Fleet Strategy

Board Briefing
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Key Fleet Considerations

- Appropriate mix of...
  - service and capital
  - service types
  - diesel and electric
  - traditional and articulated
- 4th operations center
- Enhanced Transit Concept (ETC) partnership investments

...Great opportunity with complex delivery
Five year ramp up of new service – fastest that supply of mechanics and bus maintenance facility availability will allow.

...mechanics requirement of 50+ by FY2023
Key Service Impacts

FY2019 - FY2023 only:

• 11,500 additional weekly vehicle hours = +26%
• 135 additional buses = +21%
• 360 additional Bus Operators = +31%
• 52 additional Bus Mechanics = +37%

Scenario may vary with options for articulated and/or electric buses
## Current Bus Facility Capacity & Growth

<table>
<thead>
<tr>
<th></th>
<th>Current Maximum Yard Capacity</th>
<th>Yard Capacity During Powell Construction</th>
<th>Yard Capacity After Powell Construction Complete in 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center St</td>
<td>290</td>
<td>290</td>
<td>290</td>
</tr>
<tr>
<td>Powell</td>
<td>240 (includes 60’ articulated buses)</td>
<td>180</td>
<td>328</td>
</tr>
<tr>
<td>Merlo</td>
<td>270</td>
<td>270</td>
<td>270</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>800</strong></td>
<td><strong>710</strong></td>
<td><strong>858</strong></td>
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... Powell expansion helps

... Temporary and long-term facility space strategy underway
Buses and Facility Capacity
Base, Increment and HB 2017

Scenario projections for all-40’ bus fleet

Capacity for buses each period
Bus parking capacity shortfall before HB2017
Additional buses for HB2017

Need interim solution
Need 4th garage
“Ramp up” Service Concept

- **Capacity & Reliability**: 25% (30 buses)
- **More Frequency on existing lines**: 38% (24 buses)
- **New Frequent Service Lines**: 16% (21 buses)
- **New Lines**: 14% (22 buses)
- **Span - earlier & later service**: 3% (No additional buses needed)
- **Route Changes**: 4% (11 buses)
Electric Buses

- TriMet electrification review in final stages
  - Range of economic scenarios
  - Range of fleet/operating scenarios
- Initial takeaways include:
  - Slow Charge cheaper for capital and net costs
    - Facility space implications will add cost
  - Costs vary significantly across key scenarios
  - Battery improvements expected to extend operating range and add flexibility
Bus Electrification

• **Early Candidate lines:**
  - Focusing on shorter, less frequent lines or express services that could be fully electrified with available technology (examples include Lines 16, 62, 73, 87, 99)

• **Next Steps:**
  - Review results in detail
  - Refine cost assumptions and operating scenarios
  - Develop preferred approach and integrate with overall Fleet Strategy (Q1/2 2018)
Articulated Buses – Why?

- Overloaded trips need more capacity to carry more passengers
- Avoiding customer pass-ups
- Provide more capacity with less risk of bus bunching
- Cost-effective per passenger with high-ridership trips
- Drive more ridership
- Improved customer experience

... planning to add articulated buses to fleet within 3-4 years

... procurement strategy to be developed
Candidate Lines

• **Timing:**
  - At least 2 years
  - Individual lines need work at bus stops for access, which will impact timing and implementation

• **Top candidate lines:**
  - 72 – Killingsworth/82nd Ave
  - 12 – Sandy/Barbur Blvd
  - 15 – Belmont/NW 23rd
  - 9 – Powell Blvd
  - 14 – Hawthorne (and Foster)
  - 94 – Pacific Hwy/Sherwood

• **Fleet impact:**
  - Up to 128 articulated buses between FY2022-FY2025
  - Facility implications (bay redesign, overall capacity)
Electric Articulated Buses?

• Electric buses
  • Battery-powered available from at least one manufacturer now and more are considering
  • Overhead-wire electric buses run in Seattle and San Francisco, but high capital cost

• Hydrogen has long-term potential, but still too early
Potential Enhancements: Year 1

- FY 2019 proposed service improvements
- Electric buses running on pilot line
Potential Enhancements: Year 3

- More illustrative service improvements
- Electric buses running on additional lines
- Division Transit Project
- Articulated buses on one other line
Potential Enhancements: Year 5

- Even more illustrative service improvements
- Electric buses running on multiple lines
- Division Transit Project
- Articulated buses on more lines
LIFT Fleet Strategy

- 268 LIFT cut-aways, with 5 more added this year
- Opportunities to tailor fleet to need?
- Facility implications
  - “Deadhead” increases as population moves
- Current review of future demands
Beyond HB2017

Light Rail and Commuter Rail Fleet Strategies
Number of Light Rail Vehicles Over Time

- **1986-1997**: 10
- **1998-2004**: 30
- **2005-2008**: 50
- **2009-2014**: 70
- **2015-2020**: 90
- **2021-?**: 110

*Type 6 projection does not include any vehicles for Southwest Corridor operations*

- Need to Replace Type 1’s + add 8 LRV’s for Red Line + ? future growth*

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Type I Light Rail Vehicles

• Parts no longer available
• 26 high-floor cars with no ADA access, so have to be connected to another car to make an accessible train

…Time for replacement!
• Ruby Junction has no storage track, but has space to make room for vehicles needed for another project after Red Line
• Elmonica has no space for expansion
WES Commuter Rail

- Current fleet:
  - 4 DMU’s which began service in 2009
  - 2 retrofitted historic RDC’s (originally built in 1953)
- Retrofitting 2 more RDC cars for spares
- No expansion anticipated
Future Needs and Next Steps

• **Bus garage** – Near-term need, plus long-term addition
• **LIFT** – Fleet mix and location needs deeper review
• **Light rail yard** – Growth in demand, plus new projects
• **WES** – Continue to maintain current fleet

**Key Takeaway:**

*HB2017 requires significant organizational (and partner) attention in the near term*
Thank You