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INNOVATION  
CENTER

# Charging Forward

Pursuing public-private partnerships for electric bus base conversion

**Presented to**



intelligent transportation society of washington

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King County  
**METRO**

*Moving forward together*



CONSTRUCTION MANAGEMENT

# Introductions



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# Agenda



- Introduction to the research project and problem
- Overview of the research and key findings
- Q & A

# About the Mobility Innovation Center

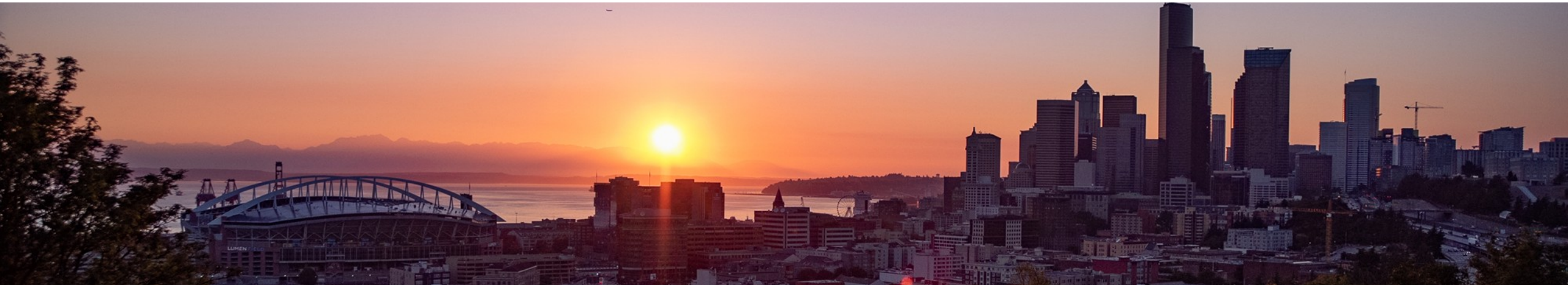


- Est. 2017 by Challenge Seattle in partnership with UW
- Challenge Seattle: Alliance of regional CEOs, led by Gov. Chris Gregoire
- Best of academia, public, private business, and non-profits to collectively address and solve mobility challenges



Photo courtesy: GeekWire, 2016

# The Mobility Innovation Center brings people together



Research to push boundaries, interdisciplinary approach



Near-term, practical projects (~6-12 months)



Partners at the table have a stake; “win-win”



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# Research into practice

- Public-private partnerships for innovative applied research
- Disrupt the traditional academic process, delivering results faster
- Research and practitioners working together

## CHARGING FORWARD

EVALUATING PUBLIC-PRIVATE PARTNERSHIPS FOR ELECTRIC BUS BASE CONVERSION TO SUPPORT A ZERO-EMISSION FLEET



King County METRO  
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DEPARTMENT OF CONSTRUCTION MANAGEMENT  
University of Washington

COMOTION  
From Transportation Planning



## 2022 SEATTLE COMMUTE SURVEY

City-Wide Report

Commuter Seattle



UNIVERSITY of WASHINGTON  
DEPARTMENT OF URBAN DESIGN AND PLANNING  
College of Built Environments



## KEEPING IT ON THE TRACKS

High-speed Rail Success and Lessons Learned



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# Bus Base Electrification



Is a public-private partnership (P3) an option?



Who else in the industry is doing this? What's working?



Best practices for contract development and procurement.



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# The problem

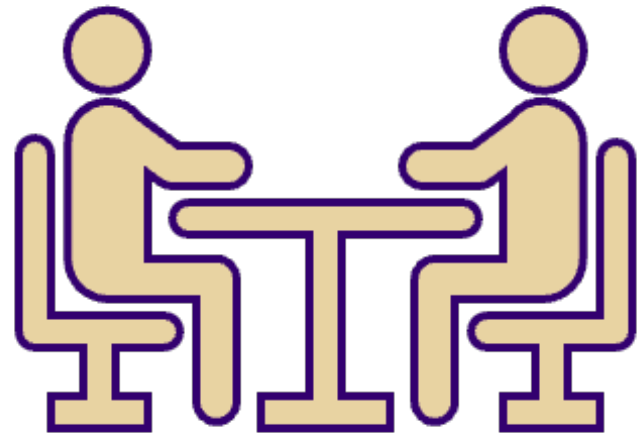
- Many transit agencies need to transition to BEBs within the next 10-20 years.
- Conflicting transit and utility schedules.
- BEB facility infrastructure is high-risk for CapEx and OpEx.
- Few expertise with high-voltage infrastructure.





# What is a P3?

- Long-term contractual relationship between a private and public entity.
- Involves private financing.
- Private partner can provide performance guarantees.
- Private entity bears significant risk.



# Type of P3s in BEB Facility Projects

- Contractual period is usually 10-25 years.
- Energy-as-a-Service (EaaS) and Charging-as-a-Service (CaaS) models.
  - Recurring subscription to energy/charging services without having to make upfront capital investment
- P3s for multi-use facilities (e.g., BEB facility with low-income housing).



# Research objectives

1. Policy: Can KCM Use a P3?
2. Decision-making criteria: Determining when to use a P3
3. Best Practices: How to have a successful P3 RFP for BEB transit facility projects
  - a. Decision-making framework
  - b. Screening tool
  - c. RFP best practice guidelines
4. Application: KCM Case Study






# Methods

1. Policy: Policy and literature review
2. Decision-making: Interviews, Case studies
3. RFP process and best practices: Interviews, Case studies
4. Application to KCM: KCM Case Study through KCM document review and interviews



# P3 Case Studies

Transit Case	Contracting Method	Partner Contribution	Best Practice
 <p>ATN Claudina and Manchester Sites</p>	<p>Charging as a Service (CaaS) with Power-Purchase Agreement (PPA)</p>	<p>Purchase, installation, integration of microgrid and charging infrastructure.</p>	<ul style="list-style-type: none"> <li>- Early power modeling and utility engagement</li> <li>- Flexible procurement accommodating scope changes</li> </ul>
 <p>Brookville Smart Energy Bus Depot</p>	<p>Energy as a Service (EaaS) including CaaS</p>	<p>Design Build Finance Operate and Maintain (DBFOM) of canopy and electric charging equipment.</p>	<ul style="list-style-type: none"> <li>- Extensive stakeholder communication</li> <li>- Early utility and permitting authority engagement</li> </ul>
 <p>LA Metro East San Fernando Valley Light Rail Transit Line (solar component)</p>	<p>P3</p>	<p>DB with Phase III quasi-maintenance and operation.</p>	<ul style="list-style-type: none"> <li>- Use of a cost allocation matrix to clarify roles and risks</li> <li>- Comprehensive team evaluation process</li> </ul>

# Washington state policy for P3

1. WA state has P3 law (TIPP), but *barriers* due to its inefficient processes
2. WA alternate procurement Design-Build (DB) laws possible, but *barriers* because it only allows for experimental small-scale DB
3. IRS 63-20 (Alternative Project Delivery) used in past KCM projects, but *barriers* due to its specific restrictions
4. *Enabler*: Bill 1777 and updated ESCO laws with performance-based contracting specifically targeting EaaS

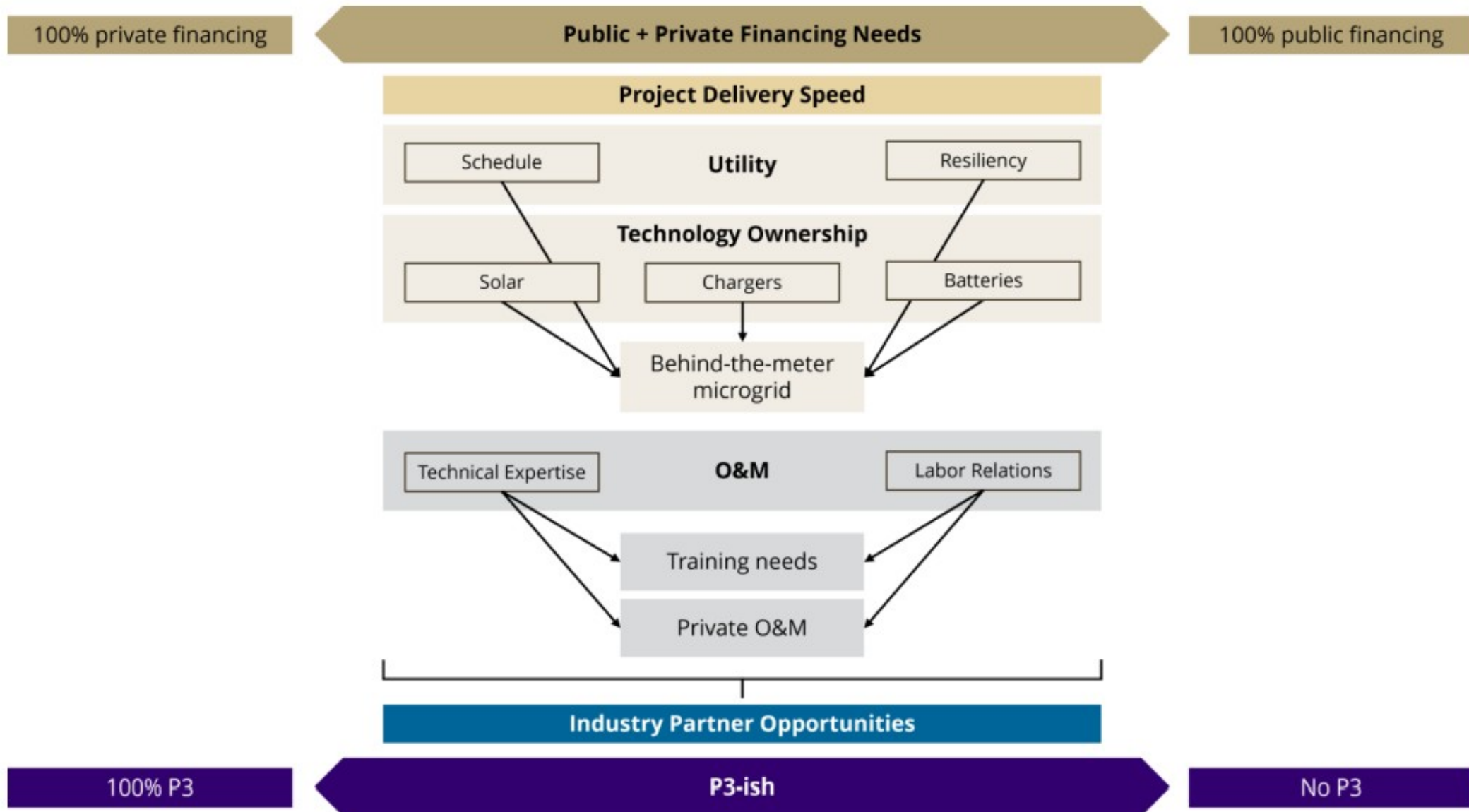
## New Bill Authorizes Energy as a Service (EaaS) Contracts for Energy Projects



Gov. Inslee signs House Bill No. 1777, May 04, 2023.

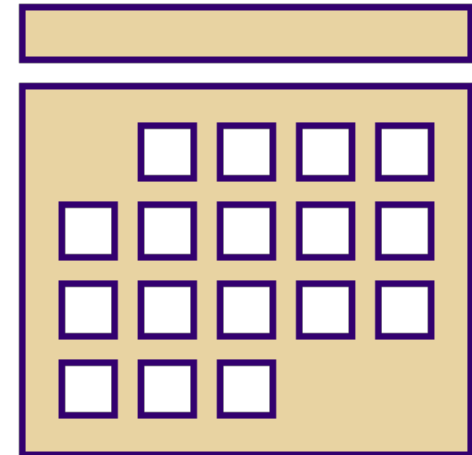


# P3 Decision-Making Framework



# [KCM Application] **Project Delivery Speed**

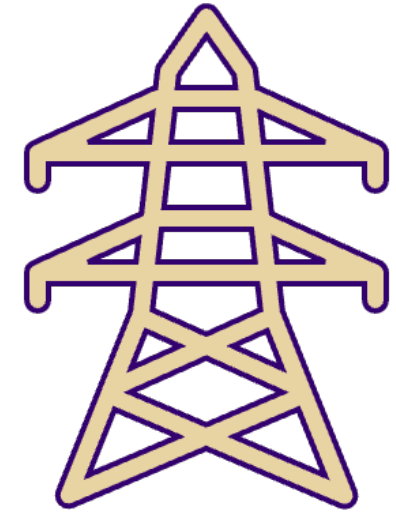
1. Evaluate construction timelines to consider if P3 is appropriate.
2. P3 could meet KCM's accelerated delivery schedule if procured under revised ESCO laws.
3. IRS rule 63-20 (Alternative Project Delivery) can be used with a non-profit entity led by the private partner.
  - Helpful if affordable housing is part of BEB facility development.





# [KCM Application] **Utility**

1. Grid improvement schedules must be considered with capital construction timelines, but currently mismatch with KCM's target timeline
2. Use of solar should and could provide additional resiliency.
3. P3 may be needed to design, build, and install a microgrid with battery storage to meet KCM needs in electrical demands and resiliency.



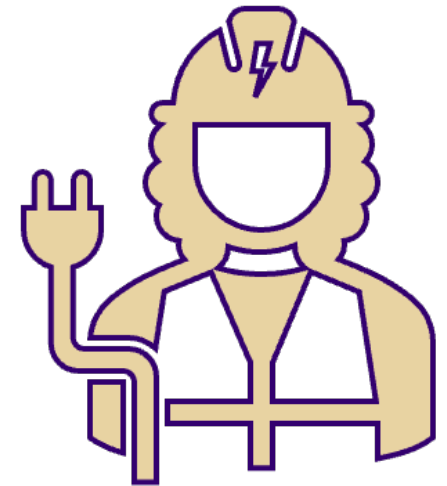
# [KCM Application] **Public and Private Financing Needs**

1. Rapid changes in BEB technology is a financial risk.
2. If a microgrid is used, utility will not own or maintain the system.
3. Private partner could take on risk and design, build, operate and maintain chargers, microgrid, and battery systems.



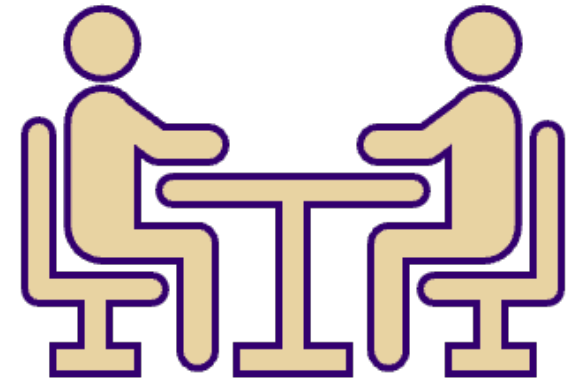
# [KCM Application] **Operations and Maintenance**

- KCM workforce relies on agreements with vendors for substantive repairs.
- KCM will need more vendors for O&M, including a microgrid.
- P3 can provide guaranteed uptime, 24/7 monitoring and operation of charge management systems (CMS), and other repairs.
- Agency and labor partners need to be able to negotiate agreeable conditions.
- KCM's equity and social justice (ESJ) may also drive P3 agreement requirements.



# [KCM Application] **Private Industry Case**

1. A P3 involving EaaS with a Power Purchase Agreement (PPA) would provide an industry partner with high risk, high return.
2. Win-win solution requires a private partner's understanding and agreement on KCM's labor agreements in order to find a profitable solution.



# P3 Screening Tool

## Project Delivery Speed

What is your schedule for completing a BEB facility project?

- Does your agency have a fixed timeline to make a facility operational?
  - Is there a public policy requiring fast speed to completion?
  - Is there a mandated due date to convert to all electric? If so, how soon is that due date?
- Do you need to expedite design and construction?

## Utility

### Schedule

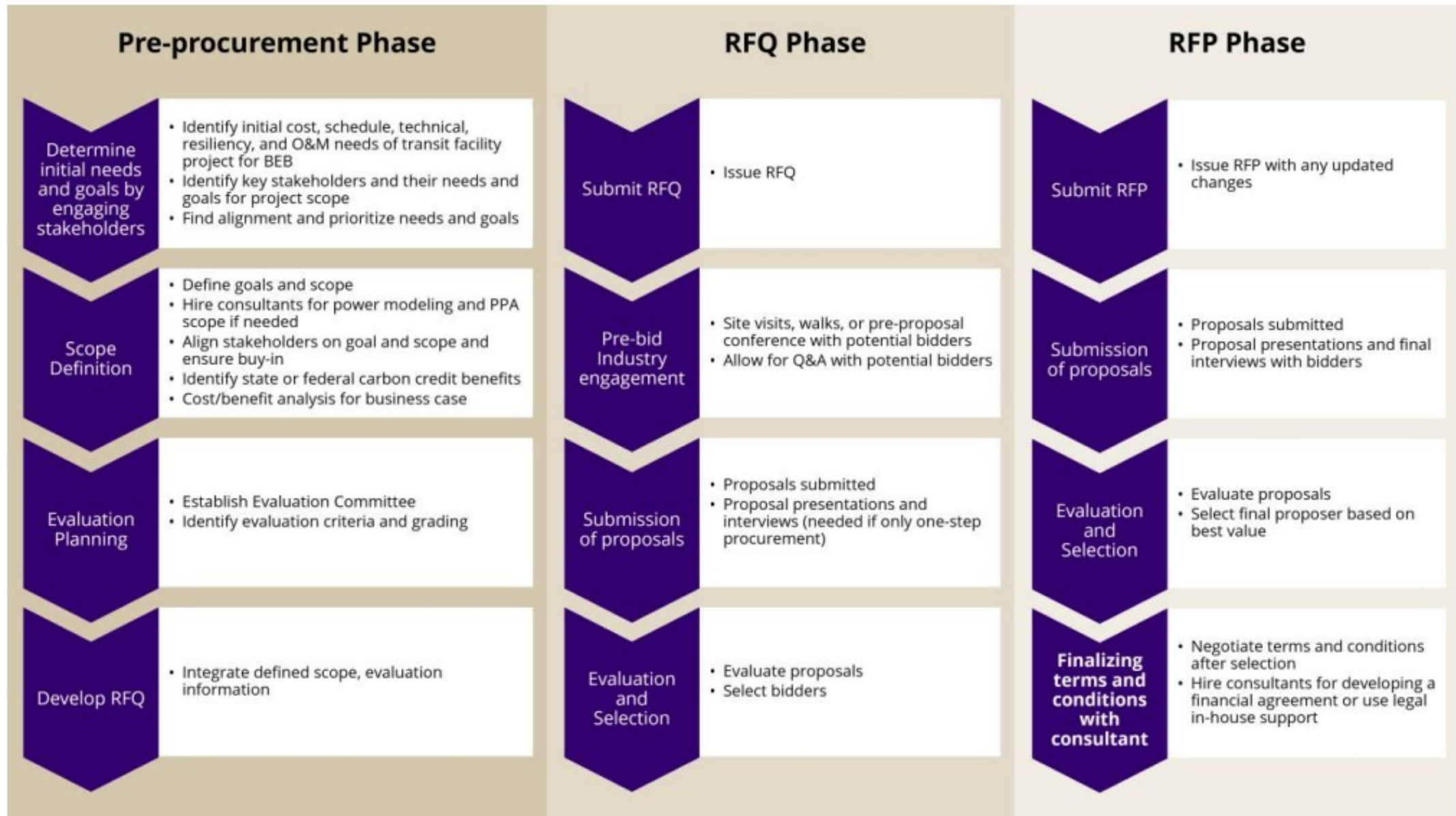
Can the utility meet the increased electrical demand needed?

- How much charging is needed on site?
- Is the current grid's capacity sufficient for forecasted operational requirements?
- If the capacity is not sufficient, will the utility be able to perform upgrades to achieve the needed demand?
- How long would the upgrades take?

Can the utility deliver a solution within your scheduled timeframe?

- Does your agency have a fixed timeline to make a facility operational?
- Will you need a microgrid to meet your agency's goals?

# P3 RFP Best Practice Guidelines



# Recommendations for Transit Agencies

1. Need for cultural change and process alignment.
2. Engagement with internal & external stakeholders, including managing workforce relations.
3. Social equity goals should be integrated into the RFP process.
4. Prepare for complexities



# Questions?



**Full report:** <https://bit.ly/UWMICP3Report>

