Union Station 2031 and Related Planning Studies
Presentation to Board
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Outline

1. Background

2. Objectives of concurrent studies
   A. Metrolinx Union Station 2031: Demands and Opportunities Study
   B. Metrolinx Union Station and Union Station Rail Corridor Capacity Study
   C. TTC Downtown Rapid Transit Expansion Study

3. Overview of each study

4. Key findings

5. Next Steps
Background

➢ *The Big Move* anticipates that:
  - Over the next 25 years, Union Station will see a significant increase of passenger traffic in the morning peak hour as a result of the expansion of the regional rapid transit network
  - Improvements to tracks, platforms, and passenger circulation will be needed to accommodate the new services proposed in the Regional Transportation Plan

➢ Union Station and the Union Station Rail Corridor (USRC) have limited capacity:
  - Train flow: tracks and mid-day storage
  - Pedestrian flow: platforms and concourse

➢ The need to plan for this growth extends beyond Union Station. Within the downtown core:
  - Population is projected to increase over 80% from 71,000 in 2006 to 130,000 in 2031
  - Employment is expected to grow over 25% from 315,000 in 2006 to 400,000 in 2031
  - Downtown core-destined transit demand is expected to increase over 50% from 156,000 peak period trips in 2006 to 236,000 peak period trips
  - The Yonge subway line and much of the downtown TTC network will be at capacity by 2031

➢ Union Station is expected to reach capacity after the coming 10-year GO expansion plan
Status of Three Studies

A. Union Station 2031: Demands and Opportunities Study
   - Metrolinx study, prepared by Halcrow Consulting. Study complete.
   - Review and confirm RTP passenger demand forecasts for Union Station and downtown core.
   - Analyse system-wide opportunities to re-distribute demand to address capacity constraints at Union Station.

B. Union Station Capacity Study
   - Metrolinx study, prepared by AECOM Canada. Study complete.
   - Assess track and platform capacity based on planned/funded infrastructure improvements and options to expand.

C. Downtown Rapid Transit Expansion Study
   - TTC study, prepared by HDR | iTrans. Study in progress.
   - Assess the need for additional rapid transit capacity to serve the downtown core and alternative strategies to accommodate demand.
A. Union Station 2031: Demands and Opportunities Study
Union Station 2031 Transportation Demand

- Union Station passenger traffic is expected to increase dramatically, in the range of 2 to 3 times the levels of 2006 by 2031
- This could be accommodated by:
  - Providing alternate routes into downtown that could “off-load” Union Station and limit the amount of expansion required
  - Further expansion of Union Station itself — if feasible
- This study looks primarily at options for off-loading
  - Strategic approach: brainstorming potential ideas
  - Engineering feasibility studies have not been undertaken at this time, and some ideas may not be physically possible
- Context: looking out to 2031 and beyond, after a major expansion of GO service and implementation of “Express Rail” concept proposed by *The Big Move*
Union Station Study Area

Study Area and 2031 Employment Growth

Employment Difference: 2031 vs 2006
- > 5000
- 2000 to 5000
- < 2000

PD1
Study Area

2006 AM Peak Period Passenger Destinations (Union Station to Spadina / Bloor / Parliament)

Straight line distance from Union
- Bloor Avenue 2800 m
- College Street 1750 m
- Dundas Street 1150 m
- Queen Street 720 m

9% (of which 22% walk)
12% (of which 49% walk)
9% (of which 69% walk)
71% (of which 99% walk)

Source: 2006 TTS
Area covered by PATH

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Study Process

Initial System Options

Screening Criteria

Refined System Options

Evaluation Criteria

Final Options for Further Study

1 2 3 4 5 6

4A 4B 5A-2 6A 6B 4B 6B
Initial System Options

1. Improved GO/TTC Integration
2. Satellite GO Stations
3. North Toronto Subdivision
4. Downtown Rapid Transit Line
5. GO Tunnel via King/Queen St.
6. GO Tunnel via Lakeshore
Initial System Options

- The initial system options were evaluated and screened according to the initial screening criteria, listed at right

- **Options 1 to 3:**
  - None provide adequate relief to Union Station
  - Can be pursued independently, for other reasons (e.g., ridership growth)

- **Options 4 to 6** were retained and refined, and then re-evaluated with additional criteria

### Screening Criteria

- Ability to offload Union Station
- Ability to serve GO rail market / PD 1 employment
- Ability to integrate new TTC subway services providing system reliability and redundancy
- Consistency with The Big Move and GO 2020
Option 4A – Downtown Rapid Transit (DRT)
Underground Downtown Rapid Transit (DRT) Line proposed to replace King and/or Queen streetcars. Integrated with GO Rail services at key stations.
Option 4B – Bathurst North Yard plus modified DRT

New GO station at Bathurst North Yard near Spadina Ave. Barrie and Georgetown GO Rail services terminate at this station instead of Union. Passengers access downtown via PATH or via underground DRT line. DRT line is adjusted to connect to Bathurst North Yard Station and Exhibition GO Station.
Option 5A-2 – Queen Street GO Tunnel
- Assumes some “Express Rail” services would utilize within the tunnel and service would be continuous for Milton, Georgetown, Richmond Hill and Lakeshore East.
- Other “Regional Rail” services would continue to Union Station
Option 6A – Lakeshore GO tunnel to Queen Street

Lakeshore GO services shift underground in a tunnel and divert north as they approach Union Station with the tunnel interfacing with Osgoode and/or Queen Stations.
Option 6B - Lakeshore GO tunnel to new station east of Union Station

Lakeshore GO service tunnelled under Union Station with new Lakeshore GO station built slightly east of current Union Station. Lakeshore GO services have exclusive use of the tunnel and second station.
Evaluation Criteria for Refined Options

- Refined Options 4A to 6B were evaluated against the earlier screening criteria, plus the following new criteria:
  - Ease of interagency coordination and approvals
  - Ability to promote new development
  - Magnitude of construction issues
  - GO/DRT capital costs
  - Risk / sphere of influence / control
  - Ability to maintain reasonable passenger flows on subway
- Two options were carried forward after this analysis
Options Selected for Further Study

- **Option 4B – Bathurst North Yard plus modified Downtown Rapid Transit**
  - Shifts more than 35% of 2031 GO Rail passengers from Union Station to new Bathurst North Yard station. Also relieves congested eastern section of downtown subway network.
  - Bathurst North Yard Station is integral to allow Georgetown, Barrie and planned Bolton rail services to be short-turned prior to Union Station.
  - PATH connection warranted for easy downtown access. Access to downtown by walking / DRT may be less attractive to GO passengers.
  - Replacement of train storage capacity at Bathurst North Yard needs to be studied.
  - Option 4A (larger Downtown Rapid Transit line) not carried forward; it does not provide adequate relief to Union Station.

- **Option 6B – Lakeshore GO tunnel to new station east of Union Station**
  - Shifts more than 40% of 2031 GO Rail passengers from existing Union Station to a new second underground level.
  - New tunnel assumed to be used by interlined Lakeshore West and Lakeshore East GO services with passengers alighting at a new station located near Yonge Street.
Union Station 2031: Other Findings

- Both satellite stations and service on the North Toronto subdivision are to some extent “solutions to different problems”
  - Not expected to significantly off-load Union Station, on their own
  - Could serve new markets – a different issue
- The last few hundred meters to the final destination has an impact on transit choices
  - The location of new GO stations must be in close proximity to existing and planned major employment centres
- Most major international centres comparable in size to the GTHA have more than one major transit interchange station to provide efficient transit passenger accessibility and transit system flexibility
- Better fare integration may need to be part of the solution in order for passengers to consider using alternative transit services (e.g., transfer from GO to TTC)
- As GO moves towards two-way all-day service, Union Station will see more “counter-peak” passengers boarding trains in the morning
  - Needs to be considered for the functioning and capacity of staircases and passageways
B. Union Station and Union Station Rail Corridor (USRC) Capacity Study
Track Capacity Study: Purpose

- Assess USRC train capacity at existing and 3 future time points:
  - Completion of planned infrastructure (2015) and implementation of service improvements, including ARL
  - GO Electrification Study Reference Case
  - The Big Move 25-Year Plan (2031)
- Identify opportunities to increase capacity by making more effective use of existing/planned infrastructure
- Identify additional infrastructure needed to address capacity shortfalls
Track Capacity Study: Considerations

- Consultant could start with a “clean sheet of paper” with respect to existing operating patterns
- Study considered track, signal and platform capacity, but passenger flows through Union Station were not part of the study scope
- Additional proposed VIA service taken into account (with assumptions about schedule)
- For the duration of train shed construction, two tracks will be out of service at a time
- Current track and signal infrastructure improvements would be complete by 2015
- On-time performance (OTP) standard raised from 90% to 95% (consumes capacity)
- Opportunity provided by the acquisition of two additional freight tracks along the south edge of the USRC
Track Capacity Study: Key Findings

- Currently:
  - Operating at current capacity
  - 29 trains in peak hour (24 GO + 5 VIA)
- 2015 capacity (current projects in place)
  - 35 trains in peak hour (24 GO + 4 ARL + 7 VIA)
  - Potential for additional trains in peak period (but not peak hour)
- GO Electrification Study Reference Case
  - 52 trains in peak hour (41 GO + 4 ARL + 7 VIA)
- 2031 and beyond (scenario similar to The Big Move 25-year plan)
  - Approx. 90 trains in peak hour requires an alternative solution such as new underground tracks and platforms
Track Capacity Study: Planned Improvements

Infrastructure:
- Develop new south platform by removal of Track 16 (preliminary design started)
- Proceed with double berthing (preliminary design started)
- Improve capacity (and reliability) with infrastructure modifications to increase straight routing
- Make relatively minor infrastructure changes to improve the utility of the two connecting tracks for commuter service (must still protect for freight operation)

Operations:
- Change GO platform assignments to make better use of capacity (2016 when train shed construction is complete)
- Change VIA platform assignments to make better use of capacity (working with VIA on options)
Track Capacity Study: Long Term Planning

Implications

- Significant capacity shortfall between planned projects and longer-term “2031 and beyond” service scenario
- Requires vertical expansion (4 new tracks below grade)
  - Depth to clear existing infrastructure (approximately 25m below current track level)
  - Vertical access challenges
  - Property requirements to widen the corridor at tunnel entrance points will be a major obstacle
C. TTC Downtown Rapid Transit Expansion Study
The problem:
- Even with currently-planned improvements, by 2031 the Yonge Subway, major transfer stations (Bloor-Yonge and St. George) and much of the GO Rail network will be at, or over, capacity during peak periods;
- Construction of the Eglinton-Scarborough Crosstown will result in Yonge-Eglinton Station having significant passenger volumes as well;
- “Shoulder” areas to the downtown Toronto are growing and require better transit service; and
- An extension of the Yonge Subway to Richmond Hill would result in increased passenger demand to the downtown, augmenting the need for additional rapid transit capacity.

The study:
- Possible solutions include policy initiatives and the construction of additional rapid transit capacity on various corridors
- The Strategic Plan component of the study to be completed early 2012
4. Key Findings Arising From All Studies

Union Station passenger traffic is expected to increase dramatically, in the range of 2-3 times the levels of 2006 by 2031

- **Short Term (within 5 years):** Planned service increases are being accommodated with improvements underway
- **Medium Term (within 10 years):** with current planned improvements, Union Station and USRC train capacity can achieve the following:
  - Peak hour train volume can be doubled
  - Total all-day train volume can be tripled
  - Planned improvements include: new south platform, double-berthing, changes to platform assignments, increase in straight routing
- **Long Term (beyond 10 years):**
  - Rapid transit network solutions exist that could help relieve both Union Station and Yonge subway capacity issues. Further detailed analysis is required to determine the feasibility of options 4B and 6B.
    - Union Station site is physically constrained. More space will eventually be needed for tracks, platforms etc.
    - Significant counter flow pedestrian flows at Union Station will also need to be addressed
  - Sustainable funding will be required to address long-term solutions
5. Next Steps

- Proceed with currently planned USRC Capacity Improvements
- Undertake further studies of the identified options 4B and 6B
- Continue ongoing collaboration with TTC/City of Toronto in their study
Thank you

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