

Design Noise Study Report Addendum
May 17, 2018

Florida Department of Transportation

District 1

I-75 and Fruitville Road (S.R. 780) Interchange

Design Phase Traffic Noise Evaluation

Sarasota County, Florida

FPID Number: 420613-2-52-01

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Date: May 17, 2018

To: John Kilgore, ICON Consulting Group, Inc.

From: Wayne Arner, KB Environmental Sciences, Inc.

**Subject: Design Noise Study Report Addendum
Interstate 75 (I-75) and Fruitville Road (S.R. 780) Interchange
Design Phase Traffic Noise Evaluation Update
Sarasota County, Florida
FPID Number: 420613-2-52-01**

Introduction

The Florida Department of Transportation (FDOT) is currently preparing final design phase plans for improvements to the I-75 and Fruitville Road interchange in Sarasota County, Florida (**Figure 1**).

Figure 1. Project Location and Area of Influence



Project Background

The Florida Department of Transportation (FDOT) conducted a Project Development and Environment (PD&E) Study in 2008 along I-75 in Sarasota County to determine the ultimate needs for the interstate and interchanges. The preferred alternative for the I-75 and Fruitville Road (SR 780) interchange was identified to be Arterial Separation along with adding turn lanes to the on and off-ramp approaches at Fruitville Road, as well as the widening of Fruitville Road from west of Cattlemen Road to west of Coburn Road to accommodate additional lanes along Fruitville Road. A Type 2 Categorical Exclusion (CE) was prepared and approved in December 2011.

This 2008 PD&E Study was updated in 2012 as part of a Systems Interchange Modification Report (SIMR). This report also concluded that the preferred alternative for the

I-75 and Fruitville Road (SR 780) interchange to be Arterial Separation along with adding turn lanes to the on and off-ramp approaches at Fruitville Road.

A new Interchange Modification Report (IMR) was prepared in 2016 to reevaluate the future traffic operations at the I-75 and Fruitville Road interchange, based on revised population/traffic growth projections and reevaluated the need for the improvements recommended by the 2008 PD&E Study and the 2012 SIMR.

The 2016 IMR evaluated two design alternatives:

- The 2008 PD&E Study and 2012 SIMR-recommended preferred alternative Arterial Traffic Separation, and
- A Diverging Diamond Interchange (DDI) alternative.

Based on the results from the evaluation of these alternatives, the 2016 IMR recommended the DDI as the preferred alternative. The two distinguishing features between the approved PD&E Concept and the DDI alternative are:

- 1) The increased lane utilization along Fruitville Road approaching I-75 with the DDI configuration.
- 2) The overall safety improvements for all modes of travel at the interchange intersections with the DDI configuration.

Similar to the PD&E preferred alternative, the DDI alternative requires reconstruction of I-75 and the interchange and provides similar impacts within the existing right-of-way. Along Fruitville Road, the DDI alternative requires widening of Fruitville Road from east of Honore Avenue to the easternmost Coburn Road intersection. Additionally, the project includes widening east of the easternmost Coburn Road intersection to provide for three westbound through lanes and a westbound right turn lane providing access to the future Lakewood Ranch Boulevard Extension.

Both alternatives fall within nearly the same footprint with a minor difference at the intersection of Fruitville Road with Cattlemen Road. Both alternatives require the acquisition of right-of-way along the south side of Fruitville Road west of Cattlemen Road to account for the widening of Fruitville Road needed to accommodate the additional lanes, however, the PD&E alternative required the acquisition of right-of-way along the east side of Cattlemen Road and at the southeast quadrant of the intersection with Fruitville Road to accommodate the additional widening previously required along Cattlemen Road south of Fruitville Road. The DDI alternative eliminates the need for this widening and the additional right-of-way east of Cattlemen Road.

Description of Alternatives

Approved PD&E Concept – Arterial Traffic Separation

As provided in the PD&E Study, this alternative adds arterial separation on Fruitville Road at the ramp terminal intersections and maintains the existing Partial Cloverleaf Interchange. This allows southbound and northbound left turn traffic along Fruitville Road to turn while eastbound and westbound through traffic continues to flow uninterrupted. Additional lanes will be added to the eastbound to northbound loop-ramp, and eastbound to southbound on-ramp. Along eastbound Fruitville Road, an additional through lane will be added beginning

east of Cattlemen Road to create five total through lanes approaching the I-75 interchange. Eastbound Fruitville Road east of the interchange contains four through lanes approaching the Coburn Road signalized intersection where the right and left-most lanes drop as the right and left turn lanes, respectively. Along westbound Fruitville Road, two lanes will be added beginning west of the stop-controlled Coburn Road approach to lead to the north and southbound on-ramps at the I-75 interchange, although only 2 through lanes exist at the northbound ramp terminal intersection. Westbound Fruitville Road west of the interchange contains five through lanes (two more than existing) approaching Cattlemen Road. The fifth thru lane merges to create four through lanes west of Cattlemen Road and the fourth through lane is dropped as the westbound right turn lane at the Honore Avenue intersection. **Figure 2** illustrates the arterial separation alternative.

2016 IMR Proposed Alternative – Diverging Diamond Interchange

This alternative will reconstruct the existing I-75 at Fruitville Road (SR 780) Interchange facility from the existing six, 12-foot travel lanes (three in each direction) to provide for a diverging diamond configuration interchange that provides for the ultimate typical section along I-75. The design of the ultimate typical section for I-75 provides a ten-lane facility with two express lanes and three general use lanes in each direction from MP 38.769 to MP 39.452, a distance of 0.683 mile. The general use lanes will be designed to transition to the existing lanes on I-75; the transition south of SR 780 is from MP 38.333 to MP 38.769, a distance of 0.436 mile; the transition north of SR 780 is from MP 39.452 to MP 40.283, a distance of 0.831 mile (the overall length of work on I-75 is 1.950 miles). The Interchange improvements will also require the replacement of the existing I-75 at Fruitville Road (SR 780) bridges, Bridge Nos. 170083 and 170084; the replacement of the existing I-75/SR 780 entrance and exit ramps; and the widening of Fruitville Road (SR 780) from Honore Avenue (MP 4.203) to Coburn Road (MP 5.844), a distance of 1.641 miles, to accommodate the transition of the proposed lanes to tie to existing lanes. Additionally, Cattlemen Road, north of SR 780, will be widened to provide triple southbound left turn lanes and Fruitville Road will be widened in the westbound direction east of Coburn Road to provide for a northbound right turn lane onto the future Lakewood Ranch Boulevard Extension and for an additional westbound lane through the intersection with Coburn Road. **Figure 3** illustrates the DDI alternative.

Differences Between the Diverging Diamond Interchange Alternative and the Arterial Traffic Separation Alternative that Require Re-evaluation

Construction Footprint

Figure 4 illustrates the differences in construction footprints between the Diverging Diamond Interchange Alternative and the PD&E Arterial Traffic Separation Alternative. As can be seen in Figure 4 both alternatives fall within nearly the same footprint. The areas highlighted in yellow are areas of additional footprint required for the Diverging Diamond Interchange alternative that have not been evaluated for environmental impacts.

Figure 2. Approved PD&E Concept – Arterial Traffic Separation



Figure 3. 2016 IMR Proposed Alternative – Diverging Diamond Interchange



Figure 4. Diverging Diamond Interchange with Arterial Traffic Separation



The construction footprint identifies the additional widening required for the DDI alternative along Fruitville Road from east of Honore Avenue to west of Cattlemen Road that was not included in the PD&E alternative, although it would have been required for construction. The widening is required to transition from the existing lanes to meet the widened typical section. The construction footprint also identifies additional construction required for the DDI alternative east of I-75 for the widening of Fruitville Road to the easternmost intersection of Fruitville Road with Coburn Road plus additional widening for westbound Fruitville Road east of the signalized Coburn Road intersection to accommodate three through lanes in the westbound direction and a westbound right turn lane to the proposed Lakewood Ranch Boulevard Extension.

The PD&E alternative identified the need for right-of-way acquisition along the south side of Fruitville Road at the southwest and southeast corners of the intersection with Cattlemen Road, as well as requiring right-of-way along the east side of Cattlemen Road. The proposed right-of-way delineated with the PD&E alternative acquires right-of-way from three parcels (two west of Cattlemen Road and one east of Cattlemen Road) for a total of approximately 0.152 acre to allow for widening of Cattlemen Road south of Fruitville Road. The proposed right-of-way necessary for the DDI alternative requires right-of-way from two of the three parcels identified for the PD&E alternative however less right-of-way is needed from these two parcels. Approximately 0.04 acre of right-of-way is necessary for the DDI alternative.

Figure 5 illustrates the right-of-way needed for both the PD&E Study alternative and the DDI alternative.

Construction Activities and Duration

The Diverging Diamond Interchange alternative would require the same construction activities and construction duration as the Arterial Traffic Separation alternative.

Operation

Once constructed, there are no substantial differences in the traffic operations of the two alternatives that would cause the Diverging Diamond Interchange alternative to have greater impacts (e.g., traffic, noise, air quality).

Noise Impact Update

This memorandum documents the design phase noise evaluation through the Phase II submittal. At the conclusion of the project's Project Development and Environment (PD&E) study, and within the project limits of the design phase for the I-75 and Fruitville Road Interchange, the FDOT committed to reevaluating one noise barrier that was determined to be a potentially feasible and reasonable noise abatement measure. The barrier (Barrier 6) was evaluated for residences of Gateway Lakes Apartments, San Palermo Townhomes, and the isolated residences west of Cattlemen Road and north of Fruitville Road. These residences, and Barrier 6, are located in the northwest quadrant of the I-75 and Fruitville Road Interchange, as shown in **Figure 6**.

Figure 5. Right-of-Way Comparisons of Both Alternatives

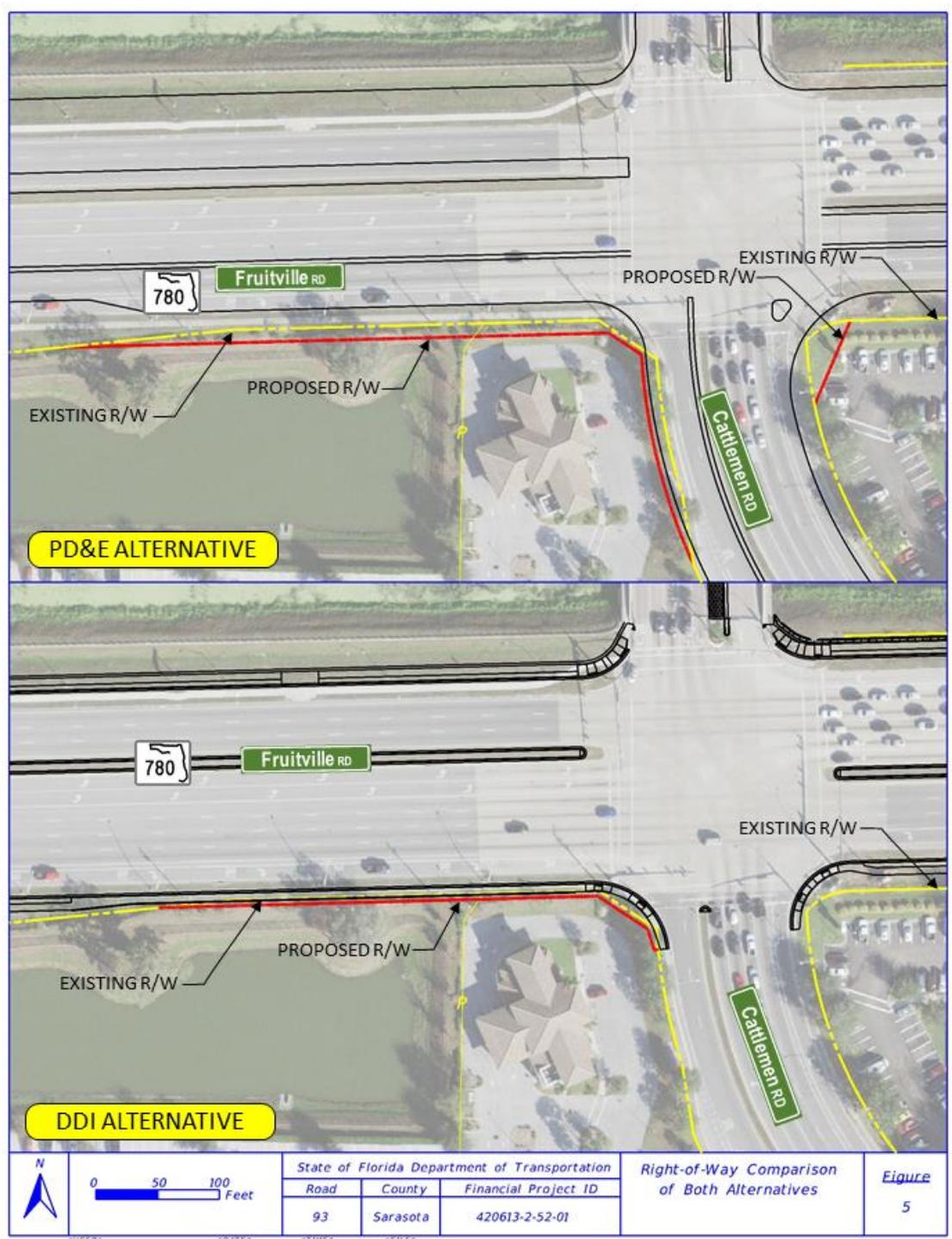


Figure 6. PD&E Barrier 6 Location

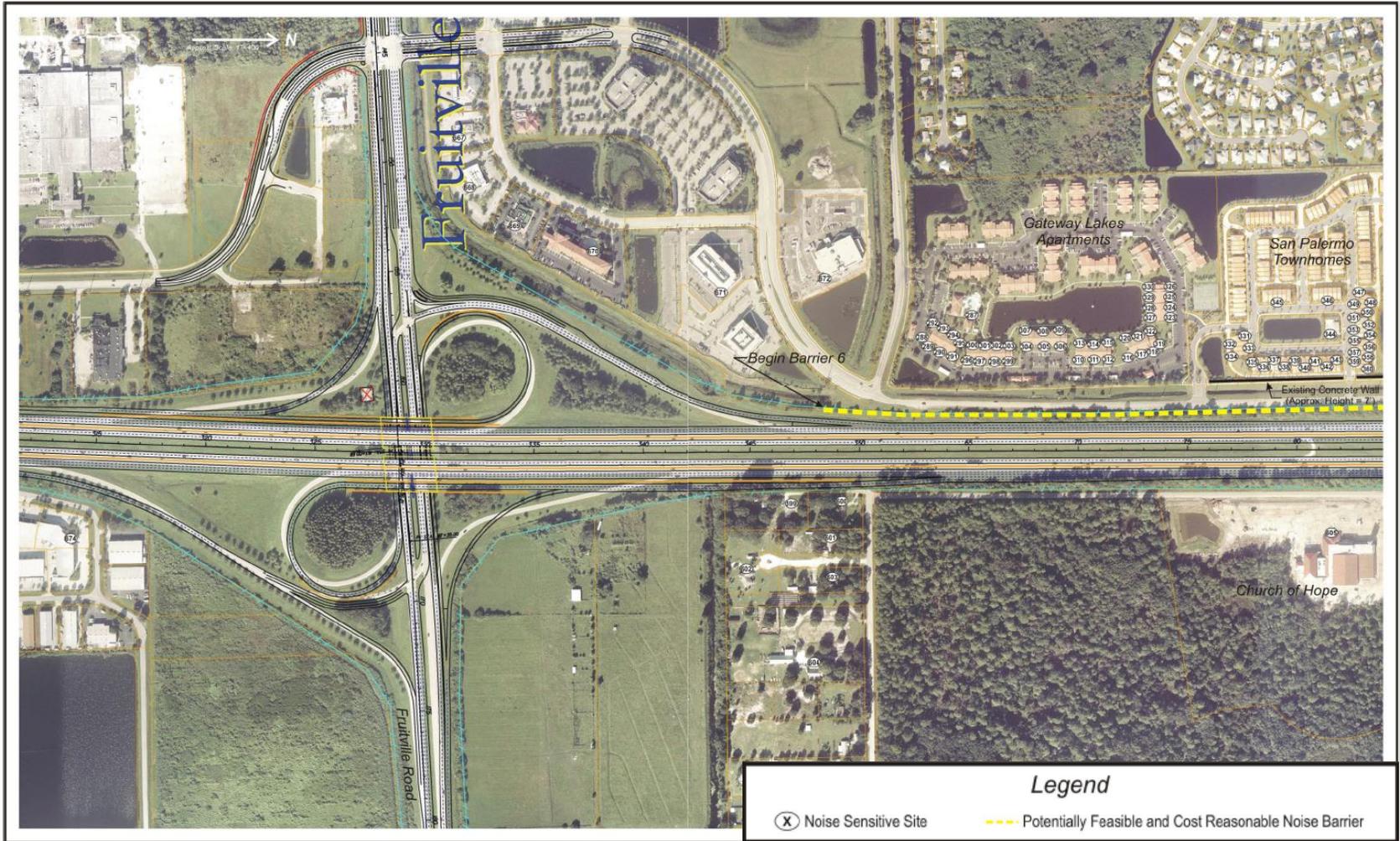


Figure 6. PD&E Barrier 6 Location (continued)



However, the commitment to reevaluate this barrier was previously fulfilled as part of the design phase project for the I-75 and University Parkway Interchange (Financial Project Number: 201277-2-52-01). Therefore, the barrier does not require to be reevaluated as part of this I-75 and Fruitville Road Interchange design project. Notably, the I-75 and University Parkway Interchange project, including Barrier 6, has been constructed and opened to the public.

The additional tasks that are performed during a project's design phase are:

1. Land Use Review – A land use review is performed to determine if any “new” noise sensitive land uses received a building permit/construction approval between the time the PD&E traffic noise analysis was performed (February 10, 2009) and the project's Date of Public Knowledge (DOPK). The FDOT does not consider noise abatement for noise sensitive land uses that are permitted and built after a project's DOPK. The DOPK that is applicable to the I-75 and Fruitville Road Interchange project is December 8, 2011.
2. Review of Current Regulations – The regulations that were in place at the time a PD&E study was performed are compared to current regulations to determine if any changes in the regulations require further traffic noise analysis.
3. Review of PD&E and Design Phase Plans – The conceptual design plans and the design plans prepared during a project's design phase are compared to determine if there has been either a substantial vertical or horizontal change from the conceptual design plans.

Land Use Review

The noise sensitive land uses evaluated for the PD&E highway traffic noise analysis is documented in a Noise Study Report (NSR) that was prepared for the proposed improvements to I-75 from SR 681 to north of University Parkway in Sarasota and Manatee Counties (Financial Project Number: 201277-1-22-01). To determine whether any new noise sensitive land uses, which were not evaluated during PD&E, but would require an evaluation for this design phase project, a building permit for that land use would have to been issued between the time that the PD&E noise analysis was performed and the project's DOPK. The aerials provided in the PD&E NSR and aerials/information from the Sarasota County Property Appraiser were compared and revealed that no new noise sensitive land uses would have been issued a building permit during this time.

Regulations

The PD&E study was prepared in accordance with Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772—Procedures for Abatement of Highway Traffic Noise and Construction Noise, dated July 13, 2010). There have been no updates to the federal regulations since the PD&E study. Additionally, the study followed the methodology documented in the FDOT's PD&E Manual, Chapter 17 (Noise), dated May 24, 2011. This document has since been updated (June 14, 2017). However, the changes in the most recent PD&E Manual would not affect the results of the PD&E study.

PD&E Versus Design Phase Plans

During a project's design phase, there is also a need to verify that there are no substantial horizontal or vertical alterations when comparing the proposed PD&E improvements and the design phase roadway improvements. To be a substantial change, the change would involve either of the following:

- Substantial horizontal alteration – A change that halves the distance between the physical noise source (edge of the nearest travel lane) and the closest receptor when comparing the distance between the existing condition and the future build condition.
- Substantial vertical alteration – A change that removes shielding (e.g., buildings, topography, etc.) exposing a line-of-sight between a receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway source and the receptor.

Although, there were no substantial horizontal or vertical alterations between the PD&E phase and design phase roadway plans, the project limits along Fruitville Road extended farther both east and west in the design phase. The result was that there were several noise sensitive land uses within the design phase project limits along Fruitville Road that were not evaluated during PD&E but existed prior to the DOPK. These land uses included four restaurants with outdoor eating areas located west of I-75 and a library with outdoor use located east of I-75. These land uses were evaluated for traffic noise impacts by using a representative receptor (i.e., a receptor exposed to similar noise sources and levels) from the PD&E NSR (receptor #667) and adjusting the predicted sound level based on the 3 dB(A) change in sound for each doubling, or halving, of distance from a line source (i.e., a roadway). The result was that neither the restaurants nor the library was predicted to be impacted by traffic noise.

Arterial Separation Alternative and Diverging Diamond Interchange Alternative Project Descriptions

Arterial Separation Alternative and Diverging Diamond Interchange Alternative concepts are provided in Figures 2 and 3, respectively. From the I-75 and Fruitville Road Interchange Modification Report, (Financial Project Number: 420613-2-32-01), the I-75 mainline cross section and operations will be identical for the two alternatives.

A comparison of the PD&E and the Phase II design concept plans indicates that there has not been a substantial horizontal alteration to the roadway design that would affect the prediction of traffic noise levels with the improvements to the roadway. Additionally, there has not been a substantial vertical alteration of the roadway. A comparison of the remaining design phase submittals will be conducted as they are completed.

Conclusion

No additional noise analysis is required for this design phase project because the noise barrier (identified as Barrier 6, for the Gateway Lakes Apartments, San Palermo Townhomes and isolated residences) in the northwest quadrant of the I-75 and Fruitville Road interchange that was identified as feasible and reasonable during PD&E was

previously reevaluated with the I-75 at University Parkway Design Noise Study Report Addendum. This noise barrier has been constructed. No other noise barriers are warranted with this project. Additionally, no new noise sensitive land uses have been identified, there have been no pertinent changes in federal or state noise regulations, and the Phase II design plans do not show any substantial horizontal or vertical changes from the PD&E Study. Finally, the noise sensitive land uses within the expanded project limits along Fruitville Road are not predicted to be impacted by traffic noise.