

# Transition to Portland Limestone Cement A Ready Mixed Concrete Industry Perspective



# PLC Industry Team

- Luke McHugh – Senior Director for Pave Ahead
  - National Ready Mixed Concrete Association
- John Whitman – Quality Control Manager
  - Clemente Latham Concrete (a CRH Company)
- Bart Bergsbaken – Technical Director
  - Specialty Products Group



Know the Audience

**PAVE  AHEAD**  
DURABLE. SUSTAINABLE. CONCRETE.





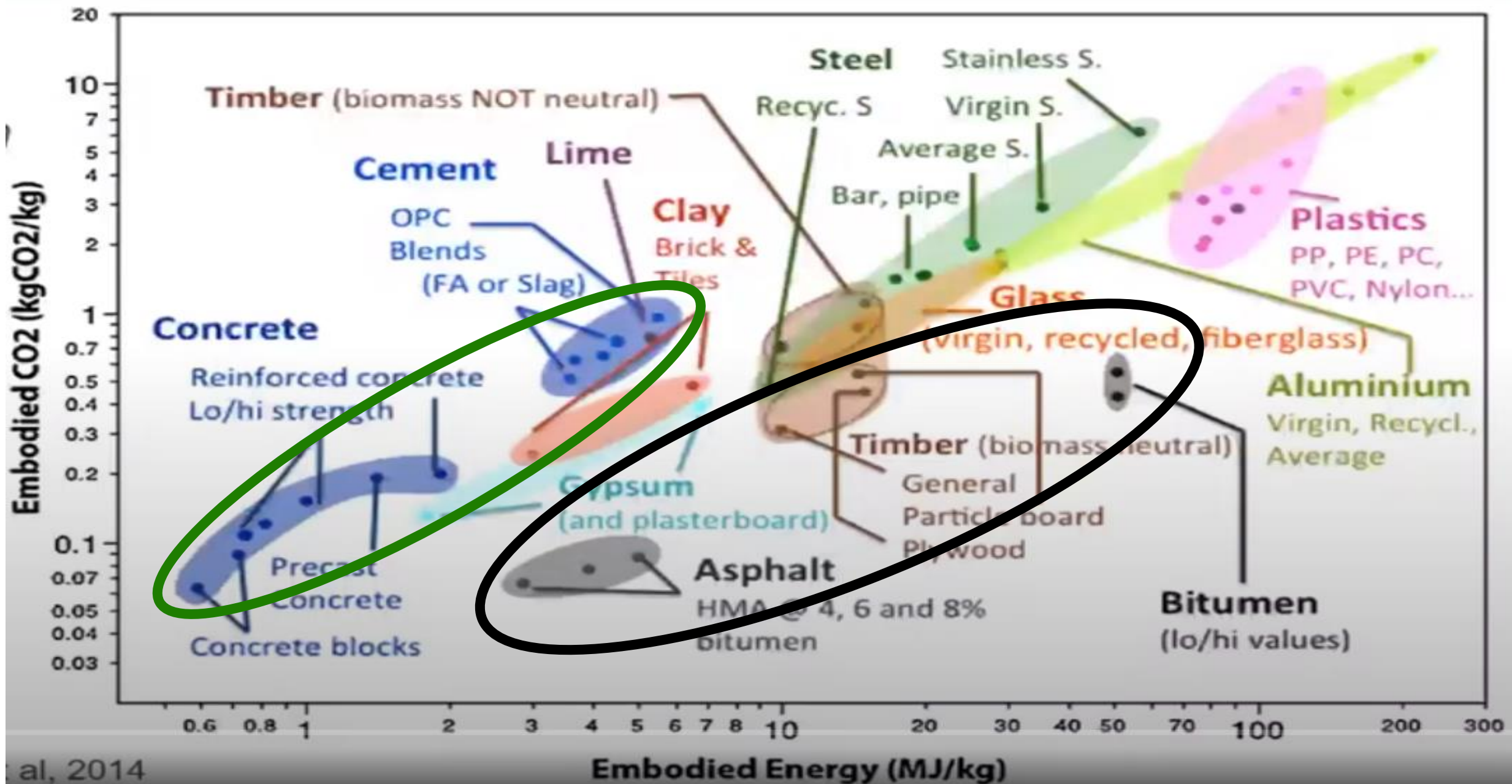
**WORLD SERIES**

**CHAMPIONS**

P

**Sustainability**

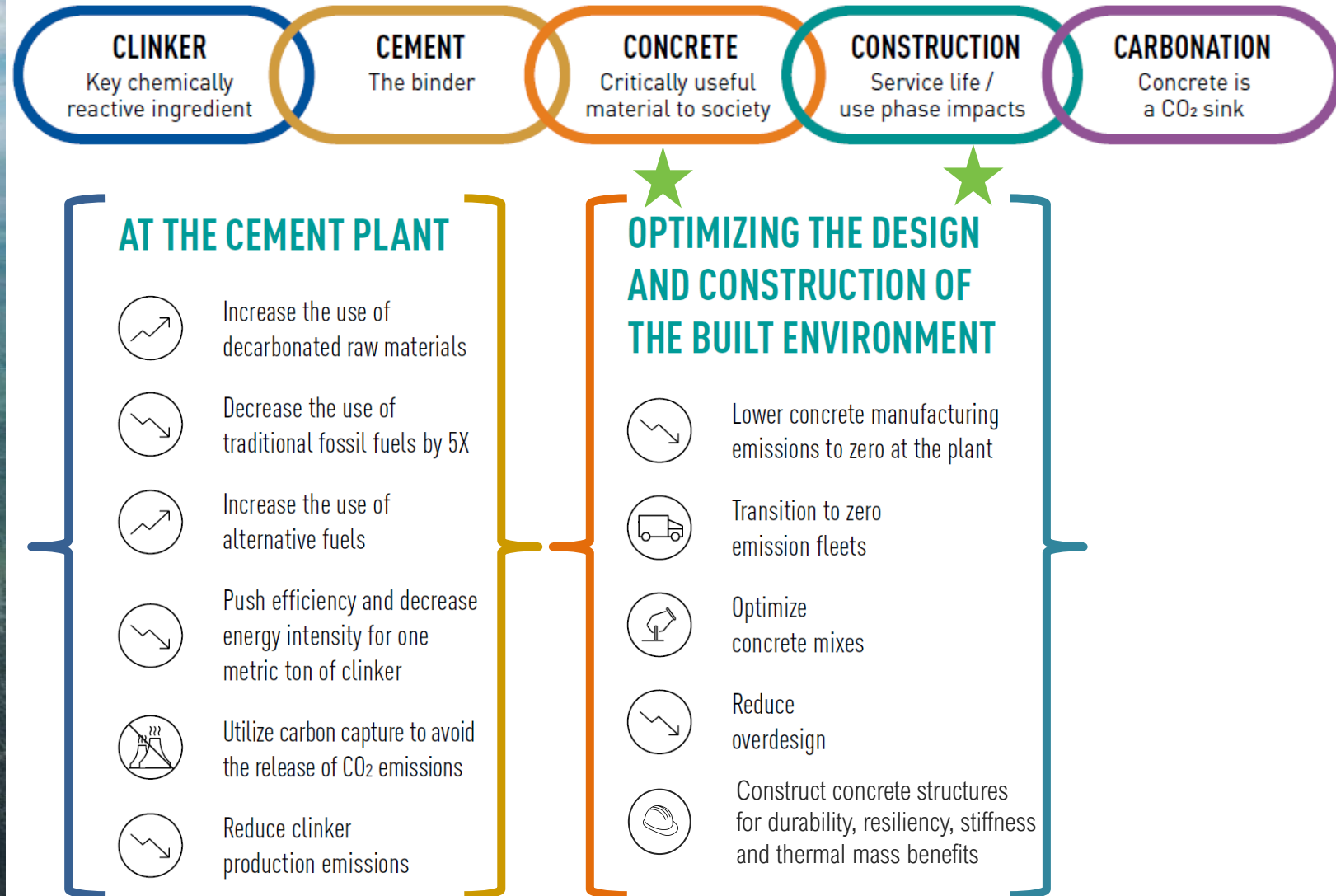
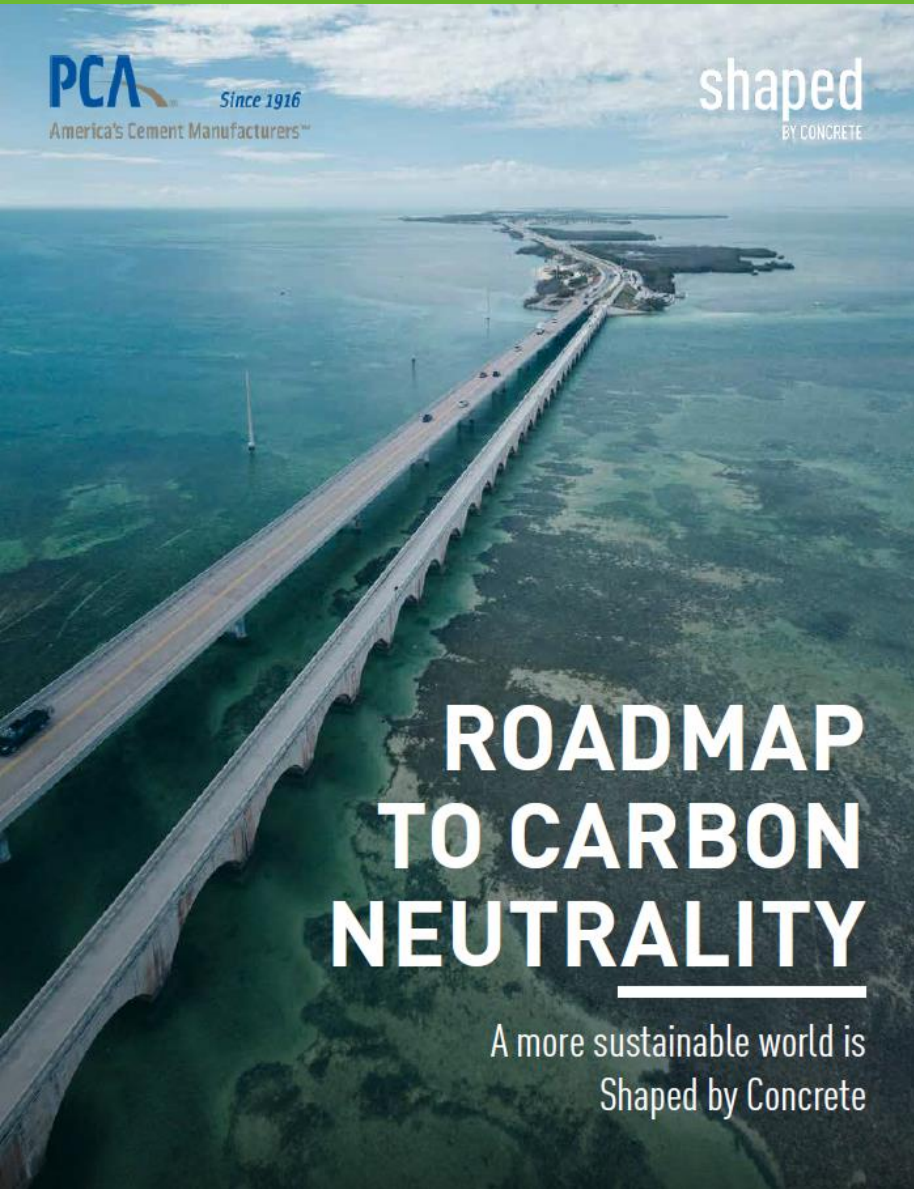




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# Roadmap to Carbon Neutrality: Cement & Concrete



# Reducing Concrete's Embodied Carbon Emissions (In-Use to Near-Term)



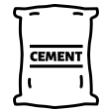
Communicate Carbon Reduction Goals



Ensure Good Quality Control and Assurance



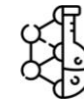
Optimize Concrete Designs & Mixtures



Specify Innovative Cements



Specify Supplementary Cementitious Materials



Specify Admixtures



Don't Limit Ingredients



Set Targets for Carbon Footprint



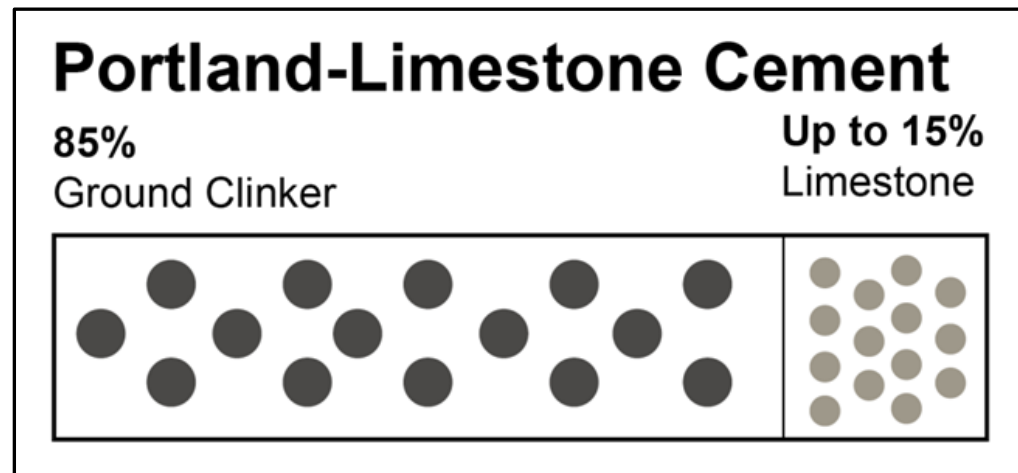
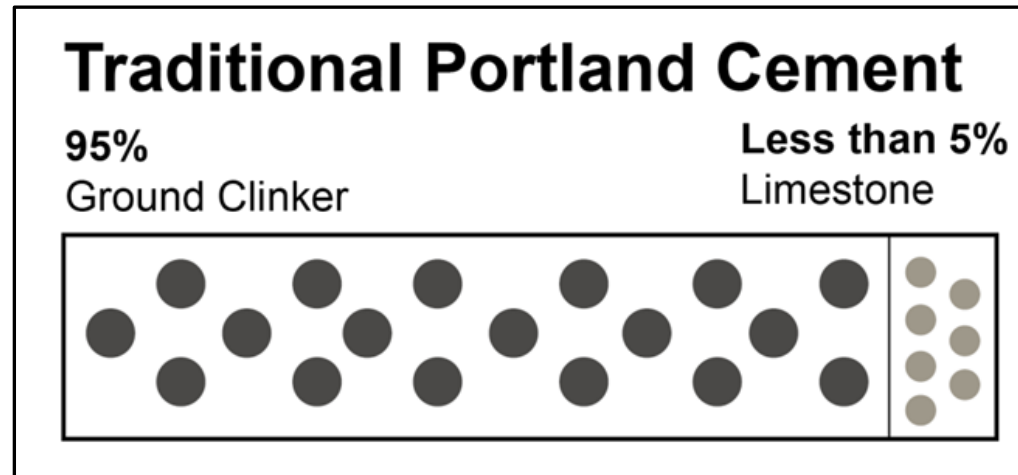
Sequester Carbon Dioxide in Concrete



Encourage Innovation

*The embodied CO<sub>2</sub> footprint of a typical concrete paving mixture today is as much as 40 percent lower than just a few decades ago.*

# What is Portland-limestone cement?



# What is Portland-limestone cement?

Composition	Type I or II portland cement (ASTM C150)	Type IL cement (PLC) (ASTM C595)
Clinker	92%	82%
Limestone	3%	13%
Gypsum	5%	5%

[greenercement.com](http://greenercement.com)

## National Partners

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Concrete Reinforcing Steel Institute



## Regional/Local Partners

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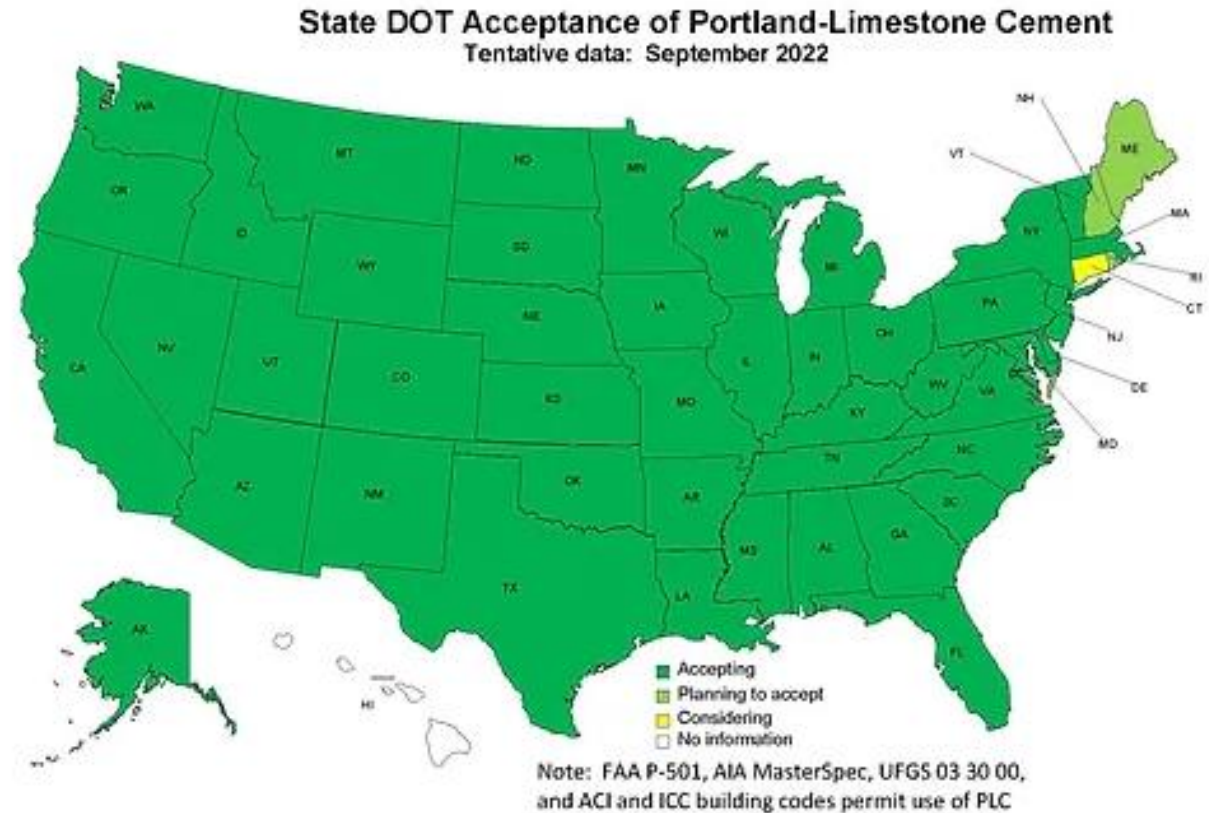


# History of PLC Acceptance/Use

Europe – 50+ years

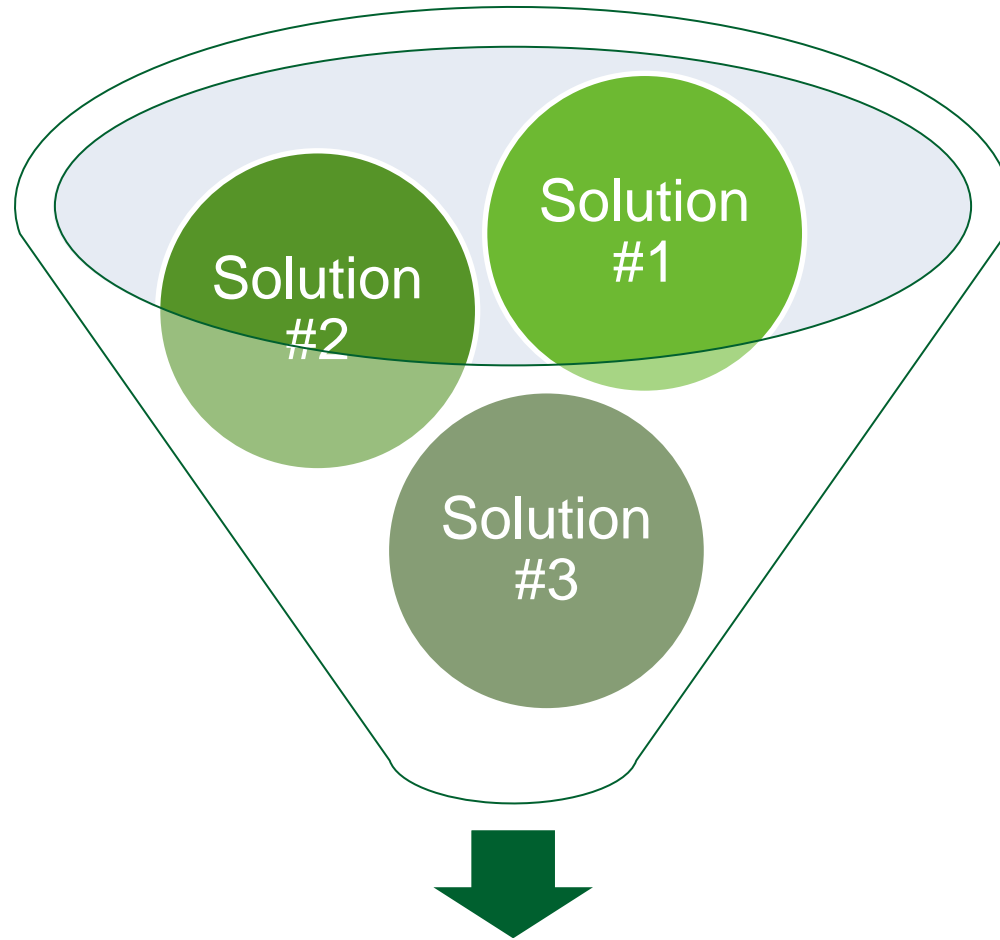
Canada – 10+ years

USA – Growing in acceptance



[greenercement.com](http://greenercement.com)

# A Combination of Solutions Required to Reach the Goal



Greener Pavements



**John Whitman**  
**Quality Control Manager**  
**Clemente Latham Concrete (a CRH Company)**



# Clemente Latham Experience

- Clemente Latham has done limited testing.
- All has been inhouse with adequate results.
- We will be proceeding with further trial testing until confident with results to involve Independent Testing Lab for verification.
- Depending on individual factors such as aggregates, and other constituent's, costs can be extensive.

# Limited testing at our company

- a) Costs of testing for performance. Independent Labs.
- b) Effectiveness of Admixtures. Air entrainment, water demand.
- c) Ash quality effect on total strength.
- d) ASR issues if any. Amount of ash used to mitigate any potential issues. Reactive aggregates effect.

# Preparation for use

- a) Silo Space – Many smaller companies have limited storage space for an added cement. Doesn't limit lab testing but can hinder field data collection. Make transitioning difficult with ongoing projects.
  
- b) Other upgrades will be minimal. Some locations will require minor batch computer upgrades to allow for extra products.

# Specifications

- a) See little if any specifications requiring PLC.
- b) Options will need to be given to companies that are unable to make the change early on.
- c) EPD's. Producers will need to invest in the cost. Most say they will wait until they transition before investing.

# DOT

- a) Several PLC's are available for use on the approved list.
- b) New 501 Performance Based Specification. Testing of new designs. Effects on resistivity. High Early Specifications. HP specifications.
- c) Work closely with our partners at NYSDOT to produce quality, cost effective and Eco-Friendly design to meet today's needs.

# Collaboration

- a) Clemente Latham Concrete is part of CRH. Worldwide company with local interests.
- b) Working with sister companies across the country to share data regarding PLC's. Some companies have partially made the transition.
- c) Data sharing is taking place on several company platforms. Able to look “real time” at other plants data and use to formulate our trials and options.
- d) Canadian arm of CRH using PLC's exclusively. Their data has been very helpful for other CRH companies to develop designs.

# Closing

This is not any different than other changes we have gone through. Fly Ash and Slag were new products at one time. It will take time, effort and of course cost. Much like any Research and Development the costs associated with the transition will need to be recouped. With all materials used in the manufacture of concrete, those costs are on the rise. Any savings that may be seen through the use of a PLC will be absorbed to offset the other materials at this time.

An aerial photograph of a parking lot with a large white outline of a dog's head overlaid on it. The dog's head is the central focus, with its ears, eyes, and snout clearly defined. The parking lot is filled with cars, and there are some trees and bushes scattered throughout. The overall image has a light, faded appearance.

# Discussion



Thank You

