

PavementDesigner.org

Preview of PavementDesigner.org, A Tool For Designing PCCP for All Applications

WCPA 2018 Annual Concrete Pavement Conference

Pewaukee, WI

February 15 – 16, 2018

Eric Ferrebee, P.E.

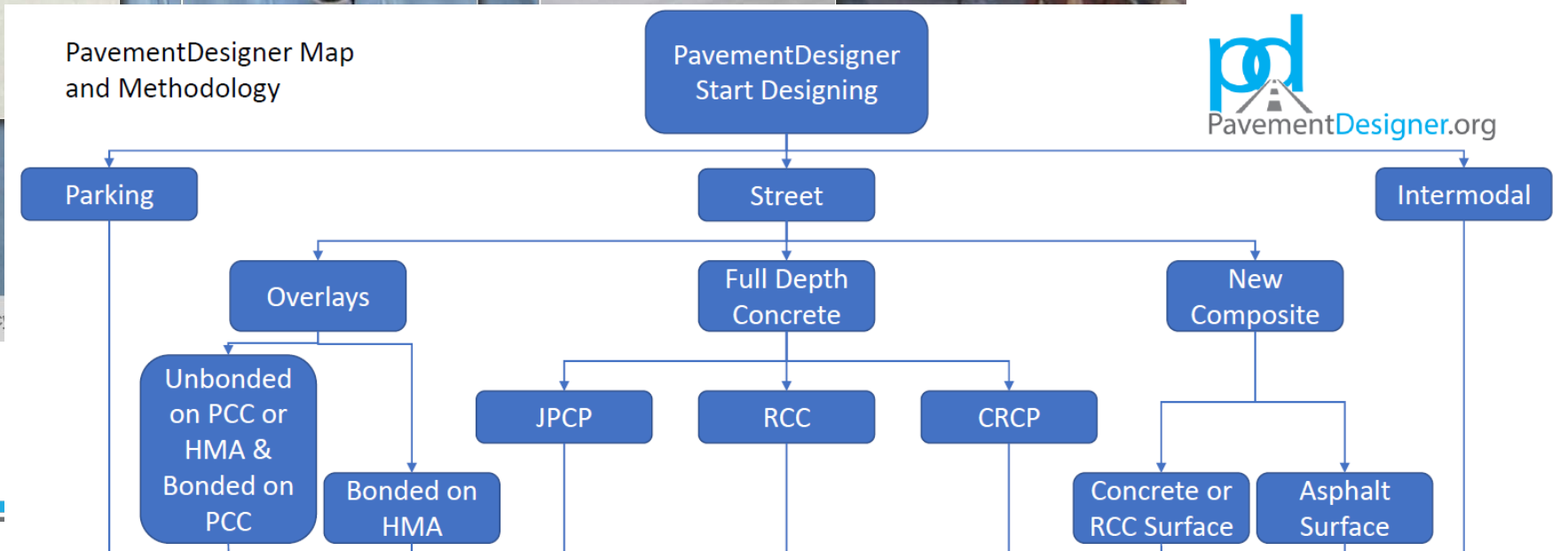
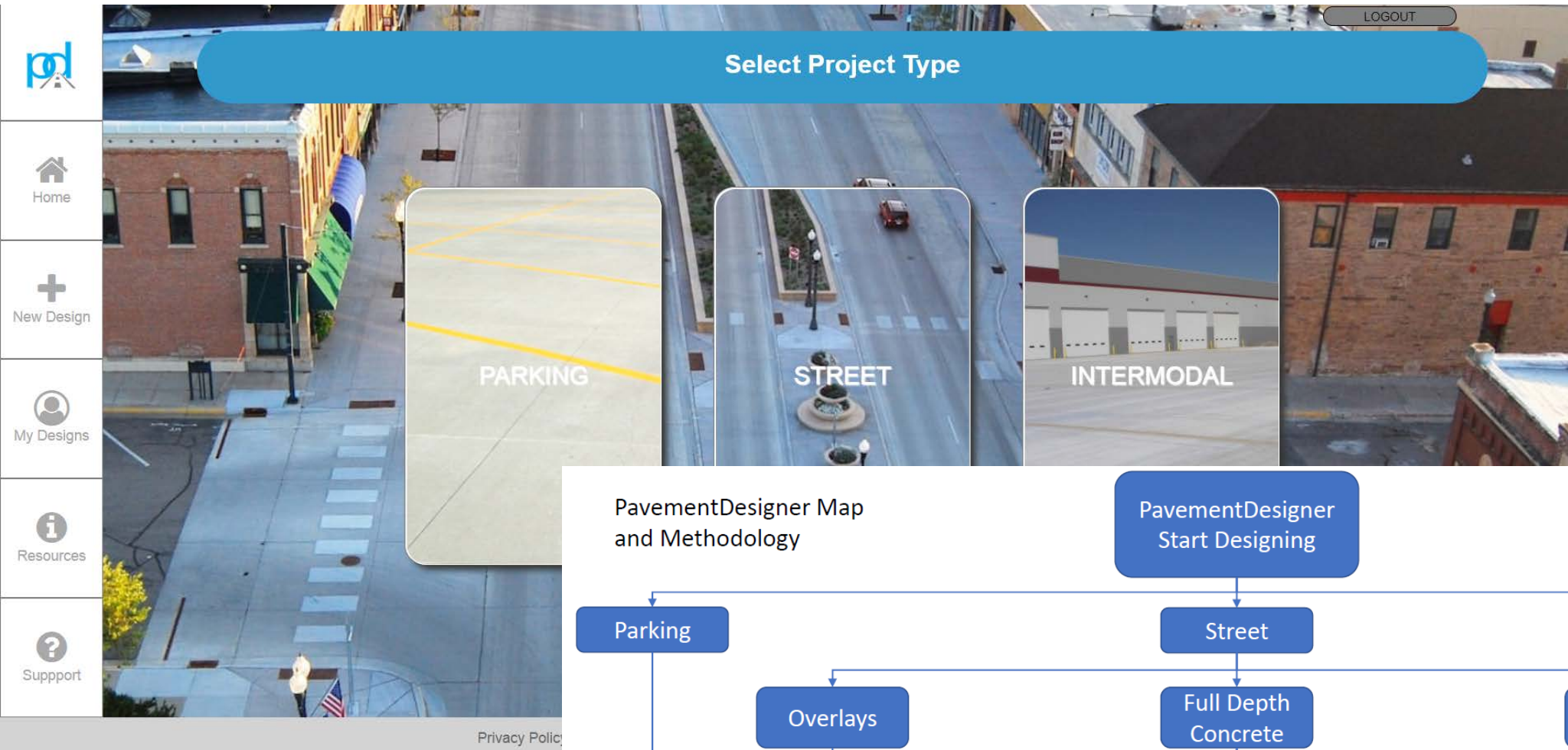
Director of Technical Services

American Concrete Pavement Association



PavementDesigner.org

PavementDesigner



PavementDesigner Solution Team

- ACPA Pavement Design Task Force Chairs

- Randell Riley, P.E and Jim Powell, P.E.
 - Illinois Chapter, ACPA & Northwest Chapter, ACPA
- James Mack, P.E. and Feng Mu, PhD., P.E.
 - Cemex

- Industry Team Partners

- Wayne Adaska, P.E.
 - Portland Cement Association
- Brian Killingsworth, P.E.
 - National Ready Mix Concrete Association

- Additional Support

- Corey Zollinger, P.E.
 - CEMEX
 - RCC Pavement Council (Chairman)



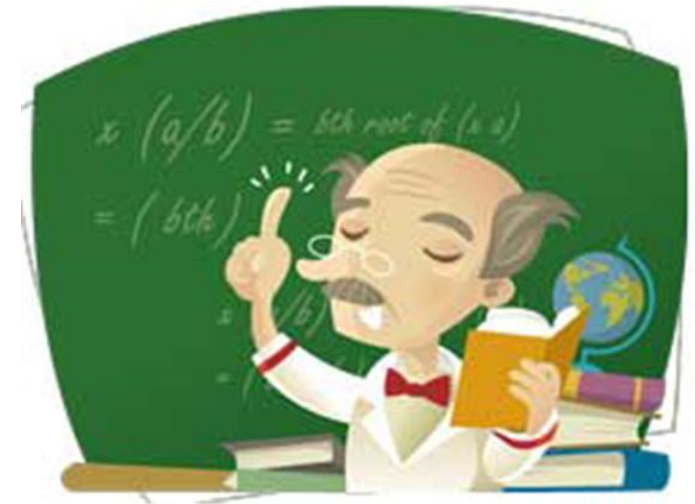
Need and Relevance – Addressing Demand

- High price point and learning curve for AASHTOWares's Pavement ME
- Non-DOT agency audience seeking affordable easy-to-understand design tools for pavement solutions, especially where traffic levels are low to moderate
- Consultants have similar needs and value quick-access design tools, providing quick answers



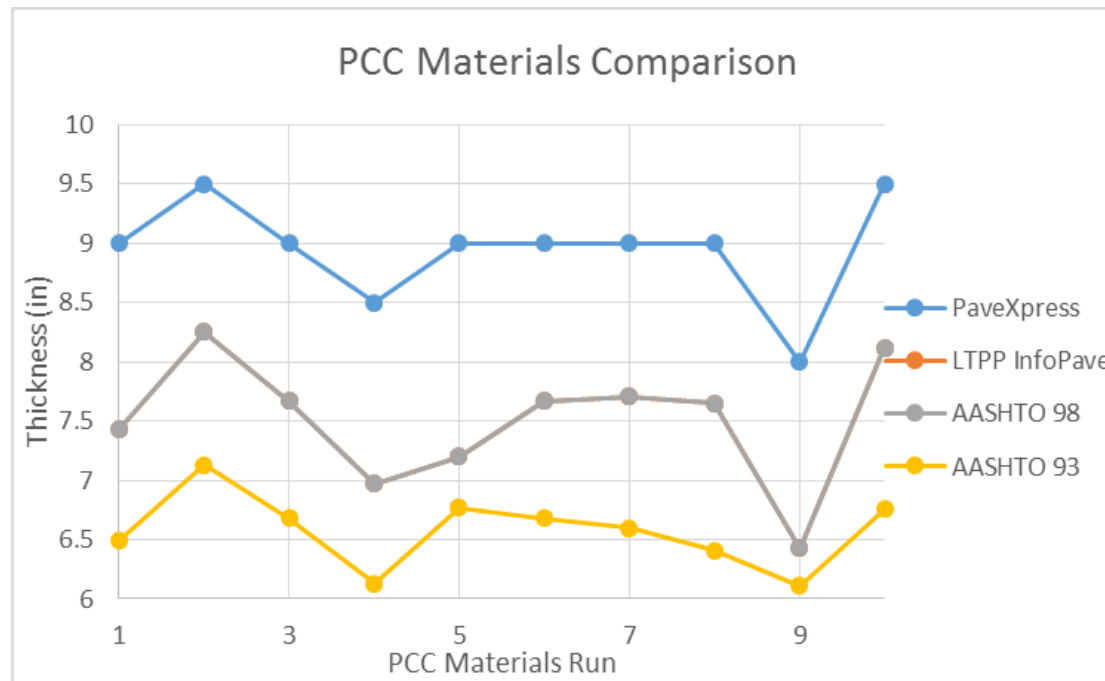
Need and Relevance – Addressing Demand

- Professors often favor simple-to-implement solutions; no complicated or expensive licensing terms or lab setup
- Students looking for technology to assist with course work
- Non-engineers seeking a simple method for designing pavements, parking lots, industrial facilities, etc. **that also provides guidance on the design**



Need and Relevance – Misleading Pavement Design Tools

- I-PAVE underrepresents foundation support
- PaveXpress claims to follow AASHTO design methods but results show otherwise...



PCC Materials Run	Modulus of Rupture (psi)	Elastic Modulus (psi)
1 (Baseline)	690	4,000,000
2	600	4,000,000
3	662	4,000,000
4	750	4,000,000
5	600	2,564,500
6	662	4,000,000
7	690	4,634,500
8	750	6,014,500
9	690	2,564,500
10	690	6,014,500

- Conservative thickness results for PCC lead to first-cost competitive disadvantages

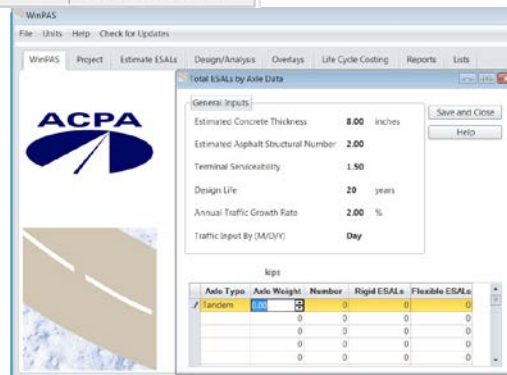
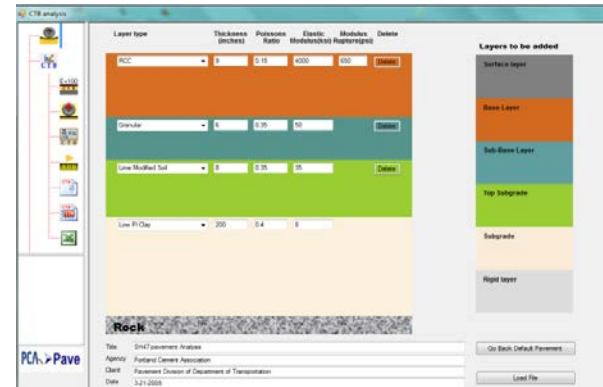
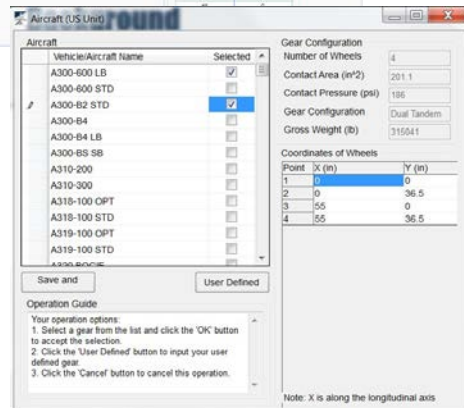
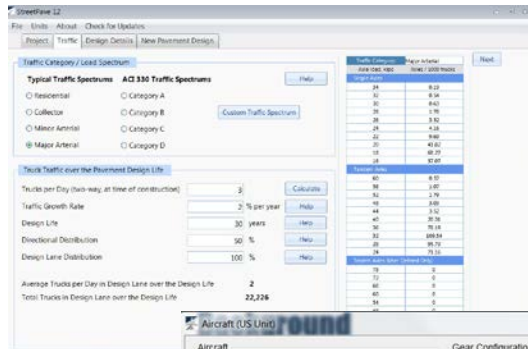
For details, see: Ferrebee, E. (Oct. 2015). *I-PAVE and PaveXpress: Equitable Pavement Design?*

<http://www.acpa.org/position-papers/>

Need and Relevance – Unify Industry Design Tools

- Many existing design programs:
 - ACPA StreetPave 12: Structural Design Software for Street and Road Concrete Pavement
 - ACPA AirPave 11: Structural Design Software for Airport Concrete Pavement
 - ACPA WinPAS 12: Structural Design of Concrete Pavement by AASHTO 1993 Method
 - ACPA BCOA: Bonded Concrete Overlay on Asphalt Thickness Design Calculator
 - NRMCA Concrete Pavement Analyst (CPA): Concrete Pavement Design for Parking Lots
 - PCA RCCPave: Structural Design of Roller-Compacted Concrete for Industrial Pavements
 - PCA PCAPave: Structural Design of Concrete Pavement
- Can be challenging for designers to determine best choice and get consistent results and recommendations across products
- Contributes to negative perception that cement-based pavement solutions are difficult to design compared to asphalt pavements

Bringing Online the Best of the Best Available Design Tools

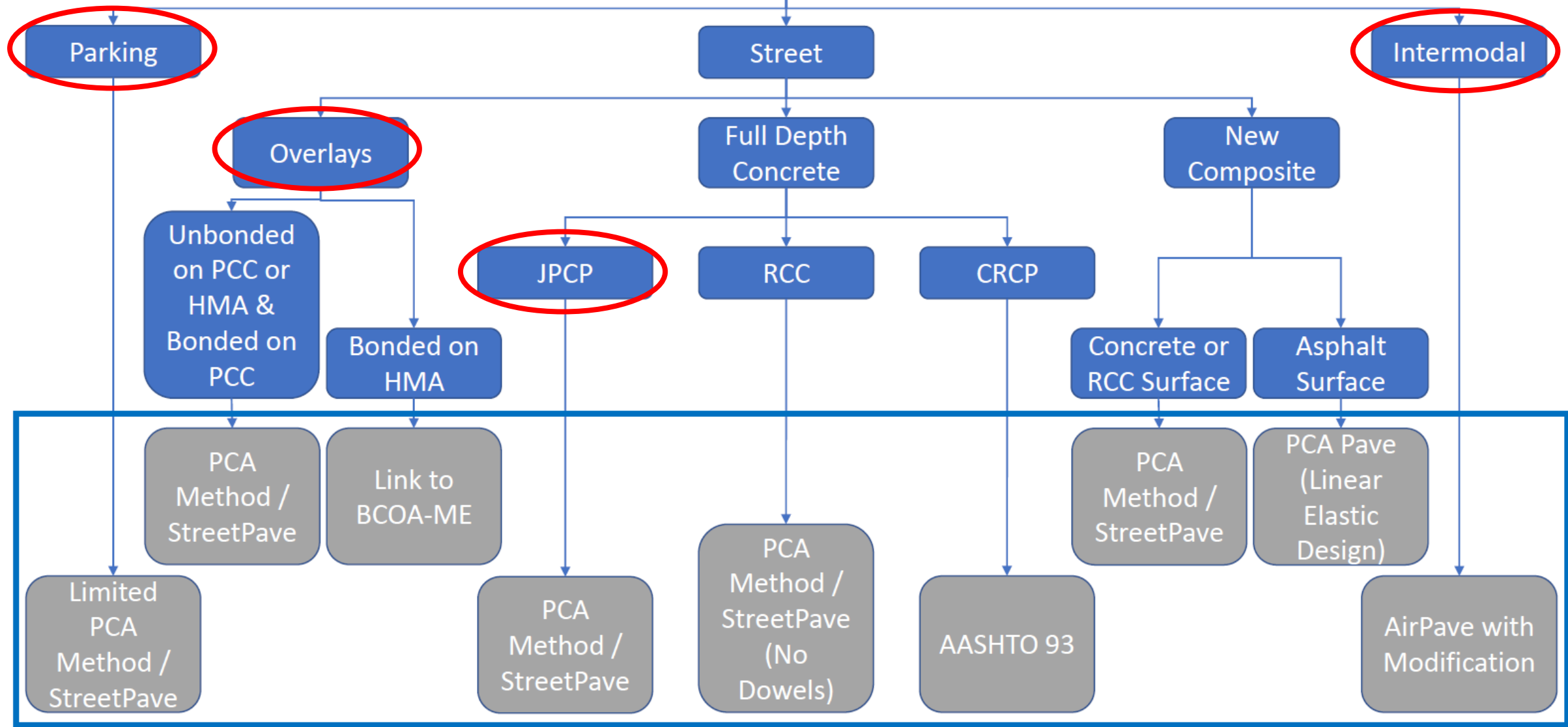


Design Guidance
Substructure Sensitivity
Asphalt Design
Evaluation

Overview and Background

- ACPA, NRMCA, and PCA partnership, with a contribution from the RCC Council to develop a website application to design cement-based solutions for:
 - Streets and Local Roads
 - Parking Lots
 - Intermodal/Industrial Facilities
- Design guidance and tools for:
 - Jointed-Plain Concrete Pavements
 - Continuously Reinforce Concrete Pavement
 - Concrete Overlays
 - Composite Pavements
 - Roller Compacted Concrete
 - Cement Modified Soils
 - Cement-Treated Base
 - Full-Depth Reclamation





Summary –

- Primary audience is city, county, and consultant engineers who design pavements
- Secondary audience is professors and students
- Unifies design methods, providing promoters with a single source to direct target audience to for consistent answers
- Fills a design void for some products
- Web-based platform, appealing to existing and future generations of design engineers...
- ...with broad industry partner support!
- **FREE, EASILY ACCESSIBLE, AND GUIDES USERS THROUGH THE DESIGN PROCESS**



Pavement**Designer**.org

Check it out now at:

pavementdesigner.org

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