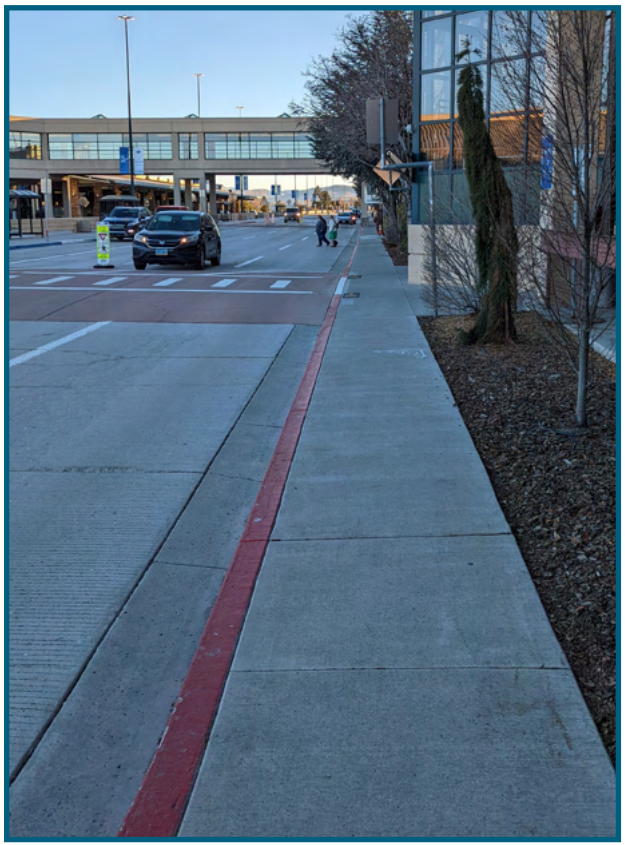
Reno-Tahoe Airport Authority,
Terminal Loop Road Reconstruction Project Design

The Need: Aging Infrastructure and Safety Concerns

The Terminal Loop Road at Reno-Tahoe International Airport (RNO) required significant upgrades to meet growing demand for air travel and improve safety and efficiency. **As part of the billion-dollar MoreRNO Infrastructure Program, this project addressed aging pavement conditions, inadequate pedestrian facilities and ADA compliance, suboptimal traffic flow and safety concerns associated with high speeds, improved aesthetics and user experience and increased protection for the Terminal building.** The Reno-Tahoe Airport Authority (RTAA) recognized the need for a comprehensive roadway reconstruction project to enhance the overall airport experience for all users. The transformation of the Terminal Loop Road is evident in the before and after photos to the right, which showcase the significantly widened sidewalk, enhancing pedestrian capacity and safety while improving the overall aesthetics of the airport approach.

This comprehensive reconstruction project exemplifies excellence in public works and is worthy of recognition for several key reasons. Firstly, it successfully addressed critical infrastructure needs while enhancing safety and efficiency in a high-stakes airport environment. The project team demonstrated exceptional skill in managing complex logistics, maintaining full airport operations throughout construction, and coordinating seamlessly with concurrent projects (both the Terminal Loop and the Ticketing Hall Expansion). **Moreover, the innovative design solutions – such as the zero-height loading zone curb, inverse crown roadway with trench drain, and strategically placed bollards – showcase a forward-thinking approach to landside airport design.** The project's commitment to sustainability, from energy-efficient canopy lighting to the use of recycled materials, aligns with modern environmental standards.



Before and After Photos of the Sidewalk Widening to Accommodate Travelers

Perhaps most importantly, this reconstruction has significantly improved the traveler experience, from improved traffic flow to enhanced aesthetics, positioning Reno-Tahoe International Airport for future growth and solidifying its role as a crucial economic driver for the region. The successful completion of this project under challenging conditions, on schedule and under budget, demonstrates the highest standards of project management and public works excellence.

Effective Construction Management and Timely Project Completion

During design, Kimley-Horn and the airport team collaborated to understand and plan for the construction requirements associated with the project, which included:

- All work was to be completed within a two-year construction period.
- Full customer access, including an accessible route, was to be maintained between the parking and rental car facilities and the terminal building/ticketing hall throughout the project duration.

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Bolllards Installed at RNO

- Maintaining a fire access lane and site/utility access for the airport's operations team was required at all times.
- Coordination of two separate construction projects and contractors within an overlapping site would be necessary.

The design team developed a comprehensive phased construction plan that balanced structure with flexibility. This plan outlined key requirements for onsite access, maintenance, and overall completion time. However, it also allowed the contractor significant latitude in preparing their own detailed schedule and approach. This flexibility was crucial, enabling the contractor to adapt to various factors such as their preferred construction methods, weather conditions, special events, and coordination with concurrent construction projects.

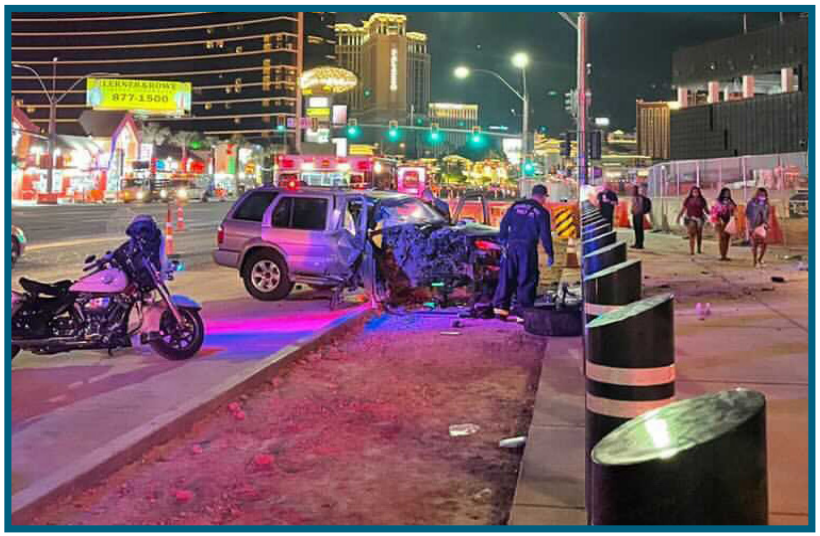
By striking this balance, the team ensured that project goals were met while accommodating the dynamic nature of airport construction. By clearly outlining general requirements in the bid package while allowing for contractor flexibility, bidders could accurately estimate costs for mandatory elements. This approach also gave contractors the freedom to tailor their work methods and phasing within these requirements, optimizing their approach to the project.

During construction, the project team consisting of the RTAA, Kimley-Horn, Construction Materials Engineers, Inc. (CME), and Q&D Construction held weekly construction meetings to plan and coordinate ongoing and upcoming construction activities while ensuring cooperation with the Ticketing Hall Expansion project team, all while maintaining regular airport activities.

On multiple occasions when unforeseen site conditions were presented, such as when a previously unknown storm drainpipe was discovered during excavation, the construction team would arrange for a quick onsite meeting to review the condition and devise solutions. This collaboration between the owner, engineer, construction manager, and contractor enabled effective problem-solving throughout the project. The team's unified approach allowed for swift implementation of solutions that satisfied all parties' needs without significantly impacting schedule, cost, or airport operations.

Safety Performance and Awareness

Ensuring the safety of airport users and workers during both the design and construction phases was a paramount concern for the project team. The team significantly enhanced safety and accessibility through two key design elements.



Bollards Protecting Pedestrians on Las Vegas Boulevard

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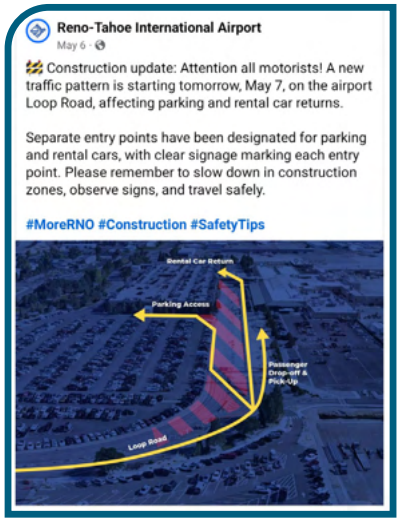

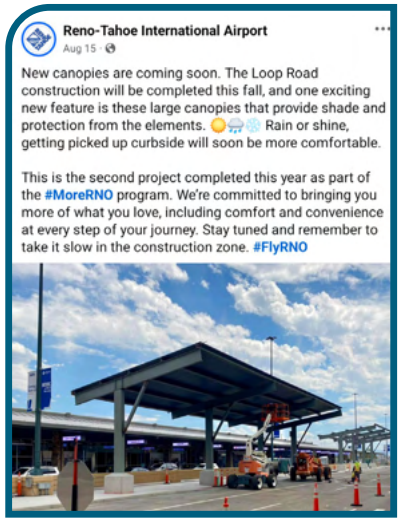

Community Engagement at RNO

Bollards Designed to Protect the Terminal Building and the Underground Utilities

First, crash-resistant **bollards** were installed along the frontage of the Terminal Building (see photo on previous page), providing robust protection for both pedestrians and the building infrastructure. Second, a **zero-height curb** was implemented for the full length of the departures loading zone. This innovative design improved accessibility and convenience for passengers while maintaining safety. The integration of the zero-height curb and bollards created a cohesive and effective safety barrier. The photo on the previous page of bollards on Las Vegas Boulevard illustrates their proven effectiveness in protecting pedestrians and infrastructure in busy urban environments. Various traffic-calming measures were implemented, including **reduced lane widths, a bulb-out, transverse rumble strips, and elevated pedestrian crosswalks**, all aimed at reducing vehicle speeds and enhancing pedestrian safety.

Careful consideration was given to bollard placement to maximize protection while ensuring practicality. They were strategically positioned to fit between existing canopy columns, avoid underground utilities, and allow maneuverability for snow removal equipment. This thoughtful design approach balanced the need for robust safety measures with the practical requirements of airport operations. The photo on the left shows the installation of bollards, exemplifying one of the many complex tasks completed during the project.

Throughout the construction process, the team maintained clear communication with all stakeholders about safety protocols and potential hazards. Regular safety meetings and inspections were conducted to ensure compliance with all safety regulations and to address any emerging safety concerns promptly.

Community Relations and Mitigating Public Inconvenience

The project team implemented a phased construction approach to maintain airport operations throughout the project. Community engagement was a crucial aspect of the project's success. The images to the left showcases social media updates used to inform stakeholders about the project's progress and potential impacts, including traffic changes and upcoming improvements.This open communication helped maintain positive relations throughout the construction phase. This strategy allowed for effective coordination between the two active construction projects often utilizing the same space. Regular communication channels were established with the public to provide updates on project progress and potential impacts. The Ticketing Hall Expansion and Loop Road reconstruction teams worked closely together to ensure unified aesthetic goals and minimize disruption to airport operations and passenger experience.

Environmental Protection and Long-Term Resiliency

The project team incorporated several environmental and sustainability features into the design. They implemented an inverse crown roadway that drains into a longitudinal trench drain, redirecting drainage away from the sidewalk area. The team worked in close collaboration with the airport's maintenance team to develop an easily maintainable trench drain design. They also ensured integration with the Ticketing Hall's sustainable design elements, including LED lighting on the canopies and development of a pavement structural section and grading to minimize the need for export/import of pavement materials. The use of local suppliers and recycled materials was prioritized where possible, including crushing and recycling of approximately 20,000 cubic feet of concrete.

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Terminal Loop Road During Construction - Departures Side

Completed Terminal Loop Road - Departures Side

Unusual Accomplishments Under Adverse Conditions

The project team overcame several challenges unique to the airport environment. They successfully coordinated multiple concurrent projects, including the Ticketing Hall Expansion and Loop Road Reconstruction, within the same general space. The team maintained 100% operational status during construction, ensuring that critical systems like power, storm drain system, and customer access remained fully functional throughout the process. Additionally, the team demonstrated remarkable flexibility and adaptability by incorporating new structural canopies into the design when the overall project was already at 90% completion. This late-stage modification showcased the team's ability to accommodate significant changes while maintaining project integrity and timeline. A significant challenge arose during construction when the team encountered unknown buried and sometimes abandoned infrastructure. This necessitated rapid design modifications and creative problem-solving. The team's expertise and agility allowed them to quickly adapt designs onsite, ensuring minimal disruption to the project timeline while maintaining safety and quality standards. This adaptive approach showcased the team's ability to navigate complex, unforeseen obstacles in an active airport environment.

Quality Control and Value Engineering

The Kimley-Horn team implemented a comprehensive approach to quality control while employing innovative value engineering techniques to maximize project benefits and manage costs effectively. Regular quality assurance meetings were held between the Ticketing Hall and Loop Road teams to review each other's plans, ensuring not only unified aesthetic goals but also consistent quality standards across both projects.

To maintain high quality while optimizing costs, the team strategically selected aesthetic elements like bollard sleeves and canopy column fascia. This approach unified existing elements with planned improvements, ensuring a significant quality and cost-saving measure involved reconstructing segments of the existing median to accommodate accessible loading requirements while leaving the majority of the existing median in place.

Throughout the design and construction phases, close collaboration between Ticketing Hall Expansion team and the Terminal Loop Road Team allowed for continuous quality checks and optimization of solutions. This partnership enabled real-time problem-solving and quality improvements, ensuring that the final product met or exceeded all quality standards while staying within budget constraints.

The team also implemented rigorous quality control measures, including regular inspections, material testing, and adherence to industry best practices. These efforts ensured that all aspects of the project, from materials to workmanship, met the highest standards of quality while still achieving cost-effectiveness through smart value engineering.

Alternative Materials, Practices, or Funding

The project demonstrated a commitment to sustainability through several key initiatives. The team implemented energy-efficient lighting and snow melt systems to reduce long-term energy consumption.

Additionally, the roadway grading and pavement structural design were optimized to maximize the use of existing materials on site, minimizing the need for new materials and reducing waste.

Project Outcomes and Benefits

Upon completion, the Terminal Loop Road Reconstruction Project delivered significant improvements to the Reno-Tahoe International Airport. Enhanced safety has been achieved through improved roadway design with traffic calming elements, larger and improved pedestrian facilities, and ADA-compliant features, creating a safer environment for all airport users. Improved traffic flow resulted from revisions to vertical grades and horizontal geometry, optimizing traffic circulation around the terminal. The project extended infrastructure lifespan, as the newly reconstructed pavement will provide long-term durability and reduced maintenance needs. User experience has been enhanced through upgraded pedestrian walkways, additional canopies, and improved aesthetics, contributing to a more positive airport experience for travelers. Increased accessibility and safety have been incorporated through ADA improvements, zero-height curbs, and bollards, providing safe and equal access for all airport patrons. Finally, the project supports RNO's sustainable growth by accommodating increasing passenger traffic while incorporating environmentally friendly practices and materials. The transformation of the Terminal Departure Loop Road is evident in the two photos, on the previous page, which shows the area during construction and after completion. These images highlight the significant improvements in roadway design, pedestrian facilities, and overall aesthetics that contribute to an enhanced airport experience.

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