KEELE FINCH PLUS PLANNING STUDY

Final Transportation Study

February 2020

18129

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1 Introduction

The Keele Finch Plus Planning Study ('Keele Finch Plus' or KFP) aims to establish a planning framework to promote appropriate development around transit infrastructure improvements in the area surrounding Keele Street and Finch Avenue. Two major transit projects – the Finch West LRT line and the Toronto-York Spadina Subway Extension – intersect at the Keele Street and Finch Avenue intersection.

LEA was retained by the City of Toronto in Phase 2 of the Keele Finch Plus Planning Study to undertake a strategic multi-modal transportation assessment of the area, building on the Phase 1 transportation existing conditions. The strategic transportation assessment consisted of providing input into the development of three built form options, evaluating the options to arrive at a preferred concept and mobility system, and additional transportation analysis to refine the preferred concept and inform final recommendations. This memorandum summarizes the process and outcomes of the transportation assessment.

2 Built Form Options Input and Evaluation

LEA assisted in the creation of three built form options for the Keele Street and Finch Avenue West area. A transportation network was created to support each built-form option. The three options were developed building on the research, public input and technical assessment completed in Phase 1 of the study. LEA provided input into the three built form options, determining the advantages and disadvantages of each option with regard to transit, pedestrians, cyclists and automobiles. The three options were presented at an open house and public workshop in September 2017 and are available on the project website.

2.1 EVALUATION

Following the public consultation, LEA evaluated the three options from a transportation perspective to understand the impact of each option on the transportation network and identify transportation improvements needed from a capacity and connectivity perspective for all transportation modes. The analysis assumed a complete build-out of the options. The City provided LEA with Gross Floor Area (GFA) estimates for retail, office/commercial, industrial/warehousing and residential uses.

Table 2.1: ITE Land use GFA/Residential Statistics

Land Use Type	ITE Code	Scenarios (GFA /Residential Units)		
		Option 1: The Stations	Option 2: Nodes + Corridors	Option 3: Main Streets
Retail	820 (Shopping Centre)	69,921 m^2	84,824 m^2	93,395 m^2
Office/ Commercial	710 (General Office Building)	314,113 m^2	527,134 m^2	543,284 m^2
Industrial	150 (Warehousing)	33,610 m^2	76,825 m^2	145,426 m^2
Residential	221 (Mid-Rise Residential)	2,546 Units	2,509 Units	4,652 Units

LEA estimated the proportion of active transportation and transit trips and the coincident decline in the proportion of personal automobile trips for each option. The three options were then evaluated based on the following four criteria:

- Future Modal Share Improvements
- Automobile Performance (volume to capacity ratios)
- Transit Performance (volume to capacity ratios)
- Active Transportation (connectivity and area coverage)

2.1.1 Future Modal Share

Possible future mode splits were calculated for the built-form options using various transportation surveys and comparable rapid transit corridors. All options benefit from the higher-order transit in reducing vehicular trips. The share of active transportation trips were also relatively similar. Option 3 had the biggest gain in active trips which provided more retail and office uses within short walking and cycling distance with greater number of connections within the study area.

2.1.2 Automobile Performance

Possible future mode splits were calculated for the built-form options using various transportation surveys and comparable rapid transit corridors. All options benefit from the higher-order transit in reducing vehicular trips. The share of active transportation trips were also relatively similar. Option 3 had the biggest gain in active trips which provided more retail and office uses within short walking and cycling distance with greater number of connections within the study area.

A screenline analysis was completed to estimate the overall volume to capacity ratios for each of the built for options. Volume to capacity of ratios were developed for each quadrant bordered by Keele Street and Finch Avenue West, and any results over 1.0 demonstrate where the number of trips exceed the available theoretical road capacity. In all of the options, the northeast and southwest quadrants had a volume to capacity ratio below 1.0, and a ratio that exceeded 1.0 for inbound and outbound trips in northwest and southeast quadrants. Within the northwest quadrant Option 3 has the greatest amount of development but it also included the most new street connections. As a result, Option 3 noted the greatest improvement over Options 1 and 2. Additionally, a reduction in the amount of office GFA assumed for the southeast quadrant in Options 2 and 3 would assist in alleviating capacity constraints. **Appendix A1** includes the volume and capacity results for each option, including a sensitivity analysis for two street connections outside of the study are (a connection of Murray Ross to Niska Road and an east-west connection across the rail corridor at the east end of the study area.

Additional sensitivity analyses were conducted to identify if two other connections outside of the study area would provide significant benefit. These included an extension of Murray Ross to Niska Road and a new street connection across the rail corridor at the east end of the study area. Both extensions were found to have significant benefit and would require further study through an environmental assessment.

2.1.3 Transit Performance

The transit performance analysis reviewed the capacity of each transit route (bus and higher-order transit) within the study area. The analysis used the transit routes and total background ridership in the City's EMME model and forecasted the additional transit trips associated with each option. No new transit routes over and above those in the EMME model were assumed in the analysis.

Results indicated capacity constraints on some existing bus routes. To address these constraints, the TTC could reconfigure routes, increase bus frequency, or increase the number of articulated busses to meet demand. New routes could also assist in handling demand.

2.1.4 Active Transportation Performance

Street and pedestrian connectivity indices were used to assess active transportation performance. The Connectivity Index (CI) uses the "Links and Nodes" method and measures "street connectivity" for vehicles and an "active mode" index for active transportation users. In the Keele Finch Plus Study, the Calgary's draft Connectivity Handbook methodology is used to measure the CI. This provides a quantitative measure of optimal or desired numbers of connections and can be used to compare connectivity across different options. Connectivity indices were measured based on the number of links (streets or pathways) divided by the number of nodes (intersection of two or more links). A higher value means greater pedestrian connectivity and the value generally improves as the number of connections increase. Generally, a value greater than 1.4 is desirable for street connectivity and 1.6 for pedestrian connectivity.

Options 2 and 3 fell within the 'desirable' range for each of the indices. Option 1 showed improvements over a baseline future condition. However, its lack of streets and other connections resulted in the option not achieving desired connectivity. **Table 2.2** summarizes the results of the analysis.

Table 2.2: Street and Active Connectivity Indices

Scenario	Street Connectivity		Active Connectivity	
	Desired Zone	Estimated	Desired Zone	Estimated
Future Existing (Pre-development)	1.4-1.7	*1.38*	1.6-1.9	*1.43*
Option 1 – The Stations		1.5		*1.56*
Option 2 – Nodes + Corridors		1.51		1.61
Option 3 – Main Streets		1.55		1.64

Walkshed maps comparing the current condition to the street and connections in Option 3 were also developed to highlight the improvements additional connectivity the option has to/from key destinations (e.g. transit hubs) over the existing condition. The analysis used a 400m and 800m walking distance for comparison purposes. The walkshed maps for the existing and potential future networks are included in **Appendix A3**.

2.2 PREFERRED CONCEPT

Overall, the Options 2 and 3 were demonstrated to have greater multi-modal performance than Option 1. Recommendations provided to the City for the development of the preferred concept included:

Northeast quadrant:

- Protect for the extension of Tangiers Road north of The Pond Road to provide additional auto capacity and active connections north to the employment areas of Finch Avenue West; and
- Include new east-west active connections and laneways between Keele Street and the Tangiers extension.

Southeast quadrant:

- Reduce the amount of office GFA contemplated;
- Contemplate reduced lane widths for existing roads with wide pavements and add sidewalk facilities to both sides of the roads; and

- Include new street improvements, such as:
  - An extension of Tangiers Road south to LePage Court;
  - A new north-south street between Toro Road and Finch Avenue West, west of the rail corridor;
  - A new east-west street south of Finch Avenue West, between Keele Street and the new north-south street;
  - Include active transportation connections where possible to improve connections to the subway station and LRT stops; and
  - A crossing of the rail corridor (subject to further detailed study to determine the location and design of the street connection, an Environmental Assessment is recommended).

Northwest quadrant:

- Include new street improvements, such as:
  - providing a new east-west connection north of Finch Avenue West;
  - providing the extension of Fountainhead Road south to connect to Finch Avenue West (already approved through council);
  - connecting Murray Ross Parkway west to Niska Road across the river valley. While the sensitivity analysis assumed a two-lane cross-section for the connection, this connection is subject to further detailed study to determine the location and design of the street connection, an Environmental Assessment is recommended; and
- Include north-south active transportation connections to formalize desire lines across the Hydro corridor.

Southwest quadrant:

- Include local streets and other active transportation connections where possible to improve connections to the subway station and LRT stops; and
- Introduce new roads between existing culs-de-sac, to move towards a grid network and provide additional connectivity.

The development of street cross-sections should protect for future bus operations in response to the capacity constraints identified on some of the existing bus routes. The City incorporated the recommendations as part of developing a preferred concept for the area. The preferred concept is shown in Appendix A4.

3 Refining the Preferred Concept

Following the development of the preferred concept, LEA undertook additional analysis to refine the concept and to develop final recommendations. This included:

- developing preliminary functional street layouts and completing a complete street typology assessment;
- completing a safety review and active transportation analysis;
- identifying potential transportation demand measures which would support reducing vehicular demand; and
- incorporating findings from the analysis into a final preliminary functional layout and developing an implementation strategy.

3.1 PRELIMINARY FUNCTIONAL STREET LAYOUT AND COMPLETE STREET TYPOLOGIES ASSESSMENT

All existing and proposed streets and connections were listed and categorized within the City of Toronto's Complete Street Guidelines Street Typologies. This is provided in Appendix B, and was used to develop the initial preliminary functional street layout. The table identifies the proposed complete streets type, functional classification and the existing/planned and recommended right-of-way (ROW) for each link.

The functional street layout consisted of a preliminary design of the preferred street network, reflecting the proposed ROW widths, the composition of ROW and how the proposed streets and connections will be integrated with the existing road network. The details provided include lane configurations, active transportation facilities, location of existing and proposed crossings, transit routes/stops and existing heavy truck restrictions.

3.2 SAFETY REVIEW AND ACTIVE TRANSPORTATION ANALYSIS

Using the preliminary Functional Street Layout, LEA conducted an existing Safety Review and provided input to the city's active transportation forecasting model to identify pedestrian activity hotspot areas (areas with current higher than average collision rates and predicted high pedestrian volumes). These outputs were used to support the proposed street and connections and to refine the preliminary design of the street network.

3.2.1 Safety Review

The safety review for the preferred transportation network considered observed existing safety concerns, collision data provided by the City and potential conflict zones proposed within new connections. This review provided the input for a hotspot analysis of the study area and demonstrated where there is a high concentration of potential conflicts.

3.2.2 Active Transportation

To determine the areas of potential high active transportation demand, LEA produced future modal share and parcel active transportation demand forecasts. These were used to update the Active Mobility model by the City, which distributed trips to the proposed road network. LEA generated hot spot maps to determine areas of high pedestrian and cyclist demand and overlaid these maps with the collision hotspot map.

3.2.3 Results

The hotspot maps for collisions and active transportation, as well as the general safety review of the study area, identified several areas of potential conflict. As there is significant overlap in the hotspot areas, in order to safely and comfortably accommodate future active transportation demand, several measures are recommended.

These locations were considered for future refinement and modifications in the functional layout, including new sidewalks, traffic calming measures, and new pedestrian crossing opportunities. The detail on Safety Review and Active Transportation hotspot analysis are included in **Appendix F**.

4 Transportation Demand Measures

In support of the preferred built form concept, LEA identified Transportation Demand Management (TDM) measures and potential locations to implement infrastructure and programs to influence and facilitate more sustainable travel choices. The TDM memo and accompanying map are included in **Appendix G**.

5 Final Functional Street Layout and Implementation Strategy

The final Functional Street Layout was prepared to incorporate the safety and active transportation review and to incorporate comments received from the City and the TTC. The final plans are included in **Appendix C (Final Street Network Layout), Appendix D (Typical Cross-Sections)** and **Appendix E (Street Typology Map).**

5.1 IMPLEMENTATION PLAN AND ORDER OF MAGNITUDE COSTS

The potential implementation plan for the proposed street network was developed considering the infrastructure need, priority of the project to accommodate demand and connectivity, and the feasibility of the project. Potential methods of implementation include City projects such as road reconstruction or expropriation, Environmental Assessments, and through redevelopment of the area. City led projects were identified by the type and approximate order of magnitude costs. The implementation approach, order of magnitude costs and potential further study is identified for each proposed street or connection is identified in the Preferred Street Network Table in **Appendix B**. The calculation for the order of magnitude costs are included in **Appendix H**.

6 Conclusions

This memorandum summarizes the transportation components of the Keele Finch Plus project, and tasks undertaken to form the Preferred Street Network. The network represents a more connected, transit-supportive street network which accommodates all users and provides access to accommodate a growing Keele-Finch neighbourhood.