Draft

20 July 2011

Airport Rail Link (ARL)

"Mid August" Deliverables

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Metrolinx: Policy Planning & Innovation - GO Planning

21 July 2011

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Context

- The Airport Rail Link (ARL) service plan is of 2009 or earlier vintage
- On 7 April 2011 a review was requested to
  - inform key decisions timed for late summer/early fall of 2011
  - set a foundation for working towards opening day in 2015
- Review deliverables for "**mid-August**" 2011
  - service plan update
  - ridership forecast update --> **GTAA access fee**
  - opening day fleet size --> **vehicle procurement contract**
  - double/single track Spur justification --> **Spur design build contract**
- Today: report status and solicit feedback/further direction

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Exec Summary

1. 25" schedule Union to Airport is still valid using new vehicle & Spur specs
2. A minimum of 4 active consists are needed to provide 15" service
3. Service reliability continues to be a concern due to route characteristics, mixed traffic, tight schedule, single platform at Union ...
4. Protecting operational reliability
    1. a 5th consist is required
    2. do not use 5th as a "hot spare", insert into service cycle
    3. no public timetables - use "next train in approx. 15 min" philosophy

- Potential for standees in PM peak hours in +/-2016 using 2-car consists
- Minimum fleet size = 18 cars for 2-car consists
  = 24 cars for 3-car consists (to avoid standees)

1. Existing vehicle procurement = 18 cars maximum
2. Double track Spur justification progressing

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ARL Service Plan - update

1. Base Service Parameters
    1. New vehicle specs and Spur/GTS geometry have been tested
        - a 25" schedule is still valid
            - ~20" minimum run time
            - 1" Bloor stop
            - 1" Weston stop
            - ~3" operating allowances

    - A service plan with a 25" schedule, 15" service frequency and 5" terminal dwells requires a minimum of 4 active consists

    - A challenging plan to operate reliably due to
        - short terminal dwells
        - 15" frequency bi-directional operation
        - mixed traffic (GO, VIA, freight)
        - only 1 platform at Union Station

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ARL Service Plan - update

2. Service Reliability

   2. SNC planned to protect service reliability with a "hot spare"
      - a crew and consist on stand by at the maintenance facility
      - requires procurement of a 5th consist for the active fleet
      - increases operating costs

   – Use the 5th consist <u>in active service</u> rather than as a hot spare
      - increases Airport dwell to 20" while maintaining 15" service frequency
      - 20" dwell improves ability to absorb planned/unplanned delays
      - does not involve reaction time to insert spare into service
      - 4 consist-cycle becomes an automatic back-up in the event of mishaps
      - better crew management (enables short breaks, reduces fatigue)
      - a necessary condition for adding future station stops

      ---

      - involves more miles, fuel & vehicle wear than a hot spare
      - <u>does not</u> increase seated capacity (service frequency is unchanged)

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ARL Service Plan - update

2. Service Reliability: Cont'

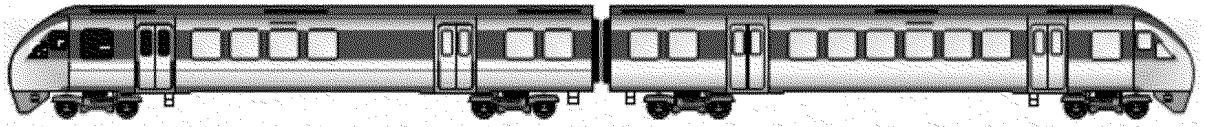
   2. Effectiveness of the 5 consist scenario can be enhanced by running an "unscheduled" operation
      - scheduled : 20" terminal dwell must expire before departure
      - unscheduled: train can leave early if required

   – requires
      - elimination of published timetables
      - adoption of a service delivery model marketed as:
        – next train in 15"
        – arrival at destination in approximately 25"
      - KPI's geared to tracking
        – frequency between departures at Union and the Airport
        – average trip time

ARL Service Plan - update

3. Peak Hour Capacity

3. Originally planned to operate with 2-car trains on opening day



- current vehicle spec provides 65 seats/car or 130 seats/2-car consist
- service plan provides 4 trains/hour/direction by any point

520 seated passengers/hour/direction

(will vary slightly as interiors are refined)

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ARL Service Plan - update

4. Service Day
   - The GTS EA quotes 140 ARL trains/day, i.e. 05:30 to 11:00
     - a 17.5 service day
     - a 6.5 hour overnight window for
       - track/signal maintenance
       - rolling stock maintenance
         - » shuttling equipment to the overnight maintenance facility
         - » performing overnight servicing
         - » shuttling equipment back to the initial terminal for the next day's operation
   - A 05:00 to 01:00 service day
     - involves 160 trains/day
     - a 4 hour overnight window
   - A 04:00 to 02:00 service day
     - involves 176 trains/day
     - a 2 hour overnight window
   - Length of service day also impacts train crew hours, support employees hours, facility operating hours, train miles operated ...

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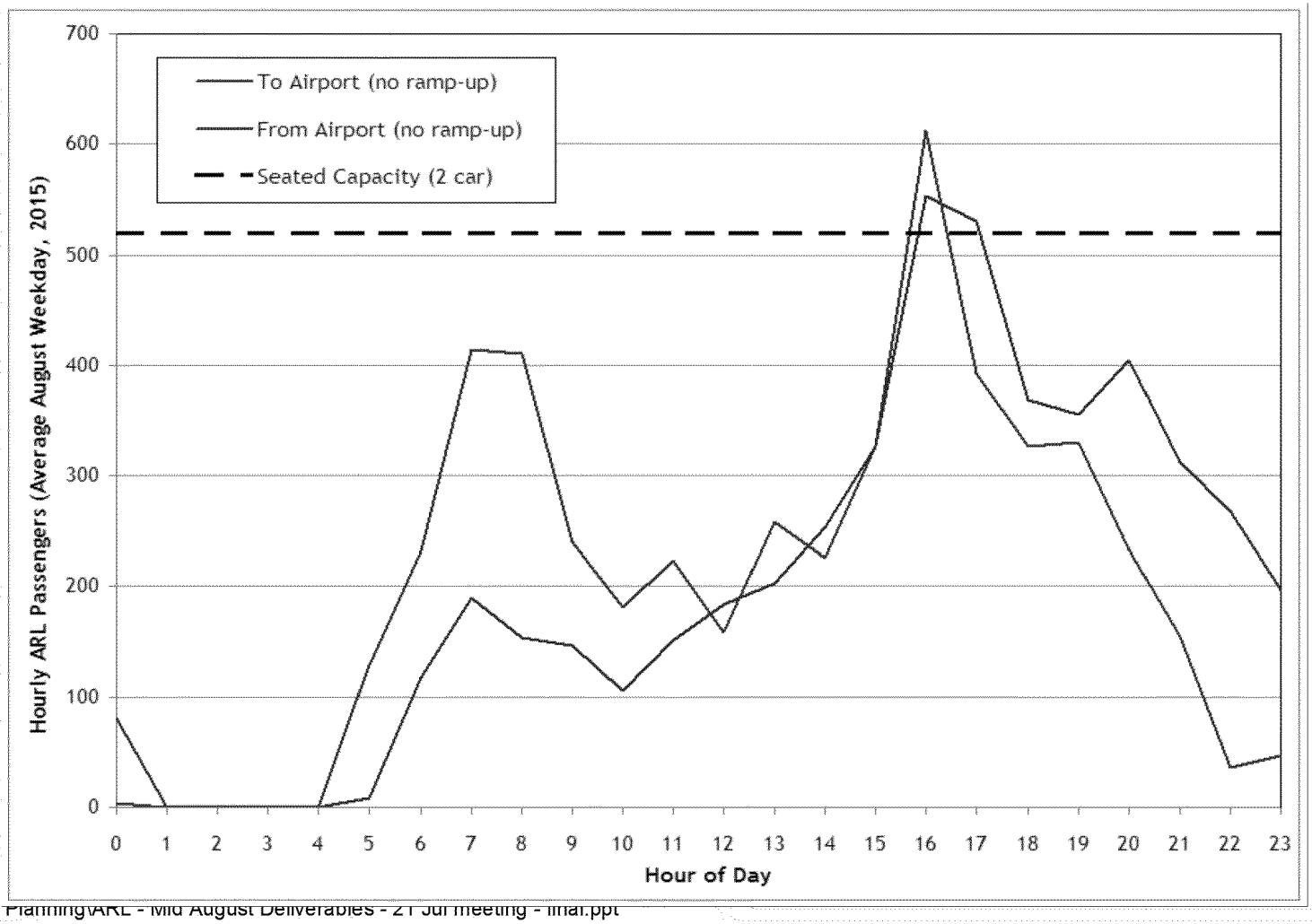
ARL Service Plan - update

5. Time of Travel/Service Day - (from SDG Forecasting)



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- For discussion purposes only, preliminary and under development

ARL Ridership Forecast - update

1. Background:
    1. Pre 2011 forecasts were undertaken by SNC utilizing
        - Greater Toronto Airport Authority (GTAA) air traffic forecasts
        - stated preference surveys
        - modal split analysis to determine ARL capture rate

    – Steer Davies Gleave (SDG) has been engaged to update ridership forecasts using the modeling process they developed for SNC
        - results are being used to develop pricing and GTAA access fee
        - <u>results presented herein are preliminary and are for discussion purposes</u>

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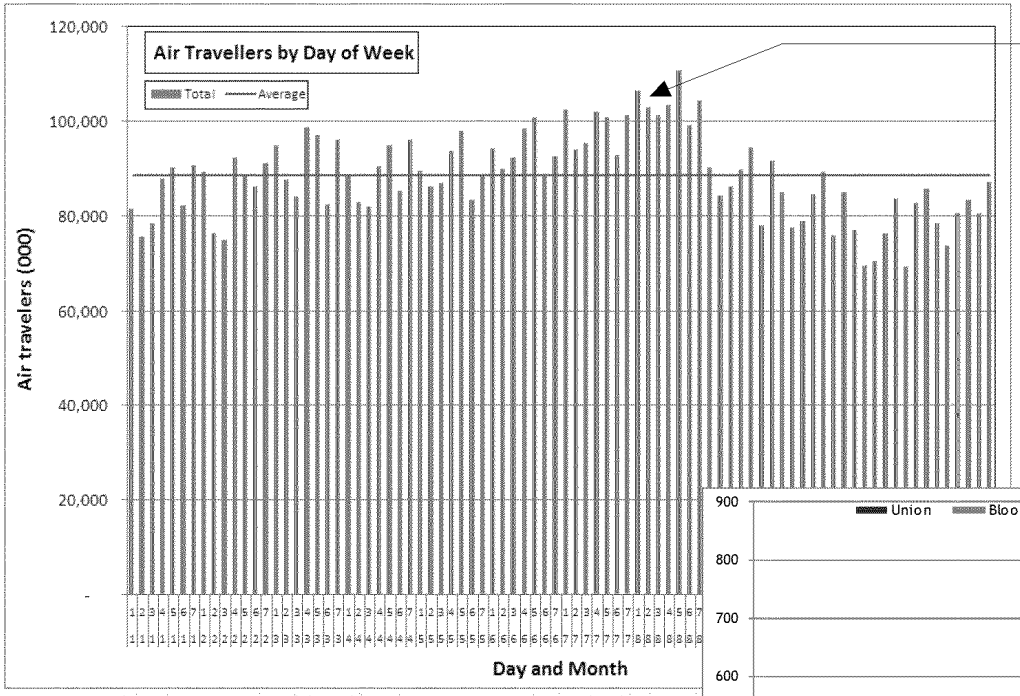
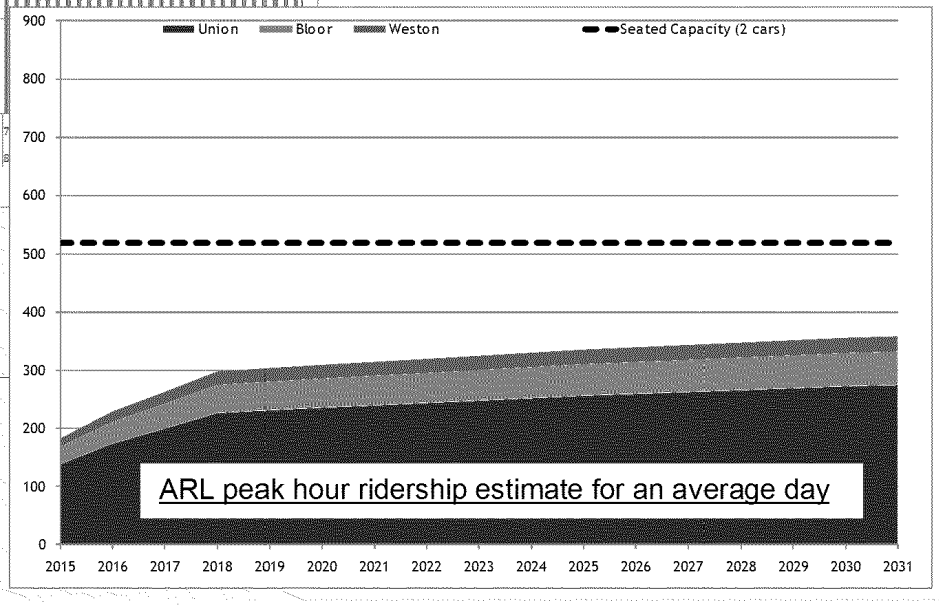
ARL Forecast Update - average day

2. Average Day Ridership



- Aug is forecast to be the heaviest travel month for the GTAA

  Note: data may be skewed by vacationers in August. This being reviewed.



- ARL peak hour travel for the average day is forecast to be less than seated capacity

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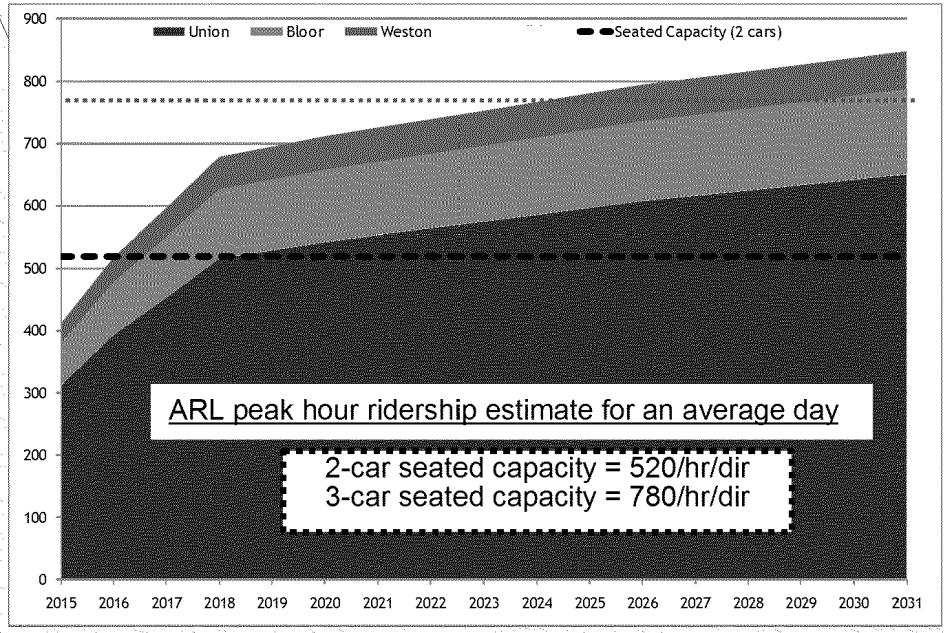
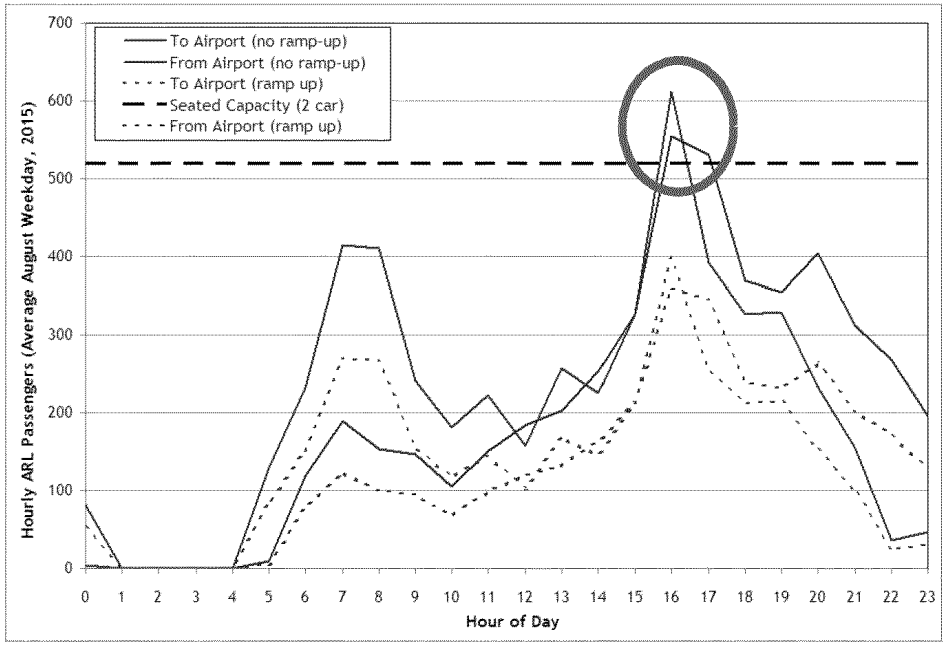
ARL Forecast Update

3. Peak Ridership

- Forecasts point to the possibility of standees during the pm peak hour in +/- 2016
- Timing of when forecasts will surpass seated capacity is a function of the ramp up assumptions
- Seated capacity could be earlier if the forecasts or ramp-up prove to be too conservative





This is an unexpected result in large created by

Exclusion per Committee Direction

- A significant increase in taxi fares since 2009

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ARL Forecast Update

4. Implications
5. Expect high passenger volumes at the Union and at the Airport termini due to coincident in/outbound air travel
6. There is a potential for some standees on/or shortly after opening day
   - **Exclusion per Committee Direction**

- Additional train length is not an option since Union/Airport terminals platforms are physically limited to a maximum of 3-cars
- Running more trains, say 10" frequency, is not possible due to
  - single track Spur
  - USRC capacity
  - single platform at Union
  - a 3-track GTS configuration

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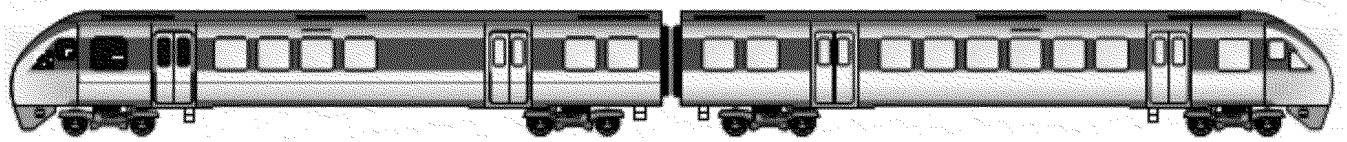
Vehicle Procurement

1. Procurement Contract



- Base order 6 x 2-car = 12 cars
- Deadline to exercise option for 6 additional cars by Sept 2011
- Delivery schedule:

Base order	12	Jan - Aug 2014
Option order	6	Jun - Aug 2015
18		

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Vehicle Procurement with 2-cars/consist

Base Order **6 x 2-car = 12**

Active Fleet 5 x 2-car = 10

Scheduled Maintenance 1 x 2-car = 2

Unscheduled repair	- in-service failures - defects found during inspections - wheel re-profiling - vandalism (graffiti, broken windows)
Field modifications	- design improvements - fleet-wide warranty repair
Heavy repair	- collision damage - derailment or other mishap
Heavy maintenance	- mid-life overhaul, - carpet replacement
Logistics	- maintenance "windows" - PM Bay limitations - married pair - spare parts availability

3 x 2 car = 6

Total 18

Option Order = 6

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Vehicle Procurement with 3-cars/consist

Base Order **6 x 2-car = 12**

Active Fleet 5 x 3-car = 15

Scheduled Maintenance 1 x 3-car = 3

Unscheduled repair	- in-service failures - defects found during inspections - wheel re-profiling - vandalism (graffiti, broken windows)
Field modifications	- design improvements - fleet-wide warranty repair
Heavy repair	- collision damage - derailment or other mishap
Heavy maintenance	- mid-life overhaul, - carpet replacement
Logistics	- maintenance "windows" - PM Bay limitations - married pair - spare parts availability

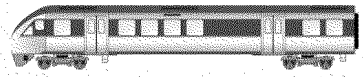
2 x 3 car = 6

Total 24

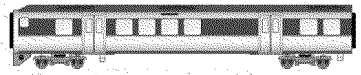
Option Order = 12

Vehicle Procurement - vehicle types

- "A“ car bullet nose

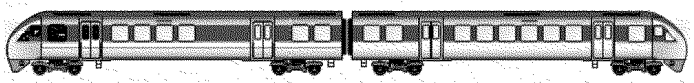


- "C" car blunt nose

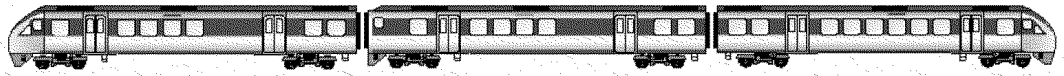


Train set configurations

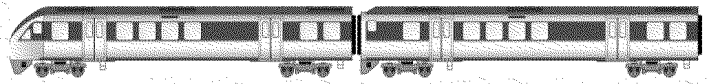
- "A-A" 2-car set



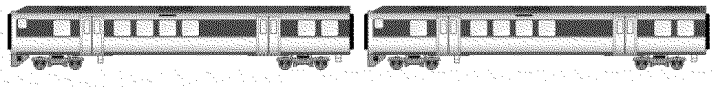
- "A-C-A" 3-car set



- "A-C" 2-car set



- “C-C” 2-car set



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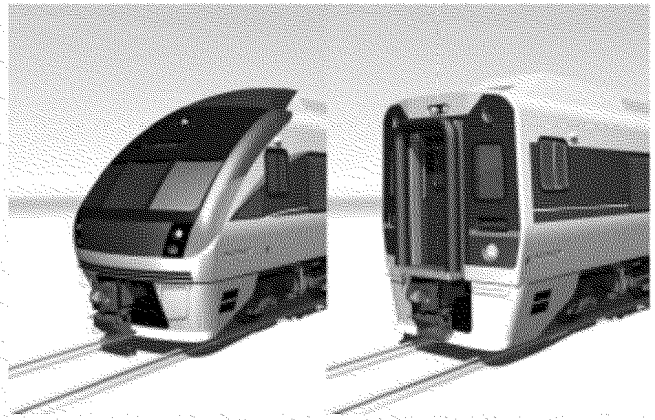
Vehicle Procurement - vehicle types

Blunt-nosed powered intermediate cars with a driving cab that normally function as a middle car but can function as a lead car.

Front View



Side View

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Double vs Single Track Spur

The Airport Spur configuration is made up of ~50% single track

- The single track section is entirely above grade, is narrow in width and will be difficult to access. Disadvantages over double track
  - customer service liability
    - it will compound delays created by down stream operational irregularities
    - entire service shuts down if major incident occurs on the single track section
  - increases maintenance costs since "per track" traffic density is doubled
    - daily track inspections
    - light maintenance
    - programmed maintenance
  - increases response time and cost associated with major disruptions due track defect, derailment or equipment malfunction
  - future expansion
    - double track is <u>one</u> of the <u>necessary</u> conditions to run 10" service
    - a very costly retrofit to expand to double track under traffic
- Short video of Canada Line elevated guideway - if time permits

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End

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