

Street Evaluation

# GULF BREEZE LOCAL RESURFACING FY2020 GROUP A

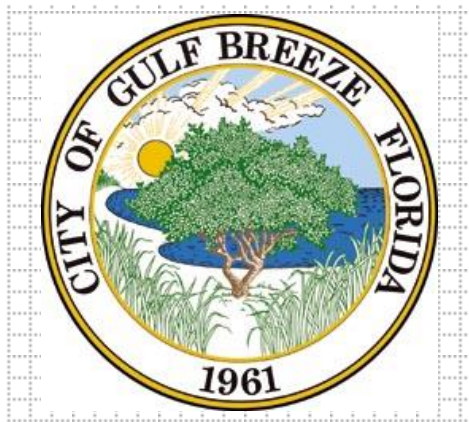
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Gulf Breeze, Florida

for

**City of Gulf Breeze**

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Prepared By

**GMC**

Goodwyn, Mills and Cawood, Inc.  
720 Bayfront Parkway Suite 200  
Pensacola, FL 32502  
T 251.380.8744  
[www.gmcnetwork.com](http://www.gmcnetwork.com)

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## EXECUTIVE SUMMARY

In accordance with contractual obligations, Goodwyn, Mills & Cawood, Inc. (GMC) conducted a Speed Limit Evaluation on the three roads listed in the FY2020 resurfacing Group A project and found that two of the three existing speed limits as currently posted are valid in their current state (Highpoint Drive and Madrid Avenue) and that one road - Cordoba Street - should have a lower posted speed limit OR additional signage for curve warnings. Additionally, the area site geometrics are challenging at best as the streets are narrow and not all of legal width while there is much vegetation, many trees and no small number of vertical obstructions that contribute to the perceived driving conditions and perceived safe travel speed for the traveling public. The details of the investigation are included herein. GMC was able to make specific recommendations regarding adding area signage, widening roadway widths and we have incorporated herein roadside improvement suggestions including the trimming or removal of bushes, trees or vegetation and other manmade vertical obstructions based on our investigations, studies and site visits.

# 1 INTRODUCTION

## Background

The streets in the Highpoint Subdivision are narrow and have extensive tree canopies overhanging the roadways. This is an existing, well-established neighborhood that has houses half a century old (or older) with many of them built in the late 1950s pre-dating even the City of Gulf Breeze. Obviously, the roadside design standards were less stringent in the 1950s than what are used today and the many decades intervening have allowed trees to grow up within the setbacks and roadside buffers that are not usually allowed these days. All of this is evident in this older, well-established neighborhood of Highpoint. All of this collectively has an effect on the maximum safe speed limits and corequisite needed signage when looking at the existing roads through the lens of modern requirements and modern design guides. While the roads will receive a much-needed resurfacing, the opportunity should be taken to erect additional warning signs, trim vegetation away from the existing edge of pavement as well as either erect advisory speed signs or lower speed limits and even widen the travelways uniformly if possible.

### 1.1.1 Referenced Existing Law

Florida Statute 316.189 "Establishment of municipal and county speed zones" sections 1 and 3 (the applicable sections here) says:

*(1) MUNICIPAL SPEED.—The maximum speed within any municipality is 30 miles per hour. With respect to residence districts, a municipality may set a maximum speed limit of 20 or 25 miles per hour on local streets and highways after an investigation determines that such a limit is reasonable. It shall not be necessary to conduct a separate investigation for each residence district. A municipality may set speed zones altering the speed limit, both as to maximum, not to exceed 60 miles per hour, and minimum, after investigation determines such a change is reasonable and in conformity to criteria promulgated by the Department of Transportation, except that no changes shall be made on state highways or connecting links or extensions thereof, which shall be changed only by the Department of Transportation.*

*(3) POSTING OF SPEED LIMITS.—All speed zones shall be posted with clearly legible signs. No change in speeds from 30 miles per hour or from those established in s. 316.183 shall take effect until the zone is posted by the authority changing the speed pursuant to this section and s. 316.187. All signs which limit or establish speed limits, maximum and minimum, shall be so placed and so painted*

*as to be plainly visible and legible in daylight or in darkness when illuminated by headlights.*

It is this existing state statute that guides municipalities and technical professionals on the establishment of new or different-than-existing speed limits to be posted. Specifically, the line that states, “*A municipality may set speed zones altering the speed limit, both as to maximum, not to exceed 60 miles per hour, and minimum, after investigation determines such a change is reasonable and in conformity to criteria promulgated by the Department of Transportation...*” is the portion of the statute that gives the City of Gulf Breeze the authority to institute speed limits lower than 20 mph and the statute that forms the basis of the recommendation included in this report. It is worth noting that the existing posted speed limits in the Highpoint Subdivision are currently posted to be 15 mph – lower than the lower limit that is stated in the state statute.

## 2 OBJECTIVES

The developed scope and objectives for the engineering evaluation included scope items in GMC's contract with the City of Gulf Breeze of: a speed limit evaluation, a signage evaluation and an evaluation of unusual site conditions related to the narrow natures of the neighborhood roads and the extensive tree canopy.

### Found Existing Conditions

The existing posted speed limit in the Highpoint subdivision is 15 mph. Note that this is lower than the lower limit of 20 mph as set out by Florida Statute 316.189, thus at some point in the past, the City decided to exercise its right under Florida Statute 316.189 Article 1 to institute a speed limit lower than 20 mph. It is this precedent and authority granted to the municipalities that GMC makes the herein recommendations. A review of publicly available tax maps shows the internal rights-of-way to be commonly around 60 feet in width while the roads themselves were measured to be, on average, between 16-21 feet wide. Twenty-four feet of roadway width is considered sufficient roadway width for safe and efficient navigation and this 24 ft width meets the expectations of drivers given its universality. It is noted here that the minimum roadway width as required by the International Fire Code (IFC) Latest Edition is 20 feet to safely and adequately handle fire trucks responding to emergency situations. The challenges found arise where there are multiple or large encroachments to the driver or encroachments within the offset shy line of the driver's comfort zone. It is obvious and conspicuous that there is essentially no roadside design nor roadside safety designed into the construction of these roads which is not to be unexpected given the age of the subdivision. Lastly, the entirety of the development has a very aesthetic but very low overhead tree canopy which likely makes it essentially impossible for heavy truck traffic to navigate the neighborhood. See below for suggested installation of R5-2 No Truck signs.

### Highpoint Drive:

Highpoint Drive is the main horseshoe shaped that connects to Fairpoint Drive in two locations – one east and one west of Oviedo Street and is the perimeter road for the subdivision. On the east north/south leg of Highpoint Drive the investigation was begun at the neighborhood tennis courts and continued all around the north and western legs of Highpoint Drive until its terminus at Fairpoint Drive. The road width was measured to be of varying widths between 19-21 feet. There were areas that the width of the road met IFC minimums but vegetation has grown to encroach into the road enough that drivers veer away from said vegetation for fear of scraping their car on the bushes, trees etc and leave their lane to partially drive in the oncoming lane or in the middle of the road. The found in-situ conditions were that the road was in severe need of repaving, no centerline nor edge striping exists and signage was limited to stop signs and speed limits sign. There were many trees of significant girth within feet (sometimes inches) of the edge of

pavement and sometimes *at* the edge of pavement as well as mailboxes set at the edge of pavement throughout the length of study. Moreover, there is so little room behind the edge of pavement in most places that on trash day, most residents set their trash cans IN the road itself creating a constriction of the available pavement for the motoring public. The edge of the pavement itself is often ill-defined (due to vegetation) as there is no curb in this subdivision and in fact few inlets were observed for the neighborhood itself as much of the subdivision seems to be drained via sheetflow drainage. Highpoint Drive has a posted speed limit though it is posted in only 2 locations – both for northbound traffic immediately north of Fairpoint Drive.

Using established practices, and many years of experience, GMC evaluated the posted 15 mph speed limit for Highpoint Drive for driver comfort and safety including the use of a ball bank indicator to check the posted speed limit versus needed advisory speed limit signs in the curves of the road. The requested corridor of study was scrutinized in both directions and the posted speed limit was found to be AT the limit of what is needed for driver comfort but still within the confines of what is considered normal and safe.

### **Madrid Avenue**

Madrid Avenue is a short 600 ft long road that runs east/west and connects to Highpoint Drive in two locations at the north end of subdivision. The entire length of Madrid Avenue was examined in both east and west directions. The road width is insufficient as it was found to vary between 16-18 feet in width and is severely constricted in front of address 3 Madrid Avenue due to excessive encroachment into the travelway of adjacent vegetation making the road essentially a one lane road in this location and impossible for two-way traffic to pass with ease or sometimes pass at all as one car often has to defer to the other. Again, it is noted that the 16-18 foot width is below the minimum standards of the IFC and well below the roadway width of driver expectations. This has the same effect as mentioned above with drivers veering away from said vegetation for fear of scraping their car on the bushes, trees etc. and leave their side of the road (as there are no lanes painted) to drive in the middle of the road. The edge of the pavement itself is often ill-defined as there is no curb on this street - like the rest of this subdivision – which is in turn clouded by seasonal debris of dead leaves that overlay the least traveled portion of the pavement at the very fringes in turn giving the driver the perception that the road is narrower than it really is. Like Highpoint Drive and Cordoba Street, on trash day most residents set their trash cans in the road itself creating a further constriction of the available pavement for the motoring public and further exacerbating the problem. Of the three roads surveyed in this contract, this was the worst of the three in its existing conditions. Lastly, on Madrid Avenue, there are no painted fog lines nor centerline striping and there is no speed limit sign at all. One has to assume that the speed limit on Madrid Avenue is the same as the rest of the of the neighborhood and is thus assumed to be 15 mph as well. While a speed of 15 mph can be safely navigated through it, the infringing bushes and overgrowth create a roadway geometry that two vehicles cannot navigate at 15 mph and in fact, one car must

come to a complete stop to let the other through at the narrowest point in the road. Again, this is more of a function of the geometrics of the thoroughfare than the maximum safe speed at which the road can be traversed.

### **Cordoba Street**

Cordoba Street was studied from its two termini with Oviedo Street. This consists of three curves in the road with varying site stopping distances and different results in the speed limit evaluation. The same geometric concerns of impinging bushes, and vegetation as well as trash cans on trash day, mailboxes and trees at the edge of pavement that are prevalent on Madrid Avenue and Highpoint Drive are also present on Cordoba Street. Cordoba Street, like almost all of the rest of the subdivision also lacks street striping in the form of either centerline striping or fog lines.

Using the same methodology used on Highpoint Drive and Madrid Avenue, GMC assumed a 15-mph speed limit for Cordoba Street as there is no posted speed limit sign within the route of examination. The entire length of Cordoba Street was examined in both north and south driving directions. This is the only street of the three streets being examined that a speed limit of 15 mph was found NOT to be adequate for the corridor of study for Cordoba Street from Oviedo Street to Oviedo Street. Specifically, the curve in the road immediately south of the northern intersection of Cordoba Street and Oviedo Street is where a speed limit in excess of 15 mph was found to be excessive. This was re-run several times to verify the findings. Compounding this problem here is that in this curve an excessive invasion of the travelway on the east side of the road of vegetation that appears to be wholly in the right-of-way which in turn limits sight distances around the curve for the driving public in both northbound AND southbound traffic. As with the other streets the need for a resurfacing of the asphalt causes a lower coefficient of friction to be present on the road meaning that in any emergency or surprise event – such as the meeting of two vehicles at the above mentioned curve in Cordoba Street – regardless of break reactions times, the distance to stop will be greater than it is on new asphalt. The current conditions of all of the three roads share this needed maintenance characteristic.

As with the other roads, GMC made several measurements of the existing width of the road and found its outside edge of pavement to edge of pavement distances to vary between 18-21 feet. Cordoba Street has the same season problems of leaves covering the least used portions of the asphalt in turn giving a perceived constriction of the available pavement for the traveling public as well as the same problem on trash day of area residents putting their garbage cans in the street creating further encroachments to the travelway. For the portions of Cordoba Street that were measured to be less than either 24 feet or 20 feet, the same concerns are present on Cordoba Street as they were for Highpoint Drive or Madrid Avenue about the existing roadway width not meeting either the IFC minimum or the width expectations of the common driver.

## 3 Conclusions & Recommendations

### 3.1 Conclusions

The pavement surfaces themselves are gravelly from many years of use and weathering and are in desperate need of a fresh resurfacing which GMC understands to already have been budgeted and approved by the City Council for this cycle. As noted in the found in-situ conditions mentioned above the challenges found on one street were common and shared throughout the subdivision. The street widths are generally inadequate thus great care should be undertaken to ensure that when the resurfacing occurs that in any areas where the road is NOT 24 feet from edge of pavement to edge of pavement – given its current non-uniform widths – that the resurfacing should extend the pavement width to a full and exact 24 feet in all possible locations. In most areas this will mean that varying amounts of base will need to be installed along the existing edge of pavement. Typically, 24 feet of pavement is sufficient for the motoring public as that width meets the driver's expectations regarding roadway and lane widths thus giving the driver the comfort level needed to navigate the road at the needed free-flow speed or the speed limit. To affect this increase in width, a rather large amount of vegetation will need to be trimmed or removed altogether including some trees of healthy diameter. An option for the City to delineate this 24 feet here would be to pour 6 inch wide ravel curbs for the entire length of the roads wherein the dimension would be 24 feet from the outside of curb to outside of curb. This would be both aesthetic in nature and provide the driver with a bounded edge for him to perceive the total roadway width.

Similarly, given the aforementioned lack of striping and stop bars in the neighborhood, there is little to keep vehicles on one side of the street from venturing into the oncoming lane when there is a perceived discomfort on the driver's side of the road (discussed below) that causes the driver to bend their travel path into the other lane. Therefore, an option to the city would be to install at least centerline striping if not centerline striping *and* fog line striping to help the driver with his defined lane and lane in which he must stay in despite hazards in the lateral clearances.

It was found that while the posted speed limit is 15 mph, that many vehicles operate at a speed much lower than the free-flow speed due to the infringement of the perceived comfort width that the average driver considers normal and customary. This is referred to as an encroachment of the Offset Shy Line. An Offset Shy Line or Shy Line Offset is defined as the distance from the edge of the traveled way, beyond which a roadside object will not be *perceived* as hazardous and result in a motorist reducing speed or changing vehicle position on the roadway. While there is no value listed in the Roadside Design Guide for the needed lateral offset for a 15 mph speed limit – the lowest speed listed in ITE tables is 30 mph – the value for 30 mph is 4 feet and 4 feet is generally considered a minimum for all values below 30 mph thus we can conclude that vertical



obstructions within 4 feet of the edge of pavement are in fact causing drivers to reduce speed, reducing the Level of Service of the road, and deflect their vehicle path into the oncoming lane of traffic in the opposite direction in turn creating an unsafe condition at curves in the road or for passing traffic.

GMC of course acknowledges the delicate nature of cutting vegetation, gardens and landscaping, and even stump removal of trees within the right-of-way because most citizens believe their private property extends to the edge of pavement and not to the right-of-way line especially when they have been maintaining this area for many years. Thus, we understand that the political realities of cutting trees, especially, large diameter heritage trees between the edge of pavement and the right-of-way line may be a touchy subject with many residents to-wit the City may want to also consider the minimum asphalt width of 20 feet that is called for in the IFC. However, in compliance with the scope items in our contract we are duty-bound to make the recommendations based on the science of traffic engineering. To this end, one will see a common theme of the removal of overgrown vegetation and tree removal (not just tree trimming) of those items that are within the right-of-way AND within 4 feet of the edge of the 24 feet of pavement once it is reestablished via the resurfacing. These 4 feet beyond the edge of pavement should be sodded and grassed only with no, or as few vertical obstructions as possible. Of further note, it appears that on all three roads the streets are not constructed in the middle of the platted rights-of-way; as such there is occasionally more and sometimes less than 4 feet from the edge of pavement to the private property lines. Obviously, the City can undertake no work on private property so where the City is afforded the space to raze existing vegetation that is in the right-of-way and deflecting or slowing the free-flow of traffic or creating perceived hazards, this vegetation should be removed whether said vegetation is shrubbery or trees. Lastly, there is a rather pleasant and severe tree canopy throughout the subdivision with almost certainly makes it difficult or unpleasant for large delivery trucks to traverse the surface streets in the development. As such, GMC suggests the erection of three (3) 24"x24" R5-2 No Trucks signs each for northbound traffic with one each immediately north of Fairpoint Drive and being on each leg of Highpoint Drive north of its intersection with Fairpoint Drive and one on Oviedo Street just north of the intersection of Fairpoint Drive and Oviedo Street.

In a similar vein, the United States Postal Service (USPS) suggests that all mailboxes be installed 6-8" from the edge of pavement to the front face of the mailbox. There are many different varieties of mailboxes in this neighborhood from brick enclosures to simple 4x4 post mounted wherein many (a majority) are even closer than the suggested 8" from the travelway. It may be worth considering a line item in the resurfacing project to move either all mailboxes or the less permanent ones (i.e. not the brick enclosures).

### **3.2 Recommendations**

Highpoint Drive

Highpoint Drive was found to have an adequately posted speed limit though it is posted in only 2 locations – both for northbound traffic immediately north of Fairpoint Drive. It is worth noting that the Manual on Uniform Traffic Control Devices (MUTCD) states, “Additional Speed Limit signs shall be installed beyond major intersections and at other locations where it is necessary to remind road users of the speed limit that is applicable.” To this end, it worth noting that no speed limit sign was observed on Madrid Avenue nor on Cordoba Street and the only two speed limit signs in the entire neighborhood are where they are noted above. Therefore, and given the conclusions presented above, GMC has the following recommendations for the subdivision:

- Resurface Highpoint Drive
- Expand resurfaced length to a uniform 24 feet width (or 20 feet) of pavement even if this means installing needed additional base
- Remove all vegetation and trees regardless of diameter within 4 feet of the edge of pavement assuming this 4 feet remains in the platted right-of-way
- Paint centerline and optional fog lines on Highpoint Drive
- Paint 24 inch wide x 12 ft stop bars at the stop sign of all intersections
- Relocate all mailboxes that are less than 8 inches from face of mailbox to edge of pavement further back to the 8 inch mark
- Erect additional diamond grade 15 mph speed limit signs past the intersections of Highpoint Drive & Madrid Avenue, and Highpoint Drive & Oviedo Street
- Option: install a 6 inch concrete ravel curb along the edge of the pavement for an outside to outside dimension of 24 feet (or 20 feet)
- Option: Install two – one for each direction – 30”x30” W1-2 diamond grade curve warning signs for the northernmost bend in Highpoint Drive if little or nothing is done about cutting down the roadside vegetation.

#### Madrid Avenue

- Resurface Madrid Avenue
- Expand resurfaced length to a uniform 24 feet (or 20 feet) width of pavement even if this means installing needed additional base
- Remove all vegetation and trees regardless of diameter within 4 feet of the edge of pavement assuming these 4 feet remains in the platted right-of-way especially in front of 3 Madrid Avenue
- Paint centerline and optional fog lines on Madrid Avenue
- Paint 24 inch wide x 12 ft stop bars at the stop signs at each end of Madrid Avenue
- Relocate all mailboxes that are less than 8 inches from face of mailbox to edge of pavement further back to the 8 inch mark

- Erect additional two 15 mph speed limit signs on Madrid Avenue – one for eastbound traffic and one for westbound traffic just east and west respectively of the Madrid’s intersection with Highpoint Drive.
- Option: install a 6 inch concrete ravel curb along the edge of the pavement for an outside to outside dimension of 24 feet (or 20 feet)

#### Cordoba Street

Regardless of the geometric design of Cordoba Street, Cordoba Street was the only road for which the posted 15 mph speed limit was found to be excessive. As such we give the City two options below to address this – the seventh bullet point below.

- Resurface Cordoba Street
- Expand resurfaced length of Cordoba Street to a uniform 24 feet width of pavement even if this means installing additional base
- Remove all vegetation and trees regardless of diameter within 4 feet of the edge of pavement assuming these 4 feet remains in the platted right-of-way especially at the curve in the road immediately south of the northernmost intersection of Oviedo Street and Cordoba Street
- Paint centerline and optional fog lines on Cordoba Street
- Paint 24 inch wide x 12 ft stop bars at the stop signs at each intersection of Cordoba Street and Oviedo Street
- Relocate all mailboxes that are less than 8 inches from face of mailbox to edge of pavement further back to the 8 inch mark
- Erect at least one additional 15 mph speed limit sign on Cordoba Street for northbound traffic AND one W1-2 10 mph sign for the curve in Cordoba Street just south of its northernmost intersection with Oviedo Street; OR lower the speed limit on Cordoba Street to 10 mph and sign the street accordingly
- Option: install a 6 inch concrete ravel curb along the edge of the pavement for an outside to outside dimension of 24 feet