

# CONSTRUCTION COSTS CASE STUDY



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## Complete Streets Construction Cost Case Study: Resurfacing of South Lawrence Boulevard (State Road 21), Keystone Heights, FL

**Location:** Keystone Heights, FL (29.78 N, 82.03 W)







**Project Length:** 6.4 mi

**Project Duration:** June 2020–March 2021 (9 mo)

### Problem Statement

In 2018, officials identified safety and mobility deficiencies in the primary roadway serving the Keystone Heights commercial district, State Road 21 (SR 21). Sidewalks were poorly maintained. Crossing the street, even at crosswalks, required crossing four lanes (two travel and two parking lanes), which increased pedestrians' and bicyclists' exposure to vehicular traffic. Visibility at intersections and crosswalks was inadequate because of poor lighting and an absence of pedestrian warning devices. The signalized intersection lacked a vehicle detection system, signal heads, and pedestrian signal devices. Driveways within 10 ft of two unsignalized intersections posed a safety hazard for merging traffic. The curb ramps were not compliant with the Americans with Disabilities Act of 1990 (ADA).<sup>(1)</sup> The roadway surface was in fair to poor condition. Existing lighting facilities throughout the project area (e.g., crosswalks, intersection) were inadequate.

### Modal Focus (check all that apply):

- |   |   |
|---|---|
| <input checked="" type="checkbox"/>  Pedestrians | <input type="checkbox"/>  Transit users        |
| <input checked="" type="checkbox"/>  Bicyclists  | <input type="checkbox"/>  Freight providers    |
| <input type="checkbox"/>  Micromobility users    | <input checked="" type="checkbox"/>  Motorists |

### Project Context

The Florida Department of Transportation (FDOT) *FDOT Context Classification Guide* provides information about traditional functional classifications for roadways as well as context classifications. Context refers to the built environment within which the roadway is located. Roadway SR 21, traversing the Keystone Heights commercial district, is designated as a rural town context (FDOT classification C2T) and the functional classification is arterial.<sup>(2)</sup> SR 21 provides access to the local downtown area, shops, a gas station, a bank, a childcare facility, and other businesses.

The annual average daily traffic in 2018 ranged from 6,300 to 10,500 vehicles. The two-lane, undivided roadway was designed to accommodate 55 mph travel speeds. It consisted of the following elements:

- Two 12-ft travel lanes.
- Two 8.5-ft, on-street parallel parking lanes.
- Curbs and gutters.
- Sidewalks (on each side).
- Five unsignalized intersections.
- One signalized intersection.

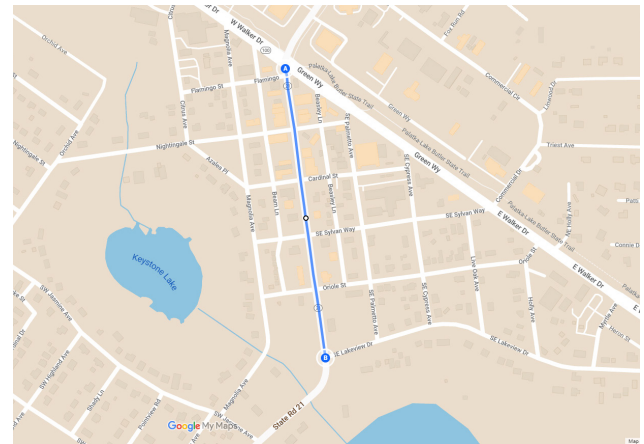
Figure 1 presents the project location. Lighting for the roadway and sidewalks was every 175 ft along the east side of SR 21, between SR 100 and Lakeview Drive. Additionally, a light pole was in the southeast quadrant of three of the six intersections along SR 21. Crosswalks had no lighting. Thus, illumination within the project area was inadequate.

Building upon its goal to address pavement deficiencies by resurfacing SR 21, the city identified additional opportunities to advance downtown revitalization and address safety and mobility challenges. Before construction, 23 crashes per year occurred along the roadway (average from 2013 through 2017), none of which resulted in fatalities or involved pedestrians or bicyclists. There was some travel-time delay, and a gap analysis indicated insufficient time for pedestrian and bicyclist crossings.

## Community Engagement Summary

The city partnered with FDOT to seek public input on proposed improvements to SR 21 and conducted community engagement in an open-house format.

**Figure 1. Map. SR 21 project location, Keystone Heights.<sup>(3)</sup>**



Original map: © 2022 Google® My Maps™.  
Modified by FHWA (see Acknowledgement section).

Community feedback indicated a desire for the following changes:

- Improved safety.
- Improved lighting.
- Midblock crossings and curb extensions.
- Improved signals and pedestrian infrastructure.

The city incorporated feedback into subsequent designs and plans. As the project progressed, the city held additional meetings and notified community members of project updates through brief presentations. The city revised project plans and designs to incorporate feedback.<sup>(4)</sup>

## Project Improvements

Table 1 presents a summary of project improvements. Figure 2 and figure 3 present before and after improvement photos from a roadway segment on SR 21.

**Table 1. Project improvements.**

Problem	Description of Improvements
Poorly maintained sidewalks.	Sidewalks replaced or repaired.
Excessive crossing distance at existing crosswalks and inadequate visibility.	<ul style="list-style-type: none"> <li>• Curb extensions at crosswalks.</li> <li>• Crosswalk lighting at and throughout the commercial district to enhance visibility and safety.</li> <li>• New midblock crossings marked with Rectangular Rapid Flashing Beacons (RRFBs).</li> <li>• Updated school zone signs to improve visibility.</li> </ul>
No vehicle detection system or pedestrian signal devices at the signalized intersection.	A new vehicle detection system, signal heads, and pedestrian signal features for the signalized intersection at SR 100 and Walker Drive.

**Table 1. Project improvements (continued).**

Problem	Description of Improvements
Driveways within 10 ft of two unsignalized intersections, posing a safety hazard for merging traffic.	Driveways removed close to unsignalized intersections.
Curb ramps not compliant with the ADA.	New ADA-compliant curb ramps throughout the project.
Inadequate lighting.	<ul style="list-style-type: none"> <li>• Lighting improvements (a mix of installing new lights and retrofitting the existing system) to meet or exceed illumination levels specified in the project design.</li> <li>• Roadway lighting on 35-ft concrete light poles spaced at 100-ft intervals in a staggered configuration within the project area. The concrete light poles are nonstandard—octagonal, with decorative acorn-style arms, skirted luminaires, and a power service point elevated 13 ft above ground level.</li> <li>• Light poles added at the new midblock crosswalks (immediately before and after) to ensure an adequately illuminated crossing area.</li> <li>• Two new concrete light poles with arms and luminaires added at the Pecan Street and SR 100 (East Walker Drive) intersection, and a retrofit of the existing lighting system.</li> </ul>

**Figure 2. Photo. A roadway segment on SR 21 before improvement.**



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These images are intended to be examples of real-world, existing conditions; the conditions shown in the photos are not limited to best practices, approved designs, or approved behaviors, and may reflect conditions that are not recommended.

**Figure 3. Photo. A roadway segment on SR 21 after improvement.**



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These images are intended to be examples of real-world, existing conditions; the conditions shown in the photos are not limited to best practices, approved designs, or approved behaviors, and may reflect conditions that are not recommended.

## Project Results

The city has conducted limited monitoring of performance metrics since construction was completed in the past year, but initial observations from the 6 mo after construction indicate no crashes, minimal travel-time delay, and sufficient time for pedestrian and bicyclist crossings. Midblock crosswalks improved pedestrian connectivity, community walkability, and safety.

## Project Funding Sources

- Federal: Surface Transportation Block Grant (STBG) program.<sup>(5)</sup>
- State:
  - District Dedicated Revenue (DDR).<sup>(6)</sup>
  - District 2 Funds.<sup>(7)</sup>

## Project Delivery Mechanism

- |   |  |
|---|--|
| <input type="checkbox"/> Alliance contracting/integrated project delivery (IPD) | <input type="checkbox"/> Construction manager/general contractor (CM/GC) |
| <input type="checkbox"/> Progressive design-build (PBD)                         | <input type="checkbox"/> Public-private partnership (P3)                 |
| <input type="checkbox"/> Design-build (D-B)                                     | <input type="checkbox"/> Project bundling                                |
| <input checked="" type="checkbox"/> Design-bid-build (D-B-B)                    | <input type="checkbox"/> Indefinite delivery/indefinite quantity (IDIQ)  |

## Project Costs\*

**Total Project Costs – \$6,913,040**

**Construction – \$5,824,118**

- Mobilization – \$560,241
- Traffic control (upgrade signal and detection) – \$111,134
- Roadway construction and related activities – \$4,467,027
- Lighting (furnish and install street lighting and accessories) – \$413,565 (15,906 each)
- Concrete sidewalk – \$276,796 (\$45 per sq yd)

**Utility Adjustments**

\$14,106

**Right-of-Way**

\$0

## Project Website

<https://nflroads.com/ProjectDetails?p=5230><sup>(4)</sup>

- Curb ramps (with detectable warning surface) – \$24,564 (\$37 per sq ft)
- Pedestrian beacons (RRFBs) – \$163,173 (12 units at \$13,597 per unit)
- Pedestrian crossing improvements – \$49,472
- Road diet (lane striping and markings) – \$216,733
- Drainage – \$482,250
- Landscaping – \$148,084

**Preliminary Engineering**

\$1,074,816

\*Project costs include improvements that benefit mobility in general and may have been necessary regardless of any safety improvements.

## Acknowledgment

The map in figure 1 was modified by the authors to mark the SR 21 project location in Keystone Heights, FL.

The original map is the copyright property of Google® My Maps™ and can be accessed at <https://www.google.com/maps/place/29%C2%B046'48.0%22N+82%C2%B001'48.0%22W/@29.783329,-82.0317273,17z>.<sup>(3)</sup>

## References

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6. Florida Office of Work Program and Budget. n.d. *Schedule A—Work Program Fund Allocation Process: An Appendix to Work Program Instructions*. Tallahassee, FL: Florida Office of Work Program and Budget. <https://www.fdot.gov/docs/default-source/workprogram/development/ScheduleA/A8-ScheduleAProcess.pdf>, last accessed February 9, 2023.

7. FDOT. n.d. *Florida Department of Transportation Locally Administered State Funded Grant Programs*. Tallahassee, FL: Florida Department of Transportation. <https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/programmanagement/lp/state-funded-grants-brochure.pdf>, last accessed February 9, 2023.

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