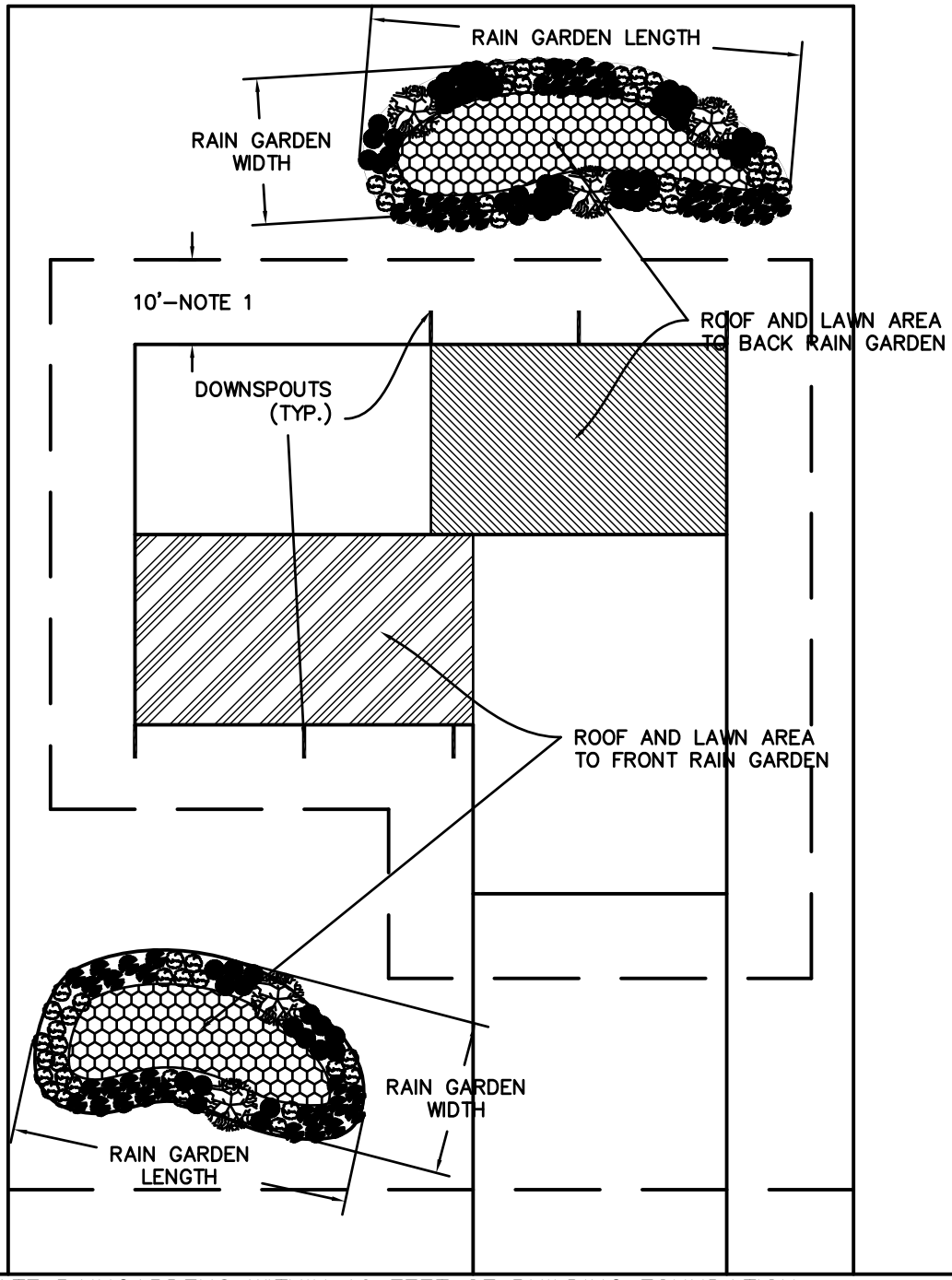
FEB 2013



BIORETENTION AREA SECTION

SCALE: 1" = 5'

CITY OF ORMOND BEACH FLORIDA	LOW IMPACT DEVELOPMENT (LID) CONSTRUCTION DETAIL BIORETENTION AREA	INDEX LID-2 FEB 2013



NOTES:

1. DO NOT LOCATE RAINGARDENS WITHIN 10 FEET OF BUILDING FOUNDATION.
2. ENSURE THAT RAINGARDEN IS PROPERLY SIZED.
3. LOCATED RAINGARDENS IN (NATURAL) LOW SPOUTS, AS POSSIBLE.
4. PLACE RAINGARDENS IN LOCATIONS THAT ALLOW FOR DRAINAGE TO EASILY TRAVEL TO RAINGARDEN AS WELL AS ALLOWING FOR OVERFLOW OF RUNOFF DOWNSTREAM DURING PERIODS OF EXTREME RAINFALL.
5. AVOID CREATING TRIP HAZARDS AND IMPEDING THE FUNCTIONAL USE OF THE PROPERTY.

CITY OF ORMOND BEACH FLORIDA

LOW IMPACT DEVELOPMENT (LID) CONSTRUCTION DETAIL

RAINGARDEN DETAIL (1/2) – LAYOUT

INDEX

LID–3

FEB 2013

CITY OF ORMOND BEACH FLORIDA

LOW IMPACT DEVELOPMENT (LID) CONSTRUCTION DETAIL

RAINGARDEN DETAIL (2/2) – SCHEMATIC

INDEX

LID–4

FEB 2013

BIORETENTION / RAIN GARDEN PLANT SELECTION LIST

Wildflowers, Ferns, Grasses, and Sedges:

1. *Asclepias incarnata,* Swamp Milkweed
2. *Canna flaccida,* Golden canna
3. *Pontederia cordata,* Pickerel Weed
4. *Eupatorium coelestinum,* Blue mistflower
5. *Helenium pinnatifidum,* Everglades daisy
6. *Lobelia glandulosa,* Glades lobelia
7. *Sabatia* spp., Marsh pinks
8. *Acrostichum danaefolium,* Leather fern
9. *Osmunda regalis* var. *spectabilis,* Royal fern
10. *Thelypteris palustris,* Marsh fern
11. *Woodwardia virginica,* Virginia chain fern
12. *Muhlenbergia capillaris,* Gulf muhly grass
13. *Aster carolinianus,* Climbing aster
14. *Asclepias tuberosa*, Butterfly weed
15. *Iris virginica*, Blue flag iris
16. *Coreopsis lanceolata,* Tickseed
17. *Spartina bakeri*, Cordgrass
18. *Muhlenbergia capillaries,* Muhly grass
19. *Osmunda cinnamomea*, Cinnamon Fern
20. *Chasmanthium latifolium,* River Oats
21. *Osmunda regalis*, Royal Fern
22. *Hibiscus coccineus*, Scarlet Hibiscus
23. *Rudbeckia hirta*, Rudbeckia
24. *Veronia gigantea*, Ironweed
25. *Solidago sp*, Goldenrod

Trees and Shrubs:

1. *Acer rubrum* var. *trilobum,* Red maple
2. *Annona glabra,* Pond apple
3. *Betula nigra,* River birch
4. *Cephalanthus occidentalis,* buttonbush
5. *Chrysobalanus icaco,* Cocoplum
6. *Gordonia lasianthus,* Loblolly bay
7. *Hibiscus grandiflorus* Swamp Hibiscus
8. *Ilex cassine,* Dahoon holly
9. *Ilex glabra,* Galberry
10. *Ilex vomitoria,* Yaupon Holly
11. *Itea virginica,* Virginia Willow
12. *Magnolia virginiana,* Sweetbay magnolia
13. *Myrica cerifera,* Wax myrtle
14. *Myrsine floridana,* Myrsine
15. *Nyssa sylatica,* Black gum
16. *Pinus palustris,* Longleaf pine
17. *Sabal palmetto,* Cabbage palm
18. *Sabal minor,* Dwarf palmetto
19. *Salix caroliniana,* Coastal plain willow
20. *Sambucus canadensis,* American elderberry
21. *Serenoa repens,* Saw palmetto
22. *Styrax americana,* snowbell
23. *Taxodium ascendens,* Pond cypress
24. *Taxodium distichum,* Bald cypress
25. *Viburnum obovatum*, Walter's Viburnum

BIORETENTION / RAIN GARDEN PLANT SELECTION LIST

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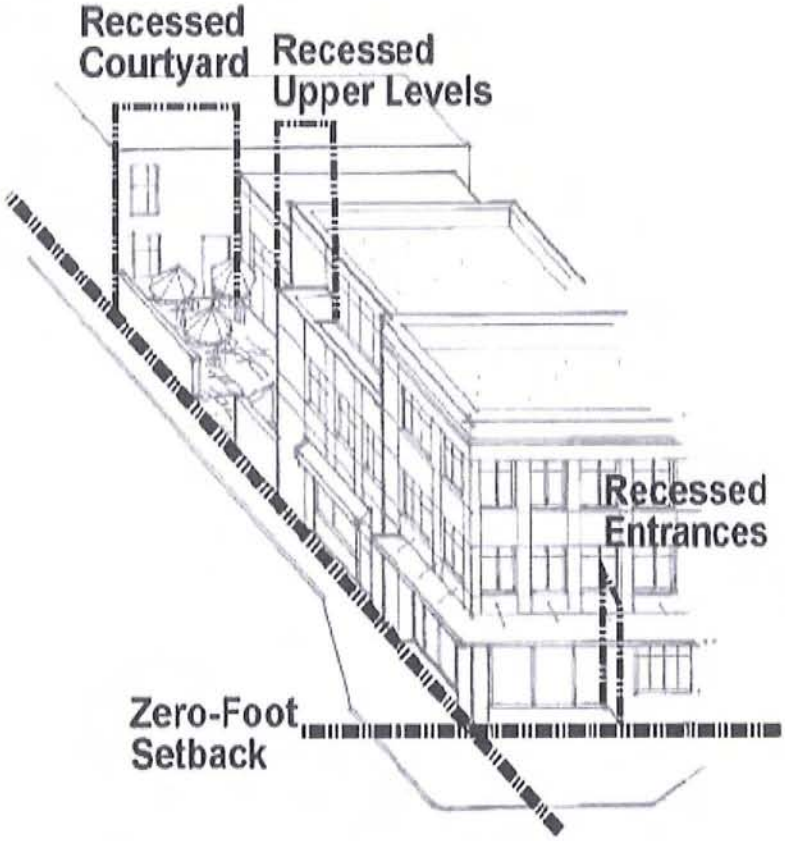
ORMOND BEACH DOWNTOWN DESIGN GUIDELINES



May 2010

Prepared by the Ormond Beach Planning Department

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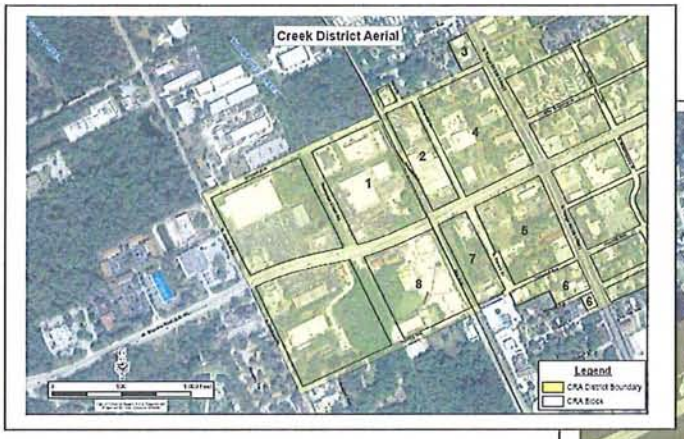
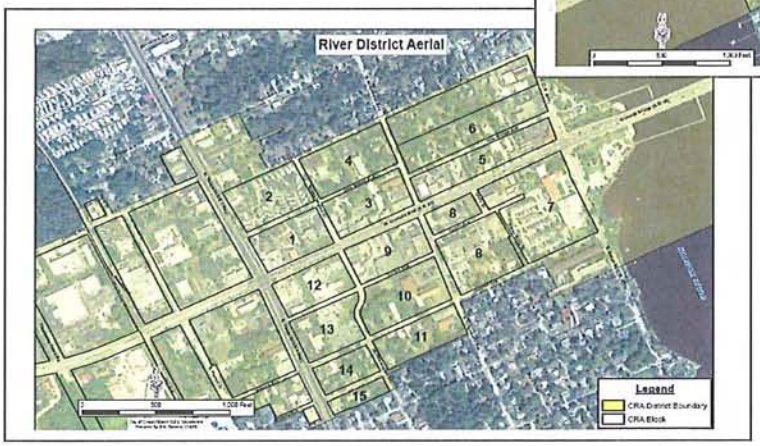
ORMOND BEACH DOWNTOWN DESIGN GUIDELINES

A. DOWNTOWN AREA: The design guidelines set forth below apply to those properties located in the Ocean, River and Creek Districts of the Downtown Redevelopment Area. While the Creek District is located within the Downtown Redevelopment Area, the plan calls for properties in this area to be built in a more suburban design. Consequently, the citywide design styles mandated in the Land Development Code apply to the Creek District. Financial assistance however is eligible for the Creek district.





B. REDEVELOPMENT AND INFILL EMPHASIS: Within the River, Ocean, and Creek Districts of the downtown, any parcel which is currently vacant or has one floor level, is considered an underutilized parcel and redevelopment to a greater intensity is advocated. Assistance is available to properties which renovate to architectural standards that either are consistent with and further the Redevelopment Plan or are considered not inconsistent with the plan. Financial assistance is not available to properties which are considered inconsistent with the Redevelopment Plan. The Ormond Beach Community Redevelopment Agency (OBCRA) provides funding through the Property Improvement Assistance Program to assist redevelopment and infill development. Existing buildings that further or are not inconsistent with these design guidelines are also eligible for financing assistance from the CRA.

C. STYLE: There is no one style advocated in the Ocean and River Districts of the Downtown area. Style will be determined by the design principles set forth herein as applied to the buildings and the streetscape. Architectural

stylizations, building setback, scale, proportion, and surface pattern are design treatments that are important in revitalization or new construction activities. Each façade should include: horizontal expression lines that define the base and cap of the building; cap type, orient windows vertically in upper floors and define edges of each window; and vertically divide the façade into segments no greater than 30 feet. The ultimate success or failure of any design proposal is determined by the ability of the property owner to artfully combine a variety of design elements into a design package that is consistent with and furthers the vision articulated in the 2008 Downtown Redevelopment Master Plan Update.

D. SETBACK: The pattern of building setback within the Ocean (Granada) and River Districts (Granada, New Britain, Tomoka, and the intersecting streets of Ridgewood, Lewis, and Washington) of the Downtown area should have a build to line (BTL) setback established at four (4) feet from the existing rights-of-way line on Granada Blvd. to allow for widening of the sidewalk where considered appropriate or to promote depth variation in storefront placement. A setback of 20 feet from the BTL for the purpose of providing building articulation or courtyard space or an outdoor café seating is permitted. Increased setbacks shall not be permitted for the purpose of placing parking in the front of the building

E. SCALE: New construction proposals must conform to the minimum building height of two stories in the River District and three in the Ocean District of the Downtown.

West Granada Boulevard
(River District)

East Granada Boulevard (Ocean District)

F. MIX USE AND PARKING: The effects of minimum parking requirements on mix use development are well documented. Nelson/Nygaard, a national consultant in downtown redevelopment, believes that minimum parking requirements reduce streetscape quality, promotes auto traffic, reduces development feasibility, discourages innovation, reduces density and intensity of development, diminishes economic vitality, and discourages mix use development. The Redevelopment Plan for the downtown calls for mix use buildings with residential above ground story commercial storefronts. Couple parking minimums with construction costs for mixed-use development which currently exceed those for similar sized, single-use buildings, it is understandable why the City is providing financial incentives and alternative parking solutions for the downtown. Due to usually higher densities and intensities in mixed-use developments, parking space requirements are likely to exceed those of a pure residential development. Thus, mixed use

projects that are sited close to transit should experience a reduction in parking requirements as well as innovative solutions such as shared parking should be promoted. While the current transit routes lack adequate headway and frequency, there is a 10 year plan by Votran to increase both the frequency and headways of the core routes which service the downtown and commercial corridors the City is promoting mix use development.

To demonstrate how a mix use development can be accommodated, a productivity analysis was performed on a typical size lot in the River District. In the example depicted, a 25,000 square foot lot is proposed with 10,000 square feet of non-residential floor area and twenty (20) units for the upper story of the building. Each unit is to have on average 750 square feet of floor area necessitating this building to be at least 2 stories. In this analysis, 80 parking spaces should be accommodated on site but the analysis indicates a deficit of 15,500 of site area. Consequently, this development would not work as presently planned and would need to be scaled back to approximately 10 units and around 6200 square feet of non-residential space. However, this development could be accommodated using the shared parking provision provided for in the Downtown Overlay District.

MIX USE PRODUCTIVITY ANALYSIS

Site Area (SF):	25,000	– Enter here
Proposed # of Upper Story DU's:	20	– Enter here
Proposed Ground Floor Retail SF:	10,000	– Enter here
Proposed floor area per unit:	750	– Enter here
Proposed parking ratio per 1000 SF	.5	– Enter here
Proposed parking ratio per DU	1.5	– Enter here
Maximum ISR	90%	– Enter here
Proposed drainage area (%):	10%	– Enter here
Land Dedications	0	– Enter here
Residential Floor Levels	2	– Enter here
Parking Levels	1	– Enter here
Projected FAR %	100%	

STEP #1: ESTIMATE OF DEVELOPABLE SITE AREA

TOTAL site area (sf),	25,000
TIMES Maximum ISR	22,500
MINUS Required Property Dedications	0
MINUS Drainage Area (sf)	2,500
EQUALS Total Developable Area (sf)	20,000

STEP #2: PROJECTED NUMBER OF UPPER STORY RESIDENTIAL FLOORS

TOTAL number of upper story units,	20
TIMES floor area per DU,	750
EQUALS total residential floor area	15,000
EQUALS # of upper floors needed based on ground floor envelope.	1.50

STEP #3: ESTIMATE OF PARKING REQUIREMENTS

REQUIRED parking for ground floor commercial space;	50
REQUIRED parking for upper story residential units;	30
EQUALS total parking spaces required;	80
DIVIDED BY Number of Parking Levels	1
EQUALS Site Coverage, Parking	28,000

Step #4: ESTIMATE OF DRAINAGE REQUIREMENTS

TOTAL site area;	25,000
TIMES drainage percentage	2,500

STEP #4: ESTIMATE OF SITE PRODUCTIVITY

TOTAL SITE AREA	25,000
MINUS Site Coverage, Buildings	10,000
MINUS Site Coverage, Parking	28,000
MINUS land dedications	0
MINUS Drainage Set aside	2,500
EQUALS Surplus\(Deficit) Site Area	-15,500

In the example above, the deficit area is roughly half of the parking area; therefore it can be assumed only ½ of the parking can be accommodated on site. Since there is very little demand for parking between the hours of 12 pm to 7 am., all of the residential parking could be provided on site plus 10 spaces could be allocated to another use that requires parking between the hours of 6 pm to 12 am. The retail use would require 50 parking spaces during the peak hours (7 am to 6 pm) from which 10 spaces would come from the city parking lot. Between the hours of 6 pm to 12 pm, 3 spaces could be allocated for evening use elsewhere. To determine how this would work from an entire city block perspective, assume 8 lots involving 2 retail uses, 3 restaurants, 1 office, 1 residential use and the above mix use project identified as Lot A8. Tables 1 and 2 provides an accounting ledger that would take place by the city to balance the parking demand based upon the time period requiring the highest peak of parking per use.

TABLE 1

			Spaces Required				On-Site Spaces			Spaces from Bank			Spaces Provided			Spaces Banked		
Lots	Use	Site Sp.	Total	12-7am	7am-6pm	6pm-12am	12-7am	7am-6pm	6pm-12am	12-7am	7am-6pm	6pm-12am	12-7am	7am-6pm	6pm-12am	12-7am	7am-6pm	6pm-12am
A1	Retail	12	20	0	20	10	0	12	10	0	8	0	0	20	10	12	0	2
A2	Rest.	15	30	15	21	30	15	15	15	0	6	15	15	21	30	0	0	0
A3	Retail	10	16	0	16	8	0	10	8	0	6	0	0	16	8	10	0	2
A4	Rest.	10	20	10	14	20	10	10	10	0	4	10	10	14	20	0	0	0
A5	Rest.	10	30	0	15	30	0	10	10	0	5	20	0	15	30	10	0	0
A6	Off.	30	50	0	50	0	0	30	0	0	20	0	0	50	0	30	0	30
A7	Res.	30	50	50	25	40	30	25	30	20	0	10	50	25	40	0	5	0
A8	Mix.	40	80	30	50	37	40	0	37	0	10	0	30	50	37	10	0	3

TABLE 2												
Lots	Spaces Provided			Spaces Withdrawn			Spaces Deposited			Balance		
	12-7 am	7 am – 6 pm	6 pm – 12 am	12-7 am	7 am – 6 pm	6 pm – 12 am	12-7 am	7 am – 6 pm	6 pm – 12 am	12-7 am	7 am – 6 pm	6 pm – 12 am
A1				0	8	0	12	0	2			
A2				0	6	15	0	0	0			
A3				0	6	0	10	0	2			
A4				0	4	10	0	0	0			
A5				0	5	20	10	0	0			
A6				0	20	0	30	0	30			
A7				20	0	10	0	5	0			
A8				0	10	0	10	0	3			
Public	50	50	50									
Parking	50	50	50	20	59	55	72	5	37	30	(4)	32

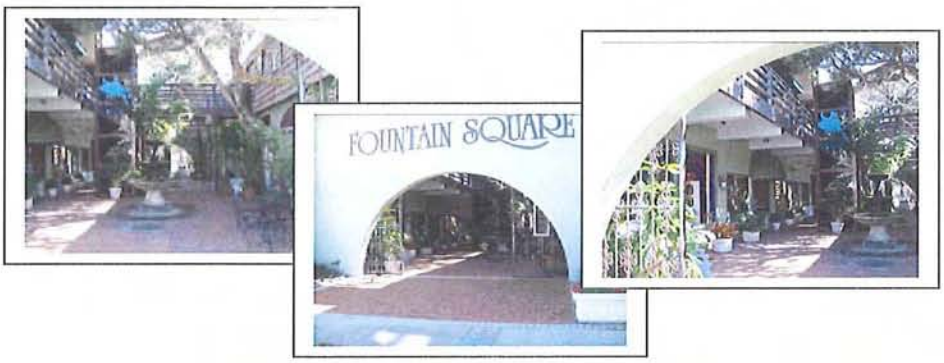
G. PROPORTION: Buildings in the Ocean District (south side) of the downtown tend to emphasize a vertical bias. Buildings on the north side of the Ocean District and throughout the River District are mixed but overall emphasize a horizontal bias. The Buschman building emphasizes a vertical bias and can be observed in window openings, facade shapes and detailing that guides the eye upwards. Conversely, modern buildings in the downtown appear to hug the ground. This horizontal emphasis is created by building shapes and window openings that extend in a direction parallel to the ground (Caffenes). Greater emphasis must be placed on vertical rather than horizontal orientation in order to promote a greater balance and depth along the overall streetscape. New one story horizontal construction is inconsistent with the vision for the River and Ocean Districts of the Downtown area. A ratio of 3:1 horizontal to vertical shall be maintained.

Caffenes – horizontal bias

Buschman Building – vertical bias

H. WALL AND WINDOW PATTERN: Alternating walls and openings create patterns in the building face and streetscape. Balanced or symmetrical spacing of windows and doors should be a common standard to adhere to in the downtown. Irregular spacing of these elements can detract from storefront appearance. Blank walls shall not be permitted along a pedestrian sidewalk or roadway.

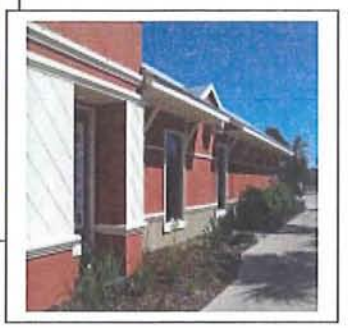
Where interconnecting walkways from the rear streets (Tomoka and New Britain) to buildings fronting on Granada Blvd. occur in mid-block areas, the side wall faces shall not be blank walls.



I. FRONT FAÇADE: Building skyline silhouettes can contribute an interesting pattern to the streetscape. Framing on some of the buildings in the downtown was carried above the roofline in the form of a false-front or parapet wall. This same technique of adding skyline interest can be used on buildings or designs that feature flat cornices. Besides creating interest at the skyline, a false front provides a large shaped area for signage. Pattern is also created by the articulation, or "insets and outsets" of the building facade.

Flat, unbroken wall surfaces are discouraged in favor of articulated exterior wall surfaces. Typical features that provide the opportunity for varied planar wall surfaces include indented bays, window and door openings, skyline profile, and cornices. Wall treatments that can create planar variety include but are not limited to boards, siding, and window and door trims. Relief detailing of this nature makes a lively and interesting pattern when worked into building facade design. Building profiles for both existing structures and proposed new construction should advance an animated, imaginative skyline through means of massing and articulation. Acceptable profiles include the common flat-frontal elevation. To ensure architectural interest, a series of storefronts as part of one building or individual buildings on self-contained lots should not all have the same setback depth. A variation of up to five feet creates effects that contribute to the liveliness of the overall streetscape. Wall surface should also feature articulated elements.

J. SIDE AND REAR FAÇADES: A building's front facade is the most important; however side and rear facades should also be finished in a manner consistent with the chosen front façade design. Acceptable exterior wall treatments for side and rear facades include horizontal hardiplank boarding, brick, stucco, and synthetic sidings. All designs for new buildings or renovations shall consider the finished appearance of side and rear facades. This is particularly important for buildings located on a corner or with reverse frontages where access is from New Britain or Tomoka.



K. EXTERIOR WALL MATERIALS AND ELEMENTS: Buildings in the downtown are principally constructed from wood frame construction or masonry block with stucco finishing. Wood material is extremely difficult to maintain. New development or redevelopment shall not use natural wood, metal panels, synthetic materials, or unpainted block as exterior wall treatments. Exterior finish of new buildings should consist of traditional materials which are conducive to the city's beach environment. Hardiplank siding, stucco, split face decorative block, or brick are good choices for exterior materials. Materials should be of a substantial nature to limit the effects of weathering and/or vandalism. Details should be sensibly designed to make certain that all portions of the building facade exposed to weathering are watertight. Large expanses of highly reflective wall surface material and mirrored glass on exterior walls cause heat and glare impacts on adjacent properties and the public right-of-way. In addition, such reflective mirror glass causes aesthetic as well as visual concerns along the public right-of-way. Consequently, use of such reflective walls or mirrors is prohibited. Building code requirements for wind loading, and fire prevention standards apply.

If used, hardiplank siding should cover all sections of the entire exterior wall, or should extend from roofline to display window level. The treatment is designed to highlight the support wall under a display window through the use of decorative paneling. Embellishments such as moulding or decorative siding applications shall be used. Horizontal board siding with trim should be used for windows and doors. Paint and stain finishes consistent with the palette colors chosen for the downtown shall be utilized. Vertical siding applications could be applied to the side façade only. If used, masonry with stucco finish and brick provide excellent low maintenance surfaces and are acceptable as finishes to new construction. Designs for masonry will blend more successfully with the downtown if they follow traditional masonry applications. Smooth exterior wall materials such as stucco or brick should extend down to the window level. Bulkheads should feature a drip cap to prevent water seepage from getting behind the wall surface below display windows. In general, cast concrete or concrete block is discouraged on front facades because they inhibit the opportunity for surface articulation. In rare cases cast concrete or concrete block will be allowed, however these types of materials must have a higher grade exterior finish in appearance. Other exterior materials may be utilized in order to promote a modern appearance unique to the design advocated by the property owner; however the exterior treatment must be consistent with a design package that furthers the vision articulated in the Downtown Redevelopment Plan.

L. WINDOWS: Windows are a key element in expressing the character of a building. Two types of display windows are advocated. The **first** features a large opening divided by wooden or metal muntin bars and filled with smaller panes of glass.

The **second** type features a large, solid plate glass topped by a ribbon of smaller transom window(s). Precedent exists for bay window treatments in the downtown commercial architecture of Ormond Beach (58 East and 11 West Granada Blvd.). Upper story window openings should not be inconsistent with the ground level windows. Whenever possible, window sashes on older buildings should be retained. If thermal upgrading is necessary, snap-in muntin insets that copy the original muntin pattern should be used. In new construction, more modern window applications may be used but window types used in suburban style development shall not be permitted. For commercial uses on the ground floor, windows should be constructed of clear or lightly tinted glass (no tinting above 20% or reflective mirror type glass).

M. DOORS AND STOREFRONTS: Doors and storefronts provide opportunities for creating an inviting building appearance. Typically, commercial buildings in a downtown have either metal framed doors with fixed glazing or wooden, paneled doors with fixed glass panes. Additional glazing is sometimes put above the door in the form of transom windows. Vertically rectangular panes of glass set in metal or wood, known as sidelights, are frequently placed to either side of the entrance to give more light to the interior. Trimming and capping of doors should follow the pattern established by window treatments. If a thick, single sheet of glass has been used as a door, the glass could be lettered or decaled to create a more inviting impression. When an object is decaled or stenciled without lettering, such object shall not be considered a sign.

N. ORNAMENTATION: New or existing buildings in the Downtown area shall use exterior wall materials, surface planes and textures for opportunities to create ornamental details. Exterior wall materials must be consistent throughout the building facade. Materials including hardiplank and stucco are advocated for contemporary infill but other materials may be approved. Surface plane and texture variations shall be used to add interest to the building facade. Detailing and window trim must be utilized to enhance the features of the building. Indented bays or projecting bay windows are other ways to provide planar variety. Textures such as hardiplank sidings or smooth stucco should be used to feature varied planes in the form of ornamental trims or copings. Other ornamental considerations in the design of the building facade include awnings and signage.

O. ROOFS: Downtown roof characteristics include front and side-end gables with pitch, hip, mansard and flat roofs. Incorporation of geometrical false fronts or parapet walls shall be used on buildings with flat roofs. When placing HVAC and other equipment on the rooftop, such equipment shall not be seen from the view of the public. Finally, roof material should reflect the style proposed. Materials such as wood shakes or corrugated metal panels are not permitted. Acceptable roof materials include: dimensional shingles, tiles, slates, or standing seam metal.

P. CORNICE TREATMENTS AND SKYLINE ARTICULATION: Cornices are a molded projection which crown or finishes the part to which it is affixed. Hardiplank and stucco-finished buildings should incorporate cornices as terminating features of the wall-roof junction. Cornices for existing buildings clad in siding could be as simple as a single horizontal board of "I" thick stock fastened to the top of the fronting wall, with a 2" thick **cap** covering it at right angles. New construction shall incorporate 3-dimentional cornices. Cornices add interest to the building profile and protect the siding or masonry below from penetration of water from above.

Front facade wall and roof junctions should be articulated to provide interest at the skyline. This can be done with a false front treatment or by building up the roof-wall junction with a series of boards and/or with brackets. Design proposals for renovations and new construction shall acknowledge the importance of the cornice in their concepts, by including cornice elements which produce a lively skyline through the use of projections and vertical variety in the horizontal parapet wall.

Q. LIGHTING ON BUILDINGS: Light fixtures attached to the building face should further the building style. Modern fixtures can be used for contemporary style. If fluorescent lighting is used on a building it should be properly concealed in an attractively designed light-box to minimize its unfinished and glaring effects. Indirect lighting provides a means of inexpensive illumination which is more in keeping with the downtown. Lights in the parking lot and along interior walkways shall incorporate "down" lighting techniques.

R. SIGNAGE: The following considerations should come into play when determining the appropriateness of a sign for a building in the downtown area:

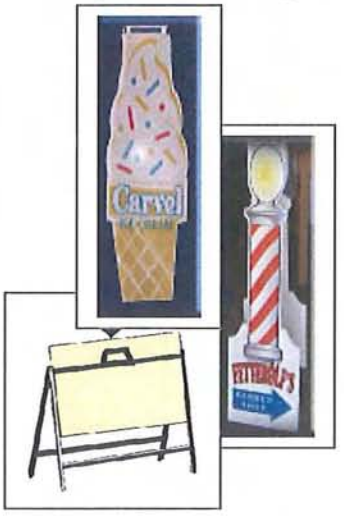
(1) Style:
(2) Design:
(3) Placement:
(4) Size; and
(5) Effect on the streetscape.

Several suburban styles of signage can be found in the downtown currently, however three sign styles shall be permitted:

1) Projecting or hanging,
2) Fascia mounted types,
3) Monument; and
3) Sandwich board signs.

These signs best provide pedestrians and motorists with the ability to easily identify the business from the street level while preserving the downtown area as a sense of place. Sign design should be consistent with and further the decorative features of the building. Signs should not have the "after thought" look. Placing signs in customary locations on the building reinforces the message and, by being in a predictable location, quickly identifies the business to passersby. Size is an important consideration for all signs erected in Ormond Beach. Signs should not overwhelm the facade due to large size. Similarly, signs should not be as small as to be hard to read or out of proportion with the building facade. Maximum allowable sign size is determined by a ratio formula of linear frontage to surface area of sign. The collective effect of building signage on the overall street image must also be considered. An understated rhythm to the look of the streetscape, created by well-designed signage, should prevail. Freestanding and monument signs should only be permitted along Granada Boulevard in the Creek District where suburban type of development is encouraged. Landscaping as part of the overall streetscape shall be designed and placed to ensure visibility for business owners and tenants.

S. SANDWICH BOARD SIGNS: A sandwich board sign is a small, portable free standing sign placed on the sidewalk close to a storefront which acts as additional advertising for the business. Sandwich board signs are permissible in the downtown. To ensure consistency in design and materials, sandwich board signs may be constructed of wood, aluminum, heavy gauge plastic or metal and should be sturdy enough to withstand reasonable wind loading conditions without blowing over. Maximum allowable dimensions are 2 feet wide by 3 feet high. Sandwich board signs shall be allowed only in areas where they do not constitute an undue impediment to pedestrian traffic on the sidewalk and during business hours only. Sandwich board signs shall not require a sign permit from the city.



T. AWNINGS AND CANOPIES

Awnings, canopies and arcades protect pedestrians, sidewalks and the lower building facade from rain and sun exposure. Sidewalk coverings also provide the opportunity for signage and attractive decorative highlights within the downtown area. When a canopy or

awning is proposed to extend past the property line, liability insurance must be provided, and an indemnity waiver agreement must be filed with the entity that has jurisdiction of the rights-of-way. On Granada Blvd, the rights-of-way are controlled by the Florida Department of Transportation. On the intersection side streets such as Ridgewood, Lewis, Washington, New Britain, and Tomoka, the jurisdiction is Ormond Beach. A variety of awning or canopy sizes, shapes, material and color are encouraged to lend a sense of individuality and animation to the distinct building facades. To incentivize the use of such window and door treatments, symbols and the name of the business placed on such signs shall not be used in the calculation maximum signage permitted on a front or corner façade when facing a street.

U. COLORS

Applicants may choose up to four colors for a single building (one or two primary colors, one or two secondary or trim colors, and one accent color; these may not all be the same). Architectural elements on the building façade, such as canopies, balconies, and arcades, shall be the same color as one of the four chosen building colors, except where constructed with a permitted material such as stone or brick that is left unpainted. Benjamin Moore's Color Palette Fan is used for reference, but any manufacturer's paint is acceptable if substantially the same in color.

Primary Colors are used on building walls, freestanding walls, and other primary building elements, and shall be used for no less than 70% of the painted surface area of any one floor of the building. Recommended but not required: use of two shades of body color – one above and one below the horizontal expression line between the first and second floors. Any of the seven color panels of an individual color strip for the following color ranges may be used as the primary exterior color:

Toned Oranges Golds 001-252
Toned Yellows and Toned Greens 253-497
Toned Greens and Teals 498-742
Teals-Blues and Fresco Pales 743-973
Warm Neutrals and Browns 974-1218
Browns-Reds Blue Violates – 1219-1456
Cool Neutrals and Toned Blues – 1457-1680

Secondary or Trim colors are used on doors, door frames, windows, window frames, storefront frames, and similar features which compliment the primary color. Trim colors shall be used for no more than 30% percent of the painted surface area of the building. Recommended but not required: trim colors usually appear best in a lighter shade than the body color. The lightest four hue color panels on each color strip for the following color ranges should be used as the secondary or trim colors:

Toned Oranges Golds 001-252
Toned Yellows and Toned Greens 253-497
Toned Greens and Teals 498-742
Teals-Blues and Fresco Pales 743-973
Warm Neutrals and Browns 974-1218
Browns-Reds Blue Violates – 1219-1456
Cool Neutrals and Toned Blues – 1457-1680

Accent colors are used to highlight special features or elements such as an individual exterior wall of a four-sided exterior wall painted with primary colors, shutters, handrails, fences, gates, ornamental features, storefront elements, awnings, and other outside appurtenances such as gazebos, etc. The accent color shall be used for no more than 25% of the painted surface of the building. The three mid range color panels between the darkest and lightest hues for the following color ranges shall be used as accent colors:

Toned Oranges Golds 001-252
Toned Yellows and Toned Greens 253-497
Toned Greens and Teals 498-742
Teals-Blues and Fresco Pales 743-973
Warm Neutrals and Browns 974-1218
Browns-Reds Blue Violates – 1219-1456
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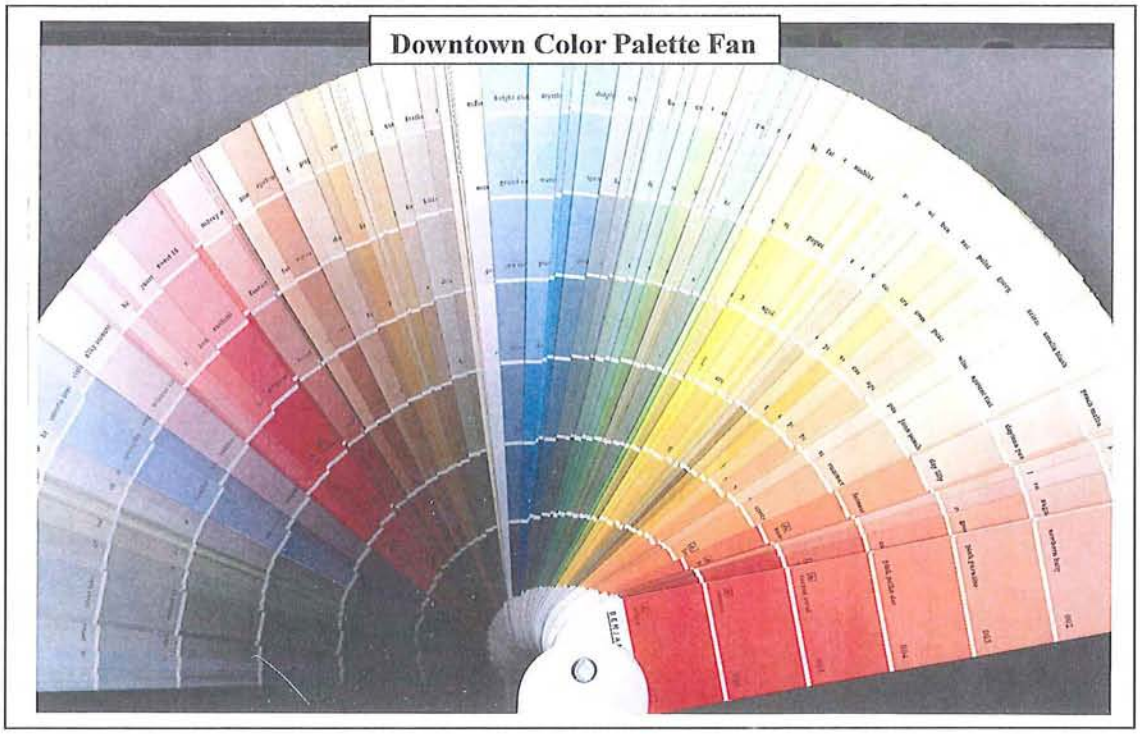

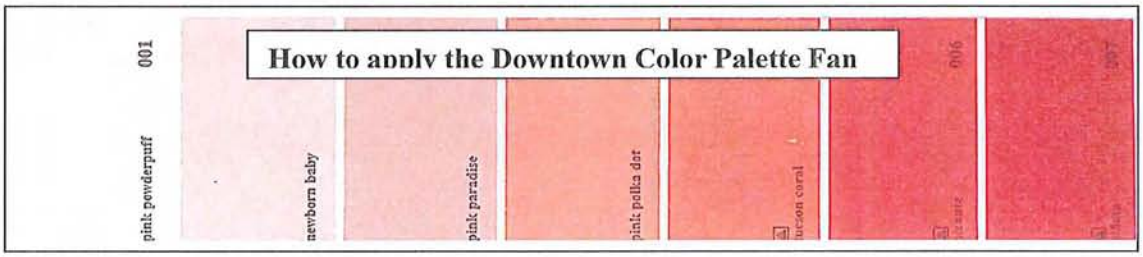

←----------Primary Color – Any 7 of the color panels----------→

←--Secondary Color – Any 4 of the lightest hue color panels ---→

←Accent Color – Any 3 of the mid-color panels→

DOWNTOWN DESIGN MATRIX SCORECARD

	Design Expectations by Element		Staff Comments
	Building Form	Yes=1; No=0	
	A. Setback		
1	Build to line is 4 feet from right-of-way line for parcels located on Granada and within the River or Ocean District.		
2	Build to line is 5 feet from right-of-way line for parcels located on side streets within the River or Ocean District.		
	B. Scale		
1	Minimum Building Height within the River District 2 story.		
2	Minimum Building Height within the Ocean District is three story.		
	C. Building Proportion as part of streetscape		
1	Building has a 3:1 vertical bias.		
	D. Wall and Window Pattern		
1	Balanced or symmetrical spacing of windows and doors.		
2	No blank walls along a pedestrian sidewalk or roadway.		
3	Windows have either glass and aluminum painted storefronts, high quality steel and glass systems, or high quality woods.		
4	Interconnecting walkways (5 foot minimums) from the rear streets to buildings fronting Granada which occur in mid-block areas do not have blank walls.		
	E. Front Façade		
1	When parapet walls are proposed, changes in wall heights and configurations are provided.		
2	Exterior elements such as banding and applied detailing are included on all sides of a building with exposure to the public viewshed.		
3	The main façade incorporates columns, arches, arcades, and articulation of individual storefronts within the larger façade.		
4	Building facades have a repeating pattern that includes elements of color, texture, and material changes. A street wall façade contains offsets, reveals, or projecting ribs. At least one element repeats horizontally. All elements repeat at intervals of no more than 30 feet, either horizontally or vertically.		
5	The wall surface is well articulated through intrastory banding, building base course, parapet wall, structural elements, indented bays, door way recesses, cornices and window/door/sills.		

6 Buildings facing the public viewscape avoids monolithic or non-descript horizontal treatments that accentuate the single tenant status.

7 If height is to be used to differentiate massing blocks, then the minimum height change is 10 feet. If parapet walls are used, must be designed with three dimensional cornice treatment.

8 Facades must incorporate wall plane projections or recesses. Building facades include a repeating pattern that includes color, texture, and material changes while maintaining a comprehensive design theme.

9 A series of storefronts as part of one building or individual buildings on self-contained lots do not have all the same setback depth.

F. Side and Rear Facades

1 Side and rear facades are finished in a manner consistent with the chosen front facade design.

2 Corner buildings (side) or buildings with reverse frontages (rear) visible from the street must have the same high finish façade as the front façade.

G. Utility and Mechancial Equipment

1 HVAC equipment placed behind a parapet wall cannot be seen by the public at ground level.

2 HVAC equipment placed on the ground is screened from the public view.

H. Exterior Wall Materials and Elements

1 Buildings are principally constructed from hardiplank or masonary block with stucco finishing.

2 Materials used are of substantial nature to limit effects of weathering and/or vandalism.

3 Details are sensibly designed to ensure all portions of the building facade exposed to weathering are watertight.

4 If hardiplank is used, all sections of the entire exterior wall is covered from roofline to display window level.

5 Downtown palette colors are used.

6 Vertical siding is applied only to side facades only and not visible from public viewscape.

7 If masonry is used, the surface application is smooth.

8 Bulkhead have a drip cap to prevent water seepage from getting behind the wall surface below display windows.

9 If concrete block is used, a high exterior finish in appearance must be applied.

10 The exterior treatment is consisent with design package when a more moderne appearance is desired.

11 Reflective walls or mirrors are not proposed.

I. Windows

1 Windows have large openings divided by wooden or metal muntin bars and filled with smaller panes or glass.

2 Windows have a large, solid plate glass topped by a ribbon of smaller transom windows.

3 Window sashes on older buildings are retained.

4 Snap-in muntin insets are used to copy the original pattern if thermal upgrading is needed.

5 More modern window applications may be used but suburban style shop windows not used.

6 For commercial uses on the ground floor, windows are constructed of clear or lightly tinted glass (no tinting above 20% or reflective mirror type glass).

J. Doors and storefronts

1 Storefront is combined with other elements such as arcades and/or columns to enhance the pedestrian shopping experience.
2 Metal framed doors with fixed glazing or wooden, paneld doors with fixed glass panes are used.
3 Transom windows are used.
4 Vertical rectangular panes of glass set inmetal or wood, known as sidelights, are placed to either side of the entrance are used.
5 Trimming and capping of doors follow the pattern established window treatment.
6 Buildings located at the corner of two intersecting streets shall have the building entry located at the corner.

K. Ornamentation

1 Surface plane and texture variation is used to add interest to the building facade.
2 Detailing and window trim or other ornamental considerations are utilized to enhance the features of the building façade.

L. Roofs

1 Gables with ptich, hip, mansard or flat roofs are proposed.
2 Geomentrical false roofs or parapet walls are used if flat roof is used.
3 All mechanical equipment not seen from roof.
4 Roof material reflects style proposed.

M. Cornice and Skyline Treatment

1 New construction incorporates 3 dimentional cornice.
2 Front façade wall and roof junctions are articulated.
3 Cornice includes the use of projetions and vertical variety in the horizontal parapet wall.

N. Lighting, signage, awnings, and canopies

1 Light fixtures consistent with building style.
2 Light spill over at the property line shall not exceed .5 foot-candles
3 Lights in parking lot and interior walkwasy incorporate down lighting techniques.
4 Signs are projecting, hanging or fascia mounted, or monument.
5 Signs are designed to part of overall style of building and do not have the "after thought" appearance.
6 If sandwich board sign is contemplated, the sign is portable, made of wood, aluminum, heavy guage plastic or metal, and able to withstand windy days.
7 Awnings, canopies or arcades are used.
8 Height of light fixtures shall be a maximum of 20 feet in vehicular areas and 12 feet in pedestrian areas measured from finished grade.
9 Lighting under awnings, canopies, etc., shall be recessed and have flat glass lenses.
10 Pedestrian walkways shall be lighted and fixture shall be consistent with and further the overall lighting design package for the vehicular area.

O. Fencing

1 Parking must be placed to the rear or it may be placed on the side of a building but the street-wall must be designed to screen the view of vehicles from the principal street. The street-wall must be designed with the same building materials as the principal building.

2 Outdoor seating areas shall be required to have a definable perimeter.

3 Dumpster shall be enclosed with a masonry wall and the building materials shall match the principal building.

4 The use of wood or chain link is not permitted for any fencing purpose

P. Pedestrian Access

1 All buildings which do not meet the BTL setback shall have direct pedestrain access that leads from the public sidewalk to the building's main entrance.

2 The minimum width of sidewalk shall be 5 feet.

3 Pavement markings shall occur at crossings of vehicular use areas

4 All sidewalks that are not within the public ROW shall be concrete with brickina bandina

Q. Colors

1 Primary Colors - No more than 70%; 2 Primary colors may be used; The darker or body colors should be used by any 7 of the color panels on a color identification number may be used.

2 Secondary Colors - No more than 30%; 2 Secondary colors may be used; Mid panel colors should be used but if a lighter hue is used as a primary color then adjustments to a darker color will be needed as a secondary color

3 Accent Colors - No more than 25%; 1 Accent Color may be used; The lightest of the hues should be used but adjustments may be required based upon what is used as primary and secondary colors.

4 Primary, Secondary, and Accent colors shall not come from the same color identification panel.

ORMOND BEACH MULTI-MODAL STRATEGY

Prepared by: Ormond Beach Planning Department
Originally Adopted by Ordinance # 2010-31 dated 6.1.10
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1. Introduction

The Volusia County MPO will be completing the 2035 Fiscally Constrained Transportation Plan in 2010. Results from community "Make Your Mark" meetings and Long Range Transportation Plan (LRTP) Committee meetings indicate that the 2035 Fiscally Constrained Transportation Plan will not adequately meet projected county or Ormond Beach needs.

During the preparation of the City's Evaluation Appraisal Report (EAR) to the Florida Department of Community Affairs, it was clear that the City, County and State could no longer afford to continue widening roads within Ormond Beach without substantial cost both in terms of right-of-way and business damages. As such, staff indicated that a more balanced approach to the future transportation needs of Ormond Beach was needed. Less emphasis on roadway capacity improvements and increased emphasis on making existing roads more efficient while improvements to transit and non-motorized modes as well better intermodal connections and network connectivity were needed.

In 2009, the Legislature passed SB 360ER. This bill designated dense urban land areas (DULAs) and one of the definitions of DULA was an area having over 1000 people per square mile. Pursuant to that bill, the Florida Legislative Office of Economic and Demographic Research transmitted to the Department of Community Affairs on July 1, 2009, a list of counties and municipalities including the City of Ormond Beach, as qualifying for DULA status. Ormond Beach as a DULA is automatically designated a Transportation Concurrency Exception Area (TCEA). A designation of a citywide TCEA means that state concurrency no longer applies to development provided the City has a multi-modal strategy approved and adopted in its Comprehensive Plan within two years of the bill's passage. However, Ormond Beach can elect through its home rule powers to be more stringent.

The multi-modal strategy has been prepared as a balance between all roadway capacity improvements and all vehicle reduction strategies. **Table 1**, on Page 2 of this strategy, depicts a matrix cross-referencing transportation themes advocated in the Transportation Element of the draft 2025 Comprehensive Plan with the multi-modal strategies of increased roadway capacity, achieving more efficiency out of the existing roadway system, reducing vehicle miles traveled and most importantly land use considerations.

In summary, the multi-modal strategy advocated in this document is simplistic in planning terms. The strategy is to locate three Transportation Concurrency Exceptions Areas (TCEAs) along three transit routes which are considered part of Votran's Eastside spine network. These transit routes are on roadway corridors which the city considers constrained as it relates to capacity improvements. Widening of these roads would be inconsistent with the context sensitive design normally attributable to a city. One of three roadway corridors which traverse the downtown is currently operating at a lower level of service than the adopted level of service. To enhance service, the City intends to improve connectivity for non-motorized modes of travel through the adoption of sidewalk level of service standards. To increase the potential of ridership, the City is proposing to increase densities and intensities along the three roadway corridors by requiring mixed use, horizontal development, and build to line standards for new development. Adherence to FDOT Transit Oriented Design Guidelines along with Votran's Transit Design Guidelines serves as guidelines for development along US1, SR 40, and A1A. A form based code is planned for that portion of SR40 which is in downtown. Enhanced transit, better connectivity, and increased attention to better form and land use are the foundation of the multi-modal strategy. In all other areas concurrency is required, and mitigation of impacts must occur. However, the only change is that mitigation may include transit options where before such an option did not exist. Finally to fund the strategy, a transit and non-motorized fee is advocated. Revenues and expenditures were projected based upon the amount of vacant land and expected development over the 15 year horizon of the Comprehensive Plan. Funds generated are less than the projected expenses but because transit routes have multiple jurisdictional benefits, the City's share of the total costs is limited by its ability and funding capacity. While the fees are new fees, they replace the Proportionate Fair Share contribution required for mitigation on SR40, US1, and A1A.

2. Strategies to Implement the Roadway Vision Plan

Travel by auto, transit, and bicycle all rely on the roadway system, making the roadway a key element in Ormond Beach's multi-modal transportation system. Consequently, a 2010-2025 Near and Long Term Roadway assessment was conducted of local, state, and county roadways within Ormond Beach to determine existing and projected conditions. (**See 2010-2025 Near and Long Term Assessment attached to end of this strategy**). An earlier assessment from 2007-2017 was conducted as part of the City's Evaluation Appraisal Report (EAR) which is required by DCA every 7 years. In 2007, the City had two road corridors which had at least one failing link. These roads were Clyde Morris Boulevard and Tymber Creek Road. Both of these roads are county roads but land use approvals are principally made in Ormond Beach. Volusia County and Ormond Beach funded improvements to Clyde Morris Boulevard which have been completed. Once Tymber Creek road is completed, all 2010 failing links will operate at acceptable LOS. Projected 2017 and 2025 roadway deficiencies with at least one failing link includes A1A, US1, SR40, Hand Avenue, Tymber Creek Road and Williamson.

Table 1- Multi-Modal Strategies Promoted by Theme

Themes	Increased Roadway Capacity	Efficiencies out of existing roadway system	Vehicle Reduction Strategies	Land Use
ROW Preservation	x			
Access Management		x		
TCEA		x		
Multi-modal strategy			x	
Context sensitive design			x	
Transit Oriented Design				x
Concurrency	x	x	x	
Sidewalks & Trails			x	
TDM			x	

FDOT completed a 2008 SR40 Feasibility Study[1] and concluded that SR 40 currently operates at adverse conditions during the daily (Interstate 95 to Nova Road) and p.m. peak hour (Tymber Creek Road to Williamson Boulevard). The future YR 2025 roadway capacity analysis indicates that two (2) sections will operate adversely along SR 40 (Breakaway Trail to Williamson Boulevard and Clyde Morris Boulevard to Nova Road). The roadway network alternative #1 focused solely on the widening of SR 40 to alleviate the anticipated adversities. This analysis concluded that even an 8- lane section would still maintain an adverse condition in the YR 2025. Roadway network alternative #2 focused on creating a viable parallel corridor, Hand Avenue, to alleviate the adversities along SR 40. This analysis concluded that extending the 2-lane Hand Avenue across Interstate 95 would not by itself alleviate the adverse conditions on SR 40. Roadway network alternative #3 focused on creating Hand Avenue as a viable parallel corridor by widening to a 4-lane section, to alleviate the adversities along SR 40. This analysis concluded that the combined capacities of SR 40 (combination of 4 and 6 lane sections) and Hand Avenue (4-lane section) would accommodate the future YR 2025 traffic demand. Roadway network alternative #4 reduced alternatives #3 to the minimum number of lanes required to accommodate the future traffic demand. This analysis concluded that the combined capacities of S.R. 40 (combination of 4 and 6 lane sections) and Hand Avenue (combination of 2 and 4 lane sections) would accommodate the future YR 2025 traffic demand. Based on the conclusions of the analysis, it is recommended that future considerations to the widening of the S.R. 40 corridor would be consistent with the roadway network alternative #4A. This alternative would include the following modifications:

S.R. 40 - Breakaway Trail to Williamson Boulevard (Widen to 6 Lanes)

Hand Avenue - Clyde Morris Boulevard to Shangri La Drive (Widen to 4 Lanes)

[1] Transportation Feasibility Study for State Road 40. GMB Engineers & Planners, Inc. 2008

Hand Avenue Extension - Williamson Boulevard to Tymber Creek Road (New 4 Lane Section)
Tymber Creek Road- Hand Avenue Extension to S.R. 40 (Widen to 4 Lanes)

The Hand Avenue Extension is currently not in the Volusia County MPO Transportation Improvement Plan, because the exact alignment has not yet been determined. For the purposes of this analysis, two (2) alignments were considered: to align directly to Tymber Creek Road (roadway network alternative 4A), or to align with Old Tomoka Road (roadway network alternative 4B). Both roadway alignments resulted in approximately the same construction cost, but the southern connection directly to Tymber Creek Road would result in less impact to residential dwellings. Therefore it is recommended to construct the future extension of Hand Avenue directly to Tymber Creek Road. The City has set aside $100,000 to jointly participate with Daytona Beach, Volusia County, and Consolidated Tomoka to prepare a Project Development and Environment (PD&E) Study for the Hand Avenue Extension. John Anderson, A1A, SR40, and US 1 are considered policy constrained either due to environmental conditions or right-of-way limitations. In addition, the Hunter's Ridge DRI is expected to pay a proportionate fair share amount to mitigate impacts due to a residential increase. Expected improvements as result of Hunter's Ridge second sufficiency response includes: funds to complete Tymber Creek Road from Peruvian Lane to Airport Road; increasing the lanes on SR40 from Tymber Creek Road to I95 interchange from a 4LD to 6LD divided facility; funds towards Hand Avenue Extension; and funds towards transit and non-motorized modes.

a. Right-of-Way Preservation

Corridor preservation, particularly for Hand Avenue Extension, provides numerous benefits to Ormond Beach, its taxpayers, and the public at large. Preserving rights-of-way for planned transportation facilities promotes orderly and predictable development. The decisions Ormond Beach continues to make regarding the location and design of its transportation network will have a lasting impact on growth patterns, community design, and modal alternatives. For these reasons, effective corridor preservation is critical to accomplishing a wide range of planning objectives. Another benefit of corridor preservation is that it minimizes damage to homes, businesses, and the corresponding costs of acquiring rights-of-way when improvements are made. Right-of-way costs often represent the single largest expenditure for a transportation improvement, particularly in growing urbanized areas where transportation improvement needs are the greatest. Consequently, preservation policies will need to be added to the Transportation Element of the Comprehensive Plan to ensure that should development occur and roadway corridors are depicted on the Future Traffic Circulation Map, then right-of way will be set aside. Policies should also be provided to permit temporary use of proposed rights-of-way but no permanent structures may be placed within these future right-of-way corridors. Corollary standards will need to be added to the Land Development Regulation.

Table 2 – ROW Preservation Strategy

Strategies/Actions	Type of Action	Priority
a. Right-of-way Preservation	**Comp Plan Amendment**	**Incorporate into EAR-Based Amendment for 2010**
	LDR amendment	**Within 1 year of Plan adoption**

b. Access Management

Costly improvements are not always the solution to safety and congestion issues. Roads, like other resources, also need to be carefully managed. Corridor access management strategies extend the useful life of roads at little or no cost to taxpayers. All development needing site plan, plat, rezoning, or a land use plan amendment shall be subject to access management. Previously this was not always true. Consequently, the City will identify a list of access management techniques applicable to a given proposed development and make the necessary changes in the Comprehensive Plan as well as in the Land Development Code as legislative support.

Table 3 – Access Management Strategy

Strategies/Actions	Type of Action	Priority
b. Access Management	**Comp Plan Amendment**	**Incorporate into EAR based amendments for 2010**
	LDR amendment	**Within 1 year of Plan adoption**

c. Constrained Roadways

In Ormond Beach, there are three roadway corridors which are considered constrained for road widening purposes only. These roadway corridors include A1A south of SR40; SR 40 from A1A to Williamson Boulevard; and US 1 from the south city line to Wilmette. In all cases, either right-of-way purchase or feasibility plans indicate the cost of improvement exceeds the resulting benefits or the improvement itself would not accommodate the traffic needed to meet the design year. Consequently, roadway improvements to expand capacity are not advocated. Improvements in the corridor for roadway efficiency such as better access management, signal optimization and coordination, and geometric improvements at intersections are needed and advocated. In addition, substantial capacity improvements are not affordable thus requiring the City to consider alternative modes such as increased transit usage. However to enhance transit usage, better connectivity and urban form with higher densities and intensities will be needed through redevelopment and infill.

To support frequency and span of service improvements, more "choice" ridership is needed. FDOT has indicated in the draft Transit Oriented Development Design Guidelines[2] that to affect a meaningful modal split, approximately 25 employees per acre is needed. In order to accomplish this modal split, a more intense land use pattern will be needed along with better connectivity. However, the establishment of Transportation Concurrency Exception Areas (TCEAs) for those roadway corridors which are considered constrained, with transit service, and where opportunities to cause redevelopment and infill at a higher density or intensity exist should be pursued.

The three commercial corridors which have TCEA potential are:

1. A1A from SR 40 to the city line (commercial redevelopment);
2. SR 40 from A1A to Williamson (includes downtown and the commercial corridor west of Orchard Street to Williamson; and
3. US 1 from Wilmette Avenue to the city line on the southern boundary (commercial redevelopment).

These corridors are being recommended because 1) Votran operates core bus service (Routes 18/19 and 3) along these corridors; and 2) the areas for the most part contain commercial corridor and downtown redevelopment opportunities that could benefit from a TCEA. Higher densities and intensities can support transit and assist Votran in their goal of reducing headways and extending service hours. Since much of the City of Ormond Beach is built out, outside of Ormond Crossings, the future of Ormond Beach depends on infill and redevelopment. The downtown has been an area of emphasis for years and success in redeveloping the downtown has been limited. The beach corridor at some time in the future will require a redevelopment strategy as well as portions of US 1 within the old section of Ormond Beach.

[2] FDOT Draft Transit Oriented Development Design Guidelines. Renaissance Planning Group April 2009

Table 4 – Constrained Road Strategy

Strategies/Actions	Type of Action	Priority
c. Constrained Roads	Comp Plan Amendment to establish TCEAs	Incorporate into EAR-Based amendments for 2010
	LDR amendment to include multi-modal strategy and fee	Within 1 year of Plan adoption

3. Strategies to Implement the Transit Vision Plan

The City of Ormond Beach is served by Votran through a number of transit routes. There are three roadway corridors within Ormond Beach which are considered constrained but served by public transit. In Votran's East Side Transit Study Final Report[3], Votran identified Routes 18/19, 1 and 3 as network spine routes that generated 49% of all the east side ridership in 2008. Between October 2007 and June 2008, Routes 1 and 3 were ranked 4 and 5 respectively out of 22 routes within the Votran eastern and southeastern system. Improvements for Route 3 and 18/19 were weekday frequency improvements as well as trolley service on the beach. The City's goal is to decrease VMT in the short term by 10% (2013) and in long term by 15% (2017). The resultant increase in transit usage on the corridors is expected to be 2.8% and 4.2% respectively. **See VMT by Roadway corridor and Projected Transit Usage due to VMT reduction which is attached at the end of the report.**

Table 5 – Existing Transit Routes

Route	Roadway	Frequency/Span of Service
18/19	A1A/SR40/Williamson loop	1 Hour headway/ 7 am – 6 pm Weekday
3	US 1	1 Hour headway/6 am – 7:30 pm Weekday
6	Nova/Hand/Wilmette/SR 40	1 Hour headway/ 6:30 am – 6:30 pm Weekday
1, 1A	A1A	1 Hour headway/5:40 am – 6:30 pm Weekday, evening and Sunday

a. Develop a transit and non-motorized funding strategy

As a starting point, public transit serves Ormond Beach's main roadway corridors. As funds are made available to enhance service, facility improvements to improve rider convenience as well as frequency and span of service improvements can be implemented. To expand bus service frequency on the A1A, US 1 and SR40 routes, it is estimated that start-up capital costs is $5.39 million while each year's operating costs is $3.55 million. Transit improvements are identified in the 2035 LRTP and Transit Development Plan which is currently undergoing an update. The City can enhance service and customer convenience by developing a transit fee component as part of a city mobility fee which would apply to city and state roads. The city does not want capacity improvements made on the constrained roadways. In addition, a non-motorized component will be required to support bike trails and sidewalks. Also proposed by staff is the establishment of CRA Districts for US 1 and A1A to principally fund multi-modal activities such as capital improvements as well as operational improvements. There are no restrictions on the use of Tax Increment Financing funds for operations. A steady funding source for operating is needed until state law is amended to permit a mobility fee to pay for long term operations.

[3] Votran East Side Transit Study. Center for Urban Transportation Research. November 2008

Table 6 – Transit Funding Strategy

Strategies/Actions	Type of Action	Priority
Develop a long term transit funding strategy.	**Transit and Non-motorized fee development**	**Initiate discussions with Votran and Volusia County immediately regarding transit fee structure design as well as assessment in lieu of road mitigation**
Established CRA Districts along US 1 and A1A to support multi-modal activities.	**Prepare CRA Plans for US 1 and A1A**	**Initiate discussions with Volusia County ED regarding the establishment of CRA TIF Districts. Upon plan adoption, integrate CRA Plans into the Comprehensive Plan.** **Adopt the US 1 CRA Plan by 2012** **Adopt the A1A CRA Plan by 2014**

b. Intergovernmental Coordination Strategy

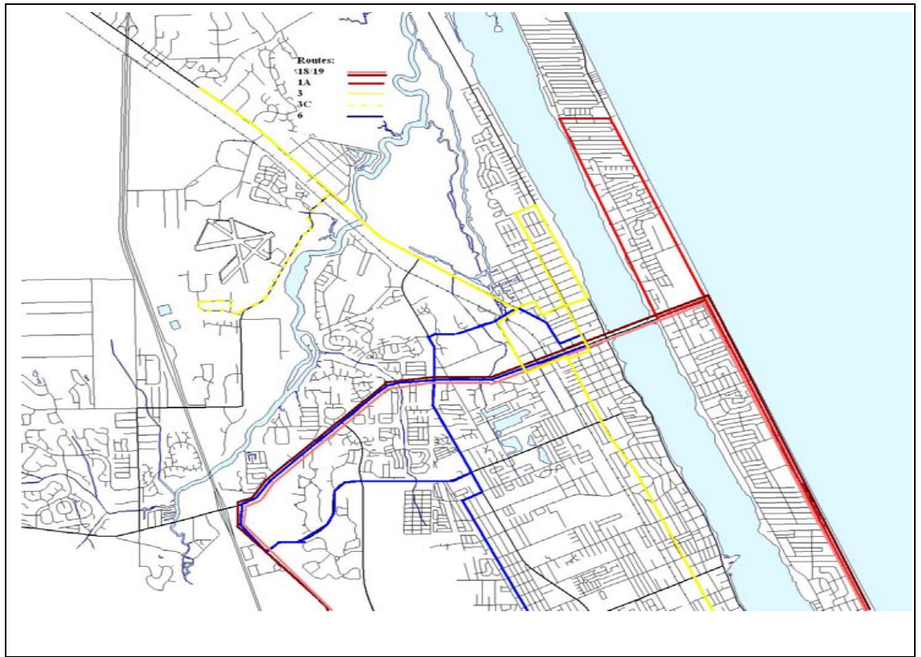
The City of Ormond Beach has adopted by reference in the draft Comprehensive Plan and in the Land Development Regulations (LDR) the Volusia County Transportation Impact Assessment Guidelines for traffic mitigation. While transit has always been a mitigation strategy, no such methodology exists to assist cities who want to use transit as mitigation. Consequently, a transit fee in lieu of road mitigation would require Volusia County concurrence through an Interlocal Agreement.

Table 7 – Intergovernmental Coordination Strategy

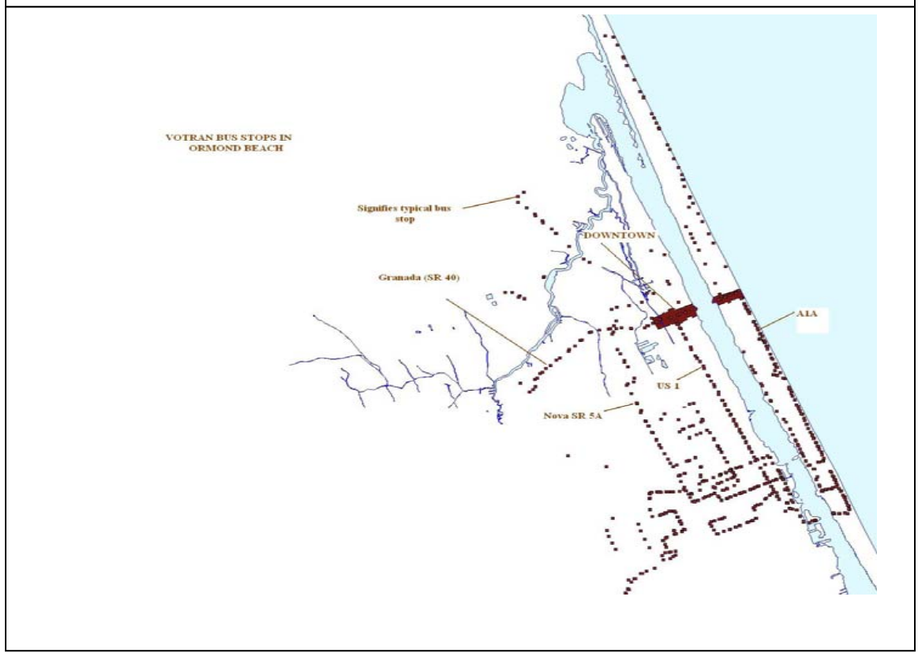
Strategies/Actions	Type of Action	Priority
Intergovernmental coordination	**Develop an Interlocal Agreement**	**Initiate discussions with Volusia County immediately.**

4. Strategies to Implement the Land Use Vision Plan

The best approach to implementing the multi-modal concept is to incorporate measures both in the development review process (short term) and in the Comprehensive Plan for land use planning (long term).



Map 1- Existing Transit Routes and Map 2 - bus stops



a. Development Review Process (short term)

An effective mobility plan should address not only modal improvements, but land use considerations. The Center for Urban Transportation Research prepared a Florida Mobility Fee Study [4] dated March 25, 2009. The study suggested that, an effective mobility plan must consider land use relative to design, density, and mix which in turn promotes walkable, mixed-use environments with relatively high densities that are connected by pubic transit. Of particular note, the study indicates that, "One way to foster growth that is sensitive to context is through the use of form-based codes that address the size and scale of buildings in relation to the public realm and each other." In 2008, the City of Ormond Beach initiated an effort whereby all the blocks within the Downtown Overlay District were surveyed. The data collected along with the vision articulated in the approved 2007 Downtown Redevelopment Plan[5] is currently being used to transform the data into conceptual building layouts. Three cornerstones of the City's formed based code are mix use, vertical development, and build to lines. Form Based Codes have been found to be an effective approach to promoting higher density and mix use while design is through mandatory compliance with financial incentives provided through the Tax Increment Financing District. The downtown corridor is traversed by Granada Boulevard which is considered constrained but served by transit.

Table 8 – Development Review Strategy

Strategies/Actions	Type of Action	Priority
a. Development Review Process	**Prepare a Form Based Code to implement the Downtown Redevelopment Plan**	**December 2010**
	Apply the Transit Design Guidelines to A1A, SR 40 outside of downtown, and US1	**December 2011**

b. Comprehensive Plan (long term)

It has already been discussed previously that the City is projecting roadway deficiencies on roadway corridors which are considered constrained. These same roadways are currently served by transit and Votran desires to increase frequency and span of service on these corridors but ridership is needed as well as transit infrastructure to make ridership a convenience. Consequently, it is proposed that during receipt of a land use plan amendment along A1A, US1, or SR40 that may or may not be congested that a tiered strategy for transit improvements be required based upon the following four land use scenarios:

1. FLUM consistent, no current or forecasted road congestion: Development proposals that are consistent with the City's Future Land Use Map (FLUM) in terms of both land use type and density or intensity and located along road corridors where congestion does not exist or is not forecasted to occur should be treated differently than development proposals which are inconsistent. Development proposals deemed consistent should include mitigation strategies that are tied to the size of development (VOTRAN thresholds) and include strategies that are basic to promoting multi-modal choices. Strategies most conducive to size of development include: access management, bike facilities, sidewalk connectivity, and review by VOTRAN during the development review process.

2. FLUM consistent, road congestion exists or forecasted: Development proposals that are consistent with the City's FLUM in terms of land use type and density and intensity but are located along road corridors where congestion exists or is forecasted to occur would require transit facility improvements based upon the degree of the traffic problem.

[4] Florida Mobility Fee Report. Center for Urban and Transportation Research. March 2009
[5] Downtown Redevelopment Master Plan. Gladding Jackson. 2007

3. FLUM inconsistent, no current or forecasted congestion: Development proposals which are inconsistent with the City's FLUM in terms of land use and density or intensity but are located along road corridors where no congestion exists or is projected would have a set of strategies applied related to the degree of the development's inconsistency. The inconsistency would be measured comparing the trip generation factors for by-right development with the proposed development. All of the strategies identified in this section would apply to include either a Proportionate Fair Share Agreement to fund transit improvements or a specified contribution for operations to support existing or expanded transit service.

4. FLUM inconsistent, road congestion exists or forecasted: Development proposals which are inconsistent with the City's FLUM in terms of land use and density or intensity and are located along road corridors where congestion exists or will exist should not be approved.

Using Votran's Transit Guidelines[6] thresholds for Votran review, the above four land use plan amendment scenarios would be reviewed for transit opportunities and depending on findings, requirements to fund operation enhancements, construct capital transit infrastructure (i.e., bus shelters, etc) would be required. The measures are put forth as guidelines and are depicted in **Table 9**. These guidelines may be discussed as a part of the land use plan amendment approval or site plan negotiations dependent upon the scale of development and its relationship to the adopted Future Land Use Map. To improve transit access to office, residential developments, and commercial businesses, applicants may be required to subsidize transportation operations. The subsidy should also include provisions for adjusting the contributions annually by the CPI to account for inflation. All developments may be required to dedicate on-site easements to Votran and to construct associated roadway improvements adjacent to the site, such as bus bays if deemed needed by Votran.

On-site" shall be deemed to include the site itself and all adjacent areas related to the site, consistent with established practice in the City. All site plan development is required currently to provide secure bicycle storage facilities in a location convenient to office, commercial or residential development areas. The facilities shall be highly visible to the intended users and protected from precipitation. Depending upon the type of development, shower facilities may be required within the development as an amenity promoting bicycle or walking for commuting employees to the site. Whereas the previously discussed measures may be associated with typical site plan review approval and would be included in part in virtually all site plan reviews, measures which deal with off-site construction must be viewed as unique and must be addressed on a case-by-case basis. There will be instances where it will be mutually beneficial for the city and the developer to pursue off-site construction such as: a) improve pedestrian access between the site, Votran and other development; b) proposed developments may find it desirable to enhance the pedestrian system by widening sidewalks or providing connections or extensions and c) Bus shelter enhancements, where such enhancements do not currently exist at bus stops.

Table 9 provides a menu of transit improvements based upon the Future Land Use Map Strategy Code. These types of improvements would vary according to the Strategy Code assigned based upon whether the land use plan amendment is consistent with the Comprehensive Plan policies and whether congestion currently exists or is projected to be congested in 2017 Discussions with Votran should be initiated immediately to ensure the transit measures proposed are compatible with Votran's operation.

Table 9 – Votran Review Strategy

Strategies/Actions	Type of Action	Priority
a. Integrate Votran into the review of site plans that exceed recommended thresholds	**Adopt a policy in the Comp Plan and implement through the LDC.**	**Immediately**
b. Integrate LUPA decision matrix into Comprehensive Plan	**Develop 4 tiered transit strategy based upon comprehensive plan consistency and congestion and amend the LDC.**	**Immediately**

[6] Transit Development Design Guidelines. Votran. 2008

5. Concurrency Outside a TCEA

All development outside of the designated TCEAs shall be required to mitigate their impacts on city, county, and state roads. The City has adopted by policy the Volusia County MPO Transportation Impact Assessment Guidelines as the methodology by which impacts will be studied. Mitigation may be through the current Proportionate Share contribution process already adopted in the LDC. However, the prop-share money can be used for more than road improvements. It can be used to finance transit facility or operation enhancements, construct sidewalks and bike trails, finance transit demand management techniques, or other appropriate improvements which reduce vehicle miles traveled. This strategy was pursued by Ormond Crossings when it opted out of the DRI provisions.

6. Connectivity Strategy

The City's multi-modal strategy is more than just public transit. LOSS policies are proposed for sidewalk coverage in the city. The concept is to connect residential areas to destination points such as shopping areas; public facilities such as libraries; parks and recreation; schools; and transit points. A pedestrian shed of a 1/4 mile of 75% of the road corridor's area population is proposed for connectivity. This represents the maximum distance a person is willing to walk. LOSS shall be adopted to include existing LOSS. Where the existing LOS is below the adopted LOS, sidewalk improvements will be required of development within the pedestrian shed that contains a substandard LOS. It is proposed that development not only build sidewalks on site, but they build sidewalks offsite or contribute cash in lieu of construction to enable the City to complete improvements. While much sidewalk work has been completed, there still is a current need for 59,000 linear feet of 5 foot sidewalk at a cost of approximately $2 million dollars.[7] Once the LOSS is established for coverage, it is expected this cost will be higher. The development of sidewalk coverage LOSS shall be completed by 2011. Between 2007 and 2009[8], Hoke Design, Incorporated was engaged by the MPO to prepare bike/pedestrian plans for students who reside within a 1 mile radius of their elementary school. Ormond Beach has five elementary schools of which four schools were studied and recommendations approved. The fifth school which is located in the downtown area is currently being studied by the consultant hired by the MPO. Missing sidewalk gaps were identified for Tomoka, Pathways, Pine Tree, and Osceola Elementary Schools. The total cost was estimated at $7,213,925. A proto-type non-motorized fee is advocated of which one is attached to this report to demonstrate its funding capacity.

Table 10 - Transit Measures

		FLUMS Code A	B	C	D
I. Transit Operations					
a.	Contribute to operation of a Votran transit route# ____ for ____ years.	o	x	o	x
II. On Site Construction – New facilities					
a.	Bike lockers, racks	o	x	x	x
b.	Shower facilities	o	x	x	x
c.	Bus stop improvements:				
	Local Stop to include all Table 9 Recommended and/or conditional improvements.	x	x	x	x
	Secondary Stop to include all Table 9 recommended and/or conditional improvements.	o	x	x	x
	Primary Stop to include all Table 9 recommended and/or conditional improvements.	o	x	x	x
III. On or Off Site Enhancements to existing facilities.					
a.	Park and Ride	o	x	o	x
b.	Bus shelter or contribute cash equivalency	o	x	x	x
c.	Bus Bays	o	x	x	x
d.	Bike Racks at existing Bus Shelters or contribute cash equivalency	x	x	x	x
e.	Bus Stop Signs or contribute cash equivalency	x	x	x	x
f.	Bus benches at existing bus stop signs or contribute cash equivalency	x	x	x	x
g.	Bus Stop leaning rails or contribute cash equivalency	x	x	x	x
h.	Trash receptacles at existing bus stop shelters or contribute cash equivalency	x	x	x	x
I.	Bus stop pads at existing bus stops without shelters or contribute cash equivalency	x	x	x	x
j.	Provide rights-of-way to accommodate bus stop improvements or contribute cash equivalency	o	x	x	x
k.	Install missing walkways with 1250 feet of the site or contribute cash equivalency	x	x	x	x
l.	Install ADA improvements to improve accessibility or contribute cash equivalency	o	x	x	x

LEGEND

o = Not required
x = Required

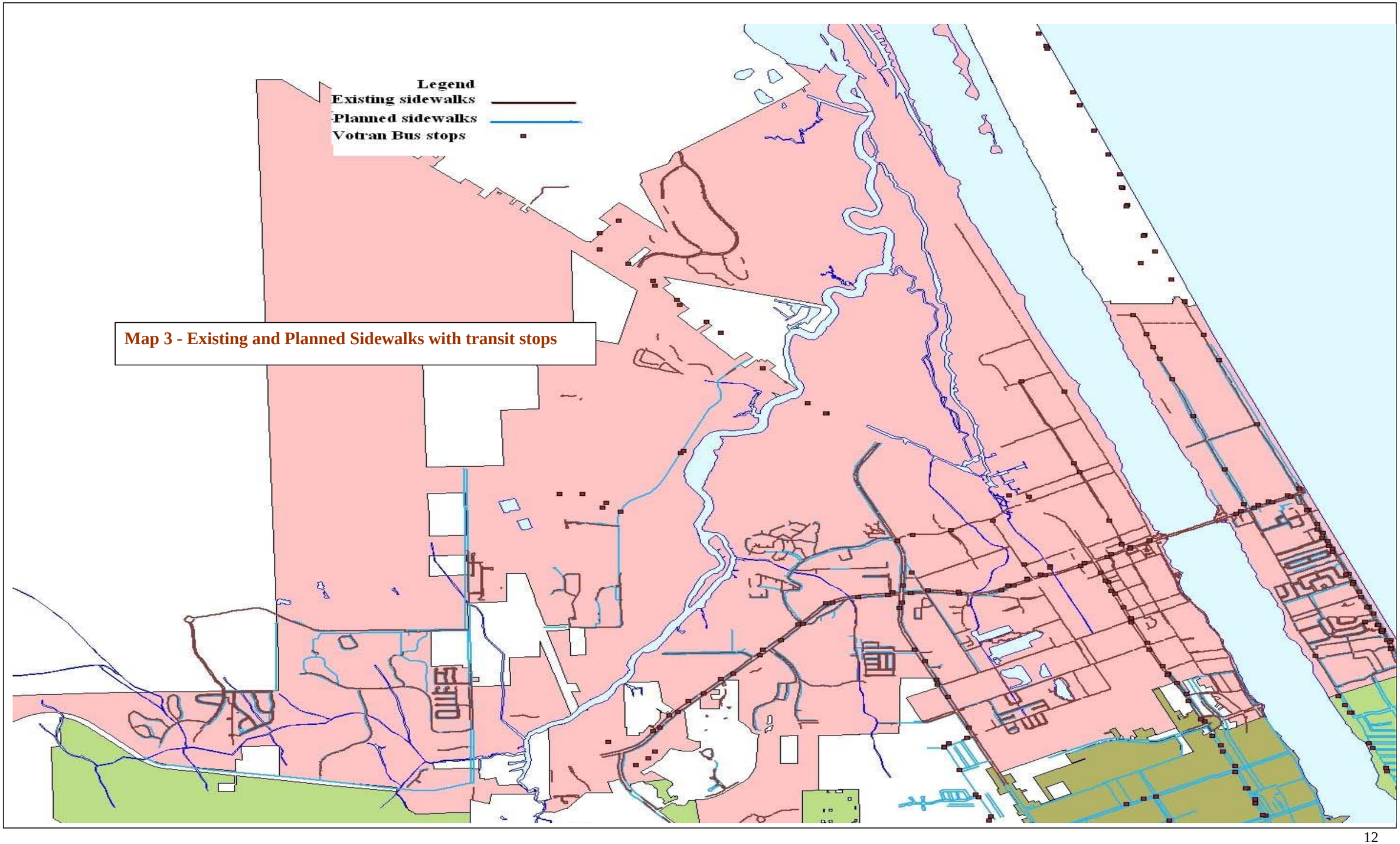
Future Land Use Map Strategy Code:

A = FLUM consistent, no projected LOS degradation below adopted standard.
B = FLUM consistent, projected LOS degradation below adopted standard.
C = FLUM amendment requested, no projected LOS degradation below adopted standard.
D = FLUM amendment requested, projected LOS degradation below adopted standard.

Thresholds[1] to which TDM applies:

1. Commercial/Industrial (+ or >25,000 square feet of floor area or 10 acres).
2. Residential/Mix Use (+ or > 500 MFD units; 100 acres; and all Senior, Low Income, Special Need, and 55+ age qualified housing)
3. Medical (All hospital, 5,000 or more square feet for medical office or medical laboratory, and all urgent care facilities and dialysis centers)
4. Recreational (Sports Complexes of 1,000+ occupancy, parks 10+ acres, and all entertainment and major area attractions).
5. Government (All government offices, social service agencies, libraries, and community centers)
6. Education (All public, private, and colleges exceeding 500 students)
7. Road Construction (arterial or collector – new, rehab, extensions)
8. Dries (all)

[7] OB Sidewalk Master Plan, Ghyabi Lassiter. 2002
[8] 2007 Pathway ES Bike/Ped Master Plan and 2008 Osceola, Tomoka and Pine Trail ES Bike/Ped Master Plans Hoke Design, Inc.



Map 3 - Existing and Planned Sidewalks with transit stops

	ROAD NAME	FROM	TO	SIDE	LINEAR FEET	WIDTH IN FEET	COST PER LINEAR FOOT[1] 5 FT WIDE $95	8 FT WIDE $145	SOURCE
1	Halifax Road	Amsden Road	SR 40	Right	6113	5	$580,735		2008 Osceola ES Bike/Ped Master Plan
2	Rockefeller Drive	Riverside Drive	S. Atlantic	South	2551	5	$242,345		2008 Osceola ES Bike/Ped Master Plan
3	Pinewood Street	Rockefeller Drive	River Beach	East	712	5	$67,640		2008 Osceola ES Bike/Ped Master Plan
4	Flamingo Drive	Terminus of sidewalk	Pinewood Street	North	244	5	$23,180		2008 Osceola ES Bike/Ped Master Plan
5	Calle Grande	Riviera Estates Blvd	S. Center Street	North	1818	5	$172,710		2008 Osceola ES Bike/Ped Master Plan
						Sub Total	$1,086,610		
1	Forest Hills Connector	Mayfield Terrace	Military Blvd	na	435	8		$63,075	2008 Tomoka ES Bike/Ped Master Plan
		Mayfield Terrace	Existing Trail	na	1138	8		$165,010	2008 Tomoka ES Bike/Ped Master Plan
2	Hidden Hills Drive	West end of terminus	SR 40	North	3201	5	$304,095		2008 Tomoka ES Bike/Ped Master Plan
3	Main Trail	SR 40	Shady Branch Trl	North	1680	5	$159,600		2008 Tomoka ES Bike/Ped Master Plan
4	Main Trail	Shady Branch Trl	Existing sidewalk	North	1313	5	$124,735		2008 Tomoka ES Bike/Ped Master Plan
5	Shady Branch Trl	Existing trail	Twelve Oaks	North	894	5	$84,930		2008 Tomoka ES Bike/Ped Master Plan
6	Main Trail	Rio Pinar Trl	East	East	896	5	$85,120		2008 Tomoka ES Bike/Ped Master Plan
7	Rio Pinar Trl	Main Trail	Existing trail	North	511	5	$48,545		2008 Tomoka ES Bike/Ped Master Plan
8	Main Tail	Irquois Trail	Nova	South	3004	5	$285,380		2008 Tomoka ES Bike/Ped Master Plan
						Sub Total	$1,092,405	$228,085	
1	Airport Road	Leeway Trail	Briargate to BWT gate	South	4555	5	$432,725		2007 Pathway ES Bike/Ped Master Plan
2	Tymber Creek Road	Durrance Lane	Airport Road	East/West	15872	5	$1,507,840		2007 Pathway ES Bike/Ped Master Plan
3	SR 40	I95	TCR	North	4025	8		$583,625	2007 Pathway ES Bike/Ped Master Plan
4	SR 40	Old Tomoka Rd	Airport Road	North	6222	8		$902,190	2007 Pathway ES Bike/Ped Master Plan
						Sub Total	$1,940,565	$1,485,815	
1	Airport	Pine Trail ES	US 1	West	14531	5	$1,380,445		2008 Pine Trail ES Bike/Ped Master Plan
						Sub Total	$1,380,445		
					Total by width of sidewalk:		$5,500,025	$1,713,900	
						Total:	$7,213,925		

Description	Conditions	Cost Range
5 foot wide concrete sidewalk, 4 " depth Typical	Minor drainage impacts, minimal clearing and grading within R/W	$85 to $95 per linear foot
8 foot wide concrete sidewalk, 4" depth Typical	Minor drainage impacts, minimal clearing and grading within R/W	$130 to $145 per linear foot

ROAD NAME	FROM	TO	SIDE	LINEAR FEET	WIDTH IN FEET	2002 Estimated Cost[1]	2009 CPI $	
Rosewood Ave	US1	N. Beach St	Either	2889	5	$56,328	$67,173	
Sandcastle Drive	John Anderson Dr.	Ocean Shore Blvd	Left	2714	5	$52,927	$63,117	
Riverside	Fluhart Dr	SR 40	Either	3709	5	$165,064	$196,845	
Fleming Avenue	Sauls Street	US 1	Left	1150	5	$22,434	$26,753	
Banyan Dr	N. Halifax Dr	St. Brendans	Either	1024	5	$19,997	$23,847	
Tomoka Oaks Blvd	Nova	St. Andrews Dr	Right	635	5	$12,373	$14,755	
McIntosh Road	St. Andrews Dr	Lindenwood Cir	Either	4553	5	$88,782	$105,875	
S. Center St	Arroyo	Fleming Ave	Right	1256	5	$24,487	$29,202	
Inglesa Ave	N. Beach St	Sanchez Trail	Either	775	5	$15,119	$18,029	
S. Center St	Hand	Division	Right	1318	5	$25,700	$30,648	
Lakebridge Plaza Dr	Shadow Lakes Blvd	Wilmette	Right	997	5	$19,434	$23,175	
Booth	Old Tomoka Rd	SR40	Either	2201	5	$42,927	$51,192	
Overbrook Dr	Northbrook Dr.	Beach St	Either	3306	5	$64,469	$76,882	
Shadow Lakes Blvd	Nova Road	Lakebridge Plaza Dr	Left	340	5	$6,627	$7,902	
Woodlands Blvd	Military	Nova	Either	1489	5	$29,043	$34,635	
Peninsula Dr	Marvin Road	CCL	Either	1861	5	$36,291	$43,278	
Arroyo Pkwy	Ridgewood Ave	Yonge St	Either	487	5	$9,483	$11,308	
Military Blvd	Royal Rd	Woodland Blvd	Either	770	5	$15,010	$17,900	
Tomoka Ave	SR 40	Bennett Lane	Either	799	5	$35,556	$42,401	
Arroyo Pkwy	Nova	Santa Fe	Left	5668	5	$252,208	$300,767	
Hand Ave	Spring Meadows	Clyde Morris Blvd	Right	1358	5	$52,952	$63,147	
Hand Ave	Shangri La	Clyde Morris Blvd	Both	2716	5	$135,104	161,116	
Airport Road	TCR	Ormond Green Blvd	Either	3408	5	$151,657	$180,856	
SR 40	TCR	I95	North	4565	8		$316,650	2009 McKim & Creed Estimate
US 1	Hernandez	Wilmette	Left	4241	5	$82,701	$98,624	
US 1	Dix	Melrose	Right	2712	5	$52,890	$63,073	
				56941				
[1] Note: Unless noted, all costs are sourced from the 2002 Ghyabei Lassiter OB Sidewalk Master Plan					Total	$1,469,563	$2,069,150	

7. Strategies to Implement the Bicycle Vision Plan

Currently the City has 5.62 miles of bike trait throughout the city. Based upon the adoption of the City of Ormond Beach 2005 Parks and Recreation Master Plan, another 2.34 miles of trails will be needed to meet the current population. Currently, the City is completing the Tomoka State Park Trail from Iglesa Avenue to the State Park along the Loop (5100 linear feet) and is under contract to build approximately 2 miles of 8 foot wide trail along SR40 which will contributes to meeting and improving bicycle travel options in Ormond Beach. But for the downtown, the Comprehensive Plan supports bike trails and requires 4 foot shoulder lanes to accommodate bike travel on roadways. Implementing additional improvements identified in the Parks and Recreation Plan is the next step to improving the bicycle system. Planned trails which require further approval include Thompson Creek Trail from Wilmette to Division Avenue.

← Map 4 – SR 40 Multi-Use Trail
Map 5 - Thompson Creek Trail ↑
Map 6 – Tomoka State Park Trail→

8. Transit Oriented Design land use principles

As part of the Transportation Element, staff is relying heavily on Votran's Transit Design Guidelines prepared in 2008 as well as FDOT's draft Transit Oriented Development Design Guidelines which form the basis from which transit oriented principles are required of development within the TCEAs.

Applicants for development approvals to include plat, site plan, zoning, and land use plan amendments which exceed the thresholds as determined by the Transit Design Guidelines, shall be required to meet the transit oriented design policies as well as make transit facility and/or operational improvements as recommended by Votran.

The following general land use considerations to support transit in the Downtown area and along US1, A1A, and that portion of SR 40 outside of the Downtown area shall be incorporated into the Comprehensive Plan:

1. In the Downtown, A1A, and SR40 the transit corridor housing densities shall reflect 8-15 units an acre to support premium transit service;
2. A mixed use pattern that places residential units above street level commercial uses without a corresponding decrease in commercial floor area;
3. Density should be organized to take advantage of transit service by being located along transit corridors and within a pedestrian shed of ¼ mile of transit stops;
4. Buildings should be moved closer to the street;
5. Pedestrian sheds should be established with connectivity to ensure transit area focus populations will not walk more than a ¼ mile to access transit.
6. Pedestrian systems should be continuous, barrier free walking surface with direct links to transit stops; and
7. Transit circulation for large scale developments should provide direct transit service through the center of the project.

Residential land use policies should be guided by the following policies:

8. To optimize transit operations, cluster development and promote multi-family structures in order to exceed 8 units a net acre;
9. A better commitment to network connectivity is needed. More efficient movement of buses through and between subdivisions is needed. Where street rights-of-way exist and the only obstacle is opening up the closed street, the city must do more to educate residents of the need for such connectivity; and
10. Transit facilities should be coordinated with Votran as part of the review of such single family developments.

Commercial land use principles should be implemented that promote the following:

11. A complimentary mix of retail and service uses should be provided offering the possibility of "chaining" trips;
12. Auto oriented uses such as vehicle sales and services, building material stores, drive-through businesses, and warehouse storage should be related to heavy commercial corridors;
13. Buildings should be moved to the front with parking located to the side or rear of the parcel;
14. Parking should be reduced through shared parking based upon am or pm characteristics of the user as well as whether transit exists on the corridor.

9. Designing roadways to reflect urban character

Ormond Beach is defined by the roadway corridors leading into and through the City. SR 40, US 1, Nova Road, and A1A are landscaped and have been designed to be compatible with their surroundings. The City is working toward roadway design solutions that are compatible to surrounding land uses. Roadway widening should not be done for capacity improvements without understanding the urban area through which the road travels. Sign standard indexes which are suitable for I95 and other SIS roads should not also be used in downtown areas where sensitivity to

size and design should be paramount. The city's effort in developing a form based code only strengthens sensitivity to context since its focus is on design and how it relates to the public surroundings and each other. Continued communication to FDOT on why on-street parking is vital to the downtown will continue. Bike lanes can be accommodated on parallel roads in more sensitive areas like the downtown, thereby improving the ability for the downtown to have landscaped medians, reducing speeds and improving safety for pedestrians and motorists alike.

Designing to reflect urban character or Context Sensitive Design promotes many specific changes in design of roadways that can support Transportation Demand Management strategies including calming traffic, traditional urbanism, and non-motorized transportation. **Table 11** depicts the potential traffic impacts as a result of Context Sensitive Design (CSD). Each impact depends on specific changes and how broadly they are applied by the responsible jurisdiction.

Table 11 – Travel Mode Impact Summary

Impact	Comments
Reduces total traffic.	Overall VMT reduced
Reduces peak period traffic.	Congestion reduced
Shifts automobile travel to alternative modes.	Efficiency of existing road capacity promoted
Improves access, reduces the need for travel.	More pedestrian friendly
Increased public transit.	Transit % of mode split increased
Increased cycling.	Non-motorized % of mode split increased
Increased walking.	"

CSD is appropriate in many areas of Ormond Beach as depicted in **Table 12**. For example, the City's downtown, residential neighborhoods and commercial corridors would be appropriate areas for CSD solutions when road improvements are initially planned. Since Ormond Beach has very few roads classified above local or residential of its own, CSD should also be applicable to FDOT Project Development & Environmental (PD&E) and Efficient Transportation Decision Management (ETDM) processes for federal and state highways respectively as well as to Volusia County for county roads. CSD if integrated into the City's Comprehensive Planning process, provides the City a much better chance of ensuring federal, state and county road facilities are built considering community character and physical attributes.

Table 12 – CSD Application Summary

Geographic	CSD Applicability	Organization
Low density suburban/rural edge transition	Fair	FDOT/Volusia County
Downtown (SR 40)	Excellent	FDOT
Commercial corridors (A1A & US1)	Good	FDOT
Residential neighborhoods	Excellent	Ormond Beach

10. Transit Demand Management (TDM) Strategies

Ormond Beach has limited ability to positively impact total VMT through TDM. However, Ormond Crossings has great potential for TDM strategies and there is sufficient industrial development within the City that a Transportation Management Initiative (TMI) could be coordinated either through the Chamber of Commerce or another entity that has an interest in business prosperity and economic development. Consequently, the city should support and foster a multi-jurisdictional effort possibly through the MPO as well as with other organizations.

The City could consider two approaches to TDM within the LDC. The first approach would be to directly require that some combination of a list of TDM measures be included in all development proposals of a given size (perhaps the threshold is the same as those thresholds contained in the Votran Transit Guidelines). The threshold for employees however could be as low as employers with having 10 or more employees and a goal for a percentage reduction in SOV trips is established. Alternatively, these regulations could be more optional. That is, they require a traffic impact assessment and provide a menu of TDM strategies as options for offsetting anticipated adverse traffic conditions. In both instances, the regulations should include the following features:

a. Application of TDM requirements only to development above a given size either for a single use or a site with multiple uses congregated together;
b. A requirement for a traffic impact assessment that includes a projection of number of SOV trips that would be generated by the development and an estimate of reduction in trips that could be achieved with TDM;
c. A menu of acceptable TDM approaches that could be used to meet TDM requirements;
d. A requirement for preparation and submittal of a TDM plan for the site that will serve as a commitment to a selected list of TDM measures;
e. A process for allowing an applicant to request a waiver from the TDM regulation; and
f. A statement of how the regulations will be enforced including a process for monitoring the implementation of the TDM plan.

For example, as an incentive to developers who use TDM and where a 15% reduction in SOV is projected using a variety of TDM measures, an applicant could get a comparable reduction in the number of required parking spaces.

11. Strategies to Implement the Multi-Modal Transportation System

To ensure interaction between all transportation modes, a number of broad, multi-modal strategies are needed. These strategies are critical to the successful development of a multi-modal transportation system.

a. Multi-modal component in Traffic Impact Studies

The City along with all other jurisdictions adopted the Volusia County Transportation Impact Assessment Guidelines. No multi-modal component exists within the Guidelines. The City and County through the MPO should include a multi-modal component in all traffic impact studies. In Ormond Beach, it is proposed traffic impact studies are required outside of the TCEAs and that transit also is a mitigation strategy. The multi-modal component should address impacts to pedestrians, bicycles, transit, and automobiles. TDM measures should also be incorporated into the assessment guidelines for SOV reduction.

b. Evaluation Standards for Transportation Modes

The City should use multi-modal performance standards to ensure that adequate facilities are provided for all modes of travel. For bicycle, pedestrian and transit modes, level of service standards addressing sidewalk coverage from residential areas to major destination points (shopping, parks, transit stops, etc.) are proposed. For transit, pedestrian and bicycle accessibility to transit stops is the key component. Pedestrian sheds of ¼ mile containing sidewalk connectivity on at least one side of the street connecting residential to shopping, parks, and transit stop is the goal of the sidewalk LOSS coverage.

c. Mobility Report Card

The City and Votran should conduct city-wide transportation mobility surveys on a periodic basis. The survey results can become the City's report card on progress towards meeting the desired modal splits. Daily, peak hour, and transit ridership reports are conducted annually either through Annual Traffic Counts or through Comprehensive Operations Analyses (COA). Total VMT on the roadway corridors on which transit exists is attached to this strategy. **Table 13** depicts the annual seat capacity available on Votran routes. Reducing vehicle miles travelled in the range of 6-10% can result in an increase in transit usage from 2.8% to 5.6% on the multi-modal corridor Routes (18/19, 1, 3, and 6). The City has existing regulatory language for parking required from all new development but parking standards must be amended to support multi-modal objectives. The City's proposed form based code permits shared parking between am and pm oriented users, 20% reduction if located along a transit route, and provides for parking waivers for uses having less than a certain amount square feet of floor area.

Table 13 – Available Transit Capacity

Route	Annual Passengers	Total Hours in Operation	Annual Seats Available	% of Capacity available
1	318,565	12,706	494,710	36% or 176,145 seats
3	132,227	5,293	185,255	29% or 53,028 seats
Total	450,792	17,999	679,965	33% or 229,173
				% of Transit Increase
10%VMT Reduction	12,641			2.8%
15%VMT Reduction	19,058			4.2%
20%VMT Reduction	25,410			5.6%

d. Parking

The City has existing regulatory language for parking but the parking requirements are more suitable for a suburban style code and must be amended to support multi-modal objectives. The City's proposed Form Based Code has been drafted to provide many options beyond on-site parking. Parking requirements for uses within the Downtown Overlay District as drafted vary according to the size of development, the location of public parking and transit availability. Where parking is required, parking may be provided through the use of shared parking, off-site valet or remote parking, a parking reduction study, a payment in lieu of on site parking, on site parking or a combination of these approaches. It also is not the intent to limit the alternative parking approaches to those just identified. Other alternative approaches which have been used successfully in other downtown areas similar to Ormond Beach which are rational and based upon applied science may be considered. Due to transit availability, and the existence of on-street parking and public parking lots in the River District, the first 2,000 square feet of floor area for any new development within the River District shall be exempt from the minimum parking requirements as calculated in Section 3-26 of the Land Development Code (LDC). All other Districts (Ocean and Creek) such parking may be reduced by 25% due to transit availability.

Alternative parking options to on-site parking provisions:

1. Valet or Remote parking: Upon application to the City, a business may utilize offsite valet parking or provide remote parking to meet the parking requirements. Valet or remote parking need not be located on the same side of the street of the use to be serviced by such parking. If valet parking is to be used, the applicant must provide the location and number of the valet parking spaces, or the location and size of the valet parking zone being requested**;** the location of the off street parking area the valet parking operation intends to use for the storing of the vehicles, and a signed contract or agreement showing that the valet parking has acquired the legal right to store the vehicles; and proof of insurance as required by the City
2. Payment in lieu of Parking: An applicant may elect to make a payment in lieu of parking to the City. Such payment shall be based upon the current construction cost of one surface parking space times the number of parking spaces. Payments shall be deposited to the City Tax Increment Financing Account for construction of parking based upon demand;

3. Parking Study Reduction: A study prepared by a qualified transportation firm or individual may be used to support reduction of parking based upon the known characteristics of the use. It shall be at the City's discretion to accept all, a portion, or none of the parking supported by the study; and
4. Shared parking may be used, if feasible, to satisfy all or a portion of the minimum off-street parking requirements. Shared parking is permitted between different categories of uses or uses with different hours of operation provided the City acts as the broker, coordinator, and approving authority for the banking of parking arrangement. The Planning Director may authorize upon application the allocation, transfer and the use of public parking spaces and private spaces to another land use to serve as the required off-street parking based upon the percentage of required parking which is anticipated to be available by general use and time of day as indicated.

e. Multi-modal Corridors

Regardless of TCEAs, the City should advocate the building of multi-modal corridors that combine higher density, mixed-use developments with complete streets that provide opportunities for travel by all modes. Multi-modal corridors should include adequate facilities for all modes of travel and should incorporate urban design that is conducive to both motorized and non-motorized travel. For a multi-modal corridor to be successful, surrounding land uses must include residential and non-residential uses and feature an increase in level of density and intensity. A1A, SR40, and US 1 are good candidates for multi-modal corridors due to transit availability, existing constraints which impede capacity improvements, and the land use includes the city's downtown as well as older commercial and beach side tourist corridors which could benefit from redevelopment.

12. Financial Projections and Expenditures

Financial revenues that could be available for implementing the multi-modal strategy are based upon two new fee components. The transit and non-motorized component combined with the City's local road impact fee forms the new mobility fee from which development and (re) development on city and state roads will be assessed. The City will need to negotiate and enter into some type of interlocal agreement as indicated earlier in this document with Volusia County to permit the city's mobility fee to be assessed to development on county roads. In the alternative, the City could also advocate a multi-modal component be put into the current Volusia County Transportation Impact Assessment Guidelines as appropriate mitigation in Ormond Beach.

The City developed two growth trip scenarios involving land use and transportation. **Table 14** depicts the land use and transportation based development trips and cost per person trip. Using the Land Use scenario that most likely could occur based upon the proposed land use category entitlements (page 31), it is estimated that 207,156 new trips will result over the next fifteen year development horizon of the City's Comprehensive Plan. A review of all of the approved traffic studies by the City from 2003-08 indicates 66% of the new trip distribution was to US 1, A1A and SR40 (page 31). SR40 remains the principal east-west corridor for purposes of the Plan's development horizon. Hand Avenue Extension is tentatively scheduled in the Volusia Transportation Planning Organization's draft 2035 LRTP for construction outside of the Comprehensive Plan's 15 year development horizon. Consequently, it seems reasonable that the future traffic distribution trend will repeat the past distribution trend. As such, under the land use scenario 136,761 new development trips are likely subject to the mobility fee (page 29). The development trips were converted to person trips by multiplying an Average Vehicle Occupancy (AVO) factor by the development trips to obtain the number of person trips.

Table 14 – Cost per Person Trip

Scenario	Total Modal Need $	Development Trips	AV0	Person Trips (PT)	Cost per PT	Comments
Land Use	**$13,639,556**	**136,761**	**1.502**	**205,415**	**$66.40**	**See Pages 29-31**
Transportation	**$13,435,422**	**114,680**	**1.502**	**172,249**	**$77.82**	**See Pages 22-24**
NOTE: Cost per person trip is derived by dividing Total Modal Need $ by Person Trips						

The land use scenario projects $7,910,942 in transit fee revenues over the next fifteen years. Non-motorized fee revenues are projected to be $4,091,867 over the same time period.

Using the transportation scenario, the development trips are projected to be 114,680. In determining existing deficiency, the existing 2010 volume and capacity was compared to the projected 2025 capacity as projected by the 2010-2025 Long Term Roadway Assessment (pages 22-23). New growth was determined by subtracting the existing deficiency. Costs for each mode of travel were estimated based upon needs stated in this document for transit and sidewalks. New growth was multiplied by the travel mode costs to determine the percentage of cost attributed to growth. The 15 year growth of trips was multiplied by an AVO factor of 1.502. **Table 15** depicts each component of the mobility fee. **Table 16** provides the projected revenue available to each mode. Estimated revenues are slightly less than using the land use scenario but the fee per person trip is higher. For purposes of projecting potential revenue for 2010-2025, the transportation scenario is used for revenue projections. Regardless of revenue estimates, the City proposes to use its mobility fees to support improved transit amenities, new buses, expanded frequency of service on US 1, A1A, and SR40, construct trails, implement the Elementary School pedestrian/bike improvement studies, enhance existing sidewalks by widening the existing width from 5 feet to 8 feet and implement sidewalk connectivity from existing residential neighborhoods to transit stops, commercial shopping areas, public parks/recreation facilities and other public facilities such as the library, etc. Revenues projected are less than the projected costs of transit service expansion. Only new capital, expanded bus service for three years are assumed to be eligible expenses from which the transit fee component can support. The City is planning the establishment of redevelopment districts on US1 and A1A to fund multi-modal activities but the rest of the funds will need to come from other communities who are on the transit routes that are also traversed by routes 1, 3, and 18/19. In addition, the county will need to find new revenues to support transit, both rail and bus, in the future. Discussions during the development of the draft 2035 LRTP include a ½ cent Local Option Sales Tax. (LOST). The revenues projected are tentative because it is based upon more robust development years than the period from 2008-2010. If projected development does not occur as depicted, then the expenditures will also be reduced to reflect the revenue.

Table 15 – Mobility Fee Components

Scenario	Roads	Transit	Non-Motorized	Mobility Fee
Transportation	**$9.40 per person trip**	**$45.40 per person trip**	**$23.20 per person trip**	**$77.82 per person trip**
Land Use	**$9.40 per person trip**	**$38.00 per person trip**	**$19.00 per person trip**	**$66.40 per person trip**

Table 16 – Projected Revenue by Mode & Scenario

Scenario	Roads (12%)	Transit (58%)	Bike-Ped (30%)
Land Use	**$1,636,746.70**	**$7,910,942.50**	**$4,091,866.80**
Transportation	**$1,612,250.60**	**$7,792,544.80**	**$4,030,626.60**

13. Summary

This document has been prepared to establish the City's rationale for a multi-modal strategy in its 2008 EAR as well as meeting the multi-modal strategy requirements established in SB 360 in 2009. The strategy is simple. Ormond Beach is a city and there are certain areas within its corporate boundaries that should not look like suburban development. Multi-modal corridors have been identified based upon capacity constraints due to environmental, physical or policy considerations. Spine routes for transit exists on these constrained roadways and because they are considered a spine network to Votran, the likelihood that such a route will be discontinued is extremely unlikely. Transit stops are found all along the three multi-modal corridors however connectivity (pedestrian/bike) needs to improve so that all residents have the ability to walk to shopping, parks, and transit stops unimpeded. To support transit, land which has the greatest potential for redevelopment and infill was identified for redevelopment to higher densities and intensities. This is being done through either the City's form based code for downtown or adherence to Votran's Transit Guidelines based upon thresholds for areas outside of downtown. To put forth some cost feasible proposal for this multi-modal strategy, the City has developed a mobility fee with a road, transit and non-motorized component. However, it is realized that the fees are limited to capital and expanded service (no more than 3-5 years of operating) until there are legislative changes to distinguish mobility fees from impact fees in order to support system improvements that do not meet the three prong nexus test.

CITY OF ORMOND BEACH - Long Term Roadway Assessment - 2010-2025

Roadway Segment	Evacuation Route	Transit Route	Distance (miles)	Acquired LOS[1]	2009 LOS	2009 LOS Capacity[2]	2009 AADT[3]	2009 VC Ratio	2017 LOS	2017 LOS Capacity	2017 AADT	2017 VC Ratio	2025 LOS	2025 LOS Capacity	2025 AADT	2025 VC Ratio	Constrained Facility	Transportation Improvement Program or Capital Improvement Program
SRA1A																		
Flagler Co. Line to CM	yes		6.1	D	C	21,300	15,100	0.71	E	21,300	19,900	0.93	F	21,300	23000	1.08	ROW constrained	
CM to Neptune	yes		2.8	D	C	21,300	16,400	0.77	D	21,300	17,400	0.82	D	21,300	17400	0.82	ROW constrained	
Neptune to SR 40	yes		1.2	D	D	21,300	17,000	0.84	D	21,300	15,100	0.85	D	21,300	17800	0.84	ROW constrained	
SR 40 to Harvard	yes	RM # 1a & b; trolley	9	D	A	35,700	10,000	0.28	A	35,700	17,800	0.50	A	35,700	16400	0.46	ROW constrained	
US1																		
Flagler Co. to I-95	yes	no	1.5	D	A	81,800	16,200	0.20	A	81,800	20,000	0.42	A	81,800	39200	0.54		
I-95 to Airport Rd	yes	RM 3a, 3b	2.5	D	B	35,700	21,600	0.60	D	35,700	28,700	0.80	E	35,700	36700	1.00		
Airport Rd. to Nova Rd.	yes	RM 3a, 3b	1.1	D	C	35,700	25,500	0.71	D	35,700	31,300	0.88	E	35,700	34500	0.97	Resolution 99-40	
Nova Rd. to SR 40	yes	RM 3a, 3b	1.75	D	A	35,700	17,000	0.48	A	35,700	19,400	0.54	A	35,700	20300	0.56	Resolution 99-40	
SR 40 to Hand Ave.	yes	RM 3	0.85	D	B	35,700	22,500	0.63	D	35,700	23,100	0.65	A	35,700	21200	0.59	Resolution 99-40	
Hand Ave. to Florida St.	yes	RM 3	2.8	D	C	35,700	25,900	0.73	C	35,700	26,100	0.70	B	35,700	29700	0.84	Resolution 99-40	
NOVA ROAD (SR5A)																		
US 1 to Wilmette Ave.	no		1	D	A	35,700	13,400	0.38	A	35,700	24,100	0.68	A	35,700	15200	0.43		
Wilmette Ave. to SR 40	no	RM 5	0.5	D	A	53,500	23,000	0.43	A	53,500	23,500	0.44	A	53,500	24200	0.45		
SR 40 to Hand Ave.	no	RM 5	1.1	D	A	53,500	27,000	0.51	A	53,500	25,200	0.48	A	53,500	28500	0.53		
Hand Ave. to PCA Blvd.	no	RM 5	1.3	D	A	53,500	29,000	0.54	A	53,500	28,700	0.54	A	53,500	30400	0.57		
GRANADA BLVD. (SR40)																		
Old Lane to Tymber Creek Rd.	yes		6.98	C - DOT	D	35,700	29,000	0.84	D	34,700	29,400	0.85	E	34,700	38400	1.11		
Tymber Creek Rd. to I-95	yes		0.8	C - DOT	D	35,700	29,000	0.84	E	34,700	31,000	0.89	E	34,700	38400	1.11		
I-95 to Clyde Morris Blvd	yes	RM 1b	1.6	D	D	48,800	36,800	0.76	E	46,000	45,800	0.99	E	46,000	51000	1.11		
Clyde Morris Blvd. to Nova Rd	yes	RM 1b	1	D	C	42,300	33,500	0.79	E	42,300	38,300	0.91	E	42,300	40200	0.95		
Nova Rd. to US 1	yes	RM 1b, 8	1.25	D	D	35,700	33,000	0.92	D	35,700	30,600	0.87	D	35,700	30600	0.86	ROW constrained	
US 1 to John Anderson	yes	RM 1b	1	E	E	35,700	34,500	0.97	D	35,700	30,500	0.85	D	35,700	26400	0.74	ROW constrained	
John Anderson Dr. to SR A1A	yes	RM 1a,b	0.5	E	C	31,065	22,300	0.71	E	31,065	26,500	0.85	E	31,065	28800	0.91		
AIRPORT ROAD																		
Tymber Creek Rd. to Pine and Tr.	no			D	A	10,080	5,830	0.58	A	10,080	6,200	0.59	A	10,080	4800	0.48		
Pine and Tr. to Ocean Pine Dr.	no			D	A	10,080	4,490	0.45	A	10,080	6,900	0.68	A	10,080	5200	0.52		
Ocean Pine Dr. to Bear Creek Path[14]	no	3c		D	A	12,400	7,190	0.58	B	12,400	7,900	0.61	C	12,400	8700	0.70		
Bear Creek Path to US 1[12]	no	3c		D	A	13,800	7,190	0.52	A	13,800	7,200	0.52	A	13,800	7100	0.51		
BEACH STREET																		
Tomoka River Bridge to Ingleside Ave.	no			D	A	16,800	2,480	0.15	A	16,000	3,300	0.21	A	16,800	3900	0.25	Constrained	
Ingleside Ave. to Domicilio Ave.	no			D	A	16,800	6,900	0.41	A	16,000	6,300	0.40	A	16,800	6200	0.40	Constrained	
Domicilio Ave. to Wilmette Ave.	no	3b		D	A	16,000	6,900	0.41	A	16,000	6,400	0.41	A	16,800	6800	0.41	Constrained	
Wilmette Ave. to Hernandez Ave.	no	3b		D	B	16,000	9,840	0.62	B	16,800	10,100	0.56	B	16,800	10800	0.63	Constrained	
Dix Ave. to SR 40	no			D	B	16,800	9,840	0.62	C	16,800	11,900	0.72	C	16,800	11900	0.70	Constrained	
SR 40 to Division Ave.	no			D	A	16,800	7,700	0.50	D	16,000	9,000	0.63	D	16,800	10000	0.59	Constrained	
Division Ave. to Arroyo Pkwy	no			D	A	16,800	6,400	0.38	A	16,000	6,400	0.41	A	16,800	6800	0.42	Constrained	
Arroyo Pkwy to Plaza Grande Ave.	no			D	A	16,800	6,400	0.38	A	16,800	6,000	0.42	A	16,800	6000	0.44	Constrained	
CLYDE MORRIS BLVD.																		
SR 40 to South Tomoka Tr.	no			D	A	31,255	12,200	0.39	A	31,255	10,800	0.34	A	31,255	12700	0.41		
South Tomoka Tr. to Falls Way	no			D	A	31,255	12,200	0.39	A	31,255	14,500	0.46	A	31,255	14400	0.46		
Falls Way to Daytona Point Dr.[13]	no			D	C	16,800	12,200	0.73	A	32,900	14,600	0.44	A	32,900	15000	0.46		
Daytona Point Dr. to Hand Ave.[13]	no			D	C	16,800	12,200	0.73	A	32,900	15,600	0.47	A	32,900	18800	0.57		
Hand Ave. to Shoreline Range Rd.[13]	no			D	C	16,800	11,300	0.67	A	32,900	15,600	0.47	A	32,900	15400	0.47		
HALIFAX																		
Sheridan Dr. to Emerson Rd.	no			D	A	10,080	1,600	0.16	A	10,080	1,500	0.15	A	10,080	0	0.00		
Emerson Rd to Neptune	no			D	A	10,080	1,600	0.16	A	10,080	2,100	0.21	A	10,080	0	0.00		
Neptune Ave. to SR 40	no			D	D	10,080	6,600	0.65	B	10,080	6,200	0.62	A	10,080	5800	0.58		

Roadway Segment	Evacuation Route	Transit Route	Distance (miles)	Adopted LOS[1]	2009 LOS	2009 LOS Capacity[2]	2009 AADT[3]	2009 VC Ratio	2017 LOS	2017 LOS Capacity	2017 AADT	2017 VC Ratio	2025 LOS	2025 LOS Capacity	2025 AADT	2025 VC Ratio	Constrained Facility	TIP or CIP
HAND AVENUE																		
Williamson Blvd. to Spring Meadows Dr.[4]	no			D	A	15,330	7,110	0.46	C	16,330	11,900	0.74	[illegible]	15,330	13800	0.90		
Spring Meadows Dr. to Cypress Mains Blvd.[4]	no			D	A	15,330	7,110	0.46	B	15,330	10,900	0.66	D	16,330	12400	0.81		
Cypress Mains Blvd. to Shangri La Dr.[4]	no			D	C	15,330	11,880	0.77	[illegible]	15,330	19,300	1.26	[illegible]	16,330	25500	1.55		
Shangri La Dr. to Nova Rd.	no			D	A	25,200	13,750	0.55	D	25,200	21,600	0.87	[illegible]	25,200	26800	1.06		
Nova to Orchard Street	no			D	A	12,800	7,270	0.57	C	12,800	9,400	0.73	C	12,800	9200	0.73		
Nova to US 1	no			D	A	12,800	7,270	0.57	A	12,800	7,400	0.58	A	12,800	6900	0.54		
JOHN ANDERSON																		
Fares Dr. to Halifax Dr.	no			D	A	10,080	5,600	0.56	A	10,080	5,200	0.52	A	10,080	4200	0.42	Policy constrained	
Halifax Dr. to Amsden Dr.	no			D	A	10,080	3,350	0.33	A	10,080	5,000	0.50	A	10,080	2800	0.28	Policy constrained	
Amsden Dr. to SR 40	no			D	A	10,080	5,550	0.55	C	10,080	6,900	0.70	D	10,080	6800	0.67	Policy constrained	
PINE TREE DRIVE																		
US 1 to Village Dr.	no			D	A	10,080	2,600	0.25	A	10,080	3,300	0.33	A	10,080	2600	0.26		
Village Dr. to midpoint	no			D	A	9,600	1,800	0.20	A	9,600	2,300	0.24	A	9,600		0.00		
midpoint to Old Dixie Hwy	no			D	A	9,600	1,020	0.17	A	9,600	2,000	0.21	A	9,600		0.00		
PINELAND TRAIL																		
Airport Rd. to Harmony Ave.	no			D	A	9,600	700	0.07	A	9,600	855	0.09	A	9,600		0.00		
Harmony Ave. to US 1	no			D	A	9,600	280	0.03	A	9,600	351	0.04	A	9,600		0.00		
TYMBER CREEK ROAD																		
Broadway Ave. to Dunance Ln.	no			D	A	12,000	1,500	0.13	A	12,000	2,400	0.20	A	12,000	3500	0.29		
Dunance Ln. to Airport Rd.	no			D	A	12,000	1,500	0.13	A	12,000	5,600	0.47	D	12,000	6100	0.54		
Airport Rd. to Tymber Run[5]	no			D	B	12,000	8,400	0.67	A	32,000	12,900	0.57	A	32,000	14500	0.65		VC CIP 2LUD to 4LD from SR 40 to Pumavon Lane
Tymber Run to SR 40[5]	no			D	[illegible]	12,000	13,470	1.07	A	32,000	19,100	0.68	C	32,000	23800	0.71		VC CIP 2LUD to 4LD from SR 40 to Pumavon Lane
SR 40 to Kyoritand Rd.	no			D	A	12,000	670	0.05	A	12,000	900	0.08	A	12,000	800	0.06		
WILLIAMSON BLVD.																		
SR 40 to Hand	no			D	D	32,000	21,040	0.66	B	32,000	21,200	0.66	B	32,000	22200	0.69		
Hand Ave. to Strickland Range Rd	no			D	A	32,000	12,790	0.39	[illegible]	15,330	15,600	1.02	[illegible]	16,330	17100	1.12		

NOTES:

1) Adopted LOS from Comprehensive Plan, Transportation Element, Objective 1.2. Adopted LOS is [illegible] adopted April [illegible]

2) Maximum Capacity. Capacities assumed from 2002 Volusia County Traffic Counts, unless otherwise noted below.

3) AADT: Average Annual Daily Traffic. Traffic data is provided by Volusia County Traffic Engineering for county roads and FDOT for state roads

4) Volume Thresholds: VC <= .50 = A; .51 - .70 = B; .71 - .90 = C; .91 - 1.00 = D; 1.01 - 1.10 = E; 1.11 - 1.20 = F; >1.20 = F

5) 2017 AADT derived from FDOT's Tradeoff Analysis Screening Tool

STEP 1 DETERMINE EXISTING DEFICIENCY.	STEP 2 DETERMINE NEW GROWTH %.	STEP 3 ESTIMATE COSTS FOR EACH TRAVEL MODE.	STEP 4 MULTIPLY NEW GROWTH % BY TRAVEL MODE COSTS.	STEP 5 MULTIPLY 15 YEAR GROWTH BY AVO TO DERIVE PERSON TRIPS.

2010 Existing Volume	2010 Existing Capacity	2025 Capacity Future	2025 Capacity Existing
15,100	21,300	21,300	21,300
16,400	21,300	21,300	21,300
17,900	21,300	21,300	21,300
19,500	35,700	35,700	35,700
15,200	61,800	61,800	61,800
21,500	35,700	35,700	35,700
25,500	35,700	35,700	35,700
17,000	35,700	35,700	35,700
22,500	35,700	35,700	35,700
26,000	35,700	35,700	35,700
13,400	35,700	35,700	35,700
23,000	53,500	53,500	53,500
27,500	53,500	53,500	53,500
29,000	53,500	53,500	53,500
29,000	34,700	34,700	34,700
29,000	34,700	34,700	34,700
35,500	46,600	46,600	46,600
33,500	42,300	42,300	42,300
32,000	35,700	35,700	35,700
34,500	35,700	35,700	35,700
34,500	31,065	31,065	31,065
22,000	10,080	10,080	10,080
5,630	10,080	10,080	10,080
4,490	12,400	12,400	12,400
7,190	13,800	13,800	13,800
7,190	15,600	15,600	15,600
2,490	15,600	15,600	15,600
6,390	15,600	15,600	15,600
6,390	15,600	15,600	15,600
9,840	15,600	15,600	15,600
9,840	15,600	15,600	15,600
9,840	15,600	15,600	15,600
7,770	15,600	15,600	15,600
5,400	15,600	31,255	15,600
5,400	31,255	31,255	31,255
12,220	31,255	32,900	31,255
12,220	15,600	32,900	15,600
12,220	15,600	32,900	15,600
12,220	15,600	10,080	15,600
11,970	10,080	10,080	10,080
1,650	10,080	10,080	10,080
1,650	10,080	15,330	10,080
6,220	10,080	15,330	10,080
7,110	15,330	15,330	15,330
7,110	15,330	25,200	15,330
11,880	15,330	12,600	15,330
13,750	25,200	12,600	25,200
7,270	12,600	10,080	12,600
7,270	12,600	10,080	12,600
5,620	10,080	10,080	10,080
3,550	10,080	10,080	10,080
5,550	10,080	9,600	10,080
2,590	10,080	9,600	10,080
700	9,600	9,600	9,600
280	9,600	9,600	9,600
1,580	9,600	12,000	9,600
1,580	12,000	12,600	12,000
8,440	12,600	32,800	12,600
13,470	12,600	32,800	12,600
670	12,600	12,600	12,600
21,040	12,600	32,900	12,600
21,040	32,900	15,330	32,900
12,790	32,900		32,800
	9,600		9,600
851,020	1,436,565	1,485,615	1,436,565

0.59239923 divided by 1.03414395 equals 0.57284 is the Existing Deficiency

Percentage for New Growth

42.7%

Estimated Costs / **New Growth Costs**

Roads	Local Road Impact Fee $141.00/SFD or $9.40 per person trip per trip		
Transit:			
	Capital:	$5,390,000	
	Operating (3 years):	$12,918,000	
		$18,308,000	$7,820,441.54
Non-motorized:		$9,283,075	$3,965,356.42
Total Costs:		$27,591,075	$11,785,798.4

Goss:

Formula: 1-.5728 = .427

Goss:
Percentage for New Growth (42.7%) is multiplied by Estimated cost to derive new growth cost

Goss:
These numbers come from the 2010-2017-2025 revised long term road assessment using FDOT's trend analysis tool

Goss:

Exisitng Deficiency Formula: (Existing Volume)- (Existing Capacity)
(Future Capacity) - (Existing Capacity)

Person Trips attributable to Growth

Horizon Year 2025	Base Year 2010	Growth	AVO 1.502	Person Trips
23,000	15,100	7,900	x AVO =	11,866
17,400	16,400	1,000	x AVO =	1,502
17,800	17,900	-100	x AVO =	-150
16,400	19,500	-3,100	x AVO =	-4,656
33,200	15,200	18,000	x AVO =	27,036
35,700	21,500	14,200	x AVO =	21,328
34,600	25,500	9,100	x AVO =	13,668
20,000	17,000	3,000	x AVO =	4,506
21,200	22,500	-1,300	x AVO =	-1,953
22,700	26,000	-3,300	x AVO =	-4,957
15,200	13,400	1,800	x AVO =	2,704
24,200	23,000	1,200	x AVO =	1,802
28,500	27,500	1,000	x AVO =	1,502
30,400	29,000	1,400	x AVO =	2,103
38,400	29,000	9,400	x AVO =	14,119
38,400	29,000	9,400	x AVO =	14,119
51,900	35,500	16,400	x AVO =	24,633
40,200	33,500	6,700	x AVO =	10,063
30,500	32,000	-1,500	x AVO =	-2,253
26,400	34,500	-8,100	x AVO =	-12,166
28,300	34,500	-6,200	x AVO =	-9,312
4,900	22,000	-17,100	x AVO =	-25,684
5,200	5,630	-430	x AVO =	-646
8,700	4,490	4,210	x AVO =	6,323
7,100	7,190	-90	x AVO =	-135
3,900	7,190	-3,290	x AVO =	-4,942
6,200	2,490	3,710	x AVO =	5,572
6,400	6,390	10	x AVO =	15
10,800	6,390	4,410	x AVO =	6,624
11,900	9,840	2,060	x AVO =	3,094
10,800	9,840	960	x AVO =	1,442
6,600	9,840	-3,240	x AVO =	-4,866
6,900	7,770	-870	x AVO =	-1,307
12,700	5,400	7,300	x AVO =	10,965
14,400	5,400	9,000	x AVO =	13,518
15,000	12,220	2,780	x AVO =	4,176
16,800	12,220	4,580	x AVO =	6,879
15,400	12,220	3,180	x AVO =	4,776
0	12,220	-12,220	x AVO =	-18,354
800	11,970	-11,170	x AVO =	-16,777
5,600	1,650	3,950	x AVO =	5,933
13,800	1,650	12,150	x AVO =	18,249
12,400	6,220	6,180	x AVO =	9,282
23,500	7,110	16,390	x AVO =	24,618
26,800	7,110	19,690	x AVO =	29,574
9,200	11,880	-2,680	x AVO =	-4,025
6,300	13,750	-7,450	x AVO =	-11,190
4,200	7,270	-3,070	x AVO =	-4,611
2,900	7,270	-4,370	x AVO =	-6,564
8,800	5,620	3,180	x AVO =	4,776
3,600	3,550	50	x AVO =	75
3,300	5,550	-2,250	x AVO =	-3,380
8,100	2,590	5,510	x AVO =	8,276
14,900	700	14,200	x AVO =	21,328
23,200	280	22,920	x AVO =	34,426
800	1,580	-780	x AVO =	-1,172
22,300	1,580	20,720	x AVO =	31,121
17,100	8,440	8,660	x AVO =	13,007
	13,470	-13,470	x AVO =	-20,232
	670	-670	x AVO =	-1,006
	21,040	-21,040	x AVO =	-31,602
	21,040	-21,040	x AVO =	-31,602
	12,790	-12,790	x AVO =	-19,211
965,700	851,020	114,680		172,249

Goss:
The AVO is sourced from a FIU Doctorial Dissertation paper authorized by Kaiyu Liu in which the survey for VC indicated an AVO rate of 1.502 unadjusted for gender types.

PROJECTED 2010-25 TRANSIT USAGE DUE TO VMT REDUCTION

Corridor	Route	Total VMT	VMT Reduction 10%	VMT Reduction 15%	VMT Reduction 20%	AVG VMT/car	Vehicle Reduction by VMT % 10%	Vehicle Reduction by VMT % 15%	Vehicle Reduction by VMT % 20%	AVG Vehicle Occupancy (1.502) 10%	AVG Vehicle Occupancy (1.502) 15%	AVG Vehicle Occupancy (1.502) 20%	Annual Passengers	Transit Usage Increase due to VMT Reduction 10%	Transit Usage Increase due to VMT Reduction 15%	Transit Usage Increase due to VMT Reduction 20%
US1	3	61,692,685	6,169,269	9,253,903	12,338,537	2,285	2,700	4,050	5,400	4,055	6,083	8,110	318,568	1.3%	1.9%	2.5%
A1A	1	26,146,775	2,614,678	3,922,016	5,229,355	1,477	1,770	2,655	3,541	2,659	3,988	5,318	132,227	2.0%	3.0%	4.0%
SR 40	18/19	93,559,720	9,355,972	14,033,958	18,711,944	2,339	4,000	6,000	8,000	6,008	9,012	12,016	New Route. Part of Route 1			
		181,399,180	18,139,918	27,209,877	36,279,836	2,034	8,470	12,705	16,940	12,722	19,083	25,444	450,795	2.8%	4.2%	5.6%

TOTAL VMT BY ROADWAY CORRIDOR SERVED BY TRANSIT

Road Name	Limits (From - To)	Distance in Miles	2008 Number of Lanes	2008 AADT	2008 Daily VMT	Days in year	2008 Annual VMT	Total VMT by Corridor
US 1	I-95 to Airport Rd.	2.81	4	22,500	63,225.0	365	23,077,125.0	
US 1	Airport Rd. to SR5A/Nova Rd.	1.13	4	29,000	32,770.0	365	11,961,050.0	
US 1	SR5A/Nova Rd. to SR 40	1.83	4	18,200	33,306.0	365	12,156,690.0	
US 1	SR 40 to Hand Ave.	0.84	4	23,500	19,740.0	365	7,205,100.0	
US 1	Hand Ave. to Plaza Blvd.	0.74	4	27,000	19,980.0	365	7,292,700.0	61,692,665.0
SR A1A - Ocean Shore Blvd.	Ormond Mall to Neptune Ave	1.69	2	17,500	29,575.0	365	10,794,875.0	
SR A1A - Ocean Shore Blvd.	Neptune Ave to SR 40 (Granada Blvd.)	0.70	2	17,100	11,970.0	365	4,369,050.0	
SR A1A - Atlantic Ave.	North SR 40 to Harvard Dr.	1.70	4	17,700	30,090.0	365	10,982,850.0	26,146,775.0
SR 5A - Nova Rd.	US 1 to Wilmette Ave.	1.00	4	14,000	14,000.0	365	5,110,000.0	
SR 5A - Nova Rd.	Wilmette Ave. to SR 40	0.51	6	24,500	12,495.0	365	4,560,675.0	
SR 5A - Nova Rd.	SR 40 to Hand Ave.	1.15	6	29,000	33,350.0	365	12,172,750.0	
SR 5A - Nova Rd.	Hand Ave. to Golf Ave.	0.77	6	30,500	23,485.0	365	8,572,025.0	
SR 40	Rima Ridge Rd. to Tymber Creek Rd.	4.36	4	10,800	47,088.0	365	17,187,120.0	
SR 40	Tymber Creek Rd. to I-95	0.79	4	26,500	20,935.0	365	7,641,275.0	
SR 40	I-95 to Clyde Morris Blvd.	1.58	4	37,500	59,250.0	365	21,626,250.0	
SR 40	Clyde Morris Blvd. to SR 5A/Nova Rd.	1.06	4	35,000	37,100.0	365	13,541,500.0	
SR 40	SR5A/Nova Rd. to US 1	1.33	4	32,000	42,560.0	365	15,534,400.0	
SR 40	US 1 to Halifax Ave.	1.11	4	36,500	40,515.0	365	14,787,975.0	
SR 40	Halifax Ave. to SR A1A	0.37	4	24,000	8,880.0	365	3,241,200.0	93,559,720

PROJECTED TRANSIT REVENUE AND EXPENDITURES

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Revenue:																	
Transit Fee	$2,200	$75,000	$125,000	$200,000	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$614,212	$7,772,744
Funding by others							$3,275,000	$1,790,000	$1,700,000	$1,736,000	$1,750,000	$1,750,000	$4,306,000	$4,306,000	$4,306,000	$4,306,000	$29,225,000
Multi-modal Expenses:																	
Transit Amenities	$2,200	$75,000	$125,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$202,200
SR 40 corridor frequency of service improvements from 1 hour headways to 30																	
Capital	$0	$0	$0	$0	$0	$0	$0	$0	$2,460,000	$0	$0	$0	$0	$0	$0	$0	$2,460,000
Operating	$0	$0	$0	$0	$0	$0	$0	$0	1,942,000	$1,942,000	$1,942,000	$1,942,000	$1,942,000	$1,942,000	$1,942,000	$1,942,000	$15,536,000
US 1 Corridor Frequency of Service improvements from 1 hour headways to 30																	
Capital	$0	$0	$0	$0	$0	$0	$1,760,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760,000
Operating	$0	$0	$0	$0	$0	$0	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$1,416,000	$14,160,000
A1A corridor frequency of service improvements from 1 hour headways to 15																	
Capital	$0	$0	$0	$0	$0	$0	$1,170,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,170,000
Operating	$0	$0	$0	$0	$0	$0	$948,000	$948,000	$948,000	$948,000	$948,000	$948,000	$948,000	$948,000	$948,000	$948,000	$9,480,000
Balance	$0	$0	$0	$200,000	$814,212	$1,428,424	$23,636	$63,848	$14,060	$272	$484	$696	$2,556,908	$5,113,120	$7,669,332	$10,225,544	$2,455,088

PROJECTED NON-MOTORIZED REVENUE AND EXPENDITURES

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Revenue																	
Non-mortorized Fee	$0	$30,000	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$285,758	$4,030,612
Xu Funds			$473,812														$473,812
Non-motorized expenses																	
Bike racks, storage lockers, etc			$5,000	$5,000	$5,000			$10,000				$10,000	$10,000	$20,000	$20,000	$20,000	$105,000
Tomoka Park Trail			$473,812														$473,812
SR 40 Trail Phase 3					$570,000												$570,000
Thompson Creek Trail																	$0
Phase 1											$1,250,000						$0
Phase 2																$950,000	$1,250,000
																	$950,000
Osceola/Ormond/Tomoka/Pathway/Pine Trail ES pedestrian/bike improvements			$20,000	$15,000		$20,000	$25,000	$40,000				$20,000	$20,000	$20,000	$20,000	$20,000	$220,000
Sidewalk enhancements from existing 5 foot wide to 8 foot wide			$50,000	$40,000	$50,000	$50,000	$50,000	$50,000				$50,000	$50,000	$50,000	$50,000	$30,000	$520,000
Sidewalk Connectivity																	
SR 40 Corridor			$15,000	$10,000	$15,000	$15,000	$15,000	$15,000				$10,000	$10,000	$10,000	$10,000	$10,000	$135,000
US 1 Corridor			$15,000	$15,000	$15,000	$15,000	$15,000	$15,000				$10,000	$10,000	$10,000	$10,000	$10,000	$140,000
A1A Corridor			$15,000	$10,000	$15,000	$15,000	$15,000	$15,000				$10,000	$10,000	$10,000	$10,000	$10,000	$135,000
	$0	$30,000	$195,758	$386,516	$2,274	$173,032	$338,790	$479,548	$765,306	$1,051,064	$86,822	$262,580	$438,338	$604,096	$769,854	$5,612	$11,224

PROJECTED 2010-25 LAND USE BASED DEVELOPMENT TRIPS SUBJECT TO MOBILITY FEE

Maximum TGR for undeveloped land based upon land use classification in Comprehensive Plan:	**510,353**
Most likely TGR for undeveloped land based upon land development code provisions governing density and intensity:	**207,156**
Past trip distribution approved to US1, A1A and SR40 from 2003-08 :	**66%**
Maximum development related trips subject to transit fee:	**336,926**
Most likely development related trips subject to transit fee:	**136,761**

2003-08 TRIP DISTRIBUTION

	Project	Type of Development		TGR	Trip Distribution			Date
		NR	R		SR40	US1	A1A	
1	Marshside @ Groverbranch		x	863	212	0	0	2006
2	Hand Avenue Medical Office	x		764	78	0		2007
3	Shoppes @ TCR	x		10,252	6,727	0	0	2007
4	River Oaks		x	1,005	200	0	0	2003
5	Courtyards	x	x	1,120		800		2005
6	East Coast Community Bank	x		669	669			2006
7	Granada Grande		x	1,852	1,600			2006
8	Tomoka Christian Church			528	100	0	0	2007
9	Tomoka Oaks Golf Village		x	773	77	77		2005
10	S.R. Perrott	x		931	0	931	0	2007
11	Root Commerce Park	x		1,305	209	927	0	2006
12	Amsouth	x		942	942	0	0	2006
13	Pineland		x	1,868	900	36	36	2008
14	Calvary Church	x		2,178	2,178	0	0	2007
15	Enclave		x	396	100	0	0	2006
		8	7	25,446	13,992	2,771	36	
					55%	11%	0%	66%

66% of all approved trips distributed to US 1, SR40, and A1A

Conclusion: The above represents all traffic impact assessment studies received and approved from 2003 to 2008. Past development was mostly located in the west end of the city. Infill and redevelopment is projected along the roadway corridors. SR40 was and is projected to continue as the primary east-west road corridor. The traffic studies as a group indicate that approximately 66% of TGR was distributed to SR40, US 1 and A1A. Future distribution will mirror past trends.

2010-25 DEVELOPMENT SCENARIO OF PROPOSED LAND USE CATEGORY ENTITLEMENTS

Land Use Classification	Developed Property		Undeveloped Property		Total (Acres)	% of Total	Most likely		ITE Trip Generation Categories	Generation Rates	Proposed (1)
	Area (Acres)	% of Total	Area (acres)	% of Total			Density	FAR			
Institutional	849	95%	49	5%	898	4%	NA	0.2	General Office (710)	11.01	4,700
Office/Professional	263	62%	159	38%	421	2%	7.5	0.2	Medical Dental Office (720)	36.13	50,048
General Commercial	583	86%	92	14%	675	3%	15	0.2	Shopping Center (820)	42.94	34,417
Tourist Commercial	186	85%	34	15%	220	1%	32	1	Shopping Center (820)	42.94	63,596
Heavy Commercial	106	88%	14	12%	120	1%	18	0.2	Shopping Center (820)	42.94	5,237
Industrial/Utilities	371	59%	259	41%	630	3%		0.2	General Light Industrial (110)	6.97	15,727
Activity Center	1270	0%	1825	100%	3,095	14%	Per remedial amendments		Per remedial amendments		Per remedial amendments
High Density Residential	101	97%	3	3%	104	0.50%	12-32 upa	0.3	Apartments (220)	6.72	302
Medium Density Residential	1,027	81%	244	19%	1,271	6%	5-15 upa	0.3	Apartments (220)	6.72	12,298
Low Density Residential	4,505	90%	519	10%	5,024	22%	4.3	0.2	Single Family Homes (210)	9.57	14,900
Suburban Low Density Residential	1,152	77%	349	23%	1,501	7%	.2 to 6 upa	0.2	Single Family Homes (210)	9.57	5,845
Rural Estate	795	70%	348	30%	1,143	5%	1 unit per 5 acres	0.2	Single Family Homes (210)	9.57	70
Rural Residential	139	89%	17	11%	156	1%	1 unit per 1 acre	0.2	Single Family Homes (210)	9.57	17
Recreation/Open Space	N/A	N/A	N/A	N/A	532	2%	NA	0.5	NA	NA	NA
Open Space/Conservation	N/A	N/A	N/A	N/A	5,005	22%	NA	0.5	NA	NA	NA
Water bodies/ROW	N/A	N/A	N/A	N/A	2,204	10%	NA	NA	NA	NA	NA
Residential/Office/ Retail	N/A	N/A	N/A	N/A	0	0%	10	0.6	NA	NA	NA
Heavy Industrial	N/A	N/A	N/A	N/A	0	0%	NA	0.75	NA	NA	NA
Total	11,347		3,912		22,999				Maximum Potential Total AADT		207,156

(1) Proposed trips for nonresidential calculated by using undeveloped land multiplied by 43,560, then multiple times the most likely FAR, then divide by 1,000, then multiplied by the trip generation rate to obtain the maximum number of potential average daily trips. Proposed residential trips calculated by using undeveloped land multiplied by the most likely density permitted by the Land Development Code.

STAFF REPORT

City of Ormond Beach
Department of Planning

DATE: September 3, 2013

SUBJECT: 260 Williamson Boulevard (United States Post Office) – Small-Scale Land Use Map Amendment

APPLICANT: Administrative

NUMBER: LUPA 13-106

PROJECT PLANNER: S. Laureen Kornel, AICP, Senior Planner

INTRODUCTION: This is a City initiated request, to change the existing Future Land Use designation of an ±8.06-acre parcel from Volusia County "Urban Medium Intensity" to Ormond Beach "Low Intensity Commercial" located at 260 Williamson Boulevard as the result of an annexation.

BACKGROUND: The property located at 260 Williamson Boulevard is owned by the United States Postal Service which operates a post office. The property was developed under Volusia County review in the early 1990's and connected to City water in 1995. The property was annexed on August 20, 2013, with Ordinance 2013-43. The annexation occurred based on connection to City utilities and contiguity. Since the subject property is now located within the City of Ormond Beach, the City is required to assign a City land use and compatible zoning. Until a City land use designation and zoning classification are adopted, the property maintains its County land use and zoning classifications.

The subject property currently has a County Future Land Use Map designation of Volusia County "Urban Medium Intensity" and fronts the west side of Williamson Boulevard. The property abuts Tire Kingdom to the north and the San Marco Apartments to the south. Interstate 95 lies to the west. The property is currently developed as a post office and there are presently no plans for further site development. Along with the land use application a zoning amendment is being processed to assign the city PBD (Planned Business Development) zoning classification to the property. Subsequent to Planning Board review, the land use amendment will be submitted to the Volusia County Growth Management Commission for review, followed by review by the City Commission for final action. The tentative land use amendment schedule of the subject property is as follows:

The purpose of this land use amendment is to assign a similar City land use to the property as the Volusia County "Urban Medium Intensity" designation based on the annexation. Along with the land use application, a zoning amendment is being processed to assign a city PBD (Planned Business Development) zoning designation to the property.

Action/Board	Date
Planning Board	September 12, 2013
Transmit to Volusia County Growth Management Commission	September 13, 201
City Commission 1st Reading	November 5, 2013
City Commission 2nd Reading	November 19, 2013
Transmit to Florida Department of Economic Opportunity	November 20, 2013

ANALYSIS: The proposed amendment seeks to change the land use designation of the subject property from unincorporated Volusia County "Urban Medium Intensity" to City of Ormond Beach "Low Intensity Commercial" to assign a land use to the subject property as a result of annexation. Staff has reviewed the proposed Future Land Use Map amendment based upon the following criteria:

1. Whether the land use meets the criteria established in the City's Comprehensive Plan and Florida Statute.

City's Comprehensive Plan:

Objective 1.2 of the Future Land Use Element of the Comprehensive Plan states that the City needs to ensure that there are adequate amounts of lands to meet the commercial land use needs of the community. The existing development pattern in this area is the "General Commercial" and "Urban High Intensity" land use designations. In addition, Policy 5.1.1 under Goal 5. Annexation of the Future Land Use Element, states that the City shall assign a similar land use to annexed properties.

2. Whether the proposed plan amendment meets the criteria established in the Florida Statutes.

Florida Statute: In accordance with Chapter 163.3187(1), Florida Statutes, any local government comprehensive plan amendments directly related to proposed small-scale development activities may be approved without regard to statutory limits on the frequency of consideration of amendments to the local comprehensive

plan. A small-scale development amendment may be adopted only under the following conditions:

a. The proposed amendment involves a use of 10 acres or fewer and:

The subject property is ±8.06 acres (less than 10 acres).

b. The cumulative annual effect of the acreage for all small scale development amendments adopted by the local government does not exceed a maximum of 120 acres in a calendar year.

The proposed small-scale amendment complies with this requirement and will be the eleventh amendment for the current year 2013. The following table illustrates previous small scale future land use amendments for 2013:

Case #	Address	±Acreage
LUPA 13-011	1428 North US Highway 1	0.53
LUPA 13-009	1438 North US Highway1	0.15
LUPA 13-007	1444 North US Highway1	0.72
LUPA 12-116	1433, 1435, 1437, and 1439 North US Highway 1	3.97
LUPA 12-099	1608 N US Highway 1	6.88
LUPA 12-101	1622 N US Highway 1	1.15
LUPA 12-103	1626 N US Highway 1	0.46
LUPA 13-041	305 N. Tymber Creek Road	0.44
LUPA 13-056	250 Williamson Blvd.	1.25
LUPA 13-092	1535 North US Highway 1	1.01
		16.56 acres

c. The proposed amendment does not involve a text change to the goals, policies, and objectives of the local government's comprehensive plan, but only proposes a land use change to the future land use map for a site-specific small scale development activity. However, text changes that relate directly to, and are adopted simultaneously with, the small scale future land use map amendment shall be permissible under this section.

The proposed amendment is solely to the Future Land Use Map and does not propose any text amendments to the City's Comprehensive Plan.

d. The property that is the subject of the proposed amendment is not located within an area of critical state concern, unless the project subject to the proposed amendment involves the construction of affordable housing units meeting the criteria of s. 420.0004(3), and is located within an area of

critical state concern designated by s. 380.0552 or by the Administration Commission pursuant to s. 380.05(1).

The site location is not located within an area of state critical concern, and this criterion does not apply.

3. Whether the land use is an appropriate use of the land.

Land Use: The adjacent land uses and zoning are as follows:

Land Use and Zoning Designations of Adjacent Property			
	Current Land Uses	**Future Land Use Designation**	**Zoning**
North	Tire Kingdom	Ormond Beach "General Commercial"	Ormond Beach PBD (Planned Business Development)
South	San Marco Apartments	Volusia County "Urban High Intensity"	Volusia County R-7 (Urban Multi-Family)
East	Vacant Land	Volusia County "Commercial"	Volusia County R-4 (Urban Single-Family)
West	Interstate 95	N/A	N/A

The future land use designation presently assigned to the subject property is Volusia County "Urban Medium Intensity" and the proposed future land use designation is Ormond Beach "Low Intensity Commercial". Initially the thought was to assign the Public Institution land use designation since post offices are identified in the Public Institution directive. However, it is quite possible that the post office could one day close and staff did not want to create a situation where ultimately the land use would need to be changed again in the future.

In addition to consideration of the Public Institution designation, the comprehensive plan identifies five other potential commercial land use categories as follows:

Land Use Category	Maximum Density (units per acre)	Maximum FAR (Floor Area Ratio)	Existing Areas
General Commercial	32	0.7	Nova Road, US1 (Nova Road to Wilmette Avenue)
Heavy Commercial	18	0.8	US1 (Granada Blvd. to Hand Avenue)
Tourist Commercial	32	1.5	South Atlantic Avenue, Interchange Blvd., Granada Blvd. and I-95, and US1 and I-95
Office/Professional	15	0.5	Granada Boulevard, Clyde Morris Blvd., Hand Avenue
Low Intensity Commercial	10	0.6	North US1

The existing County land use allows a 0.55 FAR. This area of Williamson Blvd. is in close proximity to I-95 and while the hospital and a medical office complex are located nearby, the "Office/Professional" land use designation is a less desirable option because the majority of uses in the area are of a commercial nature with the B-8 (Commercial) zoning classification. The "Heavy Commercial" is not an appropriate use for the subject property since that land use category is reserved for automotive sales and repair type uses. Given the location and size of the subject property as well as the adjacent land uses, the "Tourist Commercial" and "Commercial" land uses were also reviewed as possible land use designation options. However, those land use categories were identified as having relatively higher densities and intensities and it is staff's intention to apply a similar land use. It was determined that the "Low Intensity Commercial" is the most suitable designation because it is the least intense city floor area ratio available. The "Low Intensity Commercial" is the most similar land use category available within the City of Ormond Beach.

The proposed "Low Intensity Commercial" city land use designation is compatible with adjacent land uses. The adjacent property to the north has a Future Land Use Map designation of Ormond Beach "General Commercial". This land use is also compatible with the subject property and surrounding properties to the north and east.

At this time, the Planning Department does not have any proposals regarding any further development of the property. Objective 1.2 of the City's Comprehensive Plan

explains that the City needs to ensure that there are adequate amounts of lands to meet the commercial land use needs of the community

The future land use designation presently assigned to the subject property is Volusia County "Urban Medium Intensity". The directive text of Volusia County's Comprehensive Plan states the following for the "Urban Medium Intensity" land use category:

> "Urban Medium Intensity (UMI) - Areas that contain residential development at a range of greater than four (4) to eight (8) dwelling units per acre. The types of housing typically found in areas designated urban medium intensity include single family homes, townhouses and low-rise apartments.
>
> The UMI designation is primarily a residential designation but may allow neighborhood business areas (see Shopping Center definition in Chapter 20) and office development that meet the Comprehensive Plan's location criteria. The commercial intensity shall be no more than a fifty percent Floor Area Ratio (0.50 FAR) and shall be limited in a manner to be compatible with the allowable residential density. In order to be considered compatible, the commercial development should reflect similar traffic patterns, traffic generation, building scale, landscaping and open space, and buffers. More intensive commercial use, other than neighborhood business areas, shall be reserved to areas designated for Commercial."

The request is for an amendment to the City "Low Intensity Commercial" land use category. The directive text of the City's Comprehensive Plan states the following for "Low Intensity Commercial" category:

> "Purpose: A multi-use land use category to depict those areas of the city that are now developed, or appropriate to be developed, for retail, office and professional services, residential, and restaurants consistent with the surrounding uses, transportation facilities and natural resource characteristics of such areas. For projects that propose a mixture of residential and non-residential uses, the minimum FAR should be 0.2.
>
> Density: Maximum 10 units per acre.
>
> Maximum FAR: 0.6"

The proposed future land use designation is compatible with adjacent land uses in terms of Volusia County density and intensity standards.

4. Whether there is adequate infrastructure to serve the proposed land use.

Infrastructure: Impact analysis examines the maximum expected impacts of the current designation versus the requested designation based on a preliminary development scenario. This analysis is not meant to replace or contradict the findings of a Concurrency Management Review. However, the relative differences between designations can provide useful information in the long-range planning

process. This analysis is based on ±8.06 developed acres to be assigned the City "Low Intensity Commercial" land use.

Transportation: Based on the ITE Trip Generation Rates (9th Edition), ITE use #732, a post office of ± 21,279 square feet is estimated to generate 2,300 daily trips. Since the site is already developed and designated Volusia County "Urban Medium Intensity", a change in Future Land Use to Ormond Beach "Low Intensity Commercial" will not generate an increase in new trips at this time.

Water & Sewer: The subject property is located in the utility service area of the City of Ormond Beach and will not generate in increase in demand.

Stormwater Management: The site is developed and was constructed in accordance with current stormwater regulations. Any new development would require stormwater review.

Solid Waste: This property is developed and will not generate an increase in demand since the property is already being served by the City of Ormond Beach.

Schools: The site is developed as a post office and there will be no impacts to schools as a result of the subject land use amendment.

Other Services: City police and fire protection services serve this area. The parcel is located within an approximate 4-5 minute response time from emergency facilities.

5. Whether the proposed map amendment impacts surrounding jurisdictions.

The developed property is not located next to another City and there are no new impacts expected to any surrounding jurisdiction. The Williamson Boulevard corridor east of I-95 is a mixture of properties located within Ormond Beach and unincorporated Volusia County.

CONCLUSION: Staff supports the land use amendment from Volusia County "Urban Medium Intensity" to Ormond Beach "Low Intensity Commercial". Since the existing parcel is developed as a post office, this small-scale land use map amendment is an administrative amendment required to assign a City Future Land Use Map designation to the subject parcel. Staff believes that the Ormond Beach "General Commercial" land use category is appropriate for the following reasons:

1. The amendment meets the Goals, Objectives, and Policies of the City's comprehensive plan;
2. The amendment meets the criteria established in the City's Comprehensive Plan and Florida Statute;
3. The proposed land use is an appropriate use of land; and
4. There is adequate infrastructure to serve the proposed land use. Since the site is already developed, there will be no change to impacts on facilities and services as a result of the administrative change in land use from county "Urban Medium Intensity" to Ormond Beach "Low Intensity Commercial".

5. The proposed land use will not impact surrounding jurisdictions.

RECOMMENDATION: Staff recommends that the Planning Board recommend **APPROVAL** of Case # LUPA 13-106 – a Future Land Use map amendment to change the land use for ±8.06 acres from the existing land use designation of Volusia County "Urban Medium Intensity" to City of Ormond Beach "Low Intensity Commercial" for 260 Williamson Boulevard.

Attachments
Exhibit 1: Location Aerial and Photo
Exhibit 2: Future Land Use Maps
Exhibit 3: Legal Description and Sketch

EXHIBIT 1

Location Aerial and Photo

AERIAL MAP
260 WILLIAMSON BLVD (4231-00-00-0060)

Prepared By: The City of Ormond Beach
G.I.S. Department - March 11, 2013

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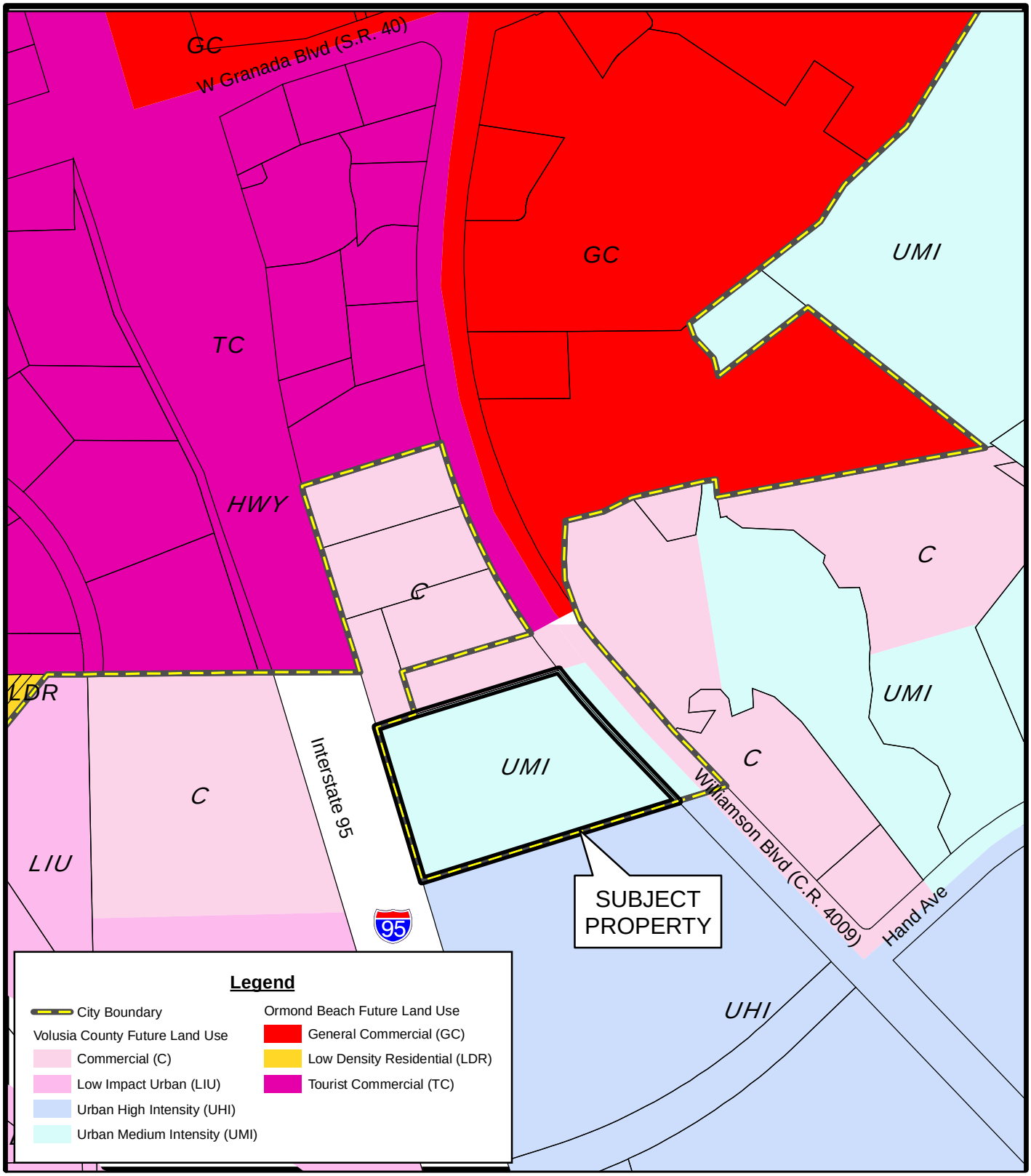
United States
Post Office

EXHIBIT 2

Future Land Use Maps



CURRENT FUTURE LAND USE MAP
260 WILLIAMSON BLVD (± 7.5 Acres)
(4231-00-00-0060)

Prepared By: The City of Ormond Beach
G.I.S. Department - August 23, 2013

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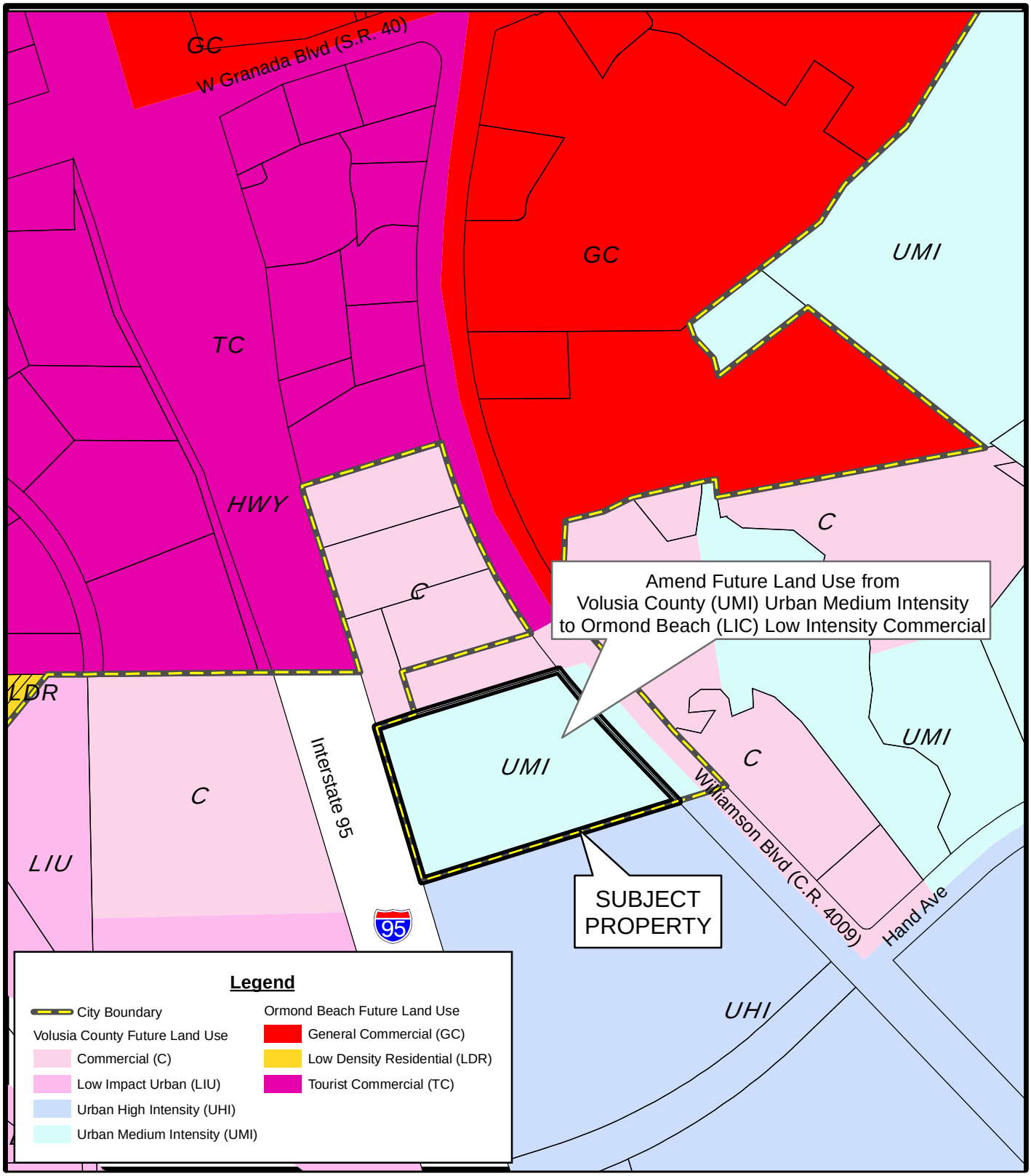

PROPOSED FUTURE LAND USE MAP
260 WILLIAMSON BLVD (± 7.5 Acres)
(4231-00-00-0060)

Prepared By: The City of Ormond Beach
G.I.S. Department - August 23, 2013

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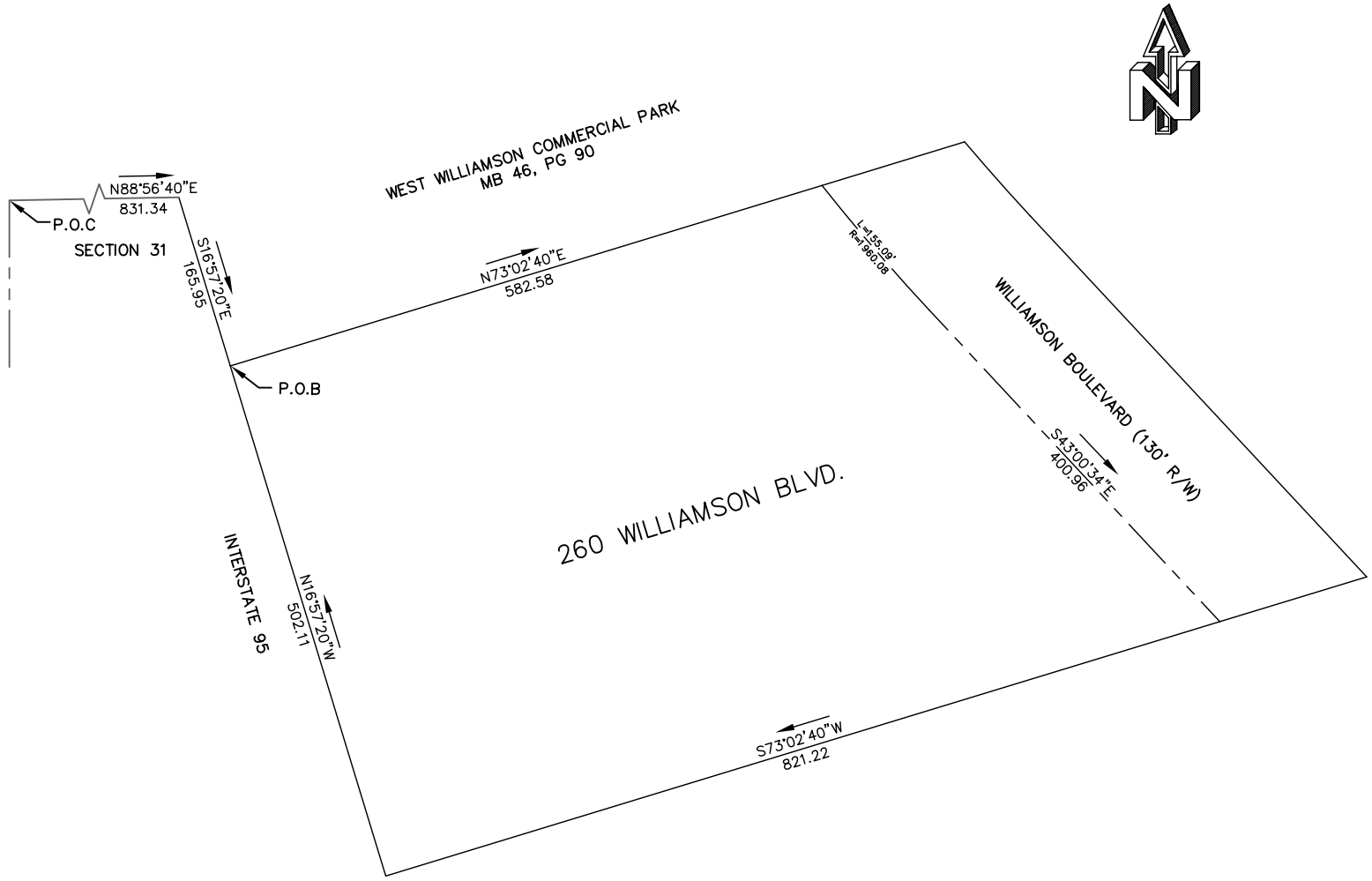
EXHIBIT 3

Legal Description and Sketch

A PARCEL LOCATED IN THE NORTHWEST 1/4 OF SECTION 31, TOWNSHIP 14 SOUTH, RANGE 32 EAST LYING WESTERLY OF WILLIAMSON BOULEVARD, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: AS A POINT OF REFERENCE, BEGIN AT THE NORTHWEST CORNER OF AFORESAID SECTION 31 RUN THENCE N88°56'40"E ALONG THE NORTHERLY LINE OF SECTION 31 A DISTANCE OF 831.34 FEET TO A POINT OF INTERSECTION WITH THE EASTERLY RIGHT-OF-WAY LINE OF INTERSTATE 95; THENCE S16°57'20"E ALONG SAID EASTERLY RIGHT-OF-WAY LINE A DISTANCE OF 165.95 FEET TO A POINT OF INTERSECTION WITH THE SOUTHWEST CORNER OF THE WEST WILLIAMSON COMMERCIAL PARK AS RECORDED IN MAP BOOK 46, PAGE 90, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY FLORIDA, AND ALSO THE <u>POINT OF BEGINNING</u> FOR THIS DESCRIPTION; THENCE N73°02'40"E ALONG THE SOUTHERLY LINE OF SAID WEST WILLIAMSON COMMERCIAL PARK A DISTANCE OF 582.58 FEET TO A POINT OF INTERSECTION WITH THE WESTERLY RIGHT-OF-WAY LINE OF WILLIAMSON BOULEVARD (A 130' RIGHT-OF-WAY AS NOW OCCUPIED AND ESTABLISHED), SAID POINT BEING ON A CURVE CONCAVE EASTERLY, HAVING A RADIUS OF 1960.08 FEET, A CENTRAL ANGLE OF 32°01'00", A CHORD BEARING OF S40°44'43"E, A CHORD DISTANCE OF 155.05 FEET; THENCE SOUTHERLY ALONG THE ARC OF SAID CURVE A DISTANCE OF 155.09 FEET TO A POINT OF TANGENCY THEREOF; THENCE CONTINUE ALONG THE WESTERLY RIGHT-OF-WAY LINE OF SAID WILLIAMSON BOULEVARD S43°00'34"E A DISTANCE OF 400.96 FEET; THENCE DEPARTING SAID WESTERLY RIGHT-OF-WAY LINE OF WILLIAMSON BOULEVARD, S73°02'40"W A DISTANCE OF 821.22 FEET TO A POINT OF INTERSECTION WITH THE EASTERLY RIGHT-OF-WAY LINE OF AFORESAID INTERSTATE 95; THENCE CONTINUE N16°57'20"W ALONG SAID EASTERLY LINE A DISTANCE OF 502.11 FEET TO THE <u>POINT OF BEGINNING</u>

SAID PARCEL CONTAINING 351,025 SQ.FT. OR 8.06 ACRES MORE OR LESS



STAFF REPORT

City of Ormond Beach
Department of Planning

DATE: September 3, 2013

SUBJECT: 260 Williamson Boulevard, United States Post Office, Zoning Map Amendment

APPLICANT: Administrative

NUMBER: PBD 13-107

PROJECT PLANNER: S. Laureen Kornel, AICP, Senior Planner

INTRODUCTION:

This is an administrative request to amend the City's Official Zoning Map for the United States Post office, an ±8.06- acre parcel of land from the existing zoning classification of Volusia County BPUD (Business Planned Unit Development) to City of Ormond Beach PBD (Planned Business Development) located at 260 Williamson Boulevard.

BACKGROUND:

The United States Post Office was approved by the Volusia County Development Review Committee (DRC) and construction completed in 1991 for a building totaling 21,279 square feet. On August 20, 2013, the subject property was annexed into the City of Ormond Beach by Ordinance 2013-43. Based upon annexation of the property, the city is required to assign a city land use category and zoning district that reflects the development entitlements of the property at the time of annexation. The city is presently processing a separate land use amendment from Volusia County "Urban Medium Intensity" to Ormond Beach, "Low Intensity Commercial". The purpose of this zoning map amendment is to assign a city zoning classification to the subject property consistent with the Ormond Beach "Low Intensity Commercial" land use designation and to incorporate the Volusia County site plan. The proposed rezoning from Volusia County BPUD to Ormond Beach PBD is contingent upon adopting the land use change. Subsequent to Planning Board review, the rezoning will be reviewed by the City Commission for final action.

PROJECT DESCRIPTION:

The project consists of the Ormond Beach Main Post Office building for a total of 21,279 square feet, a thirty-five foot landscaped buffer along Williamson Boulevard, two thirty-foot landscaped buffers along the south and west sides of the property, a ten-foot landscaped buffer along the north side of the property and parking along the front, rear and north sides of the buildings. The project has one access point of a right in/right out along Williamson Boulevard. According to Resolution 88-166, the Volusia County Development Agreement specifies that permitted uses under the Volusia County BPUD

zoning classification for the subject parcel shall be limited to the following: Either entirely as a Post Office facility, or entirely as an office building for professional uses or facilities such as insurance, medical or real estate.

ANALYSIS:

There is a separate land use amendment that proposes a change from Volusia County "Urban Medium Intensity" to City of Ormond Beach "Low Intensity Commercial". If approved as "Low Intensity Commercial", these are the following options for zoning designations:

Comprehensive Plan Future Land Use Map Designation	Corresponding Compatible Zoning District
Low Intensity Commercial	B-1, Professional Office – Hospital B-4, Central Business B-5, Service Commercial B-6 Oceanfront Tourist Commercial B-7, Highway Tourist Commercial B-8, Commercial B-9, Commercial B-10, Suburban Boulevard PBD, Planned Business Development

Chapter 2, Article I Zoning Districts, Section 2.02 Future Land Use Map Designations and Zoning Districts, Table 2-2

In accordance with Policy 5.1.1 of the city's Comprehensive Plan to apply a zoning district that is similar with the county BPUD zoning classification. According to Volusia County Planning Staff Report Case Z-88-106 dated August 29, 1988, at the time Volusia County assigned the BPUD classification to the subject property, though valuable to the community for the service it provides, the County considered the use unique and sometimes unwanted in many locations. The County elected to use the BPUD as a means to limit the permitted uses. The BPUD/Development Agreement limits the use to "Either entirely as a Post Office facility, or entirely as an office building for professional uses or facilities such as insurance, medical or real estate".

Since the city is required to assign a similar zoning, the city's PBD zoning classification along with the B-8 zoning standards was selected and the same uses as with the county BPUD classification shall apply. The B-8 zoning district is most compatible with the surrounding zoning along Williamson Boulevard. In addition, staff is seeking to incorporate the Volusia County site plan as certified September 24, 1990, as part of the applicant's zoning. If in the future the desire is to introduce additional uses, the PBD zoning classification could be amended through the regular process of review by the Planning Board and the City Commission.

Planned Business Development

According to Chapter 2, Article II, Section 2-36 of the Land Development Code, the purpose of the Planned Business Development zoning district:

> "is to establish regulatory standards for controlling the location of comprehensively planned business centers accessible to arterial roadways. The

> PBD is intended to incorporate a flexible management policy which incorporates urban design amenities, including streetscape improvements, and fosters innovative master planning in the design and development of commercial centers. The PBD district provides a diversified mix of permitted, conditional, and special land uses and higher standards of land planning and site design than are available under conventional zoning categories."

One goal of the Planned Business Development is to "provide for a coherent and visually attractive physical environment through the creation of focal points and vistas, as well as coordination and consistency of architectural styles, landscaping designs and other elements of the building environment."

Through the Planned Business Development rezoning the administrative application seeks to maintain the Volusia County approved site plan as certified September 24, 1990, as described below:

Uses

Chapter 2, Article II, Section 2-36.C. of the Land Development Code states:

> "A PBD may incorporate any commercial or residential development allowed as permitted uses in the underlying zoning district designation, as well as any commercial or residential uses allowed under the Code for any district, provided the following findings are made." **(Staff responses to the LDC criteria for permitted uses are in bold)**,

1. The use is specifically shown on the site plan and includes a list of all proposed uses not permitted in the underlying zoning district (to the maximum extent known at the time of site plan submittal), a general description of the location, floor area to be occupied by such use, typical hours of operation and other relevant operation characteristics.

   The application seeks to allow a Post Office use that is already established and to only allow either a post office facility use or entirely as an office building for professional uses or facilities such as insurance, medical or real estate. The approved site plan as certified September 24, 1990, provides a description of the location, floor area to be occupied and other relevant operation characteristics.

2. The use, by virtue of its location, vehicular circulation pattern, noise and visual buffering, traffic generation rates and peak traffic hours, odor emission controls, lighting and use of materials will not have an adverse impact on surrounding land uses, particularly where the site abuts areas developed with or zoned primarily for single-family homes.

   The subject property abuts commercial land uses to the north, east and west. While the Volusia County Urban High Intensity land use designation lies to south, the property that directly abuts the subject property to the south maintains the R-7 (Urban Multifamily) zoning classification and is developed with multi-family housing. There are currently no single-family homes abutting the subject property and there are landscaped buffers on all sides of the subject property. As such, the existing use will not negatively impact surrounding uses.

3. Conversion of occupancy from a use approved under a PBD to a permitted use in the underlying district will not require an amendment to the PBD.

   The project could in the future convert from a post office to an office building for professional uses or facilities such as insurance, medical or real estate.

4. The use does not exceed any size limitations, use restrictions or other requirements provided under Chapter 2, Article II of this Code.

   The project has been approved by Volusia County and will not exceed the size limitations, use restrictions or other requirements provided for under Chapter 2, Article II of this Code.

Consistency with Comprehensive Plan

The property is designated as Volusia County "Urban Medium Intensity" and is seeking a land use map amendment to City of Ormond Beach "Low Intensity Commercial". The directive text of "Low Intensity Commercial" land use designation within the Future Land Use Element of the Comprehensive Plan states,

> "Purpose: A multi-use land use category to depict those areas of the city that are now developed, or appropriate to be developed, for retail, office and professional services, residential, and restaurants consistent with the surrounding uses, transportation facilities and natural resource characteristics of such areas. For projects that propose a mixture of residential and non-residential uses, the minimum FAR should be 0.2.
>
> Density: Maximum 10 units per acre.
>
> Maximum FAR: 0.6"

Zoning and Adjacent Land Uses

The adjacent land uses and zoning classifications are illustrated in the following table:

Land Use and Zoning Designations of Adjacent Property			
	Current Land Uses	**Future Land Use Designation**	**Zoning**
North	Tire Kingdom	Ormond Beach "General Commercial"	Ormond Beach PBD (Planned Business Development)
South	San Marco Apartments	Volusia County "Urban High Intensity"	Volusia County R-7 (Urban Multi-Family)
East	Vacant Land	Volusia County "Commercial"	Volusia County R-4 (Urban Single-Family)
West	Interstate 95	N/A	N/A

PLANNED BUSINESS DEVELOPMENT CRITERIA:

In considering an application for a Planned Business Development, the Planning Board may recommend to approve, approve with conditions, or disapprove on the extent to which the development offers site amenities above that normally found for permitted uses in the district with regard to the following:

a) Building form, architecture and appropriateness of materials with regard to long-term maintenance, relation to the surrounding neighborhood, and aesthetics. Architectural drawings shall be approved as part of the Development Order and adhered to in all development phases.

Architectural elevations were included in the Volusia County approval. The building architectural is appropriate for the use and the corridor.

b) Landscaping and related site amenities.

There exists a 35-foot landscaped buffer along the Williamson Boulevard right-of-way, two 30-foot landscaped buffers along the south and west sides of the property and a 10–foot landscaped buffer along the north side of the property. The landscaping of the proposed application was approved as part of the Volusia County development review and there are no modifications proposed.

c) Mitigation of off-site impacts.

There are no anticipated off-site impacts. The project abuts vacant land to the north and east and a retention pond to the west.

d) Overall lighting plan, particularly in relation to aesthetics and glare.

The site lighting of the proposed application was approved as part of the Volusia County development review and there are no modifications proposed.

e) Overall signage plan, particularly related to aesthetics and readability.

Signage was approved as part of the Volusia County development review and there are no modifications proposed.

CONCLUSION/CRITERIA FOR APPROVAL:

Section 1-18 D.3. of the Land Development Code states that the Planning Board shall review non-planned development rezonings based on the Development Order criteria in Section 1-18.E. of the Land Development Code which are analyzed below:

1. **The proposed development conforms to the standards and requirements of this Code and will not create undue crowding beyond the conditions normally permitted in the zoning district, or adversely affect the public health, safety, welfare or quality of life.**

   The project conforms to the standards of Volusia County and has been reviewed and approved by the County. The PBD rezoning seeks to incorporate the approved site plan into the zoning designation. No specific development is proposed and the request is based on a need to assign a city zoning classification to the property as the result of annexation. It is staff's determination that the developed project will not create undue crowding beyond the conditions normally permitted in the zoning district, or adversely affect the public health, safety, welfare or quality of life.

2. **The proposed development is consistent with the Comprehensive Plan.**

   There is a separate land use map amendment that proposes a land use changed from Volusia County "Urban Medium Intensity" to city "Low Intensity Commercial". Policy 5.1.1. of the Future Land Use Element states that properties annexed into the City of Ormond Beach shall be assigned a similar land use. No development other than the post office is proposed at this time. The PBD zoning classification and proposed uses and site plan are consistent with the "Low Intensity Commercial" land use designation of the city's Comprehensive Plan.

3. **The proposed development will not adversely impact environmentally sensitive lands or natural resources, including but not limited to water bodies, wetlands, xeric communities, wildlife habitats, endangered or threatened plants and animal species or species of special concern, wellfields, and individual wells.**

   The subject property is currently developed and built out in accordance with approval from Volusia County. There is no new construction proposed so the criterion is not applicable.

4. **The proposed use will not substantially or permanently depreciate the value of surrounding property; create a nuisance; or deprive adjoining properties of adequate light and air; create excessive noise, odor, glare, or visual impacts on the neighborhood and adjoining properties.**

This proposed zoning map amendment is not anticipated to have a significant impact on adjacent properties and the existing Post Office will continue to operate as it historically has.

5. **There are adequate public facilities to serve the development, including but not limited to roads, sidewalks, bike paths, potable water, wastewater treatment, drainage, fire and police safety, parks and recreation facilities, schools, and playgrounds.**

   The property is currently developed and built out. There is no construction proposed so the criterion is not applicable.

6. **Ingress and egress to the property and traffic patterns are designed to protect and promote motorized vehicle and pedestrian/bicycle safety and convenience, allow for desirable traffic flow and control, and provide adequate access in case of fire or catastrophe. This finding shall be based on a traffic report where available, prepared by a qualified traffic consultant, engineer or planner which details the anticipated or projected effect of the project on adjacent roads and the impact on public safety.**

   The property is currently developed and built out. There is no new construction proposed so the criterion is no applicable.

7. **The proposed development is functional in the use of space and aesthetically acceptable.**

   The property is currently developed and built out. There is no new construction proposed so the criterion is no applicable.

8. **The proposed development provides for the safety of occupants and visitors.**

   The property is currently developed and built out. There is no new construction proposed so the criterion is no applicable.

9. **The proposed use of materials and architectural features will not adversely impact the neighborhood and aesthetics of the area.**

   The property is currently developed and built out. There is no new construction proposed so the criterion is no applicable.

10. **The testimony provided at public hearings**.

    This application has not been heard and no public testimony has been provided.

Section 1-18.E.3 of the Land Development Code states that the City Commission shall consider rezonings based on the consistency with the Comprehensive Plan. The rezoning is consistent based upon the following points:

- The impacts on facilities and services will not change as a result of the requested zoning amendment from Volusia County BPUD (Business Planned Unit Development) to Ormond Beach PBD (Planned Business Development).
- The proposed city zoning classification of PBD is most consistent with the Volusia County zoning classification of BPUD and includes similar types of uses.

- The administrative request is consistent with the compatibility matrix outlined in the Land Development Code for the Future Land Use Plan Map designation of "Low Intensity Commercial".

RECOMMENDATION:

It is expected that the application will be reviewed by the City Commission in November. It is recommended that the Planning Board recommend **APPROVAL** of case PBD 13-107 for a rezoning from Volusia County BPUD to City of Ormond Beach PBD, allowing the post office facility, office building for professional uses or other facilities such as insurance, medical or real estate and incorporating the Volusia County approved site plan as certified September 24, 1990, with one building totaling 21,279 square feet, located at 260 Williamson Boulevard.

Attachments:

Exhibit 1: Zoning Map

Exhibit 2: Photo and Location Aerial

Exhibit 3: Legal Description and Sketch

Exhibit 4: Section 2-36 of the LDC, PBD Zoning District

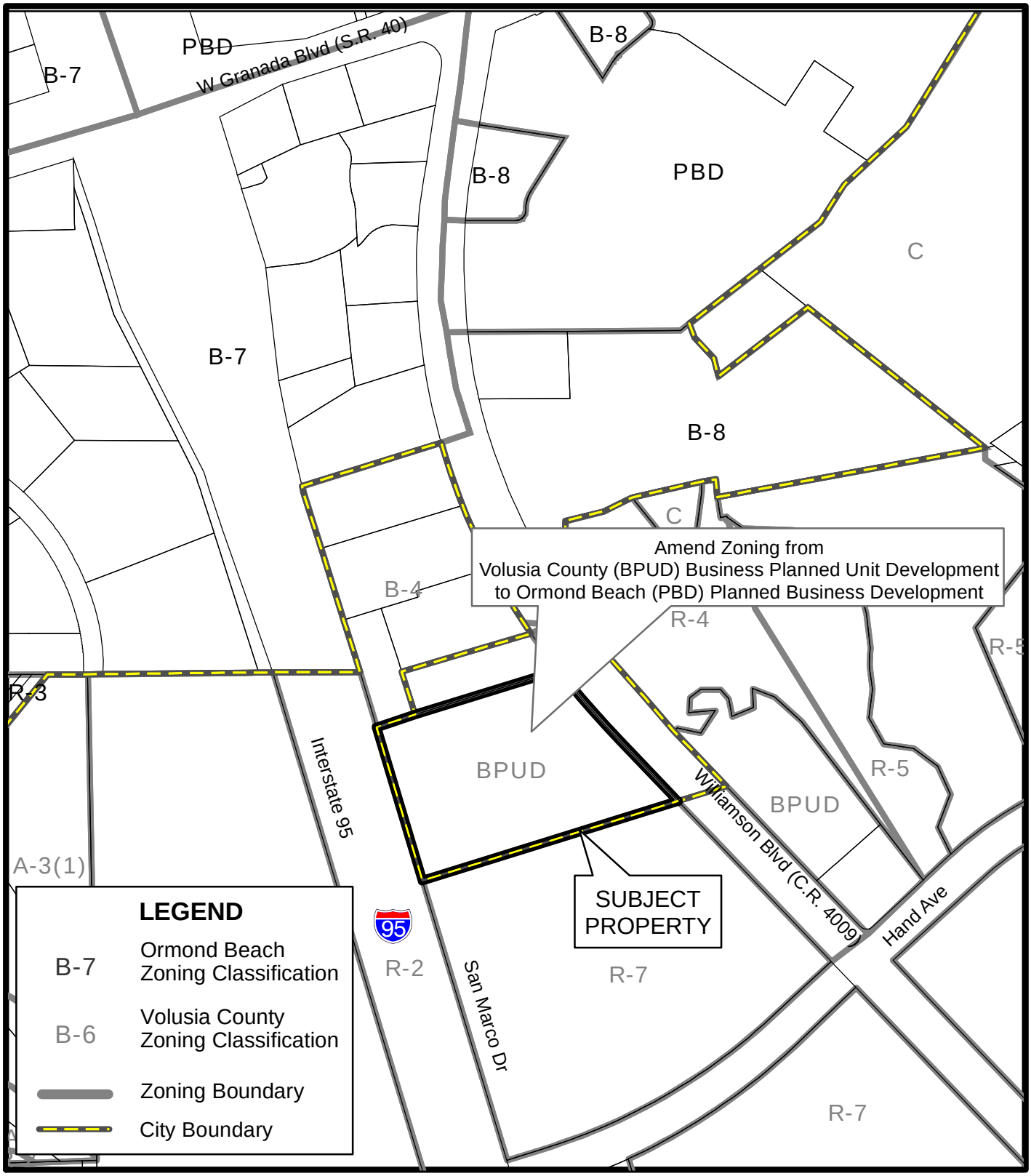
Exhibit 5: Section 2-29 of the LDC, B-8 Zoning District

Exhibit 6: Volusia County Resolution 88-166

Exhibit 7: Volusia County certified drawings September 24, 1990

EXHIBIT 1

Zoning Map



PROPOSED ZONING MAP
260 WILLIAMSON BLVD
(4231-00-00-0060)

Prepared By: The City of Ormond Beach
G.I.S. Department - August 23, 2013

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EXHIBIT 2

Photo and Location Aerial

United States
Post Office

AERIAL MAP
260 WILLIAMSON BLVD (4231-00-00-0060)

Prepared By: The City of Ormond Beach
G.I.S. Department - March 11, 2013

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EXHIBIT 3

Legal Description and Sketch

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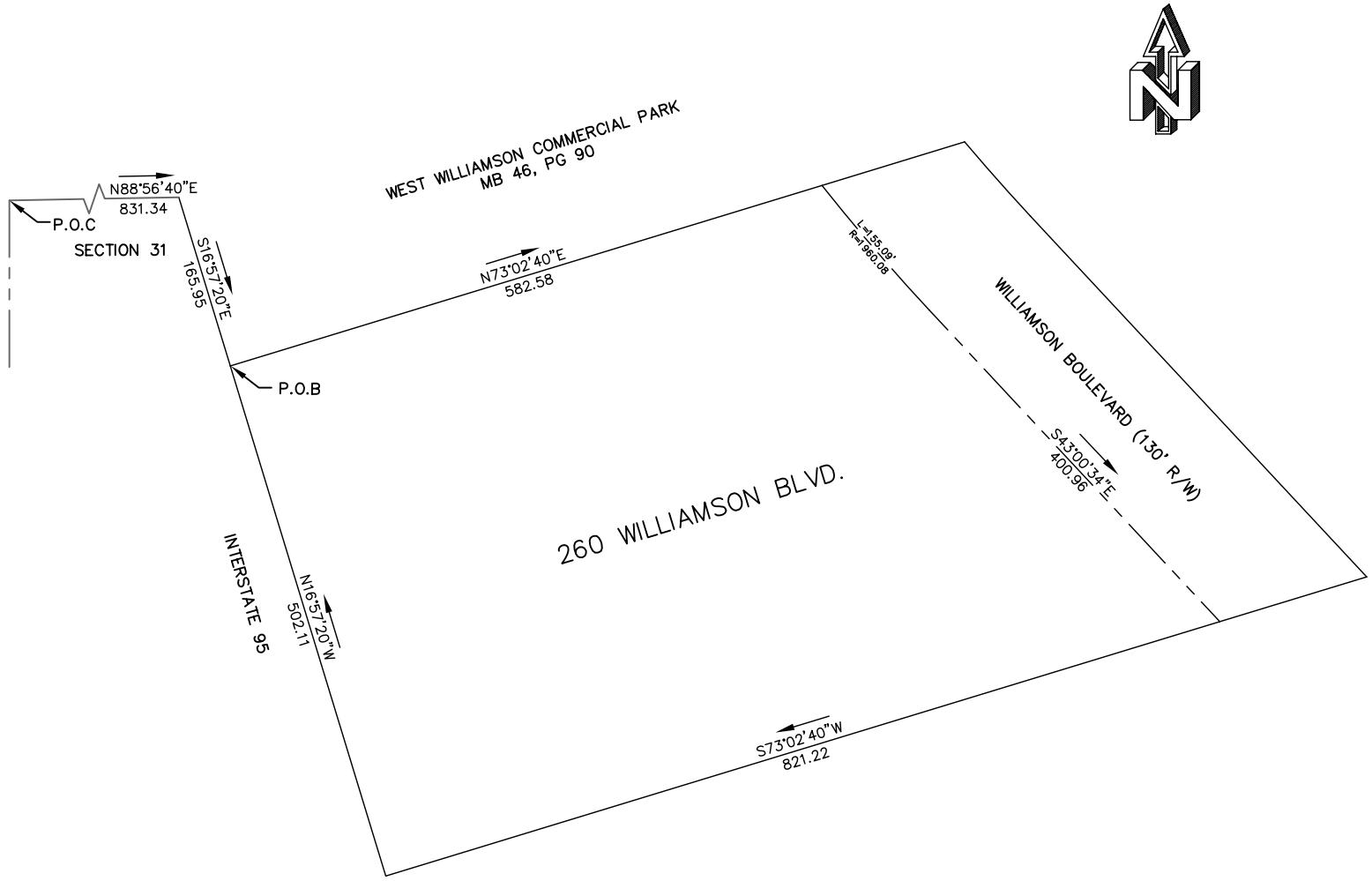

EXHIBIT 4

Section 2-36 of the LDC, PBD Zoning District

(2) *Parking standard.* In lieu of the general parking standards and subsection (f) of this section, the number of dwellings is limited by the requirement of one and one-half (1½) spaces per unit. If located on a transit route, the parking standard may be reduced to one (1) space per unit.

(3) *Setback standard.* Shall be based upon the underlying zoning district.

Sec. 2-36. PBD, Planned Business Development District.

(a) *Purpose.* The objective of the PBD, Planned Business Development District Zoning District is to establish regulatory standards for controlling the location of comprehensively planned business centers accessible to arterial roadways. The PBD is intended to incorporate a flexible management policy which incorporates urban design amenities, including streetscape improvements, and fosters innovative master planning in the design and development of commercial centers. The PBD district provides a diversified mix of permitted, conditional, and special land uses and higher standards of land planning and site design than are available under conventional zoning categories. All planned business developments shall be designed and administered consistent with the criteria and administrative procedures in this Land Development Code.

(1) Promote innovative site and building design and a high level of amenities, including traditional neighborhood developments.

(2) Provide efficient location and utilization of infrastructure through orderly and economical development, including a fully integrated network of streets and pedestrian/bicycle facilities.

(3) Establish open area set aside for the preservation of natural resources, significant natural features and vistas, and listed species habitats.

(4) Create usable and suitable located civic spaces, recreational facilities, open spaces and scenic areas; than would otherwise be provided within conventional zoning districts.

(5) Provide for a coherent and visually attractive physical environment through the creation of focal points and vistas, as well as coordination and consistency of architectural styles, landscaping designs and other elements of the building environment.

(6) Provide for other limitations, restrictions and requirements as deemed necessary by the city to ensure compatibility with adjacent neighborhoods and effectively reduce potential adverse impacts.

(b) *Land use mix.* The specific land use mix within a PBD district development shall be determined by the underlying comprehensive plan future land use map designations.

(c) *Permitted uses.* A PBD may incorporate any commercial or residential development allowed as permitted uses in the underlying zoning district designation, as well as any commercial or residential uses allowed under the Code for any district, provided the following findings are made:

(1) The use is specifically shown on the site plan and includes a list of all proposed uses not permitted in the underlying zoning district (to the maximum extent known at the

time of site plan submittal), a general description of the location, floor area to be occupied by such use, typical hours of operation and other relevant operation characteristics.

(2) The use, by virtue of its location, vehicular circulation pattern, noise and visual buffering, traffic generation rates and peak traffic hours, odor emission controls, lighting and use of materials will not have an adverse impact on surrounding land uses, particularly where the site abuts areas developed with or zoned primarily for single-family homes.

(3) Conversion of occupancy from a use approved under a PBD to a permitted use in the underlying district will not require an amendment to the PBD.

(4) The use does not exceed any size limitations, use restrictions or other requirements provided under article II of this chapter.

(d) *Dimensional requirements.*

(1) *Buffer areas.* Buffer areas may be reduced to a minimum of six feet (6'), based on a finding that due to the type of adjoining use, natural features (such as water bodies, retention ponds, conservation areas), architecture, fenestration and proposed landscaping and screening, such reduction will not have an adverse impact on any adjoining site or the subject site; provided, however, that a minimum buffer of six feet (6') shall be maintained except where there is a standing body of water.

(2) *Building setbacks.* Building setback requirements may be reduced by up to twenty percent (20%) of the required setback in order to achieve site design objectives related to architectural form and visual amenity, provided that such reduction will not have an adverse impact on abutting properties or vehicular safety, nor jeopardize the safety. The minimum setback may be reduced for sites where a bluff of ten feet (10') above the mean high-water mark exists along the Tomoka River or the Little Tomoka River.

(3) *Building height.* Height limits may exceed that allowed by district regulations by a maximum of fifteen feet (15'), provided that the structure is so located as to not have an adverse impact on adjoining properties, particularly single-family homes. This additional height allowance will not be awarded for any portion of a structure located within fifty feet (50') of a single-family home or for a vacant site in a zoning district designed primarily for such use. In no case shall any building height exceed seventy-five feet (75') when measured from the average median lot elevation to the highest point of any structure and/or attached services.

(4) *Distance between buildings.* The distance requirement between buildings may be reduced to that required by the building and fire prevention codes in order to achieve site design objectives related to architectural form.

(5) *Minimum parcel size.* The minimum parcel size shall be the same as for permitted uses within the zoning district in which the site is located. All contiguous properties under the same ownership shall either be included in the PBD or shall be subsequently

addended to and included in as part of the original PBD. Individual parcels within a planned business development may be exempt from the minimal parcel size requirement of the underlying zoning district subject to following conditions:

a. The area that is included within the planned business development is equal to or greater than the minimal dimensional and area requirements associated with the underlying zoning classification.

b. There is a property owners' association established to maintain common areas.

c. There are deed restrictions that require that all buildings within the PBD conform to a uniform design standard.

d. Reduction of the minimum parcel size will not create the need to request a waiver of buffers, building setbacks, building heights or minimum distance between parcels.

e. The site is developed to ensure safe access such that there are minimal driveway cuts onto rights-of-way and frontage roads/shared access is required.

f. Approval of subdivision in accordance with chapter 4, article II of this Land Development Code.

g. In no case shall the minimum size of a parcel be less than three-fourths (3/4) of an acre.

(e) *Landscaping and utility lines.*

(1) All common open space, parking lot islands, and all land not otherwise developed shall be landscaped in a manner that enhances the appearance of the project.

(2) An underground irrigation system shall be installed in all landscaped areas of the planned development. After installation, the system shall be regularly used and maintained. Landscaped buffer areas shall be provided as required in chapter 3, article I of this Code, if applicable.

(f) *Parking.* All development plans shall provide for adequate off-parking and traffic flow as established in chapter 3, article III of this Code. The availability of parking shall be determined based on the accessibility of these parking areas to the proposed business activity as measured by distance and ease of pedestrian access; the amount of surplus over the current and projected demand for parking; and, any other constraints that may affect the proposed business activity's ability to benefit from the designated parking area. The city commission may approve other standards for required parking subject to a parking study prepared by a registered engineer licensed to practice traffic engineering in the state; and subject to review and approval of the site plan review committee.

(g) *Supplemental requirements.*

(1) *Signs.* All signs shall comply with chapter 3, article IV of this Code and shall be integrated with the total project in terms of placement, materials and design. A sign plan shall be required and reviewed with the final plan. The city commission may allow for deviations to maximum height, size or location of signs, if the sign plan and overall

development plan indicate that the architectural standards of the buildings and site plan provide for sufficient upgrade above the minimum standards of this Land Development Code such that the requested sing waivers are justified.

(2) *Maintenance.* The person or entity with possessory interest in a site within the development must, at all times, keep the site, building, improvements and appurtenances in a safe, clean, wholesome condition and comply in all respects with all government, health and policy requirements. All landscaping and exterior portions of structures shall be maintained in order to keep an attractive appearance, including that portion of the street right-of-way between the paved portion of the street and the property lines.

(3) *Pedestrian circulation.* In areas where heavy pedestrian traffic is expected, protection from weather conditions shall be provided, to the maximum extent feasible, through the use of elements such as awnings, canopies, overhangs, covered walkways, trees, etc.

(4) *Accessibility.* Commercial business areas shall provide efficient, safe and pleasant accessibility for pedestrians coming from either residential areas within the same development or from the surrounding neighborhoods, to discourage the use of automobiles.

(5) *Unity of title.* Where there is more than one (1) principal building, a unity of title agreement or condominium association with covenants describing responsibilities is required.

(h) *Application and review.*

(1) A written application, consistent with the requirements of article IV of this chapter, for PBD shall be made to the planning department, using the application form provided by the city. The application shall be processed as required in chapter 1, article II of this Code, administration and enforcement.

(2) Applications shall include the following:

a. Complete site plan submittal per chapter 4, article I of this Code, except that final engineering and construction drawings may be withheld pending the issuance of a development order by the city commission.

b. Documentation, including written explanations, drawings, and illustrations, demonstrating conformance with subsection (g)(4) of this section.

c. Special studies including, but not limited to traffic impact study, environmental assessment report, and holding capacity analysis as required by this Land Development Code.

(3) Public benefit minimums. Applications for a PBD rezoning shall provide a minimum of two (2) of the listed public benefits listed below or propose alternative public benefits which are acceptable to the city commission. For each variance requested, an additional two (2) public benefit items shall be required:

a. Increase landscaping requirements either by density (twenty-five percent (25%) above the required minimum standards) or through more mature landscaping as measured by increased caliper of tree (twenty-five percent (25%) above minimum standards).

b. Increase the number of optional architectural attributes (two (2) or more over and above the required minimum of three (3) optional attributes).

c. Reduce the minimum parking requirement by ten percent (10%) or more and utilize this area for landscaping, reserving this area for parking if necessary.

d. Provide a sheltered bus stop (applicable only if an existing bus stop exists on site and VOTRAN provides approval).

e. Provide elements which enhance the pedestrian walking zones such as arcades, overhangs, awnings, landscape and pedestrian amenities such as outdoor art, benches, tables and umbrellas. For restaurants, provide outdoor dining areas, particularly cafe style.

f. Provide parking to the side or rear of the building with the building facing the public right-of-way.

g. Where feasible and practical, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips and/or other LID practices that can be integrated into required landscaping areas and interior landscaped islands.

h. Increase the street frontage buffer by twenty-five percent (25%) above the minimum requirement.

i. Direct rooftop runoff to pervious areas such as required yards, vegetated areas or to underground vaults for reuse irrigation.

j. Incorporate monument signage into enhanced landscaping berms using retaining walls.

k. Provide a combination of walls, berms and landscaping to define perimeter of the site.

l. In lieu of a monument sign, provide only wall signage.

m. Provide monument or walls signs which are twenty-five percent (25%) smaller than the signs permitted based upon lot or occupancy frontage.

n. Provide loft apartments above ground floor commercial space.

o. Adopt a transit route that is closest to the site in question by contributing funds to offset the operating costs of the route as determined in the PBD.

p. Attach dumpsters to primary buildings and integrate the enclosure into the selected architectural theme.

(4) In considering an application for a PBD, the planning board may recommend approval, approval with conditions, or disapproval and the city commission may base its conditions of approval or denial of the issuance of a development order on the extent to which the development offers site amenities above that normally found for permitted uses in the district with regard to the following:

a. Building form, architecture and appropriateness of materials with regard to long-term maintenance, relation to the surrounding neighborhood and aesthetics. Architectural drawings shall be approved as part of the development order and adhered to in all development phases.

b. Landscaping and related site amenities including fountains, plazas, decks, benches and the like.

c. Mitigation of off-site impacts.

d. Overall lighting plan, particularly in relation to aesthetics and glare reduction.

e. Overall signage plans, particularly in relation to aesthetics and readability.

(i) *Adoption / amendments / expiration.* The PBD development order shall be adopted by the city commission in accordance with the provisions of chapter 1, article II, of this Code.

Sec. 2-37. PID, Planned Industrial Development District.

(a) *Purpose.* The objective of the PID, Planned Industrial Development Zoning District is to establish regulatory standards for controlling the location of comprehensively PID located in areas removed from residential areas and accessible to arterial roadways. The PID is intended to incorporate a flexible management policy which fosters innovative master planning in the design and development of large scale industrial areas. The PID district provides for industrial land uses and accessory sales and service activities.

(1) Promote innovative site and building design and a high level of amenities, including traditional neighborhood developments.

(2) Provide efficient location and utilization of infrastructure through orderly and economical development, including a fully integrated network of streets and pedestrian/bicycle facilities.

(3) Establish open area set aside for the preservation of natural resources, significant natural features and vistas, and listed species habitats.

(4) Create usable and suitable located civic spaces, recreational facilities, open spaces and scenic areas; than would otherwise be provided within conventional zoning districts.

(5) Proved for a coherent and visually attractive physical environment through the creation of focal points and vistas, as well as coordination and consistency of architectural styles, landscaping designs and other elements of the building environment.

(6) Provide for other limitations, restrictions and requirements as deemed necessary by the city to ensure compatibility with adjacent neighborhoods and effectively reduce potential adverse impacts.

(b) *Land use mix.* The specific land use mix within a PID district development shall be determined by the underlying land uses as shown on the adopted future land use map.

(c) *Dimensional requirements.*

(1) Minimum industrial park size. A minimum of five (5) separate business/industrial facilities situated on a total site area of at least ten (10) acres.

(2) Setbacks. All setbacks shall comply with the setback requirements of the I-1, Industrial Zoning District. However, in order to provide greater flexibility in building

EXHIBIT 5

Section 2-29 of the LDC, B-8 Zoning District

Sec. 2-29. B-8, Commercial Zoning District.

A. PURPOSE: The purpose of the B-8, Commercial Zoning District is to provide for the establishment of general commercial activities (other than automotive or heavy commercial uses) on properties that abut arterial roads. Due to the proximity of lands in the district to residential areas, these district regulations are intended to promote the preservation of natural vegetation, increase opportunities for beautification, and provide extensive buffering between nonresidential and residential uses not otherwise separated from each other by a collector or arterial road. Multifamily, governmental and institutional uses are also encouraged in such corridors as a relief from extensive strip commercial development, and allowable uses are restricted to those most compatible with residential uses. When used in conjunction with the Planned Business Development District, these regulations are intended to encourage the establishment of totally planned, multiuse, community-level centers having a variety of retail, office, restaurant, recreation and institutional uses.

B. DIMENSIONAL STANDARDS

1. Type	2. Density	3. Maximum Building Height	4. Maximum Building Coverage	5. Maximum Impervious Lot Coverage	6. Minimum Lot Size	7. Minimum Lot Width	8. Minimum Lot Depth	9. Setbacks: a. Front	b. Rear	c. Side	d. Street Side/ Corner	e. Waterfront
Nonresidential Uses	36 (transient lodging)	30'	35%	75%	28,000 SF	100'	N/A	50' 20' for properties located on US 1 adjacent to Dodson Creek	20' 30' if abutting residential district; 5' additional combined side yard required for each story over 2.	10' 20' when abutting a multifamily district; 25' when abutting a single-family district; 5' of additional combined yard area required for each story over 2	20'	30'
Multifamily	10	30'	35%	75%	20,000 SF	100'	N/A	50'	20' 30' if abutting residential district	10; 20' when abutting a multifamily district; 25' when abutting a single-family district;	20'	30'

C. PERMITTED USES

1. Adult Day Care Center
2. Assisted Living Facility
3. Business and Professional Office
4. Business Services
5. Clubs and Fraternal Organizations
6. Convenience Store, Type "A"
7. Financial Institution
8. Nursing Home
9. Personal Services
10. Retail Sales and Services
11. School of Art
12. School, Public
13. Veterinarian

D. CONDITIONAL USES

1. Bowling Center
2. Child Care Facility
3. Community Residential Home
4. Convenience Store, Type "B"
5. Convenience Store, Type "C"
6. Dwelling, Multifamily
7. Family Day Care Home
8. House of Worship
9. Parks and Recreation Facilities, Private
10. Parks and Recreation Facilities, Public
11. Public Facilities
12. Public Utilities
13. Recreational Facilities, Indoor
14. Restaurant, Type "A"
15. Restaurant, Type "B"
16. Restaurant, Type "C"
17. School, Private
18. Sexually Oriented Business
19. Shopping Center
20. Telecommunication Tower, Camouflaged
21. Theater
22. Wind Energy System

E. SPECIAL EXCEPTION USES

1. Automatic Amusement Center
2. Outdoor Activity
3. Outdoor Storage
4. Recreational Facilities, Outdoor
5. Warehouse, Mini-rental

F. OTHER STANDARDS

All development must comply with the following requirements:

1. Wetlands (chapter 3, article II)
2. Special corridors and buffer requirements (chapter 3, article I)
3. See conditional and special exception regulations (chapter 2, article IV)
4. Multifamily dwelling units shall have the following minimum square footage per bedroom:

1 bedroom = 600 SF	3 bedroom = 900 SF
2 bedroom = 750 SF	Each additional bedroom = 150 SF

G. PERMITTED ACCESSORY USES: Accessory uses customarily associated with, dependent on and incidental to their permitted principal uses, provided that such uses conform to the regulations set forth in chapter 2, article III.

(Ord. No. 2012-03, § 7, 2-7-2012)

EXHIBIT 6

Volusia County Resolution 88-166
(Development Agreement)

11400

IN THE COUNTY COUNCIL OF THE
COUNTY OF VOLUSIA, FLORIDA

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VOLUSIA CO. FL

IN RE: Application of CONSOLIDATED-TOMOKA LAND CO.

RESOLUTION # 88 - 166

ORDER AND RESOLUTION
GRANTING A REQUEST FOR CHANGE OF ZONING
BUSINESS PLANNED UNIT DEVELOPMENT

FILED FOR RECORD
RECORD VERIFIED
156063

The application of CONSOLIDATED-TOMOKA LAND CO. (hereinafter "Applicant"), for rezoning was heard by and before the Volusia County Council, Volusia County, Florida, on October 13, 1988. Based upon the Application and other supporting documents; the advice, report, and recommendations of the Planning and Zoning Department, Legal Department, and other departments and agencies of Volusia County; the testimony presented and evidence received at the public hearing on this Application by the Planning and Land Development Regulation Commission on October 11, 1988; and otherwise being fully advised, the Volusia County Council does hereby find and determine as follows:

CLERK CIRCUIT COURT
VOLUSIA CO. FL
88 DEC -8 AM 8:22

Prepared by and Return to:
Frederick W. Leonhardt, Esq.
Holland & Knight
P. O. Box 1526
Orlando, FL 32802

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GENERAL FINDINGS

(a) That the Application of the Applicant was duly and properly filed herein on July 29, 1988, as required by law.

(b) That all fees and costs which are by law, regulation or ordinance required to be borne and paid by the Applicant has been paid.

(c) That the Applicant is the owner of a 10-acre Parcel of land which is situated in Volusia County (the "Parcel"). The Parcel is more particularly described in the legal description attached hereto as Exhibit "A".

(d) That the Applicant has complied with the "Public Notice" requirements of the Volusia County Zoning Ordinance No. 80-8, as amended.

FINDINGS REGARDING ZONING

(a) That the Applicant has applied for a change of zoning of the Parcel from Agricultural (A-2) to Business Planned Unit Development (BPUD).

(b) That the rezoning as a BPUD is consistent with both the Volusia County Comprehensive Plan and the intent and purpose of Ordinance No. 80-8, as amended, and does promote the public health, safety, morals, general welfare,

and orderly growth of the area affected by the rezoning request.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED BY THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE VOLUSIA ADMINISTRATIVE CENTER, DELAND, FLORIDA, THIS 13th DAY OF October, 1988, AS FOLLOWS:

(1) That the application of Applicant for the rezoning of the Parcel is hereby granted.

(2) That the zoning classification of the Parcel described in Exhibit "A" is amended from A-2 to BPUD as described in Article VII of the Zoning Ordinance of Volusia County, Florida, No. 80-8, as amended.

(3) That the Official Zoning Map of Volusia County is hereby amended to show the rezoning of said Parcel to BPUD.

(4) That Ordinance No. 80-8, as amended, is hereby amended in conformity with the provisions of the "Development Agreement" as hereinafter set forth in this Order and Resolution, and with respect to any conflict between Ordinance No. 80-8, as amended, and the Development Agreement, the provisions of the Development Agreement shall govern. Ordinance No. 80-8, as amended, shall govern with respect to any matter not covered by the Development Agreement. The Volusia County Enforcement Official will ensure overall compliance with this Order and Resolution.

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(5) Unless otherwise provided for herein, Article VIII, Supplementary Regulations of Ordinance No. 80-8, as amended, shall apply to the BPUD in the same manner as the B-1 classification.

(6) Nothing herein shall be taken as an abridgement to the requirments of any County Ordinance other than Volusia County Zoning Ordinance No. 80-8. Thus, timing and review procedures indicated herein may be changed in order to comply with the Land Development Code. Further, nothing in the Development Agreement is intended to circumvent the requirements of Ordinance No. 88-3, and other County Ordinances, resolutions or regulations.

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DEVELOPMENT AGREEMENT

1. Development Concept: The Parcel shall be developed as a BPUD in substantial accordance with the (a) Overall Development Plan, and (b) the Site Development Plan for the development which shall be submitted in the manner provided by Ordinance No. 80-8, as amended, Section 813.00.

(a) The Overall Development Plan consists of this Development Agreement and a "Conceptual Site Plan", prepared by Upham International Corp., dated April 14, 1988, as subsequently revised. The Conceptual Site Plan is hereby approved by this Council as part of the Overall Development Plan, and said Conceptual Site Plan is incorporated herein

as Exhibit "B". The Overall Development Plan shall be filed and retained for public inspection in the office of the County Planning and Zoning Department, and shall constitute a supplement to the Official Zoning Map of Volusia County. Roadway and entrance alignment locations and widths, parking areas, retention ponds, utilities structures, building areas and natural areas shown on the Conceptual Site Plan are for illustrative purposes only, and are subject to review and adjustment when more detailed plans are subsequently submitted by Applicant. All Overall Development Plan amendments other than those deemed by the Enforcement Official to be minor amendments as set out by Volusia County Zoning Ordinance No. 80-8, as amended, Section 813.06, shall require review and recommendation of the Planning and Land Development Regulation Commission and of the Volusia County Council in the same manner as for the original rezoning.

(b) Site Development Plan: After the Overall Development Plan has been recorded and prior to the issuance of building permits, a Site Development Plan shall be prepared and submitted in the manner required by Volusia County Zoning Ordinance No. 80-8, as amended, Section 813.06.

2. Timetable of Development: Building permits for initial construction shall be applied for within 24 months, and permits for all construction shall be applied for within 6 years.

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3. Evidence of Ownership and Control: The United States Postal Service is the contract purchaser of the Parcel from Consolidated-Tomoka Land Co., a Delaware corporation.

4. Land Use. The development of the Parcel shall be consistent with the limits for use as prescribed by this Agreement. The project shall be known as the "Ormond Beach Main Post Office." The location and size of said post office is shown on the Conceptual Site Plan, Exhibit "B." The permitted uses for the parcel shall be limited to the following: Either entirely as a Post Office facility, or entirely as an office building for professional uses or facilities such as insurance, medical or real estate; also excavations only for lakes or stormwater retention ponds for which a permit is not required by the Excavation Ordinance of Volusia County or those which comply with the Stormwater Management Ordinance or Site Plan review procedures of this ordinance and essential utility services.

5. Special Regulations: The Parcel is located on Williamson Boulevard, an arterial transportation corridor. Applicant shall comply with Section 821.01 of Ordinance No. 80-8, as amended.

6. Environmental Considerations: The Parcel contains wooded areas. Both during and after construction, the

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Applicant will attempt to preserve natural vegetation along the Parcel's perimeters as buffers.

(a) Conservation Easement: The BPUD site has one area containing significant vegetation. This area as shown on Exhibit B shall be preserved as a conservation easement.

(b) Tree Protection: The applicant shall comply fully with the Volusia County Tree Protection standards in the Land Development Code, and all separate permits and reviews required thereby.

(c) Flood Plain: A copy of the applicable Flood Insurance Rate Map is attached as Exhibit "C." The map is for flood insurance purposes only. However, it does show that the site is not in the flood zone.

(d) Soils: A copy of the Volusia County Soils Atlas Map for the subject area and corresponding definitions are attached as Exhibit "D."

(e) Landscape Area: The applicant shall provide one (1) tree within each interior parking lot landscape island done in accordance with Section 808.03 of the Uniform Zoning Ordinance. The applicant shall provide screening of the front parking lot from Williamson Boulevard, done in accordance with Sections 821.04 of the Uniform Zoning Ordinance.

7. Sewage: Wastewater management will be the responsibility of the Applicant. Applicant agree to connect to a

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public sewage treatment facility when such facility becomes available.

8. Water: Water supply will be furnished by the City of Ormond Beach, or by well, and will meet potable water demands for the BPUD.

9. Stormwater Drainage: Sufficient areas within the site will be utilized for the establishment of water retention areas. Retention areas will be sized to retain the increased runoff due to site development. The storage volume and discharge rate shall meet published Volusia County Stormwater requirements. Water control structures shall be designed to meet the requirements of the Volusia County Stormwater Ordinance and the requirements of the St. Johns River Water Management District.

10. Access and Transportation System Improvements: The parcel shall be developed in substantial accordance with the following plans for access and transportation system improvements.

(a) Access: There shall be one (1) central entrance/exit off Williamson Boulevard.

(b) Transportation System Improvements: The Conceptual Site Plan provides for the placement of the access road perpendicular to Williamson Boulevard in order to maximize traffic safety. A Traffic Impact Analysis Report is required pursuant to Section 821.06, Volusia County

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Zoning Ordinances, and the Applicant will provide all improvements identified as required to insure safe ingress and egress.

11. Binding Effect of Plans; Recording: The provisions of the foregoing Development Agreement, including any and all supplementary orders and resolutions, and all Site Development Plans, shall bind and inure to the benefit of the Applicant or its successors in title or interest. The BPUD zoning provisions of the Development Agreement and all approved plans shall run with the land and shall be administered in a manner consistent with Article IX of Ordinance No. 80-8, as amended. This Order and Resolution and all subsequent orders and resolutions shall be filed for record in the Official Records of Volusia County, Florida.

12. Reverter Provision: Within eighteen (18) calendar months from the effective date of this Order and Resolution, the Applicants shall submit a Site Development Plan as described in this Development Agreement, covering the BPUD. In the event that the Site Development Plan is not submitted on or before the date indicated, the Parcel shall revert to the prior zoning classification(s), unless the County Council, or its successor agency, for good cause shown, shall extend the time period indicated in this paragraph.

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DONE AND ORDERED by the County Council of Volusia County, Florida, this 13th day of October, 1988.

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VOLUSIA COUNTY COUNCIL

Roy Schleicher, Chairman

ATTEST:

Thomas C. Kelly,
County Manager

STATE OF FLORIDA
COUNTY OF VOLUSIA

The foregoing instrument was acknowledged before me this 16th day of November, 1988, by Roy Schleicher and Thomas C. Kelly, as Chairman of the County Council and County Manager, respectively, on behalf of the County of Volusia.

Notary Public
State of Florida at Large

My Commission Expires:

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP SEPT 22,1989
BONDED THRU GENERAL INS. UND.

CONSOLIDATED-TOMOKA LAND CO.

By: Patricia A. Lagoni
Vice President, Administration

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VOLUSIA CO. FL

STATE OF FLORIDA
COUNTY OF VOLUSIA

The foregoing instrument was acknowledged before me this 28th day of October, 1988, by Patricia A. Lagoni, Vice President, Administration, on behalf of Consolidated-Tomoka Land Co.

Notary Public
State of Florida at Large

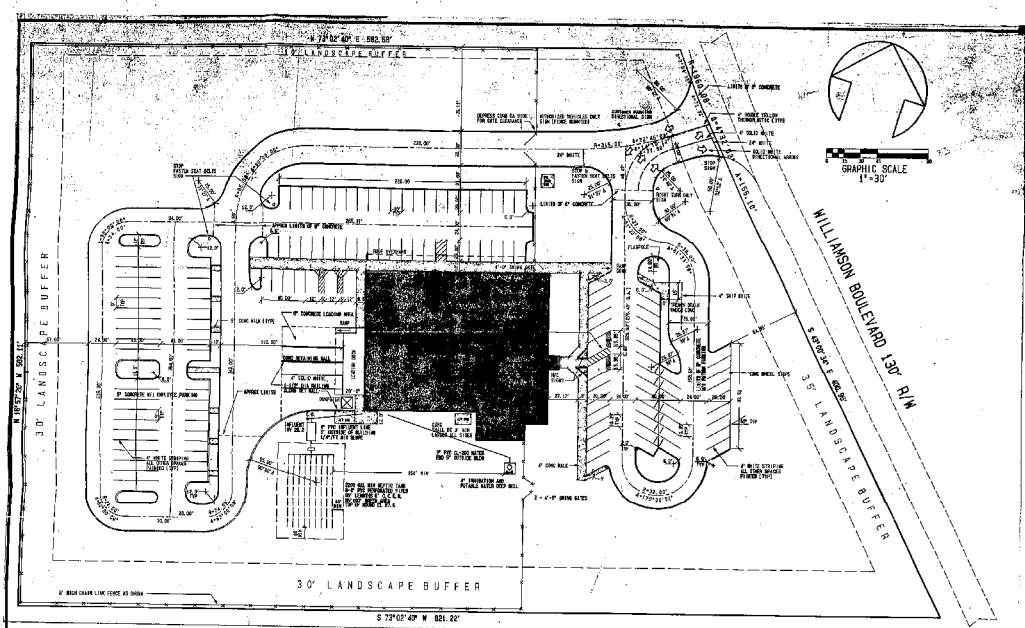
My Commission Expires:

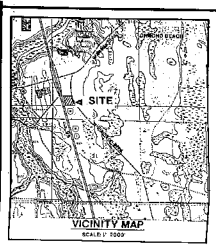
Notary Public, State of Florida
My Commission Expires Mar. 25, 1989
Bonded Thru Troy Fain - Insurance Inc.

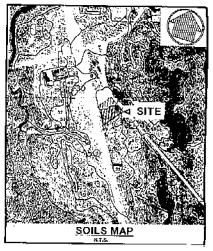
913117Res:160

EXHIBIT 7

Volusia County Certified Drawings,
September 24, 1990







SITE INFORMATION

OWNER: U.S. POSTAL SERVICE
DON MITCHELL, PROJECT DIRECTOR
1 ROSA PARKS WAY
CARL W. STOKES STATION
CLEVELAND, OHIO 44101-9998
412-746-5094 FAX:746-5094

ARCHITECT: ENGINEER

ARNOLD W. SMITH
120 W. CONGRESS, SUITE 240
ORMOND BEACH, FL 32174
904-673-1006

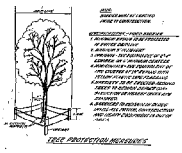
UPHAM, INC.
500 SOUTHBRIDGE AVE.
ORMOND BEACH, FL 32174
904-676-9000 FAX:677-1004

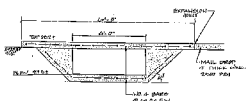
1. THE GREEN BELT OF ONE SITE IS CONSIDERED INTEGRATED WITH SLOPE FAMILY AND PARALLEL WATERWAYS. THE NORTH HALF OF ONE SITE HAS SEASTEEDED DEP CONSTRUCTION SERIES.
2. ZONE IS CONSIST OF SUSTAINED FINE SAND (CONCESSIONAL) SOIL GROUP TYPE 1 IN THE DOMINANT CONDITION OF THE SITE. REFERENCE OF THE SOIL SURVEY OF VOLUSIA COUNTY, SOIL GROUP "B/D", ACCORDING TO THE VOLUSIA COUNTY DES MANUAL.
3. SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA MAP NO. 1211160010C
4. TAX PARCEL NO. IS 4231-00-03-0020.

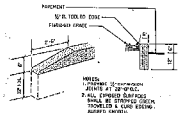
PROPOSED SITE DEVELOPMENT USE

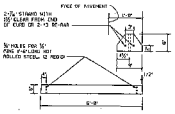
BUILDING	0.52 AC	18
DRIVES & PARKING	0.88	30
DRIVEWAY LANDSCAPE	0.47	16
LANDSCAPE LANDSCAPE	1.07	36
TOTAL	3.04 AC	100%
TOTAL IMPERVIOUS	0.35	20

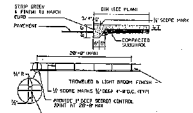
	REQUIRED PARKING	PROPOSED PARKING
PATRONS	43	50
HANDICAPPED	2	2
TOTAL PATRON	45	52
EMPLOYEE SCHEDULE	21	24
EMPLOYEE	21	24
	21	21
TOTAL SPACES	108	121

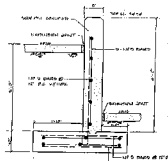












Best Available Copy

NO.	DATE	DESCRIPTION	BY
1	2010	REVISED SITE TO SUITE OWNER'S REVISED	EAST

UPHAM, INC.
Engineers • Surveyors • Planners
Ormond Beach 386/673-9000 New Smyrna Beach 904/428-9940
P.O. Box 1109 500 Southbridge Ave. Ormond Beach, Florida 32174

CIVIL SITE PLAN
ORMOND BEACH
MAIN POST OFFICE

ORMOND BEACH VOLUSIA COUNTY

FILE NO.	92-0-0
DATE	JUNE 1992
SCALE	1" = 30'
DESIGNED	KUMAR
DRAWN	RAGLAN
CHECKED	
DATE	

FOR CONSTRUCTION

Carlson and Smith
Architects
Planners
Engineers
Surveyors
Consultants
Construction Administration
Interior Design
Site Development
Construction Management
Facility Management
Cost Estimating
Feasibility Studies
Site Selection
Land Development
Environmental Studies
Transportation Studies
Traffic Studies
Parking Studies
Transportation Planning
Transportation Engineering
Transportation Management
Transportation Systems
Transportation Safety
Transportation Security
Transportation Maintenance
Transportation Operations
Transportation Planning
Transportation Engineering
Transportation Management
Transportation Systems
Transportation Safety
Transportation Security
Transportation Maintenance
Transportation Operations

United States Postal Service
Washington, D.C. 20260-1010

Ormond Beach, Florida

Facilities Service Office
Southeast Area
Atlanta, GA 30302-1275

UNITED STATES POST OFFICE

C1.0

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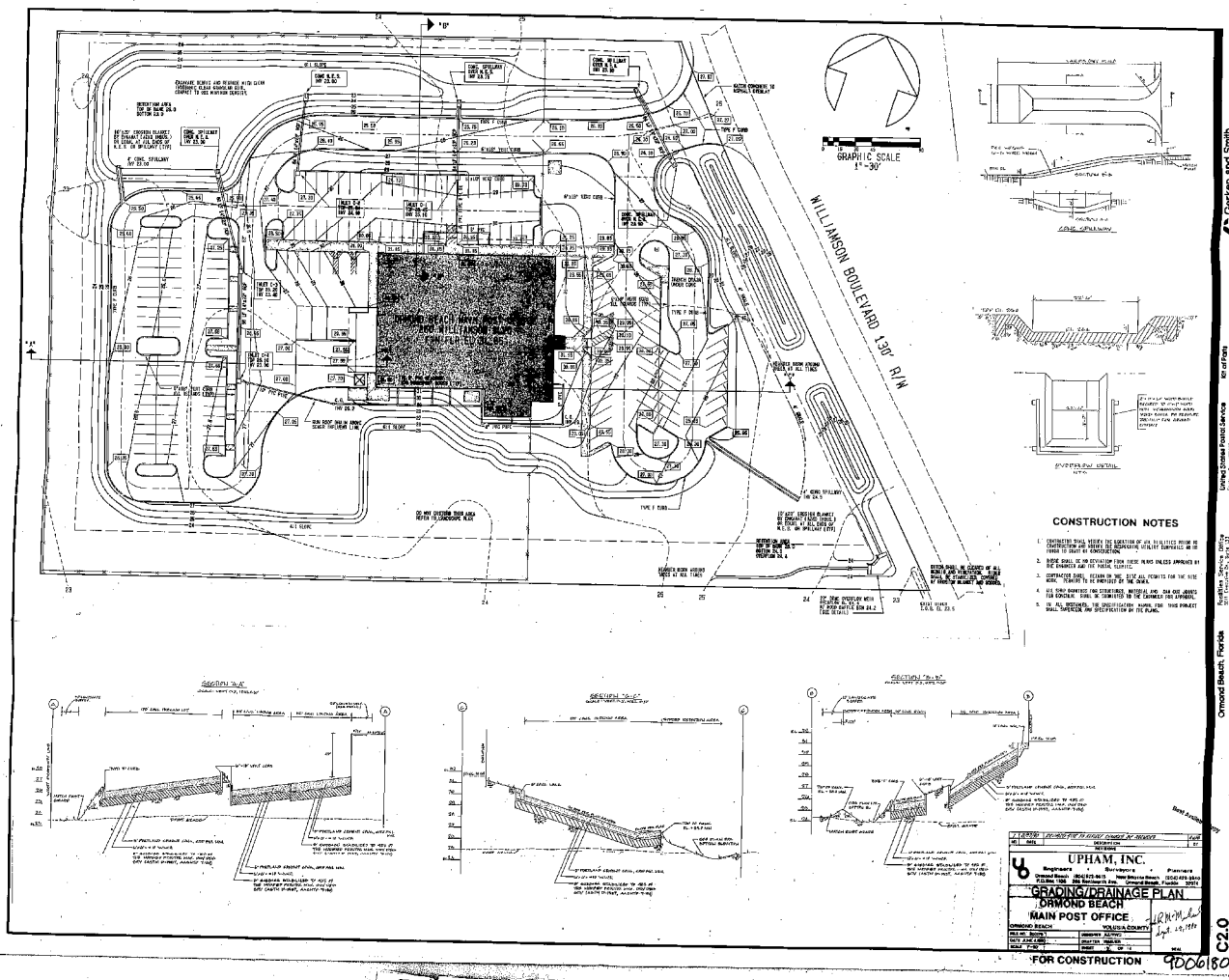
141



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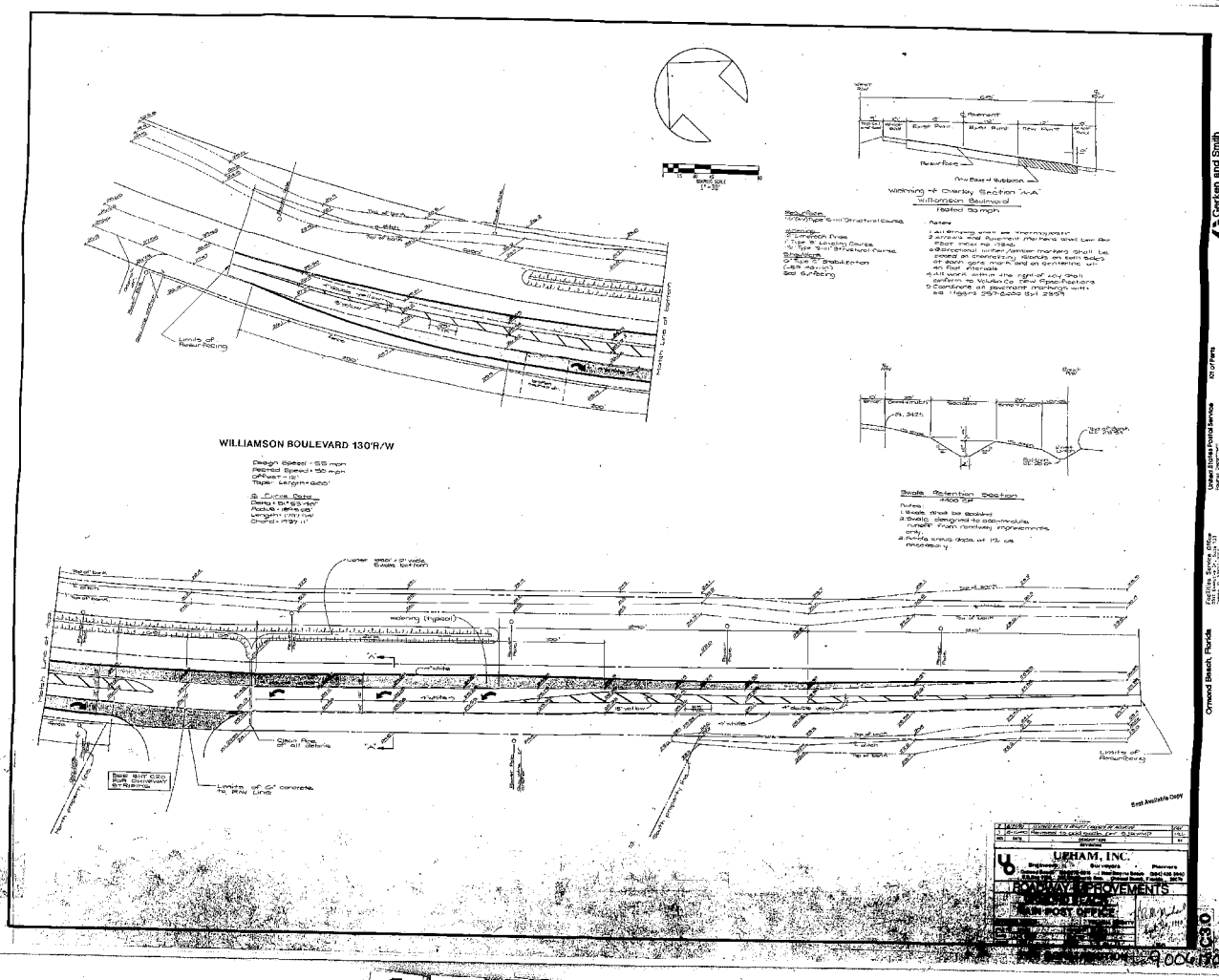
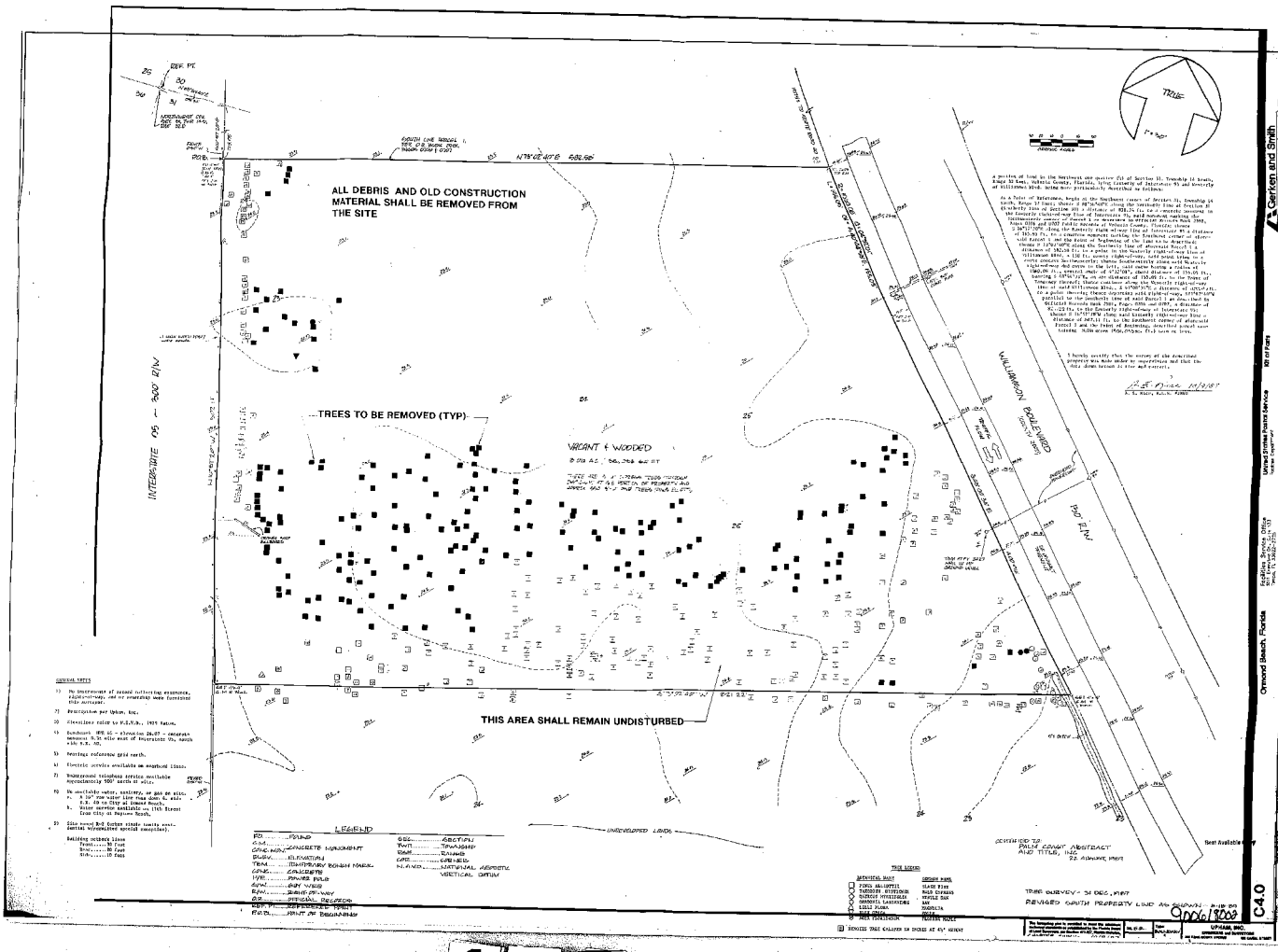
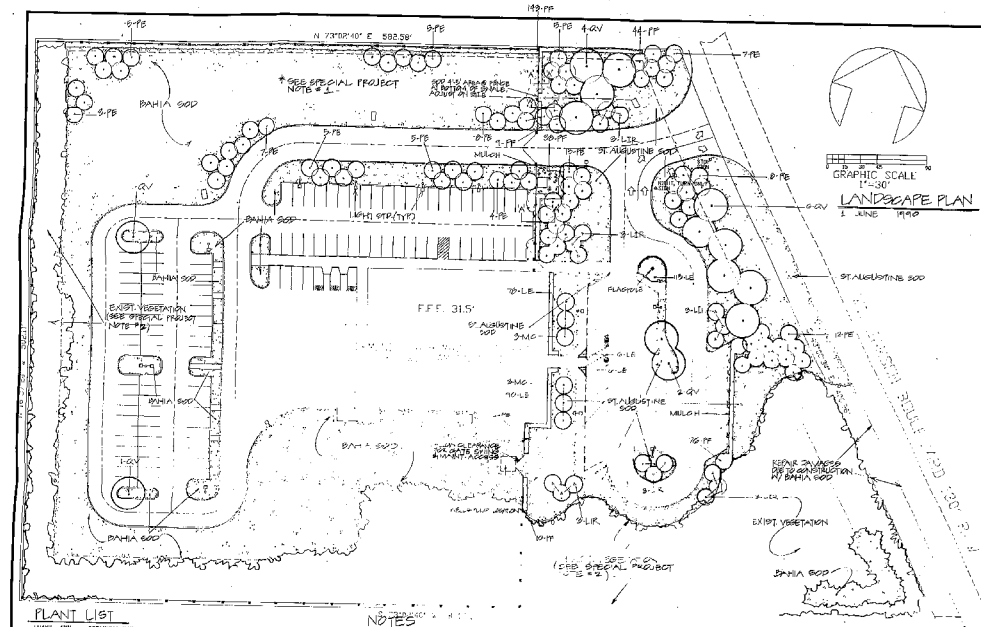

WILLIAMSON BOULEVARD 130'R/W
Design Speed - 55 mph
Posted Speed - 50 mph
Offset - 12'
Taper Length - 600'
Limits of Resurfacing
Widening of Overlay Section "A-A"
Williamson Boulevard
Posted 50 mph
Swale Retention Section
Swale Retention Section
Limits of Resurfacing
Gerken and Smith
UNITED STATES POST OFFICE
Orlando Beach, Florida
Facilities Service Office
United States Postal Service
UEHAM, INC.
ROADWAY IMPROVEMENTS
MAIN POST OFFICE
Best Available Copy
9004 13002
143


ALL DEBRIS AND OLD CONSTRUCTION MATERIAL SHALL BE REMOVED FROM THE SITE
TREES TO BE REMOVED (TYP)
VACANT & WOODED
THIS AREA SHALL REMAIN UNDISTURBED
INTERSTATE 95 – 300' R/W
WILLIAMSON BOULEVARD
150' R/W
UNDEVELOPED LAND
TRUE
MAGNETIC
SCALE: 1" = 50'
Gerken and Smith
Ormond Beach, Florida
United States Postal Service
UNITED STATES POST OFFICE
C4.0
UPLAND, INC.



PLANT LIST

Symbol	Code	Botanical name	Common name	Specifications
BG	LG	Ligustrum sinense 'glaucum'	Glossy privet	1-2 gallon per gallon can, 24"o.c.
LB	LBB	Loropetalum chinense	Chinese fringe	3-4'x3-4' 1/2", 3 stems over root (bushy) cell
C	PLC	Myrica cerifera	Wax myrtle	4'-10'x3-10', 3-5 stems
PA	PL	Phoenix reclinata	Black palm	7'-8' overall, 15 gallon container, double staked
PEG	PP	Phoenix roebelenii	Pygmy palmetto	12"-24'x18"-20', 3'o.c. PG to base
I4	QV	Quercus virginiana	Southern live oak	10'-12'x4'-6', 2"-3" caliper double staked
18,000 sq.ft.		Stenotaphrum secundatum	Augustine grass	Solid sod
18,000 sq.ft.		Stenotaphrum secundatum	St. Augustine "Floratam"	Solid sod

SPECIAL PROJECT NOTES:

1. The south half of the site is predominately covered with Brazilian pepper and Japanese. Contractor shall not fill over this material to obtain finish grades and shall remove all organic and foreign from the fill and forms for designated subgrade in all landscape areas. Contractor shall remove adequate stained material to allow for proper drainage. Contractor shall immediately report any condition which will prevent distribution of the proper material specified for the area. If contractor finds it unsuitable conditions, he will be required to remove all plantings and adequately prepare subgrade.

2. The remaining existing vegetation shall be thoroughly cleaned of all trash, debris, dead, broken and dying limbs throughout the site. This not only pertains to the edges but the entire existing vegetation. Contractor is to have Dead Brush shall be removed from periphery and rim of 8' wide mitch edge, 8' thick, shall be plugged at all lawn/building vegetation edges.

NOTES

1. The contractor shall be responsible for all materials and all work as called for on the landscape plans and to the contractor specifications. The list of plant materials accompanying the plans shall be considered a guide. Contractor shall verify all quantities and report any discrepancies at time of bidding.

2. All plant materials shall be graded Florida No. 1 or better, as outlined by Grades and Standard for Nursery Plants, Parts I & II, Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

3. All plant beds and tree wells shall be top dressed with 3" shredded cypress bark mulch (Type "B" or equal). Mulch around trees is here every 6 to 8" earlier clay around trees.

4. Contractor shall be totally responsible for stability and plumb maintain of all trees and shrubs and shall be legally liable for any damage caused by instability of any plant materials.

5. All existing plant material and vegetation cover (bush or volunteer vegetation) not shown to be plan shall be removed from the site. Contractor shall also dispose of stump into proper roots of all plants to be removed. Any depressions caused by removal operations shall be refilled with fertile, organic soil and compacted to match the surrounding grade. Contractor shall grade/rough sculpt from the existing to the designated primary grade for new plantings and/or turf areas. Finish grade shall be 3" below finish surface of adjacent paving or top of adjacent curbs.

6. Contractor shall provide soil/fertilizer/amendments plan to Business Horticulturist with uniform and adequate addition.

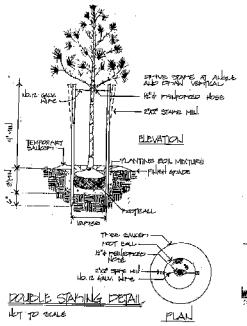
7. Contractor shall coordinate with the Irrigation and Irrigation contractors regarding timing of the installation of plant materials.

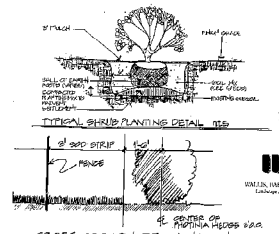
8. Every precaution shall be taken to protect building surfaces, paved surfaces, equipment and other damage. Contractor shall be responsible for any damage or injury to persons or property which may occur as a result of his negligence in the performance of the work.

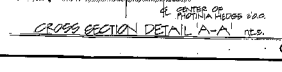
9. The contractor shall insure that his work does not interrupt established or proposed drainage patterns.

10. Peg sod on slopes, as required to prevent slippage.

11. Areas to be sodded are indicated on the planting plan. The contractor is responsible for the repair of grade and re-establishing of lawn in all areas disturbed by construction to display uniform stands of bahiagrass and turfing. Grading the area accomplished may require other sodding or sodding operations.







WALLIS, JARCHOW & VERLANDER, P.A.
Landscape Architects and Site Planners

Gerken and Smith
Architects, Engineers, Consultants, P.A.
Business Corporate Architects
Business Corporate Consultants, P.A.
Orlando, Florida

United States Postal Service
Office of Facilities

Ormond Beach, Florida

Planning Plan

L.1.1

UNITED STATES POST OFFICE

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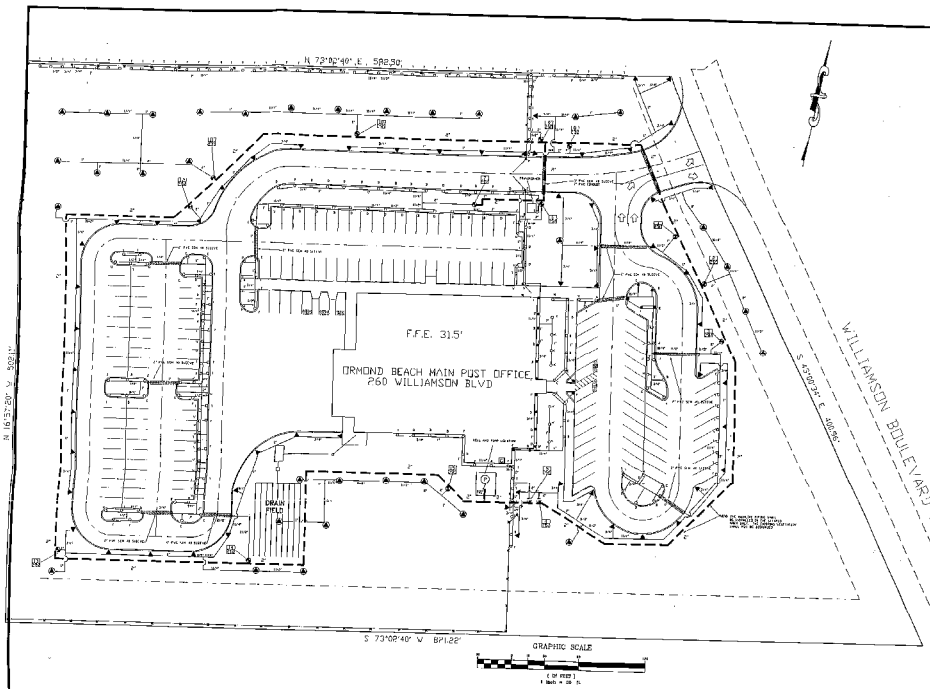


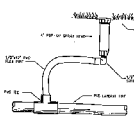
IRRIGATION PLAN

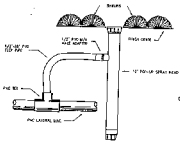
SYMBOLS LEGEND

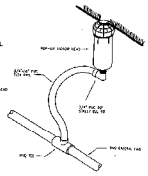
GENERAL NOTES

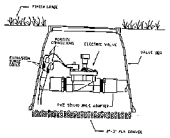
WELL & PUMP NOTES

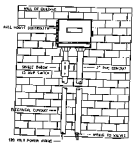
NOZZLE SELECTION CHART				
SIZE_GR	A.S.D.	GPM	MODEL	PATTERN
4.5-SQ	30	1.75	SQ	FULL
4.5-RCT	30	1.75	RCT	SINGLE DIRECTED
4.5-H/L	30	2.15	HL	HALF/LEFT
4.5-H/R	30	2.15	HR	HALF/RIGHT
4.5-QT	30	1.25	QT	QUARTER
4.5-TQ	30	1.25	TQ	THREE QUARTER
4.5-EDGE	30	1.25	EDGE	EDGE
4.5-CST	30	1.25	CST	CORNER STREET
4.5-FULL	30	1.25	FULL	FULL
4.5-FT	30	0.85	FT	FULL
4.5-RCT	30	1.25	RCT	SINGLE DIRECTED
4.5-SQ	30	1.25	SQ	FULL
4.5-H/L	30	1.25	HL	HALF/LEFT
4.5-H/R	30	1.25	HR	HALF/RIGHT
4.5-QT	30	1.25	QT	QUARTER
4.5-TQ	30	1.25	TQ	THREE QUARTER
4.5-EDGE	30	1.25	EDGE	EDGE
4.5-CST	30	1.25	CST	CORNER STREET
4.5-FULL	30	1.25	FULL	FULL
4.5-FT	30	0.85	FT	FULL
4.5-RCT	30	1.25	RCT	SINGLE DIRECTED
4.5-SQ	30	1.25	SQ	FULL
4.5-H/L	30	1.25	HL	HALF/LEFT
4.5-H/R	30	1.25	HR	HALF/RIGHT
4.5-QT	30	1.25	QT	QUARTER
4.5-TQ	30	1.25	TQ	THREE QUARTER
4.5-EDGE	30	1.25	EDGE	EDGE
4.5-CST	30	1.25	CST	CORNER STREET
4.5-FULL	30	1.25	FULL	FULL
4.5-FT	30	0.85	FT	FULL
4.5-RCT	30	1.25	RCT	SINGLE DIRECTED
4.5-SQ	30	1.25	SQ	FULL
4.5-H/L	30	1.25	HL	HALF/LEFT
4.5-H/R	30	1.25	HR	HALF/RIGHT
4.5-QT	30	1.25	QT	QUARTER
4.5-TQ	30	1.25	TQ	THREE QUARTER
4.5-EDGE	30	1.25	EDGE	EDGE
4.5-CST	30	1.25	CST	CORNER STREET

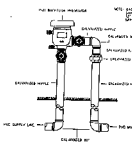

4" POP-UP SPRAY HEAD


12" POP-UP SPRAY HEAD


POP-UP ROTOR


ELECTRIC VALVE DETAIL


WALL MOUNT CONTROLLER


PVB INSTALLATION DETAIL

Best Available Copy

WILLIAMS, HARRIS & VICKLAND INC.
Landscape Architects and Site Planners

Berkshire and Smith
Architects and Planners
Engineers
Consultants

Ormond Beach, Florida

US Postal Service
Facilities Service Office
Atlanta, Georgia 30303

Irrigation Plan

L1.2

UNITED STATES POST OFFICE

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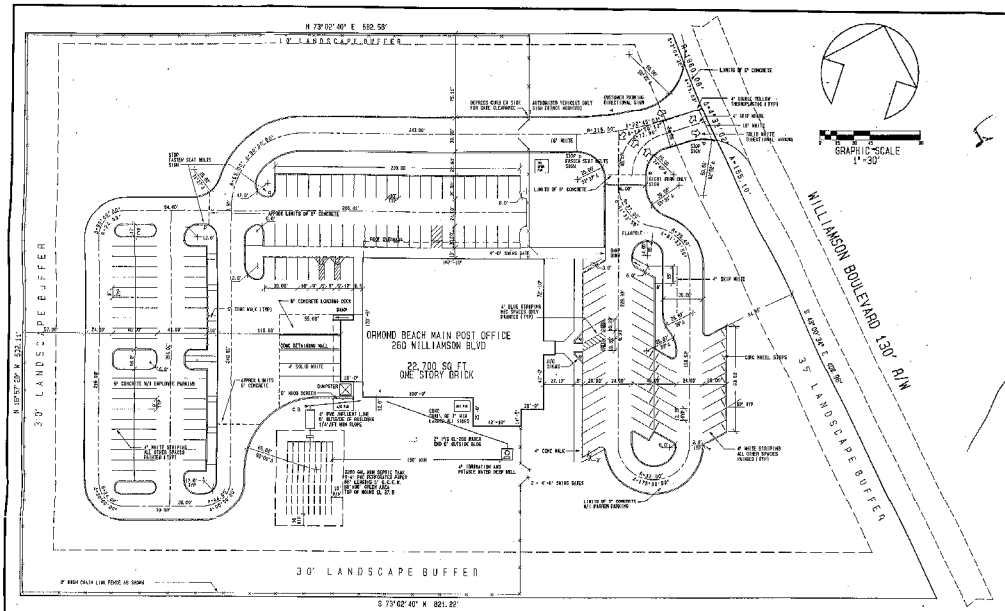
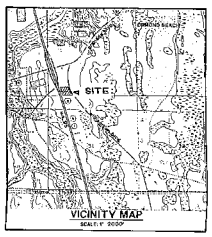
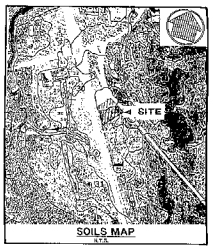




VICINITY MAP



SOILS MAP

SITE INFORMATION

OWNER: U.S. POSTAL SERVICE
ROB GUSSELL, PROJECT DIRECTOR
P.O. BOX 1000
TAMPA, FLORIDA 33622-1001
813-281-6004 FAX/813-254-

ARCHITECT: ENGINEER

GEORGE A. SMITH
PTS W GRANDE BLVD, SUITE 203
ORMOND BEACH, FL 32174
904-677-1500

UPHAM, INC.
203 ATLANTIC AVE
ORMOND BEACH, FL 32174
904-673-7563 FAX/673-9241

1. THE SOUTH HALF OF THE SITE IS SPARSELY VEGETATED WITH PINE TREES, OAK AND PALMETTO UNDERGROWTH. THE NORTH HALF OF THE SITE HAS BEEN DEVELOPED AS INDUSTRIAL PARK.
2. SOILS TOPOGRAPHY BASEDUPON FLAT, SAND PENINSULAR, SOILS GROUP "A/D" * THE LOW DIFFERENT CORNER OF THE SITE, BOUNDARIES OF THE SOILS GROUP "A/D" ARE ESTIMATED TO BE 1 TO 2 FEET FROM NORTH - SOUTHWARD TO THE VOLUSIA COUNTY DATA BASEMAP.
3. CITY IS LOCATED IN FLOOD ZONE "C" PER FIRM MAP NO. 12VC0204E.
4. TAX PARCEL NO. IS 4021-30-00-0020.

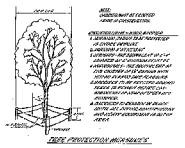
PROPOSED SITE DEVELOPMENT USE

BUILDING	0.52 AC	8%
PARKING TURNING	2.48	37
INTERIOR LANDSCAPE	0.40	6
EXTERIOR LANDSCAPE	3.37	50
TOTAL	6.77 AC	100%
TOTAL HARDSTANDS	3.00	44

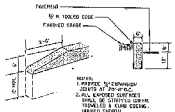
	REQUIRED	PARKING	DISPERSED PARKING
PATRONS	9		
MAILCARRIER	1		
TOTAL PATRONS	10		4
TOTAL VEHICLES	15		15
EMPLOYEES	75		71
TOTAL	90		90
DETAIL SPACES	180		

APPROVED

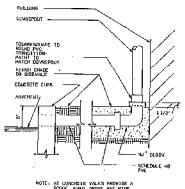
Best Available Copy



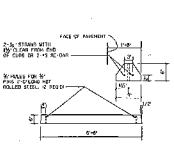
TREE PROTECTION MEASURES



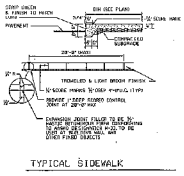
CURB TERMINATION & TYPICAL CURB



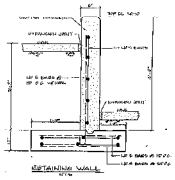
DOWNSPOUT SECTION



STANDARD BUMPER



TYPICAL SIDEWALK



RETAINING WALL

REV.	DATE	DESCRIPTION	BY
		PRELIMINARY	

UPHAM, INC.
Engineers Planners
Ormond Beach (904) 673-9015 New Smyrna Beach (904) 428-2442
P.O. Box 1175 203 Atlantic Ave. Ormond Beach, FLORIDA 32174

CIVIL SITE PLAN
ORMOND BEACH MAIN POST OFFICE
ORMOND BEACH VOLUSIA COUNTY

FILE NO. 87-1-1	DRAWING 1C.DWG
DATE APRIL 1 1989	PLOTTED 11/01/89

C1.0

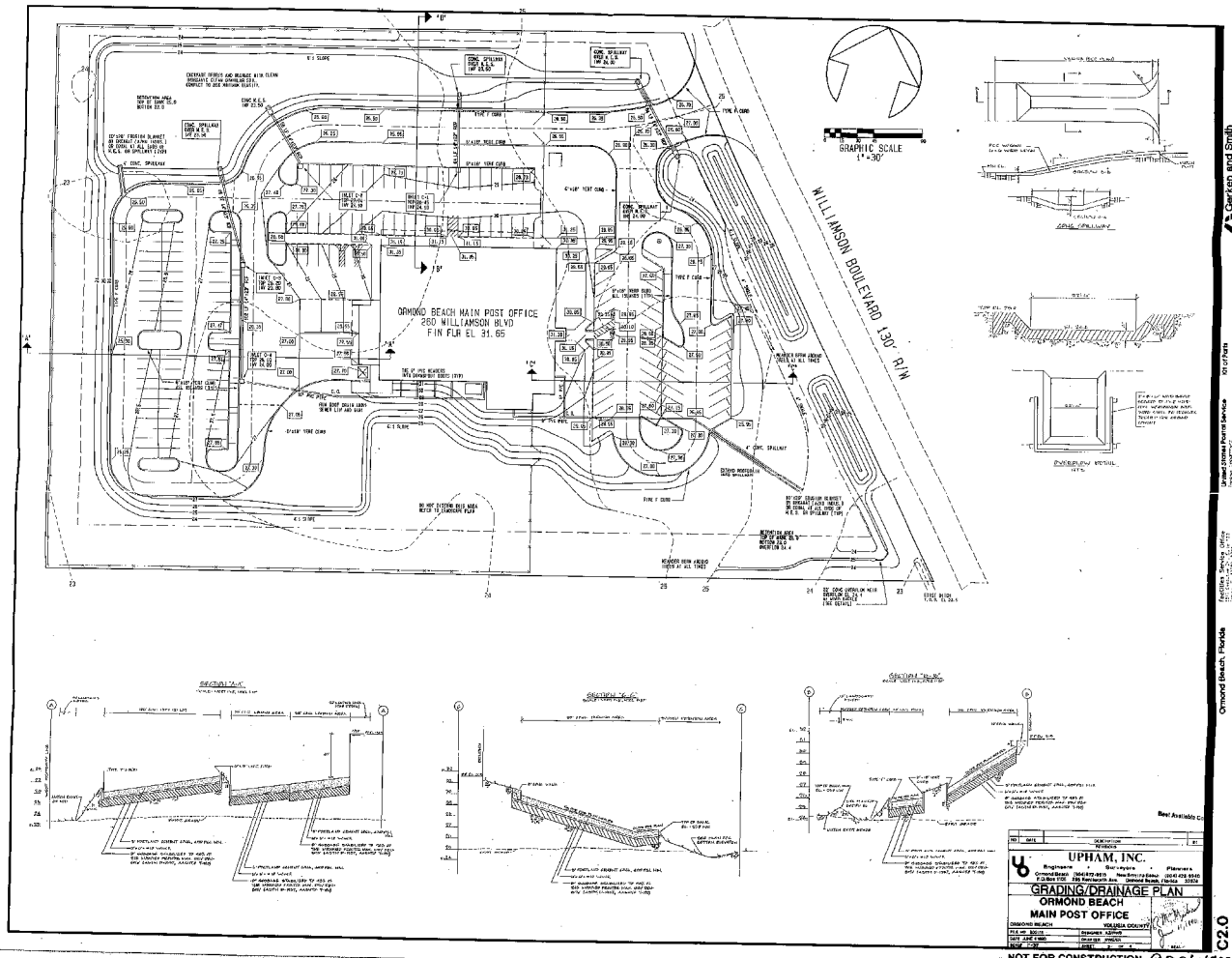
Gerken and Smith
Architects Planners
Engineers Consultants
Ormond Beach, Florida
Facilities Service Office
P.O. Box 1000
Tampa, Florida 33622-1001
813-281-6004 FAX 813-254-

UNITED STATES POST OFFICE

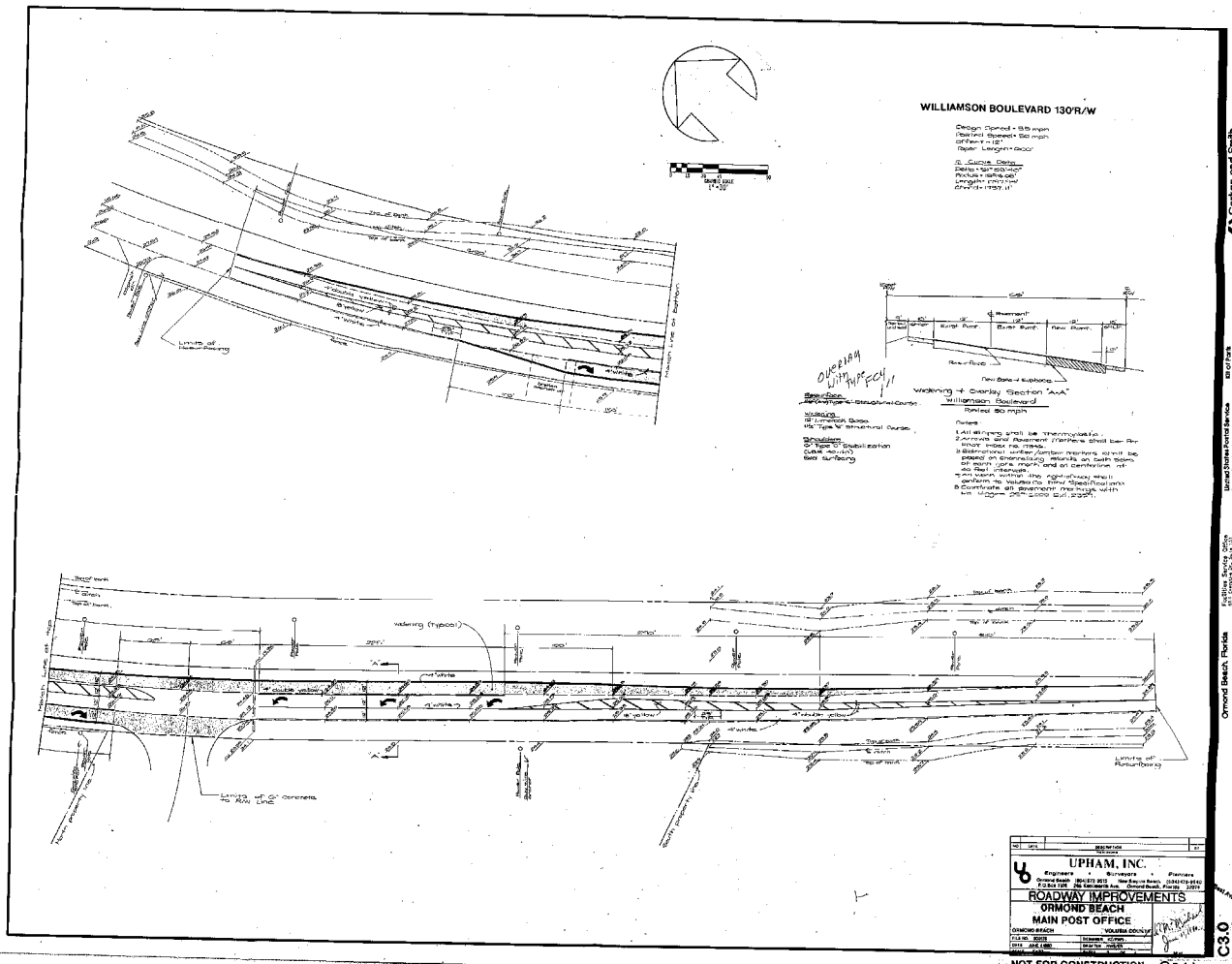
NOT FOR CONSTRUCTION

900618002

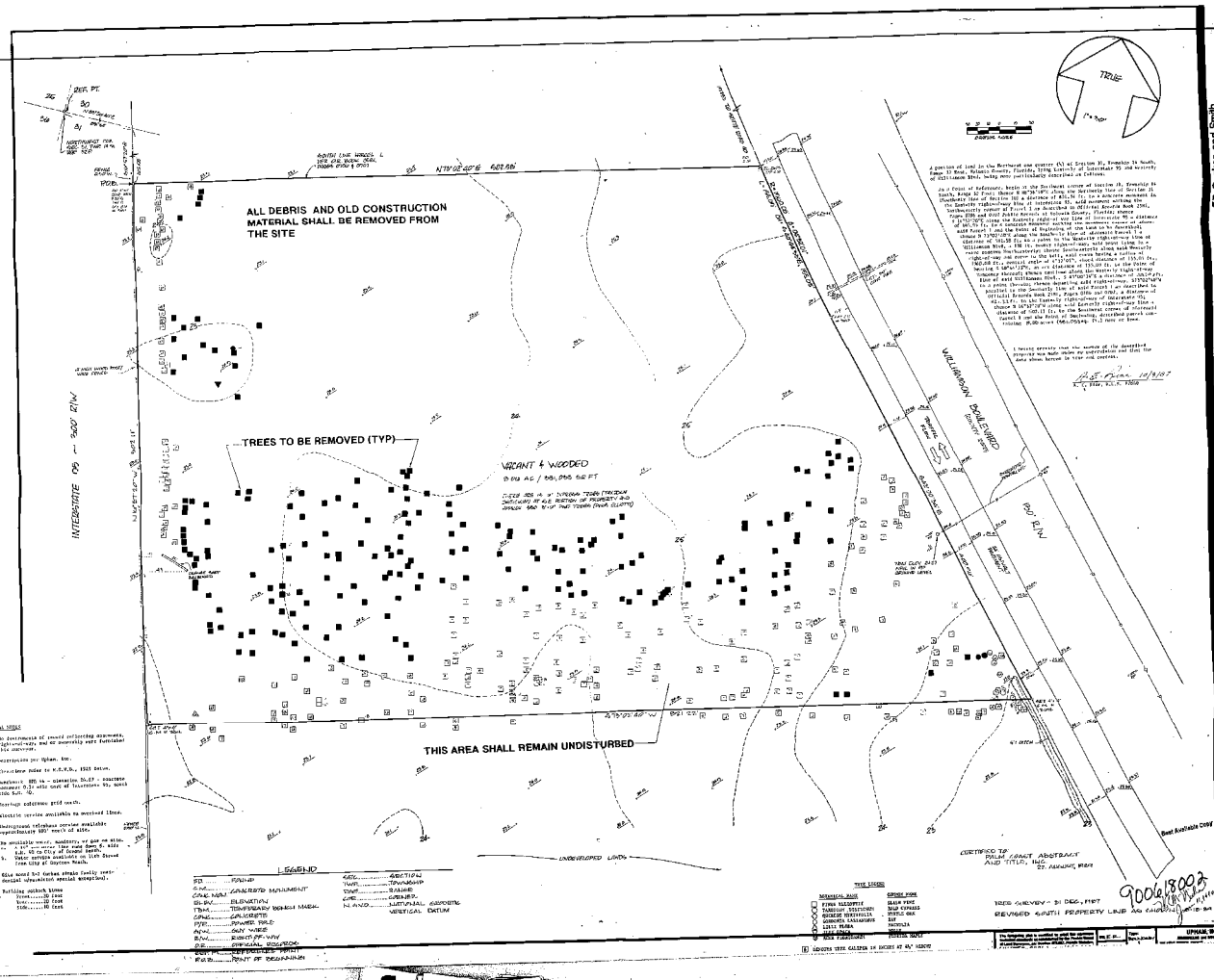
147


ORMOND BEACH MAIN POST OFFICE
260 WILLIAMSON BLVD
F/N FLR EL 31.65
WILLIAMSON BOULEVARD 130' R/W
GRAPHIC SCALE
1" = 30'
SECTION "A-A"
SECTION "B-B"
SECTION "C-C"
UPHAM, INC.
Engineers • Surveyors • Planners
GRADING/DRAINAGE PLAN
ORMOND BEACH
MAIN POST OFFICE
NOT FOR CONSTRUCTION
C2.0
UNITED STATES POST OFFICE
Ormond Beach, Florida
Gerken and Smith
Best Available Copy

148


WILLIAMSON BOULEVARD 130'R/W
Design Speed = 55 mph
Posted Speed = 50 mph
Lanes = 12'
Taper Length = 600'
Limits of Resurfacing
Widening & Overlay Section "A-A"
Williamson Boulevard
Posted 50 mph
Notes
1. All striping shall be thermoplastic.
2. Arrows and Pavement Markings shall be Pavement Index no. 17346.
3. Bituminous white/yellow marking shall be applied on thermoplastic, stripe on both sides of each lane, mark and on centerline at 50 feet intervals.
4. Contractor to verify the right-of-way shall conform to Volusia Proj. Specifications.
5. Construct all pavement markings with ...
Widening (Typical)
Limits of 2" Concrete to Run Line
Limits of Resurfacing
UPHAM
UPHAM, INC.
Engineers • Surveyors • Planners
ROADWAY IMPROVEMENTS
ORMOND BEACH
MAIN POST OFFICE
ORMOND BEACH
VOLUSIA COUNTY
NOT FOR CONSTRUCTION
C3.0
UNITED STATES POST OFFICE
Ormond Beach, Florida
Gerken and Smith
Architects
Engineers
Planners
Interiors
Consultants
Facilities Service Office
Southeast Area
Atlanta, GA 30303-3100
United States Postal Service
Washington, DC 20260-1800
Sheet 20 of Frame
Date
Revisions
Drawn by
Checked by
Date
Sheet Number
Project Number
9006198008

149


ALL DEBRIS AND OLD CONSTRUCTION MATERIAL SHALL BE REMOVED FROM THE SITE
TREES TO BE REMOVED (TYP)
VACANT & WOODED
THIS AREA SHALL REMAIN UNDISTURBED
INTERSTATE 95 - 500' R/W
VALLIANSON BOULEVARD
150' R/W
UNDEVELOPED LANDS
TRUE
GRAPHIC SCALE
LEGEND
FD.....FOUND
S.M.....SET MONUMENT
CALC.M.M.....CALCULATED MONUMENT
EL.EV.....ELEVATION
TBM.....TEMPORARY BENCH MARK
CONC.....CONCRETE
P.P.....POWER POLE
A.W.....ONLY WIRE
B.M.....BEAT OF WAY
O.R.....OFFICIAL RECORDS
P.O.B.....POINT OF BEGINNING
SEC.....SECTION
TWP.....TOWNSHIP
RGE.....RANGE
U.E.....UTILITY
N.AND.....NATIONAL AERODETIC VERTICAL DATUM
TREE LEGEND
MECHANICAL NAME
BRAZIL PINE
TAMARIND
GUMBO LIMBO
LILLY PILLY
BLACK PINE
BLUE EXPRESS
SYDEL OAK
BAY
BANYAN
BANYAN
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