



Alternatives Analysis Screening Report

August 12, 2020

Alternatives Analysis Screening Report

SC Highway 41 Corridor Improvements Project

Charleston and Berkeley Counties, South Carolina

August 12, 2020

Prepared for
US Army Corps of Engineers, Charleston District
and Charleston County

Prepared by



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1.0 Introduction

Charleston County is studying alternatives to reduce traffic congestion, enhance safety, improve transportation system and community connections, and provide bicycle and pedestrian accommodations throughout the SC Highway 41 (SC 41) corridor, located in Berkeley and Charleston counties, South Carolina. This Alternatives Analysis and Screening Report for the proposed SC 41 Corridor Improvements Project was prepared according to the provisions of the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] 1500–1508) and corresponding regulations and guidelines of the U.S. Army Corps of Engineers (USACE), the lead federal agency (33 CFR Appendix B to Part 325).

The purpose of this report is to summarize and present the results of the alternatives analysis and screening process for the proposed SC 41 Corridor Improvements Project Environmental Report (ER) within the project study area. The project study area has been defined as a mainline corridor of SC 41 from US 17 in Mount Pleasant across the Wando River Bridge to Clements Ferry Road in Berkeley County (Figure 1-1). The project also includes improvements to the intersection of SC 41 and US 17 and completion of the tie-in of Gregorie Ferry Road to SC 41 near US 17. The study corridor also includes US 17 from with a half mile south of Hamlin Road to the entrance to Oakland Plantation and an expanded study area around Laurel Hill County Park and the Phillips Community between Bessemer Road and Dunes West Boulevard. The Phillips Community is a historic district eligible for the National Register of Historic Places, as well as an environmental justice community. Additional information about communities and recreational facilities can be found in the *SC 41 Corridor Improvements Community Characterization and Impact Assessment* reports, under separate cover (HDR 2019a and 2019b). The study corridor also includes a 300-foot wide corridor on either side of the centerline of Dunes West Boulevard and Bessemer Road. The purpose of the expanded study area is to fully evaluate the potential project effects on the County Park, adjacent communities, and associated roadways.

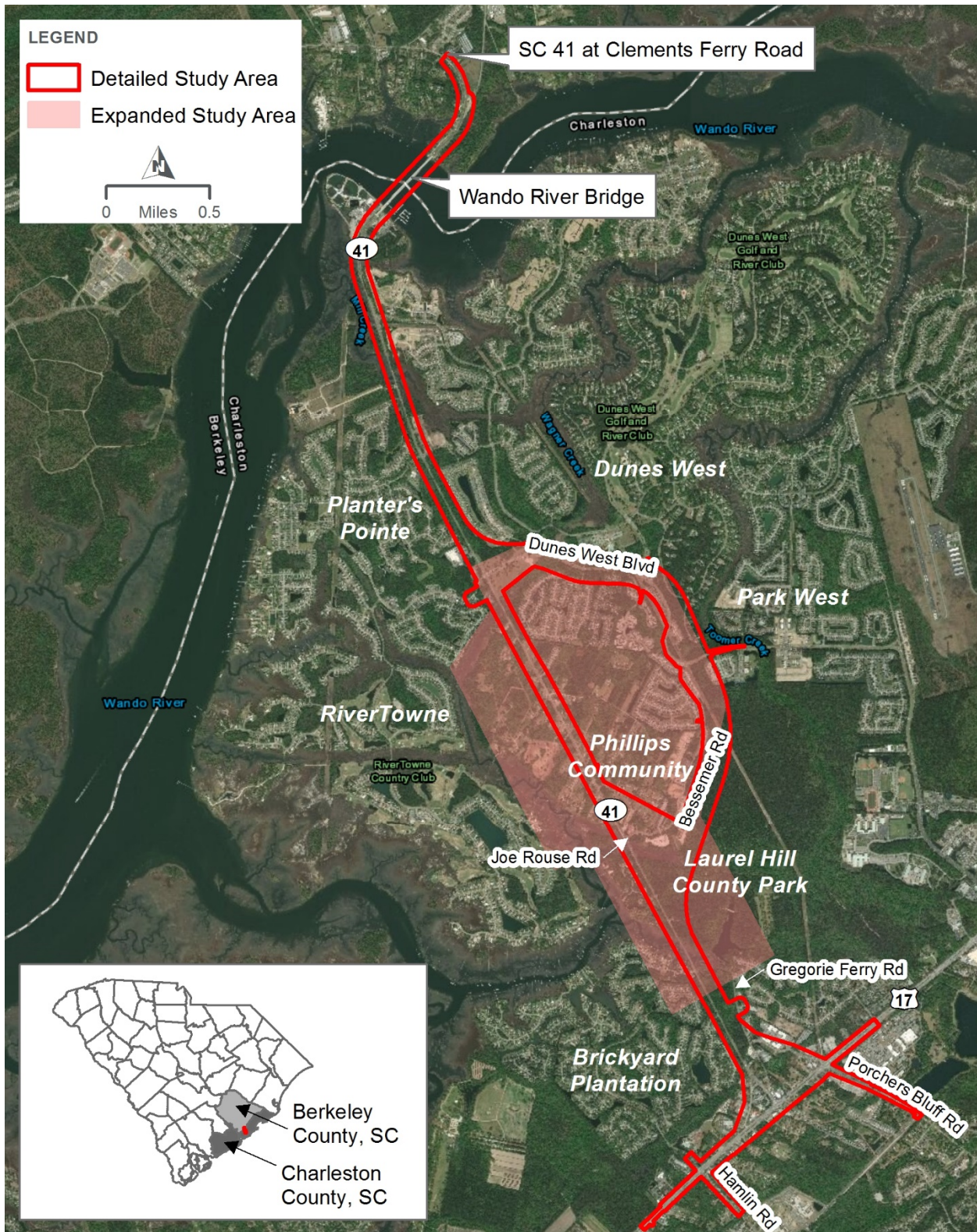


Figure 1-1. Project Study Area

2.0 Alternatives Analysis Screening Process

2.1 Alternatives Analysis Steps

In its evaluation of permit applications, the USACE is required to analyze alternatives to the proposed project that achieve its purpose. USACE conducts this analysis pursuant to two main requirements: the 404(b)(1) Guidelines (40 CFR Part 230) and NEPA (33 CFR Part 325 Appendix B and 40 CFR 1508). Complex projects, such as SC 41 Corridor Improvements, usually require several levels of screening. Coarser screens are typically applied at the beginning of a project to eliminate clearly impracticable and unreasonable alternatives. Practicable is defined as meaning the alternative is available, and capable of being done after taking into consideration cost, existing technology, and/or logistics in light of the overall project purpose(s). An alternative needs to fail only one practicability factor to be eliminated during the screening process. The alternatives analysis screening process consisted of five steps, described below and illustrated in Figure 2-1.

2.1.1 Preliminary Screening

First, a range of alternatives was developed that includes an initial list of alternatives that are general in nature. These alternatives were examined to see if they meet the primary purpose and need of the project using established evaluation criteria.

2.1.2 Level 1 Screening

The alternatives that advanced from preliminary screening were evaluated against first-level (Level 1) screening criteria. Alternatives were evaluated against the purpose and need as well as public input.

If an alternative is unable to meet the purpose and need, it was considered “fatally flawed” or not practicable. The alternatives screening process for each preliminary alternative is described in detail in the *Final Traffic Report: SC 41 Corridor Improvements Project* (Stantec 2020) and is summarized in Section 3.3 of this report. Those alternatives that are not fatally flawed would then move to a more detailed traffic analysis and Level 2 screening.

2.1.3 Level 2 Screening

Alternatives that advanced to Level 2 screening were evaluated against the purpose and need, public input, and detailed traffic analysis. Under this analysis, remaining alternatives were evaluated for level-of-service, travel time benefits, volume to capacity benefits, and delay time. The alternatives screening is described in detail in the *Final Traffic Report: SC 41 Corridor Improvements Project* (Stantec 2020).

2.1.4 Level 3 Screening

Alternatives that advanced through Level 2 screening were evaluated against public input, environmental factors, costs, and logistics. Those alternatives became the reasonable alternatives which will be evaluated in detail in the ER. The analysis process for the reasonable alternatives is found in the Alternatives Screening Memos (Appendix B).

2.1.5 Level 4 Screening

Following the Level 3 screening, a Proposed Alternative was identified based on the ability to meet the purpose and need, public input, environmental factors, costs, and logistics.

ALTERNATIVES SCREENING PROCESS

DEVELOP RANGE OF ALTERNATIVES

Based on

- Preliminary traffic studies (CHATS model and planned developments)
- Regional planning documents
- Community and stakeholder working group meetings
- Agency input

ALTERNATIVE 1	ALTERNATIVE 7
ALTERNATIVE 2	ALTERNATIVE 8
ALTERNATIVE 3	ALTERNATIVE 9
ALTERNATIVE 4	ALTERNATIVE 10
ALTERNATIVE 5	ALTERNATIVE 11
ALTERNATIVE 6	ALTERNATIVE 12

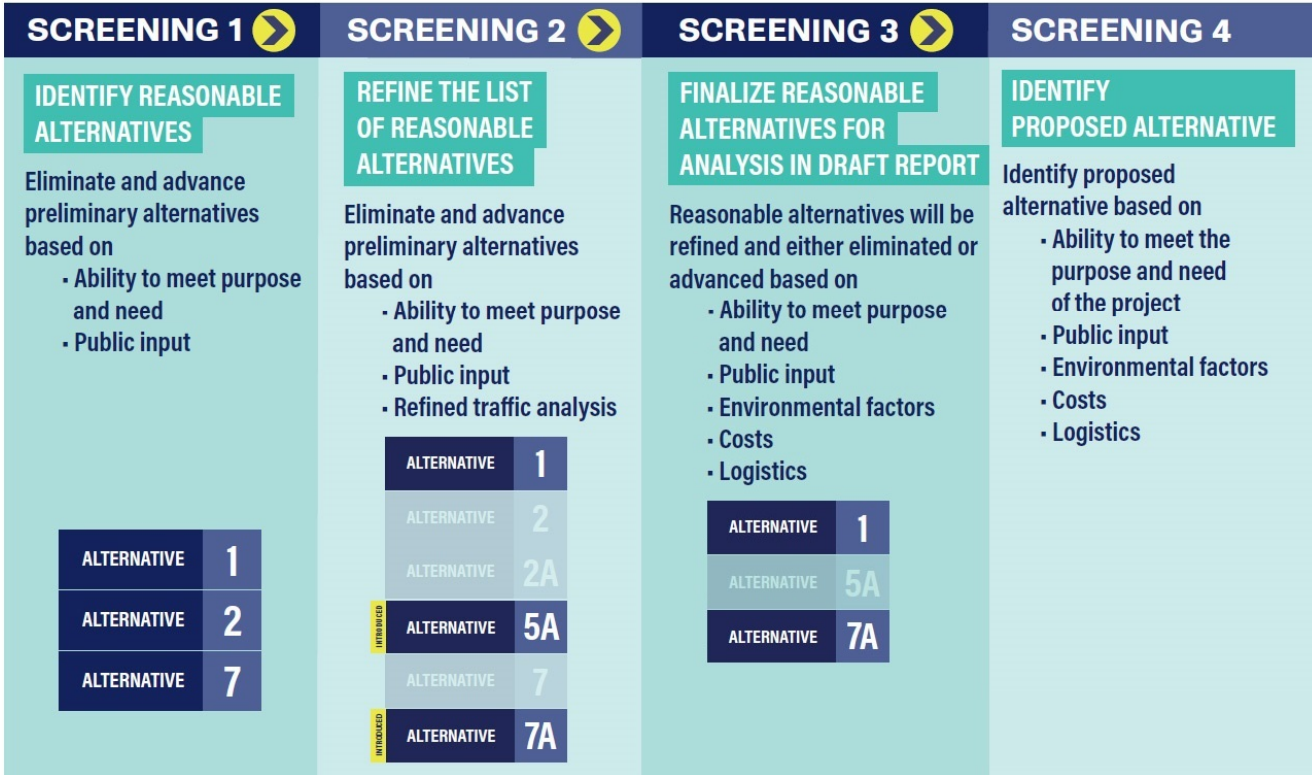


Figure 2-1. Alternatives Screening Process

2.2 Meeting the Purpose and Need

The alternatives analysis and screening process described in this report provided critical information about how well an alternative satisfies the purpose of and need for the proposed SC 41 Corridor Improvements Project and whether it is reasonable and feasible. The criteria used in the screening analyses generated measures that allowed Charleston County and USACE to systematically and objectively identify reasonable alternatives and screen out unreasonable alternatives.

USACE is responsible for compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, as well as NEPA. Under Section 404(b)(1) of the Clean Water Act, the U.S. Environmental Protection Agency, in conjunction with USACE, developed “Guidelines” to ensure compliance with Section 404 of the Clean Water Act when evaluating permit applications (40 CFR §230) for the placement of fill in wetlands or waters of the U.S. There are four “restrictions on discharge” outlined in the 404(b)(1) Guidelines. The first “restriction” is that no discharge of dredged or fill material shall be permitted if there is a “practicable” alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem. USACE considers an alternative “practicable” if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose (40 CFR §230.10(a)(2)). Therefore, in order to determine compliance with this “restriction”, USACE must determine the overall project purpose. When reviewing the proposed project, USACE must evaluate each alternative, always considering whether each of the alternatives really meets the project’s purpose.

A Letter of Intent (LOI) was distributed on July 13, 2017, to stakeholder agencies to notify them of the commencement of the proposed project. The LOI provided general project information and requested comments on potential environmental issues and concerns within the project study area. Several meetings, including in-person public information meetings, online meetings, stakeholder meetings, and neighborhood and small group meetings, have been held to date. These consisted of the following:

- Community and property owners’ association (POA) meetings held September 20-22, 2017;
- Presentations to Town of Mount Pleasant Council on October 10, 2017, November 5, 2018, June 3, 2019; and December 10, 2019;
- A public kickoff meeting held at the Park West Gym on November 13, 2017;
- Stakeholder Working Group meetings held on September 26, 2017, April 26, 2018, November 14, 2018, and March 6, 2019;
- Four meetings with leadership representing community, neighborhood and business groups on April 25-26, 2018;
- NEPA Scoping Meeting on May 16, 2018;
- Community and POA meetings on January 22, March 5-6, and August 27, 2019;
- Meeting with the Seven Mile Community Action Group for Encouragement on August 1 and August 29, 2019;
- Meeting with Charleston County School District Staff on September 13, 2019; and
- Meeting with Charleston Moves on November 12, 2019.
- A virtual public meeting is planned for the summer of 2020.

Input from local communities, stakeholders, and agencies, coupled with field research and traffic analysis, helped Charleston County and USACE develop the purpose and need of the SC 41 Corridor Improvements Project. The purpose and need explains why a project is necessary and what it should

achieve. Most importantly, it serves as the criteria for determining and evaluating the range of project alternatives, and ultimately selecting the preferred alternative for the project.

The primary purpose of the proposed SC 41 Corridor Improvements Project is to reduce traffic congestion within the SC 41 corridor to accommodate future traffic projections. The secondary purposes of the proposed SC 41 Corridor Improvements Project are to enhance safety throughout the corridor, improve transportation system and community connections, and provide bicycle and pedestrian accommodations, while minimizing community and environmental impacts.

The proposed project is needed to address anticipated local and regional growth, increased traffic congestion, safety and emergency response concerns, and inadequate interconnections of transportation modes, including pedestrian and bicycle facilities.

More detailed information about the purpose of the project and why it is needed can be reviewed in the *SC 41 Corridor Improvements Purpose and Need Report* (HDR 2020).

3.0 Determination of Reasonable Alternatives

3.1 Identification of Range of Alternatives

The project team identified 12 alternatives based on preliminary traffic studies, regional planning documents, community and stakeholder working group meetings, and agency input (Appendix A). The initial development of the range of alternatives was also completed through consideration of the Charleston Area Transportation Study Travel Demand Model. Additional details about development of the range of alternatives can be found in the *Final Traffic Report: SC 41 Corridor Improvements Project* (Stantec 2020).

3.2 Preliminary Screening of the Range of Alternatives

The 12 different improvement alternatives and a No-Build Alternative were analyzed in the Charleston Area Transportation Study Travel Demand Model. Stantec presented the results of the traffic distribution and planning level capacity analysis to the SC 41 project team at a meeting on January 26, 2018. Additional information about the traffic analyses and alternatives screening can be found in the *Final Traffic Report: SC 41 Corridor Improvements Project* (Stantec 2020). These results demonstrated that some of the alternatives did not relieve congestion issues on SC 41 for design year 2045, and consequently do not meet the purpose and need of the project.

3.3 Identification and Screening of Reasonable Alternatives (Level 1)

Table 3-1 summarizes the eliminated alternatives and the corresponding deficiency. For a more detailed summary, please refer to the Alternatives Screening Memos (Appendix B). Based on the Level 1 screening, Alternatives 1, 2, and 7 were presented as reasonable alternatives for public input at the May 16, 2018 public meeting. While traffic analysis showed that Alternative 2 did not meet the purpose and need for the project, this alternative was carried forward because it had been presented to the public

previously as a way to minimize impacts to Phillips Community. A public comment period was held between May 16 and June 16, 2018 to collect public input on the proposed reasonable alternatives.

Table 3-1. Alternatives Eliminated by Initial Screening Process

Build Alternative	Elimination Justification
3	Conversion of Joe Rouse Road, Bessemer Road and Dunes West Boulevard to one-way did not relieve congestion to acceptable levels.
4	The new alignments did not attract enough traffic volume to reduce congestion levels on SC 41 to acceptable levels.
5	
6	
8	Alternatives that included six lanes on SC 41 from US 17 to Joe Rouse Road provide excess capacity in this segment and do not reduce congestion levels in other segments of SC 41 to acceptable levels.
9	
10	
11	
12	

3.4 Refinement of the Reasonable Alternatives (Level 2)

During Level 2 screening the project team refined the reasonable alternatives based on public input and detailed traffic analysis. This refinement process resulted in the addition of modified alternatives 2A, 5A, and 7A; therefore, Alternatives 1, 2, 2A, 5A, 7, and 7A were considered during Level 2.

During Level 2 screening, detailed traffic analysis was conducted on the alternatives. Refinements were made to the traffic models, including an update of growth forecasts in the project area to correspond to changes in development plans for Cainhoy Plantation. The developer had recently committed to preserve approximately fifty percent of the previously master planned area. This forecast was applied to the remaining alternatives prior to conducting more detailed level-of-service (LOS) analyses.

Alternative 1 was found to continue to meet the purpose and need for the project and was advanced to Level 3 screening. Alternative 2 was eliminated from further consideration because the more detailed traffic analysis confirmed a three-lane section through the Phillips Community would have a failing LOS. Therefore, Alternative 2 was eliminated from moving forward because it does not meet the purpose and need of the project.

Alternative 2A was developed during Level 2 screening based on public input received during the May 16, 2018 public meeting and outreach with the Phillips Community. Alternative 2A included a 3-lane section through the Phillips Community, similar to Alternative 2, but also included a 3-lane section through Bessemer Road and Dunes West Boulevard. During traffic analysis, Alternative 2A did not attract enough traffic volume to reduce congestion levels on SC 41 to an acceptable LOS and was eliminated from further consideration.

While Alternative 5 was determined to not meet the project purpose and need for traffic operations in Level 1, as a result of public comment received, the project team re-evaluated Alternative 5 in an effort to look at alternate ways to distribute traffic in the area. Alternative 5 had initially considered 2 lanes along a transmission line easement, which did not meet the purpose and need of the project to improve traffic

operations along SC 41. During the May 16 to June 16, 2018 public comment period, the County received correspondence from stakeholders, including members from the Phillips Community and the South Carolina Coastal Conservation League that stressed the importance of considering alternatives that minimize impacts to environmental and cultural resources, including the Phillips Community. This correspondence asked about the possibility of a 5-lane alternative along the transmission line easement. Based on stakeholder input, the project team added Alternative 5A to Level 2 for consideration.

Alternative 5A would create a parallel five-lane roadway primarily along the existing Dominion Energy South Carolina power line easement running from US 17, through Ivy Hall, Laurel Hill County Park, Dunes West, and tying into SC 41 near Harpers Ferry Way. The traffic analysis showed that Alternative 5A meets the project purpose and need of improving traffic operations and congestion on SC 41; therefore, Alternative 5A was advanced to the Level 3 screening.

Alternative 7A was developed during Level 2 screening in response to public comments in opposition to Alternative 7 and to lessen impacts on residential areas along Bessemer Road. Alternative 7A modified Alternative 7 to reroute SC 41 parallel to Bessemer Road and onto Laurel Hill County Park property, turn along the power line easement, and then back along Dunes West Boulevard. The traffic analysis showed that Alternative 7A meets the project purpose and need of improving traffic operations and congestion on SC 41; therefore, Alternative 7A was advanced to the Level 3 screening. Alternative 7 was subsequently eliminated from further consideration in favor of advancing Alternative 7A.

3.5 Finalization of Reasonable Alternatives for Analysis in Draft ER (Level 3)

Alternatives 1, 5A, and 7A were advanced to the Level 3 screening. During Level 3 screening, the project team began to evaluate the alternatives based on public input, environmental factors, cost, and logistics.

During Level 3 screening, Alternative 5A was eliminated from further evaluation because of the significant impacts to the utilities and environment. Alternative 5A would result in the most property impacts, and the most tidal and non-tidal wetland impacts. Alternative 5A also cuts through a Charleston County Parks & Recreation Commission (CCPRC) park, Laurel Hill County Park, and would prevent CCPRC from using the property for its intended use as a park as stipulated in its land trust. For more details, please refer to the Alternatives Screening Memos (Appendix B).

The No-Build Alternative and two build alternatives (Alternative 1 and Alternative 7A) were carried forward for analysis in the draft ER (Figure 3-1).

3.6 Identification of the Proposed Alternative (Level 4)

Alternatives 1 and 7A were advanced to the Level 4 screening. During Level 4 screening, the project team continued to evaluate the alternatives based on public input, environmental factors, cost, and logistics. A screening matrix was used to compare these criteria and is shown in Table 3-2. Alternative 1 was selected as the Proposed Alternative as it provides the best option to meet the project purpose and need while minimizing wetland impacts. Alternative 1 would result in the fewest acres of right-of-way acquisition. The Proposed Alternative has the lowest estimated total cost of approximately \$125 million.

Environmental and community impacts were calculated for the two build alternatives. Alternative 1 (Proposed Alternative) would have less property impacts in regards to right-of-way acres, less impacts concerning wetlands (acres), Laurel Hill County Park (acres), hazardous materials, and noise compared

to Alternative 7A. Alternative 1 would result in greater cultural resources impacts and slightly greater community impacts compared to Alternative 7A. Overall, the Proposed Alternative would result in less impacts compared to Alternative 7A. A summary of the environmental and community impacts for the build alternatives is shown in Table 3-2.

Table 3-2. Summary of Impacts for the Build Alternatives

Impact Category		Units	Alternative 1 (Proposed Alternative)	Alternative 7A
Property Impacts	Right-of-Way	Acres	30.4	58.3
	Right-of-Way	Parcels	214	164
	Residential Relocations		0	0
	Commercial Relocations		0	0
Wetland Impacts	Estuarine (Tidal)	Acres	5.3	5.0
	Freshwater (Non-Tidal)		2.9	6.2
	Threatened and Endangered Species	Effect Determination	May effect but not likely to adversely affect wood stork	May effect but not likely to adversely affect wood stork
	Laurel Hill County Park	Acres	0.7	19.4
	Hazardous Material Sites	Sites	11	12
Noise	NAC B (Residential)	Receivers	58	100
	NAC C (Recreational)		0	1
	NAC D (Churches)		0	0
	NAC E (restaurant patios)		2	2
	Feasible and Reasonable Noise Abatement Barriers	Barriers	0	2
Cultural Resources	NRHP Archaeological Sites	Sites	1	2
	NRHP Eligible Phillips Community Cultural Landscape		Potential adverse impact	No effect
	NRHP Sweetgrass Basket Corridor Traditional Cultural Property		Potential adverse impact	Potential adverse impact
Communities	Brickyard/Colonnade	Severity Rating	Minor	Minor
	Cardinal Hill		Minor	Minor
	Dunes West		Minor	Minor to Moderate
	Gregorie Ferry		Minor	Minor
	Horlbeck Creek		Minor	Minor
	Ivy Hall		Minor	Minor
	Park West		Minor	Minor to Moderate
	Phillips Community		Moderate to Major	Minor
	Planter's Pointe		Minor	Minor
	Rivertowne		Minor	Minor
	Seven Mile		Minor to Moderate	Minor to Moderate
	Cainhoy		No direct effects	No direct effects
	Community Resources		2	3
Public Health and Safety Resources	Sites	1	2	
Phillips Community	Right-of-Way	Acres	4.7	0.6
	Right-of-Way	Parcels	84	2
	Residential Relocations		0	0

Cultural Landscape	Commercial Relocations		0	0
	Environmental Justice Community	Census Block Group Impacts	Disproportionately high and adverse effects	No disproportionate adverse effects

3.6.1 Traffic Analysis

The Proposed Alternative and No-Build Alternative were analyzed based on traffic measures of effectiveness (MOEs) and the extent to which they meet the primary purpose and need of the proposed project, as shown in the *Final Traffic Report: SC 41 Corridor Improvements Project (Stantec 2020)*. . These MOEs included LOS, travel time benefits, and delay time. The Proposed Alternative would have a higher mobility, meaning lower average travel time through the corridor and higher average speed through the corridor compared to the No-Build Alternative. Through the detailed traffic analysis, it was determined that the Proposed Alternative would best meet the purpose and need of reducing congestion and improving mobility while minimizing impacts. A summary of the traffic MOEs is included in Table 3-3.

Table 3-3. MOE Summary

Intersection	Intersection Control	LOS and Delay Time									
		AM Peak Hour LOS/Delay						PM Peak Hour LOS/Delay			
		2045 No-Build	2045 Proposed Alternative		2045 Alternative 7A		2045 No-Build	2045 Proposed Alternative		2045 Alternative 7A	
US 17 & 6 Mile Road	Free	B 19.8	A 1.0	A 1.7	C 25.7	A 1.4	A 1.0				
6 Mile Road & Sweetgrass Basket Parkway	Signalized	C 21.1	B 14.4	B 15.3	F 94.8	C 34.1	D 46.0				
US 17 & Long Point Road	Free	C 30.4	A 1.8	A 1.1	B 12.3	A 2.2	A 1.4				
US 17 & Brickyard Parkway/Hamlin Road	Signalized	D 42.8	B 16.8	B 15.0	D 44.2	B 13.6	B 17.1				
US 17 & SC 41	Signalized	D 48.5	B 18.9	C 22.0	F 97.6	C 22.4	C 24.8				
US 17 & Porchers Bluff Road	Signalized	B 15.0	B 13.9	B 16.2	E 79.0	B 10.5	C 25.1				
Hamlin Road & Billy Swails Boulevard	Signalized	C 17.5	D 48.2	E 56.0	E 49.4	E 58.7	D 52.4				
Porchers Bluff Road & Billy Swails Boulevard	Unsignalized	A 9.4	B 10.5	A 2.3	F 324.8	A 8.4	A 3.4				
US 17 & Lexington Drive	Signalized	C 25.4	C 29.1	C 23.3	E 75.7	C 29.8	D 45.6				
US 17 & Park West Boulevard/South Morgan's Point Rd	Free	D 43.1	A 3.6	A 2.3	F 83.0	A 1.6	C 21.3				
SC 41 & SC 41 Access Road/Gregorie Ferry Road	Unsignalized	F 60.3	A 3.5	D 25.1	F 575.0	A 6.7	E 36.0				
SC 41 & Colonnade Drive	Unsignalized	F 291.6	A 4.3	*A 3.7	F 376.9	A 7.5	*A 8.3				
SC 41 & Tradewind Drive	Unsignalized	D 29.3	F 90.0	E 35.5	F 523.1	F 85.7	D 30.4				
SC 41 & 41 Bypass	Signalized	-	-	B 14.1	-	-	C 21.9				
SC 41 & Joe Rouse Road	Signalized	F 81.4	C 20.5	A 7.5	E 71.8	C 22.1	C 22.4				
SC 41 & Bennett Charles Road	Unsignalized	F 1823.7	D 27.1	A 9.8	F 109.6	F 89.5	C 18.5				
SC 41 & Parkers Island Road	Unsignalized	C 21.8	C 16.3	B 10.2	F 1080.6	F 52.9	C 18.1				
SC 41 & Canyon Lane	Unsignalized	F 51.2	C 20.3	A 8.9	C 23.3	F 98.4	C 16.9				
SC 41 & Dunes West Boulevard	Signalized	F 81.3	D 35.7	C 27.5	E 64.7	C 30.5	D 41.8				
SC 41 & Planters Pointe Boulevard/Wood Park Drive	Unsignalized	F 428.5	C 33.3	*D 38.9	F 87.6	C 30.4	*C 30.8				
SC 41 & Harpers Ferry Way	Signalized	F 533.5	A 9.4	B 10.3	F 238.8	A 8.5	*A 10.0				
SC 41 CFI Intersection (North of Dunes West Boulevard)	Signalized	-	B 13.6	-	-	B 15.6	-				
SC 41 DDI Crossover Intersection (North of US 17)	Signalized	-	B 11.0	C 22.5	-	A 9.3	B 10.0				
SC 41 & Winnowing Way	Signalized	-	A 9.1	A 6.8	-	B 17.6	C 21.6				
US 17 & U-Turn (South of McConnell)	Signalized	-	A 3.7	-	-	A 2.6	-				

Intersection	Travel Time (Minutes)					
	2045 No-Build		2045 Proposed Alternative		2045 Alternative 7A	
	AM	PM	AM	PM	AM	PM
SC 41 Northbound	7.0	22.4	7.4	8.5	8.8	13.8
SC 41 Southbound	37.6	32.0	7.6	9.8	9.6	10.8
US 17 Northbound	14.6	11.5	6.0	5.9	7.3	5.7
US 17 Southbound	17.0	33.8	6.9	6.0	6.3	6.7

*Intersections that have been signalized in the Proposed Alternative design

3.6.2 US 17/SC 41 Intersection Design Refinements

During the Level 4 screening, the project team also completed an initial design of the US 17/SC 41 intersection and presented this information to the agencies, SCDOT, and public. The modified diverging diamond at SC 41 and US 17 is designed to allow high volume turning movements such as the left turns from US 17 to SC 41 and from SC 41 to US 17, to occur at the same time. This not only reduces the amount of stopped time that the vehicles making these turns will experience, it will reduce the amount of stopped time experienced by southbound traffic on US 17, because southbound traffic conflicts with these left turns. The intersection at Winning Way and Porchers Bluff Road includes a bridge to carry northbound US 17 traffic over the intersection, which keeps traffic moving north without stopping and allows for all other movements at the intersection to occur below. In addition, this intersection provides an easier connection from SC 41 to Billy Swails Boulevard and Hamlin Road. Intersection design concepts, shown in Figures Figure 3-2 through Figure 3-5, included:

- Modified diverging diamond intersection at SC 41 and US 17;
- Restricted crossing U-turn intersection at Porchers Bluff Road and US 17;
- Overpass bridge for US 17N at the intersection of US 17/Winning Way/Porchers Bluff Road;
- Extension/widening of Winning Way to SC 41; and
- Roundabouts at Brickyard Parkway and Hamlin Road.

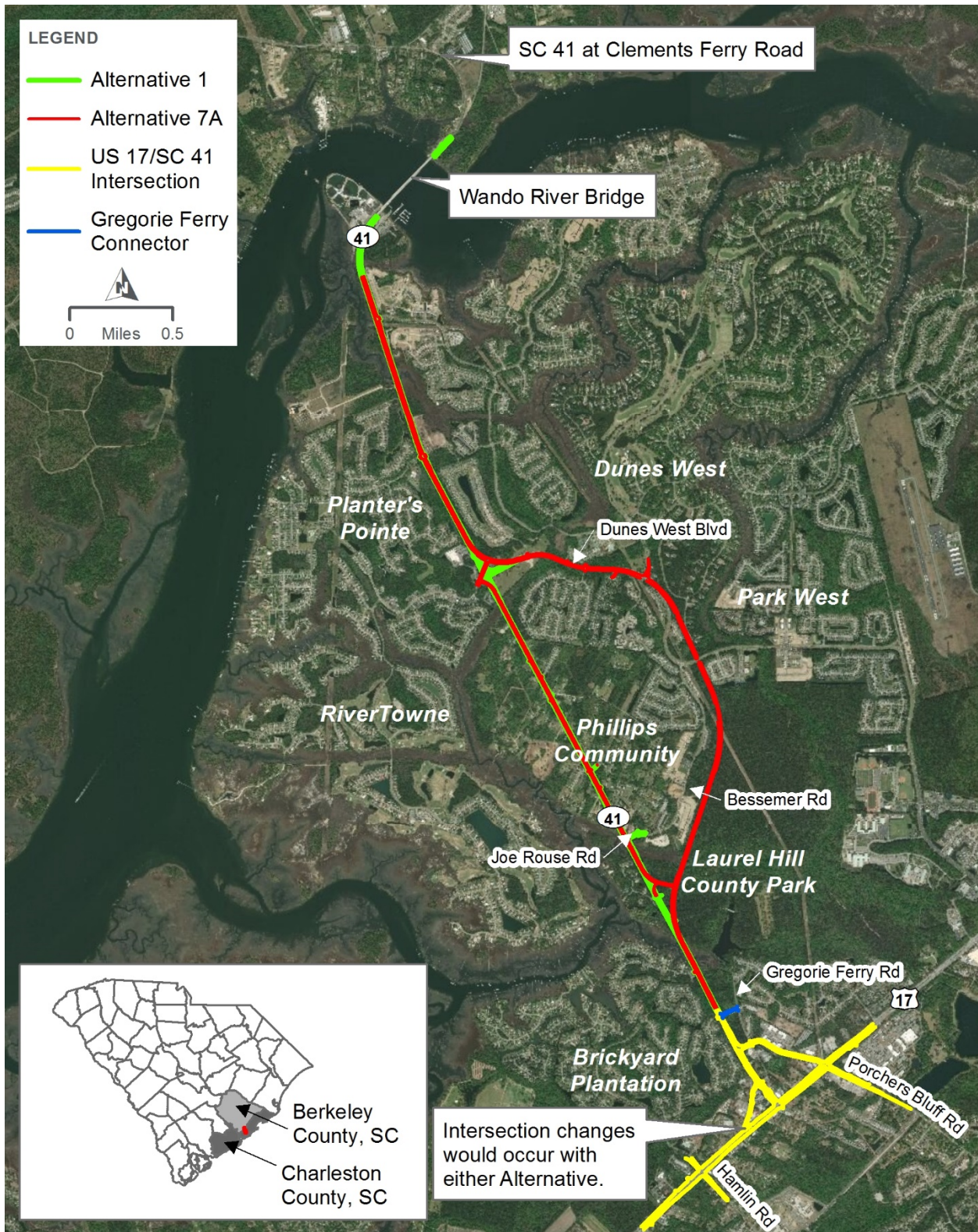


Figure 3-1. Build Alternatives Associated with the Project



Figure 3-2. Design Concept – SC 41 and US 17 Intersection



Figure 3-3. Design Concept – US 17 and Winoing Way/Porchers Bluff Road Intersection

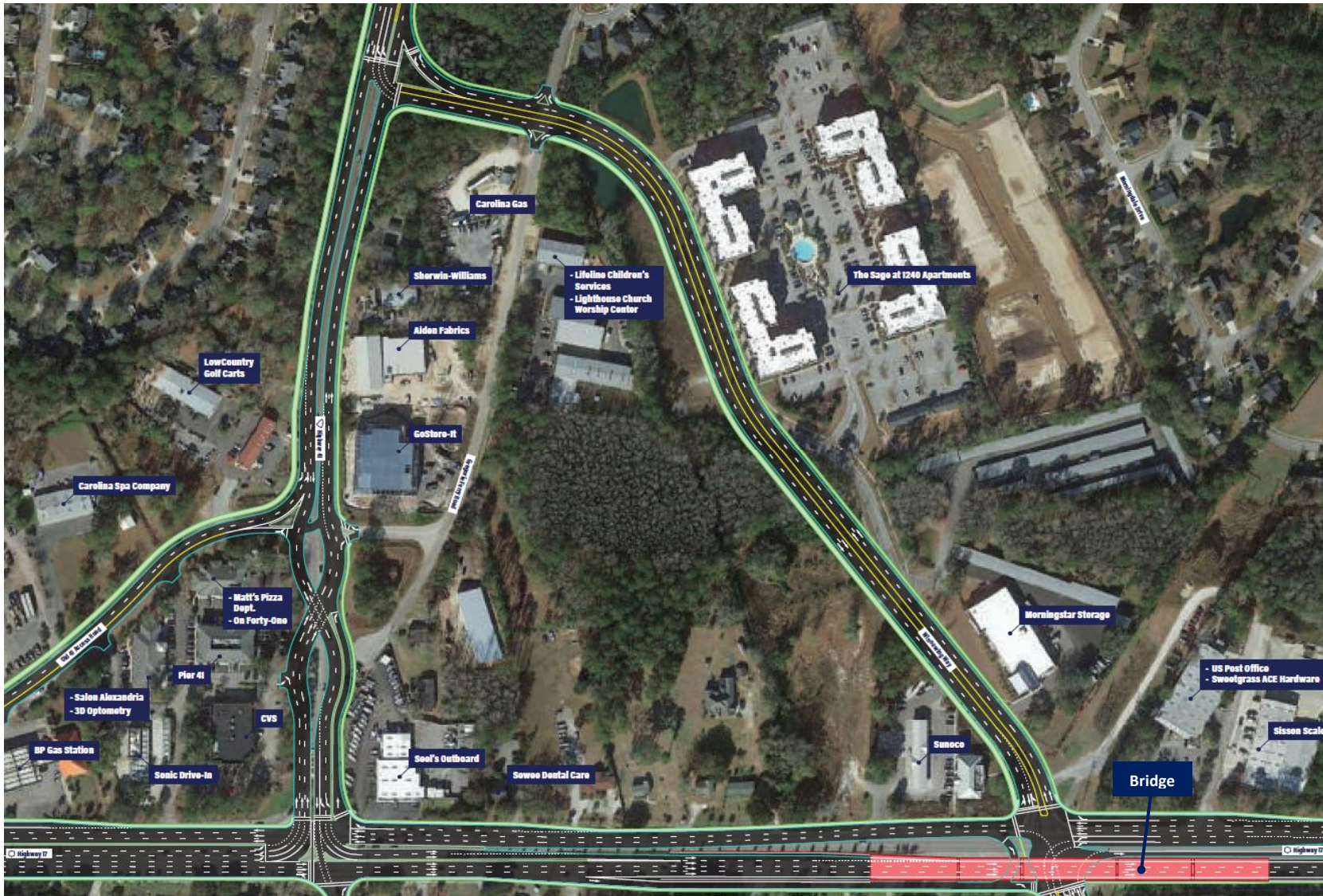


Figure 3-4. Design Concept – Extension/Widening of Wynn Way to SC 41



Figure 3-5. Design Concept – Brickyard Parkway/Hamlin Road and US 17 Intersection

In response to a request from the Brickyard Plantation community, the project team presented intersection design concepts of the SC 41 and US 17 intersection to Brickyard Plantation residents at a public meeting on August 27, 2019. A public comment period was held between August 20 and September 19, 2019 to collect comments on the proposed intersection design. Because of public concern with the proposed roundabouts at Brickyard Plantation and Hamlin Road, the intersection design was modified as shown in Figure 3-6.

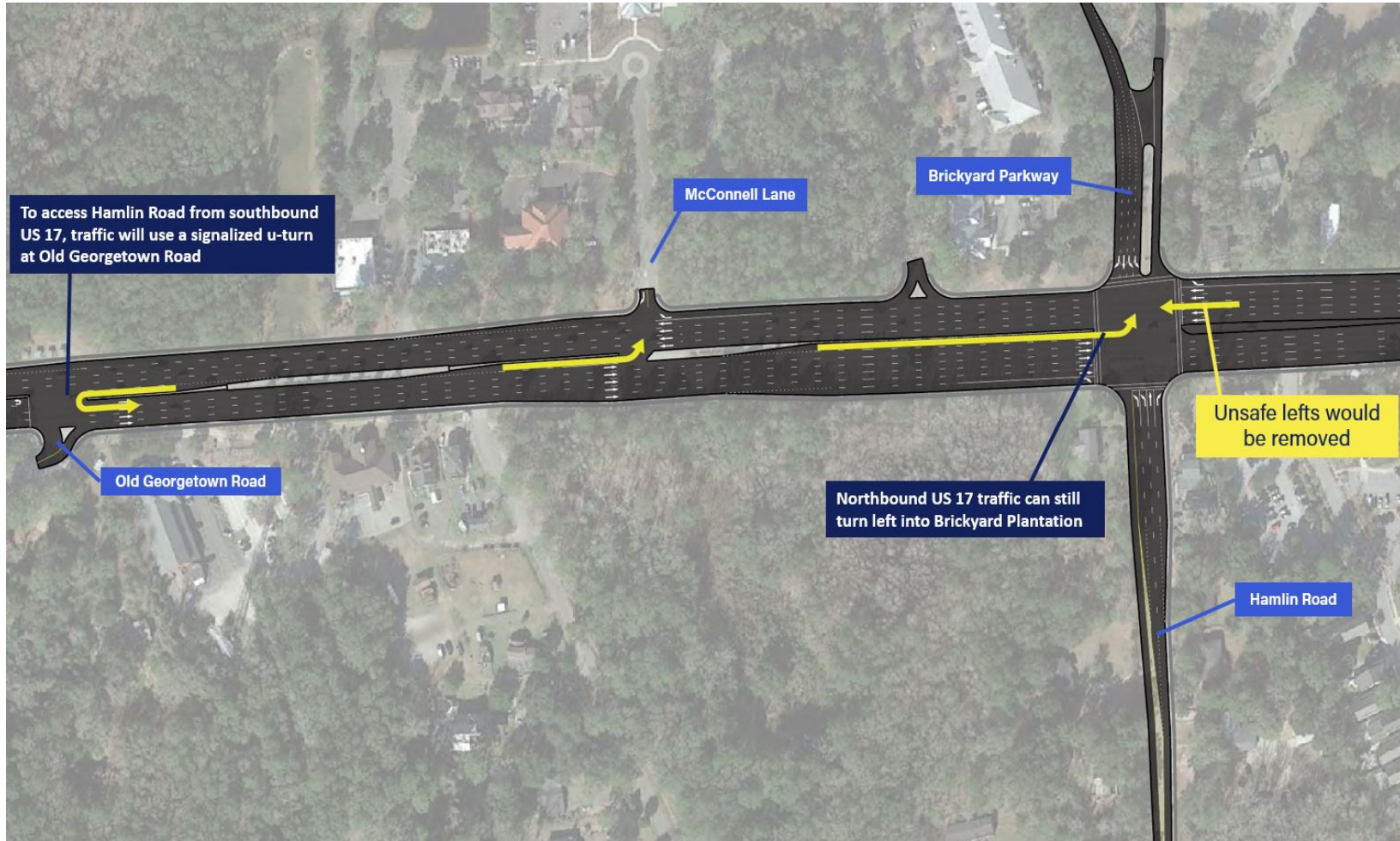


Figure 3-6. Updated Design Concept – Brickyard Parkway/Hamlin Road and US 17 Intersection

4.0 Conclusion

Based on the findings in this report, the project team plans to present Alternative 1 as the Proposed Alternative at a virtual public meeting in summer 2020. Public input will be collected and incorporated into a permit application to the USACE and South Carolina Department of Health and Environmental Control in fall 2020. During detailed design of Alternative 1, the project team will continue to identify avoidance and minimization measures for natural and community resources. Mitigation plans will be developed to offset impacts within the Alternative 1 corridor.

5.0 References

HDR. 2019a. Community Impact Assessment: SC Highway 41 Corridor Improvements Project, Charleston and Berkeley Counties, South Carolina. Prepared by HDR for Charleston County.

HDR. 2019b. Community Characterization: SC Highway 41 Corridor Improvements Project, Charleston and Berkeley Counties, South Carolina. Prepared by HDR for Charleston County.

HDR. 2020. Purpose and Need Report: SC Highway 41 Corridor Improvements Project, Charleston and Berkeley Counties, South Carolina. May 7, 2019. Revised August 10, 2020. Prepared by HDR for Charleston County.

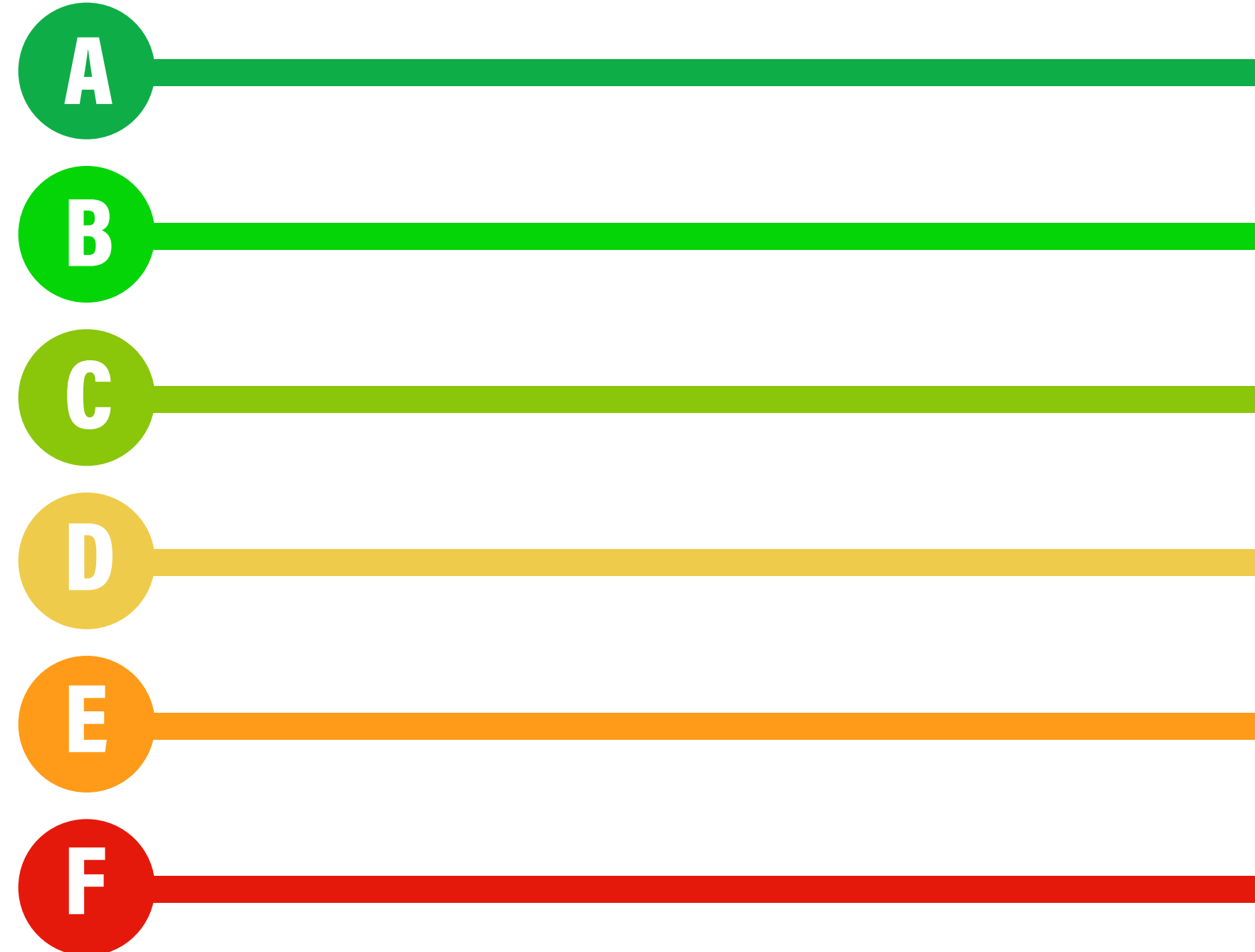
Stantec. 2020. Final Traffic Report: SC Highway 41 Corridor Improvements Project, Charleston and Berkeley Counties, South Carolina. Prepared by Stantec for HDR.

Appendix A

Range of Alternatives Figures

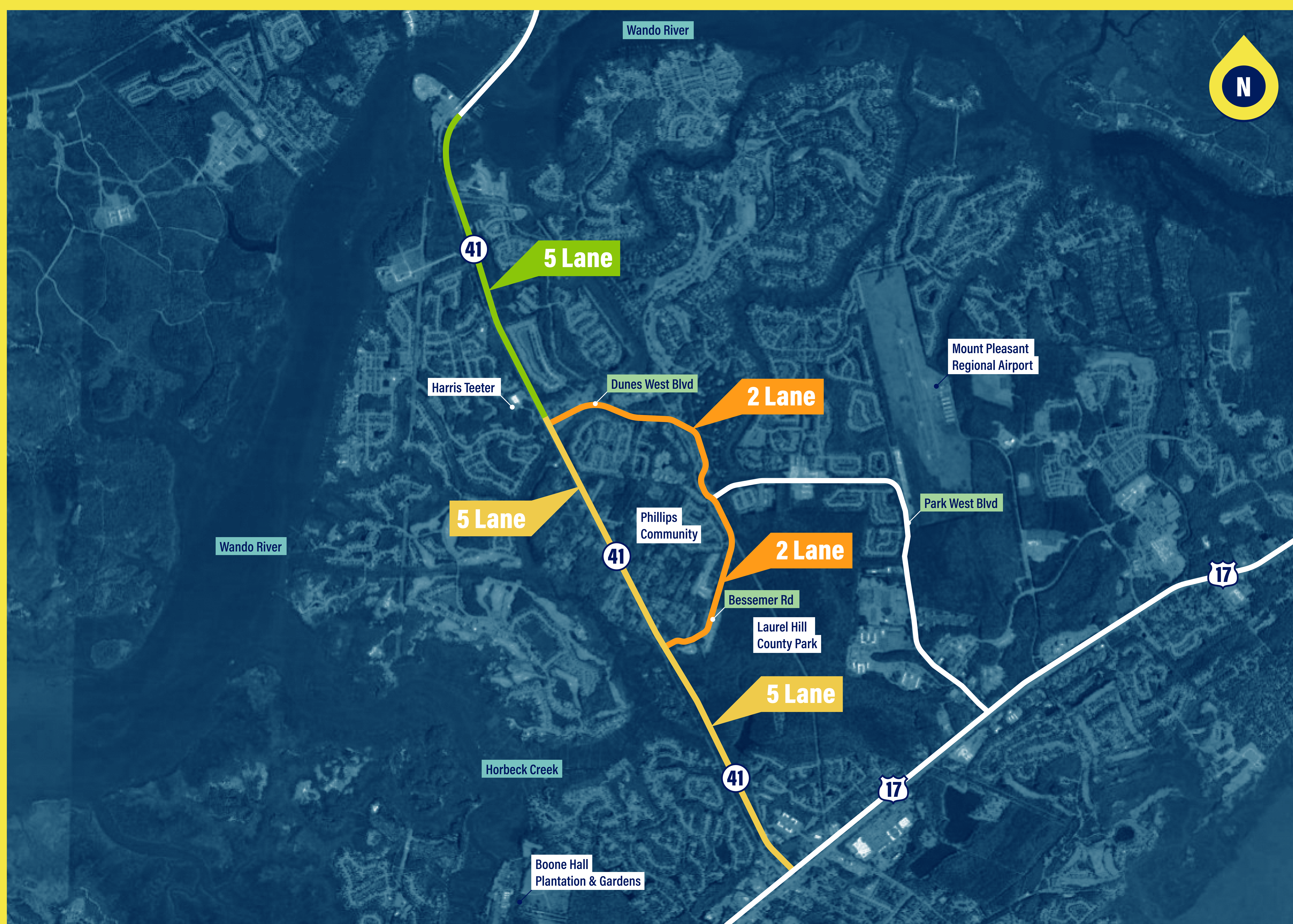
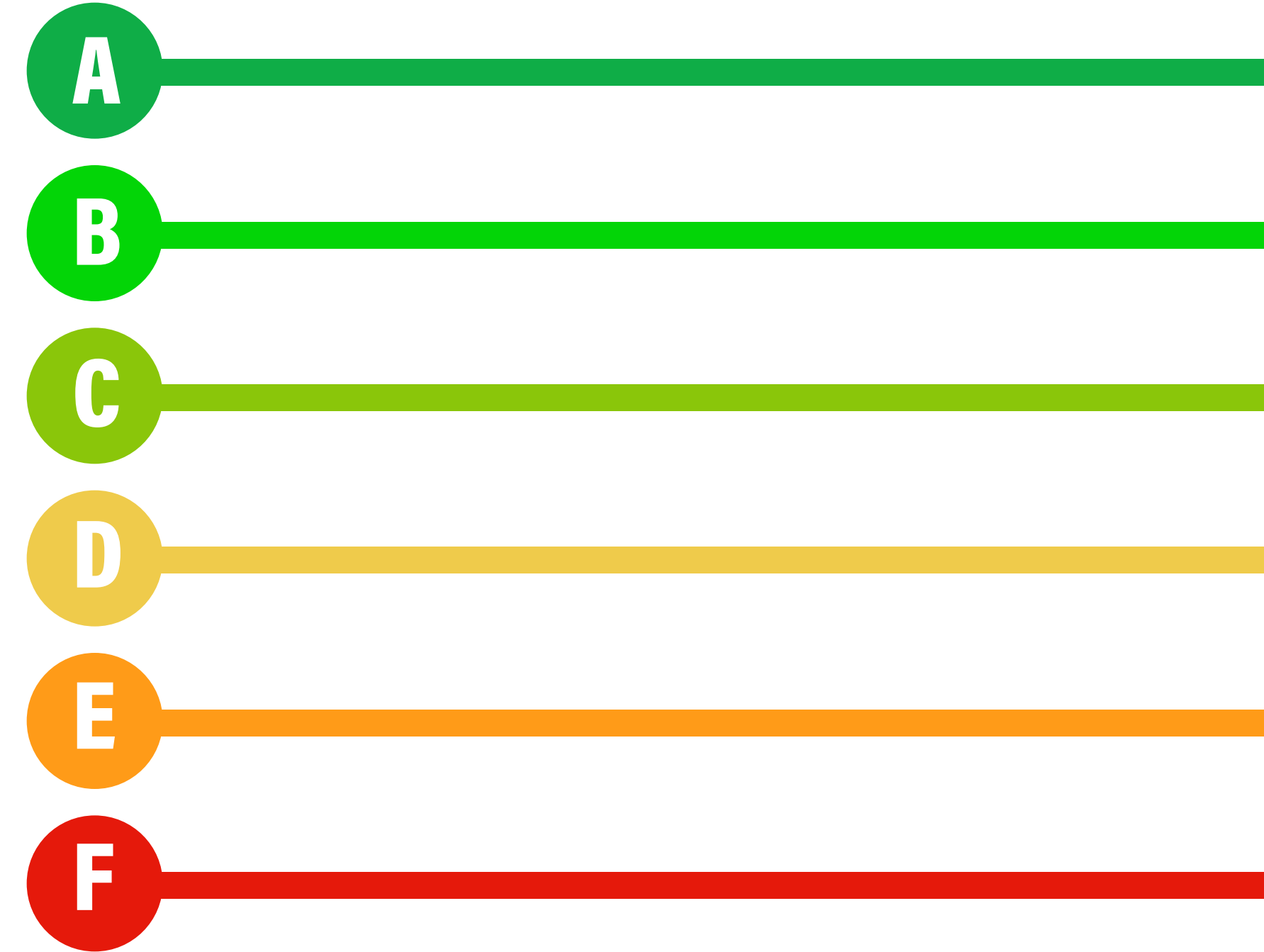
No Build

Level of Service (LOS)



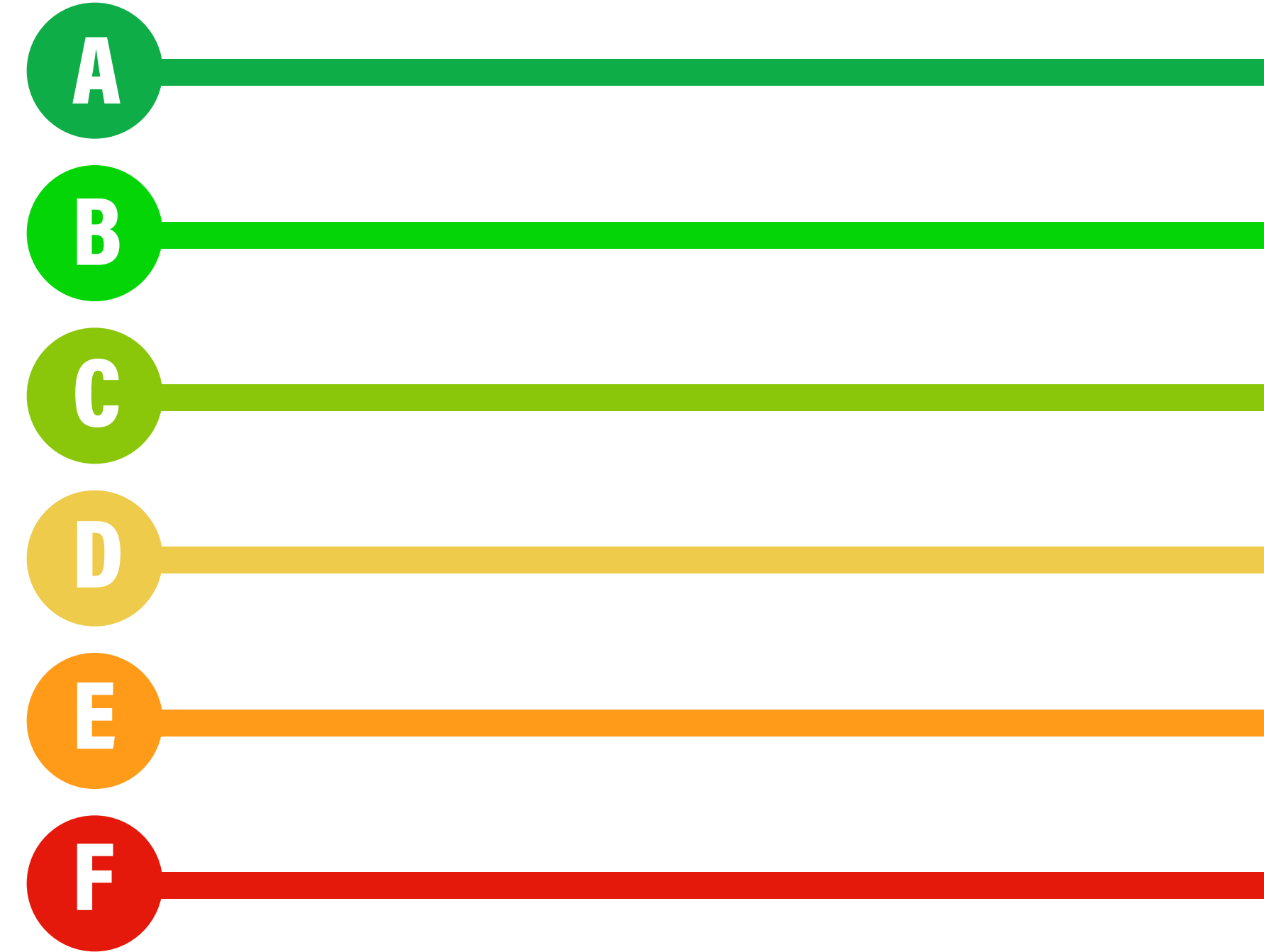
Alternative 1

Level of Service (LOS)



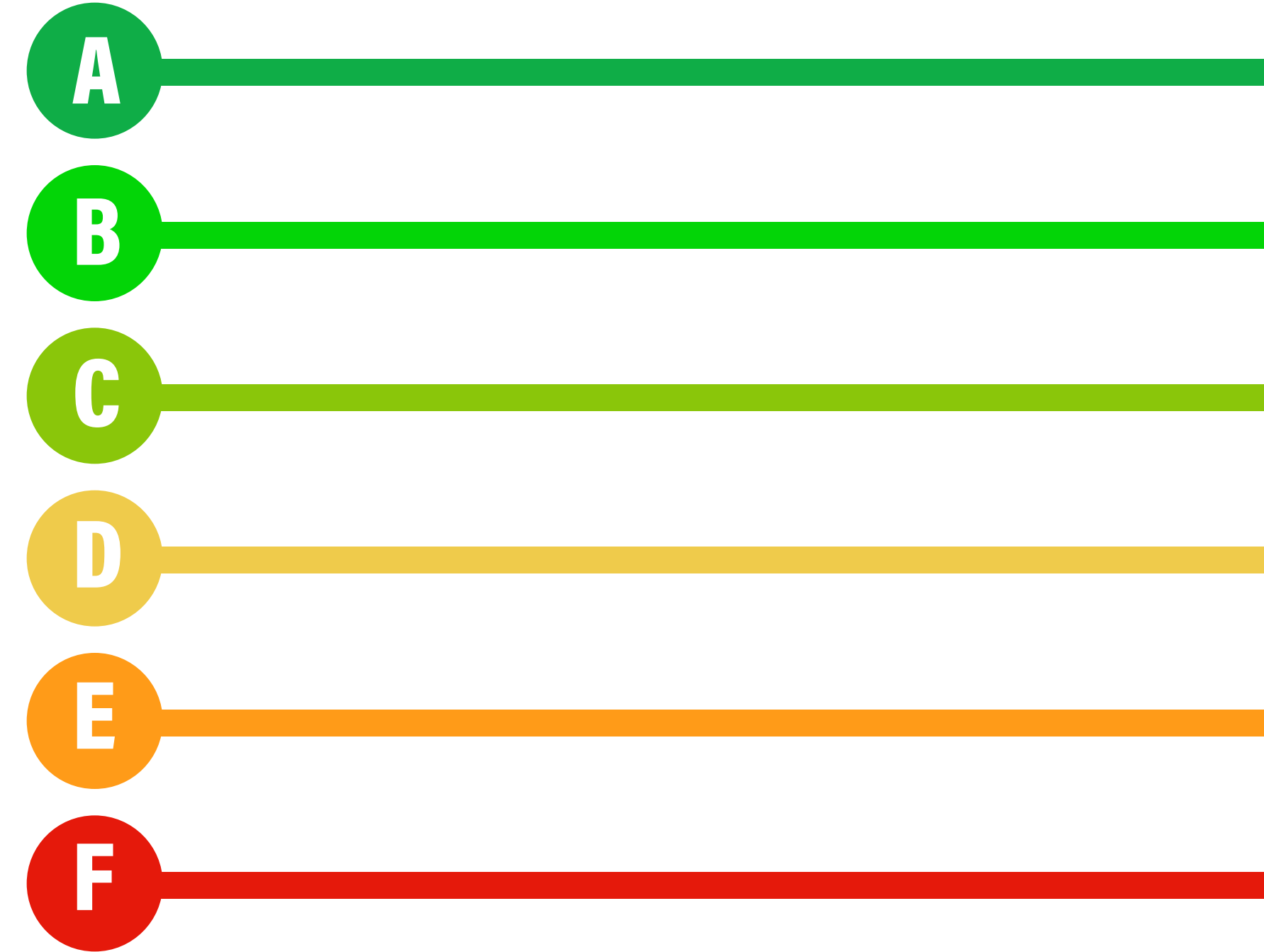
Alternative 2

Level of Service (LOS)



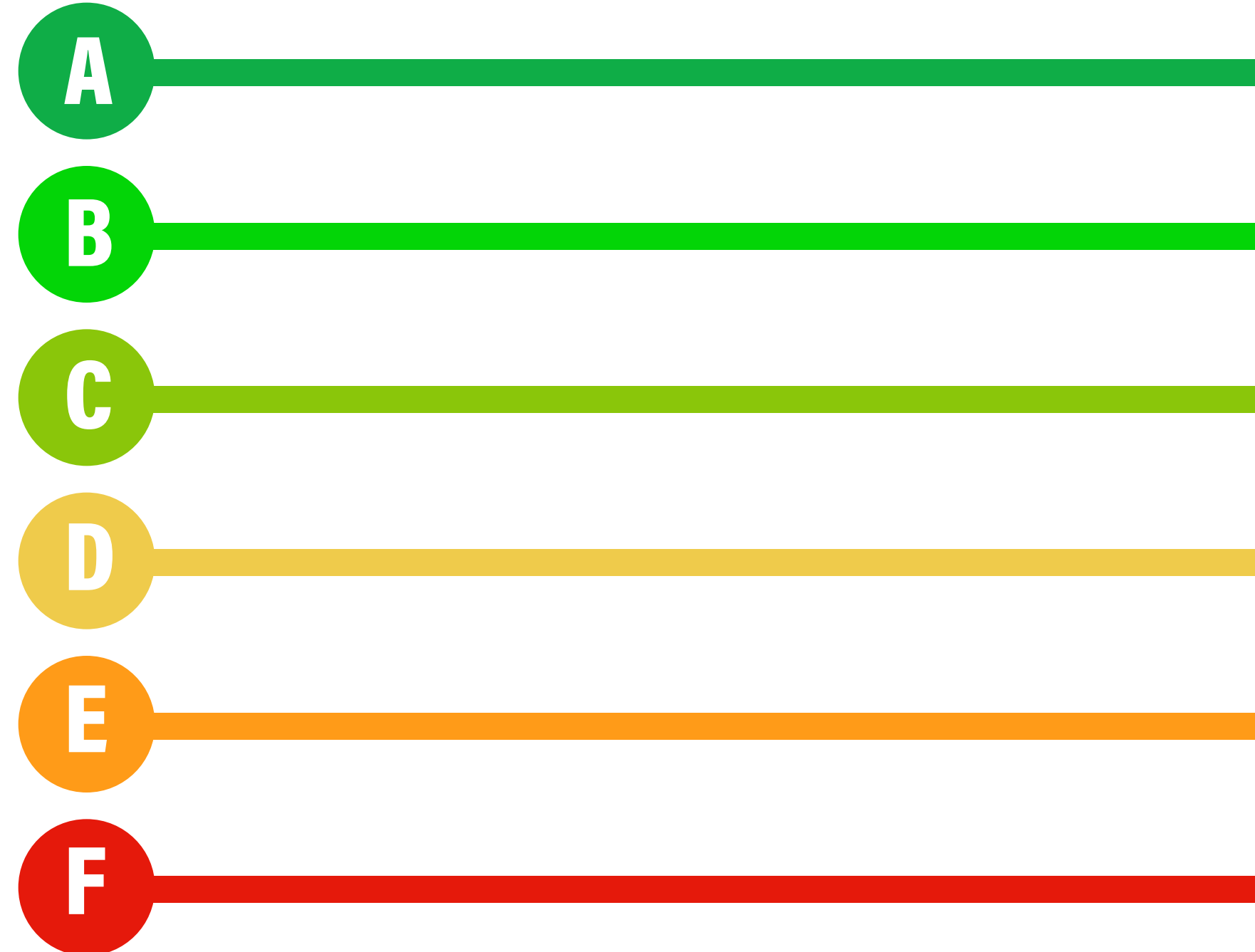
Alternative 3

Level of Service (LOS)



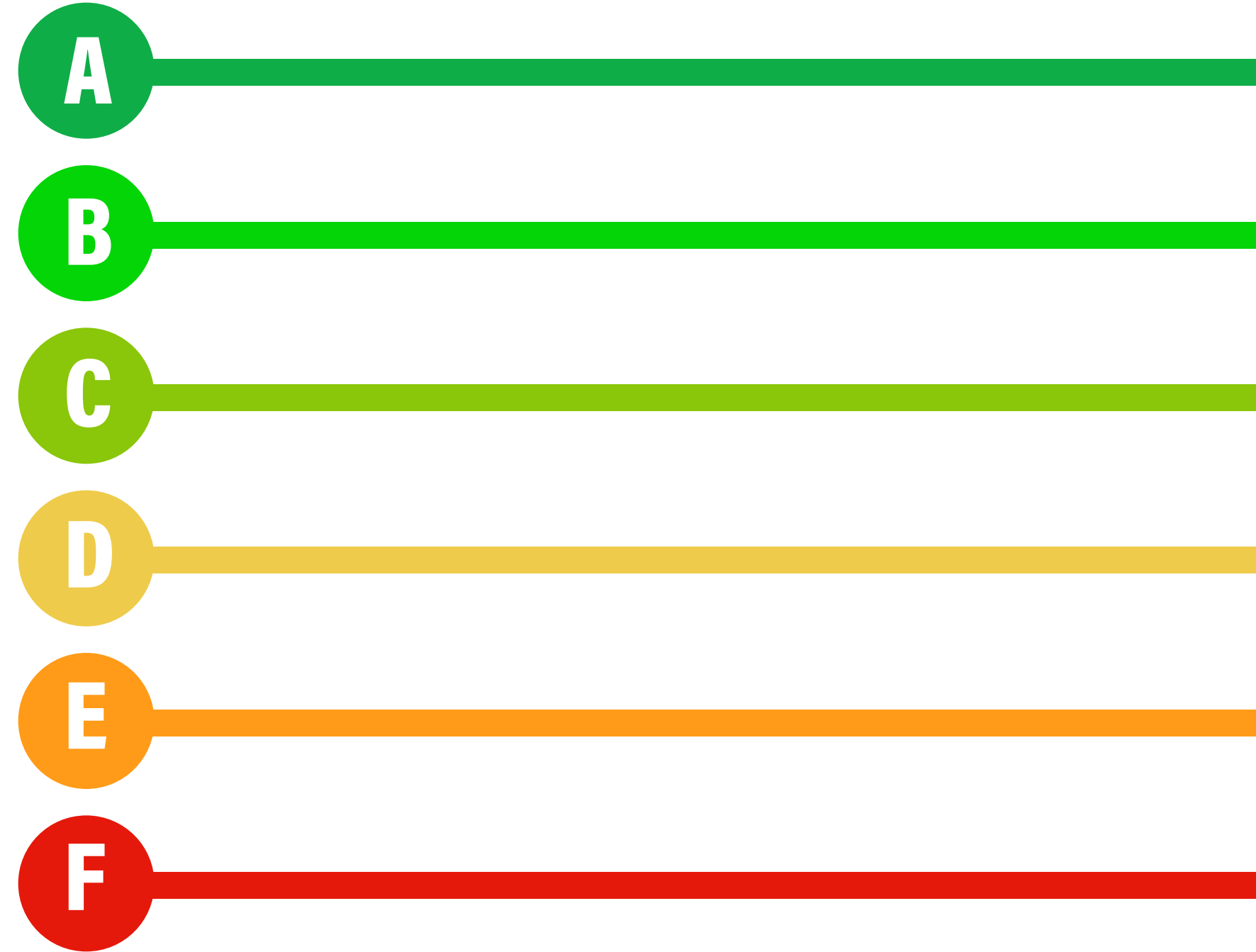
Alternative 4

Level of Service (LOS)



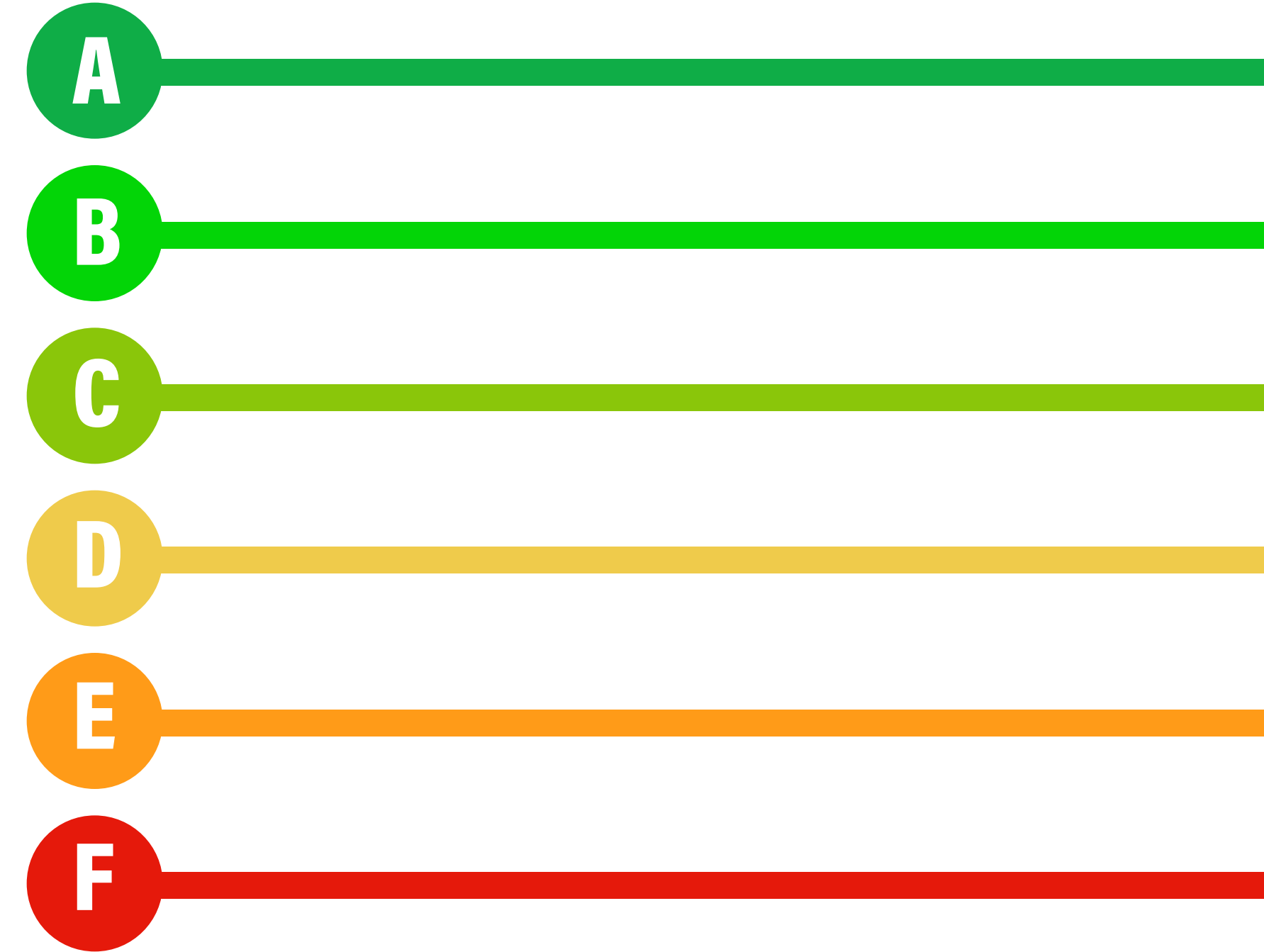
Alternative 5

Level of Service (LOS)



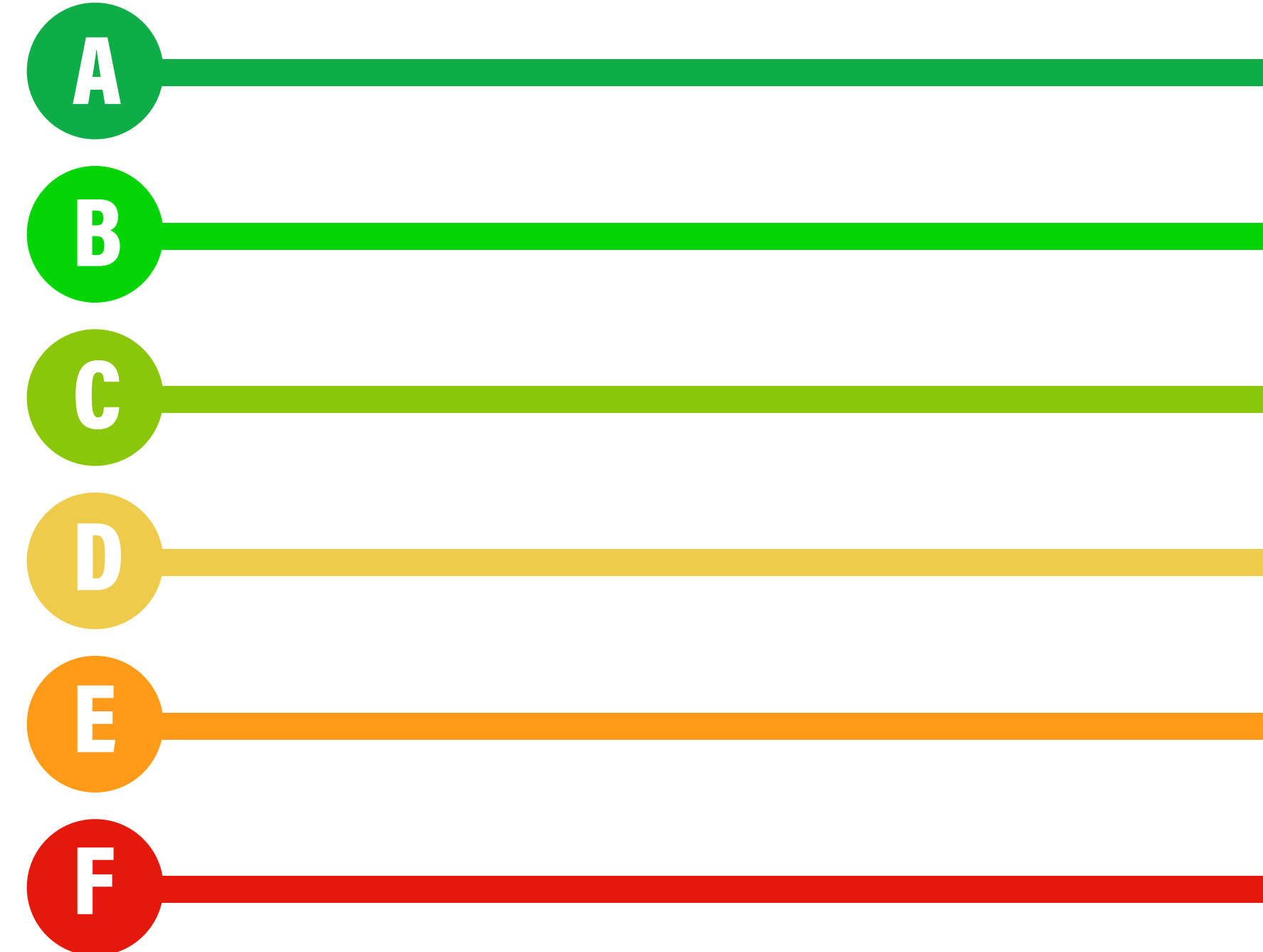
Alternative 6

Level of Service (LOS)



Alternative 7

Level of Service (LOS)



Alternative 8

Level of Service (LOS)



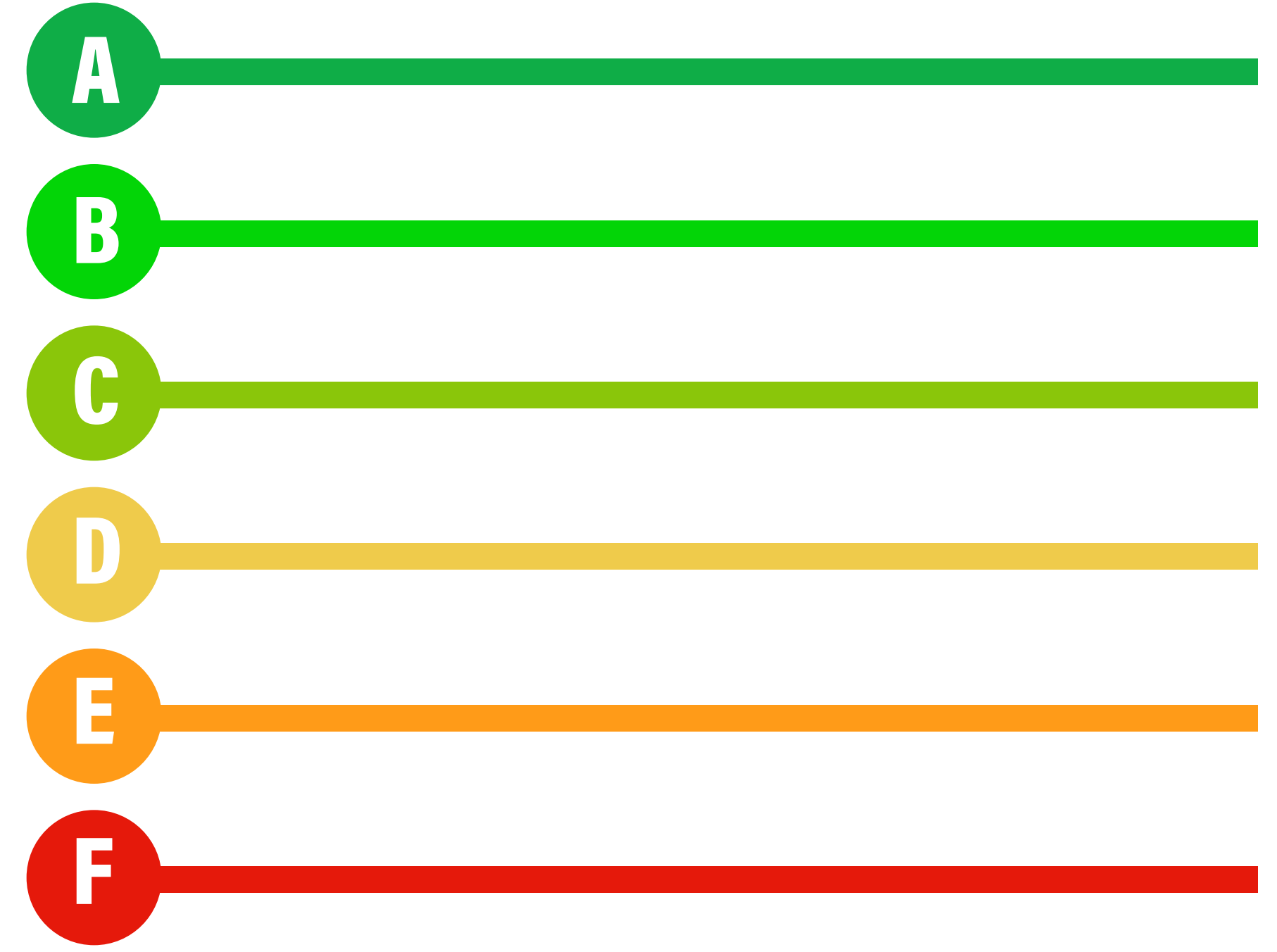
Alternative 9

Level of Service (LOS)



Alternative 10

Level of Service (LOS)



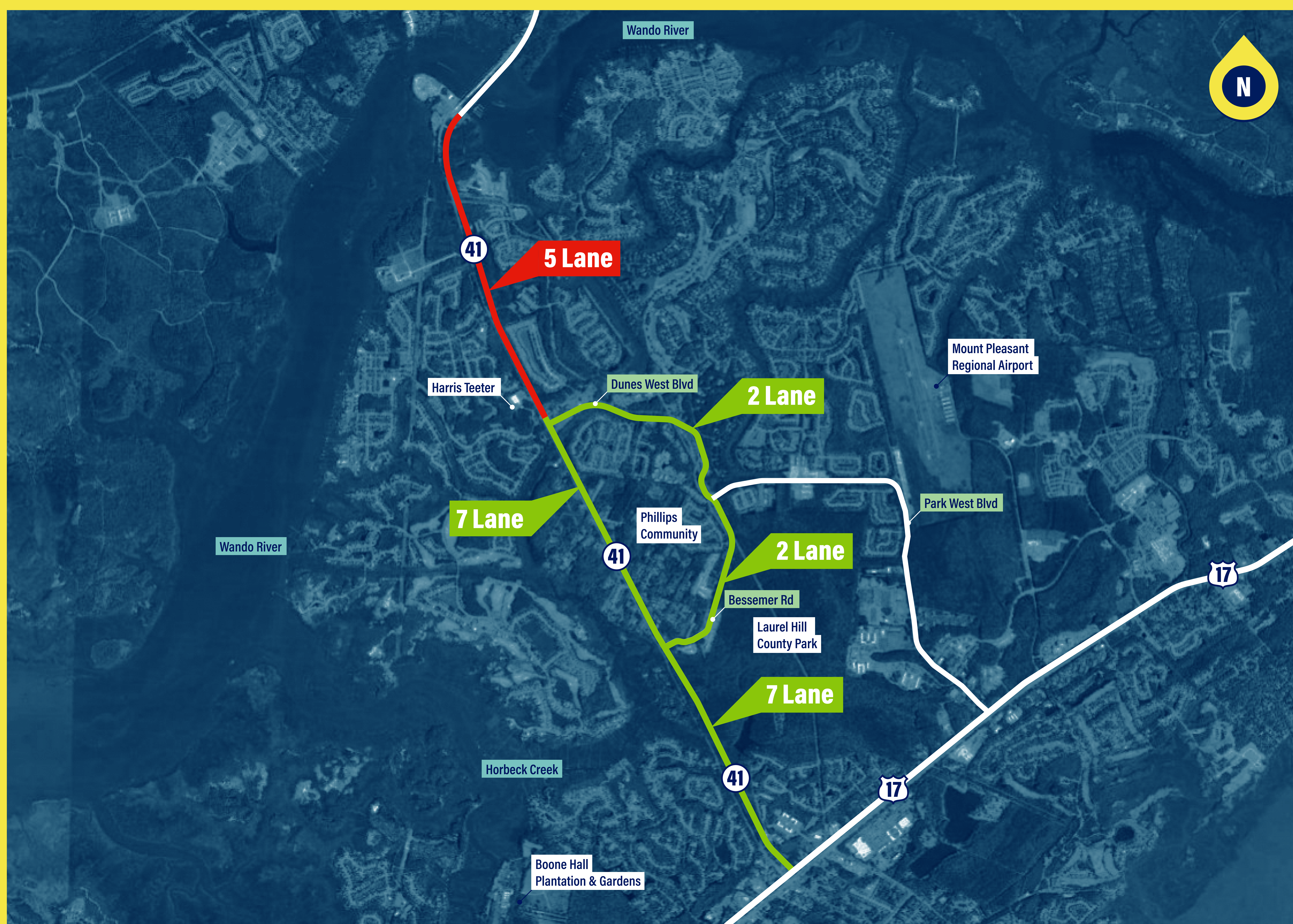
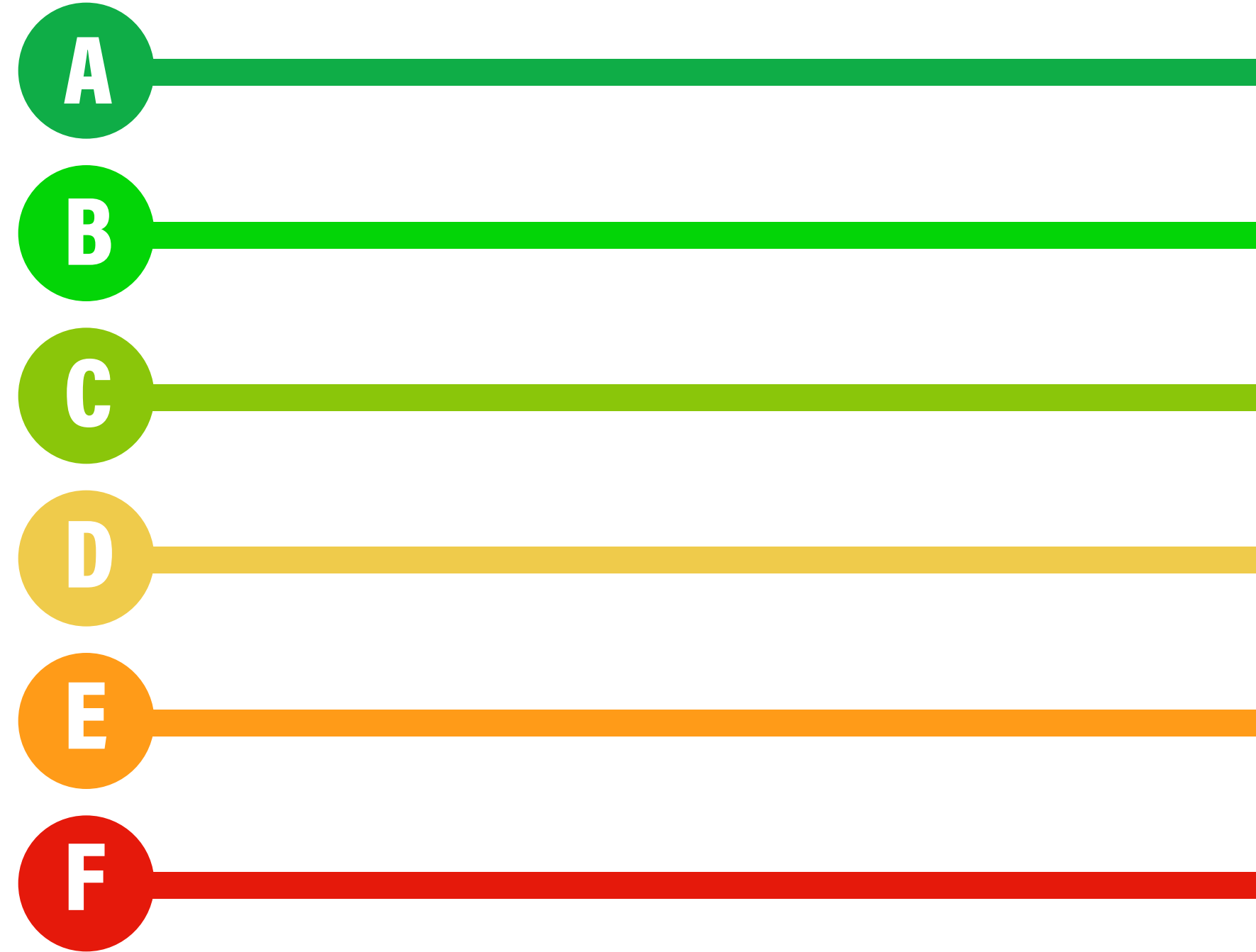
Alternative 11

Level of Service (LOS)



Alternative 12

Level of Service (LOS)



Appendix B

Alternatives Screening Memos



MEMO

Project: Charleston County SC 41 Corridor Improvements

Subject: Screening of Alternative 5A

To: Cal Oyer, PE – Charleston County
Ivan Fannin III – US Army Corps of Engineers, Charleston District

From: HDR Inc.

Date: Wednesday, February 06, 2019

Introduction

Charleston County proposes improvements to the approximately 4.6-mile-long SC Highway 41 (SC 41) corridor in Charleston and Berkeley Counties, South Carolina from US 17 in Mt. Pleasant, South Carolina across the new Wando River Bridge to Clements Ferry Road. SC 41 is a two-lane highway that provides vehicular access between US 17 and Clements Ferry Road, as well as north to Huger, South Carolina. The purpose of the proposed project is to accommodate an increase in traffic volume by improving roadway capacity and system continuity throughout the corridor.

Charleston County is evaluating the benefits and impacts from the proposed project, in accordance with the *National Environmental Policy Act* (NEPA). The purpose of this memo is to describe Alternative 5a and the associated screening criteria, and present a recommendation to Charleston County on alternatives that should be carried forward for detailed analysis in the Environmental Assessment (EA). Charleston County and the project team will submit a detailed alternatives analysis as part of the EA, which will be included with a Clean Water Act Section 404 permit application to the U.S. Army Corps of Engineers (USACE). After submittal of the permit application, the USACE will consult with Charleston County, federal and state agencies, and public to provide formal comments on the alternatives analysis process.

Screening Process

In its evaluation of permit applications, the USACE is required to analyze alternatives to the proposed project that achieve its purpose. USACE conducts this analysis pursuant to two main requirements: the 404(b)(1) Guidelines (40 CFR Part 230) and NEPA (33 CFR Part 325 Appendix B and 40 CFR 1508). Complex projects, such as SC 41 Corridor Improvements, usually require several levels of screening. Coarser screens are typically applied at the beginning of a project to eliminate clearly impracticable and unreasonable alternatives. Practicable is defined as meaning the alternative is available, and capable of being done after taking into consideration cost, existing technology, and/or logistics in light of the overall project purpose(s). An alternative needs to fail only one practicability factor to be eliminated during the screening process.

A summary of the screening process for SC 41 Corridor Improvements Project is presented in Figure 1. At the beginning of the project, the project team identified 12 alternatives based on preliminary traffic studies, regional planning documents, community and stakeholder working group meeting, and agency input. During Screening 1, Alternatives 1, 2, and 7 were identified as reasonable alternatives based on their ability to meet purpose and need for improving traffic operations, During Screening 2, the project team refined the reasonable alternatives based on public input and detailed traffic analysis. This refinement process resulted in the addition of modified alternatives 2a, 5a, and 7a. Alternatives 1, 2, 2a, 5a, 7, and 7a were considered during Screening 2.

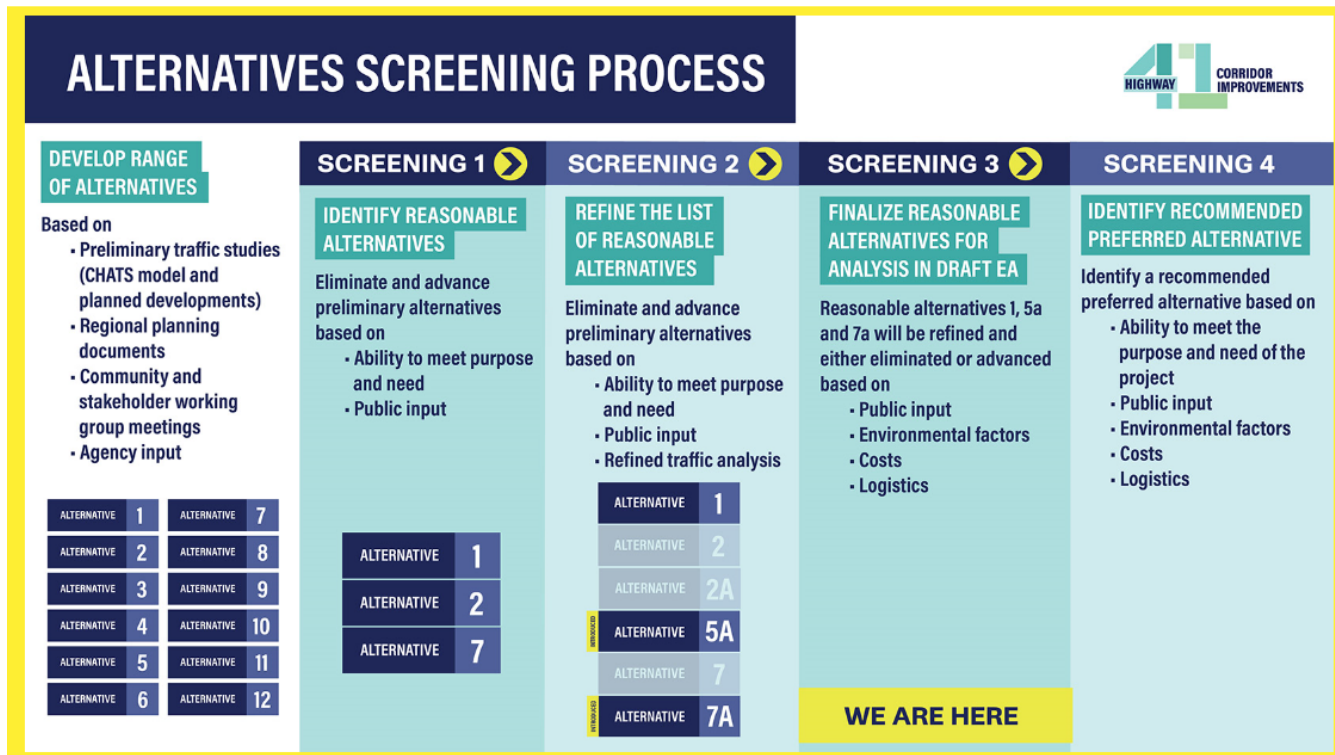


Figure 1. Alternatives Screening Process

While Alternative 5 was determined to not meet the project purpose and need for traffic operations in Screening 1, as a result of public comment received, the project team re-evaluated Alternative 5 in an effort to look at alternate ways to distribute traffic in the area. Alternative 5 had initially considered 2 lanes along a transmission line easement, which did not meet the purpose and need of the project to improve traffic operations along SC 41. During the May 16 to June 16, 2018 public comment period, the County received correspondence from stakeholders, including members from the Phillips Community and the South Carolina Coastal Conservation League that stressed the importance of considering alternatives that minimize impacts to environmental and cultural resources, including the Phillips Community. This correspondence asked about the possibility of a 5-lane alternative along the transmission line easement. Based on stakeholder input, the project team added Alternative 5a to Screening 2 for consideration.

Alternative 5a would create a parallel five-lane roadway primarily along the existing SCE&G power line easement running from Highway 17, through Ivy Hall, Laurel Hill County Park, Dunes West and tying into Highway 41 near Harpers Ferry Way. As shown below, traffic analysis shows that Alternative 5a meets the project purpose and need of improving traffic operations and congestion on SC 41.

The project is currently within the Screening 3 phase. The goal of Screening 3 is to finalize reasonable alternatives for analysis in the draft EA. Reasonable Alternatives 1, 5a, and 7a will be refined and either eliminated or advanced based on public input, environmental factors, cost, and logistics. The purpose of this memo is to describe Alternative 5a and the associated screening criteria.

Alternative 5A Screening

The following presents a summary of Alternative 5a in relation to the following screening criteria: ability to meet purpose and need, public input, environmental factors, cost, and logistics.

Ability to Meet Purpose and Need

In order for a project that requires a federal action to be constructed, the project's design scope must be established in accordance with the NEPA process. The purpose and need statement was developed with the project team and stakeholder agencies and is a required step to help guide the project and set objectives.

- The primary purpose of the proposed SC 41 Corridor Improvements project is to reduce traffic congestion within the SC 41 corridor to accommodate future traffic projections.
- The secondary purposes of the proposed SC 41 Corridor Improvements project are to enhance safety throughout the corridor, improve transportation system and community connections, and provide bicycle and pedestrian accommodations, while minimizing community and environmental impacts.
- The proposed project is needed to address anticipated local and regional growth, increased traffic congestion, safety and emergency response concerns, and inadequate interconnections of transportation modes, including pedestrian and bicycle facilities.

Alternative 5 modeled a two-lane roadway from US 17 to the Wando River Bridge and did not meet the purpose and need for traffic operations. Following the public meeting in May 2018, stakeholders asked whether the project team had considered Alternative 5 with a five-lane section. Upon modeling Alternative 5 with a five-lane section, it was determined that this alternative would meet the primary purpose and need of improving traffic operations and congestion. As shown in Figure 2, the traffic along existing SC 41 would operate at a Level of Service (LOS) D, and operates at a LOS B along the new parallel roadway. Based on this additional traffic analysis, Alternative 5a was advanced to Level 3 for additional screening for logistics, costs, and environmental impacts.



Figure 2. Level of Service for Alternative 5a

Logistics

SCE&G: The project team consulted with South Carolina Electric & Gas (SCE&G) about the possibility of positioning Alternative 5a within/adjacent to their power line easement. The easement contains three SCE&G owned utilities (8" pressurized gas line, electrical transmission, and electrical distribution) and a Mount Pleasant Waterworks 12" force main. SCE&G will not allow a road in their transmission line right-of-way (ROW) and does not allow parallel encroachments within 10-feet of their pressurized gas line. Alternatives may cross the SCE&G ROW. If Alternative 5a was constructed within the easement, or parallel to the easement, the County would be responsible for utility relocation, which would have adverse impacts to the overall project cost and schedule.

CCPRC: The proposed route of Alternative 5a passes through Charleston County Parks and Recreation Commission's (CCPRC) Laurel Hill County Park. Information on Alternative 5a was presented to CCPRC in a meeting on December 19, 2018. CCPRC has a 100-year lease on the Laurel Hill property that has been paid in full. CCPRC has an agreement with the property owner trust, with the trust's intent to have the land remain a natural area. Current park use is passive and master plans have not been finalized for the park, although preliminary plans exist. Based on the initial meeting with CCPRC, Alternative 5a would bisect the park and prevent CCPRC from using the property for its intended use as a park. CCPRC indicated a preference to minimize impacts to Laurel Hill County Park by aligning the road with park boundaries or along existing roadways. CCPRC submitted an official response letter on January 28, 2019, reiterating their preference of Alternative 7a over Alternative 5a. CCPRC stated that Alternative 5a would fragment the contiguous wildlife habitat the park provides and it would potentially jeopardize archaeological resources in the area, including artifacts from Laurel Hill Plantation slave row and a cemetery where enslaved persons and ancestors of Phillips Community residents are known to be buried. Alternative 7a; however, would allow CCPRC to operate the park as the public have become accustomed to and it would minimize impacts to natural and cultural resources.

Costs

Utility relocations for Alternative 5a are expected to cost approximately \$27 million, which is substantially greater than utility relocation costs associated with Alternative 1 at \$6,275,000 and Alternative 7A at \$5,275,000. The increased utility relocation costs for Alternative 5a are a result of this alignment's location within a SCE&G utility easement, and would include the purchase of new easement for the relocated utilities. Because of increased wetland impacts, Alternative 5a would also result in greater mitigation costs.

Environmental Factors

The project team used publically available, Geographic Information System (GIS) data to evaluate potential environmental impacts of the reasonable alternatives. Environmental impacts consider project effects to both the natural environment and communities. Table 1 provides a summary of the environmental screening for Alternatives 1, 5a, and 7a. The project team also evaluated shifts in the Alternative 5a alignment to avoid and minimize impacts to the SCE&G power line easement; however, these shifts resulted in greater impacts than Alternative 5a.

Of the three remaining alternatives, Alternative 5a has the greatest amount of possible full property acquisitions, acres of impact to tidal and non-tidal wetlands, fragmentation of contiguous forest and wetland habitats, and impacts to Laurel Hill County Park. Alternative 5a has the least amount of possible partial acquisitions, impacts to parcels within the Phillips Community and National Register of Historic Places (NRHP) structures, floodplains, and hazardous materials sites.

Table 1. Environmental Screening Table

Environmental Screening Criteria	Units	Alternative 1	Alternative 5a	Alternative 7a
Total Property Impacts (includes Phillips Community)				
Possible Full Acquisitions (impacts >50%)	Number of Parcels	7	13	4
Possible Partial Acquisitions (impacts <50%)	Number of Parcels	175	72	195
Phillips Community				
Possible Full Acquisitions (impacts >50%)	Number of Parcels	3	0	0
Possible Partial Acquisitions (impacts <50%)	Number of Parcels	82	0	75
Cultural and Historic Sites				
NRHP Archaeological Sites	Number of Sites	1	2	1
NRHP Historic Structures	Number of Sites	6	0	3
Sweetgrass Basket Stands	Number of Sites	12	4	12
Wetland Impacts				
Estuarine (Tidal)	Acres	1.2	4.5	1.2
Freshwater (Non-Tidal)	Acres	3.4	5.9	5.9
Floodplain Impacts	Acres	63.2	43.8	71.1
Laurel Hill County Park	Acres	1	16.8	13.6
Hazardous Materials Sites	Number of Sites	4	1	4

Public Input

In a letter dated June 8, 2018, the Coastal Conservation League (CCL) urged the County to pursue an alternative that has the most minimal impact to environmental and cultural resources and the greatest ability to provide multi-modal transportation opportunities. The CCL supports Alternative 7 as “...the most equitable solution that enables the highest level of traffic dispersion without negatively impacting only one single community.” Largely due to the response letter from the Coastal Conservation League and comments from stakeholders, the team re-evaluated Alternative 5 in an effort to look at alternate ways to distribute traffic in the area, which resulted in the creation of Alternative 5a.

A stakeholder meeting was held on November 14, 2018 to provide an update on the alternatives analysis. During this meeting, Alternatives 1, 2, 5a, and 7a were discussed, and the refined reasonable alternatives 1, 5a, and 7a were identified as the alternatives that would be moved forward.

Since the November 14, 2018 stakeholder meeting, a total of 255 comments have been received. As shown in Figure 3, a total of 143 of these comments (56 percent) pertain to Alternative 5a.

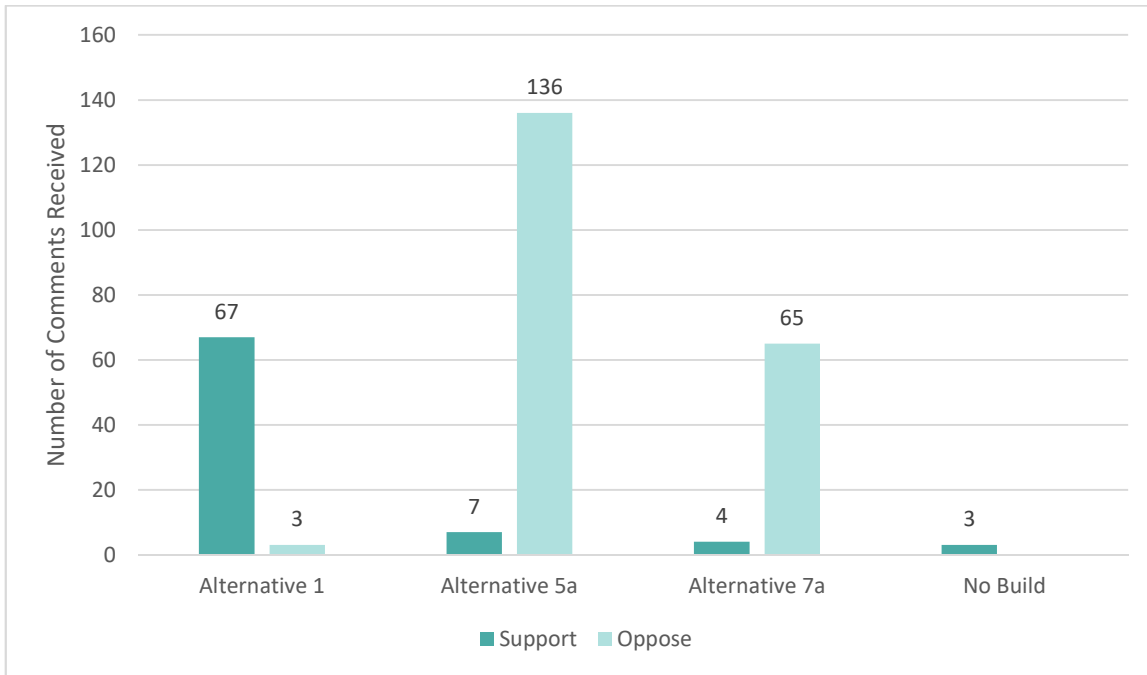


Figure 3. Comment Stances on Alternatives

Conclusion

Based on the results of the environmental factors, costs, logistics, and public input, the project team recommends the elimination of Alternative 5a from the SC 41 Corridor Improvements project. The project team recommends the continued evaluation of Alternative 1 and 7a in the EA. The public will continue to have opportunities to provide feedback on the alternatives at stakeholder and community meetings in early 2019, and public meetings in summer 2019.