For more than 100 years, we’ve partnered with our clients to shape communities and push the boundaries of what’s possible.

With nearly 10,000 professionals in more than 200 offices around the world, we think global and act local.
Our Experience

HDR’s transit specialists have completed projects across North America.
BRT fits within the middle segment of the transit system continuum.

- Ride Share (Uber, Lyft)
- Taxi
- Paratransit
- Bus (feeder, crosstown, mainline)
- Express Bus
- Streetcar / Tram (mixed traffic)
- **Bus Rapid Transit (mixed traffic, exclusive right of way / transitway)**
- Light Rail Transit (mixed traffic, exclusive right of way)
- Metro Rail / Subway
- Commuter Rail
- High Speed Rail
What is BRT?

Bus Rapid Transit is a **rubber tired bus** based transit system

It improves travel **speed, reliability, and customer capacity** and **experience** through enhancements to BRT elements.

BRT may be implemented in phases or at a scale to match passenger demand and funding availability.
BRT Project Components

- Runningways
- Stations
- Vehicles
- Branding
- Fare Collection
- Transit Priority Measures
- Passenger Information Systems
BRT Project Components

Traffic Analysis and Micro-simulation Modelling

Roadway Design

Traffic Signal Design
BRT System Benefits

- **Reduced** Bus Travel Time
- **Improved** Reliability
- **Enhanced** Customer Experience
- **Improved** Network Connectivity
The Role of BRT in Calgary

Calgary’s transit projects are part of a planning framework.

Source: The City of Calgary
The Role of BRT in Calgary

RouteAhead (2013) Core Principles for Transit in Calgary

**Customer Experience**
- Make it easy to use.
- Safe, accessible, clean, convenient, comfortable and reliable.
- Address barriers to use for non-users.

**Network Planning**
- Match transit to land use.
- Focus investment on increasing ridership.
- Evolve from radial network to connective grid.

**Financing Transit**
- Meet near-term revenue/cost ratio (50/50 to 55/45).
- Meet capital funding objectives of Investing in Mobility.
- Take care of and optimize use of what we own.

Source: The City of Calgary
The Role of BRT in Calgary

GreenTRIP Rapid Transit Corridors

Source: The City of Calgary
Implementation of BRT

Planning

Design

Construction
Existing Conditions

- Route and Station Options
- Land Use and Development
- City Owned Land
- Road Network
- Transit Connectivity
- Auto and Bus Travel Time
- Intersection Analysis
- Corridor VISSIM Microsimulation
- Transit Priority Measures
- Active Transportation
- Road Safety Audit
Transit Priority Toolbox

Transitways

Geometric Priority Measures - Runningway Priority

Geometric Priority Measures - Intersection Priority

Station Priority Measures

Regulatory Measures

Signal Priority
Functional Plan

- Route, Runningway, Stations
- Service Plan
- Transit Priority
- Station Design
- Pavement Structure
- Sidewalk/Pathway Connectivity
- Cost Estimate
- Value Engineering
- Functional Plan Drawings
Design

- Preliminary Design
- Survey
- Station Design
- Roadway Design
- Traffic Signal Plan
- Stormwater/Drainage
- Utilities
- Detailed Design
Construction Activities

- Tender Services
- Construction Administration
- Construction Supervision
BRT projects are linear infrastructure with many discrete sites over long routes.

These sites include a range of construction activities:
- Station areas
- Pathways/sidewalks
- Roadworks
- Intersection modifications
- Traffic signal modifications
Utility conflict identification and resolution

Construction Challenges
Construction Challenges

Power routing coordination

Providing power to station shelters and equipment requires running power from transformers that may be one or two blocks away in congested urban areas.

Electrical designs prepared long before ULA’s approved (and often adjusted) requiring design confirmations and contract adjustments.
Construction Challenges

Traffic signal modifications

These can be required due to TSP, Queue Jumps or geometric improvements.

As this can involve many dozens of intersections along BRT routes this work requires a long lead time.
Construction Challenges

Traffic Control
The many discrete sites along the route require lane closures for each stage of construction.
• Utilities
• Concrete slab
• Sidewalks/WCR’s
• Roadworks
• Shelters
Routes are typically on the busiest roads and require off-peak work and frequent set-ups and take-downs.
Procurement

Considerations:

• Single or Multiple projects (by route or type of work)
• Earlyworks projects (e.g. utilities) or single project delivery
• Design-Bid-Build or Construction Management
Project Completion

MAP

- MAX Orange
  - Major Destinations include University of Calgary, Foothills Medical Centre, Alberta Children's Hospital, and SAIT
- MAX Teal
  - Major Destinations include Mount Royal University, Rockyview General Hospital, Heritage Park and Deerfoot Meadows.
- Brentwood LRT Station
- Saddletowne LRT Station
- Westbrook LRT Station
- Douglas Glen Park and Ride
MAX Teal and MAX Orange
Opened in November 2018
Q&A