





CONFEDERATION LINE: OTTAWA LIGHT RAIL TRANSIT PROJECT

TUNNEY'S PASTURE TO BLAIR









AGENDA & TEAM MEMBER INTRODUCTION





Agenda

- 1.Introduction to RTG
- 2. Ottawa and RTG: Partners in a World Class Project
- 3. Ottawa's Confederation Line
 - Confederation Line Route
 - Vehicles
 - Maintenance and Storage Facility
 - Stations
- 4. Summary and Closing Comments









Finance





Finance

Design & Build





Finance

Design & Build

Maintenance





Finance







Design & Build







Maintenance













Finance







Design & Build







Maintenance





SNC·LAVALIN O&M



ALSTOM THALES





Finance







Design & Build







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ALSTOM THALES











World Class Expertise & Local knowledge





World Class Expertise & Local knowledge



- More than 80 largescale transportation projects
- More than \$13 billion in work in North America in the last three years
- More than 1,360 km of tunnel
- More than 2,500 km of rail/mass transit projects



ACS – Dragados

'Metro de Sevilla S.C.J.A, S.A. contributes each day to improving the mobility of the citizens of Seville, operating and maintaining Metro Line 1 following the highest quality standards. The construction works were completed in November 2009 during which Metro de Sevilla managed carefully and diligently any disruption on the citizens of Seville'

Andalucía Public Works Agency

ACS Group owns 34% of Metro de Sevilla S.C.J.A, S.A.





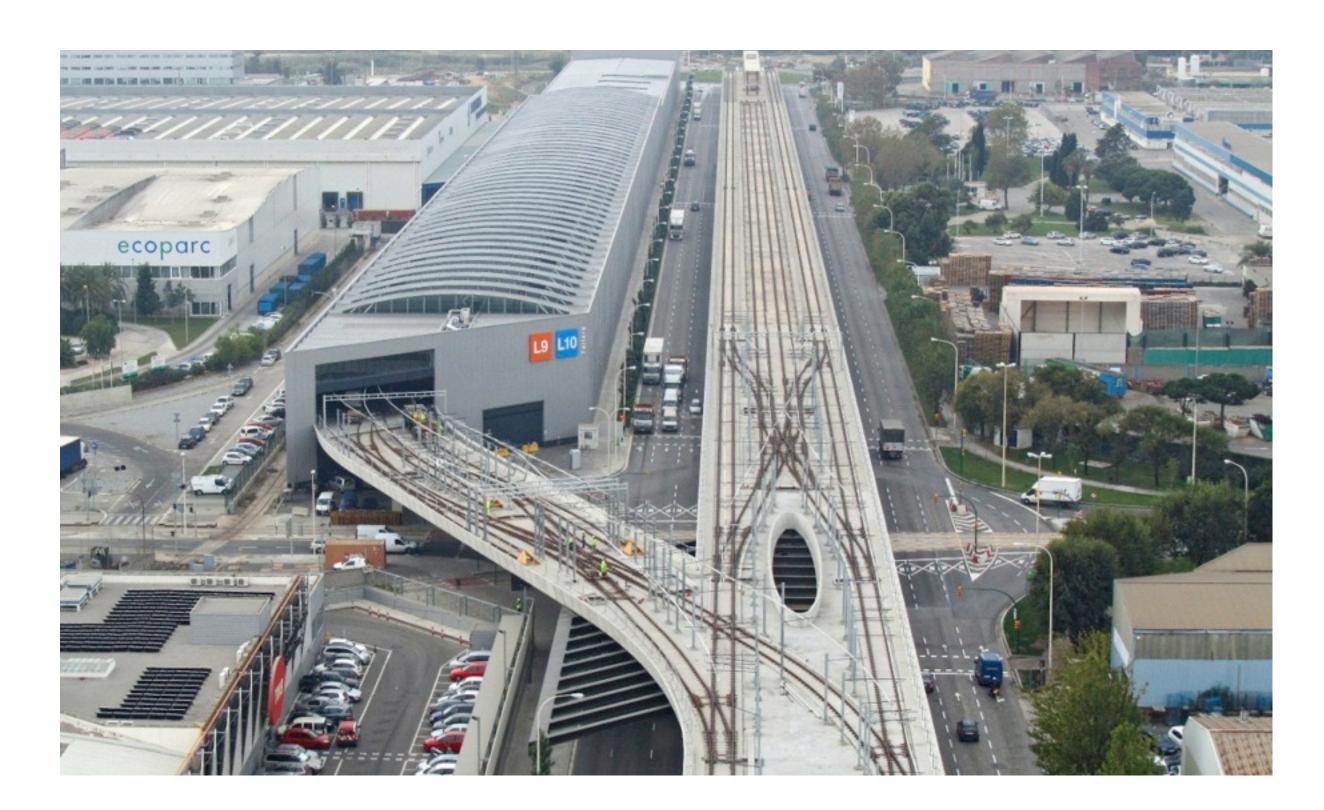




ACS – Dragados

'Barcelona Line 9 (a 48-km urban tunnel with 52 underground stations) is a clear example of successful partnership between the public and private sectors for the development of major transport infrastructures, which has resulted in **the highest standards for construction and maintenance of the line**'.

Joan Lluís Quer. Chairman. Infrastructures Catalunya. Catalan Regional Government. ACS owns 50% of Línea 9 Tramo 4 S.A. and Línea 9 Tramo 2 S.A





ACS - Dragados



'In 2009 TPFerro completed successfully and on time the construction works of one of the most challenging and sophisticated international railway projects. Since then TP Ferro has been acting as infrastructure manager of this binational high speed connection between Figueras and Perpignan in coordination with the infrastructure managers of the adjacent networks in France and Spain. This is a clear example of true partnership between the private sector and the public sector of both countries".

Manuel Niño. Railways Director General. Ministry of Transport. Government of Spain

ACS owns 50% of TP Ferro



SNC-Lavalin

'The West LRT line is a shining example of our government's commitment to connecting residents with the people and services important to them, and to supporting municipalities as they plan for the future' – Alison Redford, Premier of Alberta, December 10, 2012





SNC-Lavalin



'Certainly it was the SkyTrain and Canada Line that did most of the heavy lifting for the Games.' – Brian Lewis, The Province, February 28, 2010



SNC-Lavalin

'... as Canada's first and only fixed link between a city and a major airport, the Canada Line is now one of Vancouver's best assets.' – Lori Knowles, The Sudbury Star, February 27, 2010





EllisDon

'EllisDon found itself in a unique situation of having to deal with four levels of ownership: GO Transit as well as the City of Toronto, CN Rail and the Toronto Transit Commission. The staff at EllisDon were extremely helpful in dealing with all four parties, and their systems and procedures helped to streamline the process and successfully coordinate the approvals among all stakeholders.' - L.J. Keachie, Chief Engineer, Union Station Revitalization, Union Station Platform Improvements





EllisDon



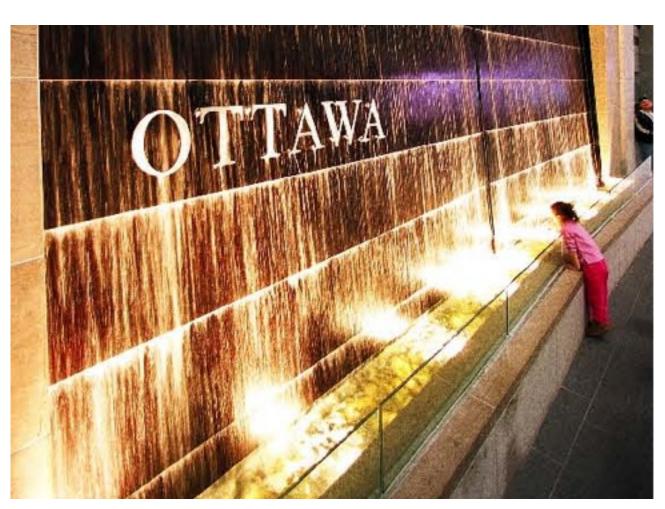
'Excellent. A very friendly, professional and cooperative team to work with.' - Stephen Choy, C.E.T, Senior Mechanical Designer, Morrison Hershfield | GTAA Automatic People Mover



EllisDon







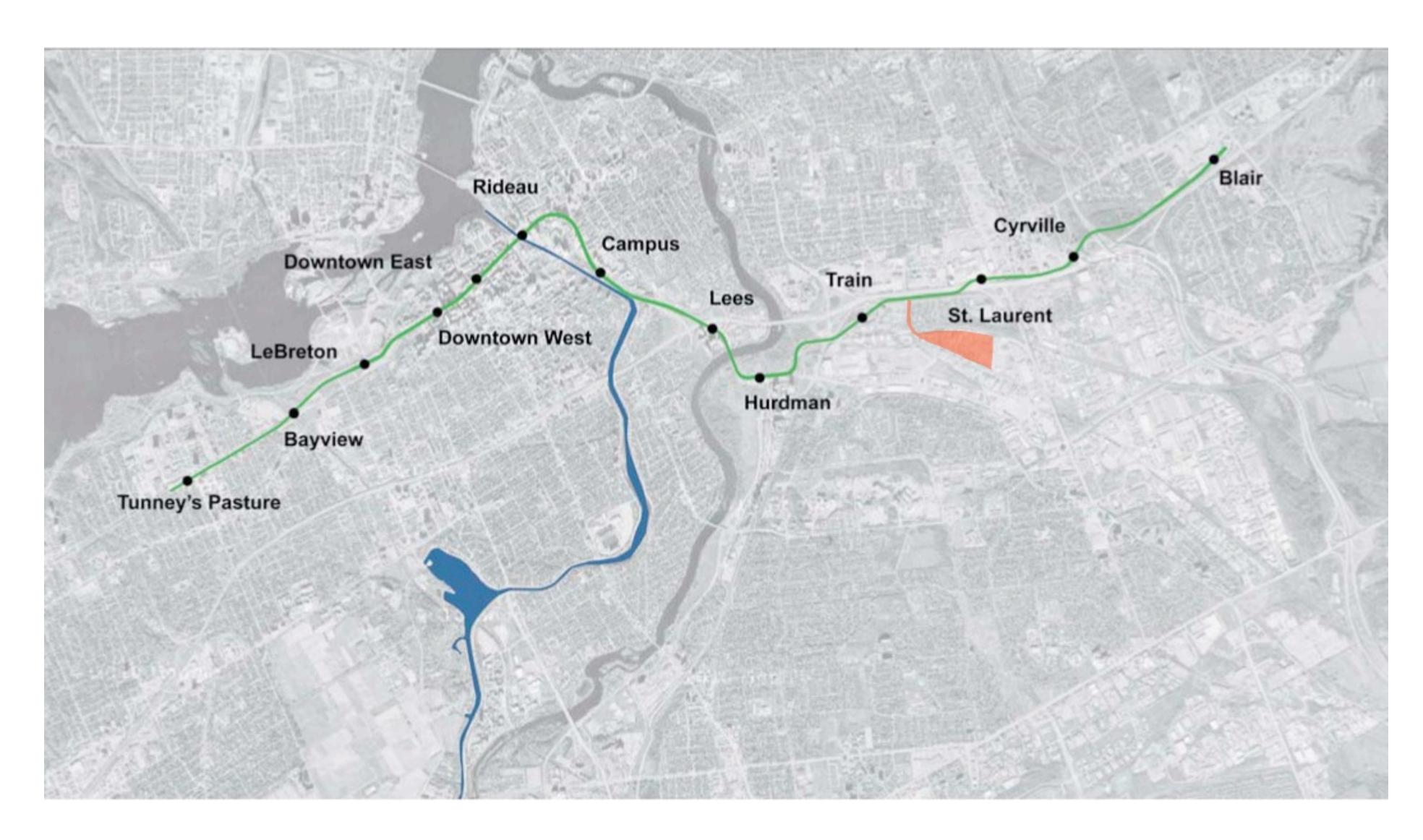




OTTAWA AND RTG: PARTNERS IN A WORLD CLASS PROJECT



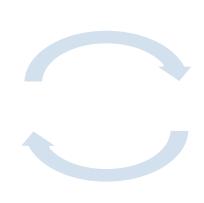
Ottawa and RTG





Approach to Ottawa's Confederation Line

Four Tier Design Approach

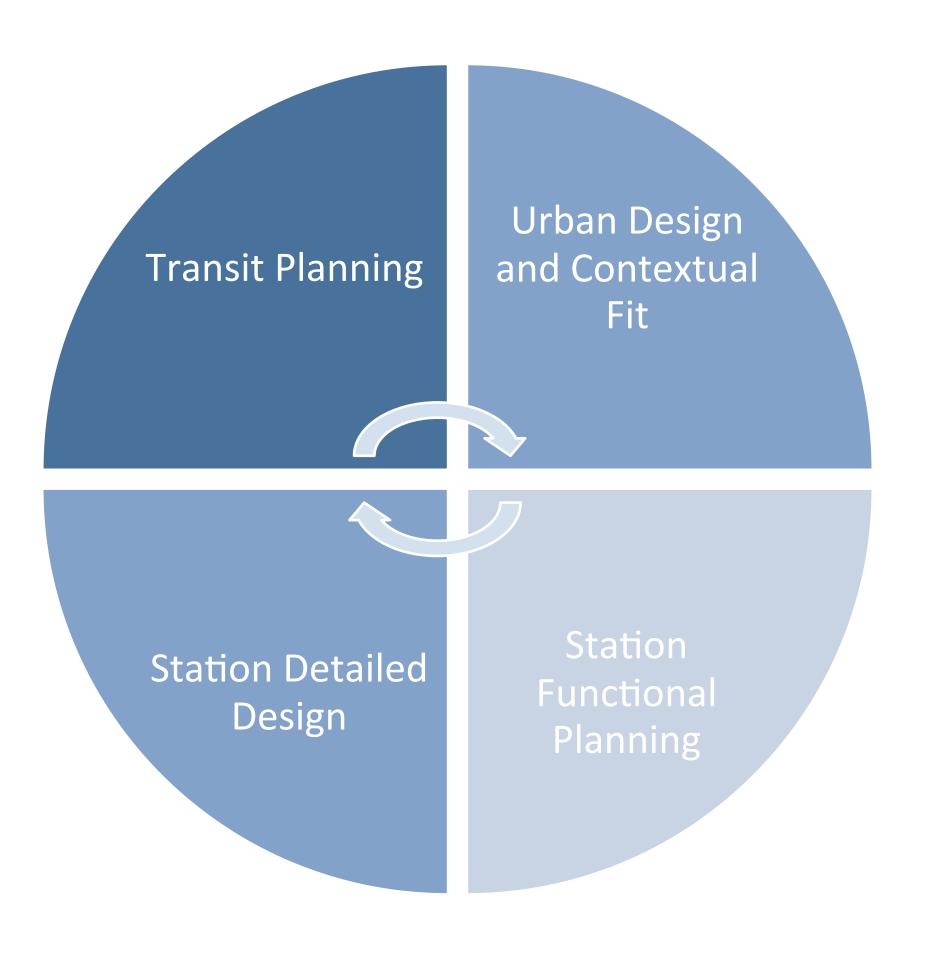


- Design based on ridership demand and contextual fit
- Optimized platform sizing to suit all scenarios including ultimate
- Developed iconic architecture with consistent identity
- Stations optimized for full range of activities



Approach to Ottawa's Confederation Line

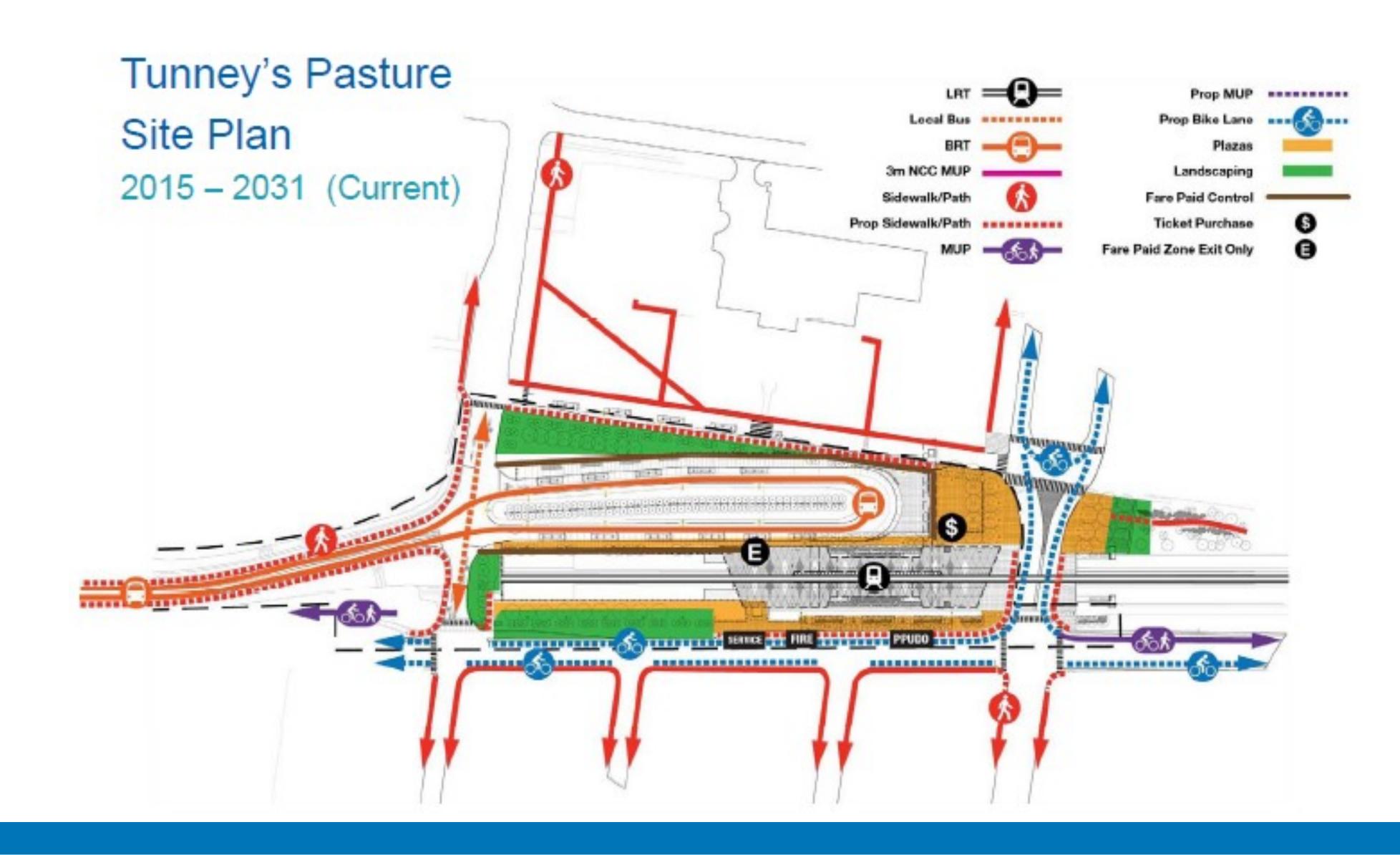
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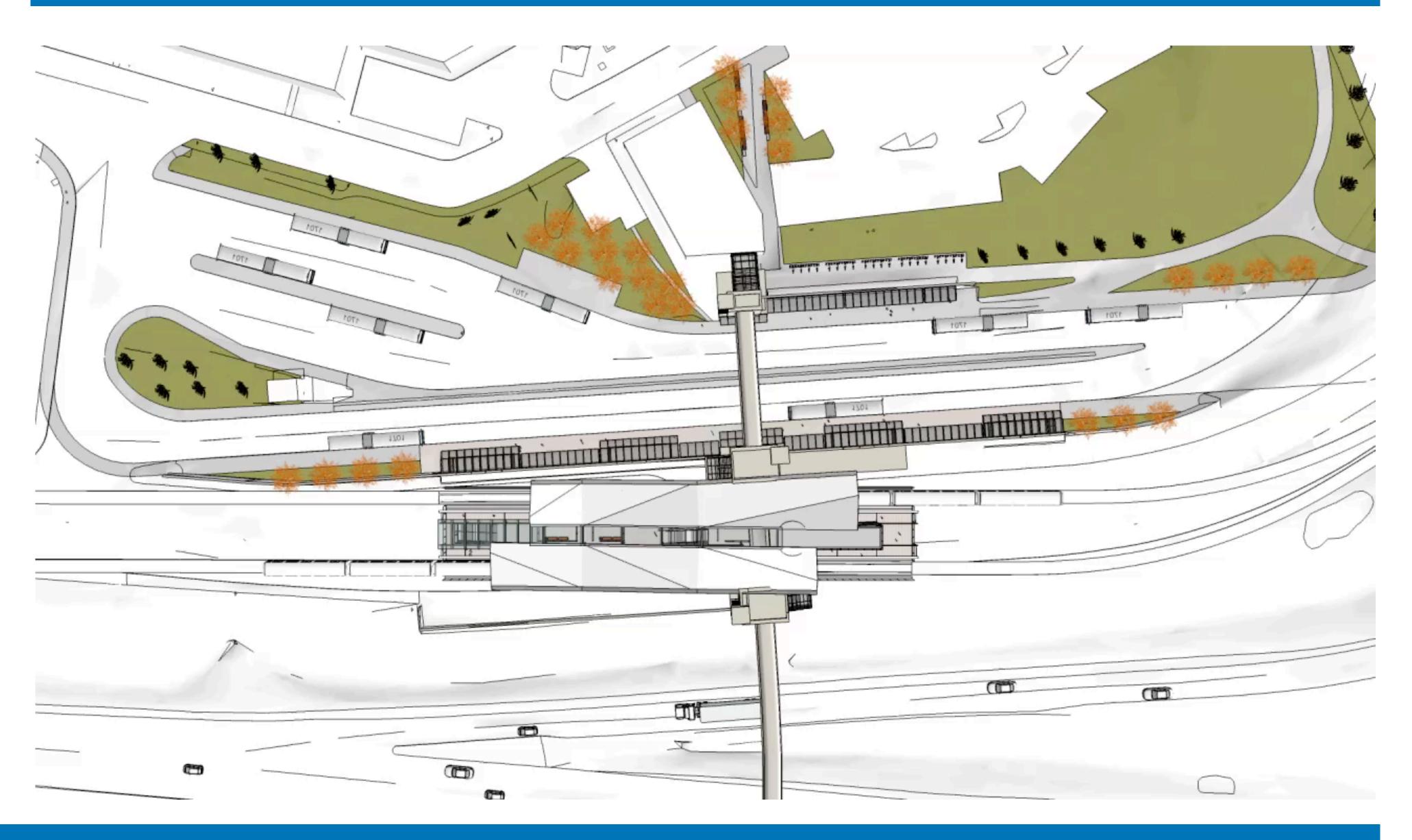


Connections and Integration





Fit for Purpose Integrated Station Design





Station Transit Integration









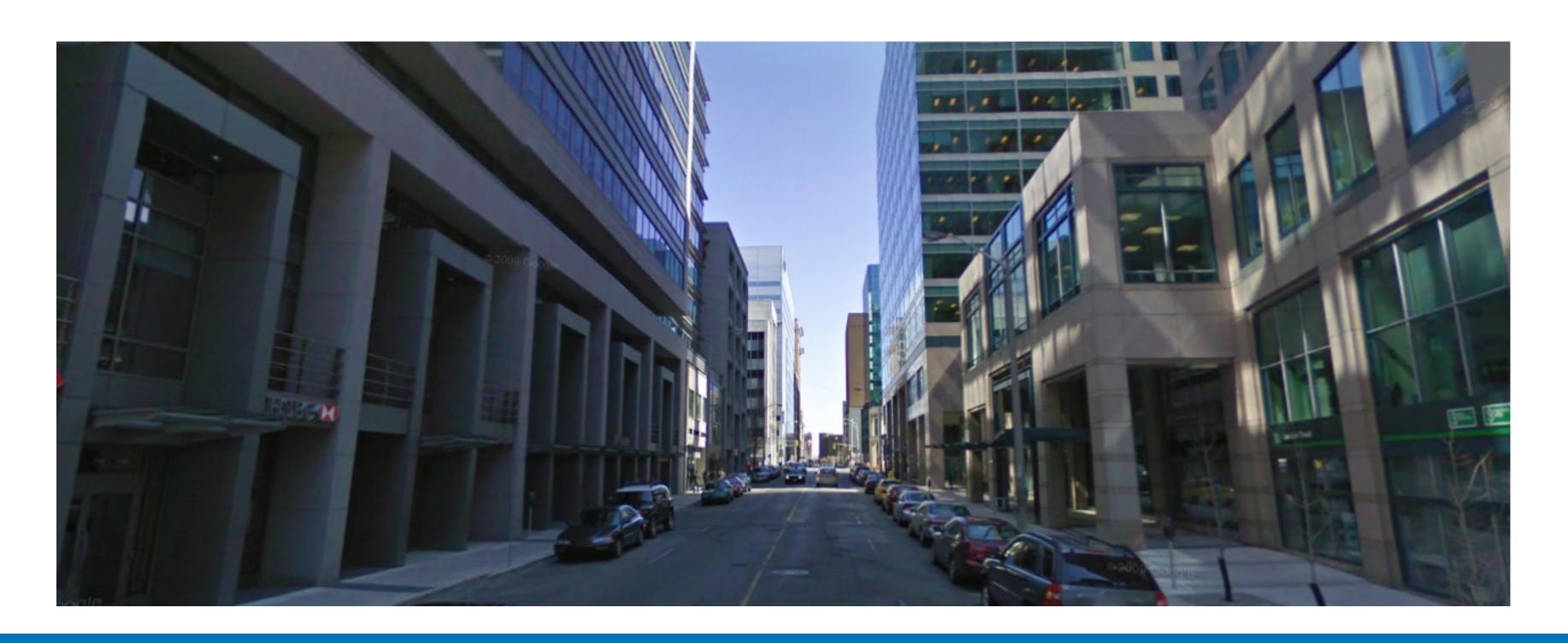


OTTAWA'S CONFEDERATION LINE



The Route: System-wide Objectives

- Safety first
- BRT remains fully operational
- Minimize construction impacts
- Sustainability
- Future flexibility

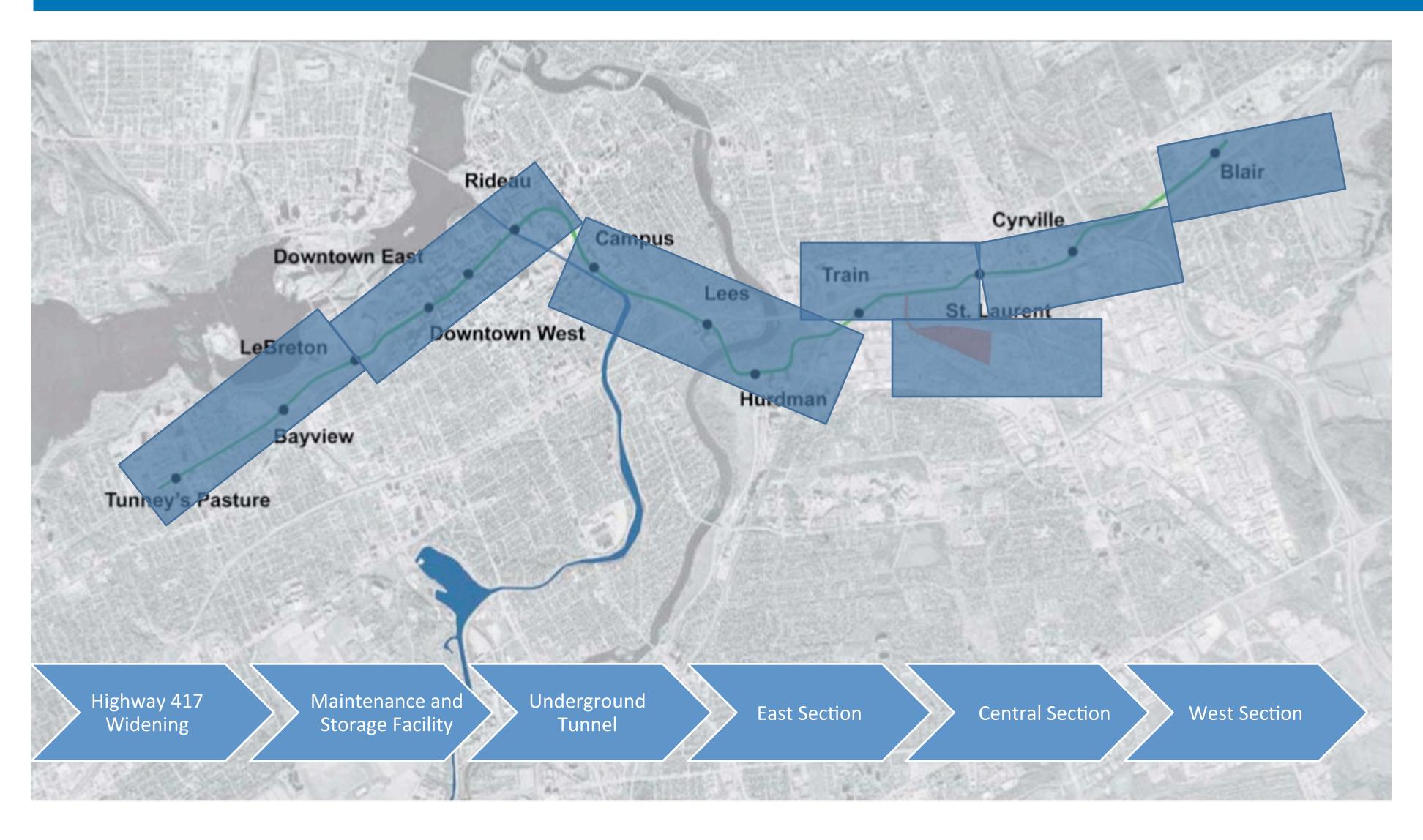




The Route: Construction Stages



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The Route: Principles

- Minimizing duration of BRT lane closure
- Minimizing noise and vibration during construction
- Maintaining current noise and vibration standards during operation
- Minimizing disruption to adjacent properties
- Maintaining cyclist and pedestrian pathways during construction and operation



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The Route: West Segment

- Use of transit-way to LRT construction
- Rehabilitation of retaining walls
- Reconstruction of twin culvert
- Scott Street detour
- Temporary station at Bayview
- Preston detour at Lebreton flats



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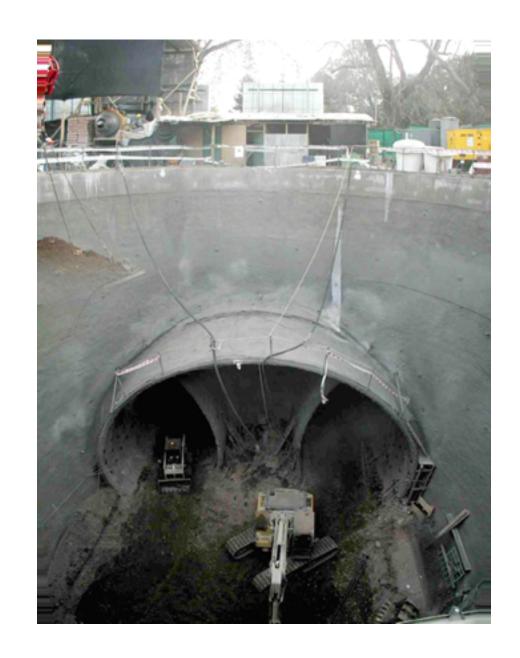




The Route: Central Underground Section

Proposed Construction Methodology - Sequential Excavation Method

- Reduced traffic impacts
- Reduced bus operations impacts
- Reduced business operation impacts
- More efficient station design
- Substantial reduction of utility impacts
- Greater Control over construction methods







Proposed Portal and Intermediate Access Activities

- Site Office
- Site workshop
- Concrete batch plant
- Water treatment plant
- Ventilation system
- Backup power supply
- Laydown area
- Truck cleaning system



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Proposed Underground Station Configuration





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Material Management

Project Sustainability

- Material from tunnel is loaded using roadheader loading bay
- Opportunity to recycle some material
- Good quality limestone sand and gravel, could be used to produce concrete
- Possible separation and cleaning process
 - Sand-Gravel separation screening
 - Bucket wheel cleaning equipment

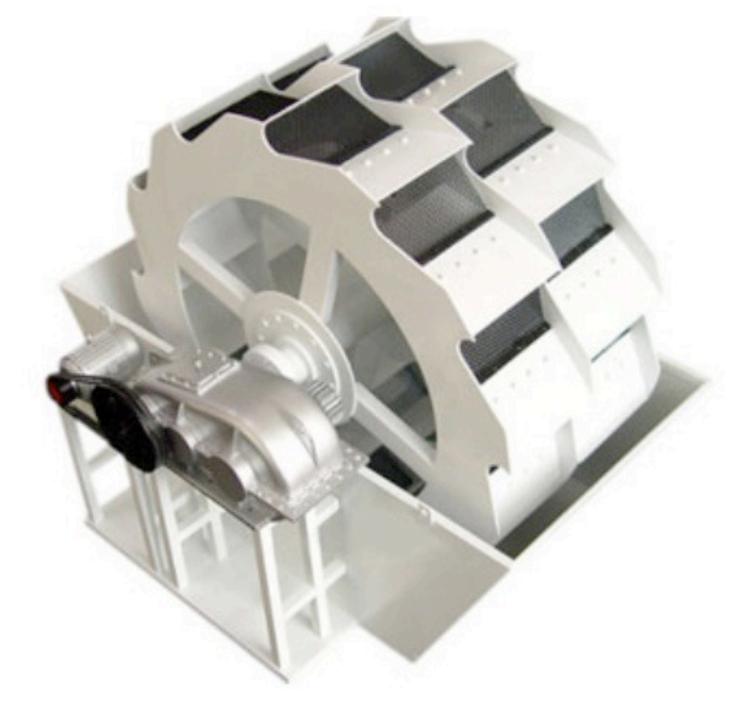


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The Route: East Segment

- Use of transit-way to LRT construction
- Early completion of Highway 417
- Campus Station open longer and Laurier
 Station remains in place
- Permanent pedestrian and cyclist connection between Campus and Lees
- Maintain Hurdman and Blair Stations operational throughout construction



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VEHICLES







- Iconic, state of the art
- Fully integrated approach station, vehicle, capacity
- Two vehicle consist = 6 articulated buses
- Initial 3 minute headway
- Service proven in similar climate



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- Designed to be expandable
- Environmentally sustainable
- Assembled here in Ottawa



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System-wide Safety

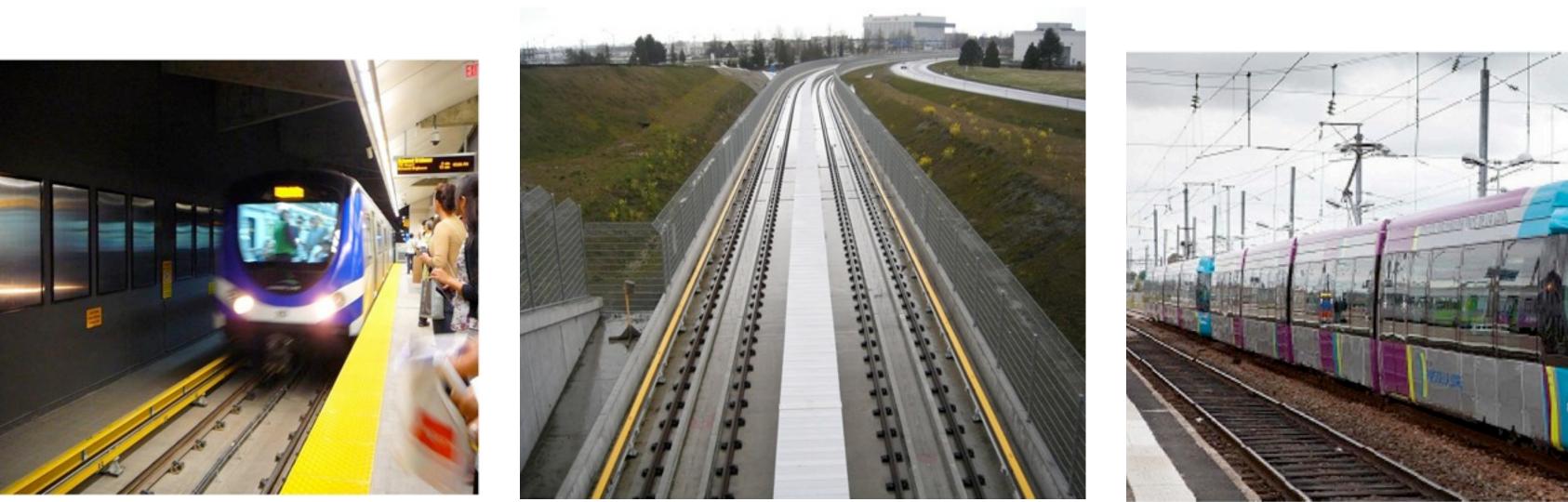
- Tactile warning strips, wayfinding and signage contribute to safety at stations
- Guideway will be fenced to prevent intrusion and ensure safety along the route
- Overhead catenary wires instead of those at track-level
- Safety of vehicle and train control systems vehicle can stop quickly
- Special provisions in tunnel ventilation



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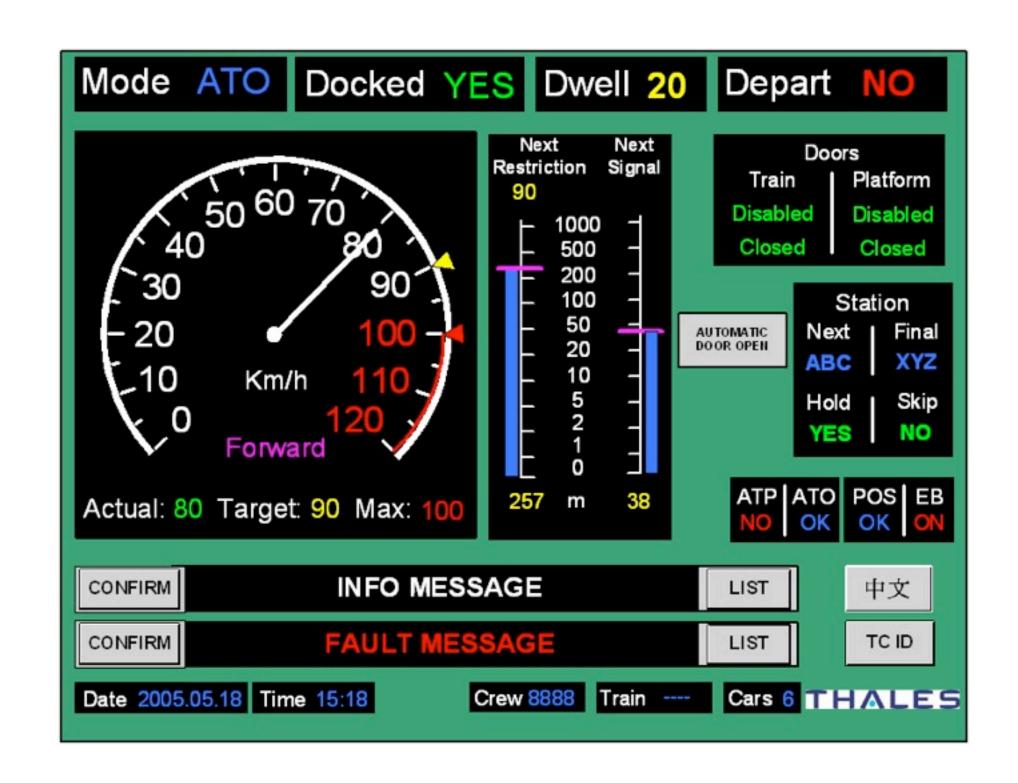
Train Control Safety

- Constantly monitors location of vehicles
- Ensure safe distances
- Controls speed and vehicle functions



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MAINTENANCE AND STORAGE FACILITY



Maintenance and Storage Facility

Overarching Principles

- Safety and security
- Integration with transit network
- Efficient layout and workflow processes
- Site that is flexible and expandable
- Sustainable design
- Being a good neighbour for 35 years



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Scope of Maintenance Services



Scope of Maintenance Services

Systems

- Traction power
- Train Control System
- Communications

Track

- Mainline, yard and storage track
- Switches and crossovers

Vehicle

- Vehicle Cleaning
- Vehicle Maintenance

Facilities

- Maintenance Storage
 Facility
- Train Control Centre

Stations

- Electrical, mechanical systems
- Elevators and escalators
- Structural elements
- Architecture and Landscaping

Tunnel

- Structural maintenance
- Drainage
- Fire and Safety features

Structures

- Bridges
- Retaining Walls
- Drainage

Alignment

- Vegetation and debris Control
- Fencing
- Snow and Ice removal
- Drainage

Help Desk

- Enquiries and service requests
- Monitoring and Notification
- Notification of emergencies
- Lost and found

Vandalism and Graffiti

 Response to vandalism acts and removal of graffiti









STATION DESIGN



design |də'zīn|

RIDEAU TRANSIT GROUP

noun

1. • the art or action of conceiving of and producing a plan, drawing or concept: good design can help the user better understand complicated information or ideas





Multiple Clients / Synthesizing all Stakeholder's Objectives



Ridership Experience

Ridership Experience intuitive orientation humane comfortable safe & accessible

stations which allow riders to take ownership of them not as transit stations but as engaging community spaces and places

stations which explain themselves from a block away



Ottawa the City & G8 Capital

Brand represents the city and Capital's core values (sustainable development progressive design, considered growth)

Not a series of stations but a continuous Civic building with entrance and forecourts in the communities it serves

As a civic building it should be an ambassador tells stories literally and subliminally about our city engages the public intellectually and emotionally

Needs both urban and architectural legibility and continuity i.e. iconic and yet familiar and friendly



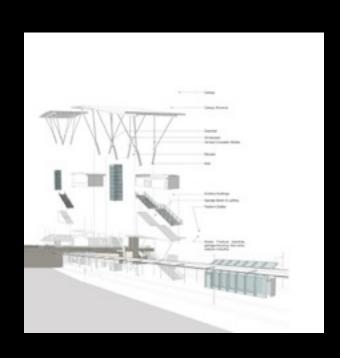
OC Transpo

Business Driven

Marketable / engages the public fosters ridership

Manageable / efficient / logically organized

Maintainable / standardized / designed longevity



Rideau Transit Group

Affordable

Standardized

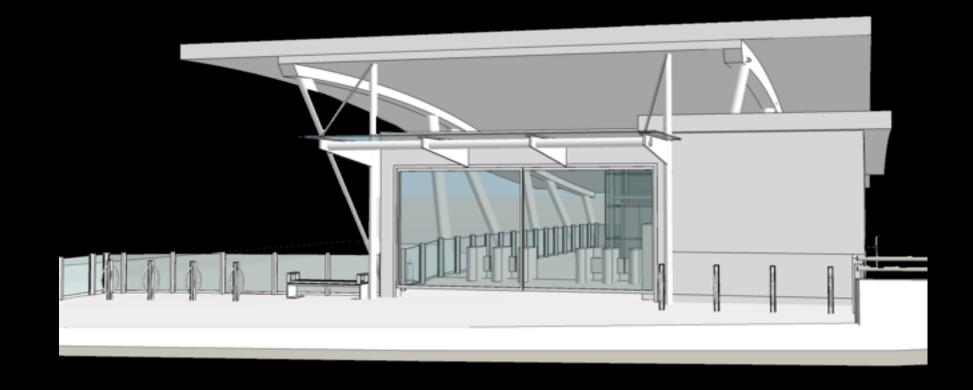
Modular

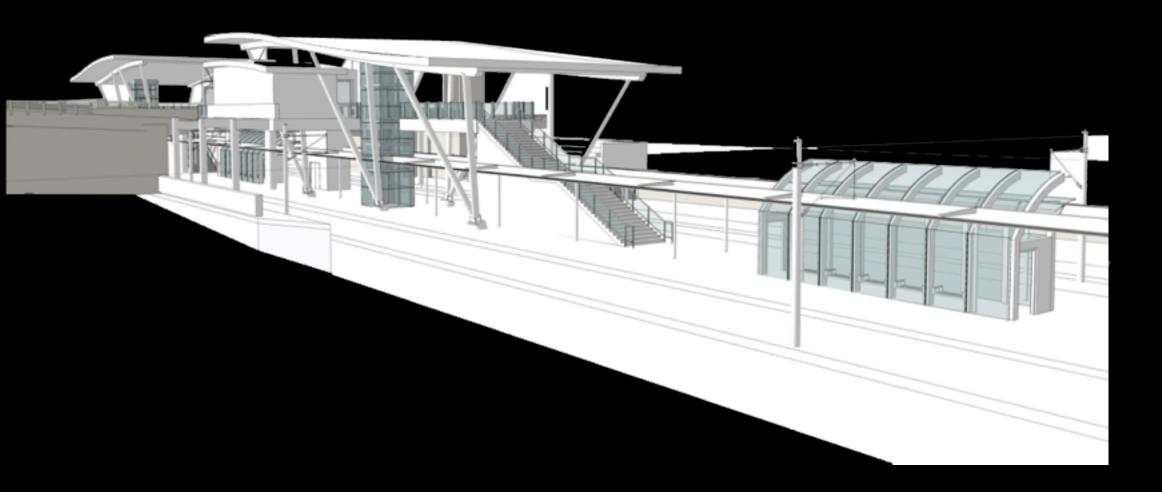
Industry Compatible Construction Details

Exploits local resources and skills

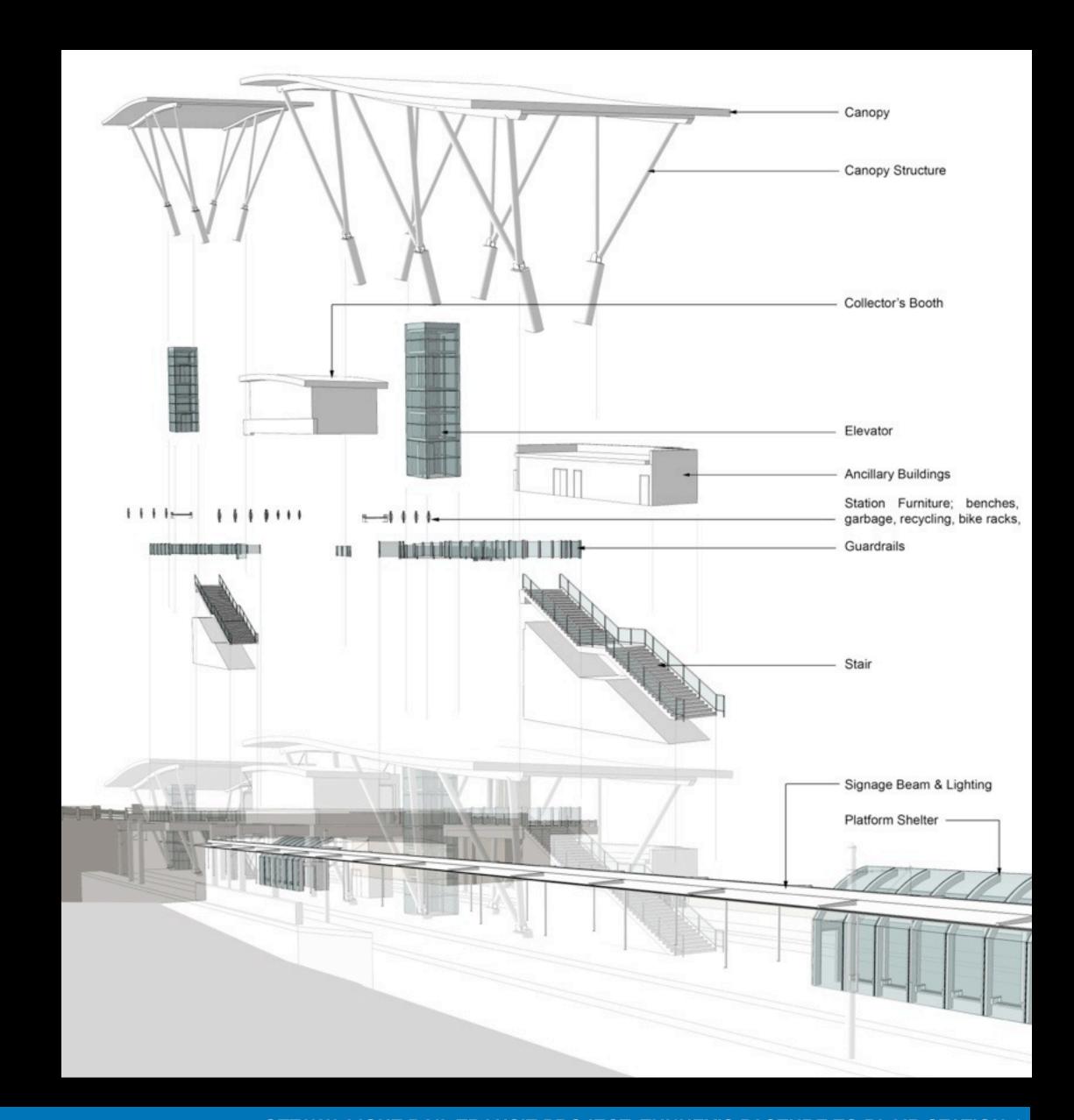
Optimized for Fabrication and timely delivery







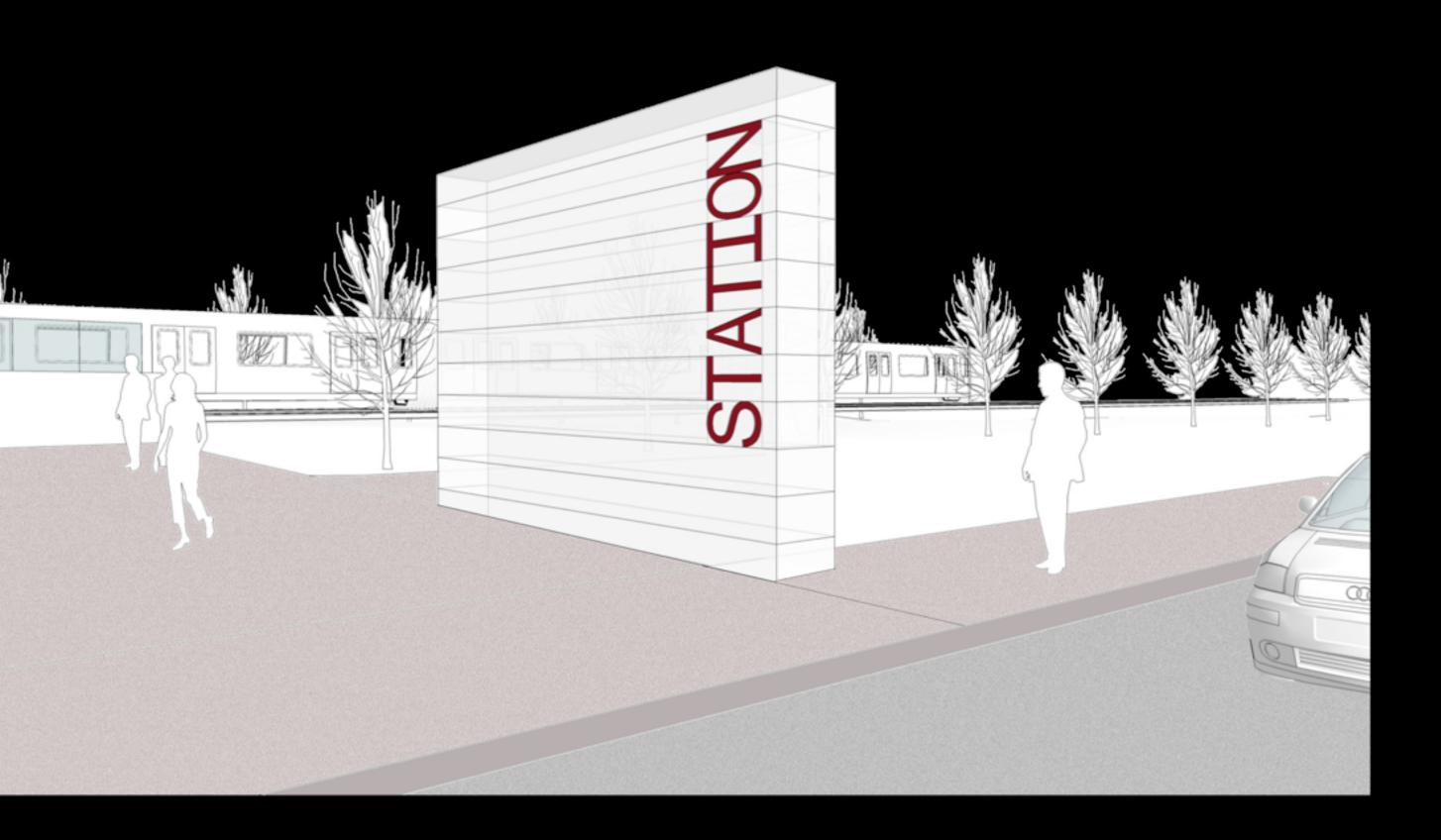
Systemized Design Flexibility / Adaptability Modularity / Standardization /





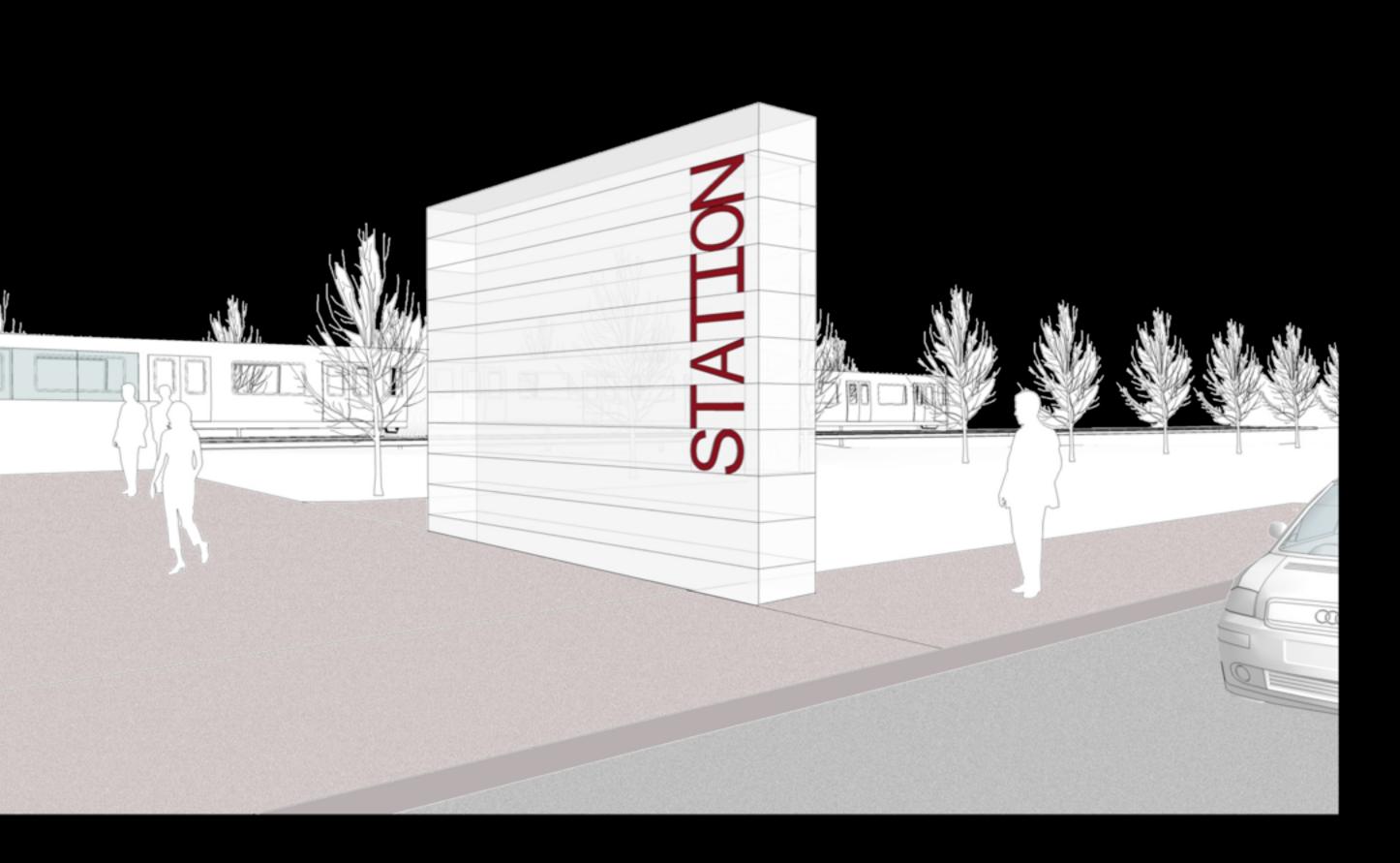
Systemized / Brand / One Common Denominator

Design Station Identity / Transit Lanterns / Orientation wayfinding & safety

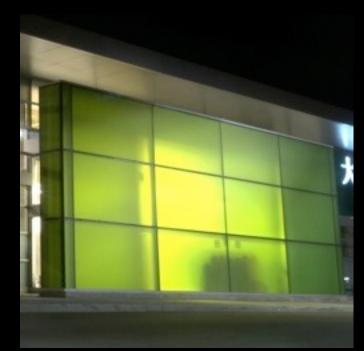




Systemized / Brand / One Common Denominator Design Station Identity / Transit Lanterns / Orientation wayfinding & safety

















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Systemized Design Continuity of Passenger Experience / Stuff Management













Station Identity / Wayfinding and Convenience



Systemized Design Continuity of Passenger Experience / Stuff Management















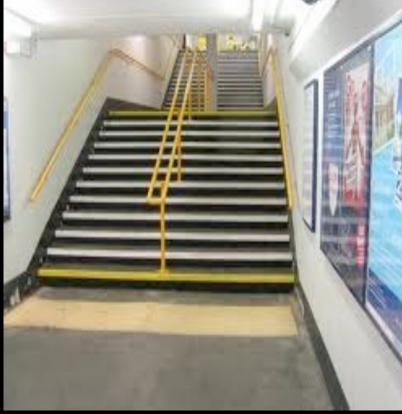
Station Identity / Wayfinding and Convenience



Systemized Design Multi-tasking elements / Stairs



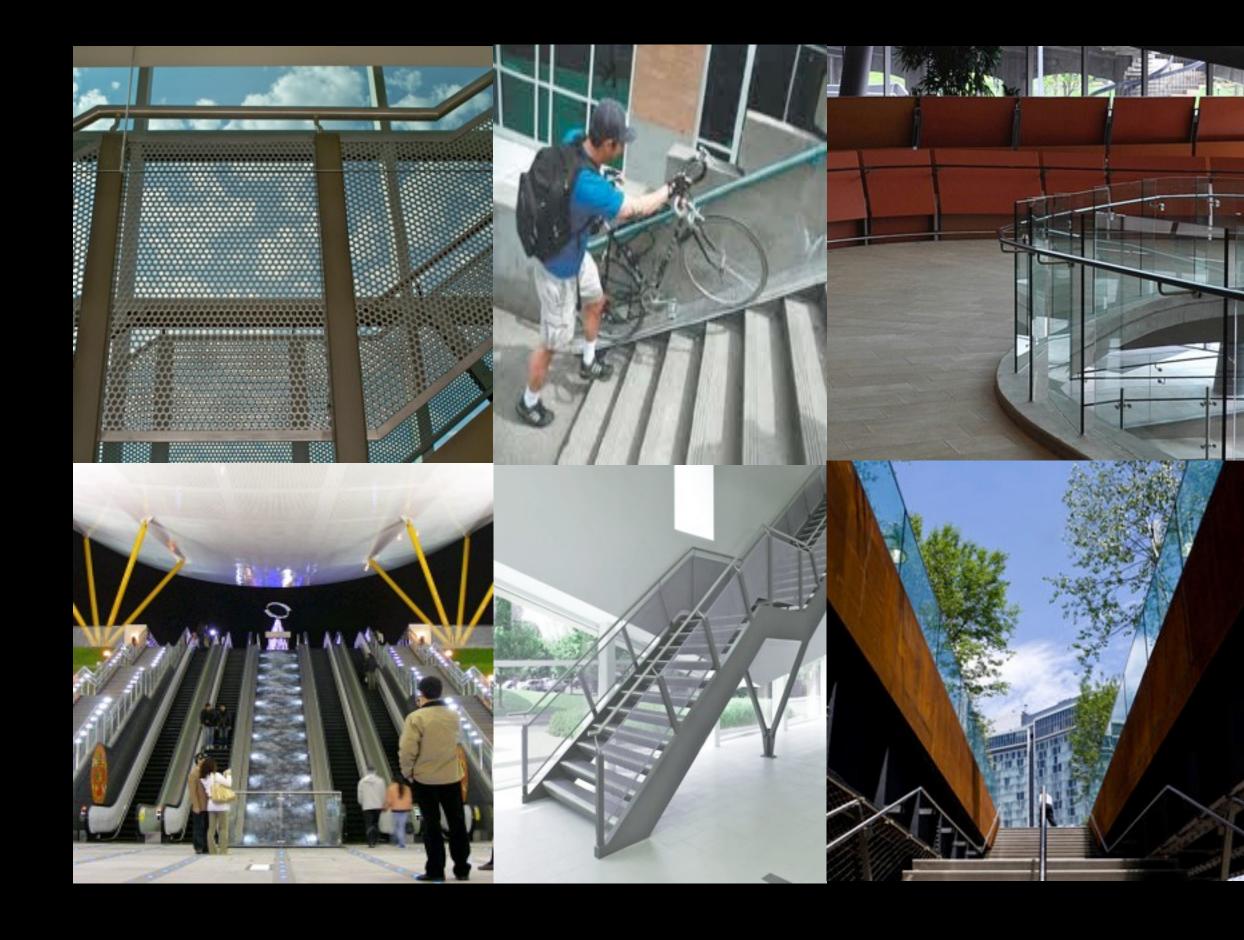




Staircase Standardization & Multitasking extending utility



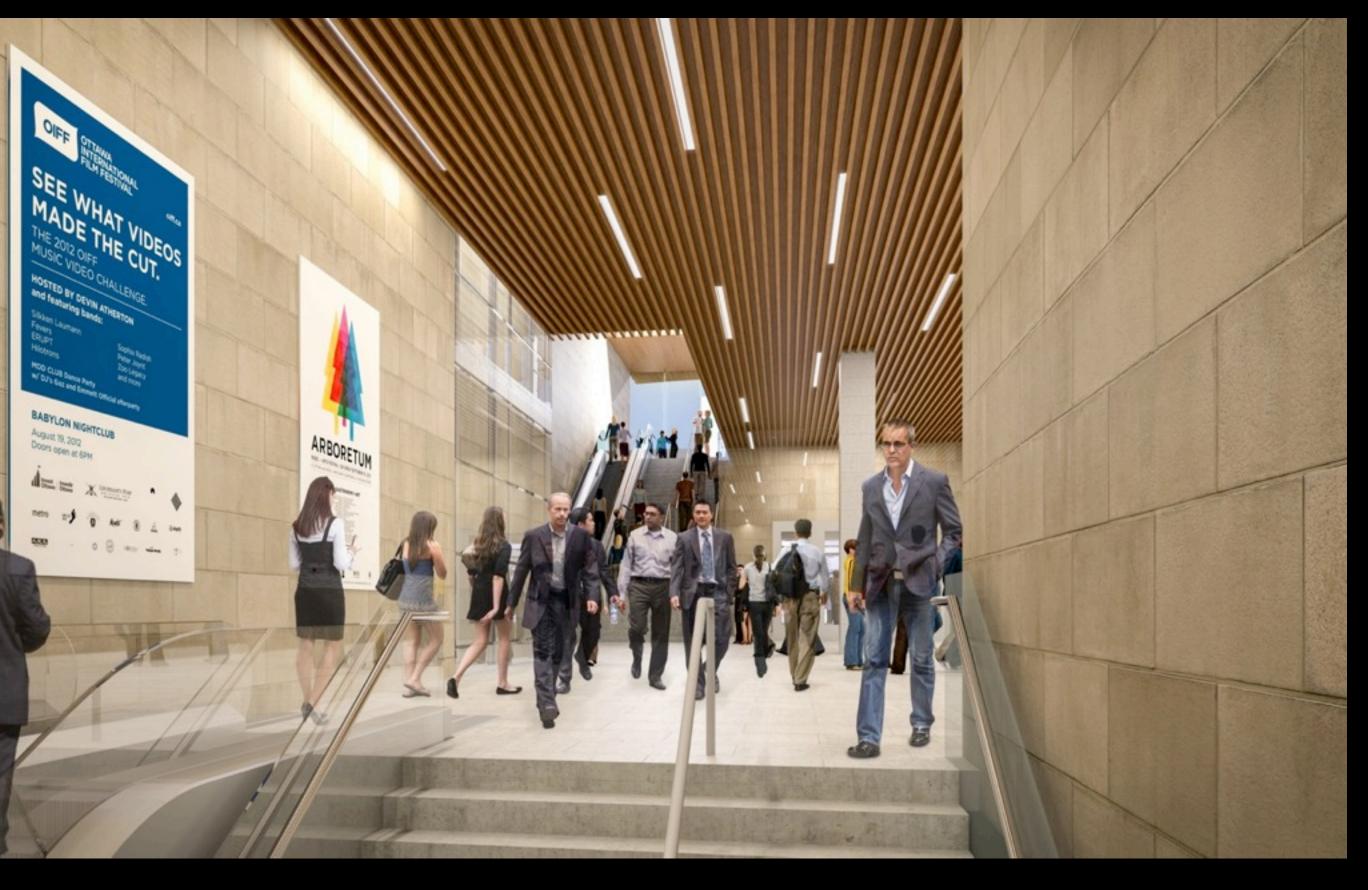
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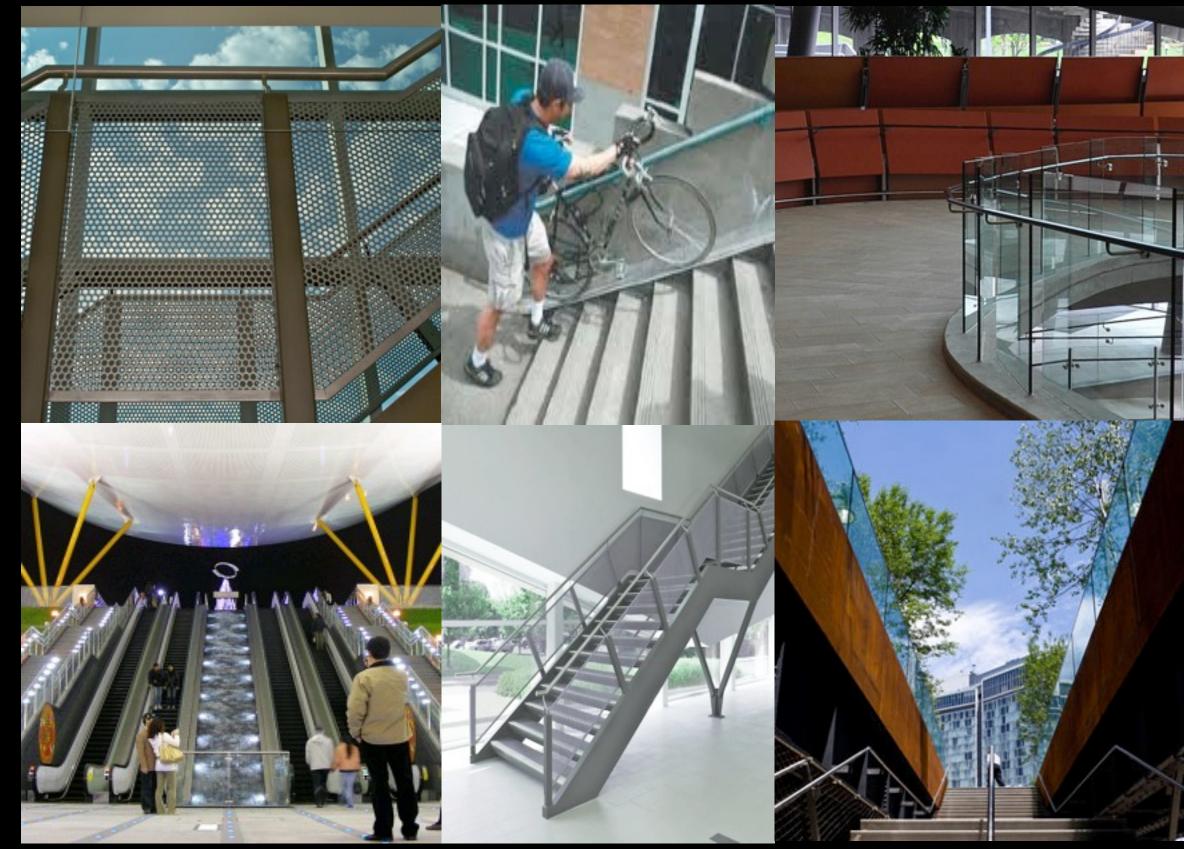


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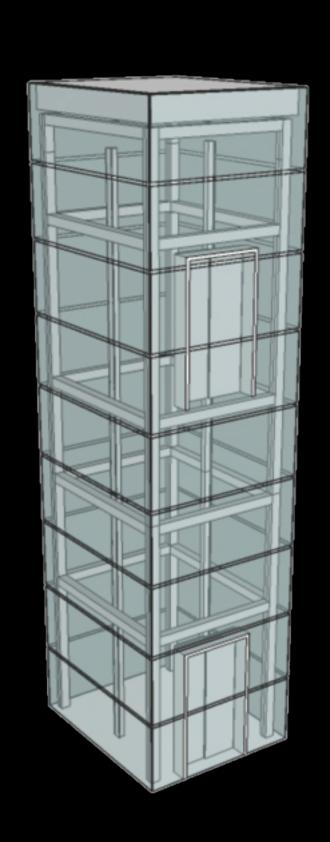
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Staircase Standardization & Multitasking extending utility





Systemized Design Multi-tasking elements / Elevators as Totems / place makers



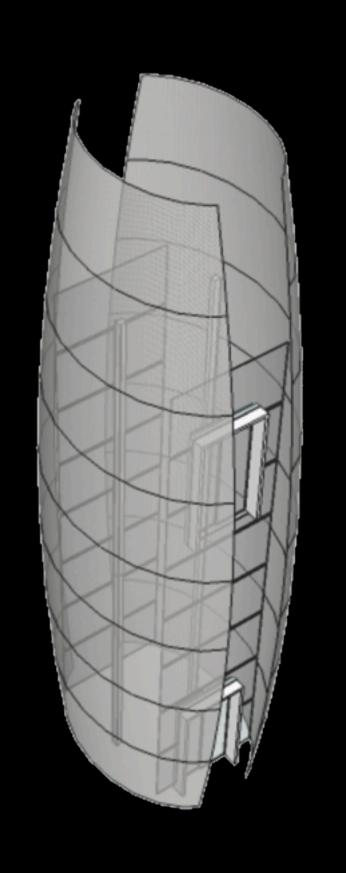






Elevators / CPTED / Maintenance & Orientation through legible place markers





Systemized Design Multi-tasking elements / Elevators as Totems / place makers







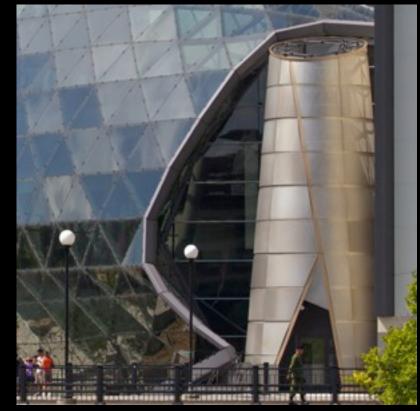


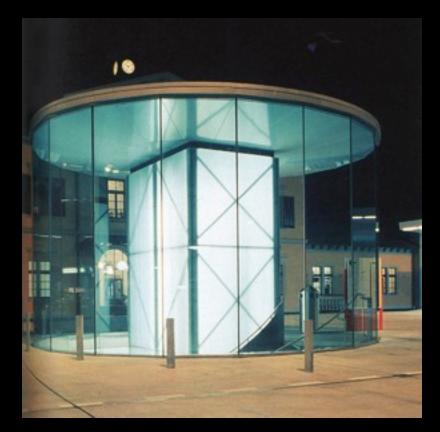
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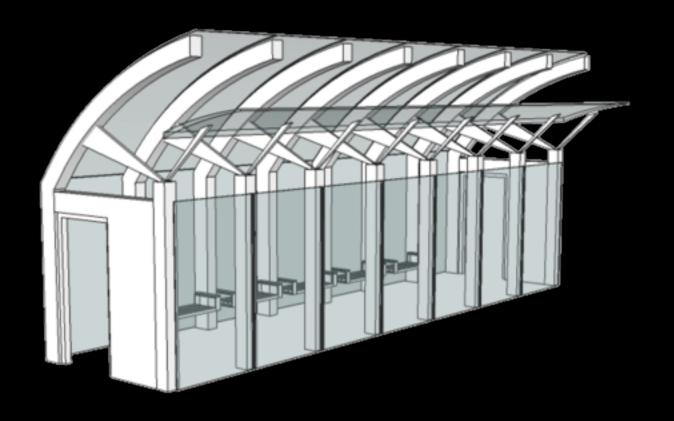






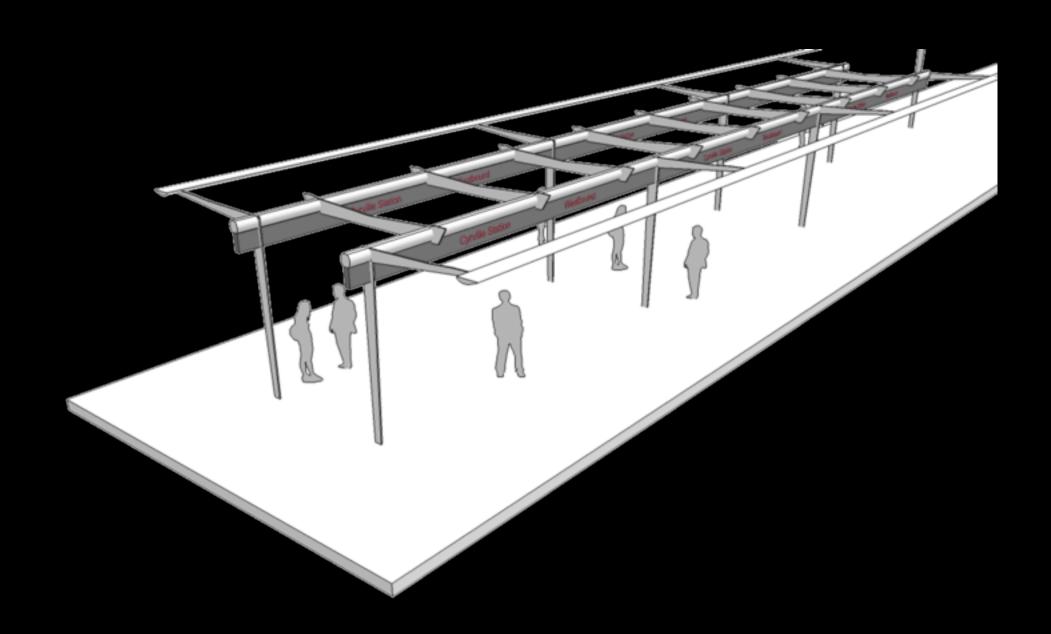
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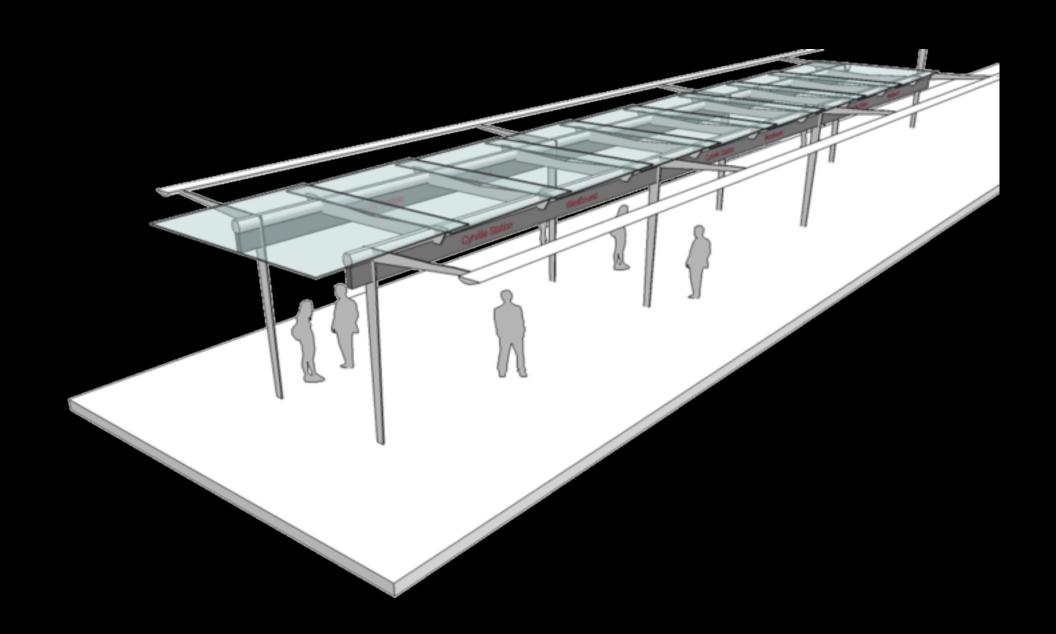


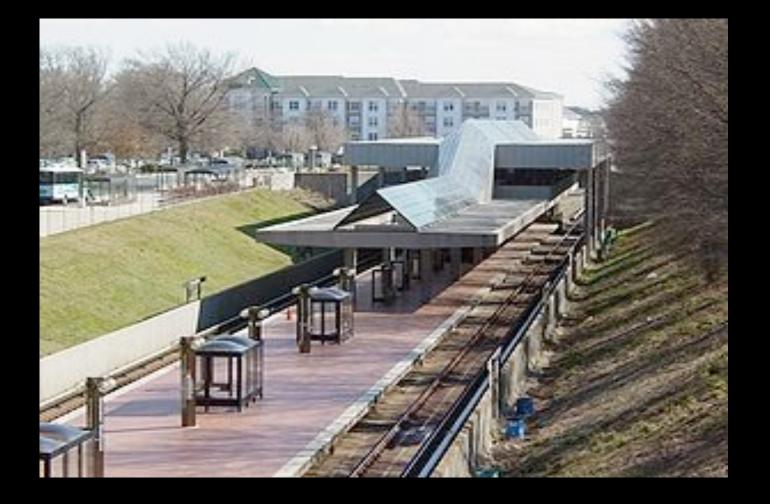




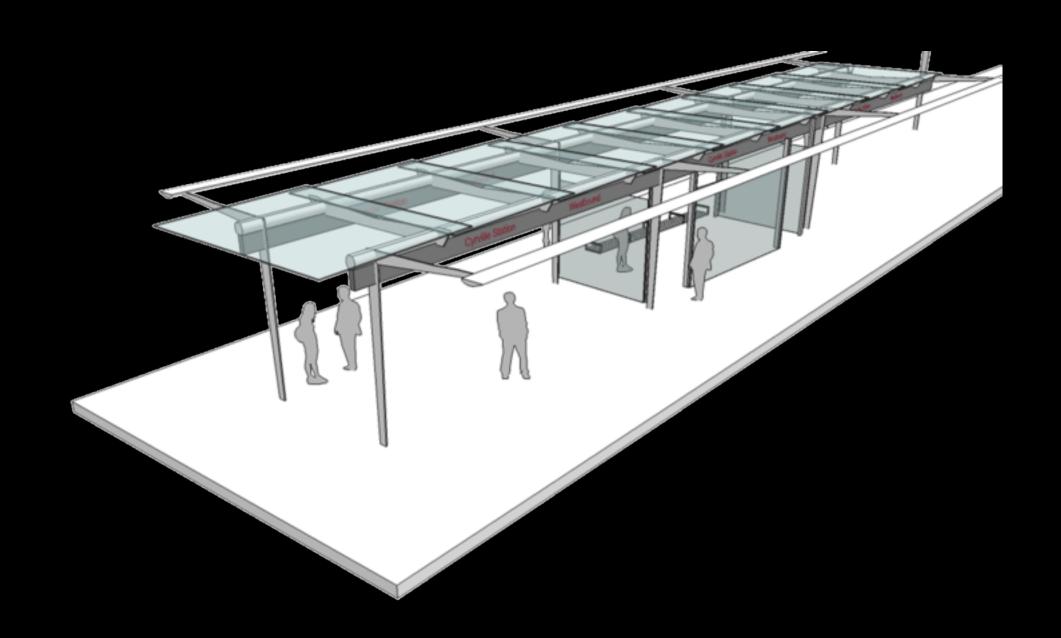






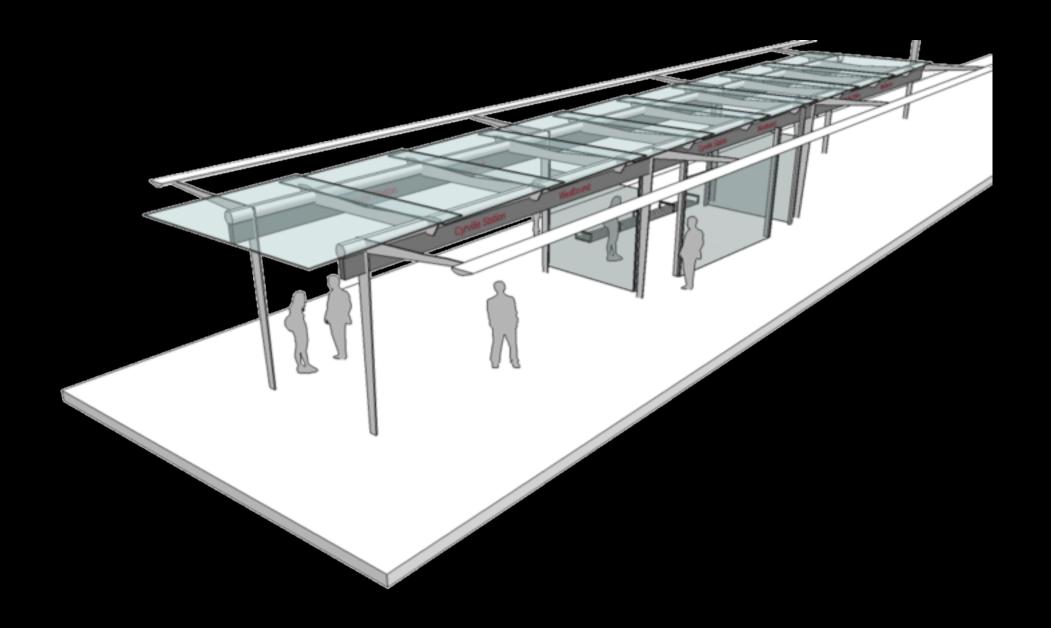








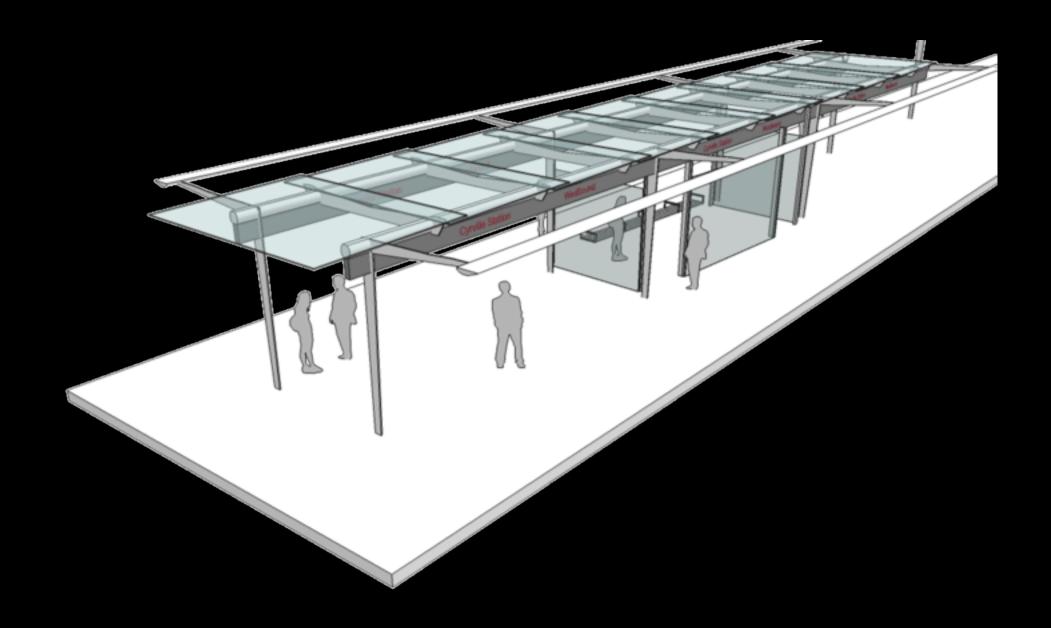




Design Integrated Elements / Shelters which expand public space not isolate it.





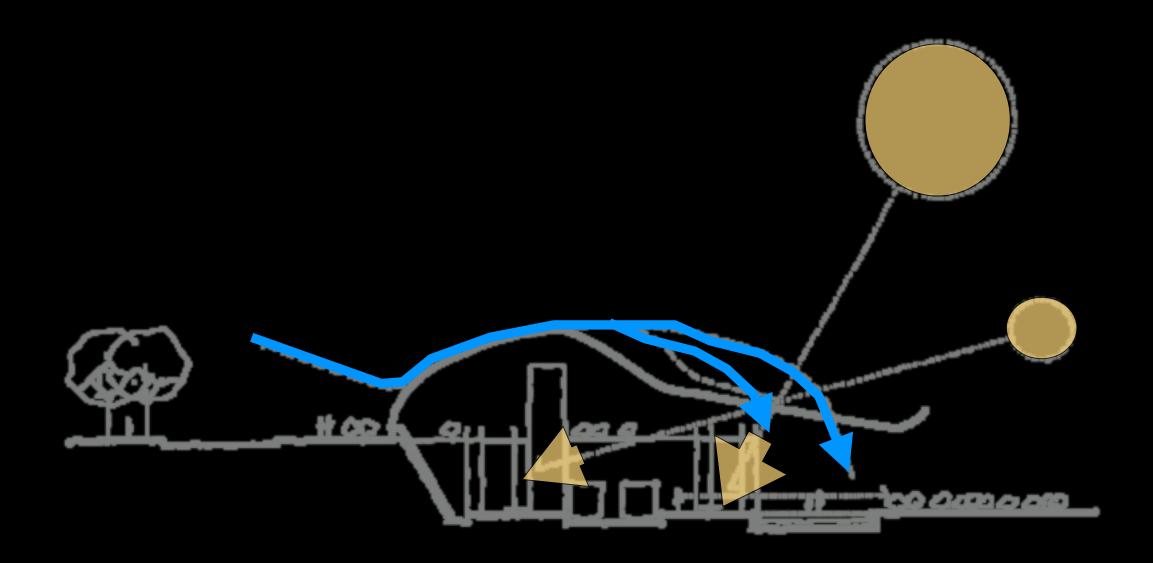


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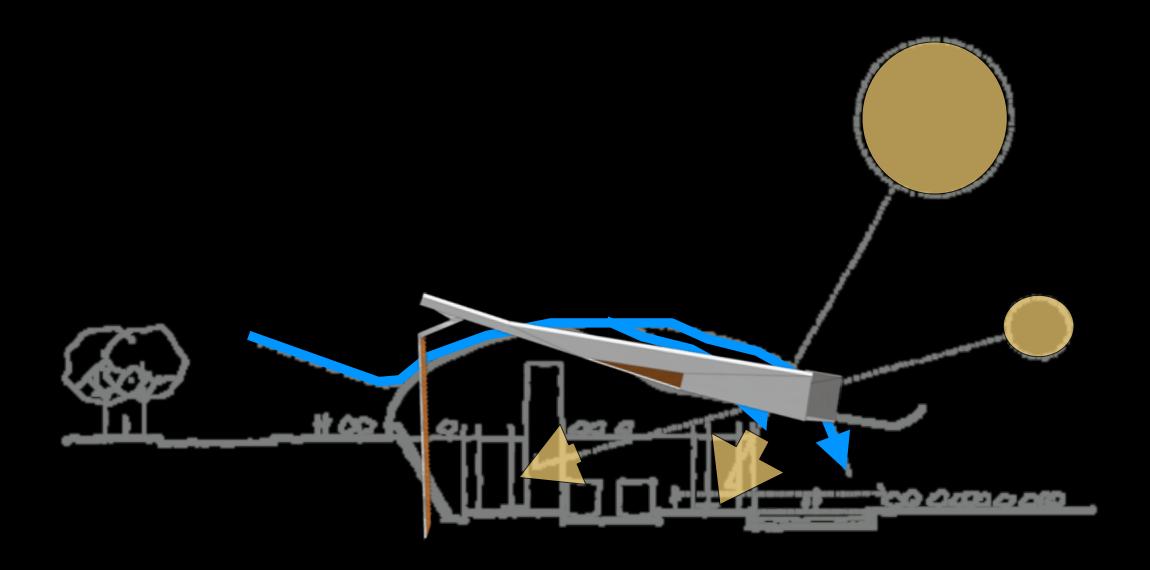


Design Multi-tasking elements / Roofs as wayfinding elements / micro climate control

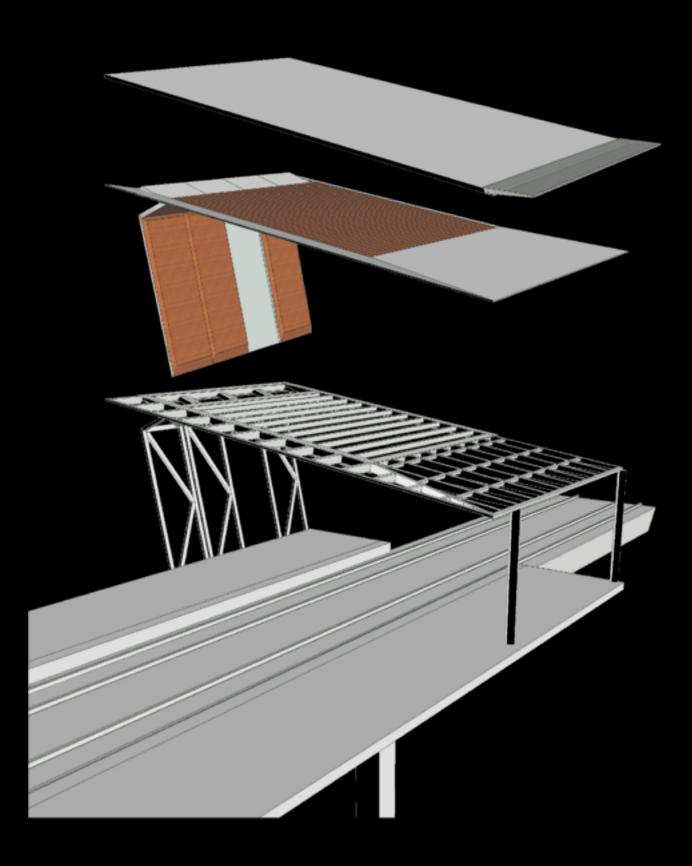




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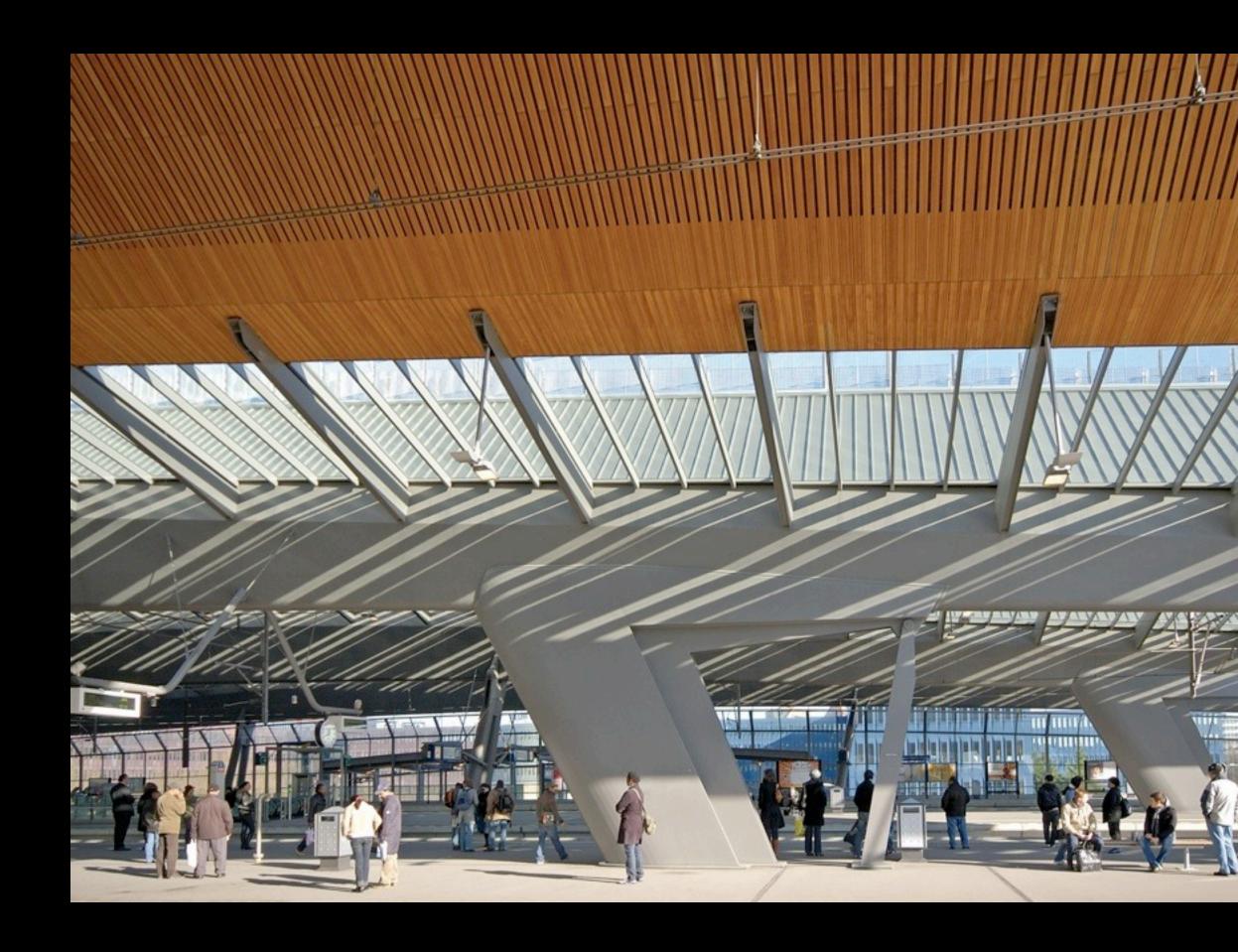




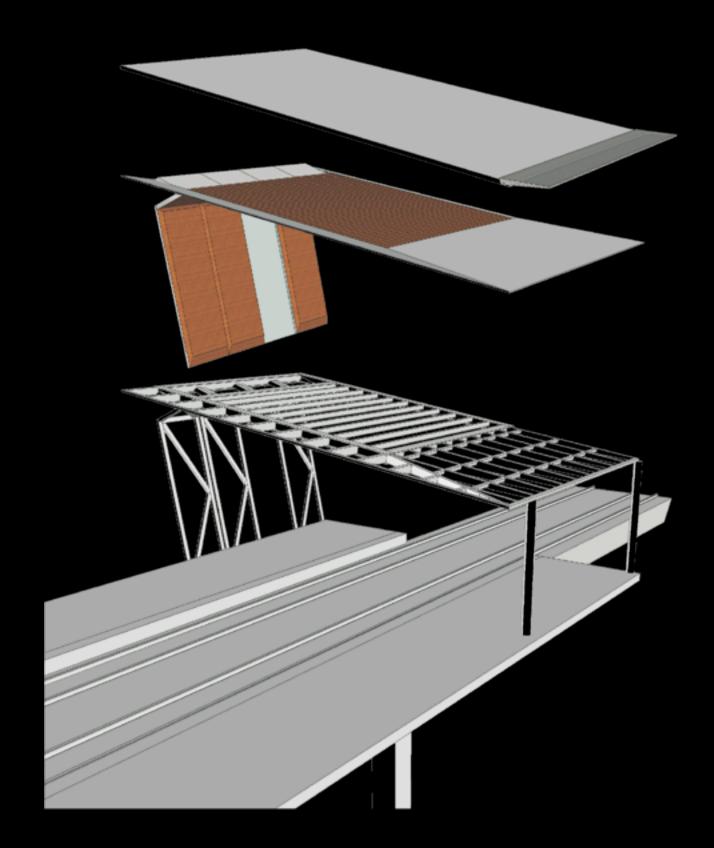


Canopy Design / Democratic Modular & Flexible

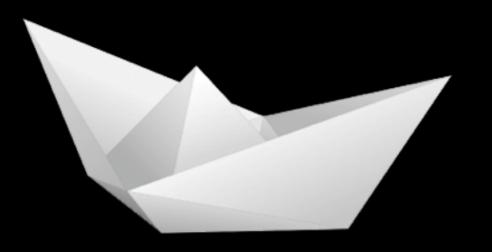
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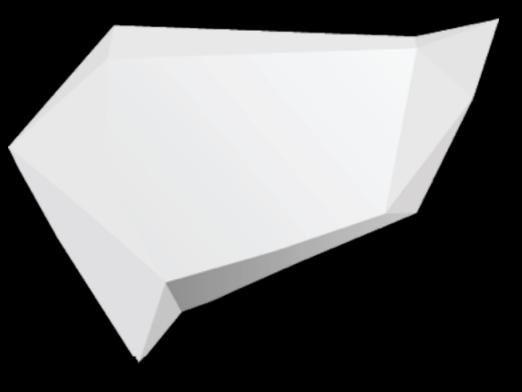






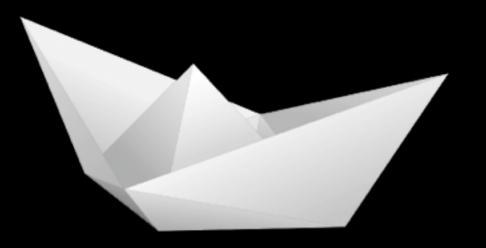
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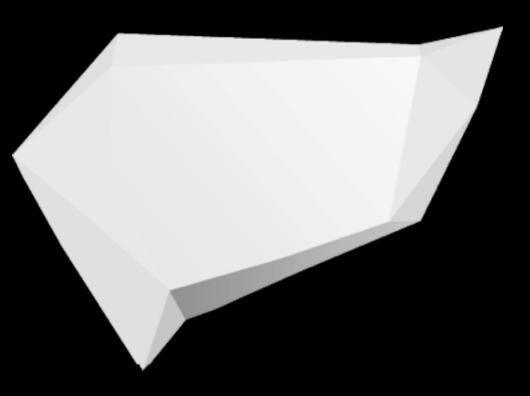




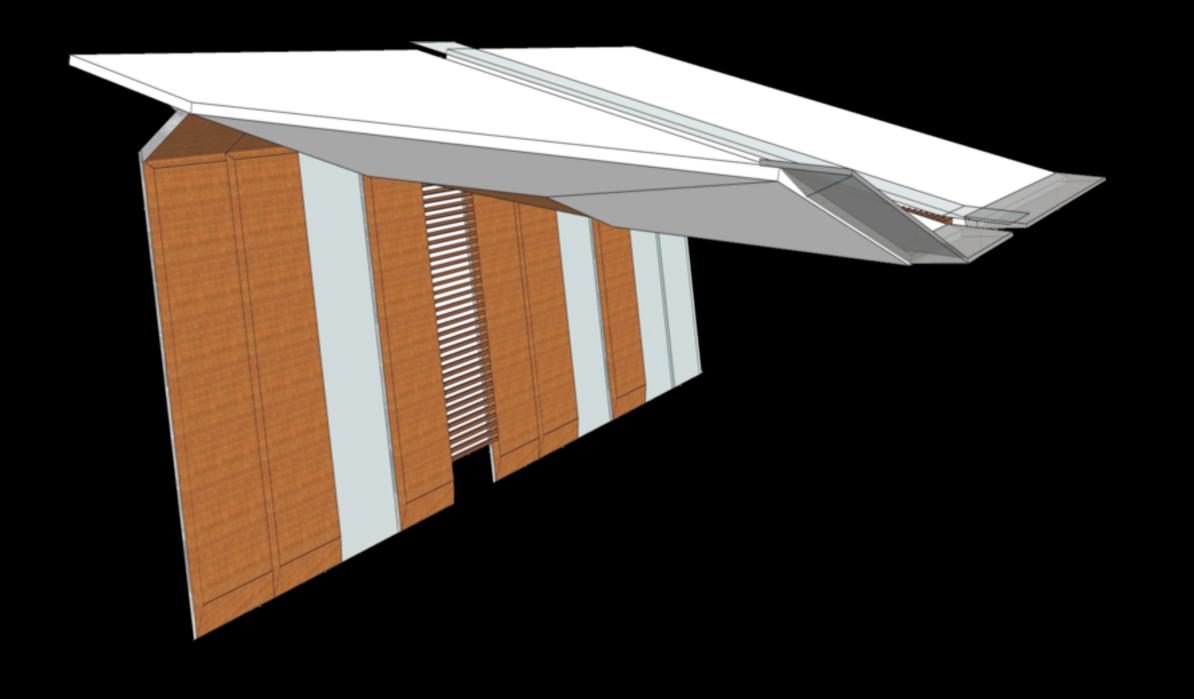


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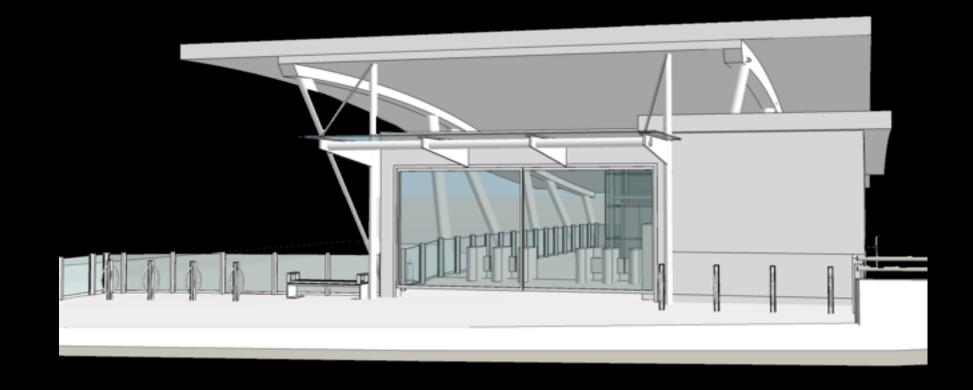


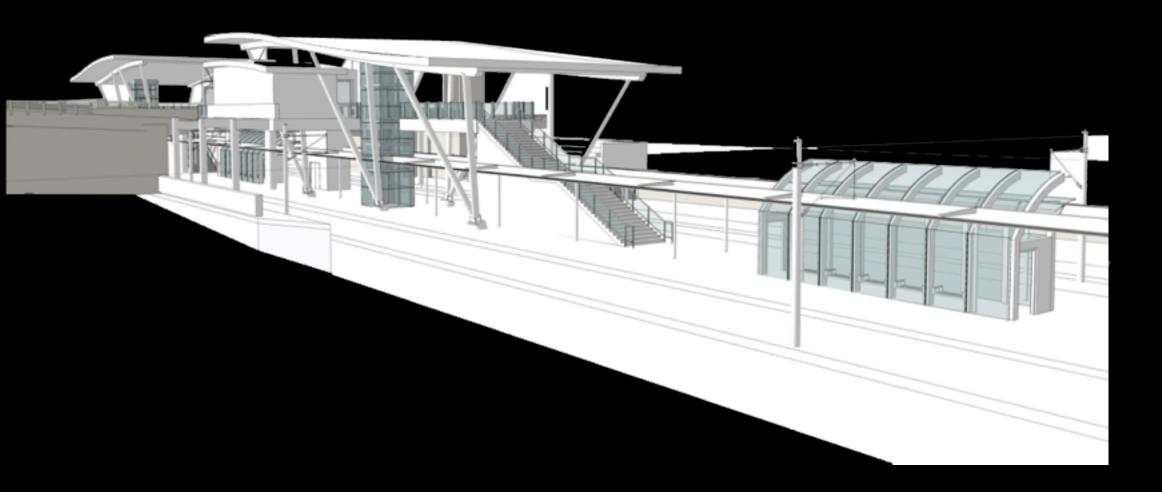


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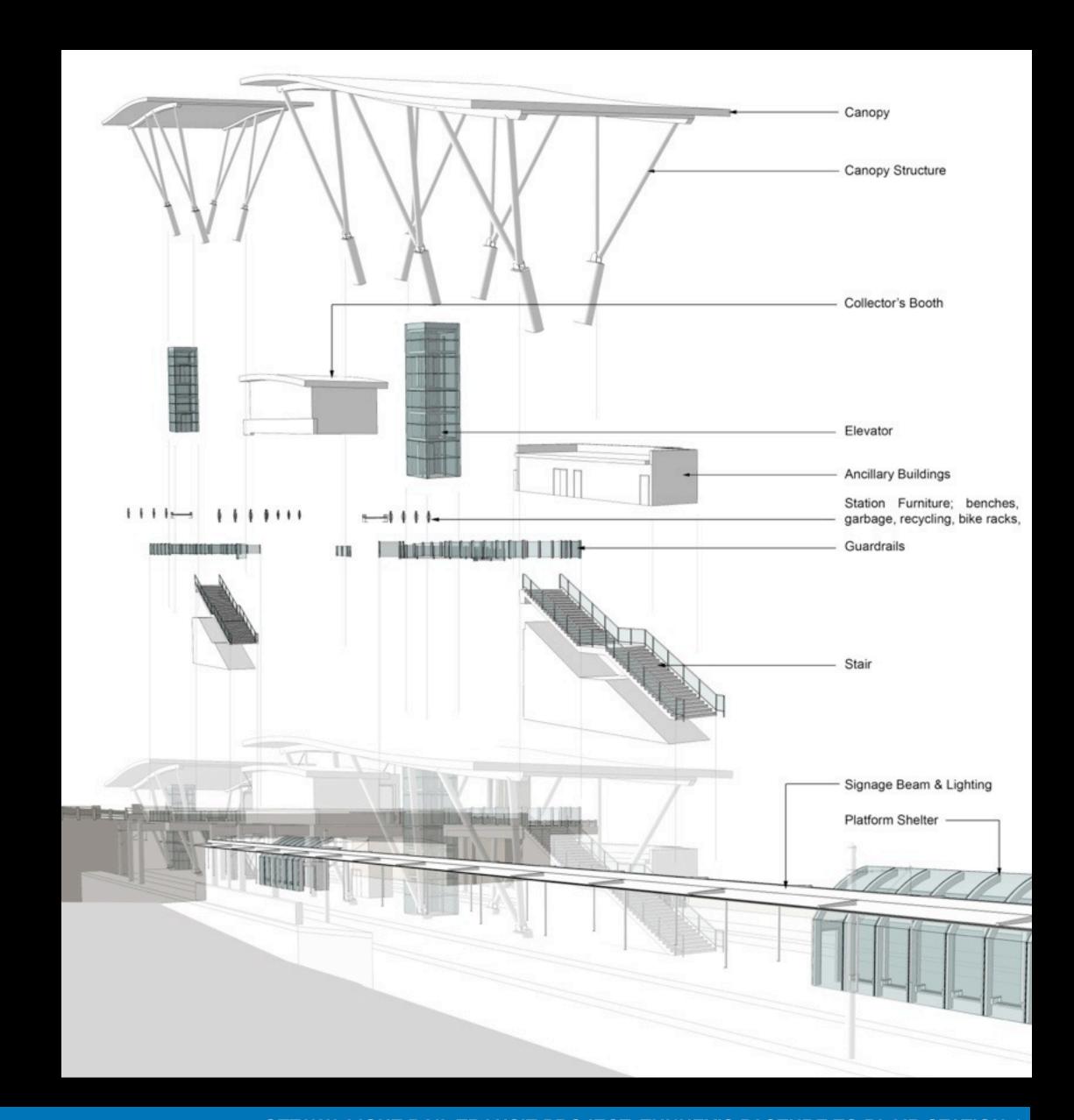




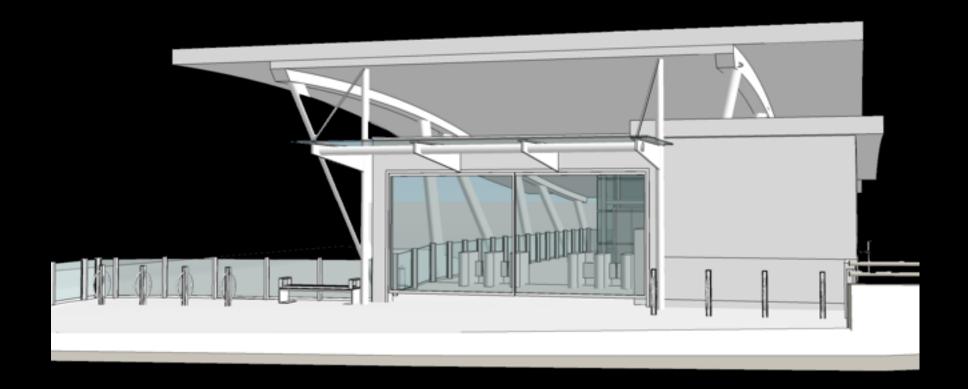


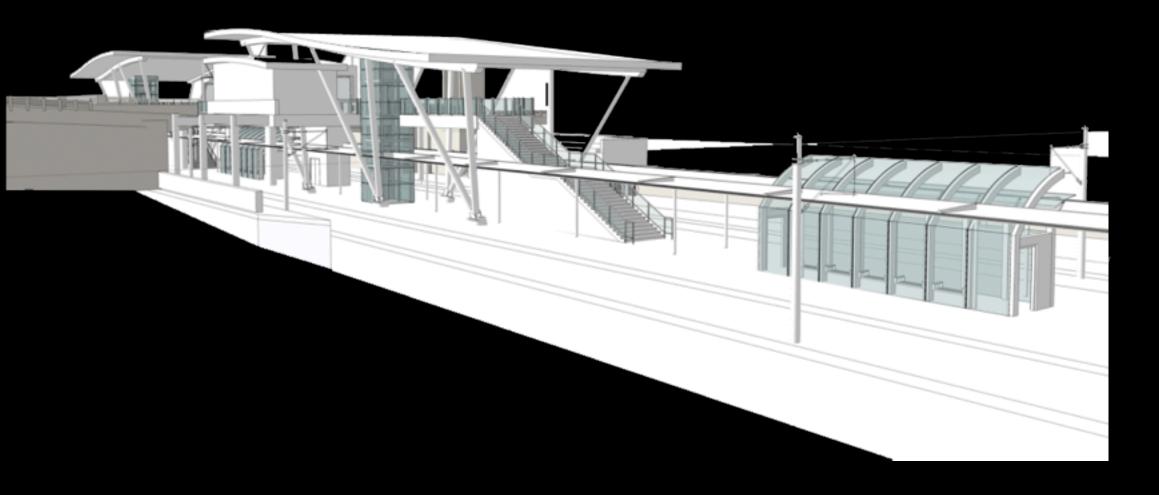


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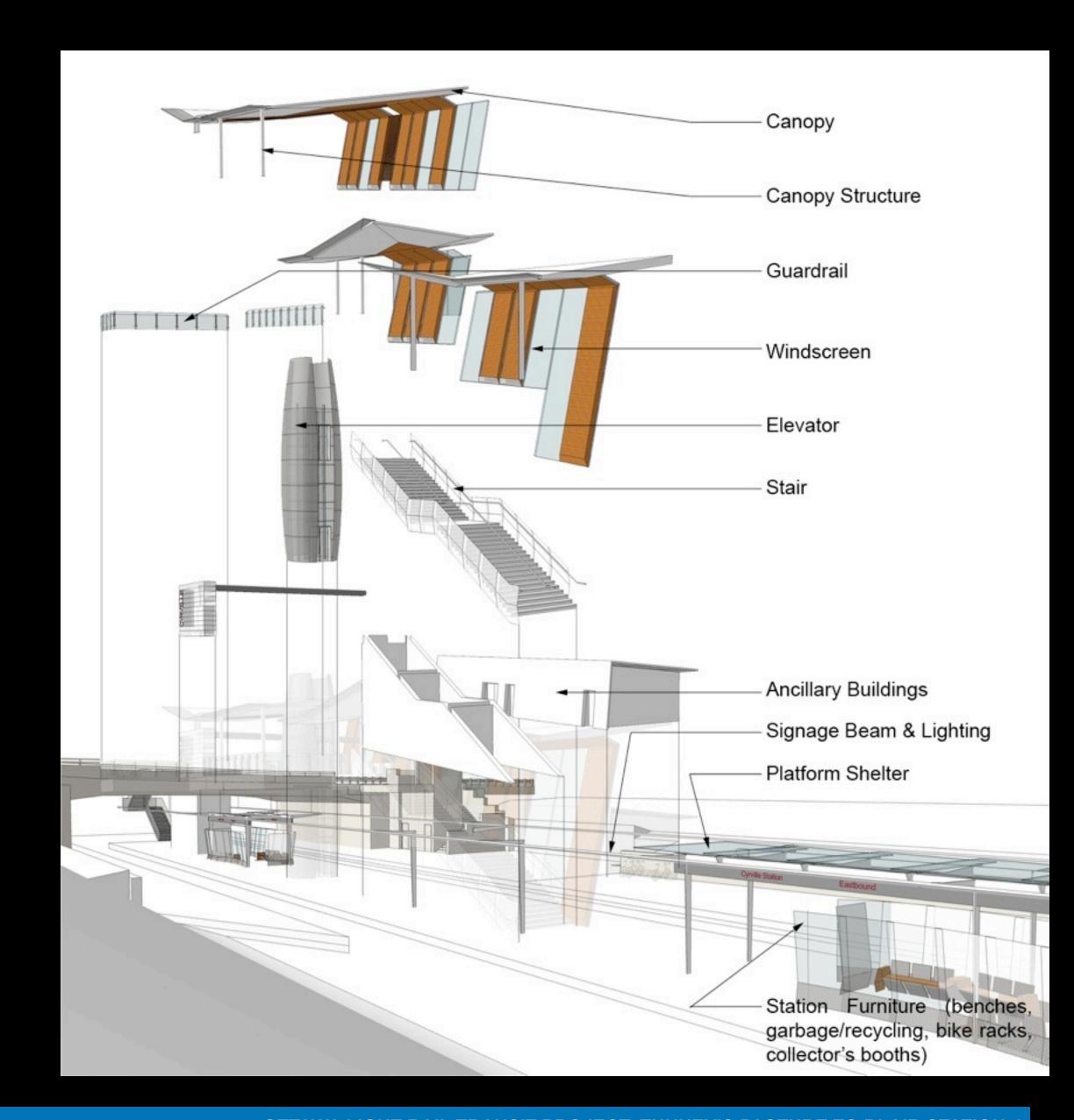




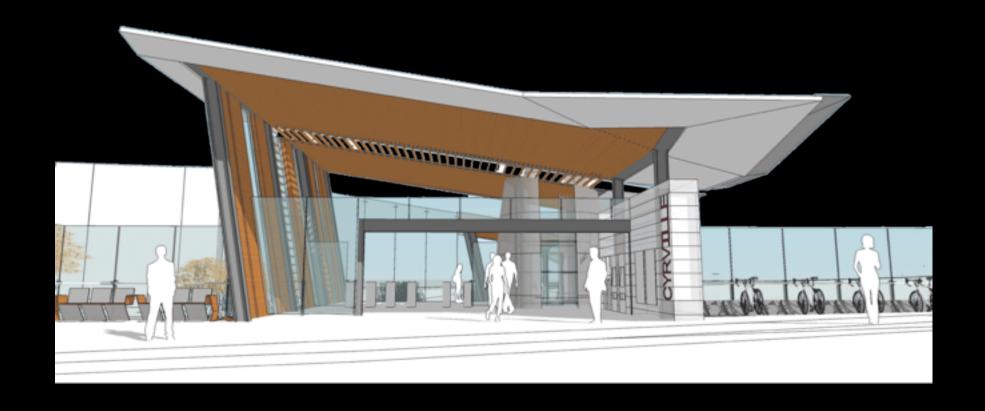




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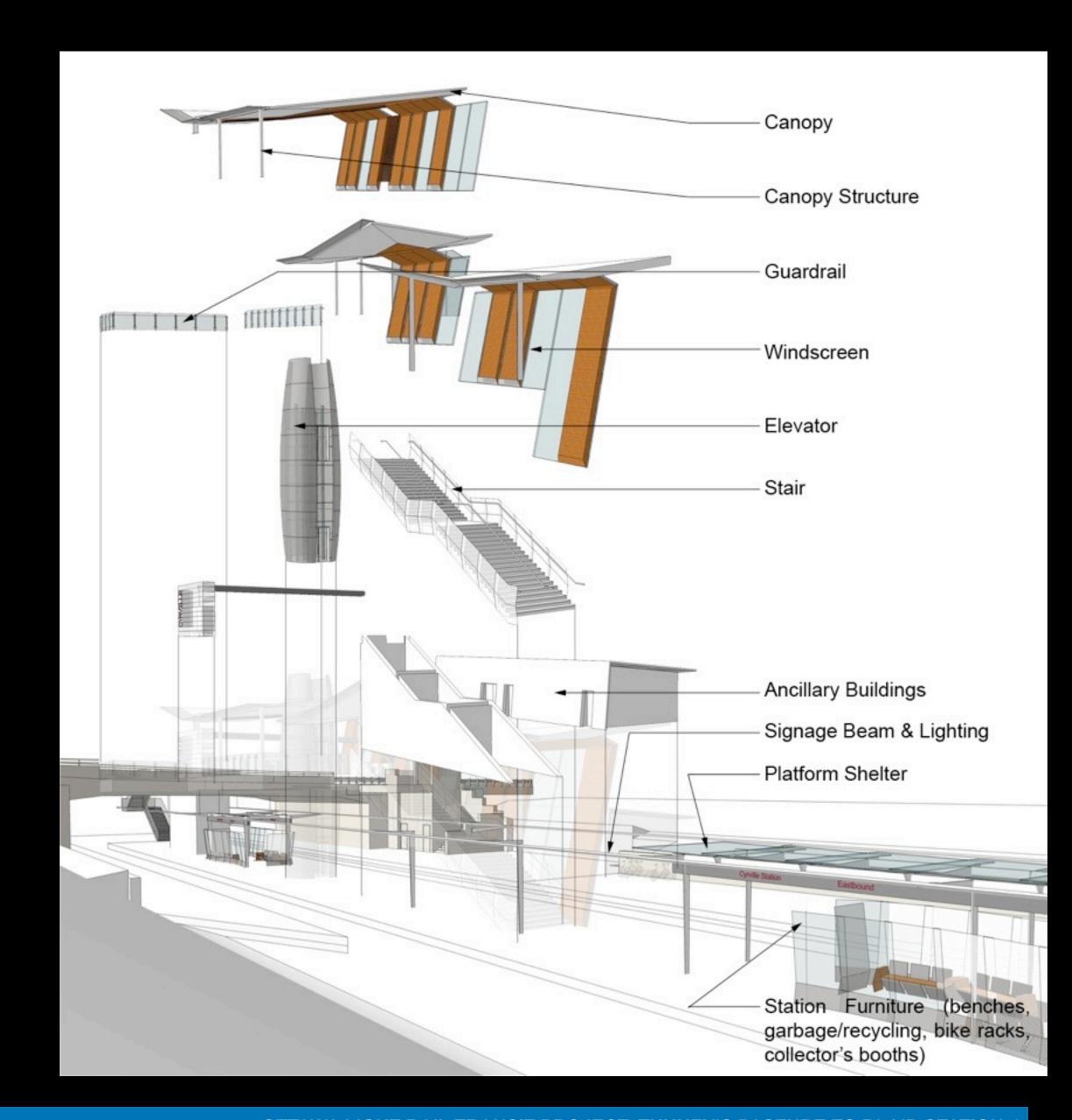








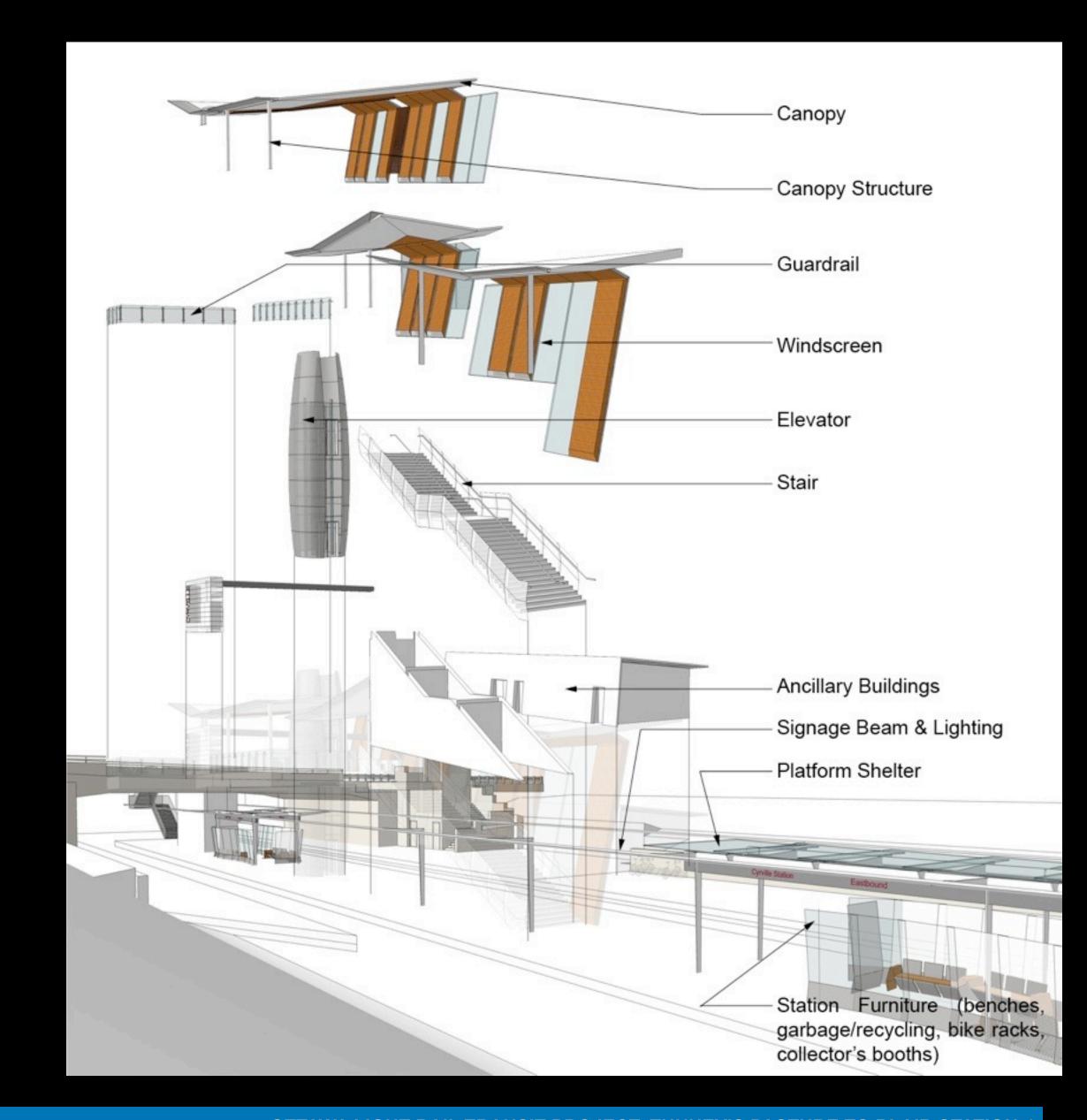
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Systemized Design

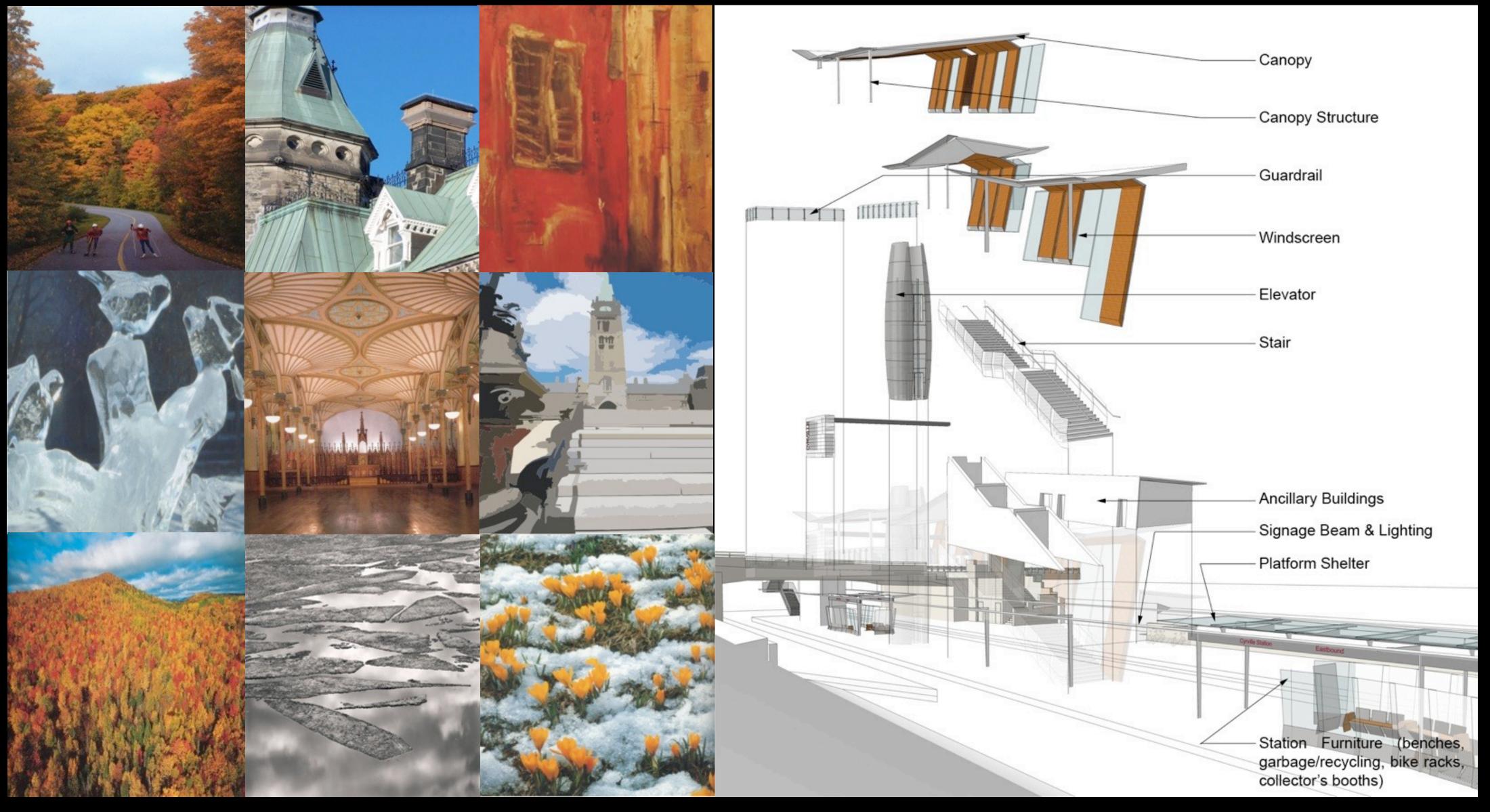
An Ottawa Palette





Systemized Design

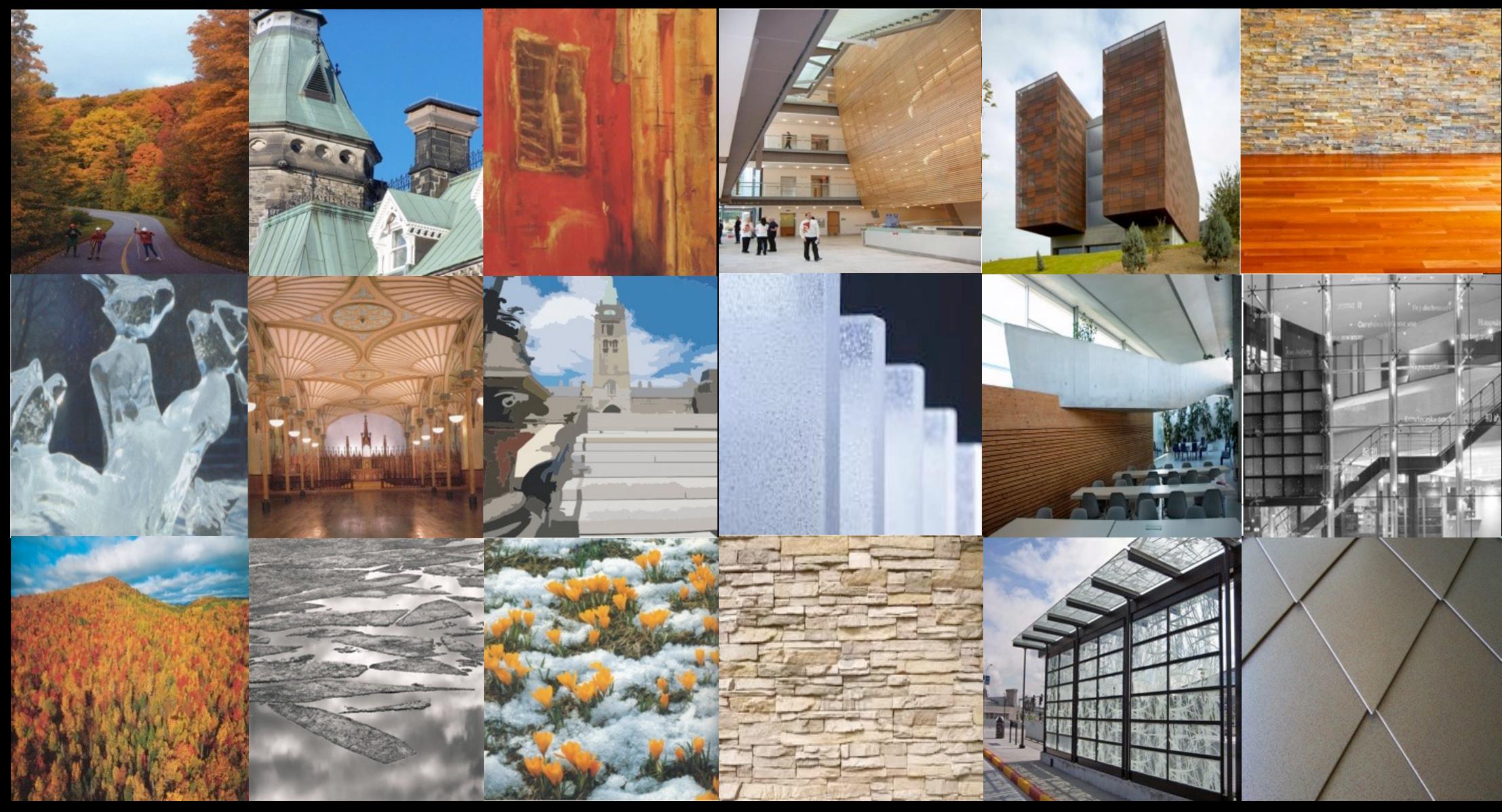
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Systemized Design

An Ottawa Palette







Ridership Experience intuitive orientation humane comfortable safe & accessible

stations which allow riders to take ownership of them not as transit stations but as engaging community spaces and places

stations which explain themselves from a block away







Ridership Experience intuitive orientation humane comfortable safe & accessible







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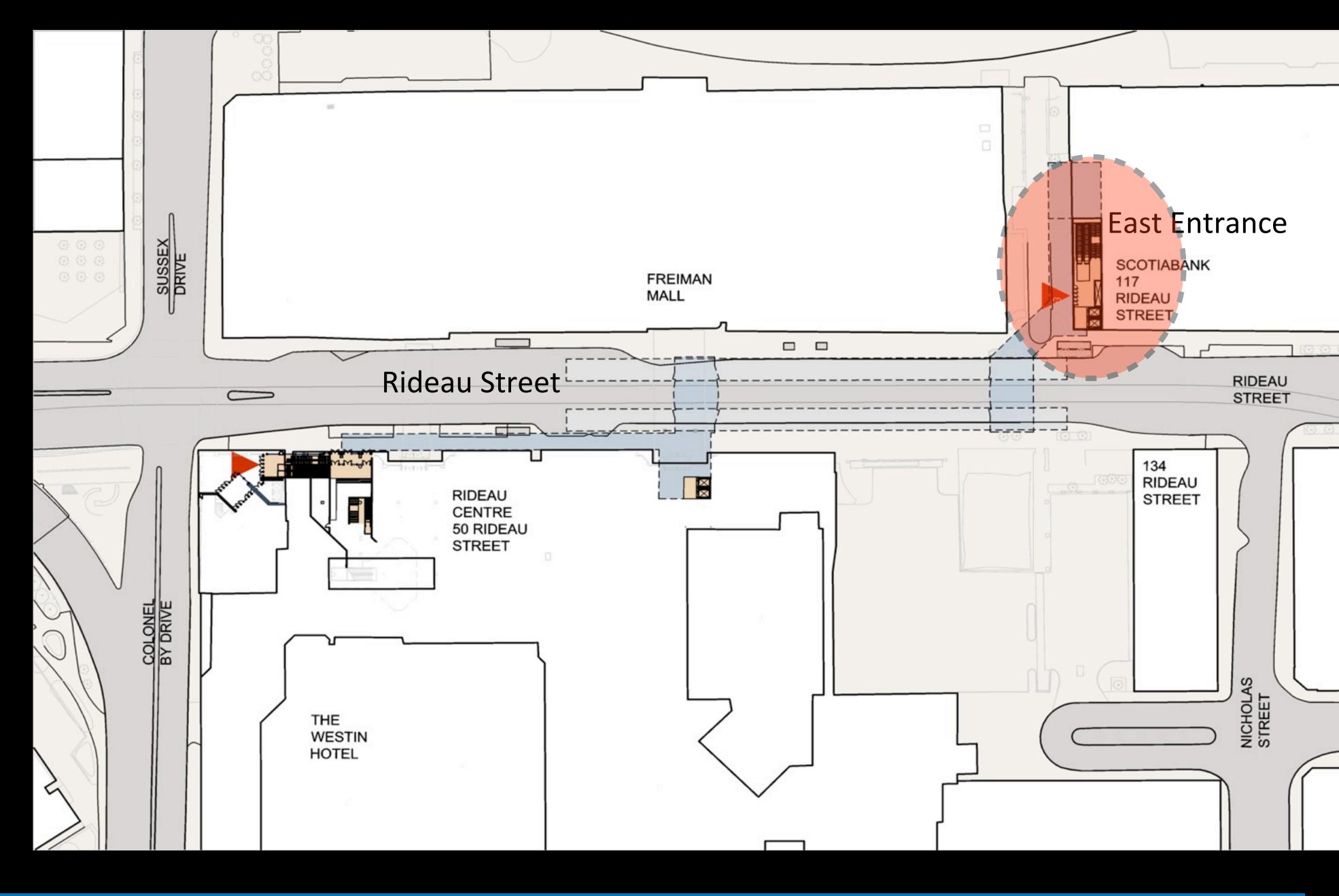
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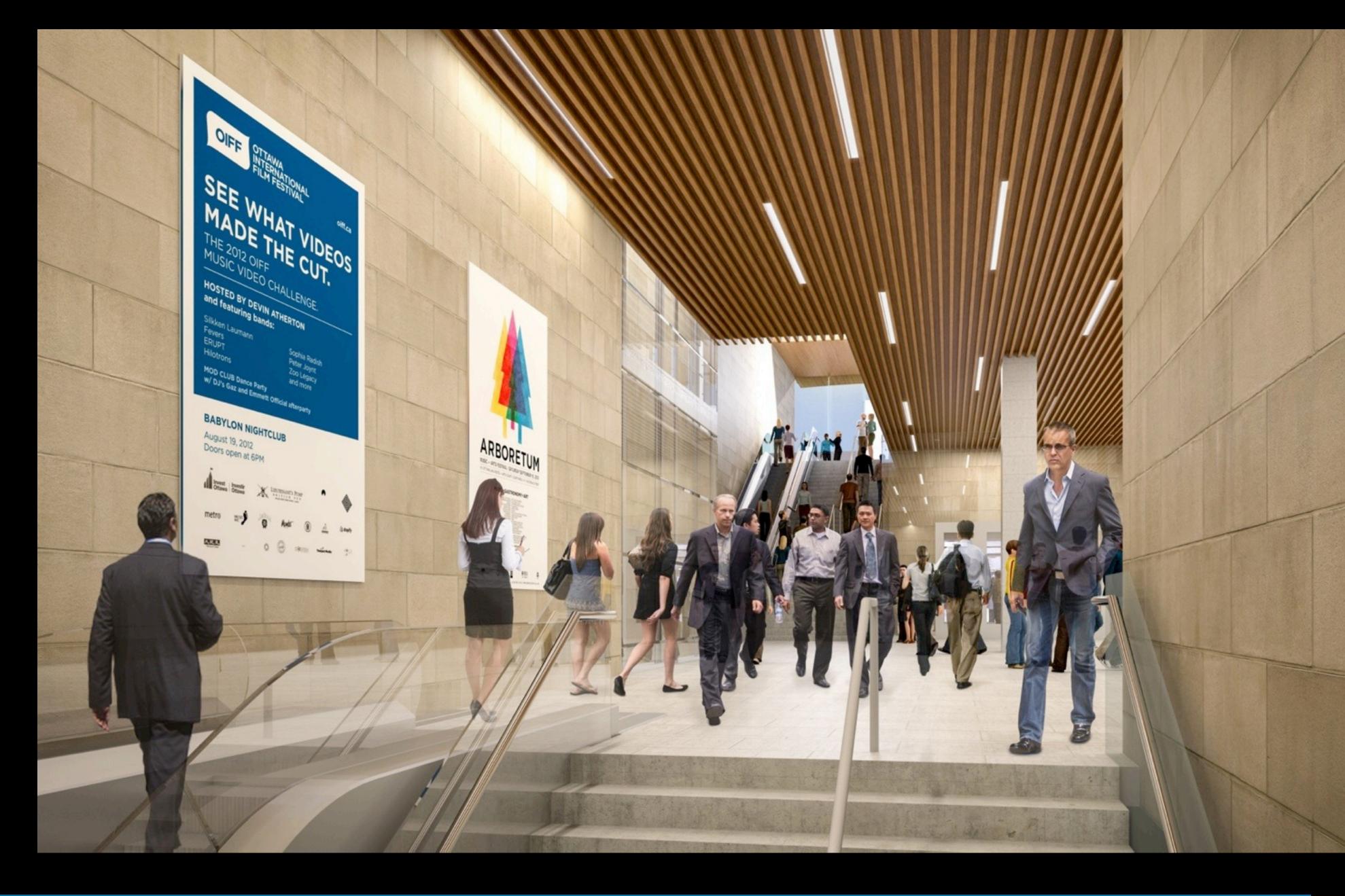
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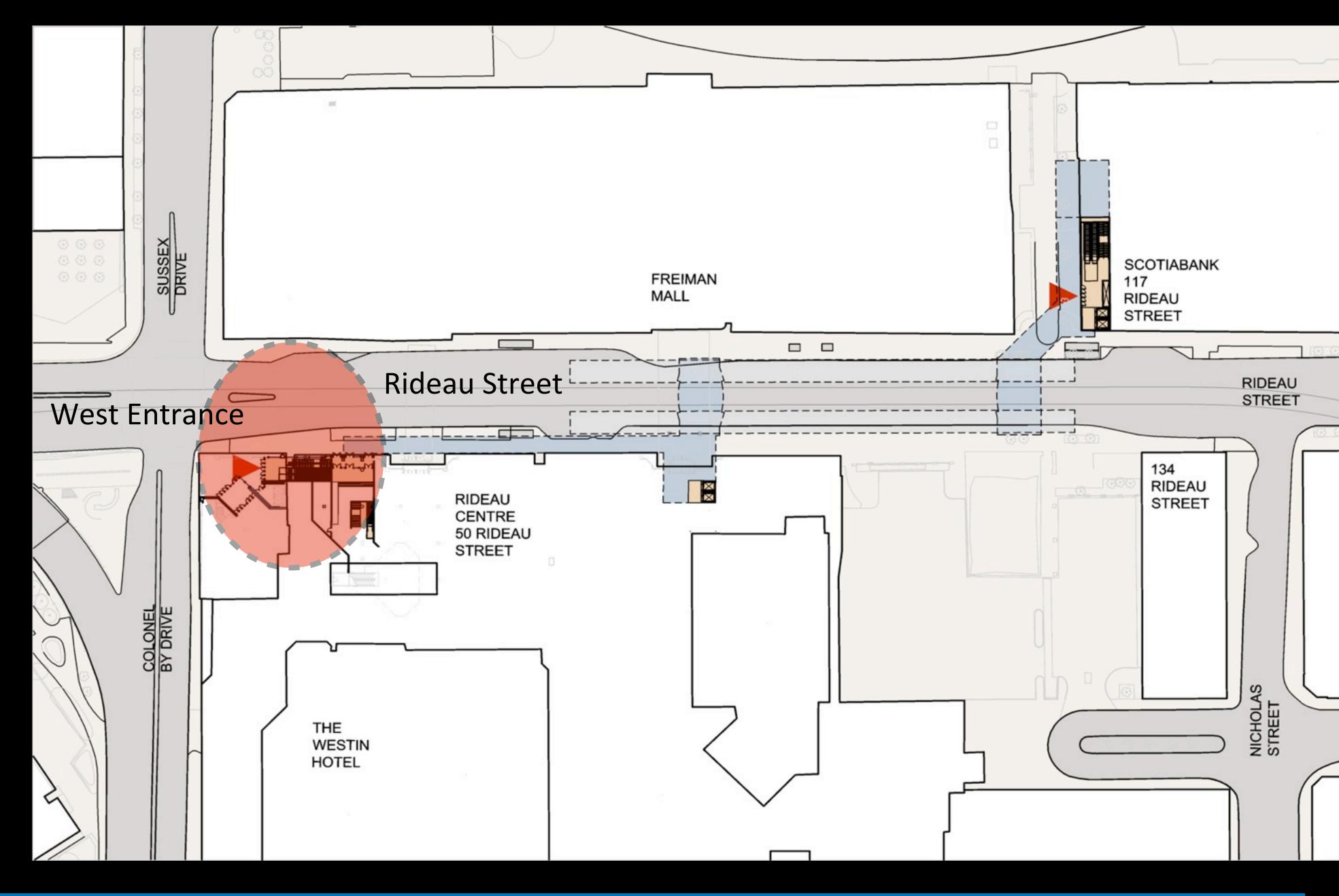




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Tunney's Pasture Station



Limit of Work



Gateway

Urban Landscape

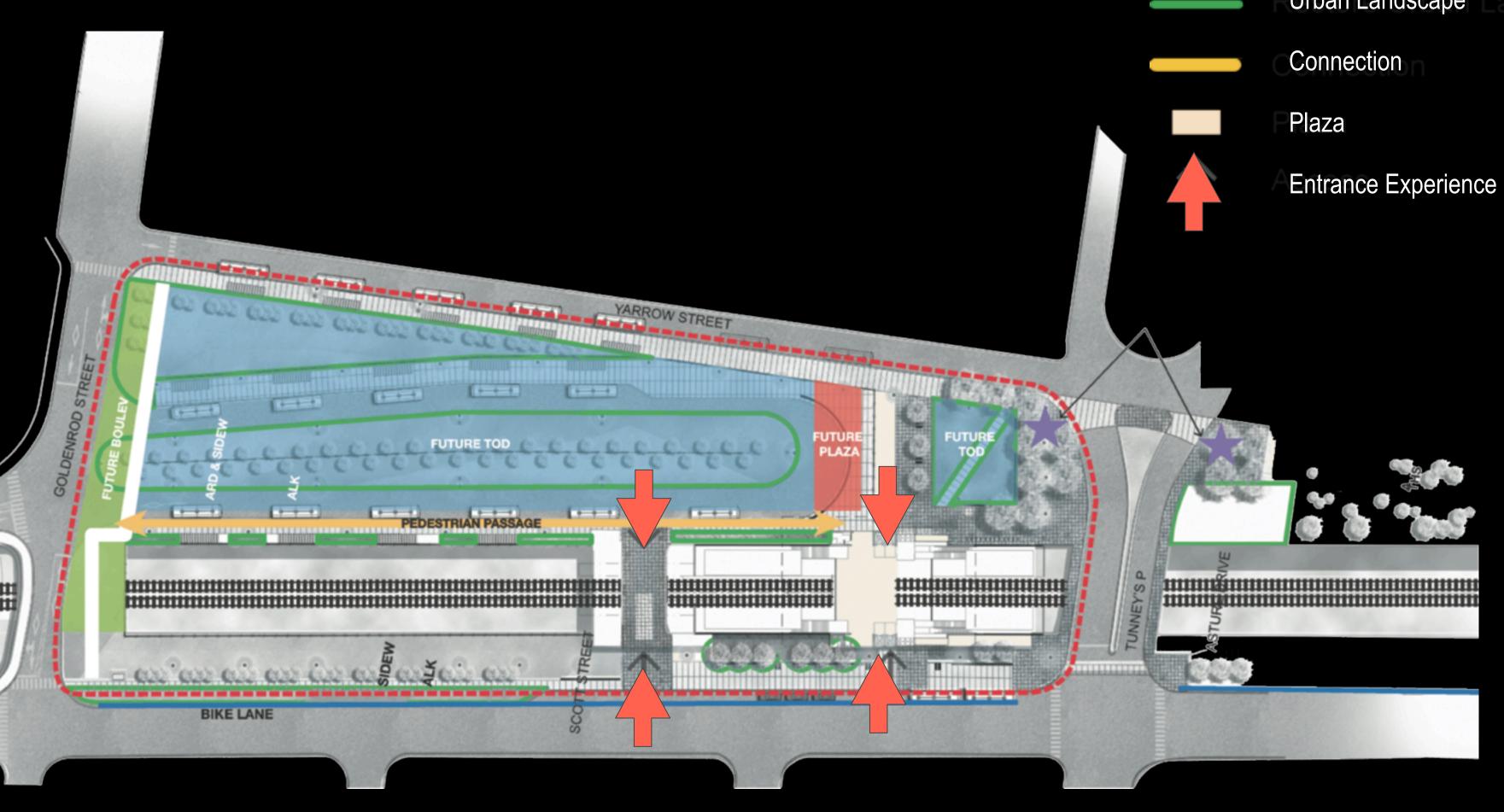


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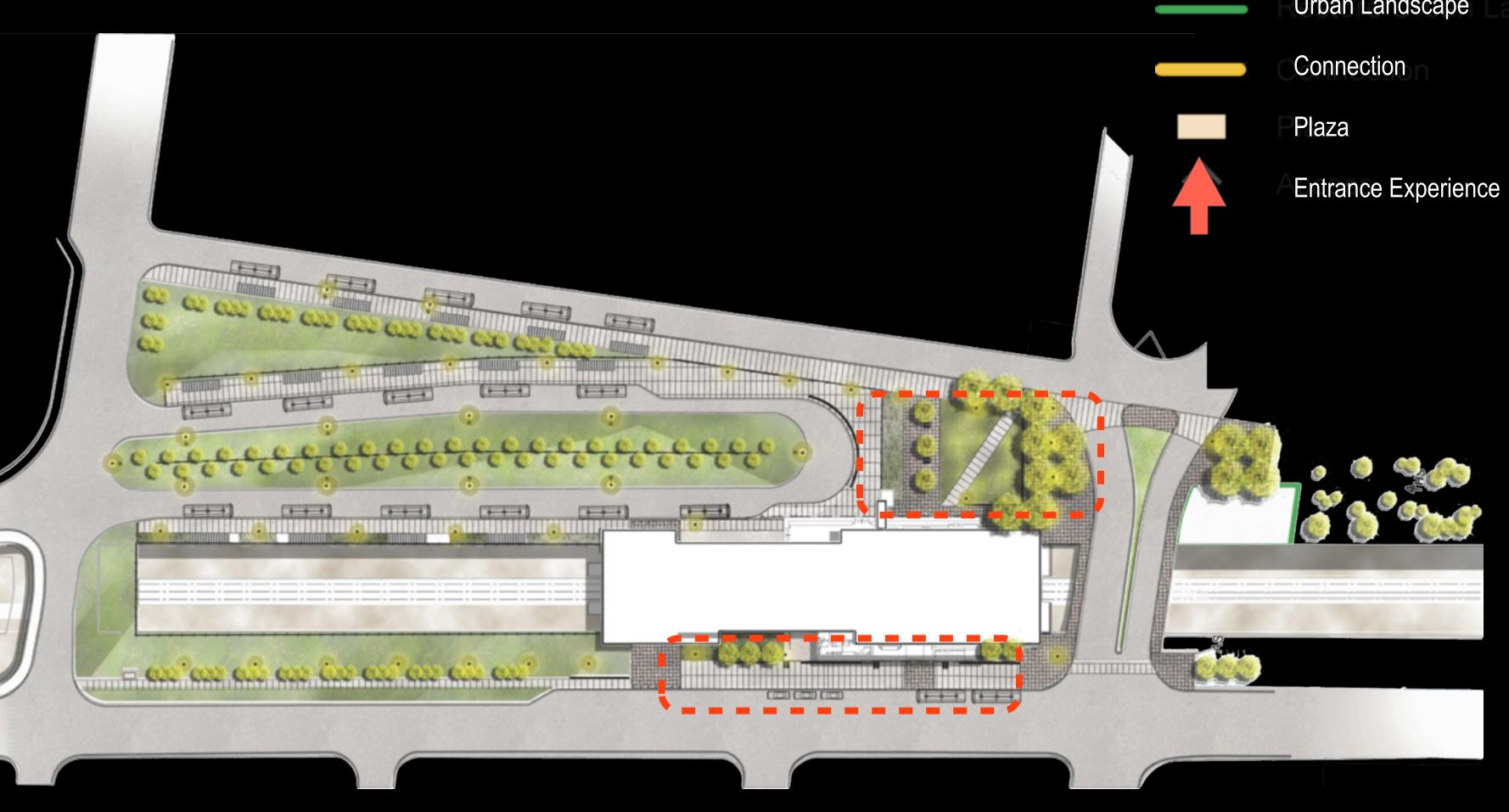


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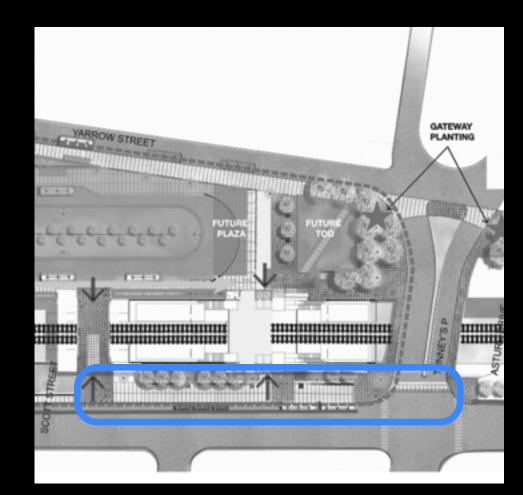
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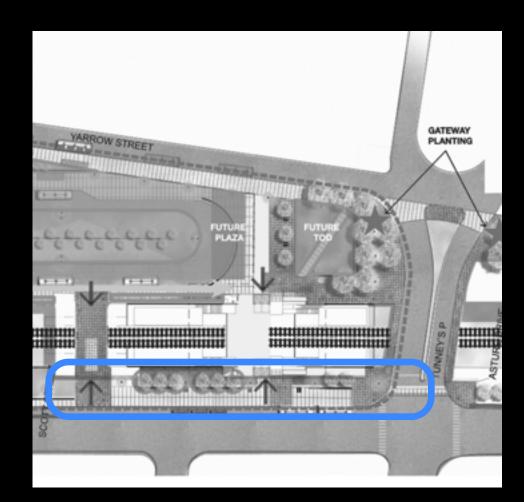
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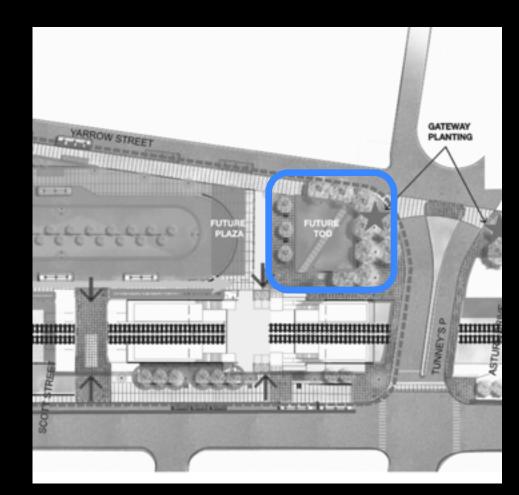
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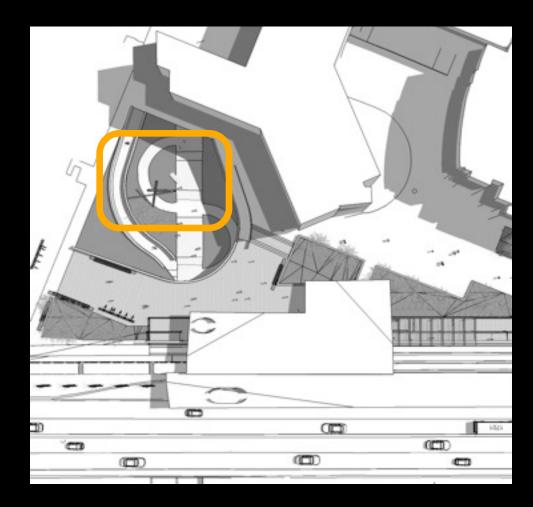
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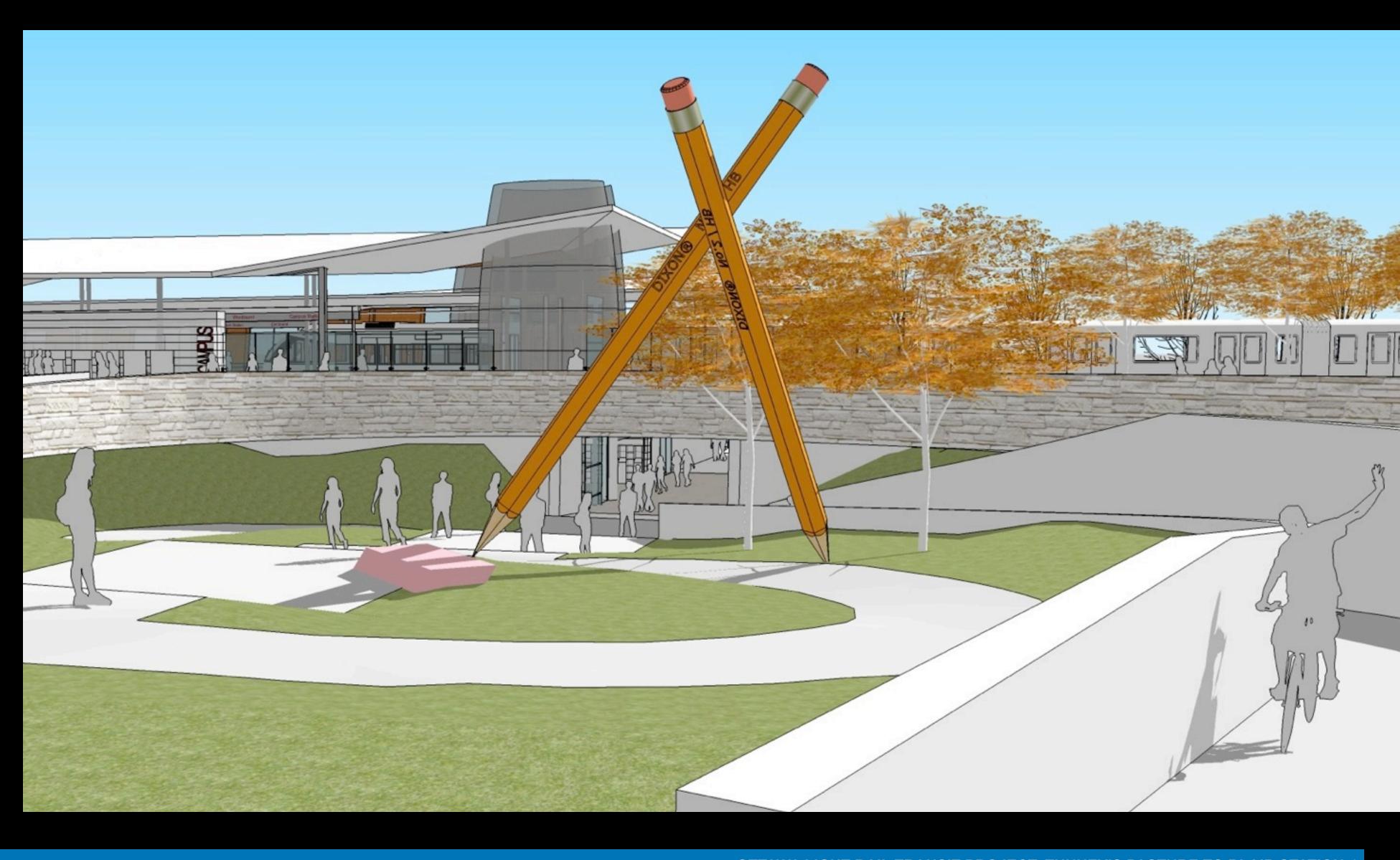


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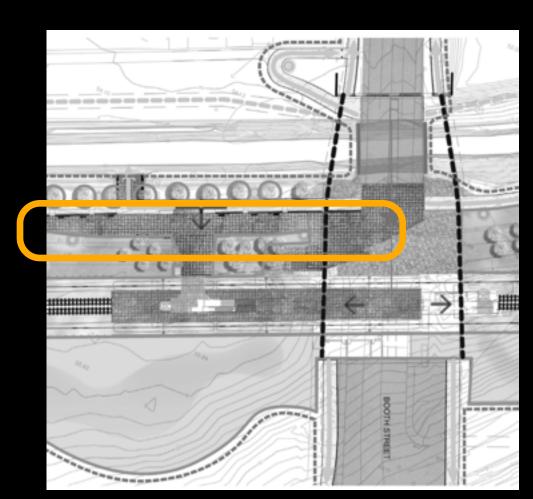
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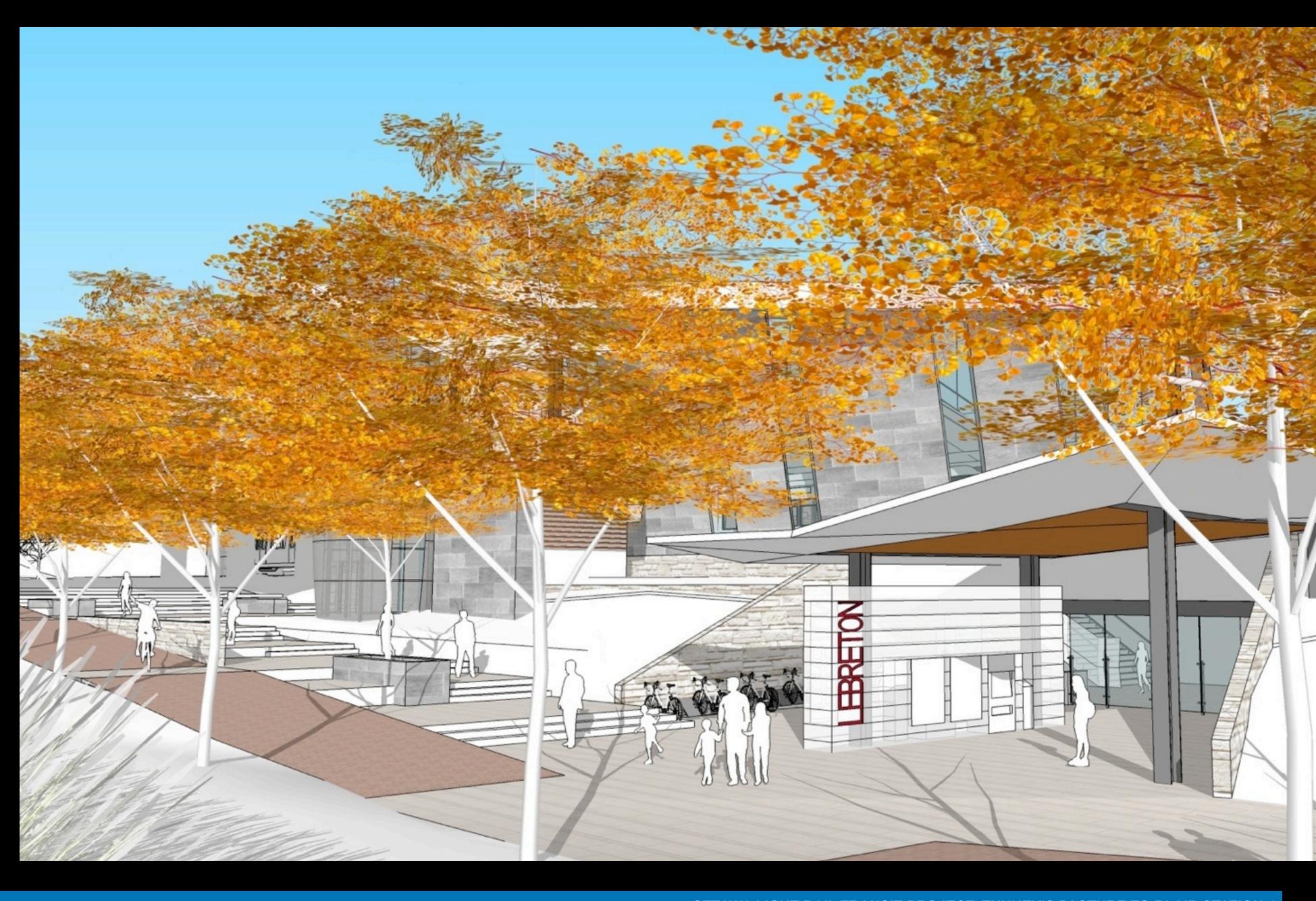


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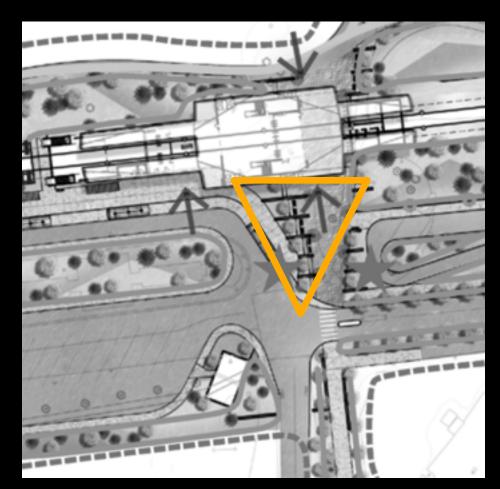
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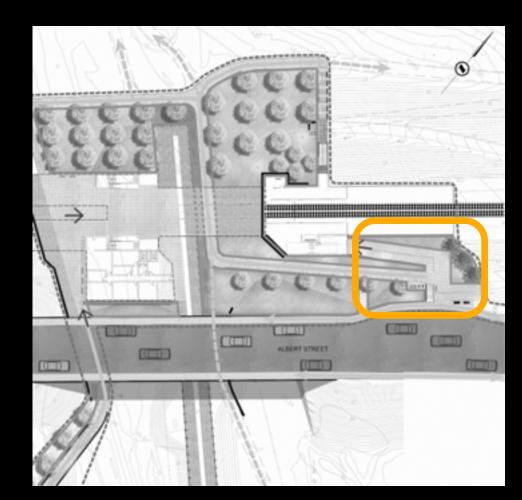
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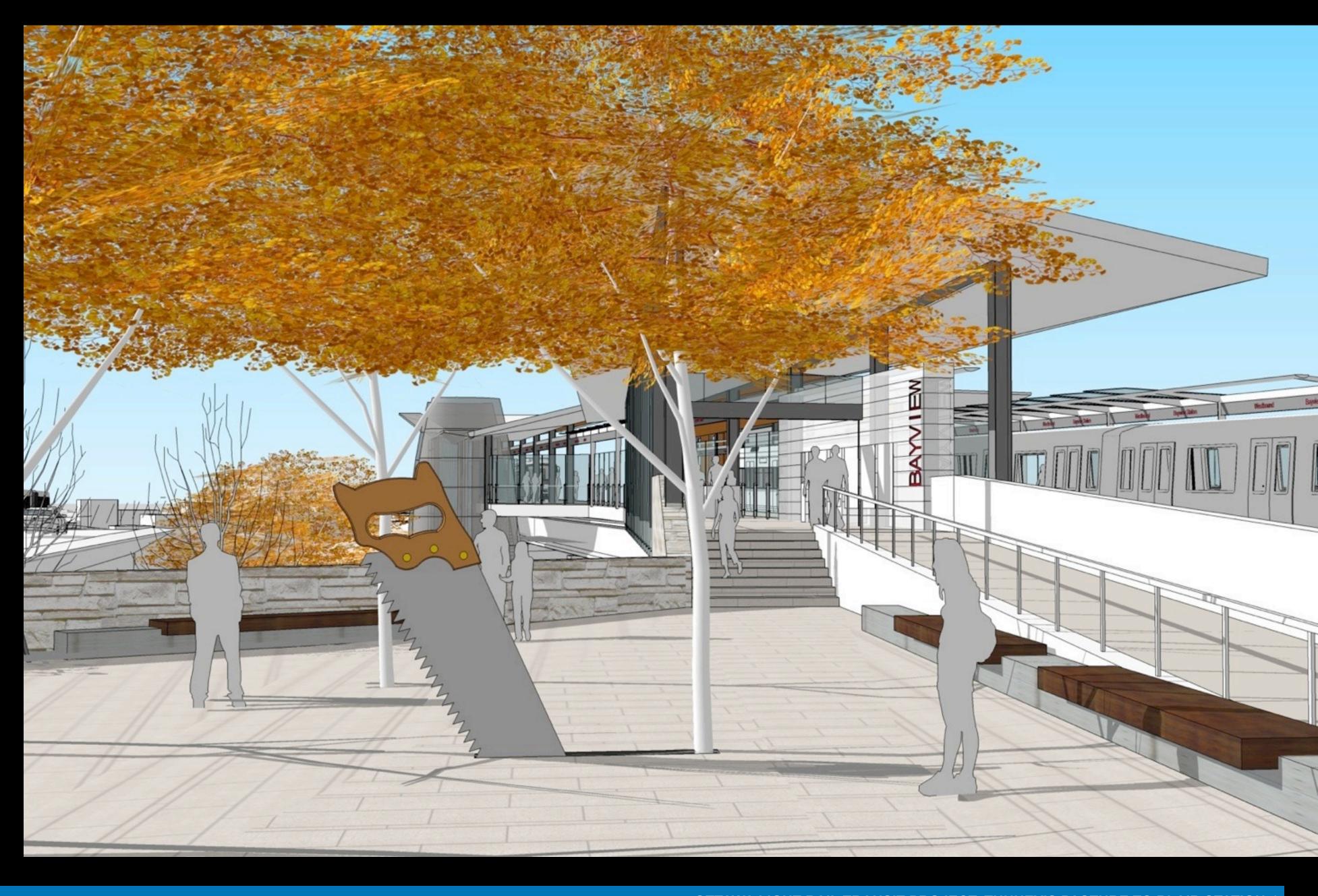


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Changing the way we See Ourselves and The Way
World Sees us







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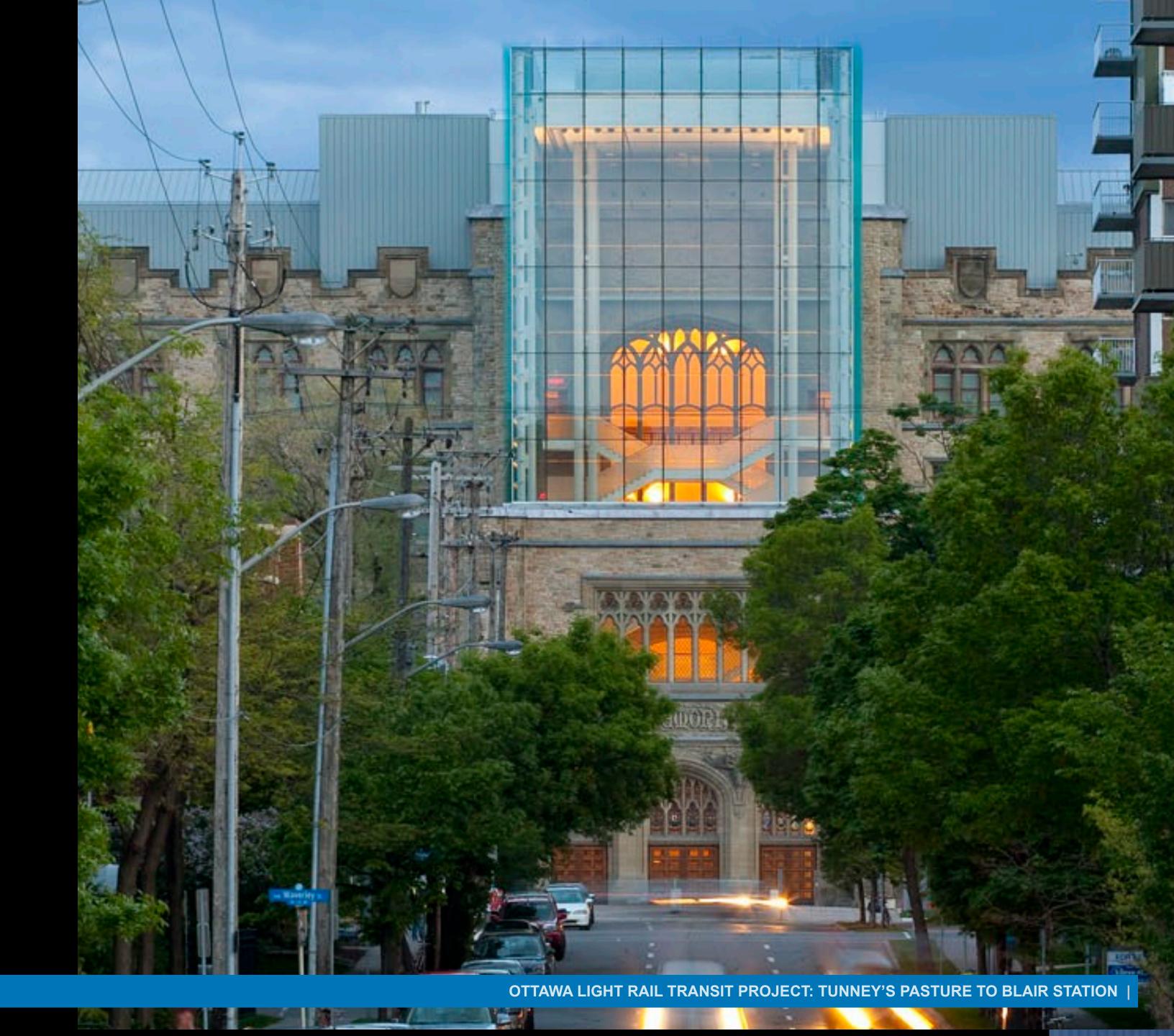




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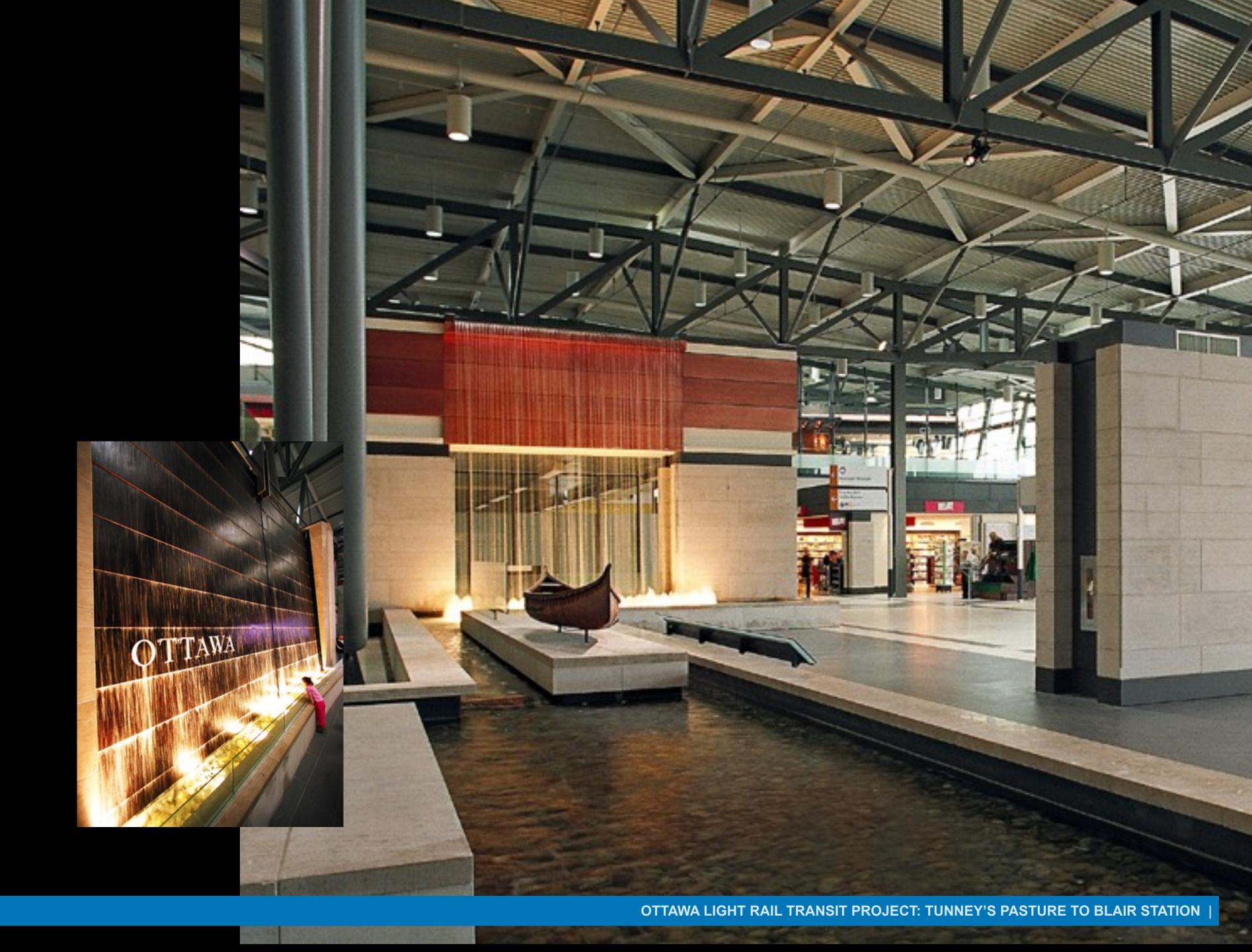




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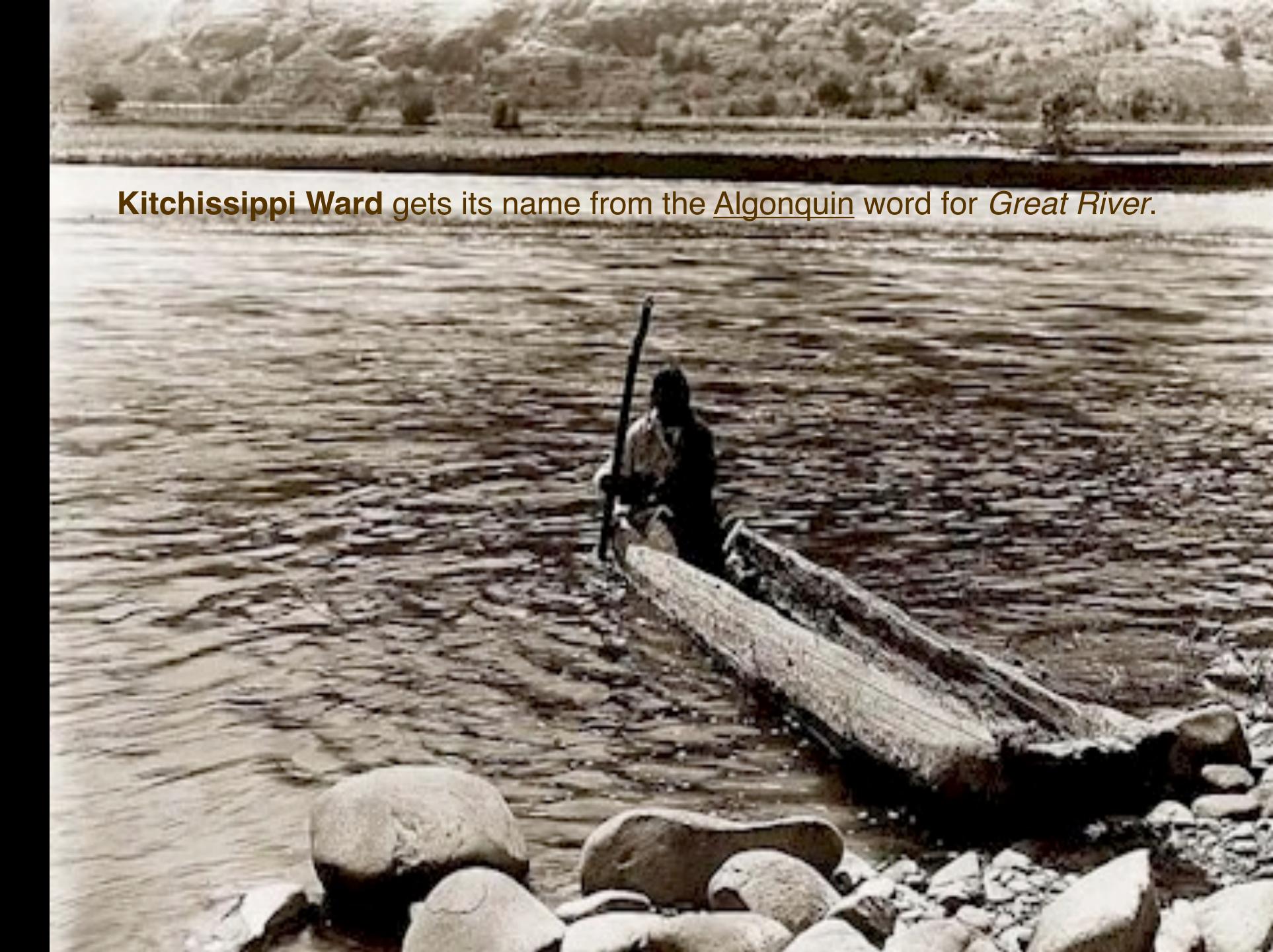




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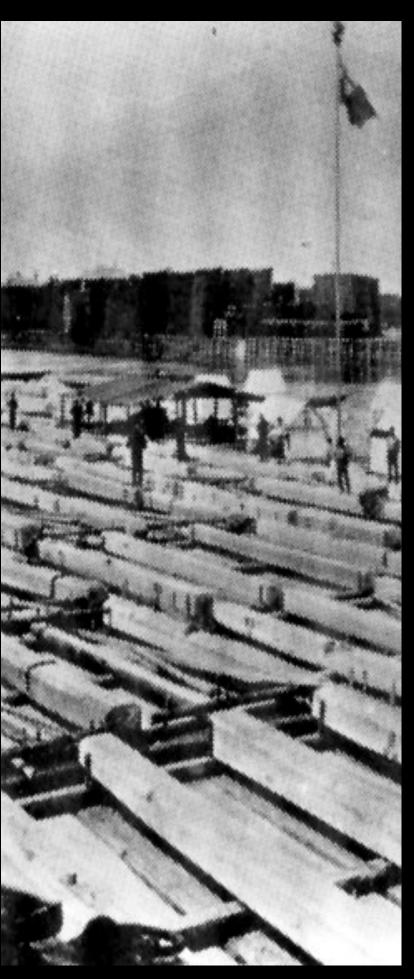
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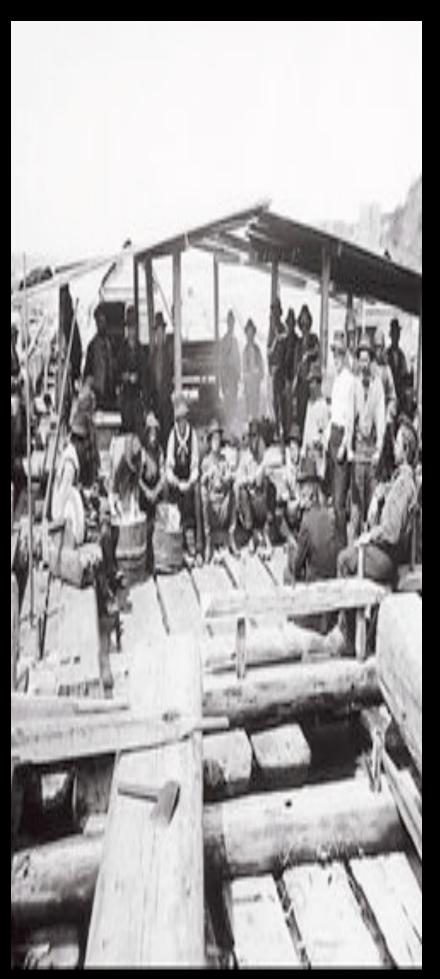
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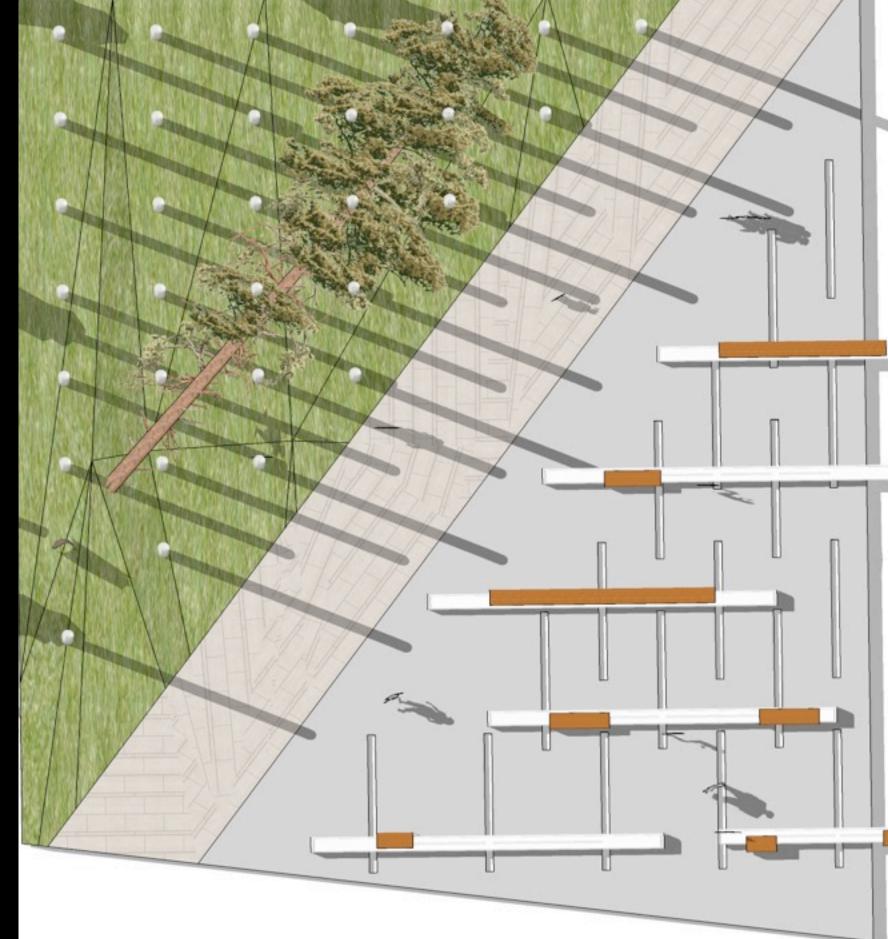






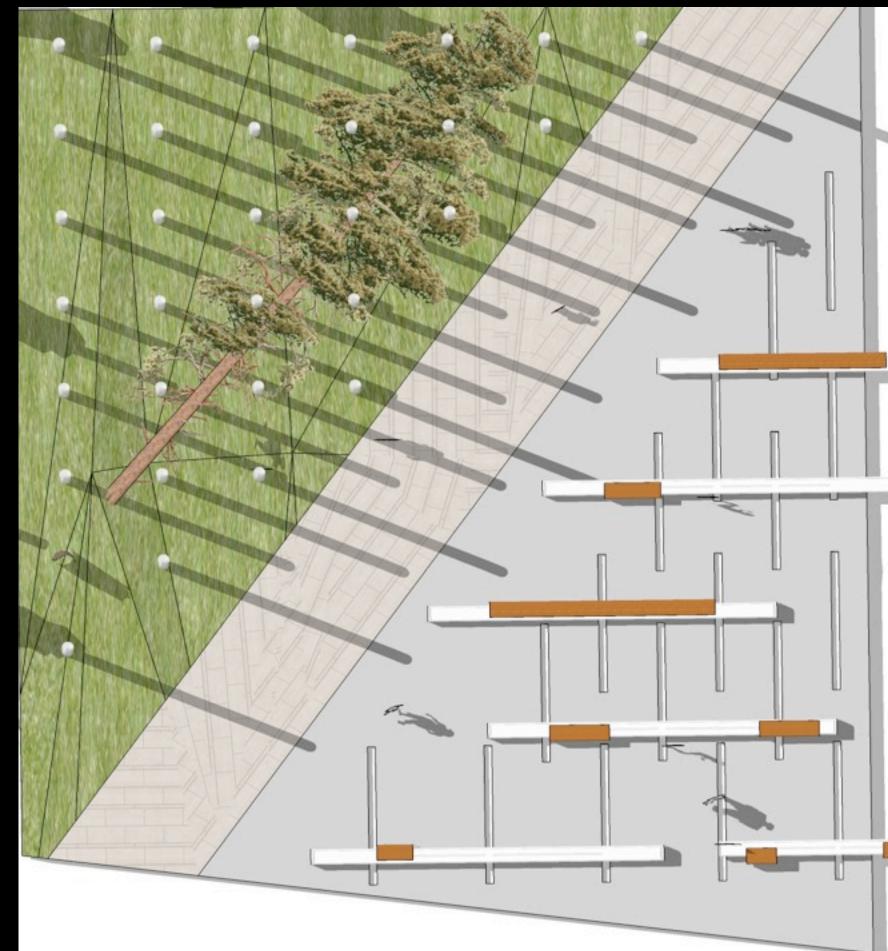












design də zīn

noun

1. • the art or action of conceiving of and producing a plan, drawing or concept: good design can help the user better understand complicated information or ideas













SUMMARY & CLOSING COMMENTS



Summary

The RTG integrated team represents a **single point of contact** for the combined strength and resources of ACS -Dragados, SNC-Lavalin, and EllisDon.



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THANK YOU - MERCI