TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON DECEMBER 12, 2016**
FROM:	**KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**DUNDAS PLACE ENVIRONMENTAL STUDY REPORT**

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services, City Engineer, the following actions **BE TAKEN** with respect to the Dundas Place Environmental Assessment:

a) The Environmental Study Report **BE ACCEPTED**;

b) A Notice of Completion for the project **BE FILED** with the Municipal Clerk; and,

c) The Environmental Study Report **BE PLACED** on public record for a 30-day review period.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- Civic Works Committee – May 14, 2012 – Dundas Street Improvements, Formulating an Implementation Plan
- Civic Works Committee – August 25, 2014 – Dundas Flexible Street Scoping Study, Consulting Engineer Assignment Increase
- Planning and Environment Committee – February 2, 2015 - Our Move Forward: London's Downtown Plan
- Civic Works Committee – February 3, 2015 – Dundas Flexible Street Scoping Study Approval
- Planning and Environment Committee – April 7, 2015 – Our Move Forward: London's Downtown Plan
- Civic Works Committee – June 2, 2015 – Appointment of Consulting Engineer Dundas Place Environmental Assessment
- Strategic Priorities and Policy Committee – January 28, 2016 – Downtown Infrastructure Planning and Coordination
- Civic Works Committee – October 4, 2016 – Infrastructure Canada Phase One Investments Public Transit Infrastructure Fund

COUNCIL'S 2015-19 STRATEGIC PLAN

Dundas Place is identified in the 2015-19 Strategic Plan for the City of London under the "Growing Our Economy" Strategic Area of Focus. Municipal Council has recognized the importance of urban regeneration. Dundas Place will invest in London's downtown as the heart of our city by creating a flexible street for shopping, leisure, civic activities, and celebrations.

BACKGROUND

Purpose

This report provides Committee and Council with an overview of My Dundas, the Municipal Class Environmental Assessment (EA) for the Dundas Place Project and seeks approval to finalize the study. The completed Environmental Study Report (ESR) documents the EA process undertaken.

My Dundas aligns with the focus and goals set by Council through the City of London Strategic Plan, Downtown Plan, and The London Plan. The purpose of this EA is to satisfy the requirements of the Environmental Assessment Act by providing a comprehensive, environmentally sound planning process with public participation. The EA has undertaken extensive public engagement and dialogue between many stakeholders and the public to inform the design in achieving the following goal approved by Council in Our Move Forward: London's Downtown Plan:

- Turning Dundas Street into a flexible street between Wellington Street and the Thames River.

The My Dundas EA has triggered actions on these related initiatives also identified in London's Downtown Plan:

- Ensuring all public realm works and planning applications support Dundas Street as the city's premier destination street;
- Relocating bus routes from Dundas Street to create a more flexible public space and promote pedestrian activity;
- Animating Dundas Street with a variety of programmed events and activities and,
- Developing a downtown maintenance program that sets Dundas Street as the highest standard in the city.

DISCUSSION

Project Description

As part of the vision approved by Council in Our Move Forward, The Downtown Plan, the vision laid out for downtown includes transforming Dundas Street into the most exciting street in London, offering a multitude of experiences along the five blocks from the Forks of the Thames to Wellington Street.

Dillon Consulting with subconsultant Gehl Associates were appointed to undertake the project EA. The goal of the EA was to identify the streetscape options, infrastructure alignments and preliminary construction project phasing, as initially envisioned in the Dundas Place Scoping Study. The programming and operations required for Dundas Place were also a focus of initial stakeholder discussions that guided the concept development and will instruct the detail

design phase. The project is intended to transform Dundas Street between the Forks of the Thames and Wellington Street from an ordinary public right-of-way into a destination. Dundas Place will be a flexible street that allows pedestrians, cyclists and motorist to effectively share the same space while offering the opportunity to serve different programmed functions throughout the year.

Observational studies were conducted with the assistance of student volunteers enrolled in GIS and Urban Planning at Fanshawe College. The studies involved observations on Dundas Street, Richmond Row and Wortley Village to characterize and compare how public life looks on Dundas Street. The findings suggest that Dundas Street currently displays the characteristics of a Financial District with periodic special events. Pedestrian and cyclist volumes are typically highest during the middle of weekdays.

Input was sought from the public on how flexible Dundas Place should be. It was determined that Dundas Place should be as flexible as possible for all users with fixed and built-in elements minimized to the extent possible. Providing a wide pedestrian realm with a flush paving surface is critical to maximizing the flexibility of the street when it is closed to traffic. Maximizing the flexibility will also mean limiting fixed features such as bike lanes and transit facilities on Dundas. These features can be located on adjacent and connector streets to ensure Dundas Place is well serviced while also maximizing flexibility for multiple purposes. Dundas Place will be designed in a way that aligns with the planned flexibility of the street by allowing vehicles and parking to utilize the street in a way that can continue to be flexible and evolve over time.

The EA was carried out in a way that aimed to create a focal point and destination place within the downtown that will be accessible to all users and serve as a stage for programmed activities such as special functions, festivals, and events, as well as day-to-day activities. The transformation of Dundas Street will encourage business and development opportunities and will forge a connection between the Forks of the Thames River and the life of the City.

Transforming Dundas Street into Dundas Place requires many coordinated actions as each block presents its own set of opportunities and constraints. The EA identified a framework of Character Block Areas and Theming Blocks that will guide and focus urban design decisions. Feedback was gathered from the public on what respondents loved about each segment of the study area, the current uses of each segment and the desired uses of each segment. Block theming will provide a unique aesthetic and tactile experience for each space. Many of the theming design elements will be common to the five blocks, linking and unifying the space, while others will be used to define and set apart key areas. The design will incorporate both the character and theming, and is intended to be flexible and adaptable throughout Dundas Place.

This project involved extensive consultation with downtown stakeholders as well as potential future users of this important destination. The EA considered both the functional design of the street from an infrastructure perspective, as well as the urban design qualities of the street that are intended to satisfy the goals of London's Downtown Plan.

Our Move Forward: London's Downtown Plan

Council adopted Our Move Forward: London's Downtown Plan on April 14, 2015. The development of the Downtown Plan involved public engagement that resulted in identification of ten transformational projects that will create a downtown that aligns with The London Plan's vision for downtown. The Dundas Place Flexible Street was

identified as the first of these ten transformational projects. Through the stakeholder engagement, it became clear that the Dundas Place project was a top priority and a clear next step in the revitalization of downtown.

The Dundas Place ESR being presented for acceptance meets the goals adopted by Council in the Downtown Plan. It progresses the plan's first strategic direction which is to make Dundas Street the most exciting place in London.

Public Consultation

Due to the nature of the project, extensive public and agency consultation went beyond the requirements of the Municipal Class EA process. It was recognized that the success of the project would depend on a comprehensive public and agency engagement program. The project team used many avenues to reach out to Londoners, including; interactive consultation events, a project website www.MyDundas.ca, social media campaigns, meetings with agencies and businesses, as well as First Nations consultation. Downtown London was an important partner in many of these activities.

The study commencement event was held on Saturday, September 26, 2015 on Dundas Street, between Talbot Street and Richmond Street. The event removed vehicular traffic from Dundas Street and created a festival atmosphere with live music, food trucks, vendors, artisans, and play activities for families. Attendance was outstanding with the street packed with people. This event allowed city staff and the project consultants to hear perspectives from many Londoners, and to get first-hand experience in the challenges and opportunities related to set-up and management of Dundas Street when used for a significant event in a pedestrian-only situation.

The "Fix to Flex" consultation event was held on January 15, 2016 at the London Music Hall. The event focused on asking the public how flexible Dundas Place should be. A number of streetscape elements and several alternative cross sections were presented for discussion. Two business workshops were also held to seek local business input on the existing conditions and desired vision for Dundas Place. Input on the construction implementation was also discussed.

The "Sights and Sounds of Dundas Place" consultation event was held on June 22, 2016 with the assistance of Fanshawe College. At this event, the preferred design concept plans and artistic renderings of the future space were presented for input. The event was held in an indoor/outdoor venue in Market Lane and the Black Box Theater of Fanshawe College Centre for Digital and Performing Arts. The overall response was favourable to the preferred design concepts.

In addition to the above highlighted consultation events, online content solicited input from a wide range of Londoners. Targeted consultation events were also held to gather feedback from local business, agencies, and First Nations.

Traffic and Transit Strategy

This assignment also included a traffic and transit study that assessed the impacts of the proposed changes to Dundas Place and reviewed the overall functionality of the downtown streets considering the influences of the currently identified downtown projects. The results of this analysis were reported to the Strategic Priorities and Policy Committee on January 28, 2016. A key component was the designation of the Kensington Bridge to a transit only facility (local and rapid transit) and the conversion of the Queen Street Bridge to a two-way four-lane facility. The design of these river crossings will be further refined in the Shift Rapid Transit EA.

Rapid Transit must be incorporated into the Dundas Place design for the block from Thames River to Ridout Street, as well as for the Clarence Street crossing of Dundas Place. The study also highlighted the importance of east-west connectivity in the downtown area and recognized the important of peak hour vehicular connectivity on Dundas Street.

The My Dundas EA recommendations envision a street that continues to serve vehicular traffic through a unique environment that encourages respect between drivers and other road users. Vehicular throughput will be restricted during programmed events; however, the project does not envision a pedestrian mall that is continually closed to traffic. Keeping the street open to vehicular traffic is supported by the observational studies of the street that identify pedestrian volumes that are not high and consistent enough to support a pedestrian mall concept. The roadway also provides legal access to many properties, facilities service deliveries/para transit service and municipal servicing requirements.

The EA process determined that, beyond the provisions for Rapid Transit, the preferred alternative is to limit transit facilities on Dundas Street. Transit services can be located on parallel and connector streets (Queen Street and King Street) to ensure Dundas Place is well serviced. Limiting transit facilities on Dundas will maximize the flexibility of Dundas Place. Regular closures of the street can be achieved without re-routing buses and inconveniencing regular transit riders. This also eliminates the need for fixed transit facilities such as bus bays, furthering the flexible vision. Administration has worked with London Transit Commission as directed by Council on route reconfigurations in coordination with Shift Rapid Transit, to move the existing bus routes on the Downtown core section of Dundas Street by September 2017.

Alternative Cross-Sections

In accordance with the Environmental Assessment Act, the following alternative cross-sections were development for Dundas Place:

- Two-way Street – Flexible Street with Pedestrian Priority (Symmetrical Cross-section)
- Two-way Street – Flexible Street Microclimate (Asymmetrical Cross-section)
- Two-way Street – Widened Pedestrian Realm
- One-way Street – Flexible Street Microclimate (Asymmetrical Cross-section)
- One-way Street – Pedestrian/Bike Priority
- Do nothing / maintain existing conditions

The above six alternatives were assessed based on a number of factors, including the compatibility of the alternative with the preferred flexibility framework, compatibility of the alternative with underground utilities and infrastructure, and adaptability of the alternative to support the long term evolution of the business environment on Dundas.

The two-way street – flexible street pedestrian priority (symmetrical cross-section) alternative was identified as the preferred alternative.

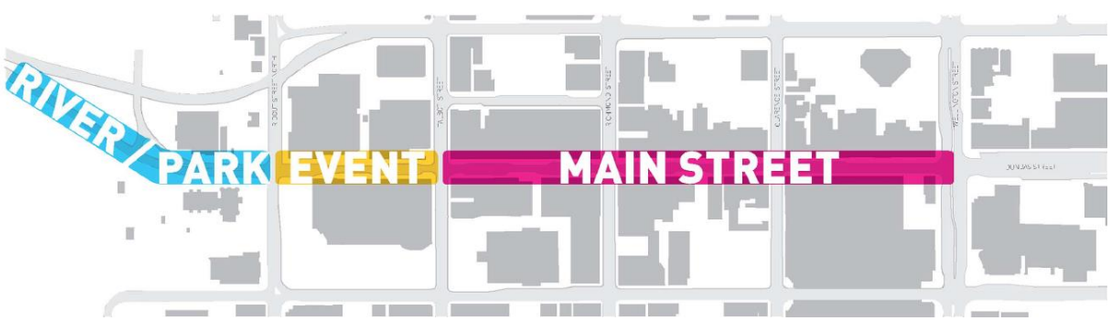
Preferred Alternative for Dundas Place

The ESR recommends a two-way flexible street with a symmetrical cross-section. Construction of the street will utilize unique high quality materials such as unit pavers, movable bollards and street furniture to define the character of the area. The ESR goes on to recommend five unique Theming Blocks within three distinct Character Areas that stretch between Kensington Bridge and Wellington Street.

The character block areas include the Main Street, Event Block and River/Park Block. Main Street includes the three blocks, from Talbot Street to Wellington Street, with the highest concentration of ground-floor uses that will transform Dundas into a vibrant everyday destination. Main Street will have a symmetrical cross-section to create varied and comfortable gathering places that add interest.

The Event Block will extend from Ridout Street to Talbot Street and will be animated by event programming and Budweiser Gardens. Both the Event Block and Main Street will have no fixed local transit routes on Dundas Street. The Main Street and Event Block areas will include flat surfaces and creative lane delineation without curbs to better facilitate programmed events.

The River/Park Block will connect the river and park network with downtown. This block will include a transitway, as part of Shift Rapid Transit.



Character Block Areas

The theming blocks build on the character block areas and include the Library Block, Marquee Block, Kingsmill Block, Event Block and Park Block. Brief descriptions for each block are provided below. The images associated with each block are available in the ESR Executive Summary attached in Appendix A and also available on www.MyDundas.ca.

Library Block - Clarence Street to Wellington Street

The Library Block is part of the Main Street Character Area and is designed to accommodate an outdoor extension of the Library program area and allows for gathering space for different users and nearby businesses. The eastern edge also provides a formal gateway into Dundas Place.

Marquee Block – Richmond Street to Clarence Street

The Marquee Block is part of the Main Street Character Area and is intended to encourage music and the arts. The Art Exchange area builds on the London Music Hall and the Art Project and is a gathering space that intended to provide an outdoor space for public art.

Kingsmill Block – Talbot Street to Richmond Street

The Kingsmill Block is part of the Main Street Character Area and will provide informal outdoor space for Fanshawe College, Market Lane, and Covent Garden Market. This block will provide strong visual and physical connectivity to Fanshawe College and promote a balance between indoor and outdoor activities.

Event Block – Ridout Street to Talbot Street

The Event Block is part of the Event Block Character Area and is intended to create an outdoor room which extends the programming of Budweiser Gardens. The design should activate the space throughout the year and be amenable to large crowds that gather for events. The streetscape along the edge of Budweiser Gardens will be open, with minimal fixed elements, allowing pedestrians to flow freely.

Park Block – Thames River to Ridout Street

The Park Block is part of the River/Park Block Character Area and incorporates a wide promenade and Rapid Transit to link the existing parks with Dundas Place and new destinations surrounding Museum London. The area is intended to integrate with the Back to the River Initiative and One River EA.

On-Street Parking Strategy

The allocation of right-of-way space is at a premium. There is a demonstrated desire for larger people-gathering spaces to enhance commerce and entertainment opportunities. These desires need to be reconciled. A benefit of the flexible street is that it can enable the allocation of parking on the basis of demand. Moveable bollards can toggle priority between pedestrian and vehicular uses on schedules that vary from hourly to seasonal.

The project contemplates a reduction in on-street parking spaces in the Dundas Place segment of Dundas Street from 51 to 24. The number of accessible spaces should not be affected. The recommended conceptual design accommodates a parking/loading zone on each side in each block between Wellington Street and Ridout Street. The scheduling to optimize these spaces may require businesses to coordinate Dundas Street deliveries according to set schedules. The details of these schedules will be developed in the detail design phase with further business input and can evolve over time based on the demands on the facility. This kind of scheduling is one example of the many aspects of permanent dedicated management responsibilities, coordinated across traditional functional areas that will be necessary to optimize the ongoing success of Dundas Place.

Para-transit stops at the library are also accommodated in the design. Bicycle parking will also be incorporated into the project at strategic locations.

The influences of this project are being incorporated into the solutions currently under development in the Downtown Parking Strategy.

Programming and Activation Strategy

The activation of Dundas Place through regular and frequent programming is an important component of the ongoing success of Dundas Place. Efficient and effective marketing, programming, approvals and business owner liaison is required for this unique space. The development of organizational concept alternatives for the future management of the facility is underway as directed in a Council resolution dated September 13, 2016. This exploration of options includes consideration of scope, governance and cost and will be the subject of a future committee report.

The input of potential facility managers to the design of the project is important. The concepts identified in the EA are informed by initial consultation with event organizers and programmers. The future design phase will incorporate more consultation to ensure the design of a space that is functional for the kind of events that are anticipated.

Pavement Snowmelt System Assessment

A pavement snow melt system was investigated for potential implementation in the project and an assessment is provided in Appendix B for information. The system would provide a unique and superior level of service in the winter months, improve accessibility and functionality, enhance the project as a catalyst for urban regeneration and help establish Dundas Place as a preeminent gathering space in London and beyond.

The capital costs associated with the snowmelt system are estimated at $4,200,000 and $400,000 in Phase 1 and 2 respectively. The snowmelt costs were not affordable within the project budget and are therefore not recommended. The system would also incur net additional operating costs of $75,000 to $130,000. While the system would provide significant benefits, it would trigger an estimated 4 to 5% increase in corporate energy levels and a 6 to 8% increase in greenhouse gas emissions that would likely incur additional annual costs of at least $70,000 to $90,000 to offset.

IMPLEMENTATION

Construction Schedule

Assuming EA approval, the project is on schedule for construction of the first project phase in 2018 and 2019 as identified in previous documents. The construction scheduling considers social considerations and envisions limiting the length of street closures to vehicular traffic. However, this does increase construction costs and prolongs the project schedule. London Hydro has significant work required in the intersections and traffic impacts to north-south routes will require further scrutiny to minimize social impacts.

The project involves a large London Hydro component and the construction duration, speed and phasing is significantly dictated by this work. Construction of the first phase is anticipated to begin in the west half, subject to further review with London Hydro and other service partners. Beginning with the west half of the project prioritizes the work in front of the Fanshawe College Kingsmills Building which is scheduled to become fully operational in September 2018. Completion of the construction in front of Fanshawe College's downtown campus will be prioritized to achieve as much as possible prior to the opening date of the new building and subject to the staging required for servicing and utilities.

The project was recently identified in the applications for Infrastructure Canada funding. The Dundas Place project application depends upon an extension of the program eligible cost window beyond March 2018. If accepted, the eligible cost deadline will influence the manner in which the project is implemented. A potential eligible cost deadline extension of one year to March 2019 would encompass the first year of construction. In this scenario, the Dundas Place construction activities and expenditures prior to March 2019 would be maximized to benefit from the funding assistance. The first year of construction would strive to accomplish as much as possible to maximize the federal funding contribution. Longer multiple block vehicular traffic restrictions would be considered to maximize the work accomplished.

The Park Block between Ridout Street and the Thames River will be constructed with the future Rapid Transit works. This will avoid throw-away costs, avoid disturbance to the premium Dundas Place features during Rapid Transit construction and create cost efficiencies between the two projects. It also creates an opportunity to coordinate implementation of Ribbon of the Thames features with these two projects.

Construction Mitigation

The EA undertook numerous outreach efforts to communicate with property owners and business operators on Dundas Street. In addition to the design and operation of the project, construction impacts were a topic of discussion.

Given the narrow 20 m right-of-way width and the large scope of construction activities, it will be necessary to close the street to vehicular traffic. Pedestrian access will be maintained and the construction will include specific pedestrian mobility measures. Communications and outreach to raise awareness about the project and promoting the local businesses environment will be important. Downtown London has committed to being a key partner in communications and promotion to mitigate the impacts of the project.

FINANCIAL CONSIDERATIONS

Capital Cost Estimates

The preliminary estimated capital investments associated with this project are as follows:

Phase 1: Ridout Street to Wellington Street

Roadworks	$5,670,000
Streetscape/Urban Design	$2,100,000
City Underground Infrastructure	$1,510,000
City Electrical	$1,600,000
Contingency (20%)	$2,180,000
Engineering and Consulting (20%)	$2,180,000
Total	**$15,240,000**

Phase 2: Thames River to Ridout Street *

Roadworks	$1,120,000
Streetscape/Urban Design	$380,000
City Underground Infrastructure	$135,000
City Electrical	$170,000
Contingency (20%)	$360,000
Engineering and Consulting (20%)	$360,000
Total	**$2,525,000**

** This cost is preliminary considering future development of the Shift and Back to the River projects. The cost assumes that Phase 2 will be implemented with Shift Rapid Transit and the travelled lanes will be allocated to the Rapid Transit budget.*

For comparison purposes, the estimated cost of a basic lifecycle renewal reconstruction of the Phase 1 limits of Dundas Place as an ordinary street not in line with the Downtown Plan vision is $7,900,000, or slightly more than half of the above costs. The additional costs to create Dundas Place are associated with items such as:

- unit paver pavement systems instead of asphalt and concrete;
- moveable bollards to create an adaptable street environment;
- trench drains instead of curb and gutter with catch basins;
- additional trees;
- custom streetlighting; and,
- theming items and unique street furniture.

The Phase 1 capital costs are within the current four-year budget capital account.

The EA envisions a much more cohesive connection to the Thames River as envisioned in Our Move Forward, London's Downtown Plan that was adopted in April 2015 and also highlighted in the "Ribbon of the Thames" winning submission to the Back to the River competition. The One River EA will further define the scope of improvements in the block that connects Dundas Place to the Thames River. The EA identifies a future Phase 2 investment of $2,525,000 to complete this in coordination with other initiatives. This estimate is subject to refinement as the scope and implementation of improvements in this area become more informed.

The snowmelt system is a stand-alone component of the project that was raised by internal and external stakeholders but was not previously envisioned in the capital budget. As identified in the previous section and Appendix B, the City capital cost of implementing this system between Ridout Street and Wellington Street would be $4,200,000. A Phase 2 extension to the Thames River would require an additional investment of $400,000. Operating costs and greenhouse gas emissions are also significant. Therefore a high level of snow removal remains preferred.

London Hydro has a large scope of upgrade works necessary on the Dundas Place corridor. This project provides a synergistic opportunity to reduce downtown social impacts, project costs for London Hydro and City infrastructure degradation. London Hydro is partnering with the City to implement their improvements under the same contract. The cost of utility upgrades and the related portion of contractual overhead costs such as traffic control is the responsibility of the utility companies. London Hydro has estimated that the hydro works planned under this project have a value in the order of $9 to $10 Million.

Preliminary Operating Cost Estimates

The vision of creating an attractive destination can only be fulfilled with an enhanced operating regime congruent with the place. The operational levels of service associated with Dundas Place need to be considered to ensure the success of this important initiative.

Currently, the operating activities on Dundas Street are consistent with stipulated levels of service for the downtown and the demands of the operating environment. Activities include plowing, sweeping, localized steam cleaning and more frequent waste management. Downtown London also contributes with some litter collection and planter maintenance. The current City annual operating costs associated with roads, horticulture and waste management within the project limit are approximately $250,000.

With the implementation of Dundas Place, frequencies will need to be increased and activities will need to be expanded. For example, waste management frequencies may be increased and equipment may be required to operate aesthetically pleasing waste systems. Some operational activities will be driven by usage and will evolve over time. It is estimated that the enhanced levels of service to be developed for Dundas Place will increase these costs by $600,000 to a total of $850,000. The previous project business case flagged the issue of increased operating costs with an initial preliminary placeholder value of $150,000, meaning $400,000 of the future $850,000 is available in existing budgets and forecasts.

The comparison of current and estimated future operating costs are summarized below. These costs are preliminary and are subject to establishment of operating protocols and levels of service. These costs will be better defined and communicated to Council prior to construction.

Annual Operating Costs	**Dundas Street Current Condition**	**Dundas Place Future Condition**
	$250,000	$850,000 *

* $400,000 currently exists in existing City budgets and forecasts

The development and review of organizational concept alternatives for the future management of the facility that would execute items such as marketing, programming, approvals, business owner liaison, etc. is underway. The expenditures associated with

this function are not included in the above but may overlap depending upon the scope of the new service delivery model. The current budget forecast includes an allocation of $100,000. Dundas Place revenue generation may be expected to partially offset increased costs, but significant annual investment into programming and activation may be required depending on the model selected, the nature and frequency of events and other desired soft services. The report back on the organizational concepts will better refine scope and timing of funds.

CONCLUSION

Improvements to the Dundas Street corridor from Wellington Street to the Thames River are necessary to fulfill the vision of making Dundas Place London's most exiting street. This project is identified as the first transformational project in Our Move Forward: London's Downtown Plan. To fulfill the requirements of the provincial Environmental Assessment Act, a Municipal Class EA was undertaken. The ESR is ready for final public review.

The EA leveraged unique engagement events and was prepared with input from people across London and from relevant stakeholder groups, including London Transit, external agencies, utilities, emergency service providers, Downtown London, as well as First Nations and property owners in proximity to the study.

The EA recommends three distinct Characters Areas that will connect five unique Theming Blocks between the Forks of the Thames and Wellington Street. Dundas Place will connect the river and park network to downtown and create areas for event programming and gathering spaces. Design features will indicate to all road users that Dundas Place is a unique inviting environment.

The EA further evaluated opportunities and mitigation measures for the project and identifies the following phasing and capital cost estimates for the project assuming EA approval. The project has been included in an application for Infrastructure Canada funding.

Phase	Limits	Construction Schedule	Cost Estimate*
1	Wellington Street to Ridout Street	2018 & 2019	$15,240,000
2	Thames River to Ridout Street	With Shift Rapid Transit	$2,525,000

* Costs include watermain account contributions. Costs do not include London Hydro and other private utility upgrade costs. Phase 2 costs assume coordination with Shift Rapid Transit and are subject to refinement based on the Shift and One River environmental assessments.

Higher operating levels of service will also be required to achieve a return on investment. Preliminary estimates of operating costs associated with the Dundas Place levels of service will result in an increase to the annual operating costs in the order of $600,000. These costs will be better defined prior to construction as levels of service and delivery frameworks are established. Implementation of a snowmelt system would provide a higher level of service and would increase this cost further.

Initial facility management assessments are underway to realize the full potential of the project. It is recognized that the management of Dundas Place will require a focused entity for activities such as marketing and programming. This will involve consideration of operations and maintenance, impacts on downtown's growing residential community, business operations on and off Dundas Place, and consequences for the wider downtown and circulation through it.

Pending Council approval, a Notice of Completion will be filed, and the ESR will be placed on public record for a 30 day review period. Stakeholders and the public are encouraged to provide input and comments regarding the study during this time period. Should the public and stakeholders feel that issues have not been adequately addressed, they may provide written notification within the 30-day review period to the Minister of the Environment requesting a Part II Order. If no Part II Order requests are received, the project will be in an immediate position to move forward to the detailed design and construction stages in accordance with the recommendations of the study.

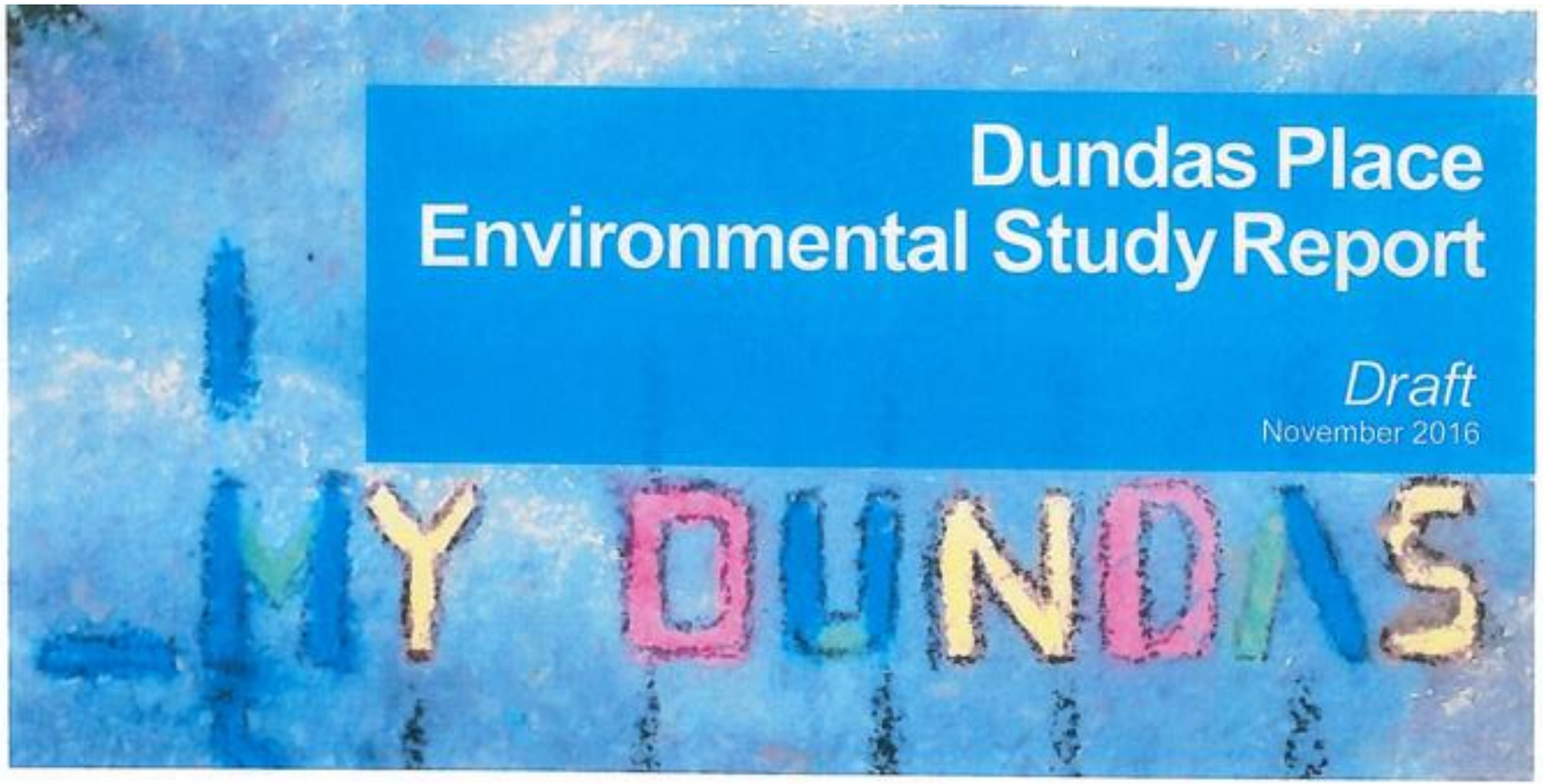
Acknowledgements

This report was prepared with assistance from Ardian Spahiu P.Eng., Transportation Design Engineer in the Transportation Planning & Design Division and Jim Yanchula Manager Urban Regeneration in the Planning Department.

PREPARED BY:	**REVIEWED AND CONCURRED BY:**
DOUG MACRAE, P. ENG. **DIVISION MANAGER** **TRANSPORTATION PLANNING & DESIGN**	**EDWARD SOLDO, P. ENG.** **DIRECTOR, ROADS AND TRANSPORTATION**
RECOMMENDED BY:	
KELLY SCHERR, P.ENG., MBA, FEC **MANAGING DIRECTOR** **ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**	

Attach: Appendix A – Environmental Study Report Executive Summary
Appendix B – Pavement Snowmelt System Assessment

c: John Fleming, Managing Director, Planning and City Planner
Bill Coxhead, Managing Director Parks and Recreation, City of London
Lynne Livingstone, Managing Director, Neighbourhood, Children and Fire Services
Jeff Matthews, P.Eng., Dillon Consulting
Janette MacDonald, CEO and General Manager, Downtown London
Sean Russell, P.Eng., Plant Manager, London District Energy
Jagoda Borovickic, P.Eng., Manager of Engineering, London Hydro



Dundas Place Environmental Study Report

Draft

November 2016

MY DUNDAS

London CANADA

Gehl Studio San Francisco

DILLON CONSULTING

Executive Summary

Introduction

As early as the 1800's Dundas Street was the City of London's thriving main street – the place to see and be seen. For many years, Dundas Street, from the Thames River to Wellington Street was the economic, cultural and institutional heart of the City. Similar to many other cities in North America, over the last several decades there has been a move away from the downtown core to the periphery of the City, by both businesses and residents.

In 2015 the City completed a new plan for the downtown, Our Move Forward: London's Downtown Plan. The Plan focuses on improvements to the public realm and the potential to leverage private investment value. Transforming the first five blocks of Dundas Street, from the Thames River to Wellington Street, was identified as the number one transformational project in the Plan.

The City of London retained Dillon Consulting Limited to undertake the Dundas Place Flexible Street Class Environmental Assessment (EA) study in 2015 as the next step towards implementing the vision of the Downtown Plan. The study was completed following the Municipal Class EA process (2000, as amended) for a Schedule C project.

This report documents the decision-making process leading to the selection of the preferred Concept Plan for Dundas Place.

Three public engagement events were held for the study, along with a multi-channel on-line campaign that included a project-specific website, on-line survey that received over 400 hundred responses and social media accounts. The transformation of Dundas Street into Dundas Place has received positive feedback from many individuals and is strongly supported by the Downtown London Business Improvement Association (Downtown London).

What is a Flexible Street?

A flexible street is a space shared by pedestrians, cyclists, and motorists. A flexible street can serve different functions for the community depending on the time of day, week or year.

Compared to a traditional street, a flexible street prioritizes pedestrian activities over vehicles. The street is designed to accommodate vehicles and Dundas Street will remain open to two-way traffic for a majority of the time. There will be times one or multiple blocks will be closed to traffic.

Environmental Assessment Focus

Dundas Place is both a physical space and a temporal concept that will make the five blocks of Dundas Street the civic heart and favourite place of Londoners. Dundas Place will have a high quality of design as the "premier" street in London.

This EA is about defining key features which create a heightened quality of public space, and reinforces a unique "atmosphere" of Dundas Place. This report provides overall guidance to the design approach for Dundas Place, with the specifics to be confirmed during the detailed design phase. Many of the streetscape elements along Dundas will be different from traditional materials, such as the type of lighting, paving material and even the colour and pattern of the pavement. Dundas Place will also include public art, seating areas, "green" and active components. All of these elements are important to creating a heightened sense of place and guiding principles to the implementation are outlined in this report.

Dundas Place will be unique and have its own defined character. The precedent images used throughout the report are intended to illustrate concepts. The images are not intended to show what Dundas Place will look like in the future. When built, Dundas Place will evoke the overall sense of place outlined in Our Move Forward and refined through this study. The specific streetscape elements, such as the type and spacing of bollards, lighting, paving material, location of public art, location and spacing of "green" and public seating will be confirmed during the detailed design phase.

Major influencing factors to the design are focused on the need to improve the public space throughout the corridor, while having regard for the need to update servicing and underground infrastructure. Dundas is a very old street, with a complex system of underground infrastructure. Some of the infrastructure and utilities are old and need to be upgraded, while some are in relatively good condition and still have many years of life remaining. A key component of this study was to review the underground infrastructure and determine what needs to be upgraded and/or moved and determine how above and below ground elements will influence each other.

It is important to note the physical transformation is only one of three key elements to the success of Dundas Place. A robust event programming and management strategy is equally important to the transformation success, as is active involvement by the businesses along Dundas and the surrounding downtown.

Extensive and valuable input was received from many different stakeholders through the study. Feedback was provided on many different components of Dundas Place, including the function and form of the street, how it should operate in the future, types of events that should be held, the types of businesses that should be located along the street, and many other aspects. The information was used to inform the EA process and decisions, where applicable. It was also collected and documented for input to the future detailed design and operation phases.

Traditionally, a Schedule C municipal infrastructure project progresses through the Class EA process and the outcome is a preferred design concept. The concept is developed to a preliminary design level of detail and then proceeds to the detailed design stage and construction. The constructed product typically looks similar to the EA design, since traditional streetscape elements and materials are used, such as an asphalt roadway, concrete sidewalks, stormwater catch basins, and standard lighting fixtures.

The Dundas Place Flexible Street EA took a different approach. Dundas Place will look and feel different than a traditional street. The alternative solutions phase (Phase 2 of the Class EA) assessed how flexible the street should be, and for whom is it flexible. Pedestrians, cyclists, buses, drivers, vendors, residents and performers are just some of the stakeholders for which flexibility in the use of the street are important. A Fixed to Flexible framework was developed to determine how flexible the space should be, with a traditional street on the "fixed" end of the spectrum and an open plaza space on the "flexible" end. The framework focussed on the physical design and transportation elements that will impact the transformation of Dundas Street into Dundas Place.

Once the level of flexibility was confirmed, alternative cross-sections were developed and evaluated, an approach to specific streetscape elements was developed and an overall concept plan was prepared (Phase 3 of the Class EA).

Problem/Opportunity

The City of London is planning to redesign the first five block of Dundas Street, from Wellington Street to the Thames River, so the street can also serve as a people-oriented destination called "Dundas Place". Transforming Dundas Street into a seamless flexible street is the first project in Our Move Forward: London's Downtown Plan.

While the five blocks will still allow vehicle access, Dundas Place will provide an exceptional pedestrian experience. It is intended to be a public amenity for those living in the downtown neighbourhood and provide a space well-equipped to routinely host programmed events to attract visitors to the downtown throughout the year.

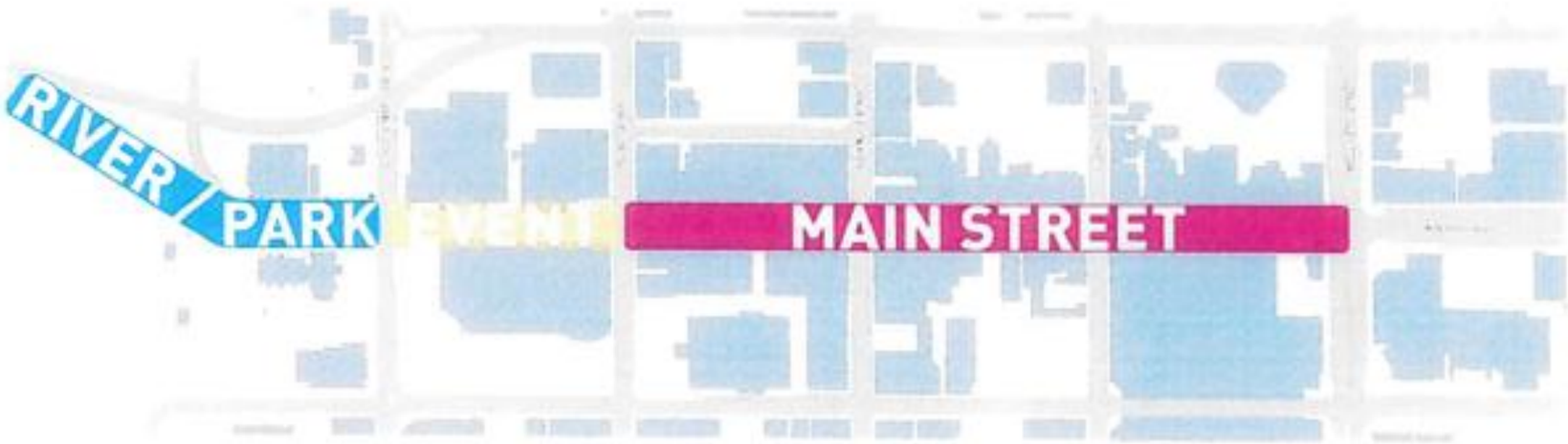
Dundas Street is an important east-west arterial road through downtown London. The corridor plays an important role for commuter traffic, providing direct access into key downtown areas from both the east and the west during weekday peak periods. As part of the Rapid Transit Initiative, a bi-directional transit corridor is proposed along King Street, which would reduce King Street to one lane for vehicles. Dundas Place will continue to play a key role in providing commuter connectivity and flow during peak traffic periods. It is recommended Dundas Place remain open to traffic much of the time, with the majority closures for pedestrian activities be on the weekday off-peak periods and weekends.

Block Character Areas

Transforming Dundas Street into Dundas Place represents a single idea that requires many coordinated actions. Each block presents its own set of opportunities and constraints for transformation. Before initiating the design, an important step is setting up a framework of character areas that will guide and focus the programming and design decisions. Three distinct character areas were developed for Dundas Place, based on the findings of the Public Space Public Life Survey and input from the project launch event. The character areas are shown in **Figure E-1** and include:

- **River/ Park, with Transitway Block.** This block, from Kensington Bridge to Ridout Street connects the Forks of the Thames, Ivey Park and the Thames Valley Parkway with downtown London. Recreational and cultural activities would thrive on this block, connecting into the larger riverfront park system. Based on the results of the Public Space Public Life survey, this block is already functioning much like a park and has the greatest diversity of staying activities compared to the rest of Dundas Street. The total number of people using the space is quite low.
- **Event Block.** This block extends from Ridout Street to Talbot Street. Budweiser Gardens holds tremendous potential to activate this block on a daily basis, and take advantage of the public realm during events. Activation of this block will likely rely on event programming. When events are not present, vehicles are allowed to pass, but the street should function as an extension of the riverfront park, allowing for recreation and play activities.
- **Main Street.** Includes three blocks, from Talbot Street to Wellington Street. The three blocks that comprise the "Main Street" character area contain the highest concentration of ground-floor uses that can help transform Dundas into a vibrant ever yday destination.

Figure E1 - Block Character Areas



Fixed to Flexible Framework

Input was sought on how flexible Dundas Place should be. The goal is for Dundas Place to be as flexible as possible for all users, with fixed/ built-in elements minimized to the extent possible. The following outlines the preferred flexibility framework:

- ***Pedestrian Realm***: A flush paving surface is recommended to maximize the flexibility of Dundas Place when the street is closed to traffic and to provide a wide pedestrian realm. The traveled portion of the street will be delineated only to the extent required to provide a safe environment for all users. Fixed elements, such as bollards, utility boxes, trees, signs, trees, etc. will be incorporated into the design with the view to maximize the flexibility of the street for all users. A clear pedestrian pathway adjacent to the building face should be kept clear at all times.

- ***Bicycle Facilities***: Public input received was strongly in favour of providing dedicated cycling lanes on Dundas Place. It was decided having dedicated cycling lanes on Dundas Place is not recommended as they would decrease the amount of space available for the pedestrian realm, in the already constrained r ight-of-way. New dedicated cycling facilities are being planned for Downtown, as outlined in the City's Cycling Master Plan (2016) and in conjunction with the Rapid Transit Initiative.

- ***Transit***: Rapid transit is planned for the block from the river to Ridout Street as well as crossing Dundas Place at Clarence Street. Relocating local transit to adjacent streets is preferred as it maximizes the flexibility of Dundas Place. If transit is maintained on Dundas Place, street closures would require buses be re-routed, inconveniencing regular riders and those using transit for festivals and events. In addition, transit stops and bus pull-outs are "fixed" locations and not compatible with the flexible nature of Dundas Place. Providing bus pull-outs would decrease the amount of space available for the pedestrian realm. Local transit would continue to use the cross streets to serve the local area.

- ***Vehicles***: With the exception of the block from the Thames River to Ridout Street, two lanes of traffic (one in each direction) will be maintained. Traffic will be re-routed during events, as required.

- ***Parking and Loading***: Flexible par king and loading will be provided. In general, two shared parking and loading areas will be provided on each block. The management and timing of when the spaces are for loading and when they would accommodate parking will be determined during the operational phase of Dundas Place and may change over time as the street continues to evolve and the uses change.

- ***Trees***: There is strong public support to "green" Dundas Place and bring nature to the City. To maintain flexibility of the space, this greening will include planted street trees and other opportunities to incorporate vegetation, including in planters. The greening strategy will be developed as the design proceeds, with a focus on providing a design that creates a suitable habitat for trees to survive and provides some flexibility so that all "green" elements are not fixed. The grouping and locations of trees will also be planned so that they do not restrict views.

- ***Seating***: To encouraging staying activities, public seating will be incorporated into the design of Dundas Place. The extent of built-in/ fixed and flexible seating will be reviewed as the design proceeds.

Alternative Cross-Sections for Dundas Place

The following alternative cross-sections were developed for Dundas Place:

Do nothing/ maintain existing condition

- Maintains the existing cross-section of Dundas Street, with sidewalks, bus bays, parking and loading areas and two lanes for traffic. Updates would potentially include improvements to the existing sidewalks to address current paving condition as needed.

Two-way Street – Widened Pedestrian Realm

- The pedestrian space would be widened where feasible. Road and pedestrian surface would be separated by a stepped curb, similar to current condition.

Two-way Street – Flexible Street Pedestrian Priority (Symmetrical cross-section) - Preferred Alternative

- Includes a flush paving condition, with the same surface from building face to building face, eliminating a stepped curb to separate pedestrians and vehicles. Roadway defined by design elements including paving, trench drains and bollards.

One-Way Street – Pedestrian/Bike Priority

- Travel lanes reduced to one-way, providing oppor tunity for a defined cycling lane. The pedestrian realm would be widened compared to existing. Stepped curb would be maintained.

One-Way Street – Flexible Street Microclimate (Asymmetrical cross-section)

- Travel lanes reduced to one-way, with the same surface from building face to building face, eliminating a stepped curb to separate pedestrians and vehicles. Traveled lane shifted to the south to provide a wider pedestrian area and space for a double row of trees along the north side of the street.

Two-Way – Flexible Street Microclimate (Asymmetrical cross-section)

- Includes the same surface from building face to building face, eliminating a stepped curb to separate pedestrians and vehicles. Traveled lanes shifted to the south to provide a wider pedestrian area and space for a double row of trees along the north side of the street. Roadway will be defined by design elements including paving, trench drains, bollards and lighting.

The alternatives were assessed based on a number of factors including:

- Compatibility with the preferred flexibility framework Compatibility with underground utilities and infrastructure
- Adaptability to support the long term evolution of the retail environment on Dundas.

The alternative, Two-way Street – Flexible Street Pedestrian Priority (Symmetrical cross-section) was identified as the preferred alternative.

Design Concept

Dundas Place is not just a concept, but a long-term strategy to enable the true potential of Downtown London to be realized, as a place of business, work and play. One goal of Dundas Place is to create the most dynamic and inviting destination in the City and look to create a benchmark in the Canada as a successful flexible street, attracting locals and tourist year round. Dundas Place needs to be a space that becomes the most celebrated public space in the City, and is flexible to adapt to today's contemporary urban demands. It will be home to indoor/outdoor commercial activity, institutional uses, and civic events. However to achieve this Dundas Place needs to be designed as not just a downtown street, but rather a place that can adapt and be flexible for a multitude of uses. Block per block the design intent must be adaptable and respond to the unique needs of its context. Therefore Dundas Place should mean a sense of community building which reimagines the Downtown as a place of multifaceted uses, however more importantly, as the "heart" of the City. The current vision as outlined by the EA looks to create a planning, urban design and engineering framework which can work towards a detailed design and implementable solution to the next chapter of Dundas over a phased approach.

Theme

Theming is an important tool to provide a unique aesthetic and tactile experience for the space. Certain aspects can be incorporated into a unifying theme including paving, landscaping, furnishings, lighting and public art. Paving will play a critical part in helping to define Dundas Place as a uniquely different public space in the City. Paving materials as well as patterning and theming will be formally identified in detailed design. Designs and treatments can be applied throughout the corridor to add another level of sense of place. Landscaping can help to identify and define 'rooms' and other areas where pedestrians will gather and reflect. Trees and in certain areas groundcovers, flowers, grasses and shrubs may be utilized to define the space. Seating can be formalized in a typical bench, or incorporated into a certain theme with customized seating or interactive public art installations. Bike racks and other amenities will also fall into a specified 'family' or 'palette' to create an overarching theme. Lighting and public art can be transformed and intertwined through customized trellis structures or canopies, or other installations that fall within the specified theme.

Block Typologies

Dundas Place is five urban blocks united together as one place, with unique qualities within each block. Many of the design elements will be common to the five blocks, linking and unifying the space, while others will be used to define and set apart key areas. The design is intended to be flexible and adaptable throughout.

Library Block - Clarence Street to Wellington Street (Figure E-2)

The Library Block is designed to accommodate an outdoor extension of the Central Library program area. The flexibility of thestreetscape allows for gathering space as well as more intimate places to encourage outdoor activity by the different users of the Library and nearby business located along this stretch. The eastern edge also provides a formal gateway into Dundas Place and the "Main Street" Block Typology.

Marquee Block – Richmond Street to Clarence Street (Figure E-3)

This stretch of Dundas Place is designed tobe an activity driven space, looking to encourage music and the arts. Building on the programming of the ARTSProject and the London Music Hall, the existing Marquee may act as "stage" to facilitate outdoor events. The Art Exchange gathering space is intended to provide an outdoor space for public art and provide an interesting viewshed terminus for the midblock connection.

Kingsmill Block – Talbot Street to Richmond Street (Figure E-4)

The Kingsmill Block is designed to serveseveral purposes including providing informal outdoor space for Fanshawe College, as well as an extension of Market Lane, linking to the Covent Garden Market. This block will provide strong visual and physical connectivity to the College and promote a balance between indoor and outdoor activities. The Kingsmill's Block also marks thebeginning of the"Main Street" Block typology and acts as a gateway to a new condition for Dundas Place.

Event Block – Ridout Street to Talbot Street (Figure E-5)

Through the Event Block the design creates an outdoor room for large events, including the potential to extend programming opportunities for Budweiser Gardens onto Dundas Place. The primary goal for this block is to activate the space, as the facades are currently dull and there are no active ground floor uses with regular hours of operation. The design should activate thespace throughout the year and be amenable to large crowds that gather for events in Budweiser Gardens. Thetrees along the north side of the street, createa backdrop for light and colour for activities along the south-side. The streetscape along the edge of Budweiser Gardens is open, with minimal fixed elements, allowing pedestrians to flow freely at peak times. Periodic patio spaces are highlighted by theclustering of metal art trees along the south side of the street. There is potential for a unique and thematic paving pattern for this block to provide vibrancy and energy.

Park Block – Thames River toRidout Street (Figure E-6)

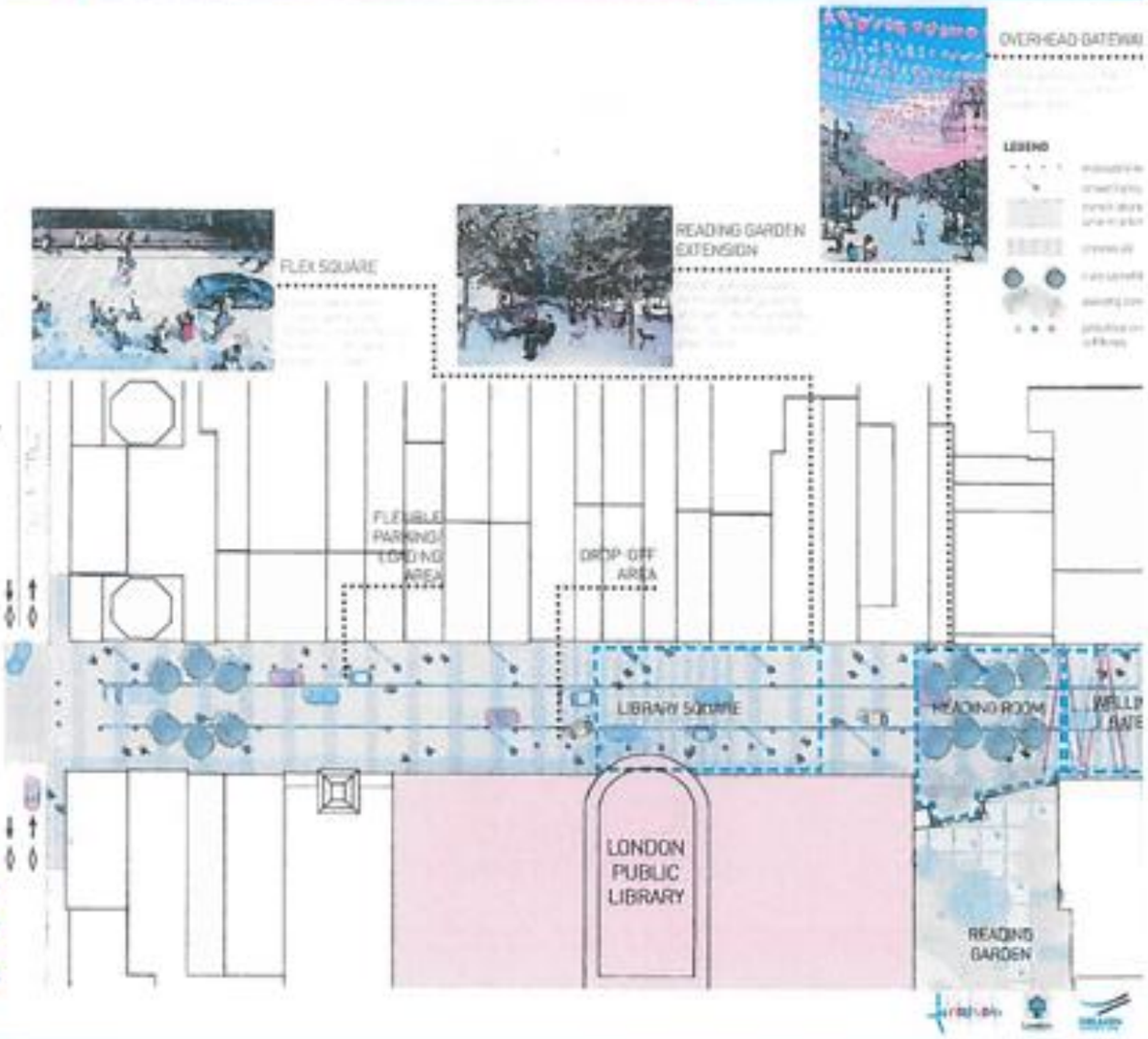
Through this stretch, Dundas Place looks to connect the City to its most important amenity, the Thames River. The wide promenade links the existing parks with Museum London, allowing for more formal outdoor exhibit and gathering spaces. The concept is flexible and incorporates the Rapid Transitway, and is designed to integrate with the "Back to the River" Design Competition Vision. The Rapid Transit and Back to the River environmental assessments will further develop thedesign for this block.

Figure E2 - Preferred Concept Plan

Library Block

Clarence Street to Wellington Street

The Library Block is designed to accommodate an outdoor extension of the Library program area. The flexibility of the streetscape allows for gathering space as well as more intimate places to encourage outdoor activity by the different users of the Library and nearby business located along this stretch. The eastern edge also provides a formal gateway into Dundas Place and the "Main Street" Block Typology.



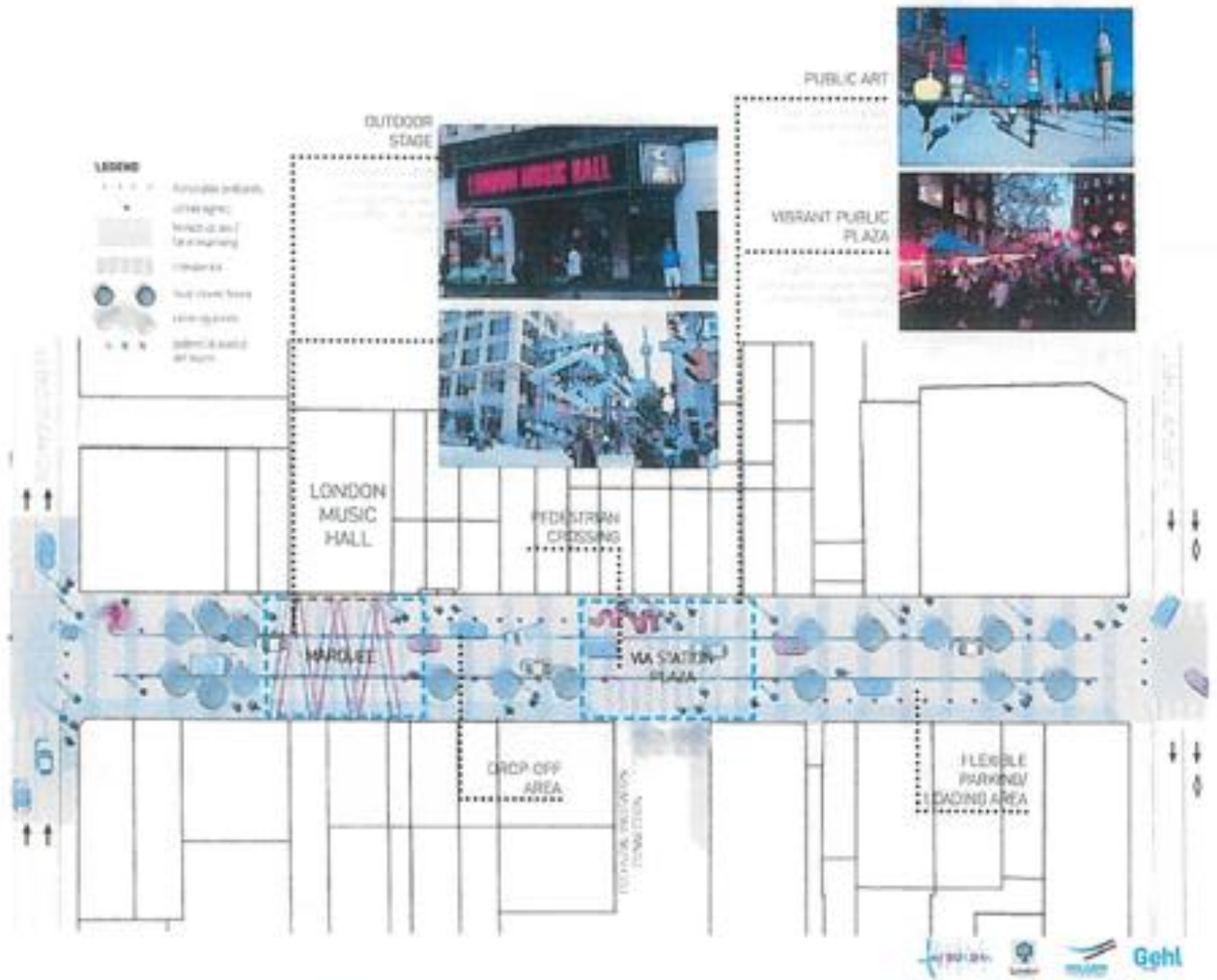
NOTE:
Precedent images are intended to provide creative and innovative examples of potential design features within the corridor. These images do not depict final proposed features. They are suggestive and for the purposes of encouraging further discussion on these detailed design components.

Figure E3 - Preferred Concept Plan

Marquee Block

Richmond Street to Clarence Street

This stretch of Dundas Place is designed to be an activity driven space, looking to encourage music and the arts. Building on the program of the Music Hall, the Marquee will act as "stage" and facilitate events on a larger scale. The connection to the VIA Station will also draw people into Dundas Place by creating an added destination, demarcated by an interesting terminus to the viewshed.



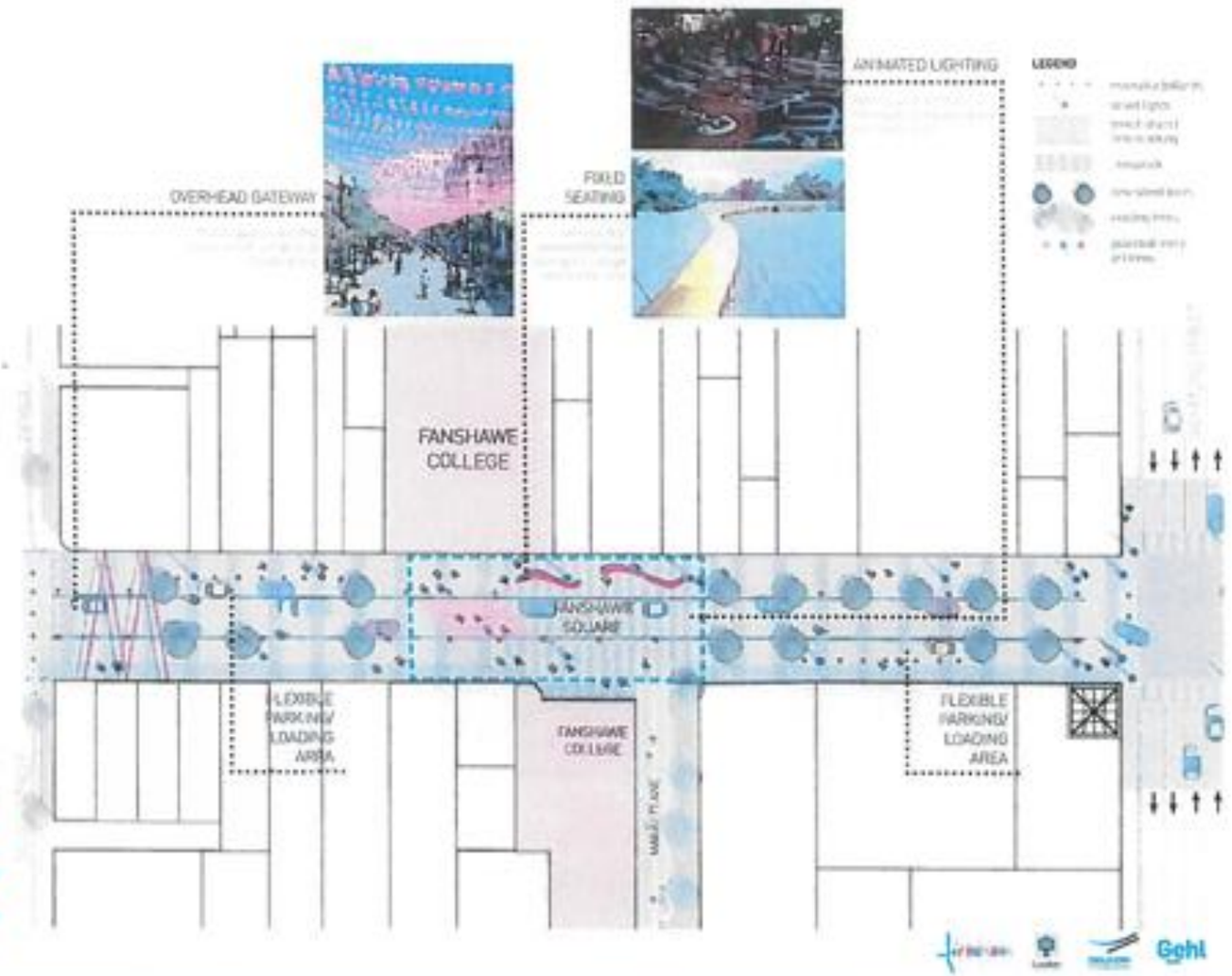
NOTE:
Precedent images are intended to provide creative and innovative examples of potential design features within the corridor. These images do not depict final proposed features. They are suggestive and for the purposes of encouraging further discussion on these detailed design components.

Figure E4 - Preferred Concept Plan

Kingsmill's Block

Talbot Street to Richmond Street

The Kingsmill Block is designed to serve several purposes including providing informal outdoor space for Fanshawe College, as well as an extension of Market Lane, linking to the Covent Garden Market. This block will provide strong visual and physical connectivity to the College and introduce a balance between indoor and outdoor activities. The Kingsmill's Block also marks the beginning of the "Main Street" Block typology and acts as a gateway to a new condition for Dundas Place.



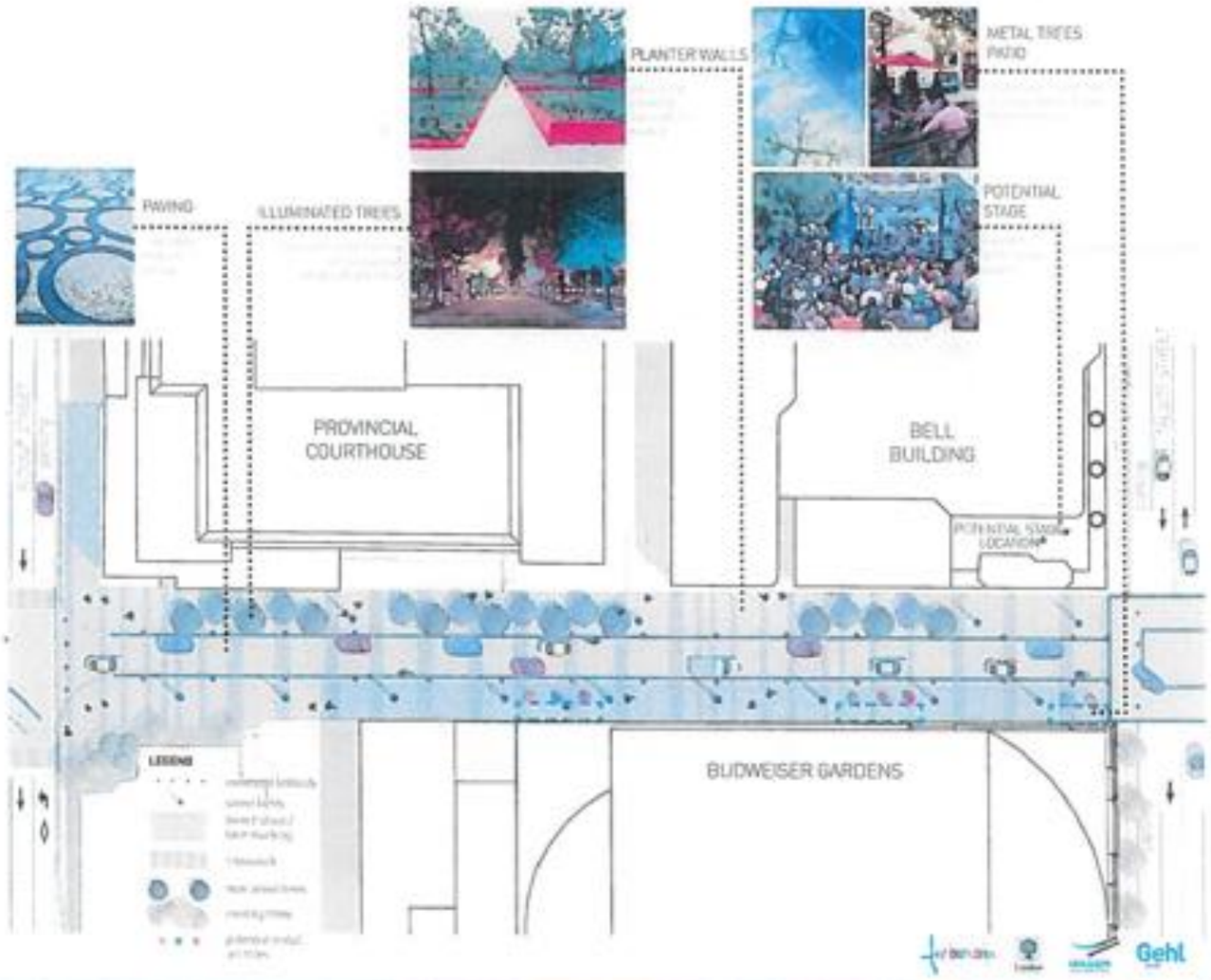
NOTE:
Precedent images are intended to provide creative and innovative examples of potential design features within the corridor. These images do not depict final proposed features. They are suggestive and for the purposes of encouraging further discussion on these detailed design components.

Figure E5 - Preferred Concept Plan

Event Block

Ridout Street to Talbot Street

Through the Event Block the design creates an outdoor room which extends the programming of Budweiser Gardens. The proposed planters along the north side of the street will support robust tree planting, creating a backdrop of light and colour for activities along the south side. The streetscape along the edge of Budweiser Gardens will be opened up and allow pedestrian flow at peak times. Periodic patio spaces are highlighted by the clustering of metal art trees. This will be tied together by a unique and thematic paving pattern giving this block strong vibrancy and energy.



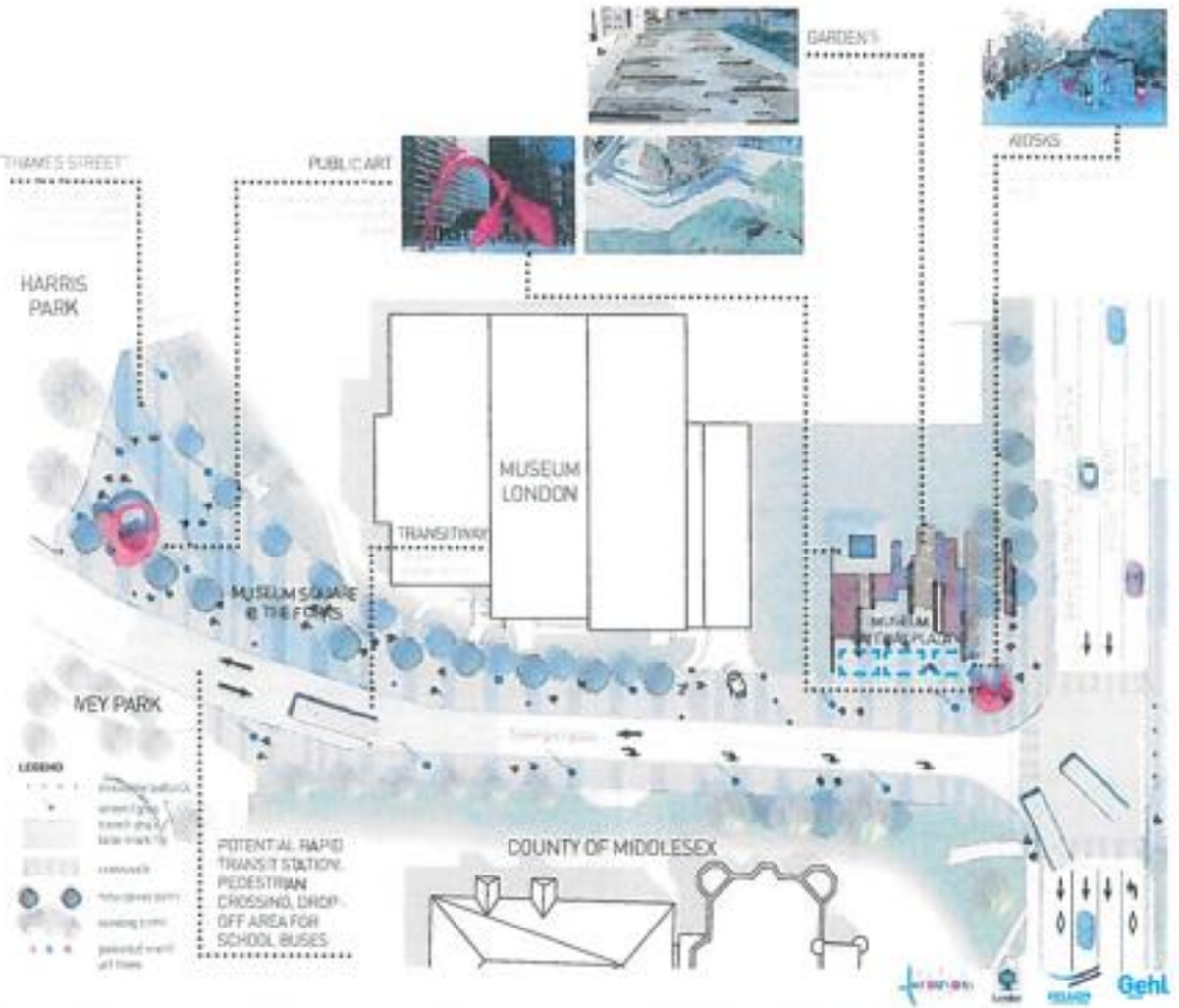
NOTE:
Precedent images are intended to provide creative and innovative examples of potential design features within the corridor. These images do not depict final proposed features. They are suggestive and for the purposes of encouraging further discussion on these detailed design components.

Figure E6 - Preferred Concept Plan

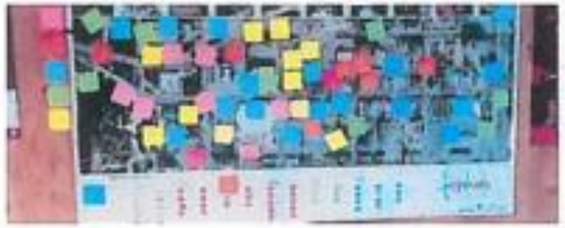
Park Block

Thames River to Ridout Street

Through this stretch, Dundas Place looks to connect the City to its most important amenity, the Thames River. The wide promenade links the existing parks with new destinations surrounding Museum London, allowing for more formal outdoor exhibit and gathering spaces. The concept is flexible and incorporates the Transitway and is designed to integrate the "Back to the River" Design Competition Vision. The Shift and Back to the River environmental assessments will review this further.



NOTE:
Precedent images are intended to provide creative and innovative examples of potential design features within the corridor. These images do not depict final proposed features. They are suggestive and for the purposes of encouraging further discussion on these detailed design components.



Consultation

A comprehensive public and agency engagement program was implemented throughout the study and included three consultation events, project website, social media campaign and meetings with agencies and businesses within the Study Area. The study team has interacted with hundreds of Londoners through the course of the project, with much of the input received supportive of the proposed work. Consultation activities met the requirement of the Municipal Class EA. Project notices were published in "The Londoner" and on the City's website. Consultation activities included:

- Study Kick-off Event and Notice of Study Commencement: An interactive project Launch Event was held Saturday, September 25, 2015 on Dundas Street, between Talbot Street and Richmond Street and was attended by hundreds of individuals throughout the day. The event included closing one block of Dundas Street to traffic and creating a festival atmosphere, with live music, food trucks, vendors, artisans and play activities for families. The event included several consultation touch points, and oppor tunities to interact with staff from the City, Dillon and Gehl
- Favourite Places Online Survey – Interactive online survey completed by over 400 individuals and was used to identify the qualities that should be incorporated into Dundas Place to make it a favourite place for Londoners
- "Fix to Flex" consultation event – January 15, 2016 event focussed on asking the public how flexible Dundas Place should be by seeking input on a number of street scape elements. The alternative cross sections were also presented for input. Two business workshops were held the same day as the event to seek input on current challenges, individual's vision for Dundas Place be and to discuss challenges related to construction. The event was attended by over 150 individuals
- "Sights and Sounds of Dundas Place" – June 22, 2016 event where the preferred design concept plans were presented for input. The overall response was favourable to the plans. Artistic renderings of the future space were also shown. The event was in an indoor/outdoor venue in Market Lane and the Fanshawe Black Box Theater and input was provided by over 100 individuals
- Consultation with First Nations
- Consultation with local businesses and agencies – there have been several opportunities for local business to provide input, including two drop-in events and a workshop. Downtown London has been part of the project steering committee and provided input throughout the study. There has also been one-on-one meetings with Museum London, London Public Library and two meetings with Fanshawe College. A meeting was also held with local event and festival organizers to obtain input on the concept plans.
- Consultation with local utilities who an have existing plant on Dundas street, or are interested in placing new underground infrastructure for Dundas Place.

Snow Melt System

A snow and ice melting system to reduce or eliminate snow and ice accumulation along Dundas place was reviewed. The snowmelt system would reduce or eliminate the need for snow removal on Dundas Place. Snow storage along the curb line would be eliminated as well a significant reduction or elimination of de-icing chemicals.

A snow and ice melting system to reduce or eliminate snow and ice accumulation along Dundas place was reviewed.

The system includes plastic piping installed under the pavement. Glycol is pumped through the tubing to heat the surfaces and melt the snow and ice. The system components include a heat exchanger, hot water pumps, main snowmelt transmission piping, branch snowmelt piping, and snowmelt tubing. Steam from the Veresen London District Energy system would provide thermal energy for the system.

Major benefits of the snow melting system includes:

- Removes snow removal and salting requirements on city streets and sidewalks
- Reduces the risk of pedestrian slips and falls, potentially saving healthcare costs
- Reduces the freeze-thaw damaging effects on the paving and streetscape elements. Road surfaces usually last longer
- Reduces tracking of snow and debris onto the interior floors of buildings
- Reduced use of salt on the street is anticipated to positively impact street tree longevity.

Disadvantages of the snow melting system includes:

- Installation and operating cost is relatively high.
- Snowmelt tubing installed may be in the way of accessing underground utilities for future repairs/upgrades required, increasing costs of this work in the future. The system is designed to allow for sections of the tubing to be removed and reinstalled for underground work.
- Heat used in the system would contribute to the City's total greenhouse gas emissions.

Although The cost of the constructing the snowmelt system as well as the ongoing operational costs are not included in the overall capital cost of the project. it can be included if funds become available.

Typical Winter Chnditions on Dundas Street

Winter Conditions after a large snowfall on the Pavement Snowmelt System in Holland Michigan

Operation and Management of Dundas Place

Throughout the EA it has been recognized that the physical transformation is only one of three key elements to the success of Dundas Place. A robust event programming and management strategy is equally important to the transformation success, as is active involvement by the businesses along Dundas and the surrounding downtown.

Dundas Place should be managed as an independent public place, not just as a public street, with a defined mandate and operating budget. Potential operating and management structures are under review..

Preliminary Costs

Preliminar y cost estimates developed are included below. The project costs will be updated during the future detailed design phase.

Phase 1: Wellington Street to Ridout Street	
Project Component	Project Cost
Road works	$5,670,000
City Underground Infrastr ucture (Storm, water, sanitar y)	$1,510,000
City Electrical (Illumination, traffic signals)	$1,800,000
Streetscape/ Urban Design	$2,100,000
Engineering (20%)	$2,180,000
Contingency (20%)	$2,180,000
Total	**$15,240,000**

Phase 2: Ridout Street to the Thames River	
Project Component	Project Cost
Road works	$1,120,000
City Underground Infrastr ucture (Storm, water, sanitar y)	$135,000
City Electrical (Illumination, traffic signals)	$170,000
Streetscape/ Urban Design	$380,000
Engineering (20%)	$360,000
Contingency (20%)	$360,000
Total	**$2,525,000**

Next Steps

Following completion of this EA, the City will initiate the detailed design phase. It is anticipated detailed design will be completed in 2017. Subject to Council approval, completion of the design and obtaining required permits/ approvals, it is anticipated construction could begin as early as 2018 may be completed over one or two years. Construction staging will be finalized during Detailed Design.

Appendix B

Pavement Snowmelt System Assessment

Traditional snow and ice removal practices involve the use de-icing materials such as salt in combination with mechanical methods to scrape off the snow from the surface. The higher presence of street amenities and pedestrians along Dundas also requires extensive hand shovelling. In the downtown core, merchants are required to clear the sidewalks fronting their business, however this is supplemented by City crews to reach the bare pavement level of service in this zone.

Pavement snowmelt systems were investigated for potential application in the Dundas Place project in response to internal and external consultation. Snowmelt systems are being considered across North America for both private site applications and municipal street applications.

Typical Winter Conditions on Dundas Street

Winter Conditions after a significant snowfall on the Pavement Snow Melt System in Holland Michigan

Hydronic snowmelt systems generally use heated water or a glycol/water antifreeze mixture that is circulated though subsurface plastic tubing that warms the pavement surface to slightly above freezing. Snow melt occurs as it falls on the surface resulting in a combination of runoff and evaporation. A typical subsurface hydronic piping installation is shown in the figure below. The system is comprised of pumps, piping, manifold, and a heat source. The heat source is typically a boiler for smaller systems or local power plant or district heating systems for larger systems.

Snowmelt System Subsurface Hydronic Tubing Installation

The snowmelt system investigation for the My Dundas EA identified that the existing London District Energy system that is servicing buildings along Dundas Street would be an economical source of energy to heat the fluid for the system. The heat exchangers and recirculation pumps would likely be located inside buildings already housing London District Energy plant for maintenance and operations accessibility. These components of the system would be under the ownership of London District Energy. The piping system in the street would be a municipally owned asset.

The system would require a long-term operating agreement with London District Energy. The agreement would commit the City to regular operating expenditures associated with energy charges and capacity (system) charges. The agreement term would likely be 20 years with renewal options. The terms of the agreement would be negotiated and submitted to Council for approval subject to endorsement of this project component.

Snowmelt System Qualitative Assessment

<u>Advantages</u>

The introduction of a snowmelt system along the right of way can make Dundas Place an exciting destination through all seasons. In the winter, sidewalks covered in snow and ice are a hindrance to pedestrian activities. A snowmelt system can eliminate the need for snowplowing operations while providing a better level of service. The system can make Dundas Place an attraction to residents and visitors all year.

The benefits of a snowmelt system can be seen in many locations including Union Station, Toronto, Fallsview Casino Resort, Niagara Falls and streets in Steamboat Falls Colorado. An example of a broad municipal street application similar to Dundas Street

can be found in Holland, Michigan where dry streets in winter attract “mall walkers” and joggers to the downtown throughout the winter season.

Advantages of snowmelt systems over traditional snow removal methods include:

- a greatly improved winter pedestrian environment;
- improved tree survival with the elimination of winter salt application;
- eliminates snow plow damage to the premium Dundas Place built environment;
- potentially improved assessment values for fronting businesses;
- elimination of salt damage at business entrances;
- improved Thames River water quality as a result of reduced salt effluent in stormwater runoff; this would be only an incremental improvement when considered in the entire City roads network, however, the amount of salt applied to the downtown sidewalks to meet Council standards is proportionally higher than elsewhere;
- a unique feature with tourism appeal that can be promoted and draw attention to the area;
- reduced slip and fall liability; and,
- less asset management costs as a result of longer pavement service life by eliminating frost deterioration.

Disadvantages

Despite the efficiencies of the district energy source, the replacement of manual and mechanical snow clearing practices with a pavement heating system will result in a large increase of energy consumption and greenhouse gas emissions. The operating procedures for the system would be subject to refinement during design and initial implementation. Based on current conservative assumptions, the steam energy levels estimated to run the system required for Dundas Place are estimated to create approximately 1,350 to 1,800 tonnes/year of CO_2 emissions as compared to 20 to 30 tonnes/year for conventional plows and other equipment. This increase is the equivalent to the emissions created by approximately 150 to 200 households and would represent a 6 to 8% increase in corporate energy related emissions. The Ministry of Environment and Climate Change has developed a Climate Change Action Plan with the goal of reducing greenhouse gas emissions and boosting low-carbon innovation. Council has established a community-wide target to reduce London’s emissions to 15% below 1990 levels by 2020.

Council has established a corporate energy reduction target of 10% below 2014 levels by 2020. The estimated energy consumption increase associated with a snowmelt system represents an increase in the order of 4 to 5%.

Corporate strategies may be available to mitigate the energy related impacts of a snowmelt system. These include purchasing greenhouse gas emission offsets, the use of renewable natural gas and geothermal energy storage, all of which have financial implications.

Another disadvantage associated with a snowmelt system is the subsurface layer of underground piping would make accessing underground utilities more onerous. The utility companies have been encouraged to consider the life span of their underground assets in the project with a goal to minimizing future excavation requirements within this project regardless of installation of the snowmelt system. However, utility access to facilitate new development servicing and unexpected maintenance is inevitable in the long term.

Snowmelt System Quantitative Assessment

A snowmelt system was not identified in the Dundas Place scoping study and therefore not reflected in earlier cost estimates and the capital budget account.

Capital Cost

The City capital cost to install the system in the initial phase of Dundas Street is estimated at $4,200,000. This system would treat the entire width of Dundas Place from Wellington Street to Ridout Street. The entire width is being considered, versus partial implementation, based on the relatively narrow street width and the intent to create a seamless and easy to activate space.

Implementation of the Park Block west of Ridout Street is planned to be coordinated in a later phase with Shift Rapid Transit. Considering the dedicated Rapid Transit lanes and restrictions on road closures, it is recommended the snowmelt system cover sidewalks only. The estimated capital cost of the sidewalk system in this block is estimated to be in the order of $400,000.

The upfront increased capital cost associated with the implementation of the snowmelt system can result in long-term cost avoidance equal to approximately half the value of the capital cost. A calculation of the net present value of the forecasted savings associated with quantifiable items is represented in the following table.

Snowmelt Benefit Long-Term Savings	**Net Present Value**
Pavement rehabilitation savings as a result longer pavement service life by eliminating frost effects	$1,610,000
Longer tree life by eliminating salt runoff	$370,000
Street asset damage to the premium Dundas Place environment	$210,000
Total	**$2,190,000**

Operating Cost

The estimated ongoing annual operating cost charge for a snowmelt system on Dundas Street is estimated to be between $325,000 and $380,000 depending on energy usage as a result of weather conditions and operating procedures. London District Energy provided input into the operating costs for the system. If desired, these values will be further refined during detailed design.

Ontario's Cap and Trade program will also influence future energy costs. The long-term effects of cap and trade on the price of steam energy is unclear. The estimate above does not include costs associated with potential methods to achieve greenhouse gas neutrality mentioned in the previous section. The purchase of offsets to reach this goal is likely the most cost-effective and is estimated at $70,000 to $90,000 annually based on current projected carbon pricing. London District Energy has applied for short term free allowances under the program. The Ministry of Environment and Climate Change has not identified how the distribution of free allowances will be phased out.

The cost of current snow and ice removal by City of London Roadside Operations personnel averages $125,000 per year between the Thames River and Wellington Street. However, this cost would be expected to increase to $250,000 upon the

implementation of Dundas Place which will require a higher level of service to meet its potential. The table below summarizes the future winter operating costs with and without a snowmelt system.

Estimated Future Annual Winter Operating Cost	**Conventional Snow Clearing**	**Snowmelt System**	**Snowmelt System GHG Neutral**
	$250,000	$325,000 to $380,000	$395,000 to $470,000

Incorporation of a snowmelt system into the project is independent of EA approval. The project can proceed with or without the snowmelt system.