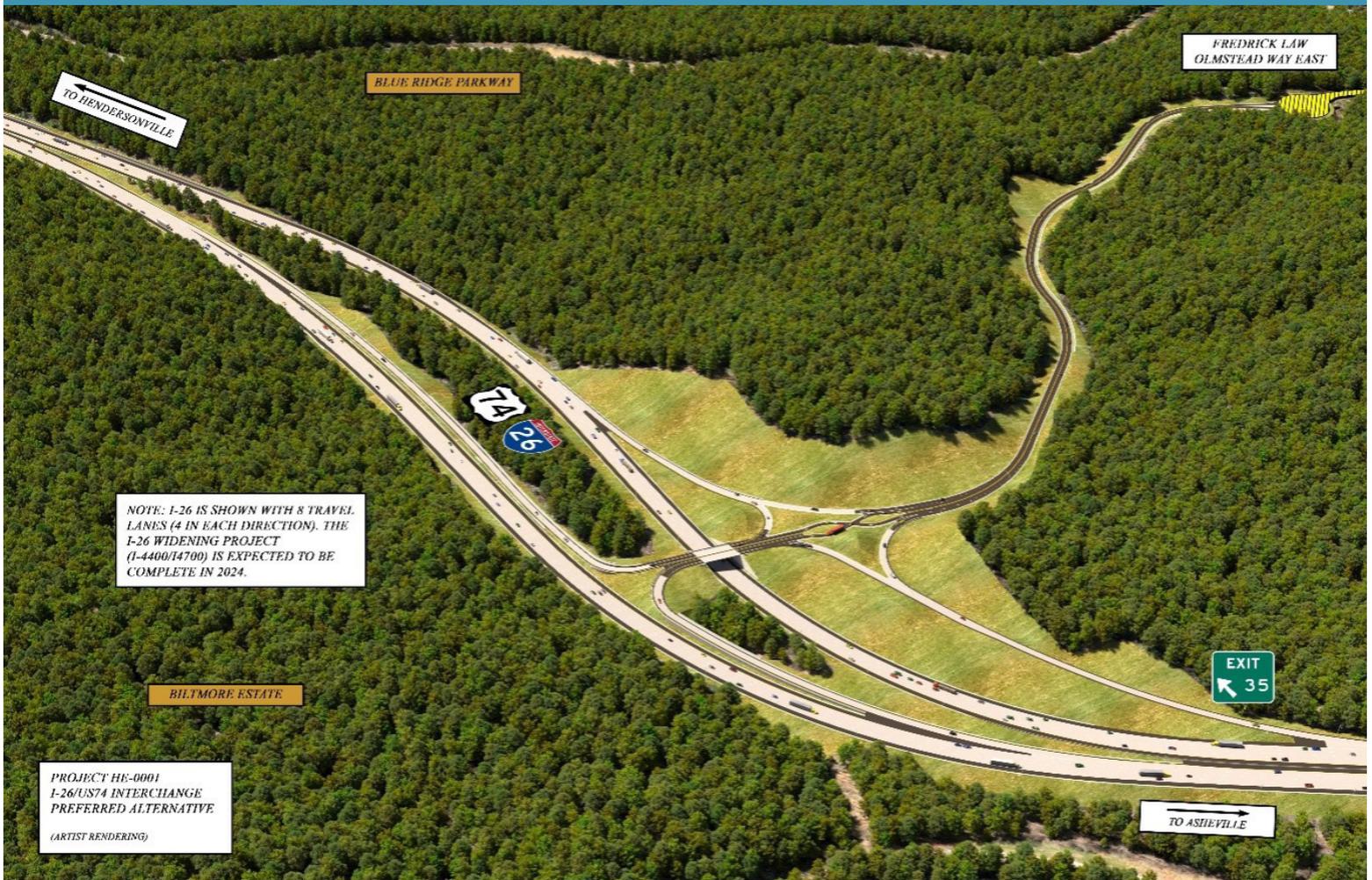


GROUND TO SKY PROJECT



Project Requirements

**MPDG FFY 2023 and 2024
GRANT APPLICATION
AUGUST 2023**



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Supplemental information, including letters of support and appendices, may be accessed:
<https://connect.ncdot.gov/resources/MPDG2023-126DIV13/Pages/default.aspx>

Statutory Project Requirements

Rural Project Requirement #1: Regional Economic, Mobility, or Safety Benefits

The project will generate regional economic, mobility, and safety benefits. Ground to Sky (G2S) addresses current and projected vulnerabilities that left unaddressed would threaten future transportation network efficiency, mobility of goods and people, and economic growth. By creating a new connection within the existing 4.5-mile gap between Exits 33 and 37 on I-26, future Exit 35 will create a connection allowing travelers to reach their destinations more directly. The connection not only improves the east-west access through the site but improves I-26 and NC 191's connectivity, benefiting citizens of southern Buncombe, Henderson, and Haywood counties, and tourists to the region. The connection will operate at acceptable performance levels for the foreseeable future and will help the movement of freight, commuters, visitors, and other travelers to their destinations more quickly, efficiently, and safely than the current transportation system allows.

The economic benefits of G2S are of regional significance. The prospect of improved interstate access attracted Pratt & Whitney to Biltmore Park West due to the large number of jobs envisioned and the need to ship its commercial and military aviation products. The interchange will continue to attract businesses and economic opportunities to the Biltmore Park West site. Pratt & Whitney plans to invest at least \$650 million through 2029 in the turbine airfoil production facility, including 800 good paying jobs with average annual salaries of \$68,000, almost \$10,000 more than the Buncombe County median household income. The project will bring transformational economic and education opportunity within 20 miles of 13 disadvantaged communities by providing efficient and safe access to I-26 and NC 191, major regional commuter corridors within western North Carolina and the greater Appalachian region.

In addition to incorporating safe roadway intersection design elements including a roundabout and half diverging diamond interchange (DDI), the new connector road between I-26 and NC 191 is critical to maintaining a safe flow of traffic. The project will lessen pressure at adjacent interchanges (exits 33 and 37) and ease congestion and stacking on NC 191 and the local roads surrounding it, reducing the potential for incidents, and improving travel reliability. This transportation network enhancement will result in a greater separation of freight traffic among local roads and the interstate.

The project's enhanced connectivity benefits access to emergency services and fulfills local EMS providers requests for a needed turnaround between exits 33 and 37. Emergency response needs are greater still with new development in Biltmore Park West. Emergency situations at Biltmore Park West, on NC 191, and/or on I-26 will be easier to access with G2S and will enhance survivability through expedient access. (See the Skyland Fire & Rescue letter of support.) The interchange and roadway will also improve alternate route options in the area in case of a road closure or evacuation scenario.

Rural Project Requirement #2: Cost Effectiveness

The benefit-cost analysis (BCA) evaluates the benefits and costs associated with G2S. Two scenarios were used for comparison: a No-Build and a Build Scenario. The No-Build Scenario assumes the project is not built and existing area traffic and new traffic from Biltmore Park West must utilize Exit 33 to the north or Exit 37 to the south to access I-26, leading to more congestion

and less access. The Build Scenario, which will allow area traffic to access I-26 more directly, results in anticipated benefits associated with completing G2S. Future Exit 35 will shift traffic off NC 191 (Brevard Road) and NC 146 (Long Shoals Road) leading to decreased distances and travel time. The shifting traffic patterns also reduces exposure to crash risk by moving traffic from NC 191 to I-26, which has a lower crash rate. The analysis timeline encompasses project development, construction, and 20 years of infrastructure service life following construction completion. Benefits were quantified where possible; the additional and substantial unquantifiable benefits are described following the BCA Calculations. All monetary values are expressed in 2021 dollars. A real discount rate of 7% was applied to calculate present values. The analysis results are presented as a benefit-cost ratio (BCR or B/C) and a net present value (NPV) for the project (see **BCA Narrative** and **BCA Calculations**).

Table 1 shows the total monetized benefits of G2S, estimated to be \$81.32 million (in 2021 discounted value terms). The benefits reflect reductions to vehicle operating costs, travel time delay, crash risk, and the residual value of the project after the 22-year analysis period. The total project cost of the analysis period is \$51.18 million (in 2021 discounted value terms). This amount includes the capital expenditure of the project and future resurfacing. Per USDOT BCA guidance, the future operations and maintenance costs are accounted for in the BCA as a disbenefit (subtracted from benefits total). **G2S produces a net benefit in 2021 value terms of \$30.14 million (discounted) and a benefit-cost ratio of 1.59.**

Table 1: BCA Summary.

Costs (Real, 2021\$, Discounted)	\$ 51.18 M
Benefits (Real 2021\$, Discounted)	\$ 81.32 M
Net Present Value (NPV)	\$ 30.14 M
Benefit Cost Ratio (BCR)	1.59

NCDOT has developed, and continues to enhance procurement, project management and project development practices to ensure that transportation improvements are cost-effective. The department's commitment to continuous improvement has resulted in outstanding project development efficiency and effectiveness.

Quantified Economic Benefits

The BCA follows the January 2023 USDOT guidance and parameters. The analysis years cover the 22-year period from 2023 (year 0) to 2045. Construction takes place from 2023 to 2026, with the first year of benefits beginning in 2026.

Traffic volumes, by auto and truck, are foundational inputs into each benefit category. The volumes are drawn directly from the Project-Level Traffic Forecast Report (April 2022) for G2S with 2021 and 2045 traffic projections. Specific years are identified using trends to cover the analysis period. All dollars are adjusted to a 2021 basis and discounted with USDOT's 7% rate.

Vehicle Miles & Operating Costs: Operating costs are based on the total millions of vehicle miles traveled (MVMT) estimates shown in the **BCA Calculations** file. Unlike many new highway projects, this one results in a slight decrease in total travel miles. The new interchange is more direct, and the expanded network affords more route options via better connections. The change in truck and auto mileages are multiplied by the supplied costs per mile.

Travel Time Saving: Adding a more direct network connection to I-26 reduces travel times for traffic that must spend more time on NC 191 or NC 146 in the No-Build Scenario compared to the Build Scenario. The 9.5% truck volume is applied before multiplying by values of time and auto occupancy parameters in the guidance.

Safety: The estimated reduction in crash rates account for a small percentage of the monetized benefits for G2S. This benefit accrues from a reduction in risk exposure resulting from trips diverted from higher crash locations (e.g., NC 191) to lower crash locations (e.g., I-26). A five-year crash history was drawn from NCDOT data for five of the existing nearby routes. The overall crash rate was assumed to be 10%.

Other Economic Benefits

The following benefits also result from the completion of the new interstate and are significant to the impacted population and organizations, and they directly help the region. The combination of transportation, economic development, job training, and public-private collaboration make this a model initiative for rural Appalachia. These unquantified benefits include the following:

- *Infrastructure resiliency, reliability, & redundancy*: G2S's improved connectivity and alternate route options improve resilience and maintain essential travel on the state's highway network.
- *Emergency Response*: through this project, police, fire, emergency medical services, and other first responders will gain new route options, especially in the event of full interstate closure and will also benefit from reduced travel time for emergencies off the interstate.
- *Wellness and Quality of Life*: This project not only connects people and jobs, but also improves access to outdoor recreational resources, many of which encourage exercise and healthy living.
- *Repurposed ROW and Work Zones*: G2S minimizes right-of-way impacts by utilizing existing I-26 right-of-way. This project will be integrated with the I-26 Widening Project to decrease work zone impacts.
- *State of Good Repair*: This project lessens additional burden, wear, and tear on the existing roads in the area, offsetting maintenance and resurfacing.
- *Agglomeration Economies*: This project benefits the regional economy given its new connections among communities, jobs, and other economic activities.

Rural Project Requirement #3: National Goals (23 USC § 150)

G2S contributes to the accomplishment of each national goal established by 23 USC § 150:

Section (b)(1) Safety: Safety is the overarching priority throughout project development to protect motorized travelers, communities and residents from health and safety risks. The design implements actions and activities identified in the National Roadway Safety Strategy to promote safer people through engineering solutions and safer roads. Overall, creating a more direct connection between I-26 and NC 191 reduces the potential for incidents and collisions. For more information, see **Outcome Criteria Section, Criterion #1: Safety**.

(b)(2) Infrastructure condition: G2S is consistent with the NCDOT Asset Management Plan¹ to maintain transportation systems in a state of good repair and addresses current and projected vulnerabilities that if left unaddressed would threaten future transportation network efficiency,

¹ <https://connect.ncdot.gov/resources/Asset-Management/TAMP/Final%20TAMP%20-%20June%202021.pdf>

mobility of goods and people, and economic growth. The connection will allow operation at acceptable performance levels for the foreseeable future and will help the movement of freight, commuters, tourists, and other travelers to their destinations more quickly, efficiently, and safely than the current transportation system allows. For more information, see **Outcome Criteria Section, Criterion #2: State of Good Repair**.

(b)(4) System reliability: Increased connectivity produces more efficient, reliable, and resilient networks. By providing needed connectivity at a time of transformational development at Biltmore Park West, G2S ensures that the surface transportation system will be efficient and reliable for employees, residents, freight, and visitors for the foreseeable future. The project is anticipated to improve traffic operations along roadways and intersections throughout the area by introducing a new access to the interstate, thus improving mobility and connectivity to meet future travel demand projected to result from regional population and employment growth.

While Biltmore Farms has developed an interior roadway network, the area lacks convenient interstate access that is crucial to the continued success of the greater region, the site, and future development in the area. A No-Build Scenario will exacerbate congestion on the existing system, leading to longer travel times and longer distances traveled to get to long-term, high-quality jobs. G2S will reduce vehicle miles traveled and time spent in vehicles; balance traffic in the network; reduce strain on adjacent interchanges at exits 33 and 37; and reduce congestion on NC 191, an older four- to five-lane facility north of the project, and a two-lane facility south of the project.

(b)(5) Freight movement and economic vitality: I-26 is a critical component of North Carolina's freight economy as part of the National Highway Freight Network and NCDOT's Strategic Transportation Corridor (STC). Pratt & Whitney's shipment of aircraft engine components to Georgia and Connecticut supports national defense purposes.

By providing direct access to the Pratt & Whitney Manufacturing Plant, G2S facilitates economic vitality and freight movement of current and expected growth in the project vicinity. Analysis of the economic contributions of Pratt & Whitney indicates that the ongoing, annual employment impact will ultimately result in at least 1,534 jobs, including 800 direct jobs and 734 jobs through indirect and induced effects. Additional jobs occur in wholesale machinery, equipment, and supplies, custom computer programming services, employment services, and in supporting sectors like restaurants and real estate. The ongoing, annual direct economic impact of the facility will result in an increase of the region's gross domestic product by approximately \$636 million. Total State output, including indirect and induced effects, will increase by more than \$1 billion because of the Pratt & Whitney. Further, Pratt & Whitney is partnering with five regional technical colleges to train the highly skilled workforce.

Plans include the continued development of Biltmore Park West, which would include mixed use land development consisting of industrial, institutional, commercial, and residential land uses. Bicycle and pedestrian accommodations and connection to local and regional walking paths and trails are also part of the development plan. For more information, see **Outcome Criteria Section, Criterion #3: Economic Impacts, Freight Movement, and Job Creation**.

(b)(6) Environmental sustainability: G2S is an opportunity to improve environmental sustainability through innovative aviation technology manufactured by Pratt & Whitney that will reduce aircraft emissions using environmentally conscious facilities and processes that eliminate discharge and use recycled materials. The strong environmental focus also serves to make the overall initiative a model for future Appalachia.

G2S will be designed, constructed, and maintained such that water resources on the site will be protected. In addition to implementing a stream monitoring program to evaluate stream conditions at the project site, NCDOT designed an approximately 400-foot stream relocation as part of the G2S interchange, which is preferable for stream health. G2S incorporates numerous conservation-measures relative to the protection of federally protected species and NCDOT is committed to implementing the most restrictive sediment and erosion control (SEC) measures. Through consultation with NPS, NCDOT and FHWA agreed to a No Adverse Effect, with conditions for the Blue Ridge Parkway. NCDOT will design, plant, and maintain approximately 900 feet of native vegetation to screen the project from the Blue Ridge Parkway. For more information, see **Project Readiness Section, Environmental Risk** and the **Outcome Criteria Section, Criterion #4: Climate Change, Resiliency, and the Environment**

(b)(7) Reduced project delivery delays: G2S is being designed and phased to align with the I-26 widening schedule. NCDOT, with state appropriated funds, is pursuing construction of G2S beginning fall of 2023 in conjunction with the I-26 Widening Project. This integrated approach is expected to advance project construction, leverage material buying power associated with the larger, ongoing interstate widening project, significantly reduce any mobilization time and costs, and construct the project in a more convenient manner for the public by taking advantage of existing road closures. For more information, see the **Project Readiness Section**.

Rural Project Requirement #4: Preliminary Engineering

NCDOT has invested nearly \$3 million to advance G2S through preliminary engineering (PE) and environmental approvals. Through close coordination with FHWA-NC Division and regulatory and resource agency partnerships, and with feedback from local citizens, legislators, and stakeholders, G2S has achieved National Environmental Policy Act (NEPA) approvals in August 2022 and received a Section 404 individual permit in August 2023 that authorizes construction activities to commence. Environmental issues have been completely and adequately resolved, including the identification and commitment to mitigate effects to historic properties, federally protected species, and waters of the US.

An interstate access request (IAR) was approved by FHWA-NC Division certifying that the project meets FHWA's policy points for interstate access, including that the change in access does not have a significant adverse impact on the safety and operation of the Interstate facility. NCDOT has developed preliminary engineering plans according to state and federal roadway design guidelines and policies, founded on good engineering judgement. Because the transportation project exceeds \$25 million, a value engineering study was completed in the Spring of 2023 in accordance with NCDOT policy. Construction cost estimates have been prepared throughout preliminary design and have been updated most recently for this grant application, in July 2023. NCDOT is progressing final design tasks according to the expected project delivery schedule included in the **Project Readiness Section**.

Rural Project Requirement #5: Timely Start to Construction

G2S is reasonably expected to begin construction within 18 months after the date of obligation of funds for the project. Based on NCDOT's current construction schedule, the interchange (HE-0001A) will begin construction in Fall 2023; the connector road (HE-0001B) is expected to begin construction in Summer 2024. Obligation of funds is anticipated in Winter 2023/2024.

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