# INDIANAPOLIS INTERNATIONAL AIRPORT'S 5R-23L AND TAXIWAY D STRENGTHENING AND CAPACITY ENHANCEMENT PROJECT EARNS ENVISION® PLATINUM AWARD FOR SUSTAINABILITY

*Concrete slabs on the project site at Indianapolis International Airport (photo courtesy Woolpert).*

***January 4, 2023*** — The Indianapolis International Airport (IND)—which Airports Council International (ACI) World named the best North American airport in its class for the 10th consecutive year—has another reason to celebrate. IND earned an Envision Platinum award for their Runway 5R-23L & Taxiway D Strengthening and Capacity Enhancement Project. Envision Platinum is the highest award level provided by the Institute for Sustainable Infrastructure (ISI) for projects that significantly contribute to sustainability and resiliency. This is the first airfield project in the world to receive the prestigious Envision Platinum recognition.

The award singles out this Project for contributions to the local economy and workforce development, engagement with partners to specifically guide those contributions, use of a life-cycle economic analysis to support decision-making, renewable energy measures, and novel uses of technology to reduce carbon emissions.

Owned, developed, and operated by the **Indianapolis Airport Authority (IAA)**, IND is a medium hub primary commercial service facility located on approximately 7,700 acres seven miles southwest of downtown Indianapolis in Marion County, Indiana. IND is home to the second-largest FedEx Express Hub in the world, making IND a crucial link in the movement of freight across the globe.

This Project centers on Runway 5R-23L and Taxiway D, critical facilities located on the airport's southeast side. Known as the “south parallel,” Runway 5R-23L is a 150-foot-wide-by-10,000-foot-long runway. It supports most cargo operations at the airport, along with a significant amount of commercial airline traffic.

The Runway 5R-23L and Taxiway D Strengthening and Capacity Enhancement Project (“Project”) will ensure the continued serviceability of this essential infrastructure. The scope of the project includes the following:

- Reconstructing Runway 5R-23L and Taxiway D with full-depth Portland cement concrete (PCC) pavement. This includes installing an underdrain system, markings, signage, and lighting, as well as widening and modifying the runway and taxiway to meet safety standards.

- Updating electrical infrastructure, including lighting and signage, power distributions, and the Midfield Vault (facility housing regulators, controls, and other equipment necessary to provide power and control for airfield operations).

- Upgrading several Navigational Aids (NAVAIDs), including upgrades to the Runway 23L Localizer, new capture effect Runway 23L Glide Slope, and relocation of the Runway 23L Precision Approach Path Indicator (PAPI) lights.

- Improving existing vehicle service roads.

“The Runway 5R-23L and Taxiway D Reconstruction exemplifies the Indianapolis Airport Authority’s commitment to meeting our operational needs without compromising the natural environment,” said **Mario Rodriguez, IAA executive director**. “From day one, we have kept the community front of mind and worked with a diverse set of individuals to deliver a meaningful project that emphasizes the airport’s public value to our stakeholders, passengers, and community.”

“The Indy airport is committed to sustainable and resilient development, maintenance, and operations,” said **Jarod Klaas, IAA senior director of planning and development**. “We accomplish this with the help of our team members, project partners, and the support and guidance of the Federal Aviation Administration.”

“This project has pushed the boundaries of what sustainability means for airport infrastructure,” said **Todd Cavender, IAA director of environment and sustainability**. “Our focus on public value enabled us to think creatively and work with industry partners to maximize environmental, social, and economic outcomes for all involved.”

“We are pleased to announce an Envision Platinum Award for Indianapolis International Airport’s Runway 5R-23L & Taxiway D Strengthening and Capacity Enhancement Project.” said **Melissa Peneycad, ISI managing director**. “The project team recognized the potential for job creation with the project but went much further, collaborating with local partners to address opportunity gaps and proposing an even stronger community impact. The project also builds in several environmental accomplishments, and notably, it represents the first-ever FAA-approved design for an airfield project using carbon capture technology.”

*Concrete demo (photo courtesy CTL Engineering); concrete piles (Woolpert); dedication of a three-dimensional mural, "Transitions" (Indianapolis Airport Authority – IAA).*

## VERIFIED SUSTAINABILITY ACHIEVEMENTS

### Stimulating economic prosperity and development.

The project aims to ensure the ongoing serviceability of critical airport infrastructure at IND and to support a significant expansion of on-airport logistics activity. IND is a major economic driver in Central Indiana, so the ability to maintain and expand operations is crucial for growth in the region. The Project's economic impacts are significant. It will generate 2,700 direct and indirect jobs and will also enable significant expansion of the on-airport FedEx hub. Economic analyses show that for each dollar of Project spending, an additional $0.80 of economic activity in Marion County will be generated.

### Working with local partners to develop local skills and capabilities.

Training requirements included in the Project's specifications were developed in partnership with several workforce development organizations, including EmployIndy, a leading workforce development agency in the region focused on removing barriers to quality employment for underserved and underrepresented residents; Ascend Indiana, a state-level workforce and economic development agency focused on connecting candidates to opportunities at partner organizations such as the IAA for this Project; and the Women's Transportation Seminar Indianapolis Chapter focused on providing educational and professional development programming focused on the Project. IAA worked with these organizations to address "green skill" and opportunity gaps as part of the Project. Example requirements and initiatives include:

- **Contractor and subcontractor training:** all contractor and subcontractor employees working on this project receive training on the Project's sustainability measures, commitments, and tracking requirements, including a formal training program, focused on water and energy conservation and implementing other sustainability measures as part of the Project.

- **Job fairs and assistance for job seekers:** contractors are required to conduct a minimum of one job fair in a socioeconomically disadvantaged area, provide job postings or employment listings to area workforce development agencies, and identify a team member to serve as an Employment Services Coordinator to assist employees, including potential new hires from lower income areas, access information and social services that could help them be successful employees.

### Conducting a life-cycle economic analysis to support project decision-making.

The Project team utilized economic analyses to identify the full economic implications and the project's broader social and environmental benefits. For example, a benefit-cost analysis (BCA) was conducted according to Federal Aviation Administration (FAA) guidelines to compare Project costs and benefits for

two project alternatives against a base case. Alternative 1 – using a 22-inch Portland cement concrete surface was better than alternative 2 – using a 4-inch hot mix asphalt and deeper crushed aggregate surface. The cost side of the BCA encompassed all components of a life-cycle cost analysis, and the benefits covered a range of financial, social, and environmental benefits.

**Generating renewable energy.**

The Project will incorporate solar photovoltaic (PV) energy production and battery storage for the Midfield Vault, which will offset electrical consumption used by the Project (e.g., for airfield lighting, airfield signage, approach lighting, and NAVAIDS). The Project will incorporate a 1,000-kilowatt, direct current solar PV system at the Midfield Vault, which is anticipated to produce 1,552,341 kWh annually, far more than the Project's anticipated electricity consumption of 419,060 kWh. The excess energy produced by the Project will serve additional loads on the airfield, including other airfield electrical systems located outside the Project boundary.

**Using carbon capture technology to reduce the Project's net embodied carbon.**

Incorporating resilience and reducing the airport's carbon footprint is a significant focus of the Project.

The Project team compiled a comprehensive inventory of total materials and associated weights, of which three materials constitute 87% of the Project's total estimated embodied carbon: Portland Cement Concrete Pavement, Recycled Concrete Aggregate Base Course, and Asphalt Mixture Base Course.

Since Portland cement is the primary ingredient in concrete and is directly responsible for most carbon emissions from concrete, the Project team is working to reduce embodied carbon emissions on the Project by spearheading the first-ever FAA-approved design for an airfield project using carbon capture technology. This in-situ carbon dioxide (CO2) mineralization technology introduces post-industrial carbon dioxide ($CO_2$) into freshly mixed concrete, where it converts to a solid mineral, calcium carbonate (CaCO3). The addition of $CO_2$ is anticipated to improve the compressive strength of concrete without impacting other fresh or hardened properties of the concrete, and importantly, sequestering carbon in the concrete and thereby permanently removing $CO_2$ from the atmosphere to reduce carbon emissions.

**PROJECT DETAILS AT-A-GLANCE**

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| **Envision-verified Project:** | Runway 5R-23L & Taxiway D Strengthening and Capacity Enhancement Project |
| **Location:** | Indianapolis, Indiana, USA |
| **Envision Rating:** | Platinum |
| **Owner:** | Indianapolis Airport Authority |
| **Project Delivery:** | Design-Bid-Build |
| **Lead Envision Firm:** | C&S Companies |
| **Project partners:** | Circle City Aviation Partners (a joint venture)—Prime; C&S Engineers, Inc.—Sustainability Integration Services |
| **Award Date:** | January 4, 2023 |
| **Project Phase:** | Under construction |
| **For more information:** | Please visit the airport's website |