



# TORONTO WATERFRONT VIADUCT



## **Reconnecting our city.**

The end of the crumbling Gardiner Expressway and the rail corridor barrier.



# TORONTO WATERFRONT VIADUCT

**Our last opportunity to connect  
downtown to the waterfront.**

**The Toronto Waterfront Viaduct (TWV) is a cable-stayed viaduct that will  
combine a new route for vehicles with a new east-west transit line,  
in a unique waterfront transportation corridor.**



**An extraordinary legacy for the citizens of Toronto.**

**skyPATH is a panoramic, weatherproof, “hanging gardens” destination  
for pedestrians and cyclists... *under* the viaduct.**

# THE OPPORTUNITY

Remove the crumbling Gardiner Expressway and relieve traffic gridlock... with little or no disruption.



# Cable-stayed Bridges & Viaducts



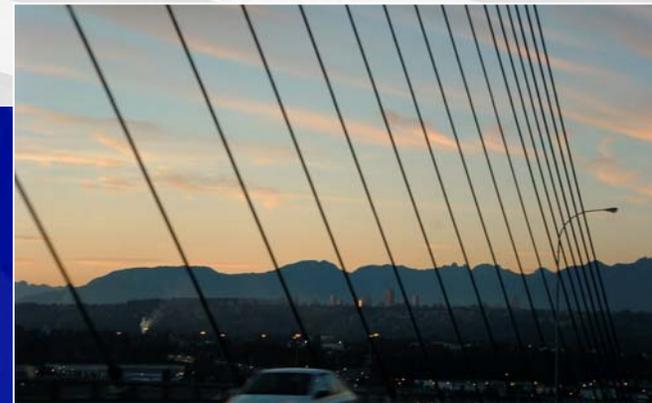
Millau Viaduct, France



Leonard P. Zakim Bridge, Boston



Cooper River Bridge, South Carolina



Crossing Alex Fraser Bridge, Vancouver, B.C.

# No Disruptions

- ▶ **WHERE:** the viaduct straddles the rail corridor directly south of Front Street.
- ▶ **HOW:** cantilevered construction methods will minimize disruptions to rail service.
- ▶ **WHY:** commuter traffic would be paralyzed if the Gardiner was demolished before a replacement vehicular link was provided.

# Cantilever Construction Method

Cantilever construction methods using “A” frame pylon design (straddles existing train tracks) = little or **no disruption** of activities below the viaduct.

When construction is complete, demolition of the Gardiner begins.



# Toronto Waterfront Viaduct

A spectacular cable-stayed structure.

An essential commuter link.



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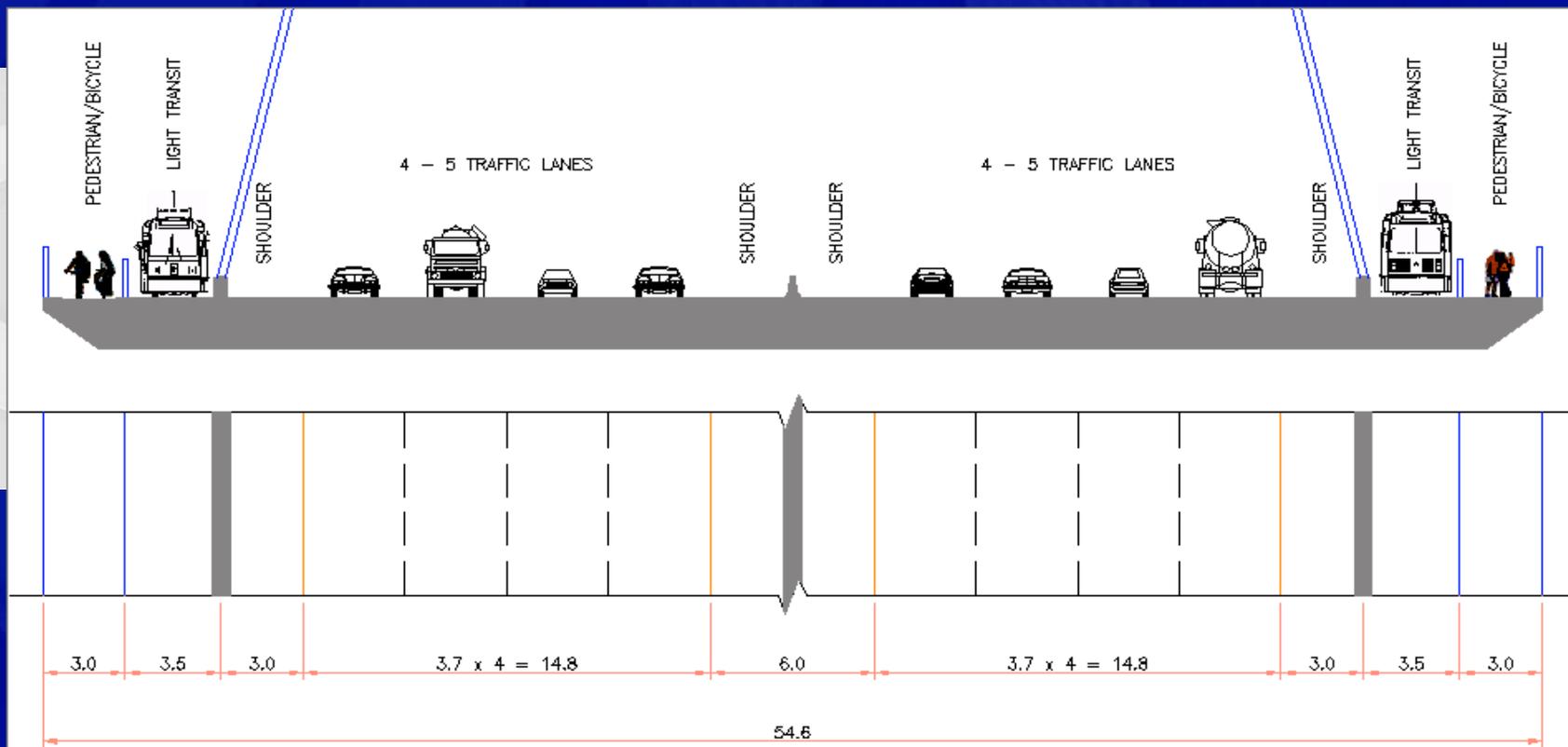
# Toronto Waterfront Viaduct

**The viable alternative.**

- ▶ **all modes of transportation hosted in a unique corridor.**
- ▶ **drive, walk, cycle or take public transit in and out of the downtown core.**
- ▶ **a barrier to the waterfront (the rail corridor) is transformed into a priceless source of connections.**

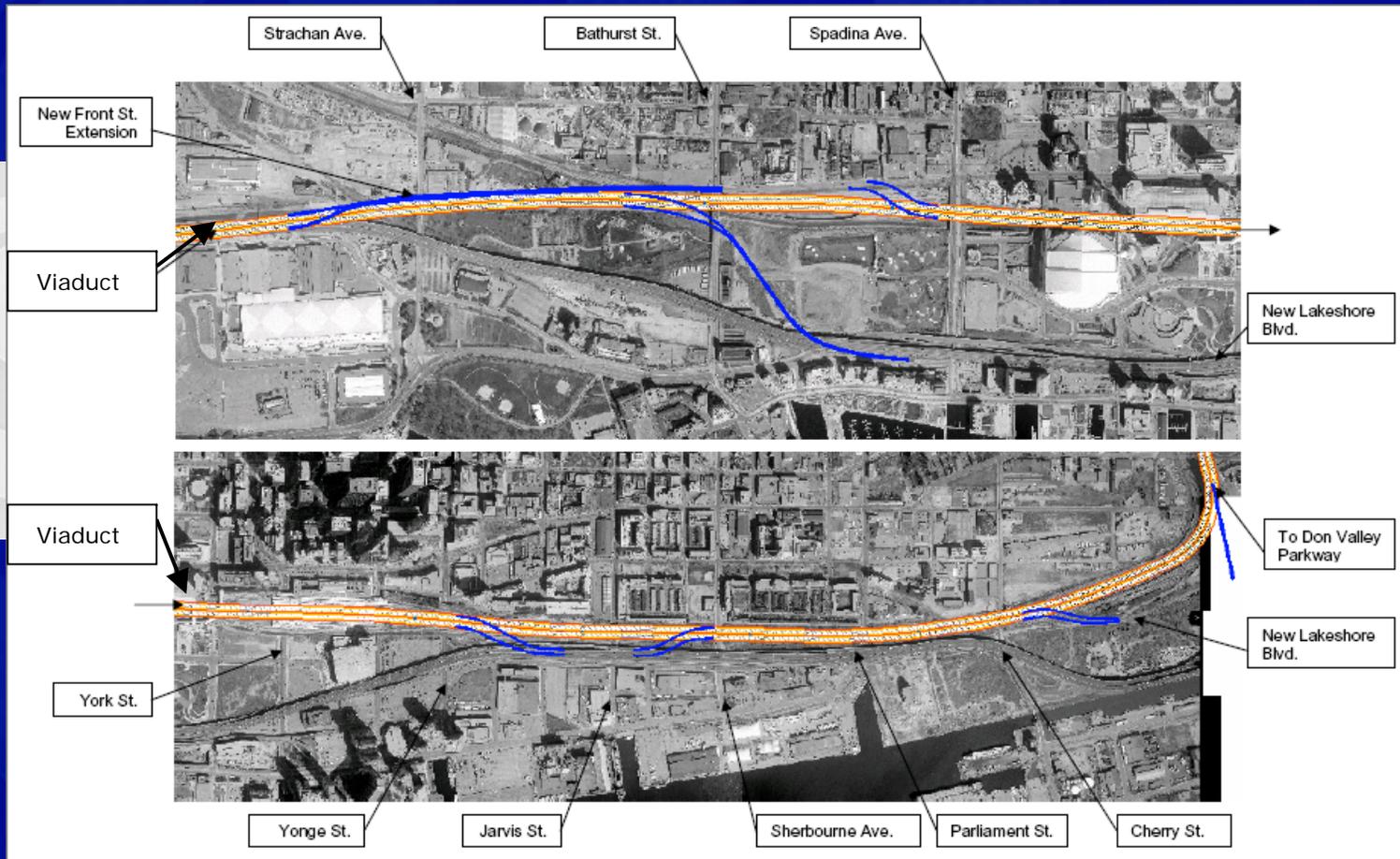
# Toronto Waterfront Viaduct

## Typical cross-section.



# TWV Ramps and Connections

DRIVE ▲ TRANSIT ▲ WALK ▲ CYCLE



# Speed Limit Issues

## Spadina to Parliament



**“boulevard”**  
pace for  
2.5 kilometers



- ▲ **narrowing lanes of the viaduct east of Spadina (due to proximity to Rogers Centre, CityPlace etc.).**
- ▲ **virtually no “noise pollution” (canopy deflectors etc.).**
- ▲ **more *neighbourly* traffic flow through the core.**
- ▲ **a few extra seconds on the higher capacity viaduct still = a huge net time saving for commuters (gridlock eliminated).**

# Toronto Waterfront Viaduct

Complementing the city skyline.



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# skyPATH

A modern wonder of the world.



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# skyPATH

**Walk, jog, cycle - or just sit and relax  
in an extraordinary all-weather park.**

- ▲ perhaps the greatest new pedestrian amenity in the city's history and destined to become a major tourist attraction.
- ▲ complements the huge PATH underground network.
- ▲ an ideal companion project in support of 2015 World Expo bid.
- ▲ helps eliminate the "real" barrier - the railway corridor.
- ▲ funded by residential and commercial developers for highly valued direct connections (*eg. Calgary's PLUS 15 system*).
- ▲ appreciates the value of residences nearby, mitigating the potential "NIMBY" opposition to the Viaduct.

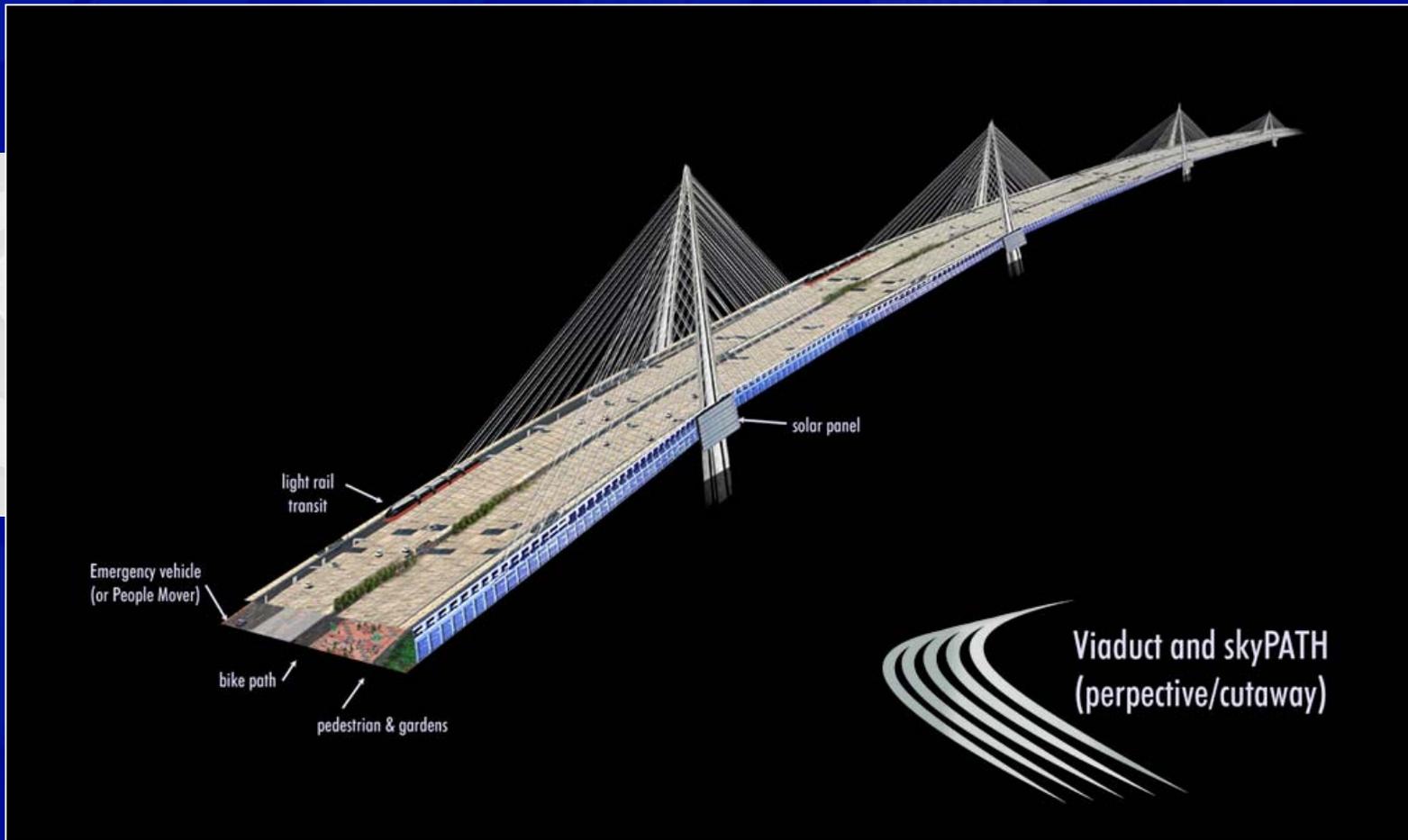
# skyPATH

## Partnerships and Beneficiaries.

- ▲ **Toronto Parks and Recreation.**
- ▲ **botanical and horticultural organizations.**
- ▲ **boards of education and other learning organizations.**
- ▲ **local artists, performers and other arts associations.**
- ▲ **pedestrian, cycling and neighbourhood associations.**
- ▲ **Toronto tourism in general, and Fort York in particular.**

# Cutaway View

## TWV and skyPATH.



# THE SITUATION

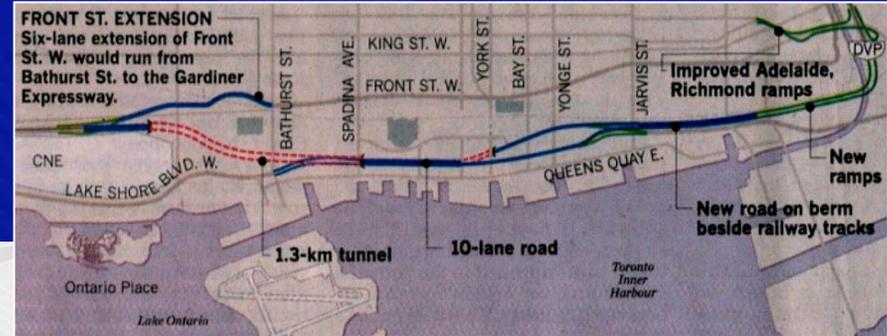
## A Closer Look

- ▲ **traffic gridlock and commuter volume = virtually an “all day rush hour” on the Gardiner Expressway.**
- ▲ **the crumbling expressway: maintenance costs continue to soar annually.**
- ▲ **the “real barrier” to the waterfront: the wide, below-grade rail corridor to the west of and the raised rail berm to the east.**
- ▲ **the explosion of development west of Yonge, south of Front Street.**
- ▲ **entire new neighbourhoods will be emerging east of Yonge.**

# Past Proposals



**Dismantling**



**Tunnelling**

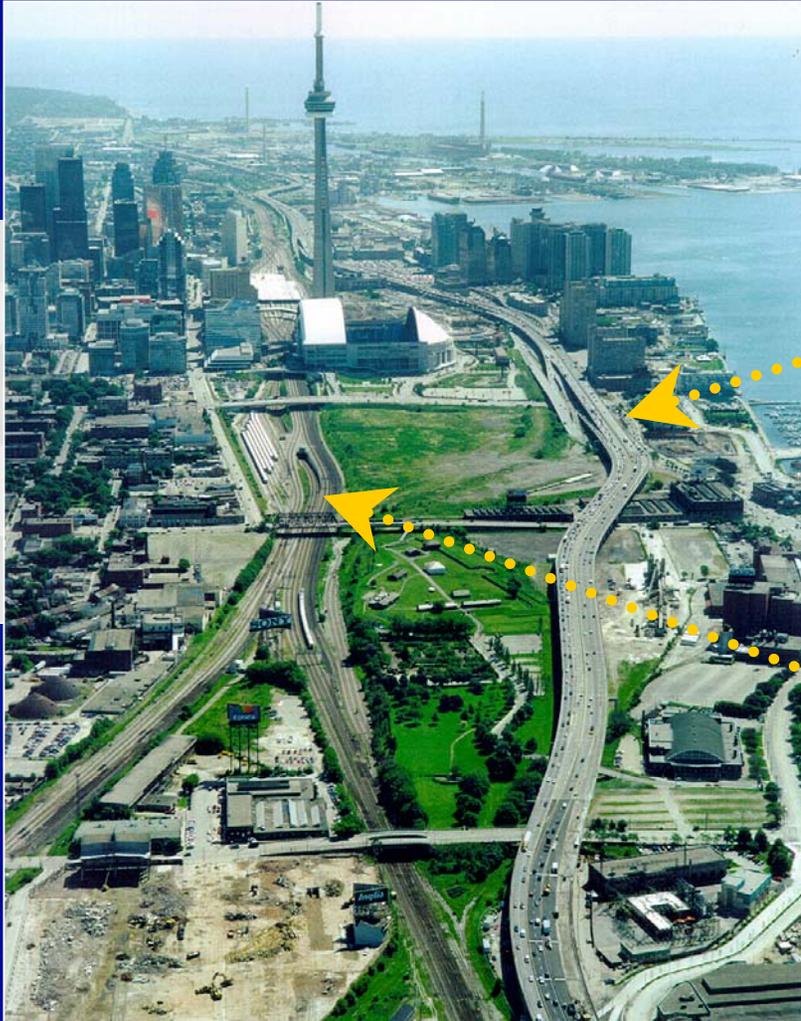


**Front Street Extension**



**Beautifying under Gardiner**

# Eastern View



**Two separate corridors,  
and two separate barriers.**

••••• The “psychological” barrier - the elevated Gardiner Expressway.

••••• The physical barrier - the rail corridor, a wide canyon between downtown and the waterfront.

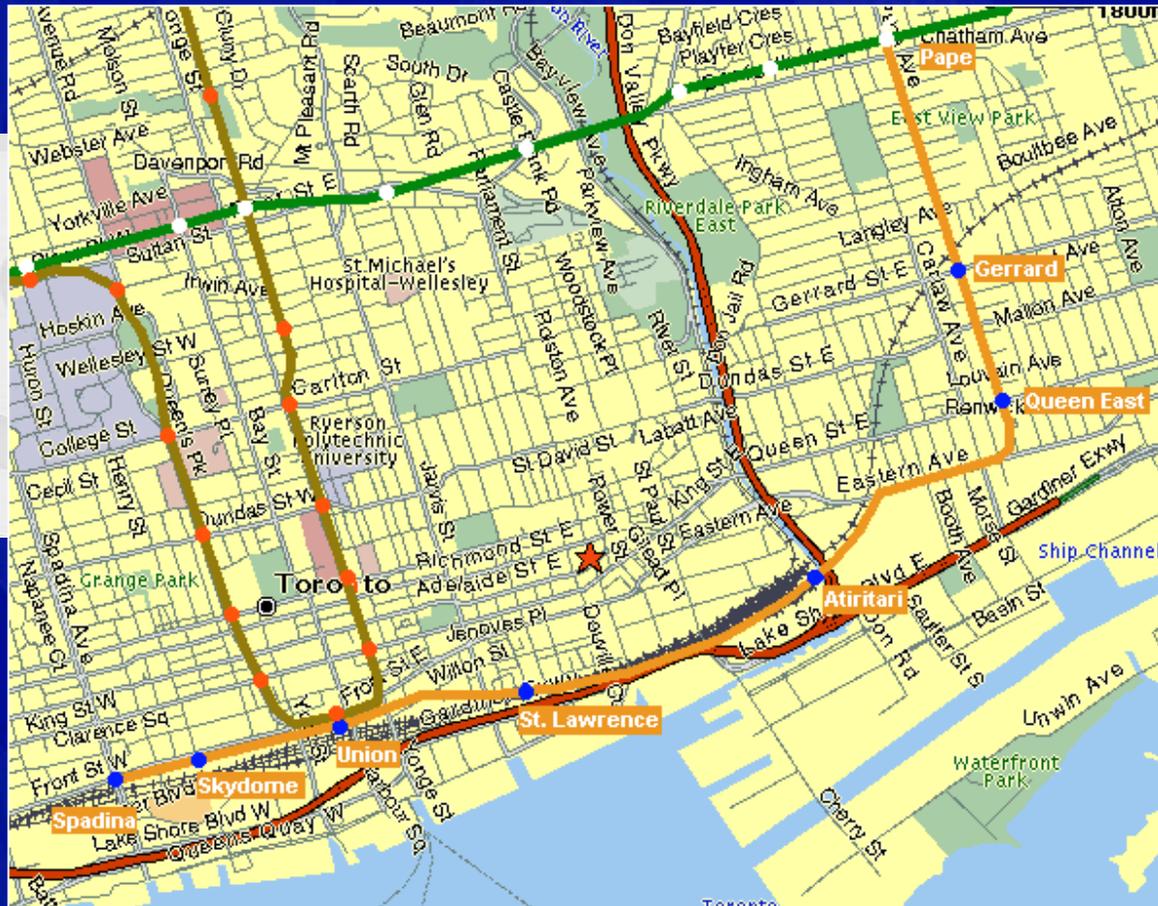
# THE SOLUTION

## A Closer Look

- ▲ keep the Gardiner Expressway vehicular link until the viaduct construction is complete.
- ▲ a new Lakeshore *rapid* transit line to relieve congestion and serve thousands of new residents south of Front Street.
- ▲ a grand new Lakeshore Boulevard is designed.
- ▲ innovative retail and north/south links below the eastern rail berm.
- ▲ skyPATH: an extraordinary pedestrian and cycling route, underwritten by the private sector.

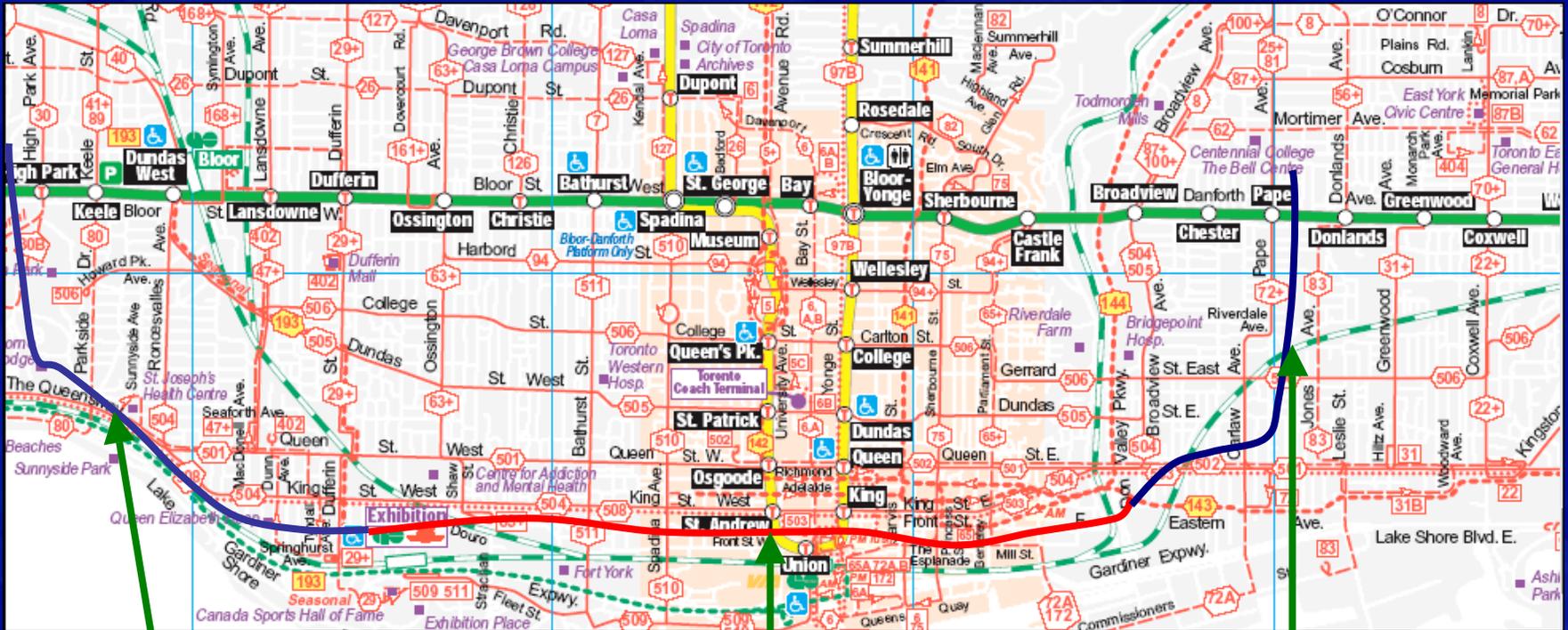
# Lakeshore Rapid Transit Line

TTC's Network 2011 Downtown Relief Line (proposed 1985)



# Lakeshore Rapid Transit Line

## Downtown Toronto subway system and proposed relief line



Western extension

Proposed viaduct

Eastern extension

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# Western View

Present day - elevated Gardiner Expressway & rail corridor.



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# Future view

Gardiner is dismantled and a “new” Lakeshore Boulevard graces the waterfront.



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\*illustration shows Island airport replaced by western portion of the proposed 2015 World Expo site.

**TWV deck and skyPATH straddle the rail corridor just above trains.**



**skyPATH connections to neighbourhoods (cutaway view)**



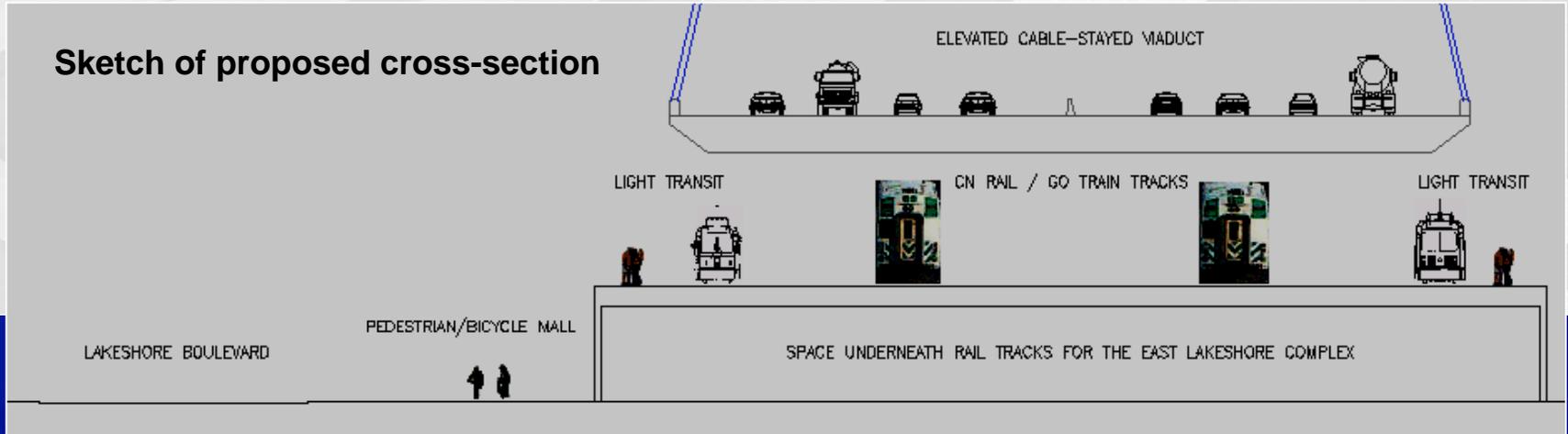
**North-south pedestrian connections to skyPATH, underwritten by developers.**

# Residential, Retail and Tourism Opportunities

- ▲ **EAST LAKESHORE MALL** - retail and pedestrian connections to the planned East Bayfront community, under the railway berm.
- ▲ **habitable viaduct pylons** - residential and/or commercial construction “piggy-backs” on pylon strength.
- ▲ **TOURISM** - new destinations such as skyPATH and 2015 World Expo.

# EAST LAKESHORE MALL

East/west retail mall under the railway berm (phased construction).



Pedestrian connections north to The Distillery District and West Donlands, and south to the East Bayfront.

# EAST LAKESHORE MALL

Present day rail embankment (berm) east of Yonge.



Only a few crumbling access points (north/south)  
at major streets such as Sherbourne.

# EAST LAKESHORE MALL

Future view of the rail berm east of Yonge.



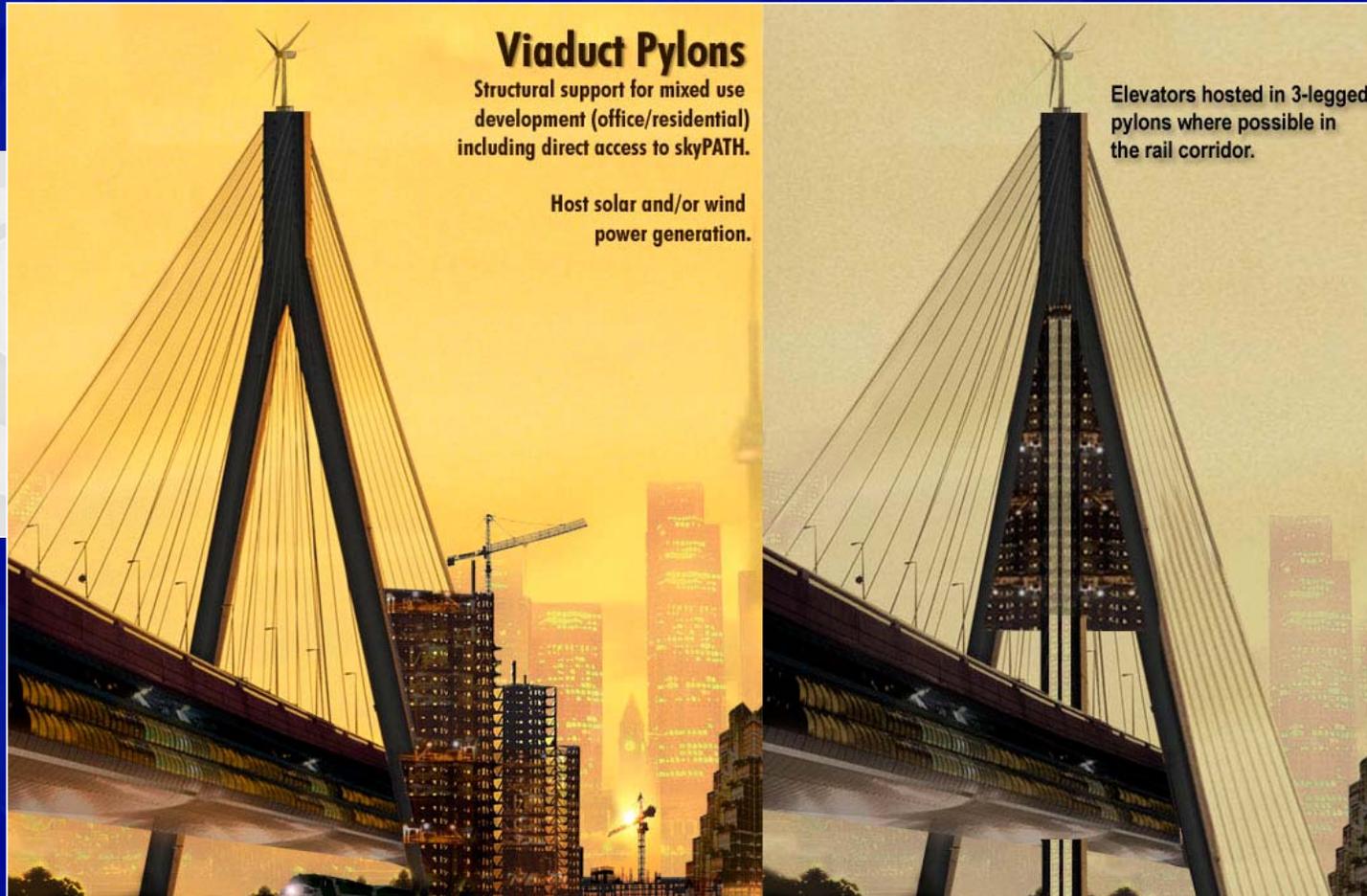
# EAST LAKESHORE MALL

Future interior view: retail opportunities, parking etc.



# A Multi-purpose Structure

Residential/commercial construction- HABITABLE PYLONS



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# 2015 World Expo Bid

**A viable transit link between 2 fair sites .**

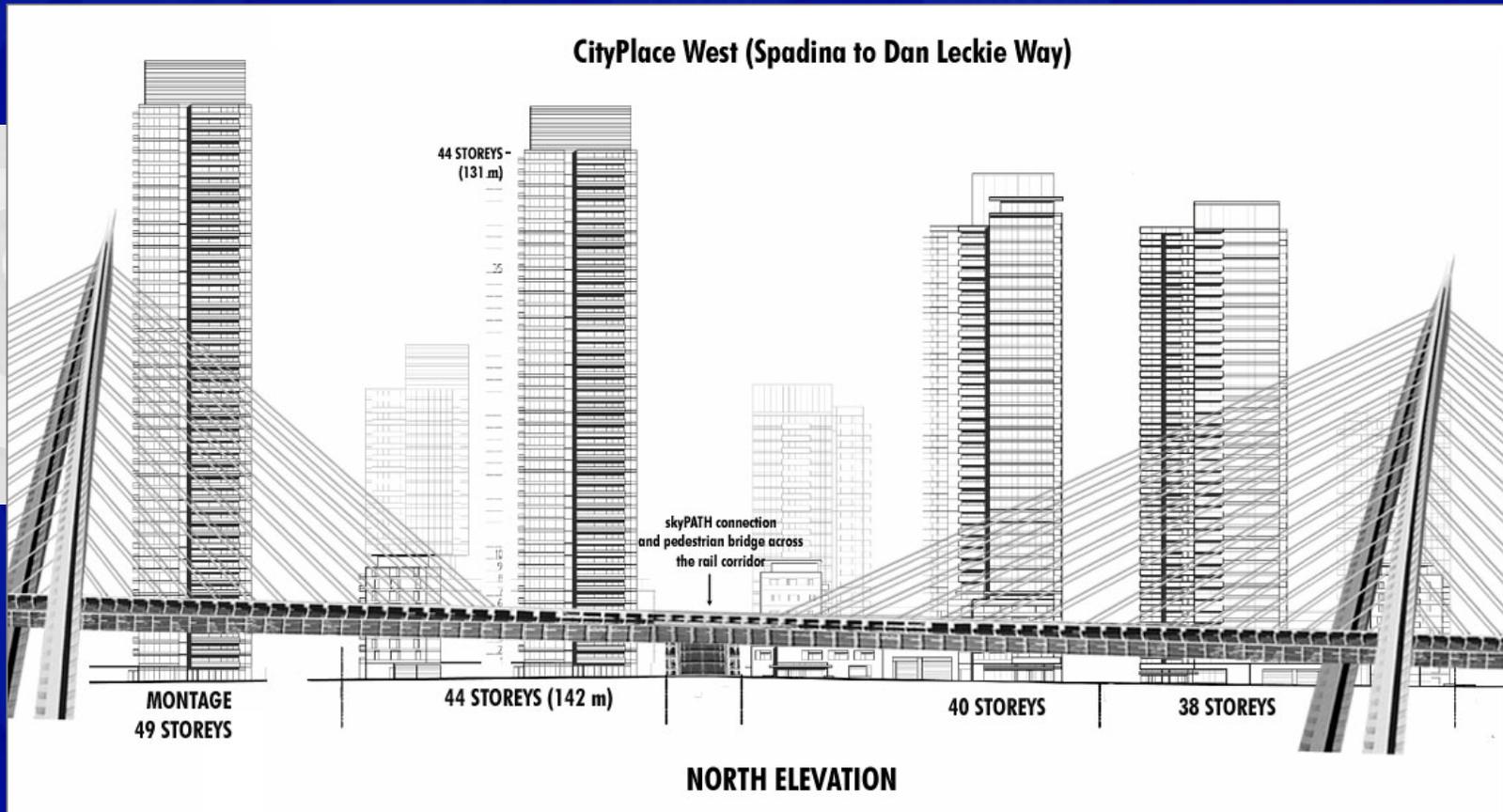
- ▶ **TWV hosts a fast transit link between the proposed east (Portlands) and west (Island airport) sites of the fair.**
- ▶ **spur lines to Exhibition Place, Ontario Place and the Island will provide a much-needed tourism boost.**
- ▶ **development of the Portlands, the East Bayfront and the West Don Lands will be accelerated.**

# 2015 World Expo Bid



# Neighbours

## Future Towers of CityPlace



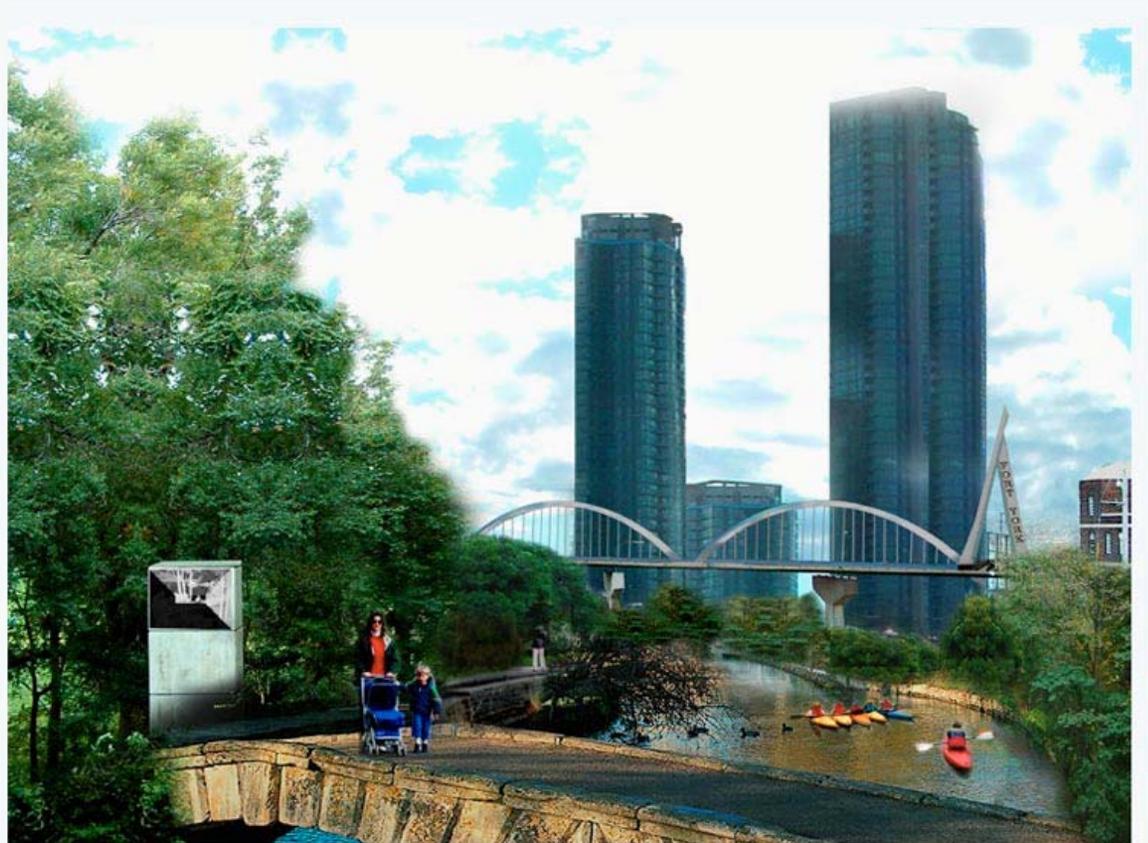
# Future View - Fort York

One of the nation's most important historical sites in a worthy setting.



**PRESENT DAY (ABOVE)** - the crumbling expressway immediately south of FORT YORK.

**FUTURE VIEW** - a new perimeter worthy of one of the most important historical sites in Canada.

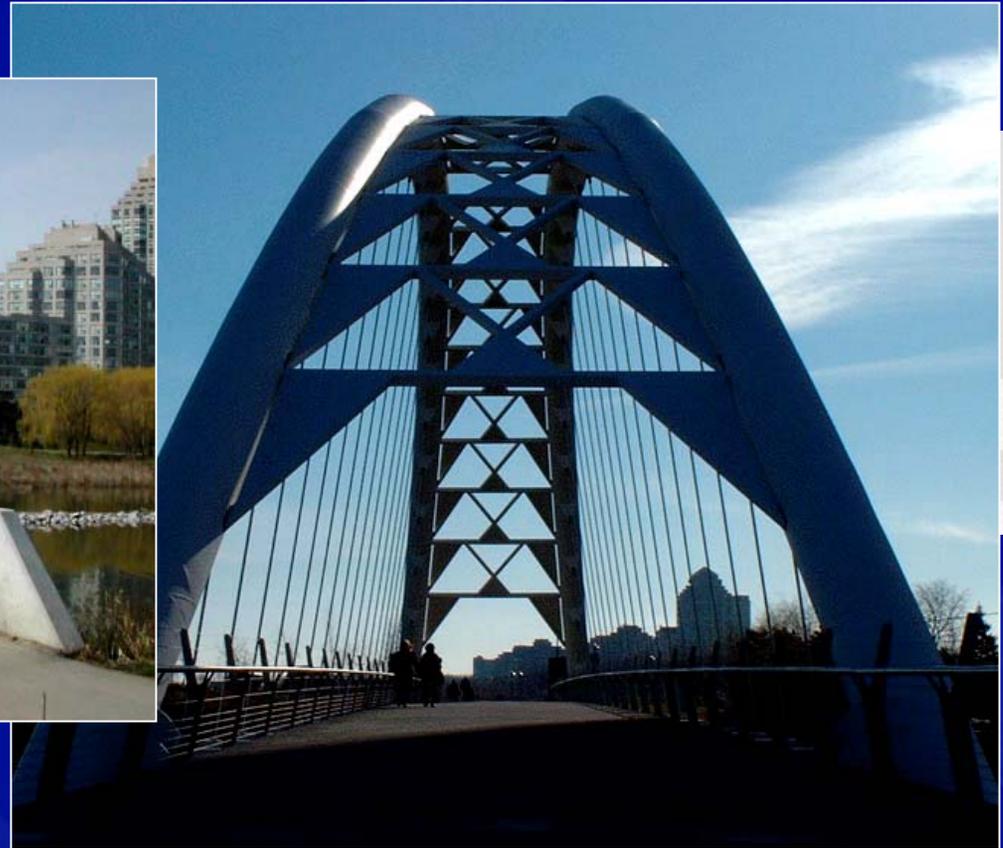


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# Design Matters.

Precedents in Toronto - pedestrian bridges.



# Aerial View

Toronto now demands great design.



*Asymmetric cable-stayed viaduct design.*

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# Budget Estimate (TWV)

**Estimated cost** for a 10-lane cable-stayed viaduct = **CAD \$115 million per 500 metres**

**Proposed length of viaduct** = **6 kilometres**

**Cost of the viaduct** = **CAD\$1.38 billion**

**Cost of ramps and connections** = **CAD\$190 million**

**ESTIMATED TOTAL COST** = **CAD\$1.57 billion**

**Estimated cost** for the 4-lane (1.3 km long) **tunnel proposed in 2000** = **CAD\$1.8 billion\***  
\*year 2000 estimate/not adjusted for inflation

\* **The year 2000 costs (\$1.8 billion) for a 1.3 km tunnel are greater than the year 2006 budget estimate for the 10 lane, 6 km viaduct.**

# Financing Options

- ▲ **diversion of 2 cents a litre from gas tax in Toronto.**
- ▲ **\$0.50 to \$1.00 electronic toll per use, for a period of 30 years.**
- ▲ **private investment opportunities:**
  - § **East Lakeshore Mall retail**
  - § **habitable Viaduct Pylons**
  - § **development of priceless waterfront lands after dismantling the elevated Gardiner Expressway**

# Key Partnerships

Support from Union Station stakeholders will be critically important.



Original Elevation from **UNION**  
Roof sample - Santiago Calatrava

**TORONTO WATERFRONT VIADUCT (TWV) & skyPATH converge with the new Union Station trainshed.**

- ▲ a convergence of many stakeholders.
- ▲ City of Toronto, GO Transit, VIA, Union Pearson Group, precinct plans and area landowners.

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# LEGACY

## ECONOMIC AND SOCIAL GAIN FOR DOWNTOWN AND THE ENTIRE G.T.A.

- ▲ **iconic structure enhances the skyline.**
- ▲ **more expressway lanes and a new rapid transit line.**
- ▲ **new pedestrian and bicycle routes in all directions.**
- ▲ **beautiful redesign of Lakeshore Boulevard.**
- ▲ **new shopping and tourism areas connecting the city to its waterfront.**
- ▲ **development opportunities for private investors and new tax revenues for the city.**

# Next Steps.

- ▲ build political support at all three levels of **Government**.
- ▲ communicate with all **stakeholders**, neighbours and landowners.
- ▲ solidify **civil engineering/architectural development issues**.
- ▲ identify **financing options** and draft budget.
- ▲ identify private **investors**, partners and funders.
- ▲ conduct city-wide **consultation** and public awareness campaign.

# An Unrivalled *Mobility* Corridor

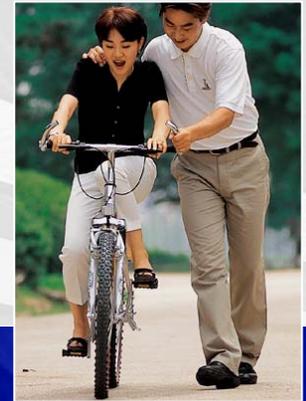
▲ **DRIVE**



▲ **WALK**



▲ **TRANSIT**



▲ **CYCLE**

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# A New, Connected City Emerges.



Under construction and proposed downtown projects.

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# TORONTO WATERFRONT VIADUCT



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