PLEX

Center of Excellence for Concrete
Preservation and Service Life Extension

Board Meeting

January 19, 2026

Center of Excellence for Concrete Preservation and Service Life Extension

ANTITRUST COMPLIANCE STATEMENT

It shall be the policy of this Non-profit Organization to observe strictly, in letter and spirit, the Antitrust Laws of the United States.

It is important to remember that those in attendance at this meeting may be your competitors. Any discussions of commercial matters with one's competitors may create the appearance of an antitrust violation, even though there is none. Examples of such discussions would include discussing pricing and agreements to limit production or output, etc.. Therefore, such discussions should be avoided at all times. If a sensitive topic under the Antitrust Law is being discussed or is about to be discussed, the Organization Chairman, or any meeting attendee, may advise those in attendance on the sensitive nature of the topic and halt further discussion.

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Agenda

Review of P+Ex Strategic Plan

- Mission & Vision review (incl. 6 goals)
- Achievement in 2025

Plan for FY 26-27

- Deliverables & publication list
- Operational resources plan

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Mission & Vision Statement

Mission

To drive global awareness, education, tools and actions to preserve and extend the service life of concrete structures to ensure a sustainable built environment.

Vision

To promote and lead “Concrete Preservation and Service Life Extension Initiatives” to contribute to sustainable solutions for society

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Strategic Plan (Version 1.1) Approved by the Board in July 2025

1. Highlight the **societal benefits** of enhanced service life for new and existing structures.
2. Develop strategies to **conserve resources and reduce environmental impact** through proper concrete asset management.
3. Raise awareness of the **financial benefits** of durability design and service life extension.
4. Advocate for responsible stewardship of the built concrete environment.
5. Serve as a knowledge hub for tools and techniques to extend service life.
6. Publish periodic sustainability reports on the repair industry’s efforts and set future goals as needed

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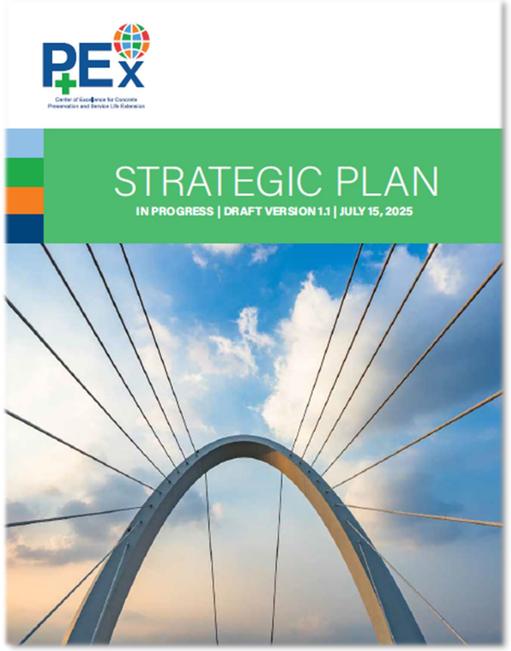
Progress Made in the Last 6 Months

- P+Ex website updated with the approved strategic plan
- P+Ex is supported by ICRI (International Concrete Repair Institute) and has Memorandums of Understanding (MoU) with:
  - ✓ NEx (ACI Center of Excellence for Nonmetallic Building and Construction Materials)
  - ✓ NCBC (National Concrete Bridge Council)
  - ✓ PTI (Post Tensioning Institute)
  - MoU are pending with:
    - ACI (American Concrete Institute)
    - ACA (American Cement Association)
    - ASA (American Shotcrete Association)
    - ASBI (American Segmental Bridge Institute)



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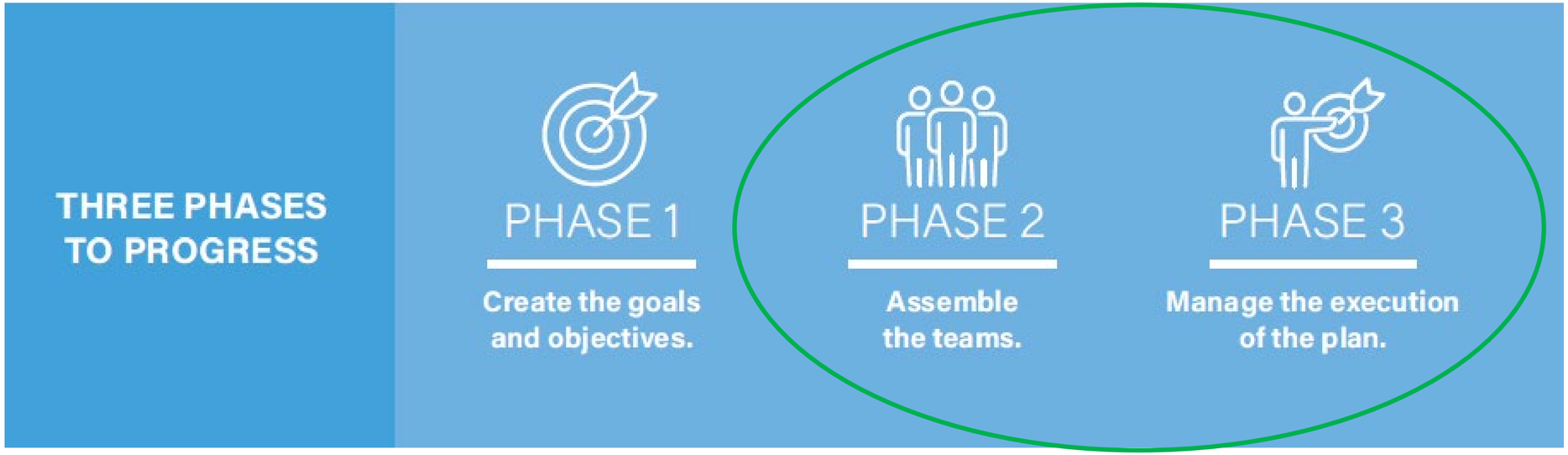
Progress Made in the Last 6 Months (Conti.)

- We are moving forward with implementation
  - Three working groups were assembled
  - Conducted workshops and meetings to execute the plan
  - Focused on Goal #1, 2 & 3



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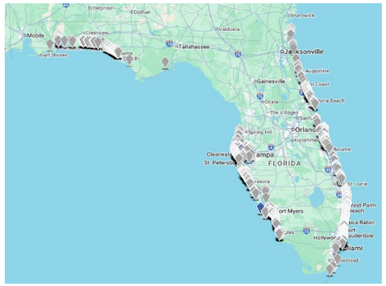
Goal #1 – Societal Benefits of Enhanced Service Life for New and Existing Structures

- Building permit research in Florida within 1 mile of coastline (2023-2024) showed 80% of the permits were for rehabilitation and 20% were for new construction
- Concrete buildings are not designed to resist aggressive chloride ingress (no building code requirements)
- Aging infrastructure, deferred maintenance, break-and-fix mentality
- Key categories of coastal rehabilitation projects
  - Structural concrete repair – spalling concrete and corroded rebars
  - Balconies, parking garages, columns, beams, structural walls
  - Building envelope & waterproofing
- **P+Ex recommends inclusion of mandatory durability requirements in the building code to enhance the service life of concrete structures**



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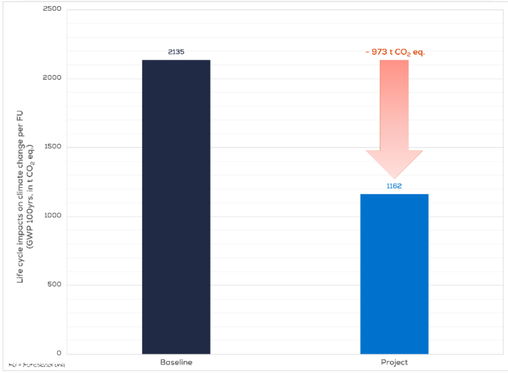
Goal #2 – Conserve Resources and Reduce Environmental Impact

- A case study combines service-life analysis (SLA) carbon footprint calculation for PVM Parking Garage
- Follow applicable standards and guides, e.g.
  - ISO 21930:2017. Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.
  - ISO 14064-2:2019. Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
  - ASCE Guide: 2017
- Saved life cycle GHG emissions of PVM garage project is estimated to be ~973 ton of CO_2 eq*
- In addition, raw materials, energy, water and cost saved



* Roughly 1200 tons of OPC emission; or 4800 CY RMX concrete emission based on EPD of OPC & RMX

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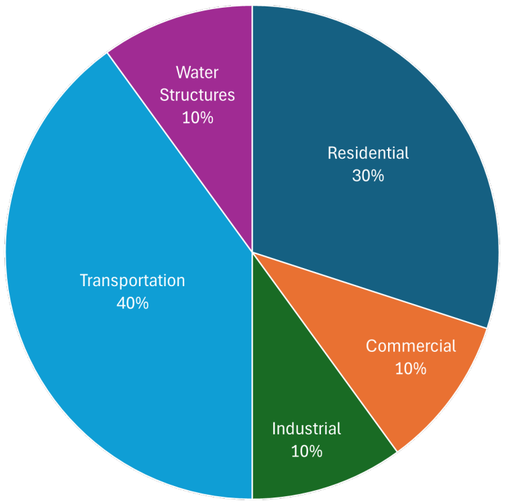
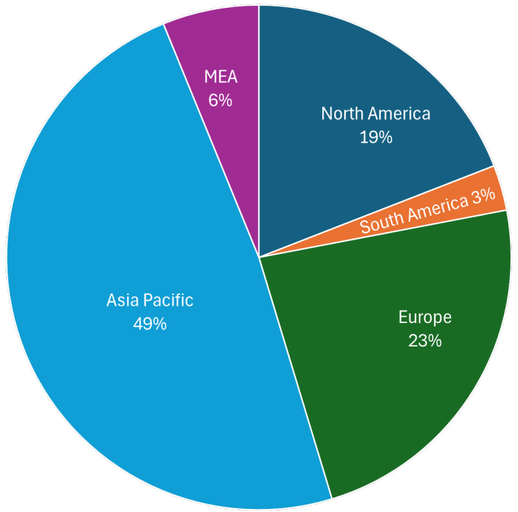
Goal #3 – Financial Benefits of Durability Design and Service Life Extension

- Determine current market size of concrete repair, protection, and strengthening (NA/global) was our first task
  - Data collected from material suppliers, contractors and verified with public information

- US repair market is estimated to be ~ $ 65 B
- Global repair market ~ $ 450 B





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Plan for Goal #1 in next 24 months – Highlight the societal benefits of enhanced service life for new and existing structures

- Collaborate with ACI/ASCE for the inclusion of durability requirements in codes and standards
  - MoU with ACI (f-t-f meeting at WoC) and establish action plan
  - Publish 4 white paper re. ACI/ASCE's roadmap of action plan (e.g. in Concrete International or ICRI Concrete Repair Bulletin)
    1. Roadmap for durability design
    2. durability design and maintenance are related to life safety
    3. Learning from international codes
    4. Unfortunate causes to maintaining parking structures
  - 1 White paper re. FL Condo financial/societal impact
  - Lobby FL building code body to join the effort
- Educational videos for condo owners, parking garage, general audience

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Plan for Goal #2 in next 24 months – Develop strategies to conserve resources and reduce environmental impact through concrete asset management

- Assemble case studies to build database for environmental declaration of repair systems (EDRS)
  - Publish the LCA case study: verification of the preliminary results and publish in a technical journal
  - Assemble at least 5 more case studies based on established methodology and enter them into the database
- Initiate “Environmental Declaration for Repair Systems ” (EDRS) by engaging professionals, program operators and create a panel to establish c-PCR (complementary Product Category Rules) for repair systems (see next slide)

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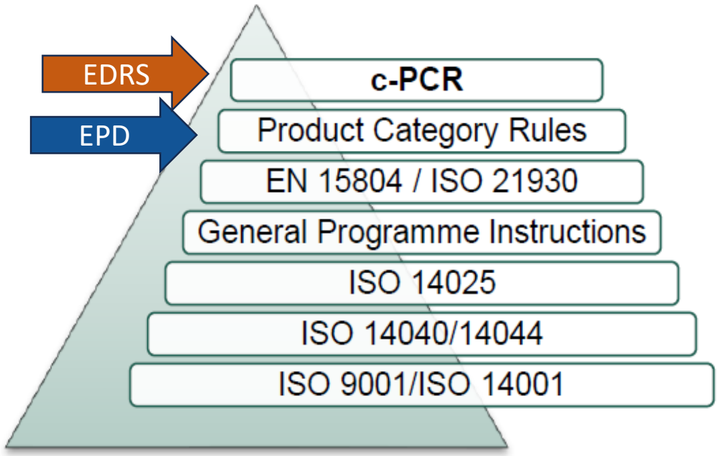
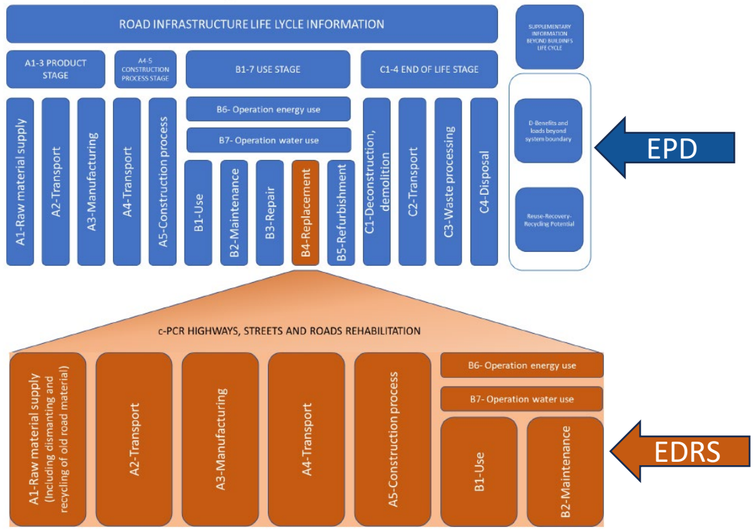
Initiate “Environmental Declaration for Repair Systems ” (EDRS) in next 24 months

- Based on current pr-EN 15978-2023 standard, it would allow us to build EPDs for repair systems (with some open issues, such as service life timeframe)
- Engage professional and create a panel to establish complementary Product Category Rules (c-PCR) for Environmental Declaration of Repair System
  - Follow International EPD System, modify existing ISO or EN standards or create NA based rules (less comprehensive than EN and ISO standards)
  - Example already established for [Rehabilitation of Highways, Streets and Roads]
  - Estimated timeline ~2 -5 years





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Plan for Goal #3 in next 24 months – develop asset management through service life extension

- Conduct market research for Concrete Repair Industry
  - White paper on market size analysis (Trade Journal, e.g. CI)
- Assemble case studies of financial benefits based on Sitter's "Law of Fives"
  - Publish a paper on how to communicate the savings (incl. environmental and financial) to the clients
- Establish framework/methodology for asset management best practices of extending the service life of concrete structures
  - Explore potential collaboration with Institute of Asset Management (IAM) and Institute for Sustainable Infrastructure (ISI)
  - Examples of supporting local municipality's asset management (Freysinnet's suggestion)

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Plan for Goal #4 in next 24 months – Advocate for responsible stewardship of the built concrete environment

- Develop and deliver internal and external communication package
  - Video for company employees
  - Presentation for company sales pitch
  - Publish an article for promoting P+Ex's progress and achievement (incl. sponsoring companies)
  - Publish a paper on how to communicate the savings (environmental and financial) to the clients
- Host 3 P+Ex events per year
  - Presentation at @ICRI / ACI conventions, conferences, trade association meetings, etc.

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Plan for Goal #5 in next 24 months –
Serve as a knowledge hub for tools and techniques to extend service life

- Preparation for Knowledge Hub
  - Expand and utilize partnerships (MoU with NEx, ICRI, PTI, ACA, etc.) for knowledge management
  - Build up database hosting case studies of comparative LCAs, remaining service life estimation, improved ESG scores through repair and reuse of existing structures

- Expand P+Ex initiative globally
  - Initiatives to Promote Awareness of Maintenance Business in Japan (Sho-Bond & MIT)

Initiatives to Promote Awareness of Maintenance Business in Japan

SHO-BOND & MIT
Infrastructure Maintenance Corporation

19th January 2026
SHO-BOND & MIT Infrastructure Maintenance

Background

- At the STVSL Board meeting in last June, an update on the “P+Ex” activities was provided.
- **Peter requested that awareness activities on the economic and social value of maintenance projects be expanded in Japan as well.**

Current Actions

- In response to this request, **we consulted Prof. Maekawa, President of the Japan Concrete Institute through Sho-Bond.** As a result, we were introduced to Prof. Iwaki, who is working on the development of a **Smart Infrastructure Management System under the Cabinet Office’s Strategic Innovation Promotion Program (SIP).**

Current Situation and Challenges in Japan

- Aging of bridges and roads managed by local governments is becoming severe, while the **national budget for repair and maintenance is insufficient.** As a result, local governments tend to respond on an ad-hoc basis.
- Under the current approach, an **economically and environmentally unsustainable future is foreseeable.**

Overview and Goals of SIP

- **SIP is a national project initiated by the Council for Science, Technology and Innovation (CSTI)** to realize science and technology innovation. It functions as a command center, managing initiatives beyond the boundaries of ministries and traditional fields.
- By examining five perspectives—technology, business, human resources, and others— it promotes strategic efforts toward social implementation.
- **A total budget of USD900million over five years (2023-2027) has been allocated.**
- The third phase, launched in 2023, established 14 key objectives. **The Smart Infrastructure Management System is a key objective within this phase .**
- It is a project aiming for technology development, policy design, and social implementation to promote infrastructure maintenance through industry-academia-government collaboration.
- **The goals are shifting to a maintenance system that enables timely and appropriate repair and preservation and securing sufficient national budget for repair and maintenance.**

Activities

- **Target infrastructure: bridges, roads, civil engineering structures, tunnels, railways, ports, agricultural facilities, buildings, and power-related civil structures.**
- In addition to maintenance of existing infrastructure, **the initiative aims to improve durability in new infrastructure by utilizing high-quality designs and materials**, developing new technologies and construction methods, and promoting institutional reforms.
- Current efforts focus on **developing inspection and diagnostic technologies to visualize the societal impact (economic and environmental)** of delayed maintenance using digital technologies.
- This initiative also utilizes crowd flow visualization technology, funded by Mitsui.

Future Direction

- In addition to social impact assessment, establishing evaluations and predictions of a structure's remaining service life to clarify priorities for preventive maintenance.
- This enables optimal infrastructure maintenance by performing repairs at the appropriate timing and construction methods.
- Future plans include promoting the development of repair and reinforcement technologies, and expectations for Sho-Bond and Mitsui in this field are also high.
- Sho-Bond and Mitsui intend to participate in this initiative and will share progress with P+Ex.
- **By linking SIP and P+Ex, Japan has the potential to contribute to forming a Knowledge Hub, so we would like to discuss collaboration methods going forward.**

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Acknowledgement

- Thanks to P+Ex Sponsoring Members' engagement and financial contributions
- Appreciation to all active participants in our working groups