Mass Transit Modes: How They Fit

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Presentation Outline

1. Historical Development of Transit Modes
2. Typical Transit Mode Types (Where Streetcars Fit)
3. Common Operating Alignments
4. Approach to Planning
5. TransLink Rapid Transit Studies
6. Concluding Thoughts
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They are hard to catch...  
And one harder to get into safety.
But they are a great convenience.
The roof is generally a little low.
A hint to feminine passengers.
"Some me, mons!"
The safest way to get into them.
The safest way to leave them.
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6. Concluding Thoughts
Diverse range of urban transport technologies
Transit Mode Performance

- Mixed Traffic Bus
- Bus Rapid Transit
- Streetcar
- Light Rail
- Rail Rapid Transit
- Commuter/Regional Rail

Speed and Capacity
Bus Rapid Transit (BRT)

- Typically diesel. Hybrid, CNG and electric possible.
- Largely separated from other traffic – dedicated bus lanes or roads.
- Routes typically 5-20 km long.
- For urban arterials:
  - Headway: 2-10 minutes
  - Average speed: 30 km/h
  - Stops: 400m – 1.5 km apart
  - Moderate capacity: 2,000-3,000+ passengers/hour/direction
Bus Rapid Transit (BRT)
Bus Rapid Transit (BRT)
Bus Rapid Transit (BRT)
Bus Rapid Transit (BRT)
Bus Rapid Transit (BRT)
Light Rail Transit (LRT)

- Used extensively worldwide
- Typically Electrically powered
- Segregated or in-street
- Routes typically 10-30 km long
- Headway: 2-15 minutes
- Average speed: 25-40 km/h
- Stops: 400 – 1.5 km apart
- Moderate capacity: 6,000-10,000+ passengers/hour/direction
Light Rail Transit (LRT)
Light Rail Transit (LRT)
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Light Rail Transit (LRT)
Light Rail Transit (LRT)
Light Rail Transit (LRT)
Streetcar: part of the LRT family

- LRT technology in a “lighter” application:
  - Lower capacity
  - Lower speeds
    - More frequent stops
    - Less priority over other traffic
  - Less intense infrastructure
    - Track, stations, power, etc.

Modern Streetcar – Seattle, WA
Streetcar: part of the LRT family
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Streetcar: part of the LRT family
Rail Rapid Transit (RRT)

- SkyTrain, Canada Line; subways & metros worldwide
- Electrically powered; usually by 3rd rail
- Segregated from traffic
- Automated or driver-operated
- Routes typically 10-30 km long
- Headway: 1.5 - 10 minutes
- Average speed: 40 km/h
- Stops: 800 m - 2.5 km apart
- High capacity: 10,000 – 25,000+ passengers/hour/direction
Rail Rapid Transit (RRT)
Rail Rapid Transit (RRT)
Regional (Commuter) Rail Transit

- Used extensively worldwide
- Electrically or diesel powered
- Typically segregated on existing railway right of way
- Routes typically 30-70 km long
- Headway: 10-120 minutes
- Average speed: 70 km/h
- Stops: 5-10 km apart
- Variable capacity: 2000-8000+ passengers/hour/direction

UBC Line Rapid Transit Study
Regional (Commuter) Rail Transit
80,000 daily trips along Broadway, and 51,000 daily trips to UBC
West Coast Express – Vancouver, BC
Regional (Commuter) Rail Transit
Regional (Commuter) Rail Transit
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## Summary: Alignment Compatibility

<table>
<thead>
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<th>Mode</th>
<th>In-street reserved lane</th>
<th>Physically reserved in-street</th>
<th>Private at-grade right-of-way</th>
<th>Elevated</th>
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<tr>
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<tr>
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<td>🟥</td>
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</tbody>
</table>

**Legend:**
- 🟢: Compatible
- 🟢: Challenging
- 🟥: Incompatible
Reserved In-street
Fully Segregated
Summary: Speed and Capacity

- **Regional/Commuter Rail**
- **Rail Rapid**
- **LRT**
- **Streetcar**
- **Bus**

Speed vs. Capacity chart showing the overlap in performance characteristics of different transportation modes.
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How to identify the ‘right’ technology?
Alternatives Analysis
**SCOPE OF ANALYSIS**

In the initial phases of the study, many alternatives are subject to a high-level analysis.

- **high-level analysis**
- **many alternatives**
- **high-level design and detailed analysis**
- **shortlist alternatives**
- **preferred alternative**

As the study progresses, the number of alternatives reduces as the level of analysis increases.
Multiple Account Evaluation

- Economic development
- Environmental
- Financial
- Social community
- Transportation
- Urban development
- Deliverability
Approach to Planning
Approach to Planning
Approach to Planning
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A collaborative approach

Study Partners

Municipal Governments
Metro Vancouver
UBC
University Endowment Lands
UBC Line Rapid Transit Study

- Regionally important corridor: connects major population, employment and institutional centres
- Central Broadway and UBC are the largest transit destinations outside downtown
- Busiest bus corridor in North America
- Service reaching capacity, growing demand
- Priority for rapid transit expansion (Transport 2040, Provincial Transit Plan)
UBC Line Study: Timeline

**Phase 1**
- Identify shortlist alternatives
- Summer 2009 – Spring 2010

**Phase 2**
- Design development
- Evaluate the alternatives
- Spring 2010 – Early 2011

**Phase 3**
- Develop the design, phasing and implementation timeline
- To be determined

*Stakeholder consultation*

*Public consultation*
Surrey Rapid Transit Study

- Area of rapid growth
- Significant opportunity to shape transit-supportive land use
- Identified as a priority in past plans

Study will:

- Identify and evaluate a range of technology and alignment network alternatives on several corridors
- Identify a preferred network alternative
Surrey Rapid Transit Study: Timeline

WINTER 2010–LATE SUMMER 2010

Phase 1
Identify shortlist alternatives

FALL 2010 – EARLY 2011

Phase 2
Develop the design and Evaluate the alternatives

TO BE DETERMINED

Phase 3
Design the preferred alternative, phasing and implementation timeline

Stakeholder consultation

Public consultation
Rapid Transit Studies

Network Sub-studies

- UBC Line
  - Alternatives Analysis Phases 1 and 2
- Surrey Rapid Transit
  - Project Set-up undertaken through Network Review/RFP
  - Alternatives Analysis Phases 1 and 2
- Expo Line Upgrade Strategy
  - Project Development and Implementation
- Other Studies TBD by Strategic Network Review

Regional Rapid Transit Plan
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Concluding Thoughts

- The streetcar is one of a family of transit modes very closely related to Light Rail Transit.

- Performance is largely a function of operating environment.

- Transit mode choices are based on a range of locally specific criteria.

- Alternatives analyses consist of public input and a systematic approach to recommend transportation solutions that support goals and objectives.
Bus, BRT, LRT or Streetcar?
Thank you.

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