

EV Infrastructure Building Codes

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Opportunities to Support PEV Adoption
Roadmap 11 | Portland, OR

Agenda

- Who is Adopting Building Codes?
- Why Adopt Building Codes?
- What to Include in Building Codes?
- Conclusion



* Alaska not to scale

Who is Adopting EV Infrastructure Building Codes?



Multi-Family



Non-Residential



Single Family



- Berkeley
- Burlingame
- Contra Costa County
- Cupertino
- Emeryville
- Fremont
- Marin County
- Menlo Park
- Mountain View
- Oakland
- Palo Alto
- San Mateo
- San Francisco
- San Rafael
- Santa Clara County
- Santa Cruz
- Santa Rosa
- Sunnyvale

- Beverly Hills
- Lancaster
- Los Angeles
- Long Beach
- Pasadena
- Santa Monica
- West Hollywood

- District of Squamish
- City of North Vancouver
- District of North Vancouver
- Vancouver
- Port of Coquitlam
- Surrey
- District of West Vancouver
- Richmond

- Seattle
- Washington
- Portland
- Salem
- Gresham
- Eugene

California

- Salt Lake City
- Boulder
- Denver

Hawaii

Ontario

Toronto

Auburn Hills

New York City

Philadelphia

Montgomery

Washington, DC

Atlanta

Pinecrest

Miami Beach

Jupiter

Surfside



Why Adopt EV Infrastructure Building Codes?

1-Help overcome a critical barrier to EV adoption by facilitating EV charging infrastructure

2-Avoid EV charging infrastructure retrofit costs including:



Electrical system retrofits



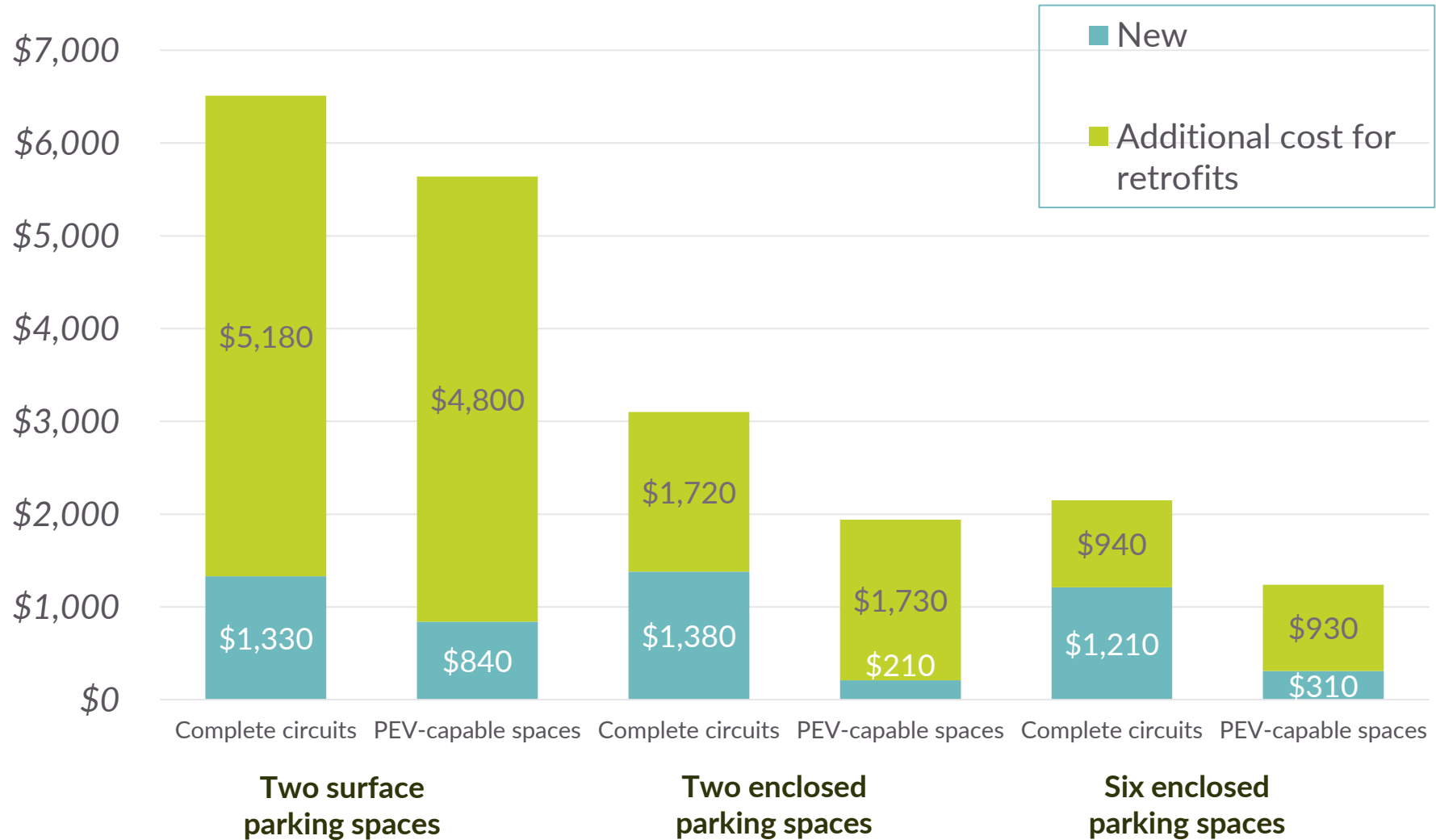
Breakage and repair of hardscapes



Soft Costs: permitting, inspection, HOA or landlord approvals, etc.

Why Adopt EV Infrastructure Building Codes?

Cost Savings Modeled for the City of Oakland



What to Include in Building Codes?

Levels of EV Charging Infrastructure

**No EV
Infrastructure**

**EV Charging
Capacity**

**EV Charging
Full Circuit**

**EV Supply
Equipment
Installed**



What to Include in Building Codes?

EV Capacity

Electrical Panel Space and Capacity

This accommodates future build-out of EV charging at 10% of parking spaces with 208/240 V, 40-amp circuits.

Install Difficult to Access All Conduit (Raceway)

Hard to alter after construction
e.g. enclosed within walls or pavement, etc.

Rationale:

Provide hard-to-retrofit elements while minimizing up-front cost.



What to Include in Building Codes?



EV-Ready (Full Circuit)

Install Full Circuits for 10% of Spaces During Construction

Full circuit installations include 208/240V, 40-amp panel capacity, raceway, wiring, receptacle, and overprotection devices similar to a dryer circuit.

Rationale:

Full circuits are plug-and-play ready and minimize total costs and additional barriers to installing Electric Vehicle Supply Equipment (EVSE).

What to Include in Building Codes?

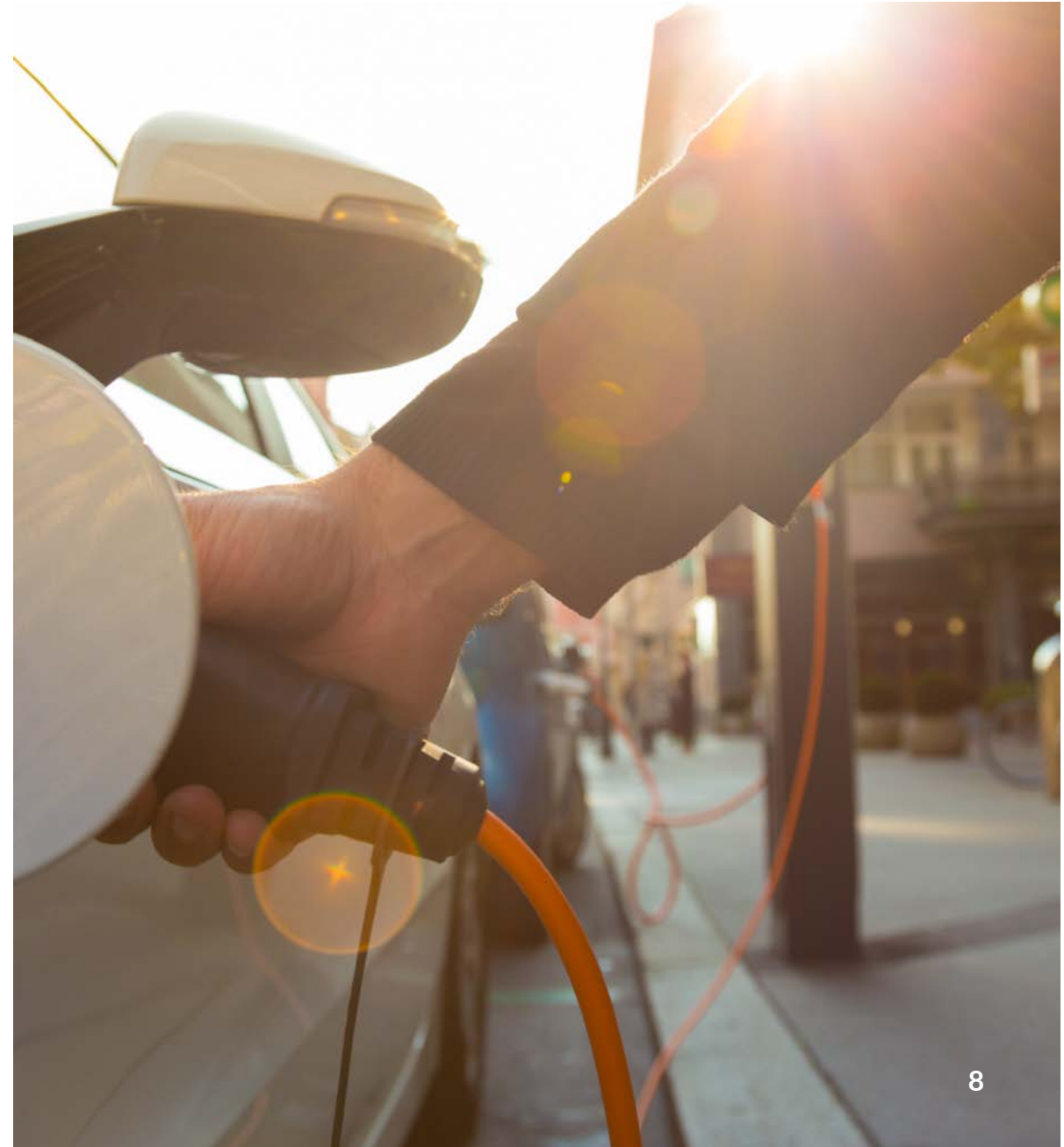
EVSE Installed

Install Electric Vehicle Supply Equipment (EVSE)

Install for one or more parking space, at least for larger buildings.

Rationale:

provide a visible signal that building supports EV charging.



What to Include in Building Codes?



Existing Buildings

**Additions; Major Building Alterations,
Surface Parking and Electrical System
Upgrades**

These will likely provide cost-effective opportunities for EV infrastructure installation.

Rationale:

Buildings typically have a 50-year lifespan and should be retrofitted during significant alteration or additions.

Conclusion

1-EV infrastructure building codes:

- Are highly cost-effective and
- Support EV charging infrastructure, a critical step to facilitate EV adoption.

2-Jurisdictions Can:

- Leverage many precedents to adopt or expand EV infrastructure building codes.





Thank You

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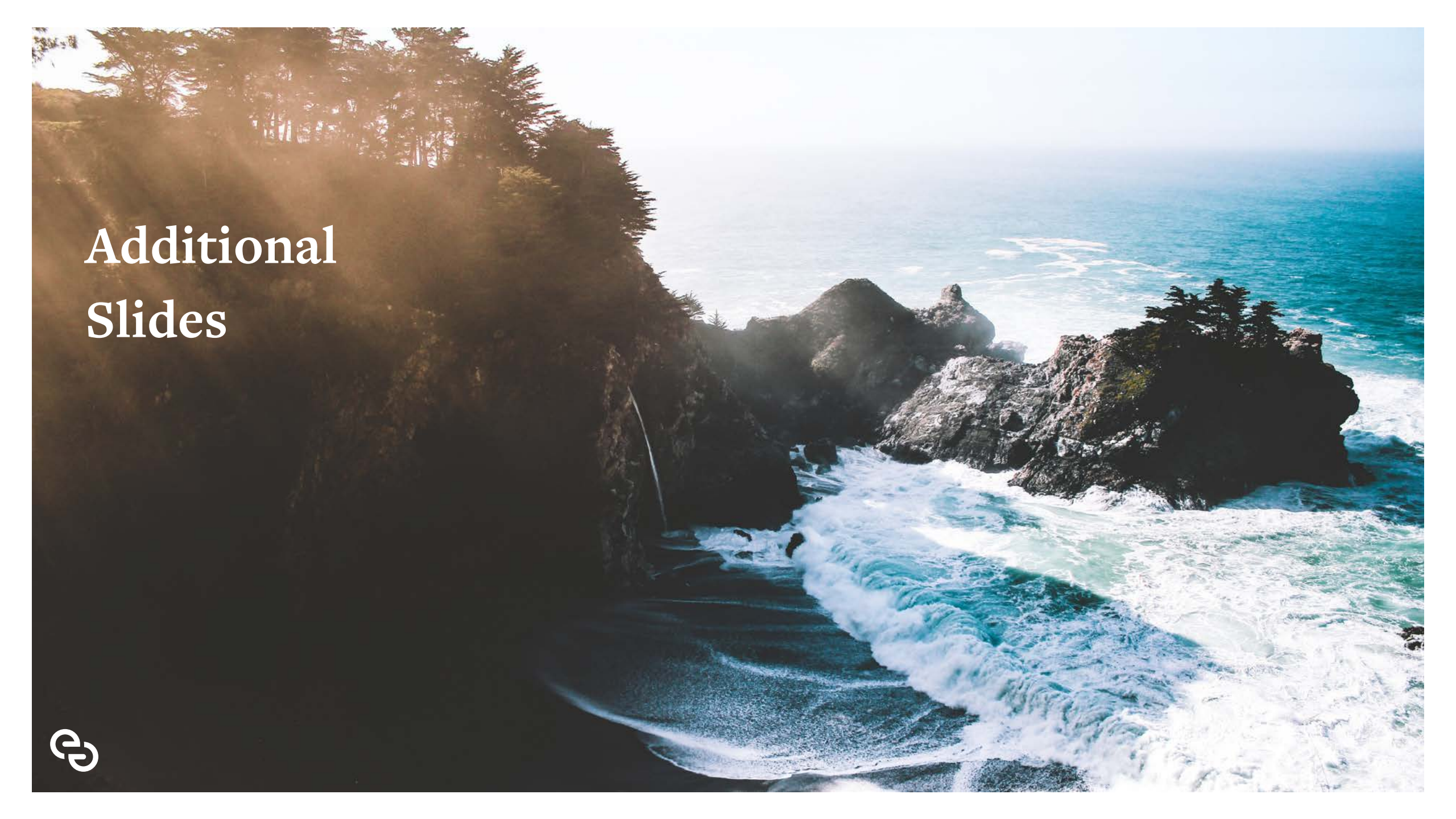
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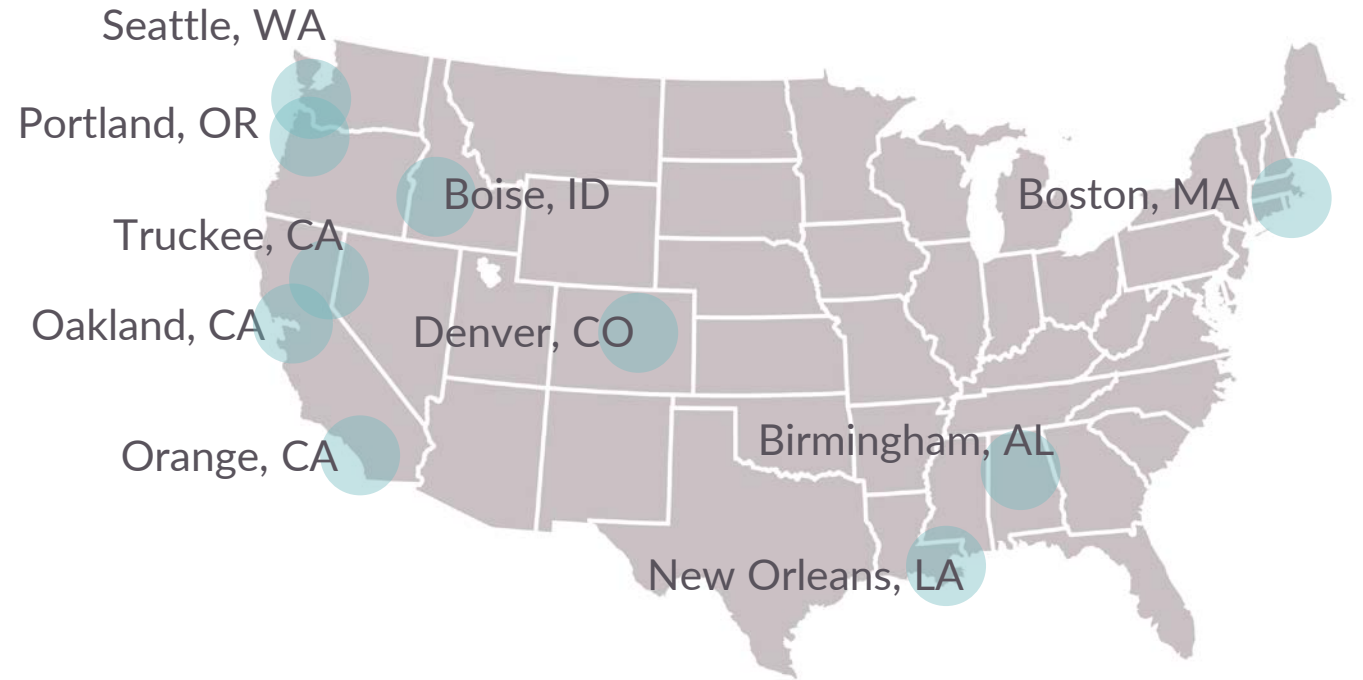
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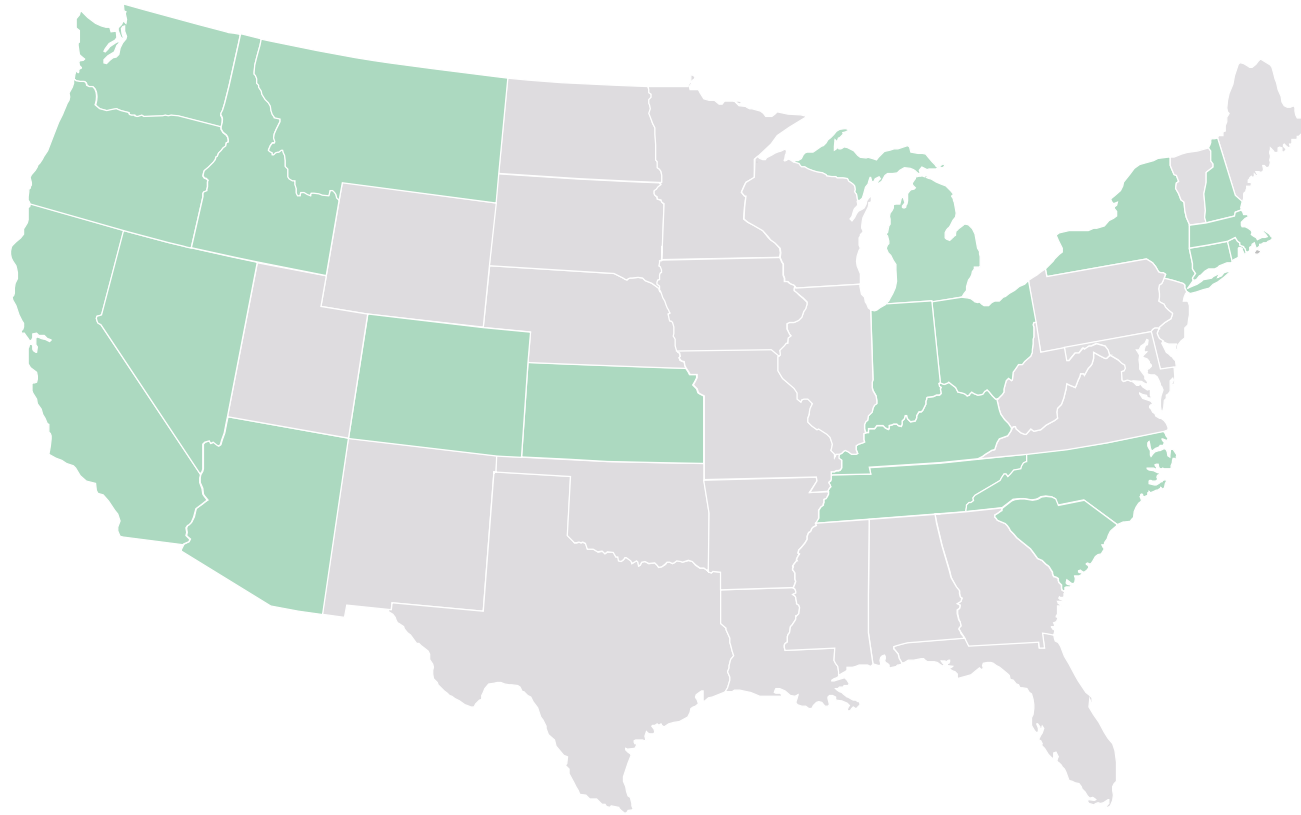
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About Our Work

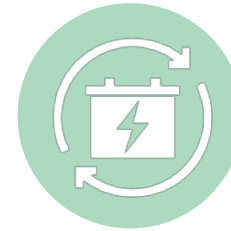
We have programs in 20 states across the country



Energy Efficiency



Policy and Ratings



**Distributed Energy
Resources**



**Intelligent Energy
Services**



EV Building Code Example: City of Oakland

Scenario	Full Circuit	Inaccessible Raceway Installed	Electric Panel Capacity
1 parking space	1 parking space	-	Able to supply 1 parking space
2-10 parking spaces	2 parking spaces	-	Able to supply 2 parking spaces
11-15 parking spaces	2 parking spaces	1 parking space	Able to supply 3 parking spaces
16-20+ parking spaces	2 parking spaces	2 parking spaces	Able to supply 4 parking spaces
21+ parking spaces	10% of parking spaces (rounded up)	Multi-Family Buildings: Remaining 90% of spaces Non-Res Buildings: Additional 10%*	Able to supply 20% of spaces**

*Inaccessible raceway includes raceway installed through walls, under concrete slabs or under asphalt, etc.

**Full circuits are counted towards panel capacity requirement