4.2 Series Station Option Description

The series station proposal features a new set of side platforms constructed approximately 250 feet north of the existing platforms. The two new platforms would extend northward along the existing alignment, from Asquith Avenue to the Ellis Portal. This option is shown in Exhibit 4.2.1.

Each platform would be dedicated to either loading or unloading passengers. Northbound trains would unload at the existing Bloor Station northbound platform and then proceed north to the new platform where loading would take place. Conversely, southbound trains would unload at the new southbound platform and load at the existing platform.

Two 460 feet pedestrian tunnels would be constructed outside the existing structure to connect from the east and west mezzanines to the centre of the new platforms. They would be equipped with moving and fixed walkways.

Another set of passages, 250 feet long would be constructed between the unloading and loading platforms by widening the tunnel structure connecting the two. The caissons supporting the Bay and the Bell Canada buildings limit the widening to a maximum of 6 feet. There will be no moving walkways in these passages.

Further, to provide passengers with direct access from street level to both of the proposed new platforms, an auxiliary entrance should be added on the north side of Church Street. The cost of constructing this new station is estimated at $100,000,000 in 1988 dollars. This proposal is dependant upon the implementation of Automatic Train Control (ATC) because the existing wayside signal system will not permit safe train operation with stations only 250 feet apart. The $100M estimate for the option was used in the evaluation. If the option had been developed to the same level of detail as the centre Platform Option, a similar increase in cost would be anticipated and the evaluation would not be affected.

Feasibility

It would be possible to construct two new platforms north of the station with pedestrian tunnels outside the existing structure. There are no existing structures north of the station that would conflict with the new structure construction.

An advantage of this proposal over others presented is that there are no track diversions required during the construction of the new station structure.

There are many deficiencies associated with the proposal. The new pedestrian tunnels would require some restructuring of existing facilities through private property. Further study is required on the affected property and the structural modifications necessary to implement the outside pedestrian tunnels.

This option would extend the length of the Bloor Station by an additional 750 feet. Thus, the existing track crossover for train switching between stations would have to be moved further north, or eliminated entirely at this location.

In conclusion, this proposal is physically feasible, but there are large extra costs required for ATC implementation. This option is not recommended because of this large extra cost.

4.3 Bi-Level Station Option Description

This proposal consists of two levels of platforms at the Bloor Station. The existing Bloor Station would be converted and utilized for southbound loading and unloading only. A new lower level structure would be constructed below Yonge Station, directly under and aligned with the Upper Bloor Station. The Lower Bloor Station would be used exclusively for northbound passenger loading and unloading operations. A plan of the new Bi-level Bloor Station is shown in Exhibit 4.3.1.

In converting the existing Bloor Station to the new Upper Bloor Station the existing southbound platform would become dedicated to southbound unloading only. The existing northbound track would be eliminated by widening out the old northbound platform across the track. This extra wide platform would be dedicated exclusively for loading southbound passengers. The existing centre bench columns could be eliminated by replacing the existing roof with one that spans the width of the structure.

A single northbound track would be installed in the Lower Bloor Station, along with a standard 12 foot unloading platform on the east side of centre line. This would allow for the construction of a 26 foot wide loading platform on the west half of the new station profile.

The new configuration would allow trains to load from one platform and unload onto another simultaneously, while also maintaining the northbound passengers separate from the southbound passengers. The existing subway running structure would have to be modified north and south of the station to provide the new northbound grade separated tunnel which connects into the Lower Bloor Station. Also, temporary diversion tracks will be required around the areas where the northbound grade separations are being constructed. The plan and profile of this alignment is shown in Exhibit 4.3.2.

A pedestrian passage would be required under the Yonge Station (B.D.S.) to connect the new Lower Bloor Station to the Yonge Station via 4 sets of new stairs and escalators. Other stairs and escalators would be constructed at the north and south ends of the two levels of Bloor Station.

The increased capacity expected from the new Bloor Station Bi-Level platforms would provide the required 30 second dwell times.

The preliminary cost estimate of building this option is $203,000,000 in 1988 dollars. This figure does not include property acquisition, signal modification or temporary facilities for track relocation and assumes sub-surface conditions compatible to normal construction methods. Tunnelling was assumed under the existing structures.

Feasibility

The feasibility of this option is determined by its constructability and cost. In order to construct the lower level platform and portals for northbound traffic, two northbound diversion tracks and tunnels would be required. One diversion would be located just south of Rosedale Station and the other just north of Wellesley Station.

Construction of the proposed Lower Bloor Station would necessitate tunnelling under the existing station. Tunnelling under the station would be risky to the Hudson's Bay Centre, the Bell Canada building, and the TTC station structure, because some settlement which could cause structural damage is inevitable. A detailed study would be required to determine if this construction is actually feasible without causing structural damage to the neighbouring buildings.

It seems evident that the structural implications for the Bi-Level proposal involve a high degree of risk to both the subway station and the adjacent structures. It would be very expensive to make this option constructible; thus, this option does not appear economical.

4.4 Divided Station Option

4.4.1 Park Road Alignment Description

This option proposes dividing the northbound and southbound tracks of the Yonge Subway. The existing southbound tracks would remain in place and Bloor Station would be converted to the 'Bloor Southbound Station'. The northbound tracks would follow a new parallel alignment along Park Road and a new 'Bloor Northbound Station' would be constructed under Park Road, north of Bloor Street. The platform and connection plans for this option are shown on Exhibit 4.4.1.

The new alignment as shown in Exhibit 4.4.2 swings east just south of Rosedale Station and dips down under the surface to avoid an apartment building on the north side of Collier Street before reaching Park Road. The alignment is proposed to extend under the New York Life Centre at Bloor Street, then curve back to the existing subway just north of Wellesley Station.

The existing Bloor Station would be modified similar to the Bi-Level Option with separate loading and unloading platforms. Also, the roof slab would be replaced to eliminate the existing centre columns. A single northbound track and two standard size platforms (approximately 12 feet wide), would be constructed at the new Bloor Northbound Station. The platform occupying the east half of the new station would be dedicated for northbound unloading operations only. The opposite platform, situated

along the west side of the station, would be strictly for northbound loading passengers. This would permit the loading and unloading of passengers to occur simultaneously, between the opposing platforms.

Access to the new Bloor Northbound platforms would be provided from the Yonge Station, Bloor-Danforth Subway level. New stairs and escalators would be added to the extreme east end of the existing Yonge Station centre platform. These would connect to a pedestrian crosspassage approximately 200 feet long, which would be constructed under the existing Bloor-Danforth tunnel structure. This main east-west crosspassage would provide passengers with direct access to the new Bloor Northbound loading platform from Yonge Station.

There would be a north-south passage under the new unloading platform which will extend under the Yonge Northbound Subway and connect up to the main east-west passage via stairs and escalators.

Possible future entrances and control areas could be provided to the Bloor Northbound Station from the basement levels of the Hudson Bay Centre, the Plaza Hotel or the New York Life Centre.

The 30 second dwell time objective is obtained by the separation of loading and unloading passengers onto dedicated platforms in each station.

The preliminary cost estimate for the conversion of Bloor Station, construction of a new Bloor Northbound Station, and installation of temporary structures is $173,000,000 in 1988 dollars. The acquisition of property is not included in this estimate.

Feasibility

The construction of this option is obstructed primarily by the foundations of high rise towers along the new alignment. Other construction problems will require further study before this option could be justified.

One high alignment profile located the subway box structure through the basement of the New York Life Centre, but there was insufficient room for the box structure between the columns. The alternative was to position the subway under the footings of the building. This arrangement is not desirable because of the large soil stresses present. It would be necessary to tunnel deep under the New York Life Centre.

Thus, the substructure of the New York Life Centre would require extensive underpinning. Structural damage from settlement is likely. Two other high-rise buildings at 42 Charles Street and 45 Charles Street have foundations that may be influenced by the alignment.

The existing Bloor-Danforth subway consists of a double tunnel structure where it crosses this new alignment. Underpinning these tunnels would be required over approximately 300 feet in order to excavate for the underlying connecting passages.

Construction under smaller structures would require underpinning or demolition of the structures. A preliminary list of the affected properties would include the Canada Post Station and Children's Aid Society Administration offices on Charles Street; and four private dwellings housing a number of professional business offices, commercial establishments and residential buildings.

The difficulty of overcoming the numerous construction obstacles required to make the alignment feasible in this heavily developed area of the city, makes this an undesirable high cost option.

4.4.2 Yonge Street Alignment Description

An alternative to diverting the northbound alignment along Park Road is diverting the southbound alignment along Yonge Street. The new alignment would swing west to Yonge Street just south of Rosedale Station. It continues under Yonge Street to Hayden Street and then curves east to meet the existing subway again at Isabella Street. The plan and profile of the proposal are presented in Exhibit 4.4.3.

The existing Yonge Subway would be converted to the Yonge northbound alignment similar to the Park Road Alignment Option.

The new station would be constructed similar to that of the Park Road Option with two standard size platforms, except that the west platform would be the loading platform and the east platform would be the unloading platform.

If this alignment were to cross over the Bloor-Danforth Subway, the new Bloor/Yonge West Entrance would be demolished along with the crosspassage connecting the 2 Bloor East with the 2 Bloor West shopping concourse.

If the new alignment crosses under the Bloor-Danforth Subway, the new Bloor/Yonge west entrance could be used for access to the new station. This arrangement is preferred because it has less impact on existing structures and passenger flow.

The preliminary cost estimate for the Yonge Street alignment of the Divided Platform Option which crosses under the Bloor-Danforth Subway is $173,000.000 in 1988 dollars excluding property acquisitions.

Feasibility

This option is located directly under Yonge Street where cut and cover construction can be used with no obstructions except utilities although there would be adverse effects to traffic on this major arterial road during construction.

There are some low level buildings on the east side of Yonge Street south of the Rosedale Station which are located on the alignment. These would require underpinning or demolition. Some small buildings on the east half of Yonge Street located between Hayden Street and Isabella Street would require similar measures for the construction of this new alignment. Further study would be necessary on the property requirements after the alignment has been refined.

The structural implications of crossing under the Bloor-Danforth Subway must be investigated further. A detailed geotechnical and structural study of the Yonge/Bloor area should be performed to look at all potential impacts to the caissons and foundations in the area, especially those of 2 Bloor East and 2 Bloor West.

The preferred profile curves down on a maximum grade into a portal south of Rosedale Station to avoid the building foundations along Yonge Street. Maximum grades are also required south of the new Bloor Station in order to come up from under the Bloor-Danforth Subway and meet up with the existing Yonge Subway. These operational factors are disadvantages which detract from the option.

In conclusion, it is anticipated that this option would be very expensive because of the costs of working around the towers at Yonge and Bloor and the potential property costs along Yonge Street. Also, there are maximum grades and a track relocation required with this option. Thus, the Divided Station-Proposal along Yonge Street is not a preferred option.

Evaluation of Bloor Station Options

Order of Magnitude estimates determined that the Centre Platform Option was the lowest cost option at $70,000,000 (1988 dollars). This cost was used in the evaluation which established the Centre Platform Option as the preferred proposal. Further study of this option resulted in the estimate being increased to $120,000,000. The other alternatives, having been rejected, were not developed further. Further study of these options would presumably result in similar increases in cost.

The advantages and disadvantages of the options presented for Bloor/Yonge Station are summarized in Exhibit 4.5.1.

The centre platform option is the preferred proposal. It accomplishes the 30 second dwell time objective with the lowest cost. Also, expensive downtown property acquisitions are minimized. Transferring passengers' walking distances are not increased significantly over the present station layout.

The option can be implemented with either wayside signalling or automatic train control technology.

The Series Platform Option is the alternative solution to obtain a 30 second dwell time. This solution is only cost effective if the ATC signalling system is selected for imple-

mentation. The station could not be operated until the ATC system is fully operational. This early expenditure of time and money for ATC technology is not feasible since the centre platform option can be implemented without it and would provide a significant improvement in service for a lower cost.

The preferred Divided Station Option is the Yonge St. Alignment because there is less interference with existing buildings than in the Park Rd. Alignment. The risk of damage to the subsurface structures at Yonge & Bloor and the higher construction costs give this option a lower preference.

The Bi-Level Option is too costly to construct because it is under the existing subway. Also, there is a risk of structural damage to the adjacent towers.