IGGA
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minneapolis's concrete pavement preservation strategy

A Model for Urban Infrastructure Renewal

A comprehensive Concrete Pavement Preservation (CPP) strategy can extend the life of aging concrete streets.

THE CITY OF MINNEAPOLIS, FACING SIGNIFICANT INFRASTRUCTURE CHALLENGES from harsh freeze-thaw cycles, implemented a comprehensive Concrete Pavement Preservation (CPP) strategy to extend the life of its aging concrete streets. By integrating advanced pavement rehabilitation techniques with innovative contracting and a focus on sustainability, Minneapolis has successfully extended the lifespan of its roadways by an estimated 25 years. The program serves as a benchmark for other municipalities, demonstrating a cost-effective, environmentally responsible and long-term solution to urban pavement management.

Challenge

Minneapolis's road infrastructure is subject to extreme weather conditions, particularly destructive freeze-thaw cycles. These recurring temperature fluctuations cause significant damage to concrete streets, manifesting as cracks, joint deterioration and potholes. This ongoing degradation compromises road safety and ride quality while creating a continuous and costly maintenance burden. The city required a proactive, long-term strategy to move beyond short-term fixes and effectively preserve its extensive network of concrete pavements.

Solution

In 2016, the City of Minneapolis launched its Concrete Pavement Preservation (CPP) strategy. The program was designed to rehabilitate structurally sound pavements before they deteriorate to a point requiring full reconstruction. The core of the solution is to apply a suite of targeted preservation techniques that restore pavement integrity, improve surface characteristics and prevent future damage. This approach maximizes the value of the existing infrastructure while minimizing costs and environmental impact.

Implementation

The CPP program was rolled out strategically, beginning with a pilot project in the Waite Park neighborhood that involved rehabilitating six to eight miles of concrete streets. Building on the success of this initial phase, the city expanded the initiative to target three to four miles of streets annually across different neighborhoods.

The implementation process involves several key components:

- **Strategic Planning:** Pre-construction assessments are conducted to identify suitable candidate streets and determine the most appropriate preservation treatments. The city effectively balances the use of in-house crews with specialized contractor services to optimize expertise and cost-efficiency.
- **Advanced Techniques:** The city employs a multi-faceted technical approach, including:
  - **Diamond Grinding:** To restore a smooth, high-friction riding surface.
  - **Full-Depth and Partial-Depth Repairs:** To address localized structural failures and joint deterioration.
  - **Dowel Bar Retrofitting:** To improve load transfer across transverse joints and cracks, reducing slab deflection.
  - **Slab Stabilization:** To fill voids beneath concrete slabs, restoring support and preventing further cracking.
  - **Joint and Crack Sealing:** To minimize water infiltration, a primary cause of freeze-thaw damage.
- **Innovative Contracting:** Minneapolis utilizes Indefinite Delivery/Indefinite Quantity (IDIQ) contracts. This flexible procurement method allows the city to efficiently allocate its budget and adjust project scopes as needed, ensuring resources are used effectively and work proceeds with minimal disruption.

"Minneapolis has established a robust Concrete Pavement Preservation program, delivering impressive results. By prioritizing long-term strategies over short-term fixes, the city stands in contrast to many others facing premature pavement failures. Through fiscally and environmentally sustainable practices, Minneapolis is effectively reducing maintenance and construction disruptions over the pavement lifecycle—bringing lasting benefits to both residents and local businesses."

Dan Labo, *Executive Director*
Concrete Pavement Association of Minnesota

Results

The CPP strategy has delivered significant and measurable results for the City of Minneapolis. The rehabilitated pavements are projected to have an additional 25 years of service life, extending their total lifespan to between 65 and 70 years. This represents a substantial return on investment compared to the high cost of full reconstruction.

Key benefits achieved include:

- **Extended Infrastructure Lifespan:** The program has proven effective in prolonging the viability of the city's concrete street network.
- **Enhanced Cost-Effectiveness:** Pavement preservation is significantly less expensive than reconstruction, allowing the city to address more lane miles within its budget.
- **Improved Sustainability:** By reusing existing concrete materials, the CPP strategy reduces the consumption of new aggregates and bituminous oil. This approach lowers the program's carbon footprint and aligns with the city's environmental goals.
- **Increased Safety and Ride Quality:** Diamond grinding and other surface repairs create smoother, safer road conditions for all users.

The City of Minneapolis's Concrete Pavement Preservation program exemplifies how a strategic, forward-thinking approach can effectively manage the challenges of aging urban infrastructure. By combining advanced engineering techniques with smart contracting and a commitment to sustainability, Minneapolis has created a cost-effective model that delivers long-lasting, high-quality results. The program not only preserves the city's physical assets but also provides a valuable blueprint for other municipalities seeking to build more resilient and sustainable road networks.

» 2025 PROJECT TEAM

- **Owner:** City of Minneapolis
- **Contractor:** PCiRoads
- **Diamond Grinder:** Interstate Improvement
- **Ready-Mix Supplier:** Amrize

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ABOUT IGGA

The International Grooving & Grinding Association (IGGA) is a non-profit trade association founded in 1972 by a group of dedicated industry professionals committed to the development of the diamond grinding and grooving process for surfaces constructed with Portland cement concrete and asphalt. In 1995, the IGGA joined in affiliation with the American Concrete Pavement Association (ACPA) to form what is now referred to as the Concrete Pavement Preservation Partnership (IGGA/ACPA CP3). The IGGA/ACPA CP3 now serves as the lead industry representative and technical resource in the development and marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world.