ART and BRT Systems

Summary of the Modes and
Observations from the Pacific Northwest

ART

Arterial Rapid Transit

Features
- Queue Jump Lanes at Select Intersections
- Transit Signal Priority
- Enhanced Stops with Next Bus Information
- Limited Off-Board Fare Collection
- Potential Level Boarding
- Frequent

(Top) Vancouver, WA; (Bottom) Seattle, WA

BRT

Bus Rapid Transit

Features
- (Mostly) Dedicated Transitway
- Traffic Signal Preemption
- Defined Stations with Next Bus Information
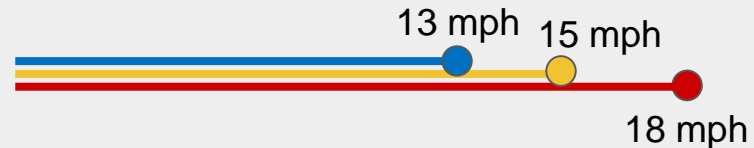- Off-Board Fare Collection
- Level Boarding
- Frequent

Eugene, OR

Service

Our goal is to provide **fast**, *frequent*, and *reliable* service

How *fast* do you want to move?

Local Bus moves 1 mile every **5 min**

ART moves 1 mile about *every* **4 min**

BRT moves 1 mile about *every* **3 min**
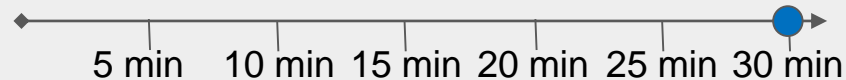
13 mph 15 mph
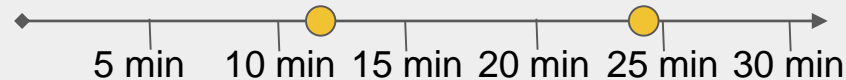
18 mph

Service

Our goal is to provide *fast*, *frequent*, and *reliable* service

How *long* are you willing to wait for a vehicle?

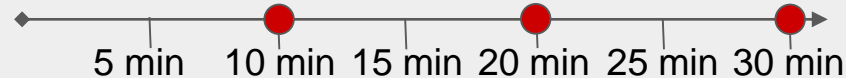**Local Bus** runs *every **15-60 min***

5 min   10 min 15 min 20 min 25 min 30 min

ART runs about *every **12 min***

5 min   10 min 15 min 20 min 25 min 30 min

BRT runs about *every **10 min***

5 min   10 min 15 min 20 min 25 min 30 min

Service

Our goal is to provide *fast*, *frequent*, and **reliable** service

How *consistent* do you want your travel time to be?

Local Bus runs *in traffic*

ART runs with improvements at strategic intersections to *beat traffic*
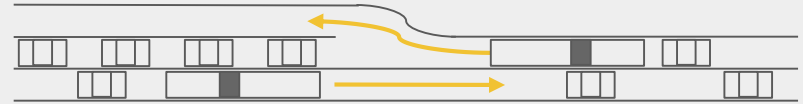
BRT runs with corridor improvements to *keep out of traffic*
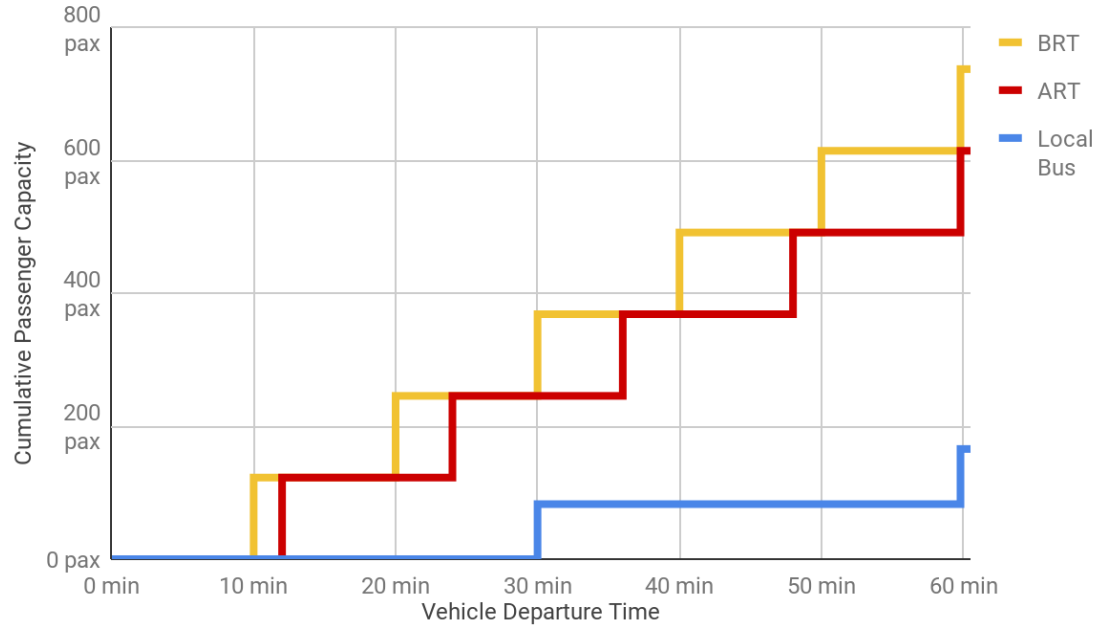
Supply and Demand

Capacity of Service

Local Bus = ~150 riders/hr →
~2,700 riders/day

ART = ~600 riders/hr →
~10,800 riders/day

BRT = ~750 riders/hr →
~13,500 riders/day

For context, Route 39 on Buford Hwy, the busiest route in the system, serves ~6,000 riders/day

Capacity of Service Concept by Mode

Mode Benefits Comparison

	Service			
	Speed	Frequency	Reliability	Capacity
Local Bus	1x	1x	1x	1x
ART	1.2x	2x	1.5x	1x
BRT	**1.4x**	**3x**	**2x**	**1.5x**

Local Bus = **no** service improvements

ART = **low-med** service improvements

BRT = **high** service improvements

Mode Cost Comparison

	Capital Cost			Operating Cost
	Route Cost	Vehicle Cost	Station Cost	O&M Cost
Local Bus	0x	1x	1x	1x
ART	2.5x	1.3x	10x	1.2x
BRT	25x	1.6x	20x	1.3x

Local Bus = **low** upfront cost, **low** on-going cost

ART = **low-med** upfront cost, **low** on-going cost

BRT = **high** upfront cost, **low** on-going cost
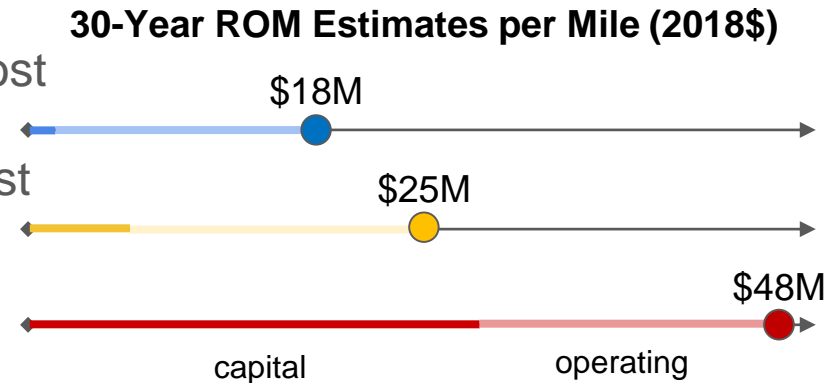
30-Year ROM Estimates per Mile (2018$)

$18M
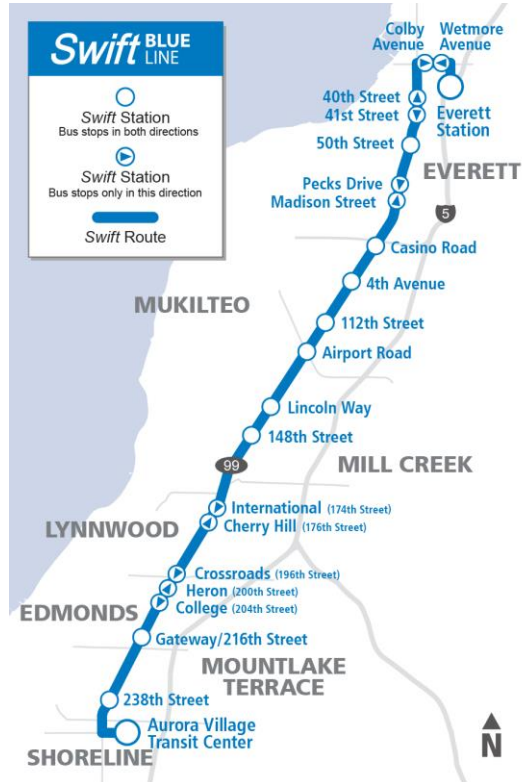
$25M

$48M

capital   operating

ART in the Pacific Northwest

Everett, WA
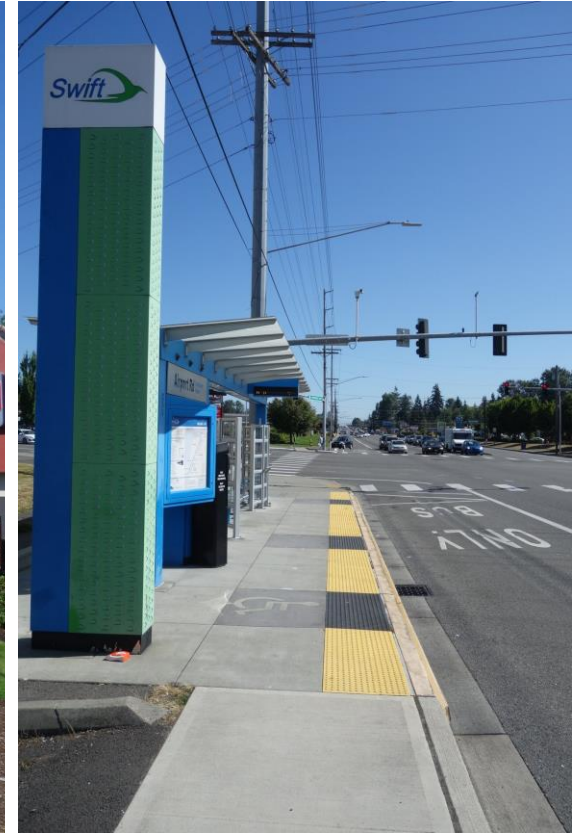
The Swift

Profile

► 17-mile corridor using curbside GP lane, partial BAT lane

► Limited Transit Signal Priority

► 33 defined stations, about 1 per mile in each direction

► No Level Boarding

► 12 min service on weekdays

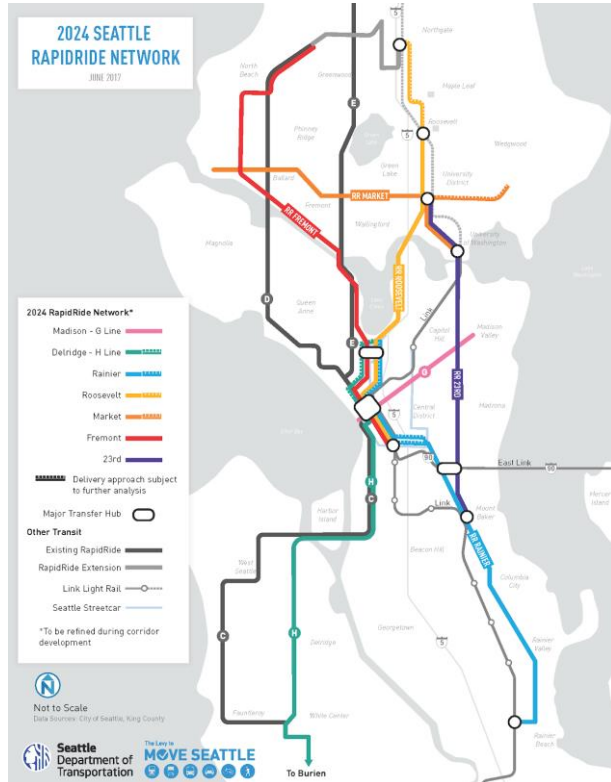► 20 min service on nights, weekends

Business Access and Transit (BAT) Lane
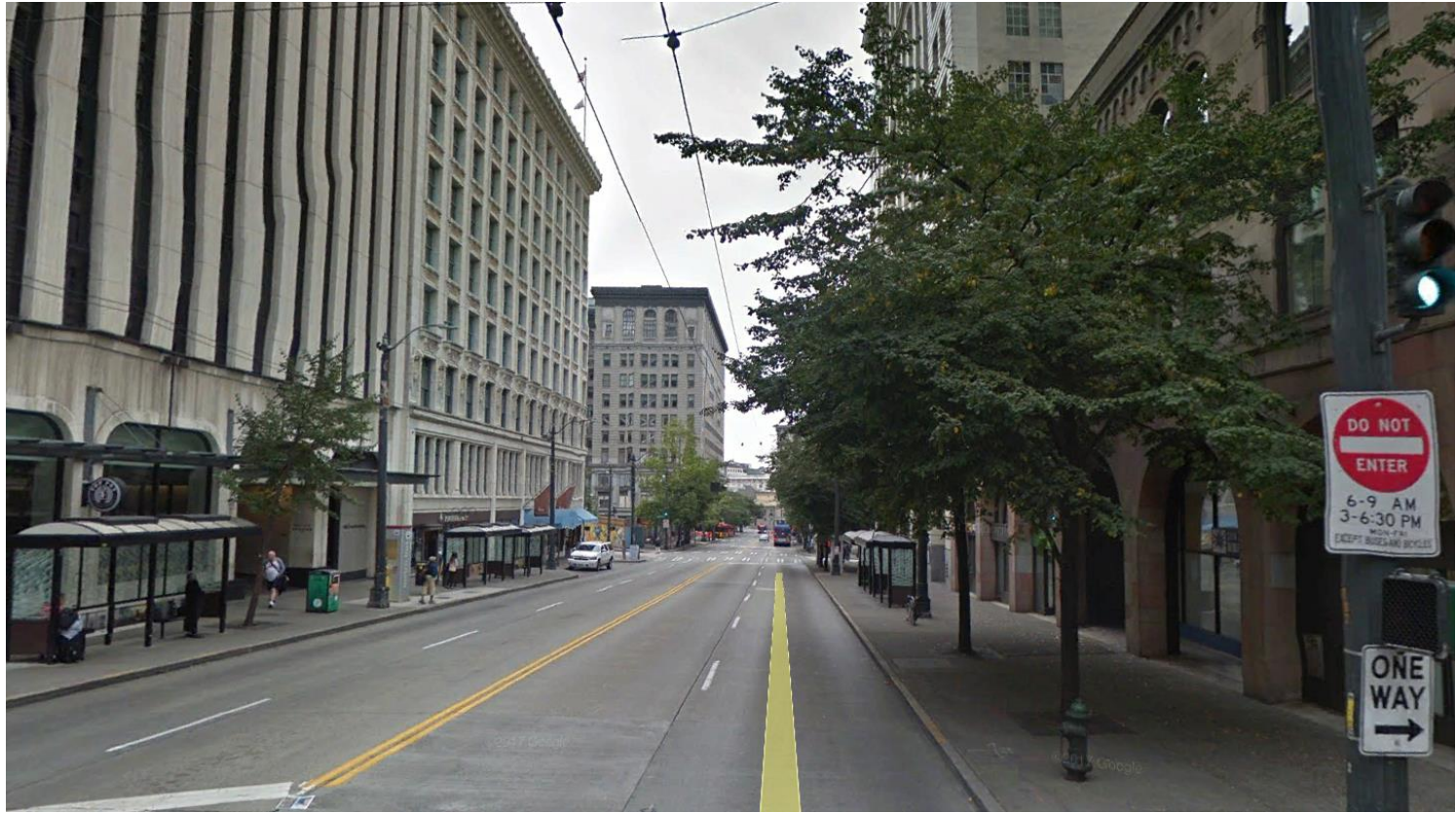
Transit Center

RapidRide

Seattle, WA

RapidRide

Profile

► Multiple corridors using curbside GP lanes, limited BAT and exclusive lanes downtown

► Limited Transit Signal Priority

► Stops have 3 levels of infrastructure

► No level boarding
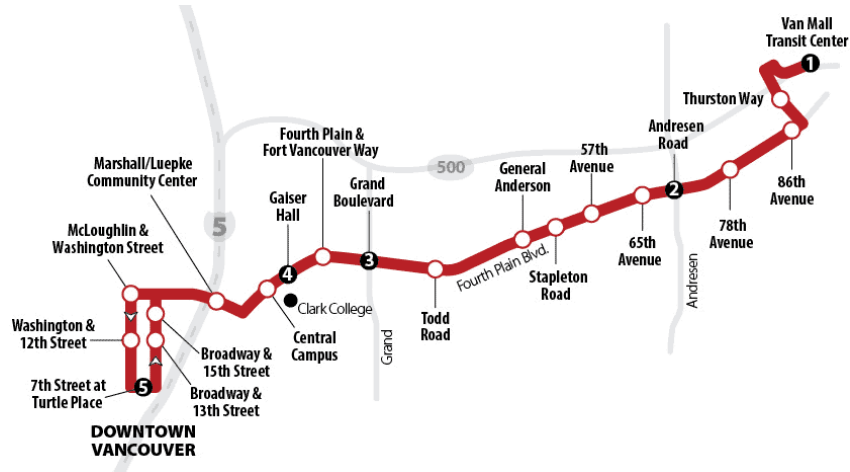
► 10 min peak service

► 15 min off-peak service

Downtown Peak Hour Bus Corridor

Transit Center

Vancouver, WA

The Vine

Profile

► 12-mile corridor using curbside GP lane

► 2 Queue Jumps w/o TSP overlay

► 34 defined stations, inconsistent distances

► Level Boarding

► 10 min service on weekdays

► 15 min service on nights, weekends

Queue Jump

Downtown End of Line (EOL)

Level Boarding

BRT in the Pacific Northwest

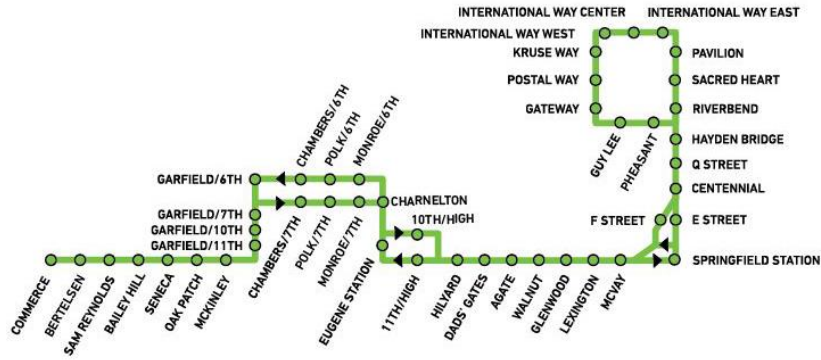**Eugene, OR**

Emerald Express (EmX)

Profile

► 24-mile corridor using exclusive lane, BAT lane, GP lane

► Traffic Signal Preemption

► 52 defined stations, about 1 per ½ mile in each direction

► Level Boarding

► 12 min service on weekdays

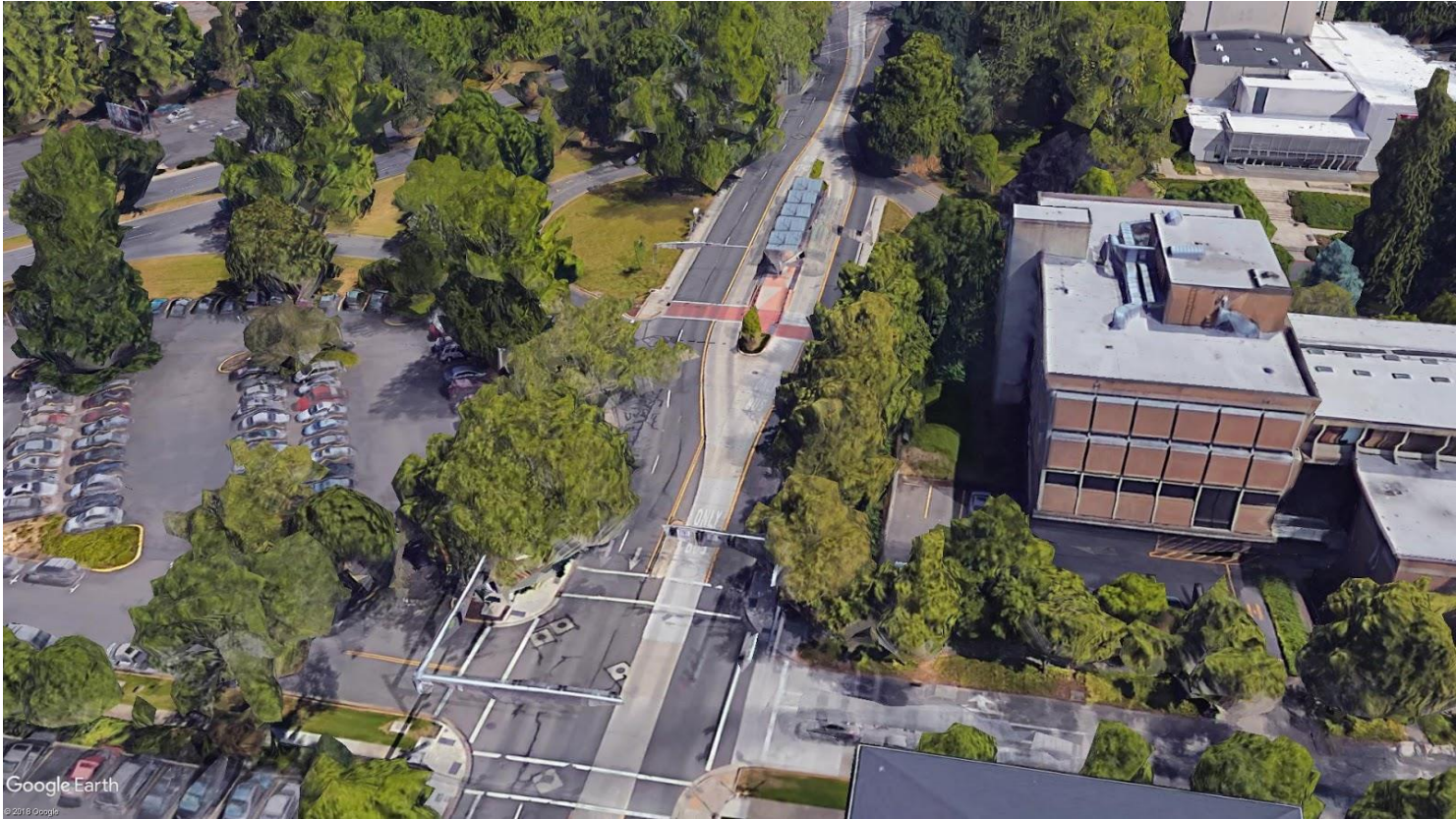► 20 min service on nights, weekends

Median, One-Way Lanes

Transition to Median, Bi-Directional Lane

Median, Bi-Directional Lane

Big Lessons Learned

Avoid "BRT Creep" like it's a festering disease

► Call it what it is, of the three agencies with ART, only RapidRide was not branded as "BRT"

Understand expectations are for *fast*, *frequent*, and *reliable* service

► Fast is a function of the infrastructure:
  – Bus-only lanes (minimize traffic conflict and congestion delay)
  – TSP systems (minimize intersection delay)
  – Station TVMs and level station platforms (minimize boarding delay)
► Frequent is a function of the schedule
► Reliable is an inter-related function of the infrastructure, the schedule, and the operator

Use station amenities to improve perceptions of service

► Amenities reduce transfer and wait time penalties (makes waiting easier)

Questions

► Christopher Silveira
► csilveira@itsmarta.com
► 404-848-5252