Rapid Transit Planning in the GTA – What Have We Learned?

November 23, 2018

Rapid Transit in the GTA – what have we learned.
Tyrone Gan. November 23, 2018.

Disclaimer

- Materials and discussion reflect personal views of Tyrone Gan, and not the views of HDR, the University of Toronto, TTC, City of Toronto, Metrolinx, or any other public agency

- Rapid transit planning in the GTA has historically been characterized by grand plans, little plans, revised plans, ad hoc plans, abandoned plans, and new grand plans. Taking the Downtown Relief Line as a case study, having been involved with the Relief Line for many years, Tyrone describes how the Relief Line has evolved over time – from 100 years ago to where it is today. He also outlines how transit planning has evolved over time, from a focus on transit relief and ridership, to a more holistic view of how transit can contribute to the overall economic, social, and environmental well-being of society.

- Early 1900s to 1950s
- 1960s to 1990s
- Modern Era
- Lessons Learned

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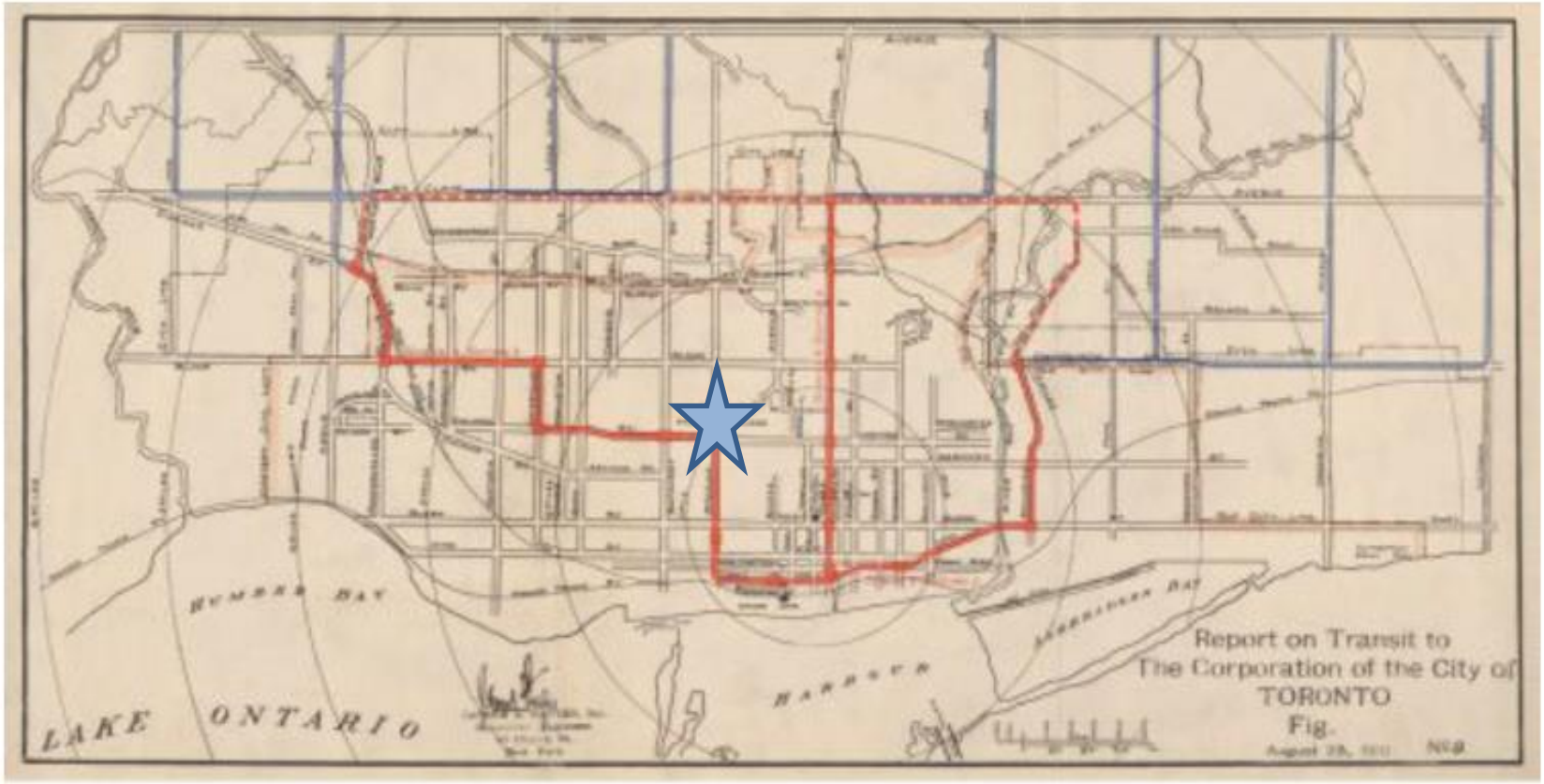
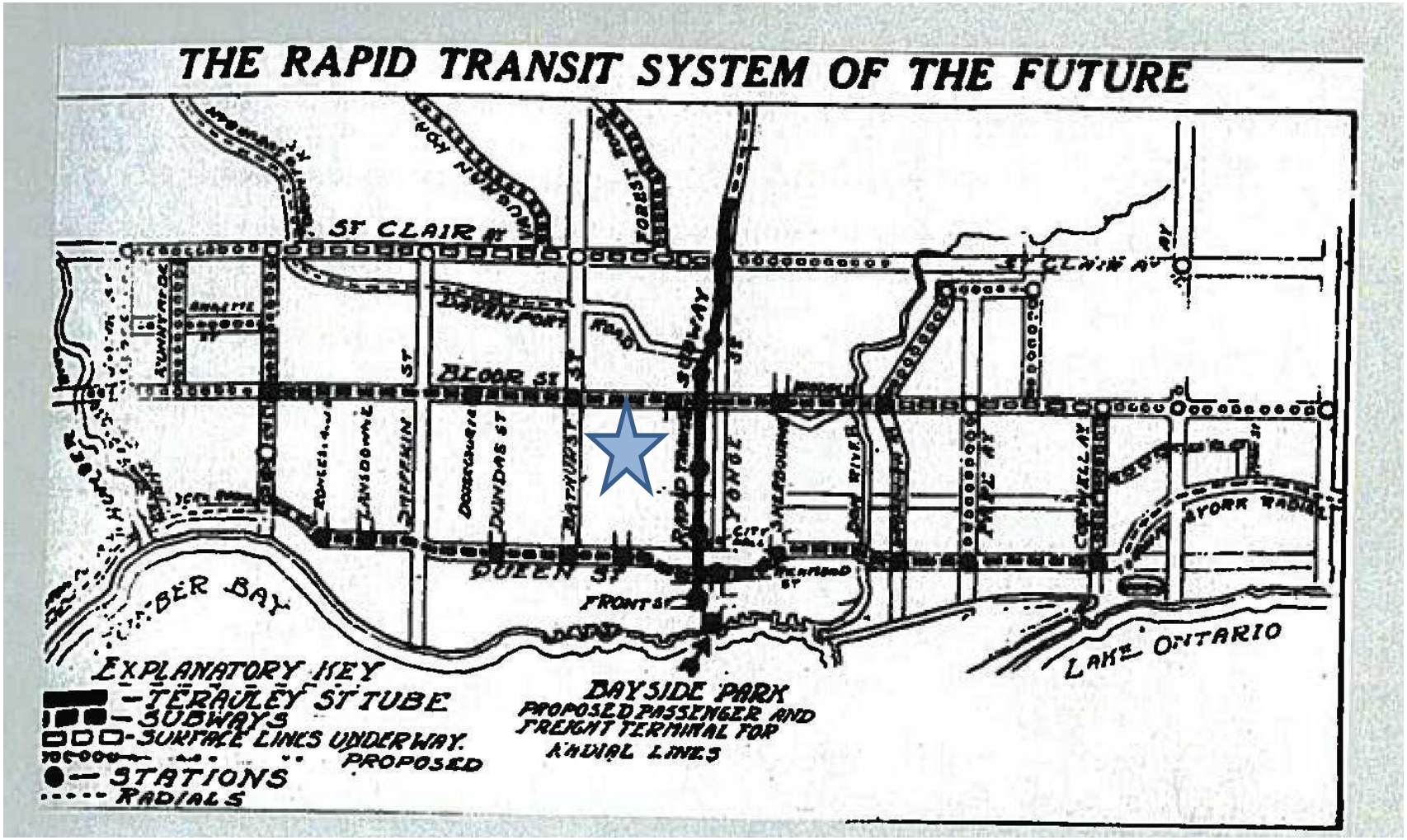
1910 Jacobs & Davies report recommended underground streetcar network.
Including northeast line to Broadview / Danforth.
Impractical network layout.

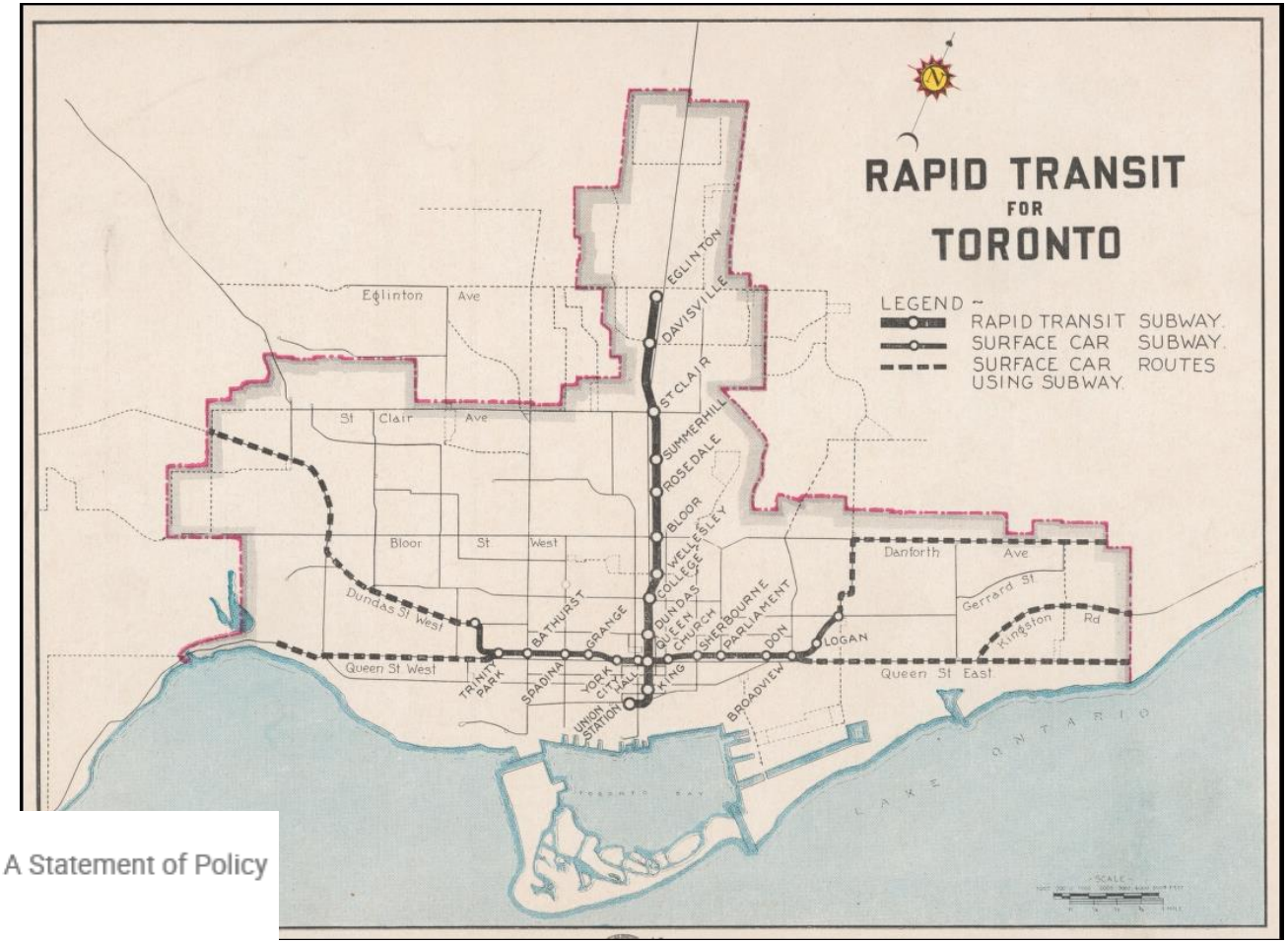


City of Toronto Archives, Series 60, Item 22, Figure 9

1911 Cousins plan – Queen subway High Park to Woodbine
1912 – voters reject funding for subway lines –
political decision based on public input

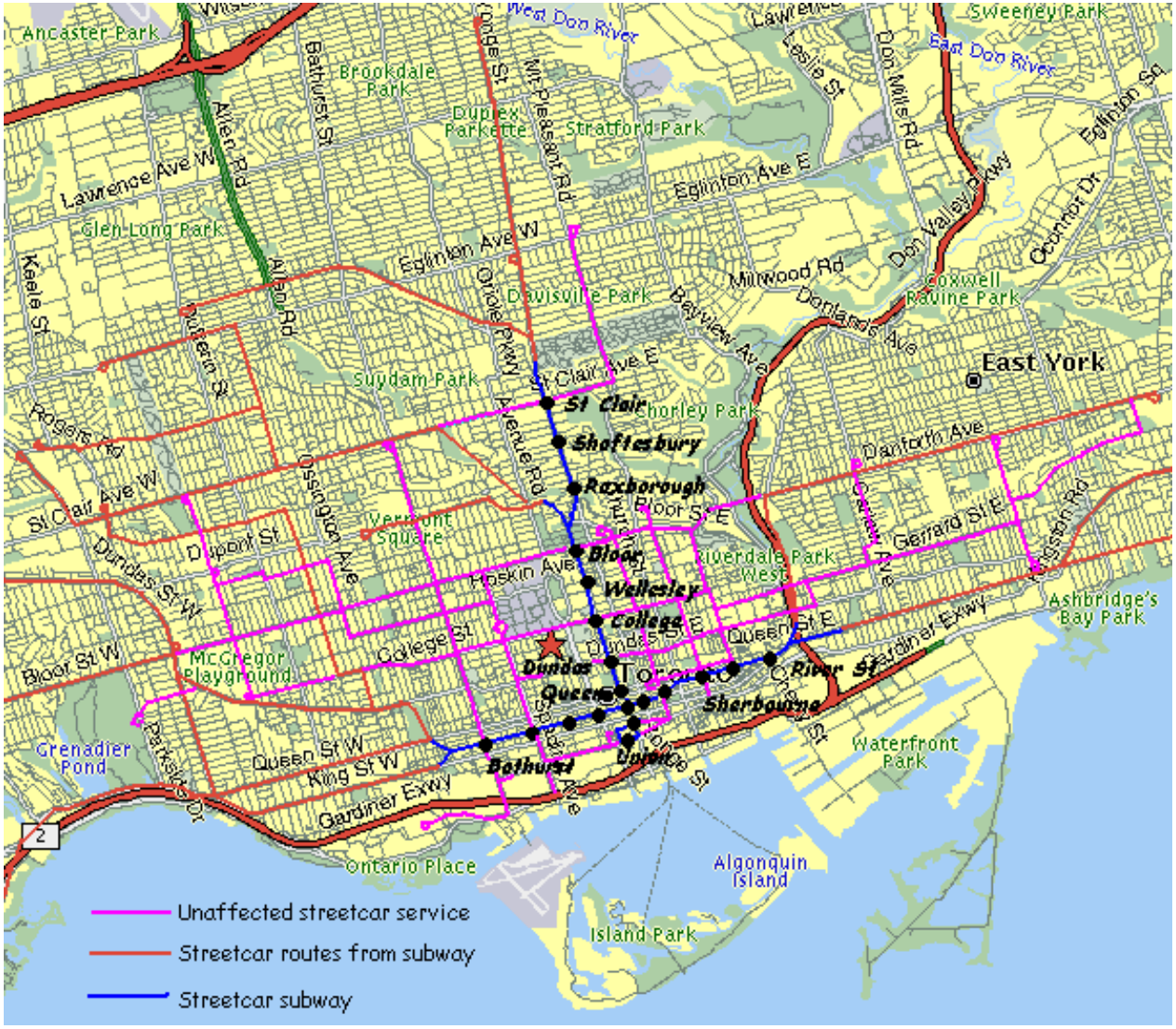


1945 TTC plan for subways with streetcars under Yonge and Queen

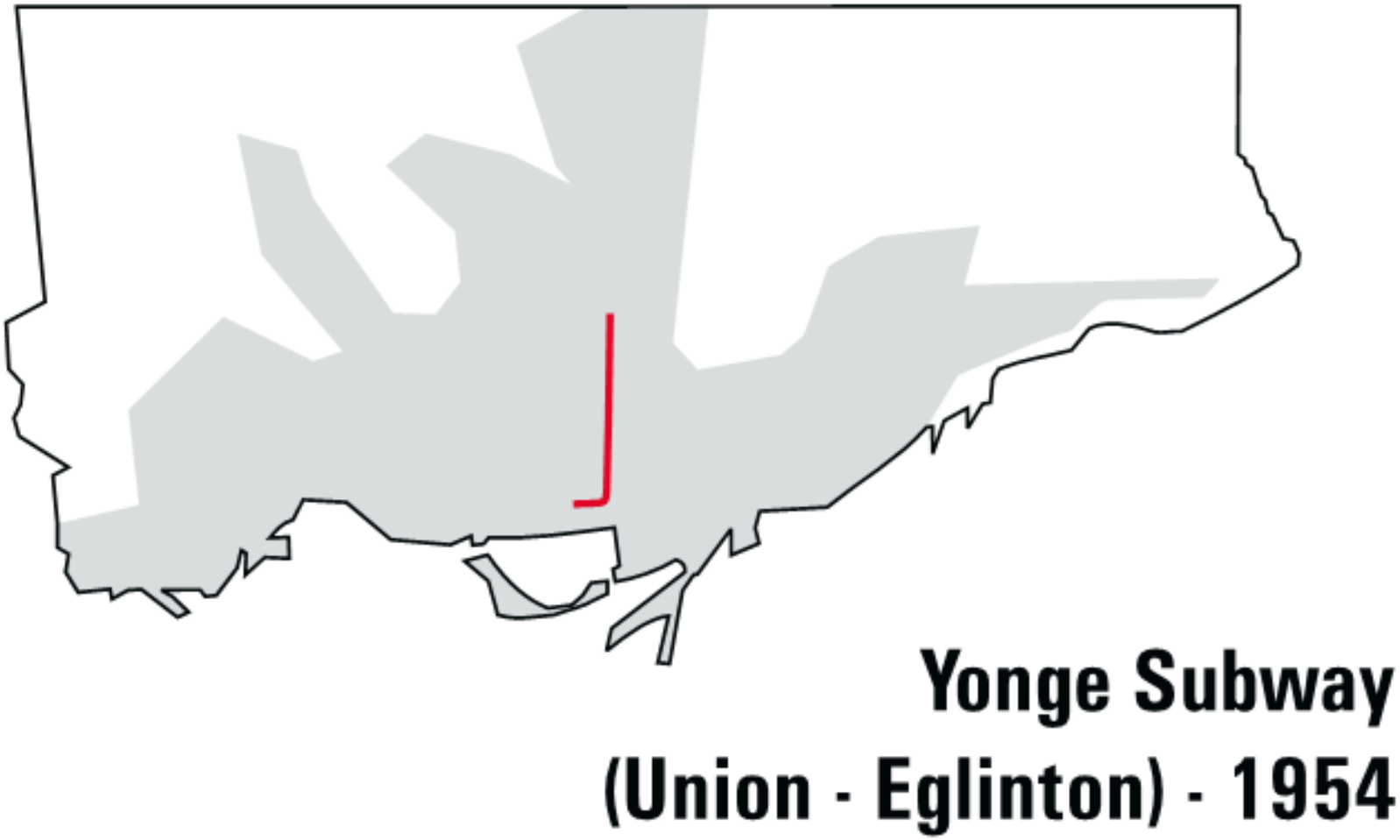


Rapid Transit for Toronto
Rapid Transit for Toronto: A Statement of Policy
1945
City of Toronto Archives
Series 836, Subseries 2, File 51

1946 – voters approve funding for Yonge subway, with plans for underground streetcar line along Queen



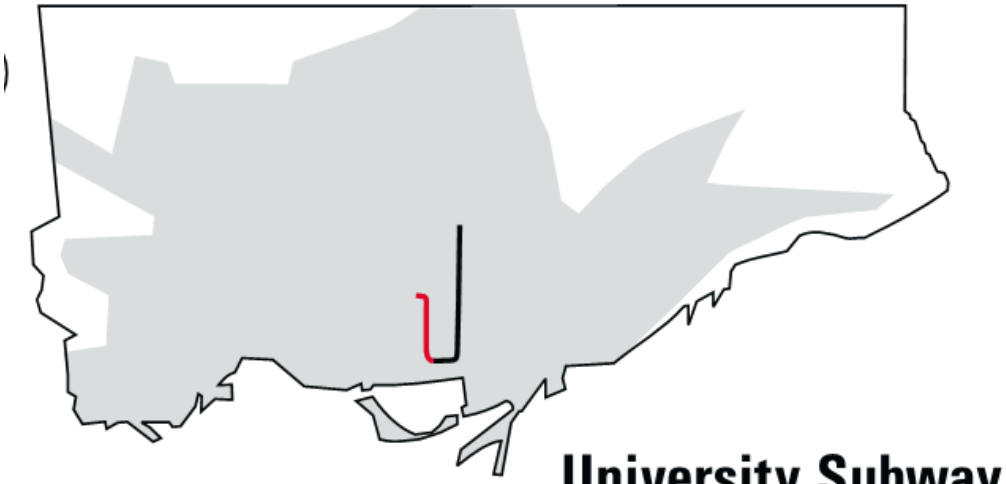
Toronto's first subway line



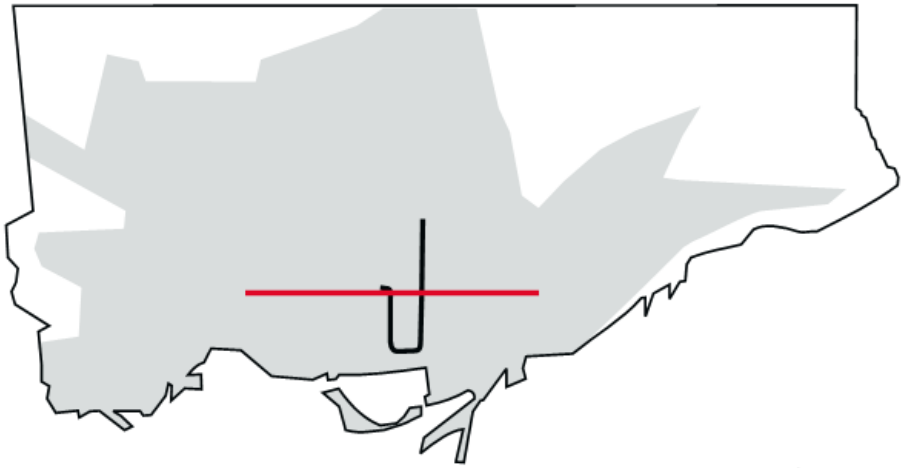
Queen vs Bloor debate. Suburban expansion and increased demand on Bloor. Suburban councillours favour Bloor. Approved by Metro Toronto and Province. Resulting impact on development patterns in Toronto area

Compromise "U" plan

University Subway first, then Bloor-Danforth Subway



University Subway (Union - St. George) - 1963



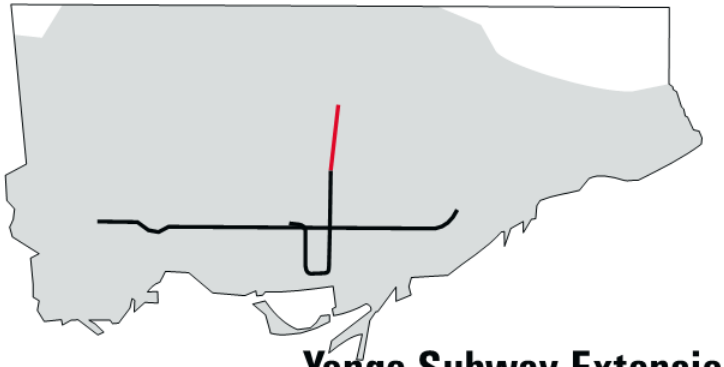
Bloor/Danforth Subway (Keele - Woodbine) - 1966

Timelines 1960s to 1970s
Death of the Queen subway (Relief Line)

- 1968 Metropolitan Toronto Planning Board recommends **Queen subway**
- 1969 TTC Concept for Integrated Rapid Transit and Commuter Rail Systems in Metropolitan Toronto: **Queen subway line** connecting with new Eglinton subway line at Don Mills and CP
- 1973 TTC approves funding for **Queen subway**
- 1974 Metropolitan Toronto Metroplan review concludes **no need for Queen subway** – urban railway instead
- 1977 City **prohibits subway construction in downtown**

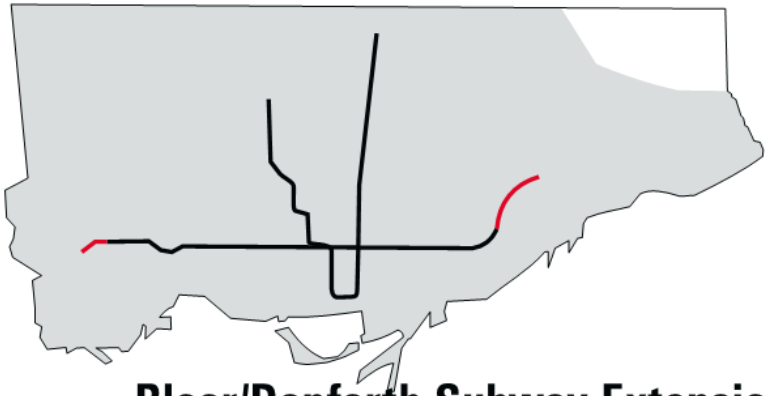
Suburban subway expansion

Bloor/Danforth Subway Extensions (Islington - Warden) - 1966



Yonge Subway Extension (Eglinton - Finch) - 1974

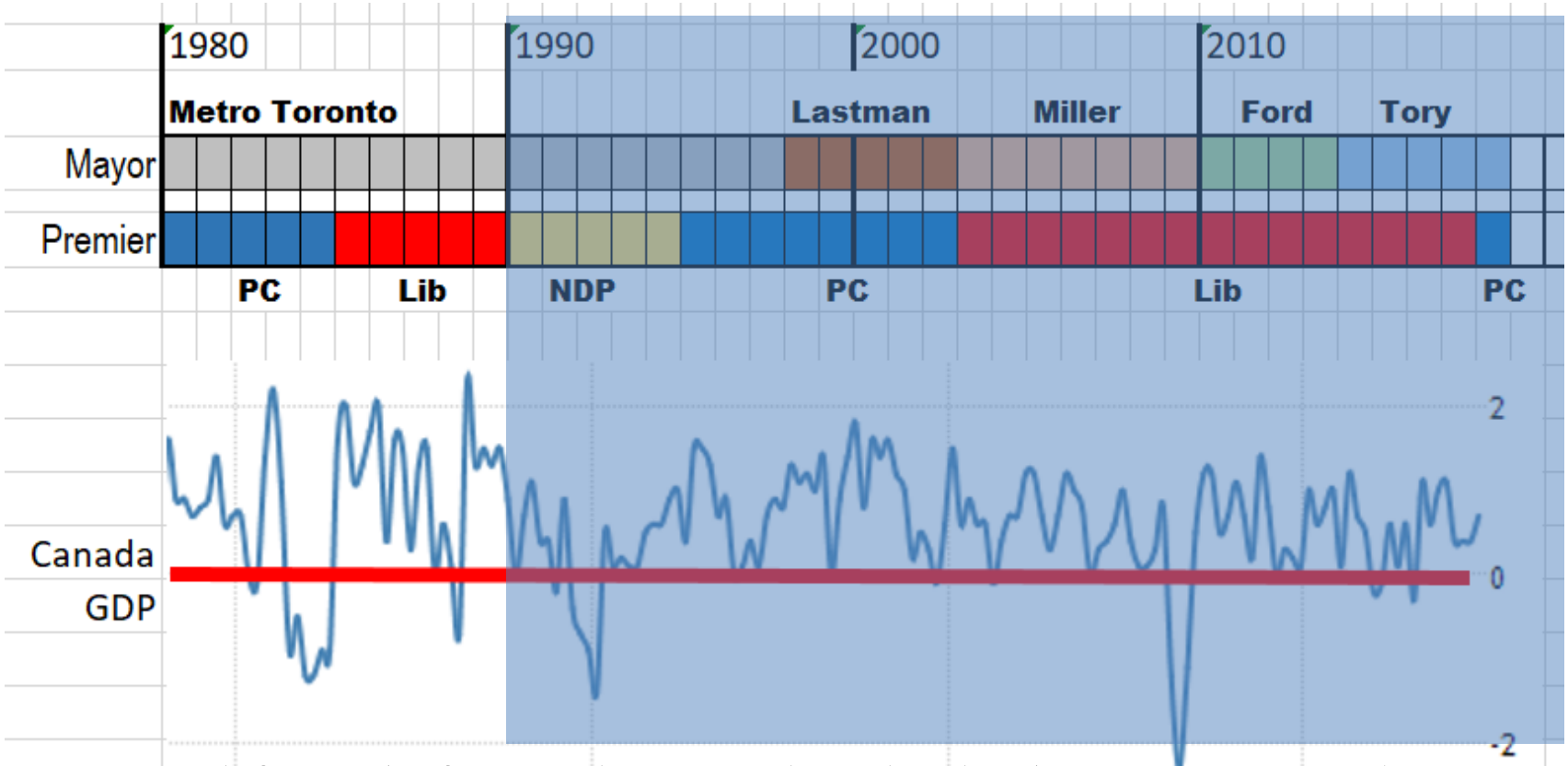
University/Spadina Subway Extension (St. George - Wilson) - 1978



Bloor/Danforth Subway Extensions (Kipling - Kennedy) - 1980

1980s – Recession; no downtown growth

- Recession mid 1980s and downtown collapse

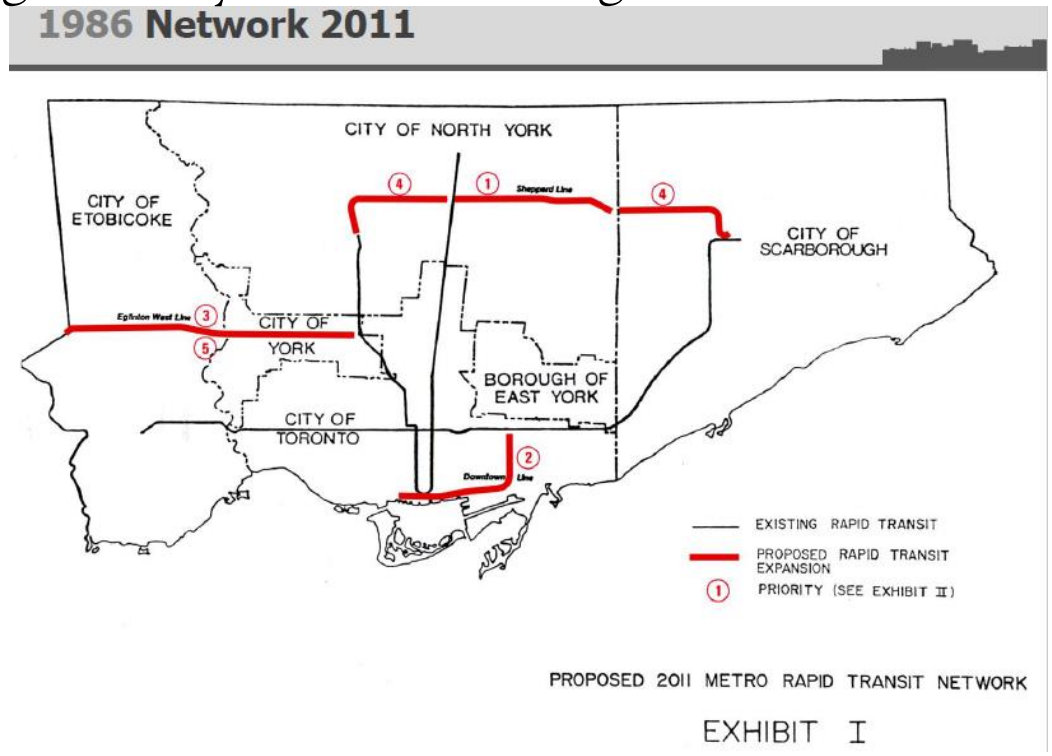


Less need for Relief Line due to reduced ridership on Yonge Subway and reduction in downtown development

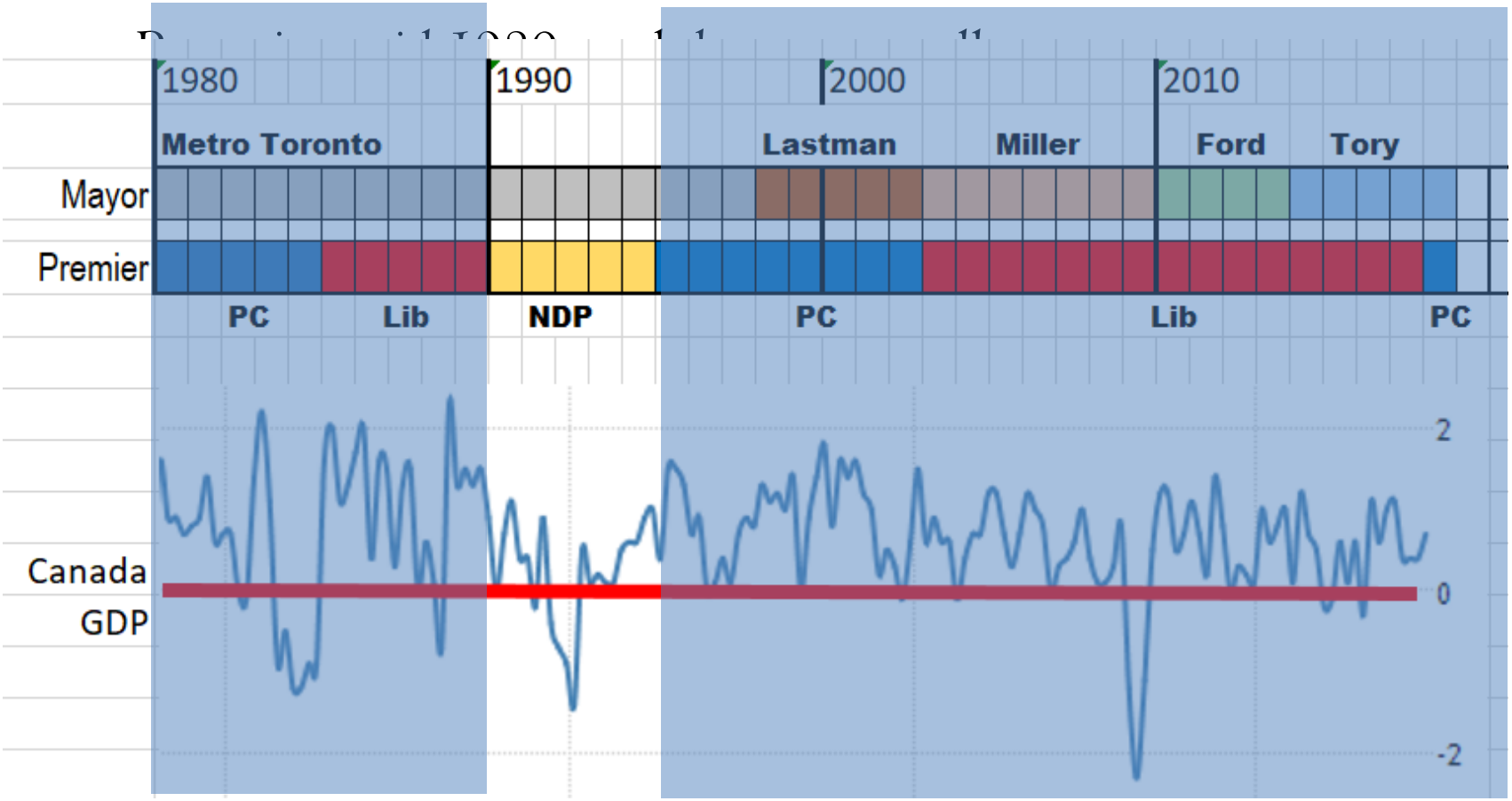
Early 1980s planning led to Network 2011 Plan

Planning by Municipality of Metropolitan Toronto.
Balancing needs of 6 municipalities. Preference for subways – Sheppard Subway and Eglinton West Subway.
Relief Line to Union Station as #2 priority to relieve increasing congestion on Yonge Subway and Bloor-Yonge Station.

Not adopted by Province



Early 1990s – new NDP government; recession



Let's Move Program – early 1990s

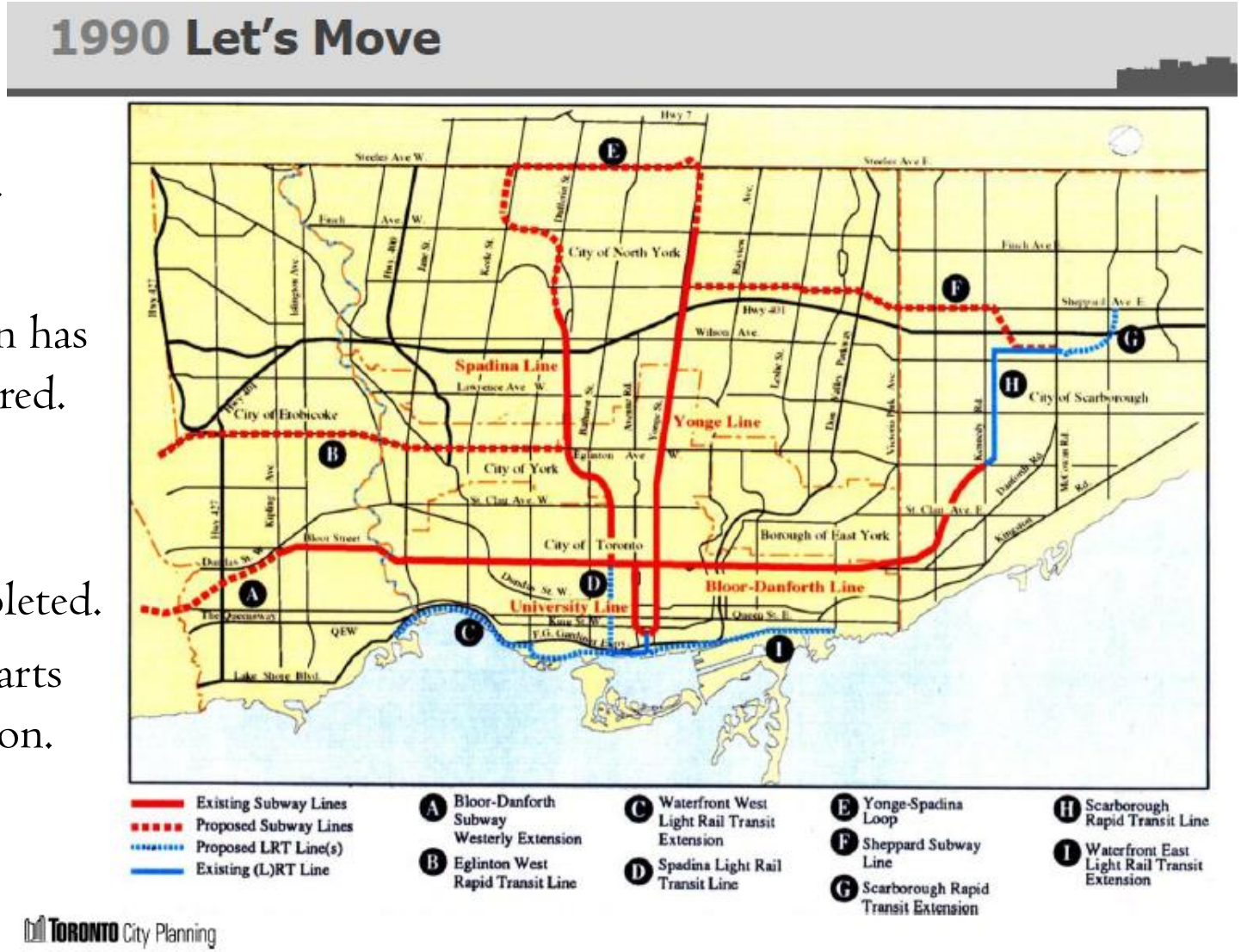
No Relief Line.

Downtown has not recovered.

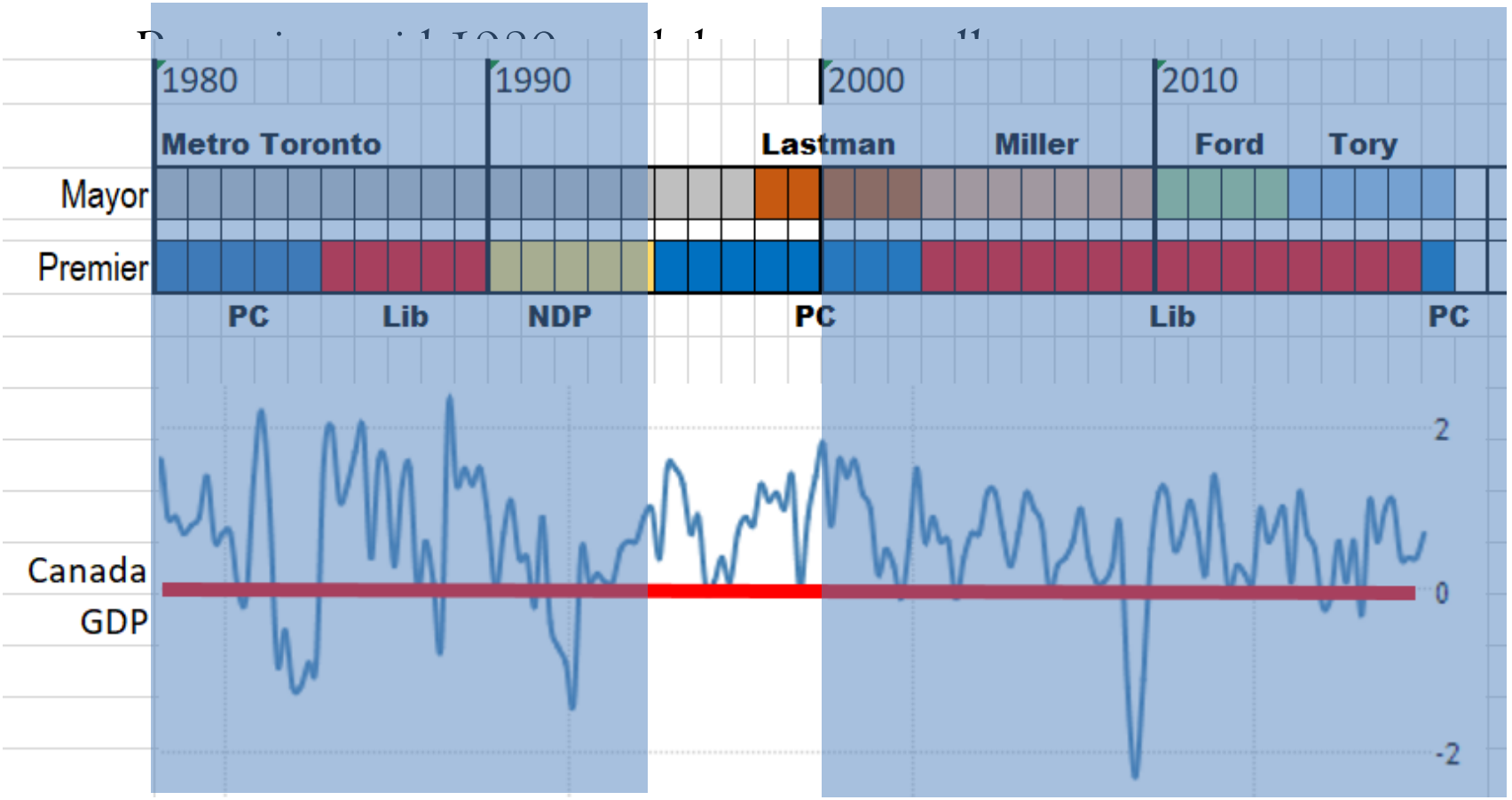
Suburban oriented.

EAs completed.

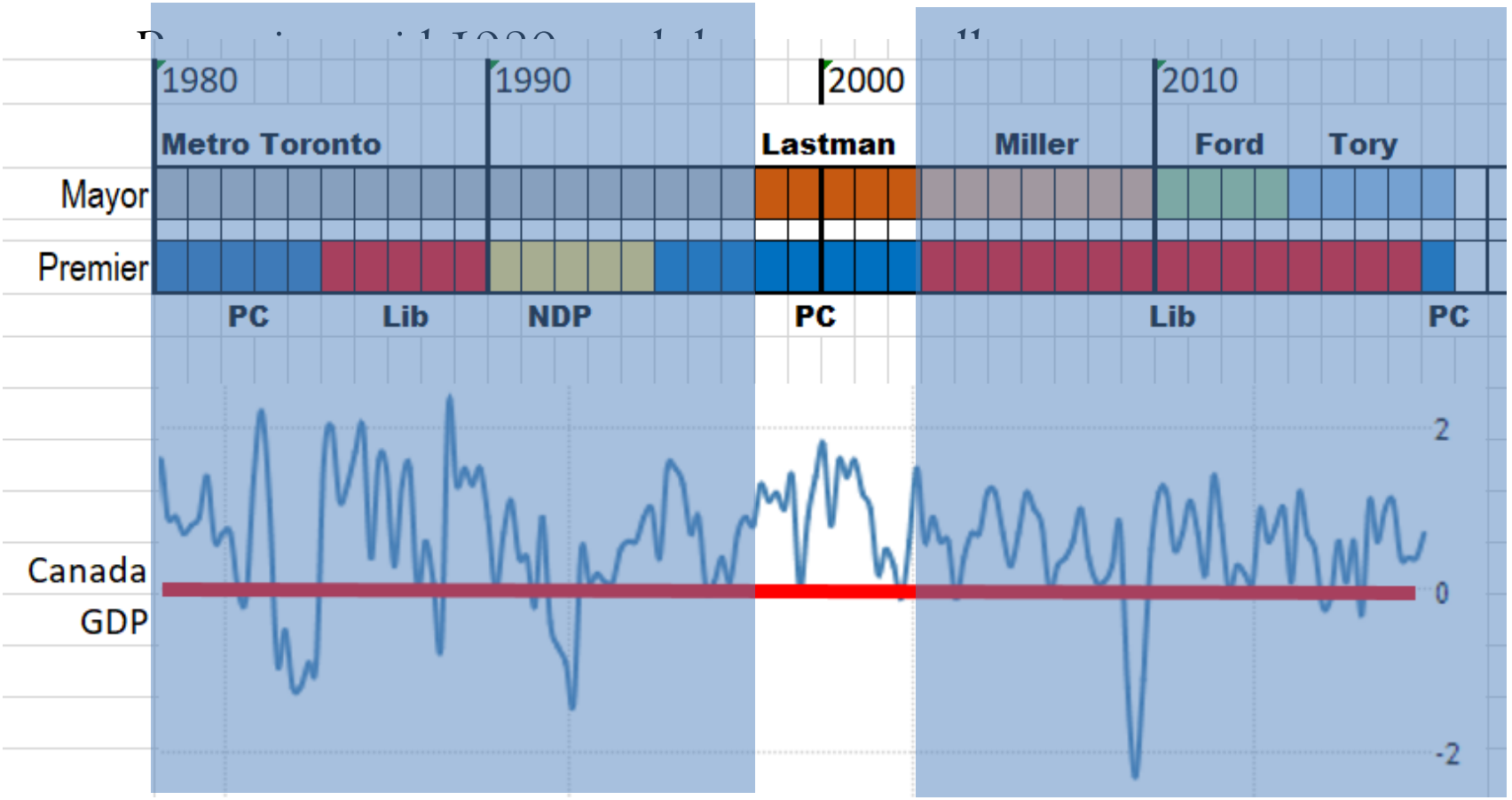
EWRT starts construction.



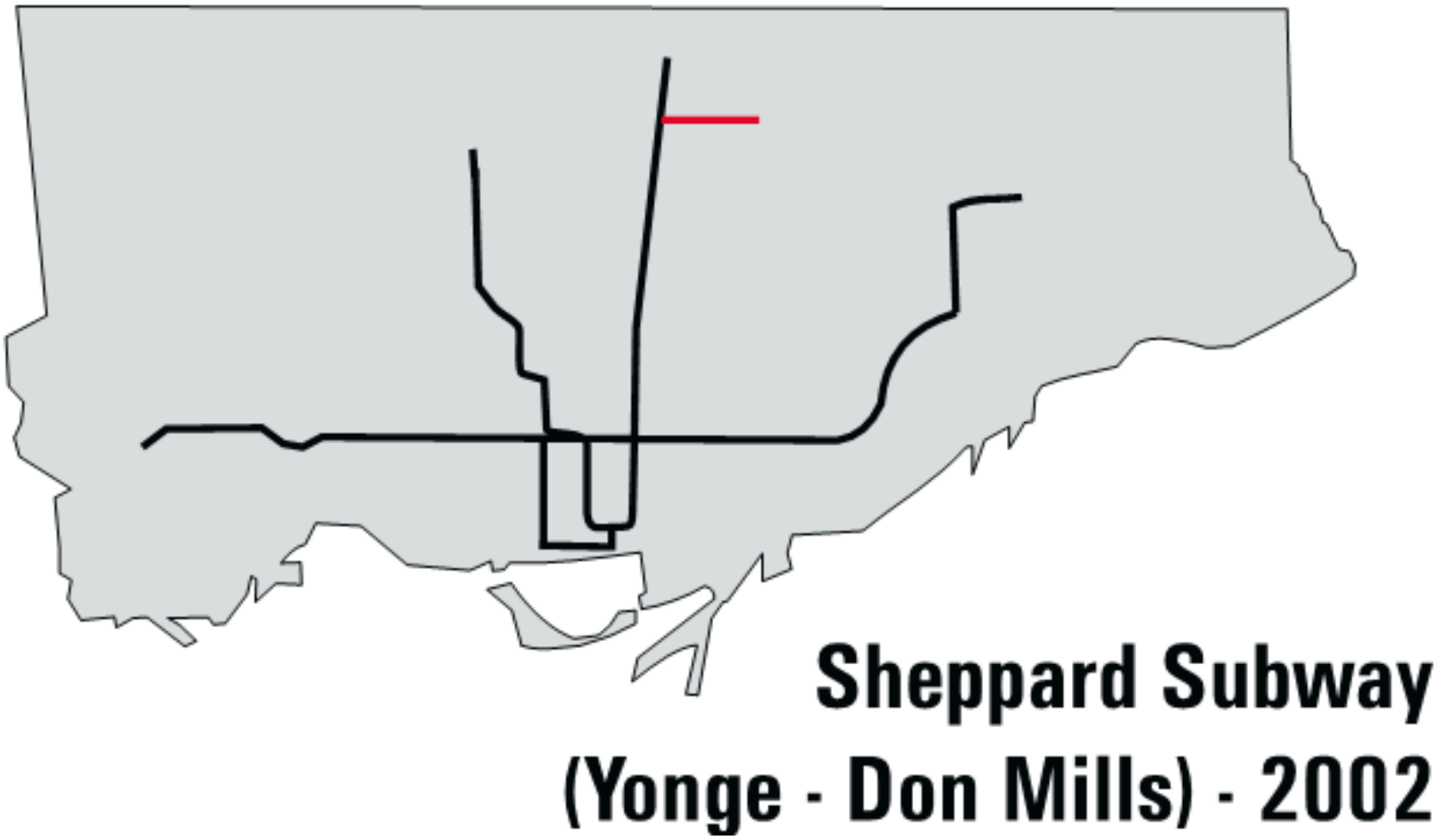
Mid 1990s – PC government cancels Eglinton West subway. The "lost years".



New Century - Ist mayor Amalgamated City of Toronto

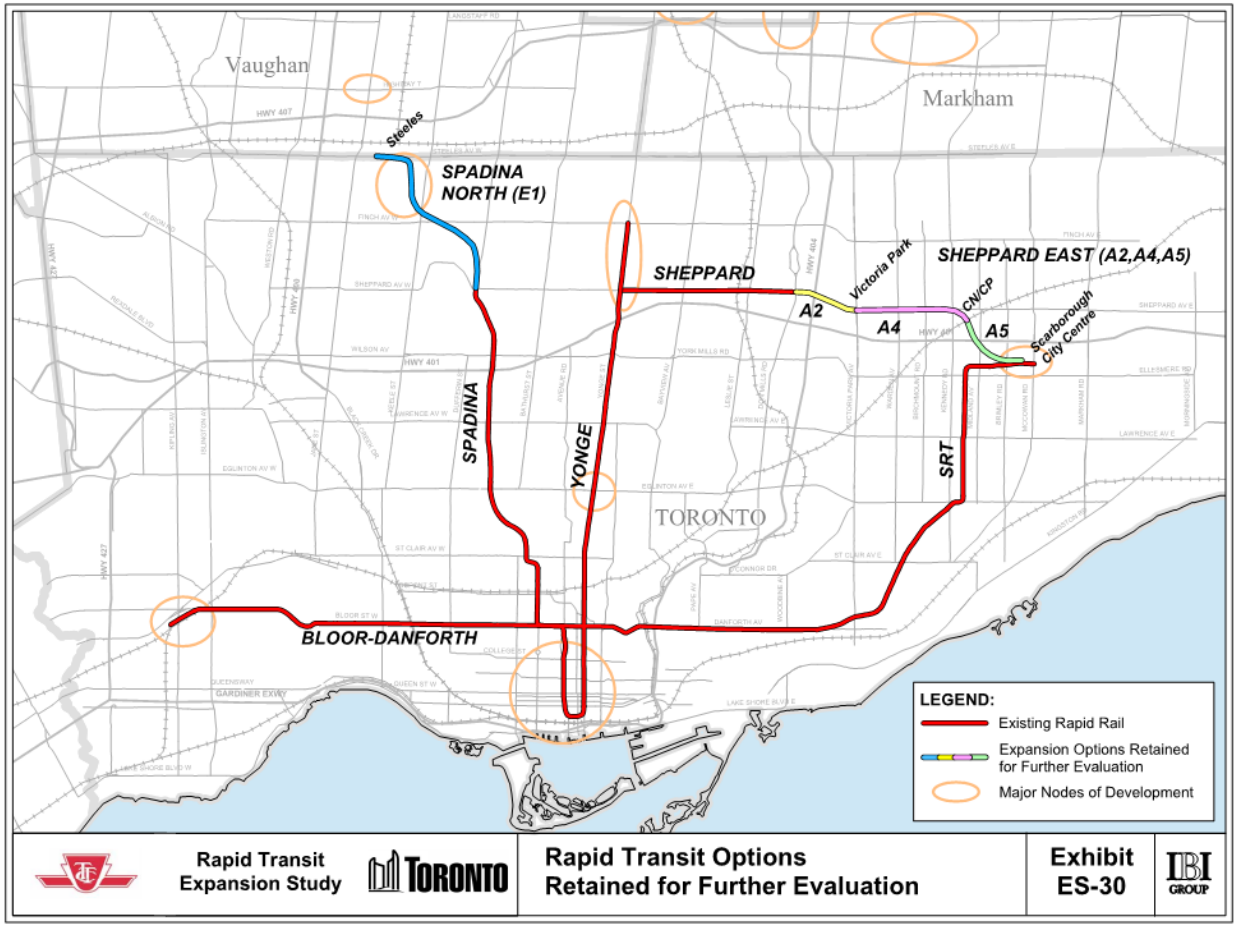


Subway expansion reflecting political climate

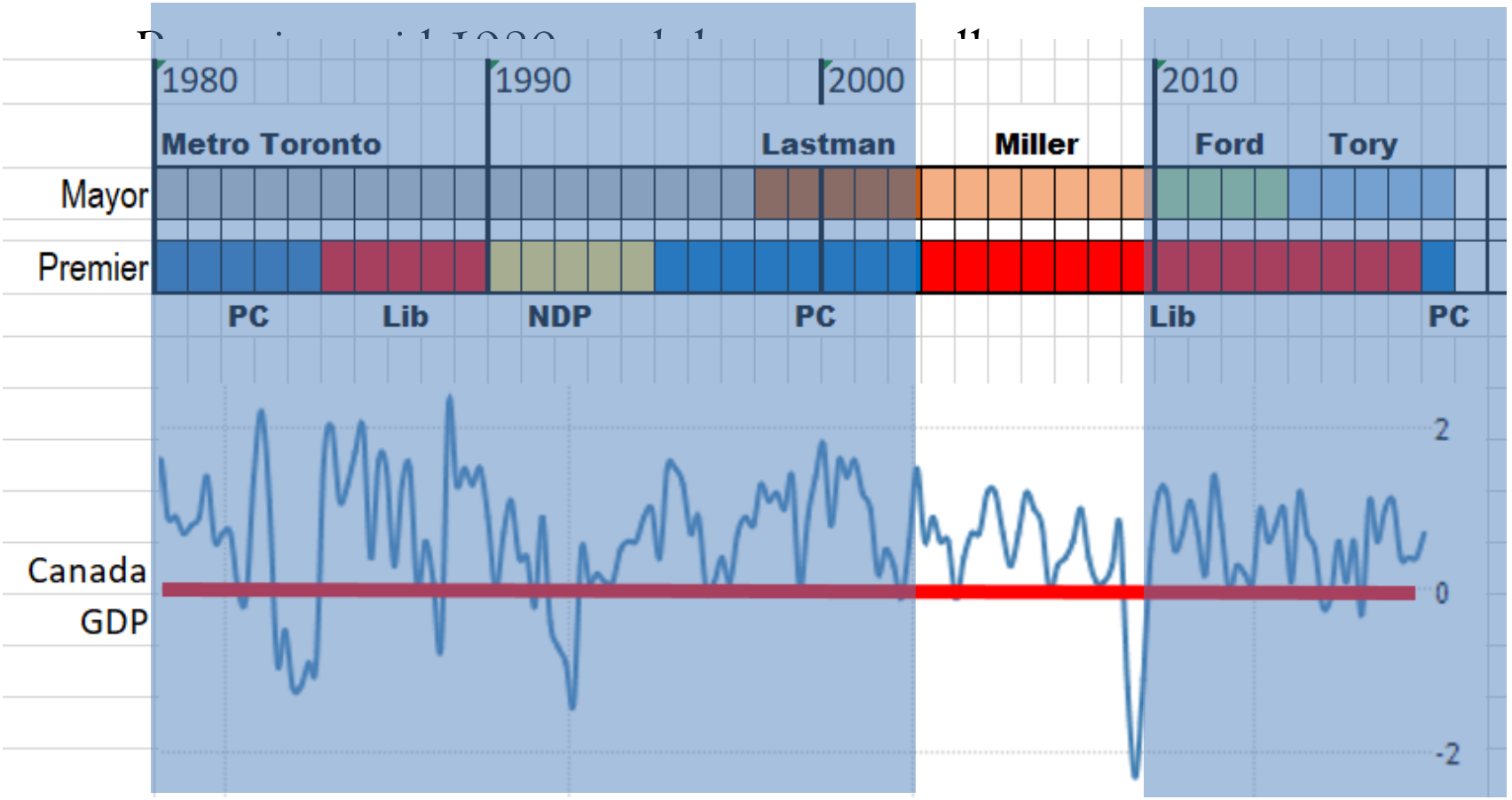


2001 – TTC Rapid Transit Expansion Study

Subway and suburban focus. Priorities Sheppard and Spadina extensions. Yonge Subway ridership recovering. No Relief Line.



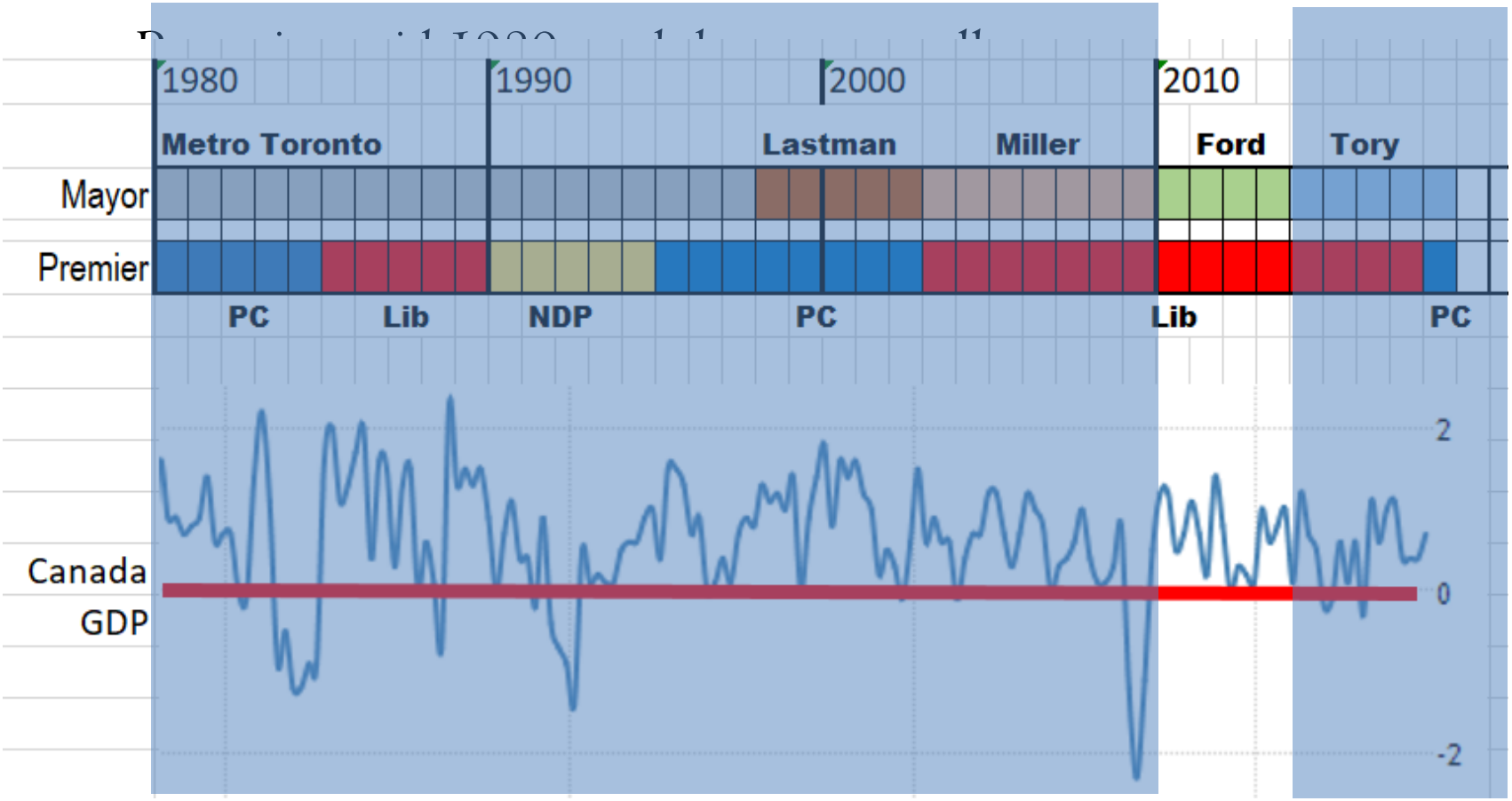
2000s – Miller and Liberal era



2007 – New mayor, new plan
Transit City Plan (City and TTC)

7 new LRT lines – narrow focus on one technology. No Relief Line. Would worsen subway congestion.

2010 – Ford era – new mayor, new plan - "subways, subways, subways". Transit City Plan is cancelled.



2010 – Downtown Rapid Transit Expansion Study begins

- Increasing congestion.
- First focused transit network study for downtown Toronto in many years.
- Growth in and demand to Downtown is increasing
- 2031 horizon
- Even with planned improvements, what else will be needed?

Exhibit 1-6: 2031 Reference Network

Rapid transit is a 100-year investment. Our planning should reflect this.
Plan from a multi modal, network perspective.
Dependent on land use forecasts and network assumptions.

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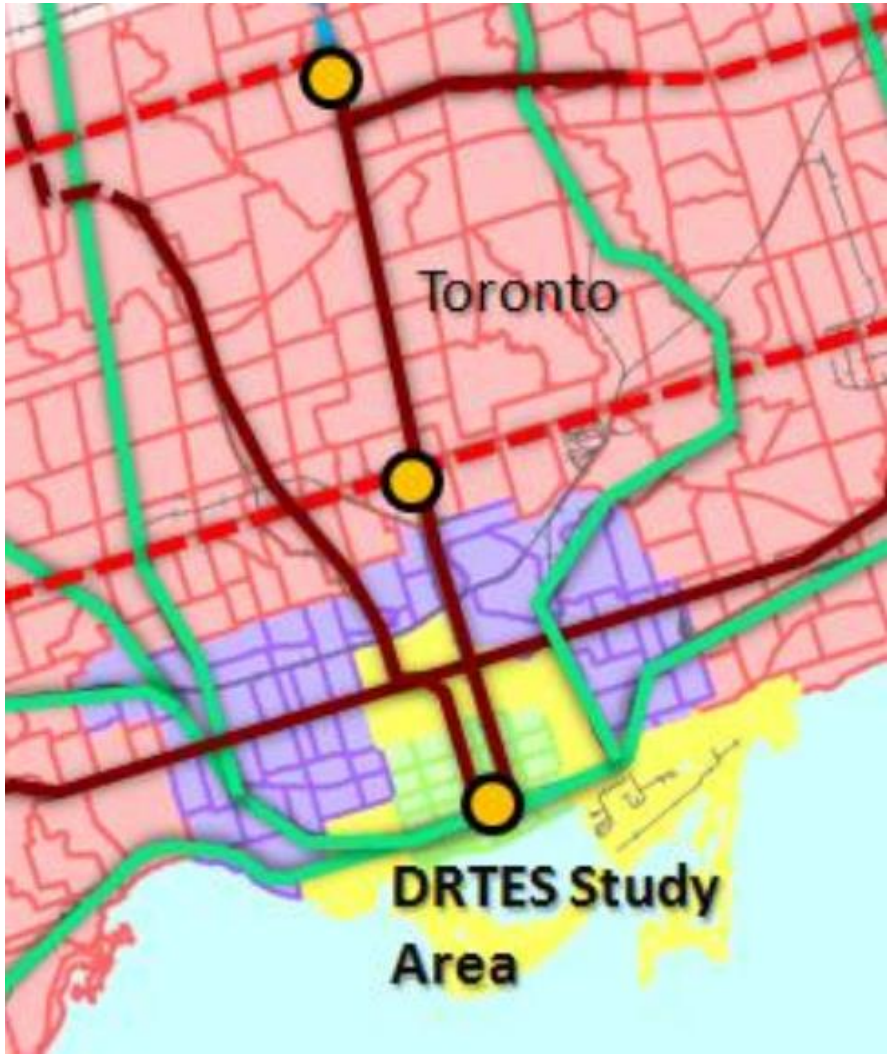
Assessing Need – from a Network Perspective

- Capacity needs – more than Line 1 north and south of Bloor-Yonge Station:
  - Bloor-Yonge Station
  - Line 1 stations
  - Streetcar network
- Network resilience
- City-building
- Serving the rapidly growing "shoulders"



Assessing Need – from a Network Perspective

- Rapid transit capacity affected by station capacity – dwell times, platform capacity, vertical circulation, passageways
- Growth in station alightings and boardings

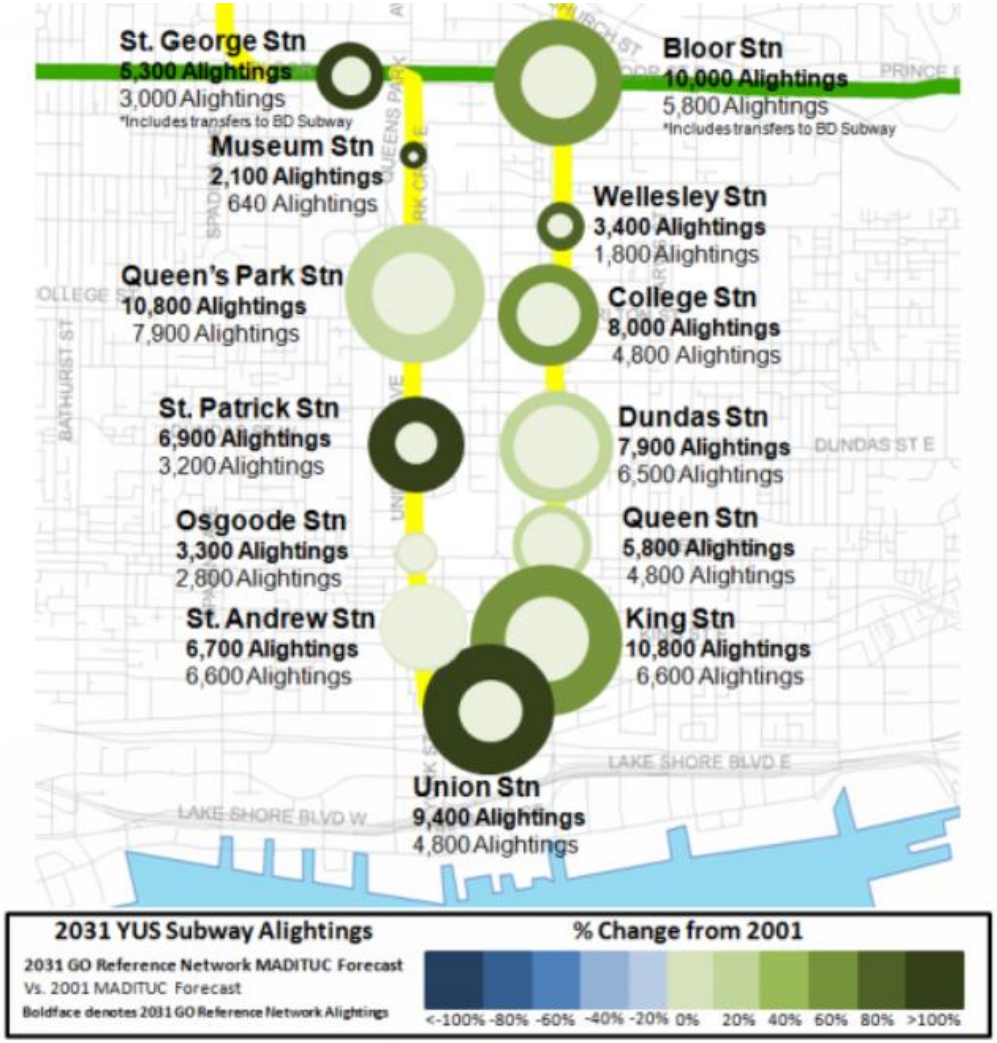


Exhibit 1-13: 2001 & 2031 Downtown Station Alightings

DRTES Recommendations approved 2012

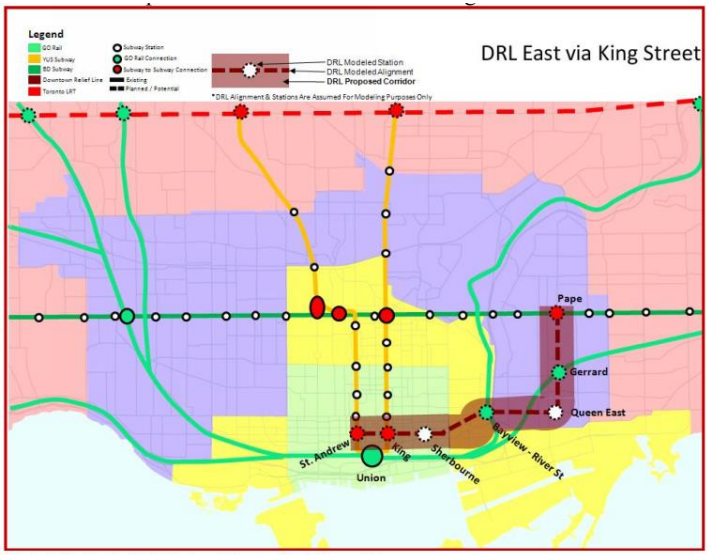


Exhibit B-1: DRL 1 – East via King St

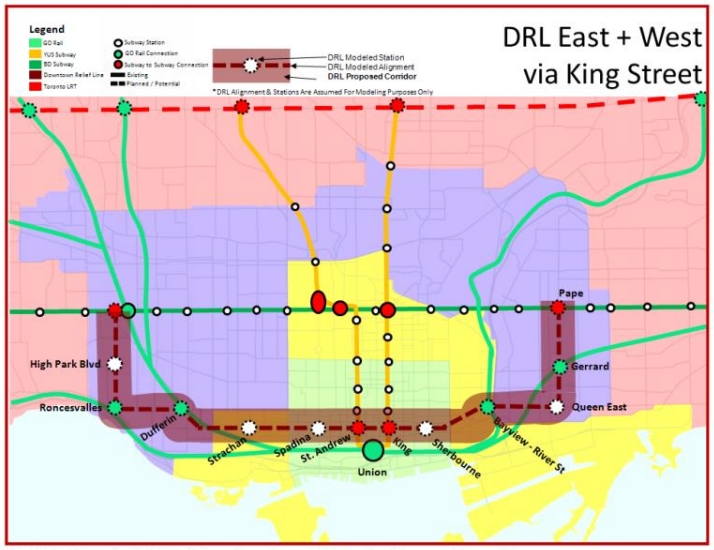


Exhibit B-2: DRL 2A –East and West along King St

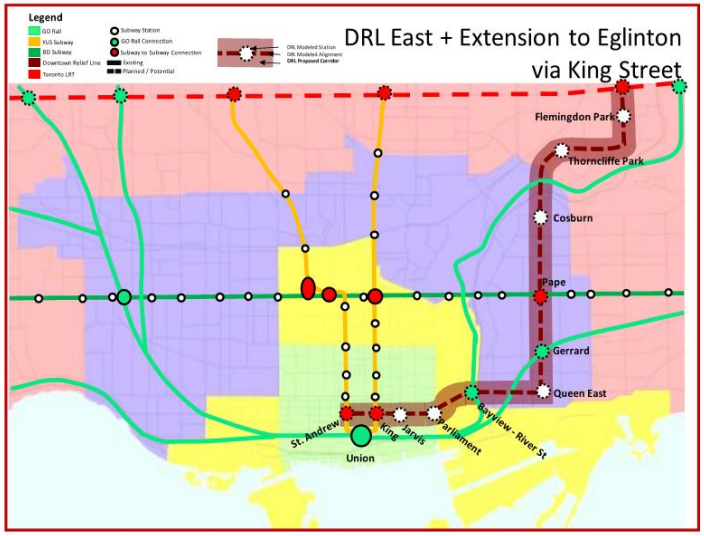


Exhibit B-3: DRL 2B - East with Extension to Eglinton

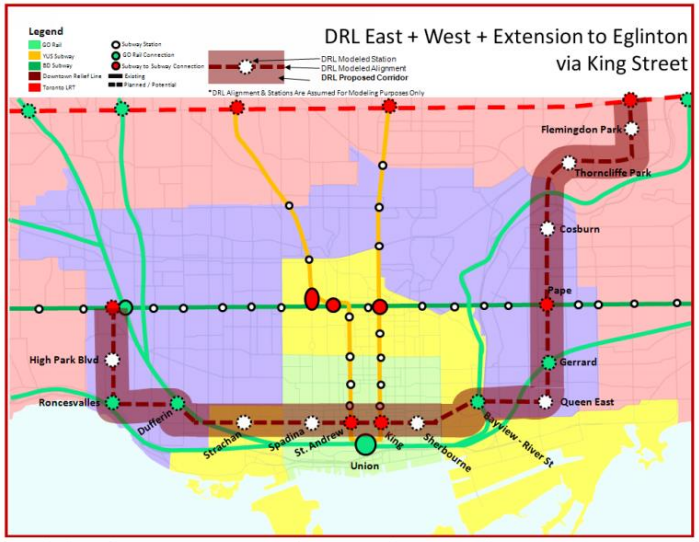


Exhibit B-4: East and West with Extension to Eglinton

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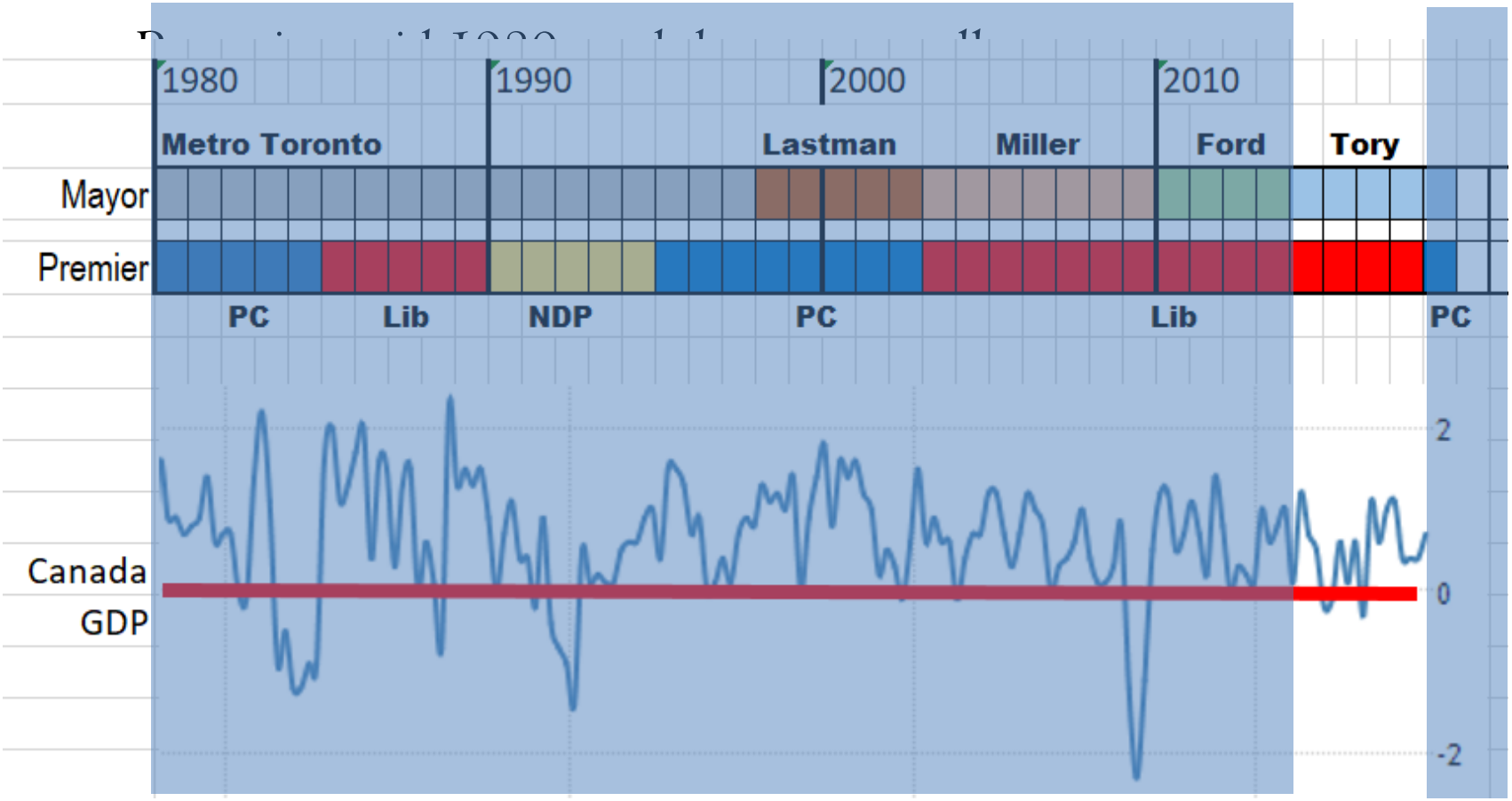
Role and function of the Relief Line focused on transit service

- Relief to the Yonge Subway Line
- Relief to Bloor-Yonge Station
- Network flexibility for the TTC subway network
- Improved service to the downtown shoulder areas

Tory era – new mayor, new plan



SmartTrack plan

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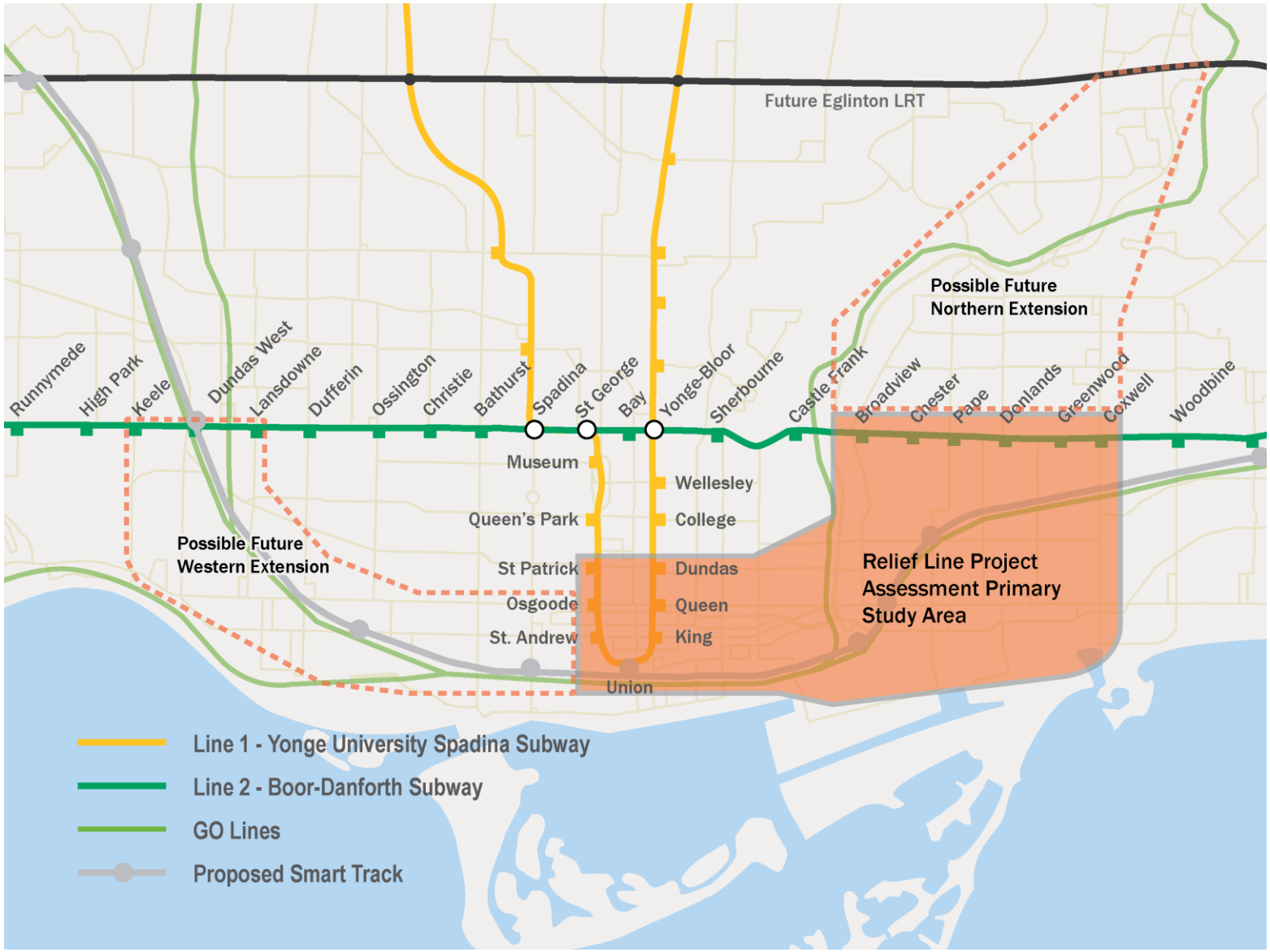
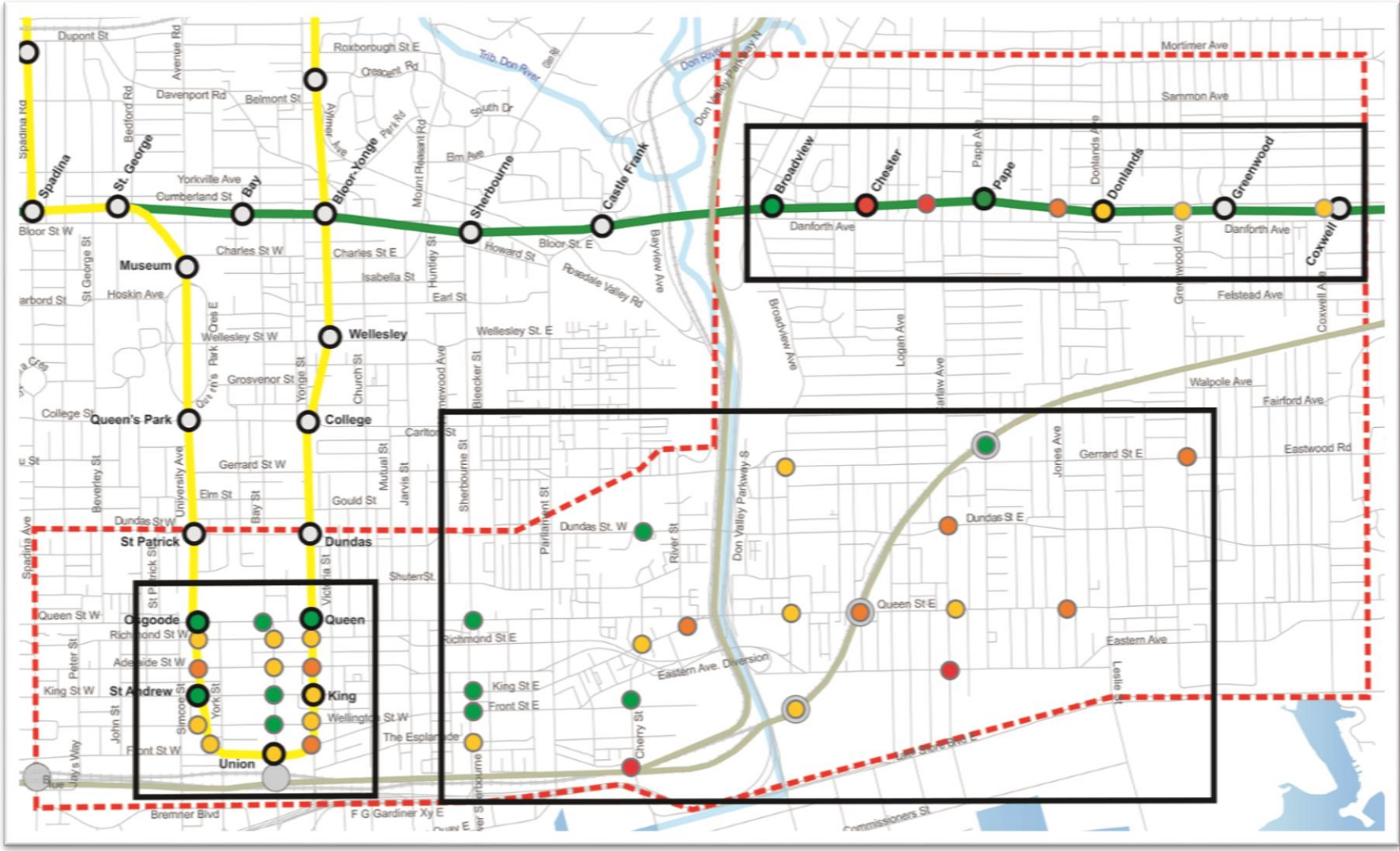
Relief Line Project Assessment Study Area



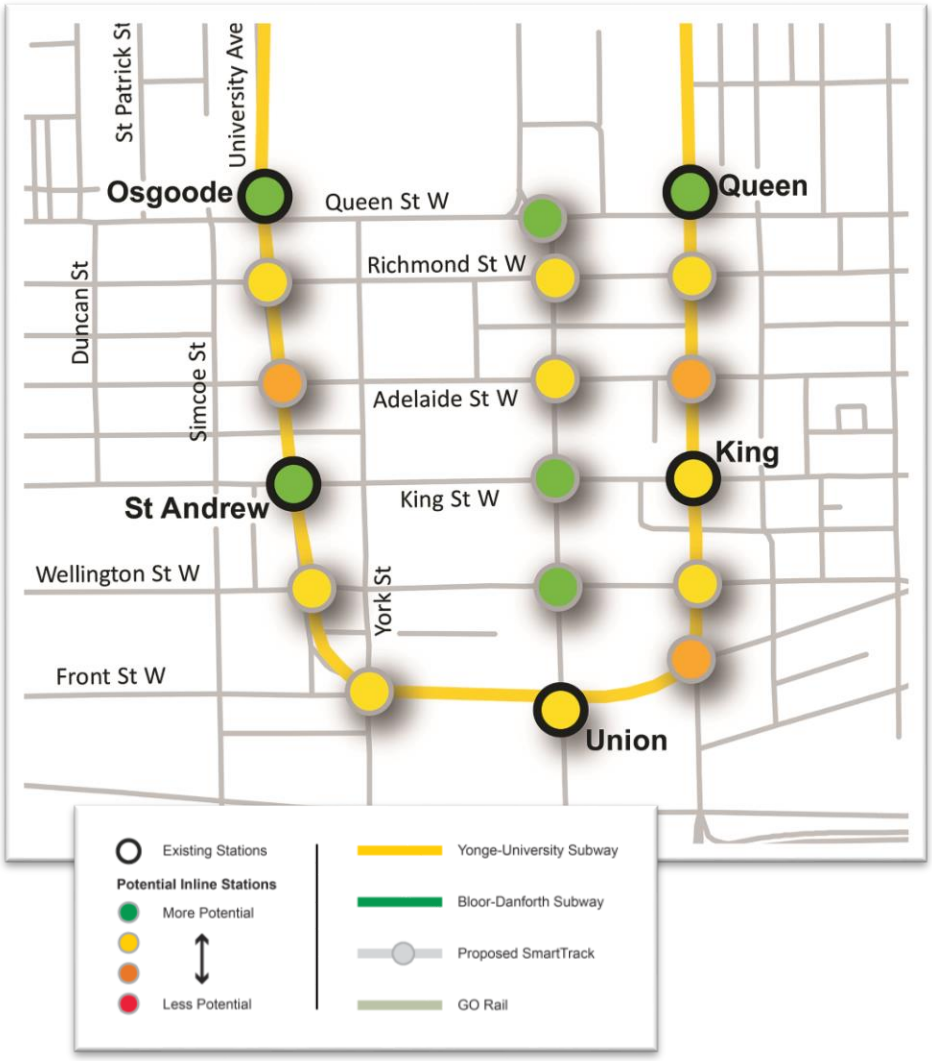
Potential Station Areas – all reasonable options considered including terminus locations



Evaluation Criteria – holistic approach

Evaluation criteria based on principles and criteria developed during the Official Plan Review process "Feeling Congested?"

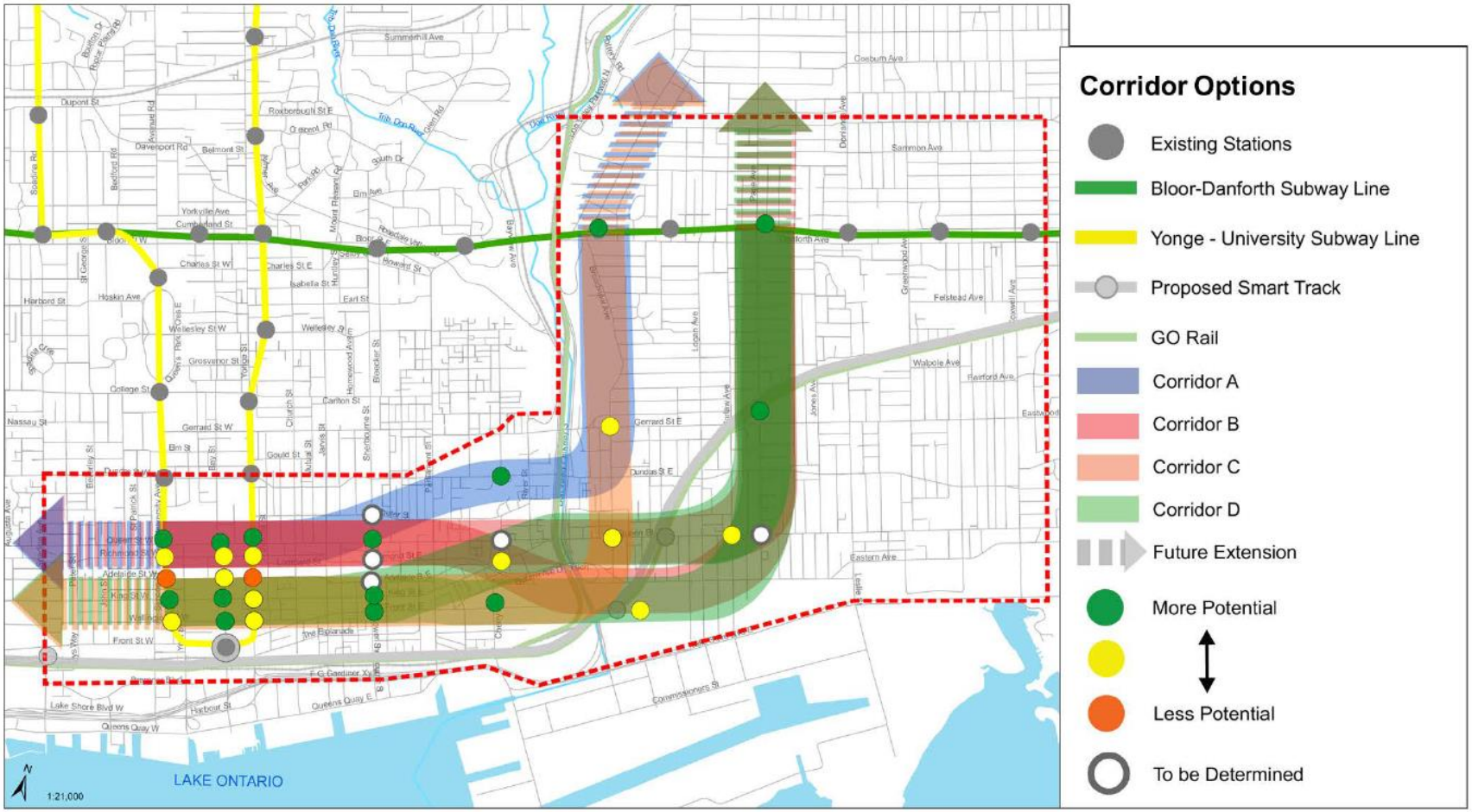
Evaluation of Downtown Stations



Key Station Evaluation Findings:

- **Bay Street** – close to area of high employment density
- **King / Wellington** corridor has:
  - Proximity to highest employment density
  - Ability to extend west along existing public right-of-way
- **Queen Street** serves key destinations such as the Eaton Centre, St. Michael's Hospital and City Hall
- **Front Street / Union Station** has high existing pedestrian volumes
- **Adelaide** and **Richmond** are more challenging to extend to the west

Alternative Corridors

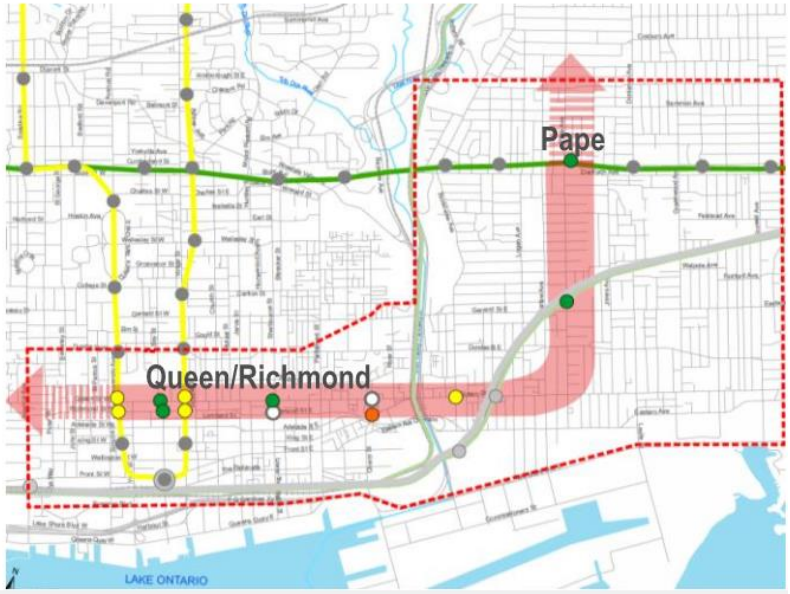


Emerging Preferred Corridor

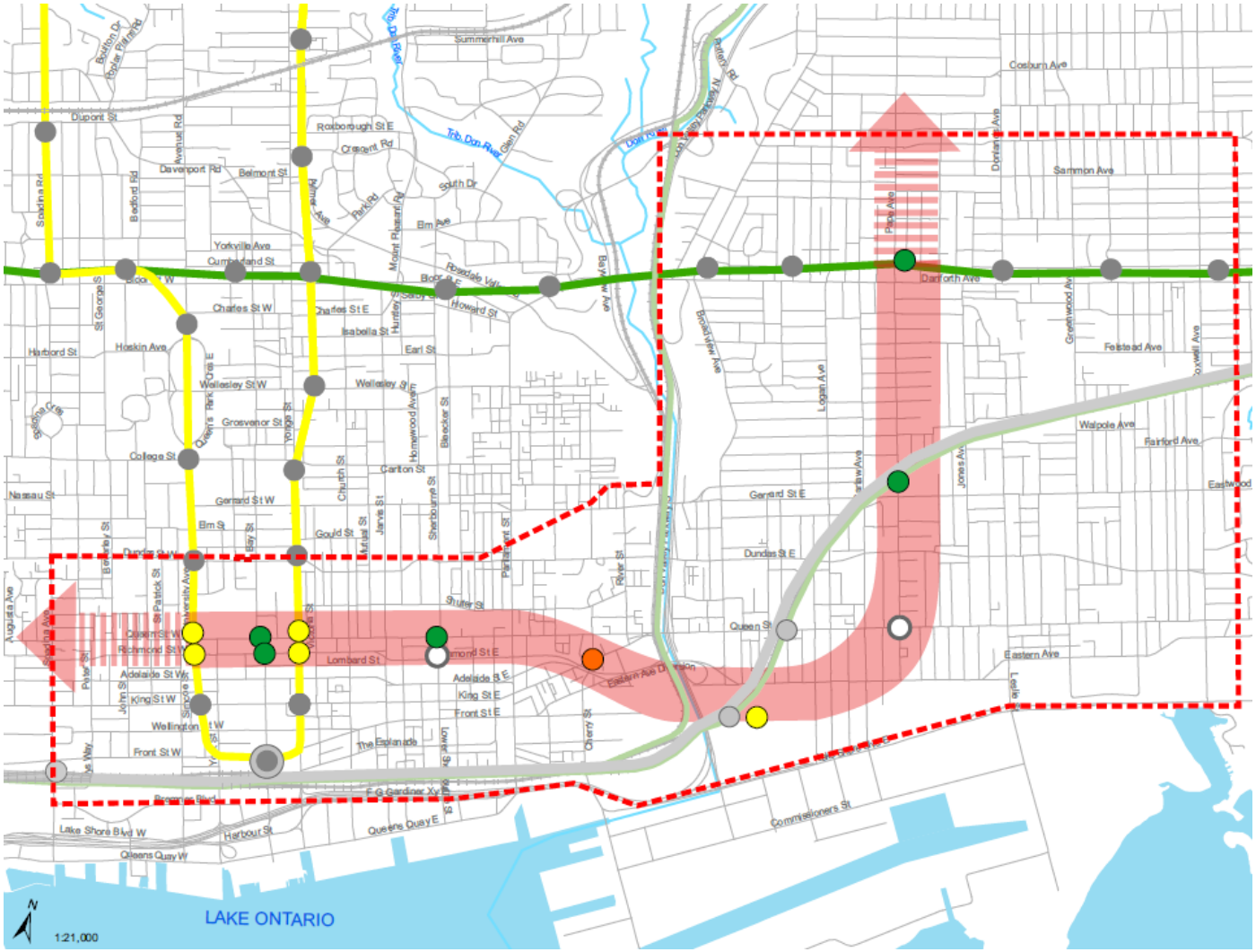
Preferred Corridor

SUMMARY	A	B1	B2	C	D1	D2
CHOICE Develop an integrated network that connects different modes to provide for more travel options	◑	●	●	◑	◕	◕
EXPERIENCE Capacity to ease crowding/congestion; reduce travel times; make travel more reliable, safe and enjoyable	◕	◕	◕	●	●	●
SOCIAL EQUITY Do not favour any group over others; allow everyone good access to work, school and other activities	●	◕	◕	◔	◑	◑
SHAPING THE CITY Use the transportation network as a tool to shape the residential development of the City	◑	◕	◕	◑	◕	●
HEALTHY NEIGHBOURHOODS Changes in the transportation network should strengthen and enhance existing neighbourhoods; promote safe walk and cycling	◕	◕	◕	◑	◕	◕
PUBLIC HEALTH & ENVIRONMENT Support and enhance natural areas; encourage people to reduce how far they drive	◕	●	◕	◕	●	◕
AFFORDABILITY Improvements to the transportation system should be affordable to build, maintain and operate	●	●	◑	◑	◕	◑
SUPPORTS GROWTH Should support economic development; allow workers to get to jobs more easily; allow goods to get to markets more efficiently	◑	◑	◑	◕	◕	●
OVERALL PRELIMINARY TECHNICAL SUMMARY	◑	◕	◕	◑	◕	◕
PUBLIC & STAKEHOLDER INPUT Project Team assessment of public and stakeholder comments received during June 2015 consultations	◑	◕	◔	◕		

Corridor B1 (*Pape Station to Downtown via Queen/Richmond*) has emerged as the Preferred Corridor



Final Preferred Corridor – reflecting city-building

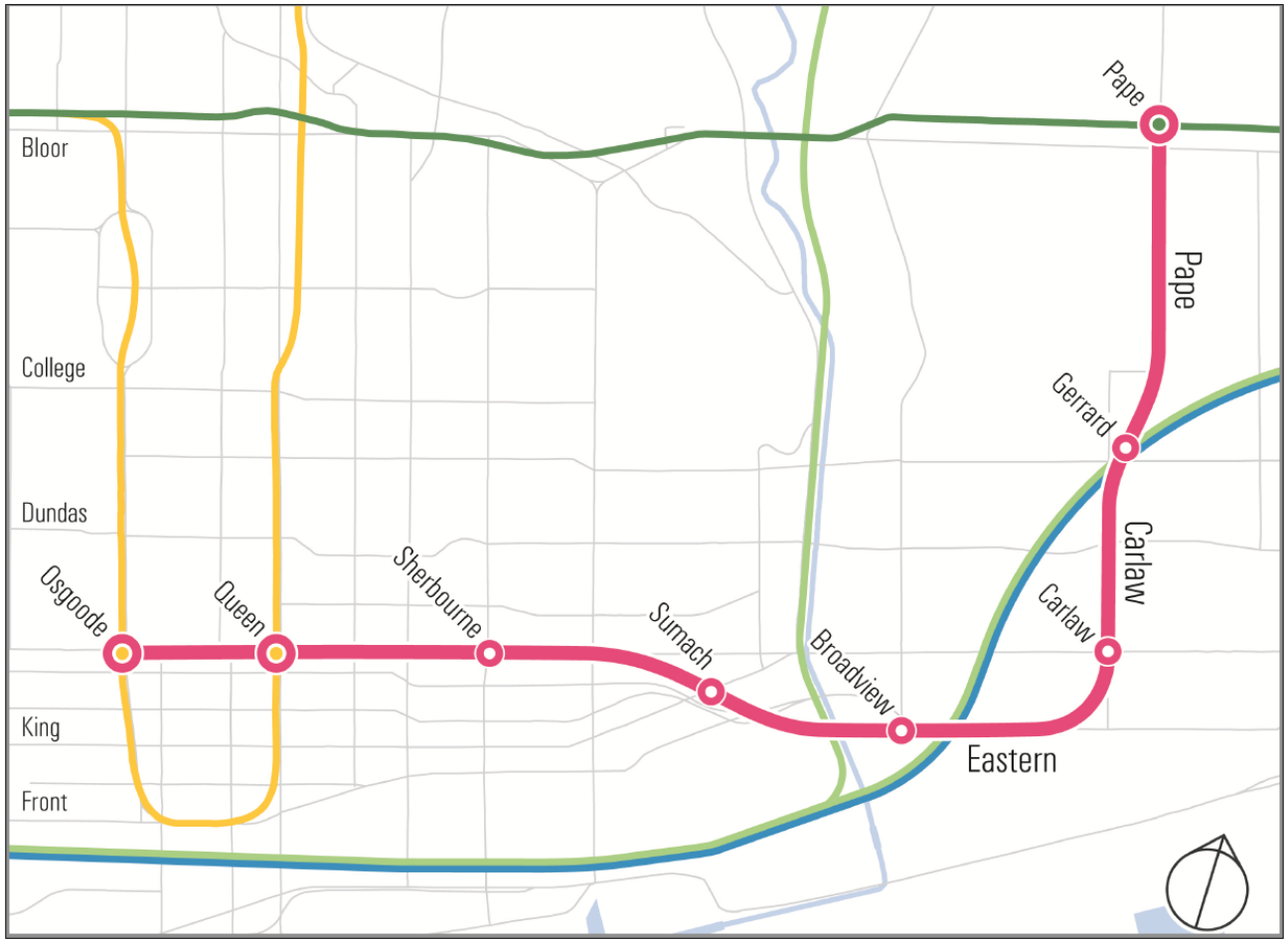


Preferred Alignment – local area evaluation with extensive public consultation

Relief Line as approved by City Council, with the Local Segment area highlighted in blue.

A better solution

Final City Council approved alignment (after 100 years) – reflecting extensive consultation and holistic evaluation criteria



Relief Line Status

- 2018 Relief Line South Transit Project Assessment and Conceptual Design completed.
- 2018 Minister approval of Relief Line South TPAP
- 2018 Relief Line South 15-30% design has started
- 2018 Relief Line North Study has started

- New Provincial Government's views??????

Lessons Learned

- We are planning for the next 100 years
- Affects how we plan for major transportation investments and policies:
  - Long-term horizon
  - Land use forecasting
  - Travel demand forecasting
  - Synergies between land use and travel demand
- Transit projects are more than transportation projects
- Success depends on public and stakeholder engagement
- Political support is essential

Lessons Learned – land use and development

- Policy vs Market
  - Most previous planning tried to divert downtown Toronto development to suburban centres
  - Cannot "force" development to occur where governments dictate – ignores economics and market forces
  - Difficult to foresee land use and development trends e.g. downtown Toronto today
- Land use forecasting
  - Policy-focused (see above) versus market-driven
  - Demographic trends
  - Socio-economic trends
  - Longer-term forecasts
  - Range of forecasts – perhaps a probabilistic approach
- Impact on travel forecasts

Lessons Learned – Travel Demand Forecasting

- Travel demand models are essential tools for transportation planning
- However, they are a tool – albeit an essential tool
- Inherent limitations and risks in the assumptions:
  - Horizon year limited by land use forecasts
  - Land use forecasts including demographic and socio-economic
  - Network assumptions – Realistic? Fundable? Feasible?
  - Technology
  - Economy
- False precision inherent in travel demand forecasts

Lessons Learned – Travel Demand Forecasting

- Although significant progress made, inherent limitations and risks in transportation macromodels:
  - Strategic models that are suited for strategic network planning
  - Only as good as key assumptions – land use, network
  - Key assumptions that are not challenged – fare policies, network attributes
  - How housing affordability affects OD patterns
  - Impact of socio-economic and demographic characteristics on demand
  - Used in business case assessments without appreciation of limitations
  - Suited for demand forecasting for specific facilities only with careful detailing and calibration
  - Deterministic models based on one set of assumptions
- Unrealistic belief in macromodels and their outputs without acknowledging their limitations and weaknesses

An alternative approach– Travel Demand Forecasting

- Macro models are a tool and should be used as tools
- Tiered approach to travel demand forecasting
  - Detailed macro models for short to medium-term demand forecasting within the limitations of reliable land use forecasts, and
  - Coarser macro models for long-term demand forecasting, e.g. sketch models
- Incorporate other key factors that affect travel demand:
  - Socio-economic and demographic characteristics
  - Housing affordability
- To recognize uncertainty:
  - Much more sensitivity testing for all key assumptions
  - Producing range of forecasts
  - Probabilistic approach
  - Requires less complex macro models that don't require running them over the weekend

Exploring synergies between land use forecasting and travel demand forecasting

- Traditional linear approach:
  - Land use forecasts
  - Travel forecasts
  - Recommended network
- Does not recognize interaction between land use and transportation infrastructure
- Newer approach:
  - Recognize synergies
  - Cyclical approach
  - Opportunity to shape travel demand and land use
  - Requires appropriate tools

Transit projects are more than transportation projects

- More than satisfying future travel demand

- City building and shaping the city
- Shaping travel demand
- Economic benefits
- Environmental benefits (and impacts) – macro and micro
- Social equity and benefits (and impacts) to the community

Success depends on public and stakeholder engagement

- Many examples of project failures
  - Leslie LRT in York Region
  - Eglinton West widening in Toronto
- Relief Line is an example of meaningful and effective engagement
- What does real engagement mean?
  - Proactively engaging all stakeholders
  - 2-way communication
  - Willingness to understand and empathize
  - Willingness to change and get a better project

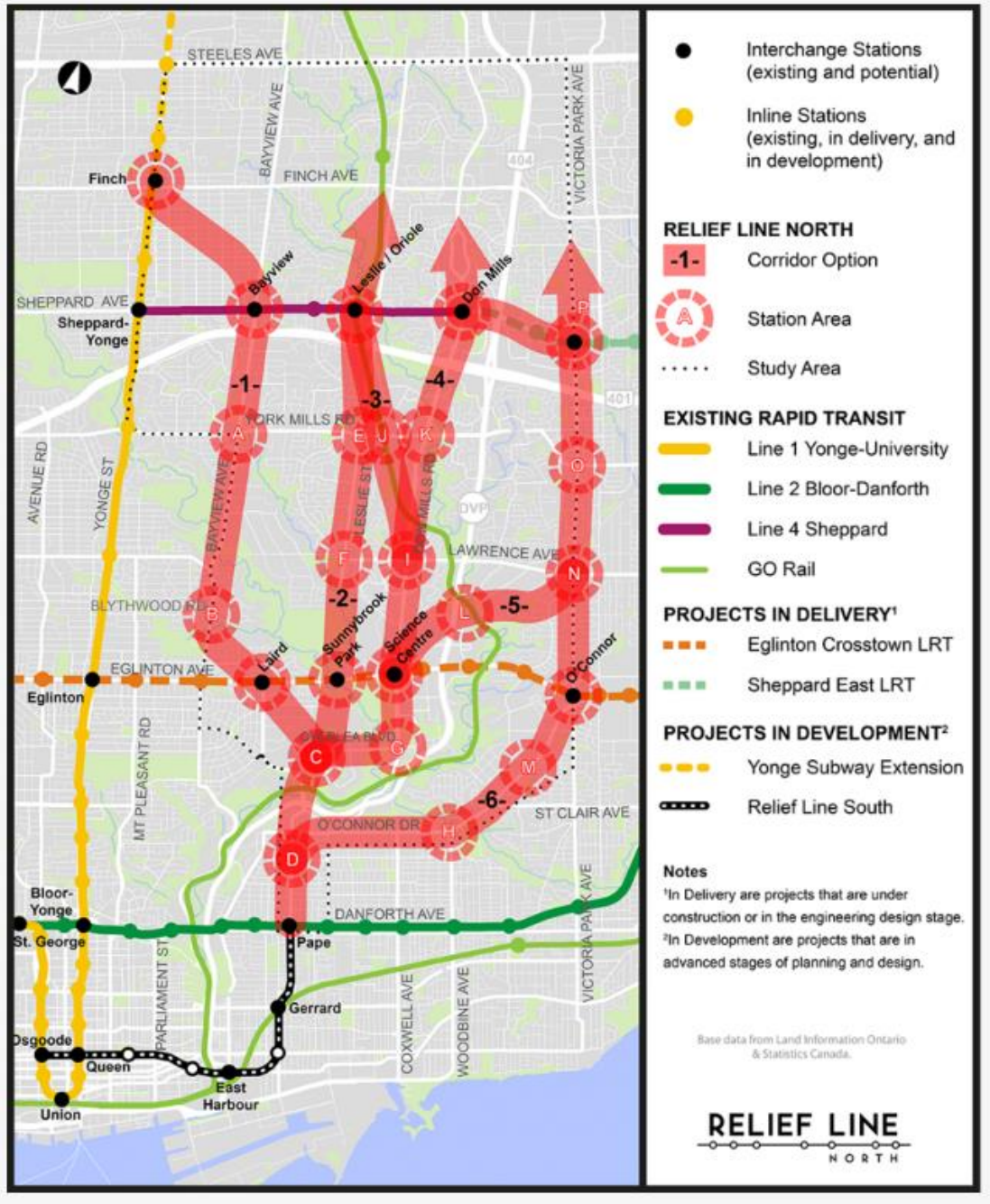
Must obtain political support

- Political support comes from public support
- Political support essential for funding

Our opportunity

- Looking beyond our technical role
- Opportunity to do good and create a better society
- **We are more than transportation planners/engineers**

Q & A



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