
Left
Turning
Lane /
Median
3.6 m
1.8 m
Bike
Lane
Lane
Traffic Lane
3m
Turning Lane
3m
3m
Traffic Lane
3m
3m
Roadway
15m

c. DTAH

Chapter 3 describes the five general steps in the street design process. Not all projects follow these steps, as the number of steps and time spent on each one often depend on the type, scale, scope and resources of a project.

Making decisions about street design is a collaborative process with many different voices at the table, including City staff, stakeholders, and members of the public. It is important to identify these voices early on and involve them throughout the process. It is also important to document key decisions to ensure the rationale and design process are transparent and defensible.

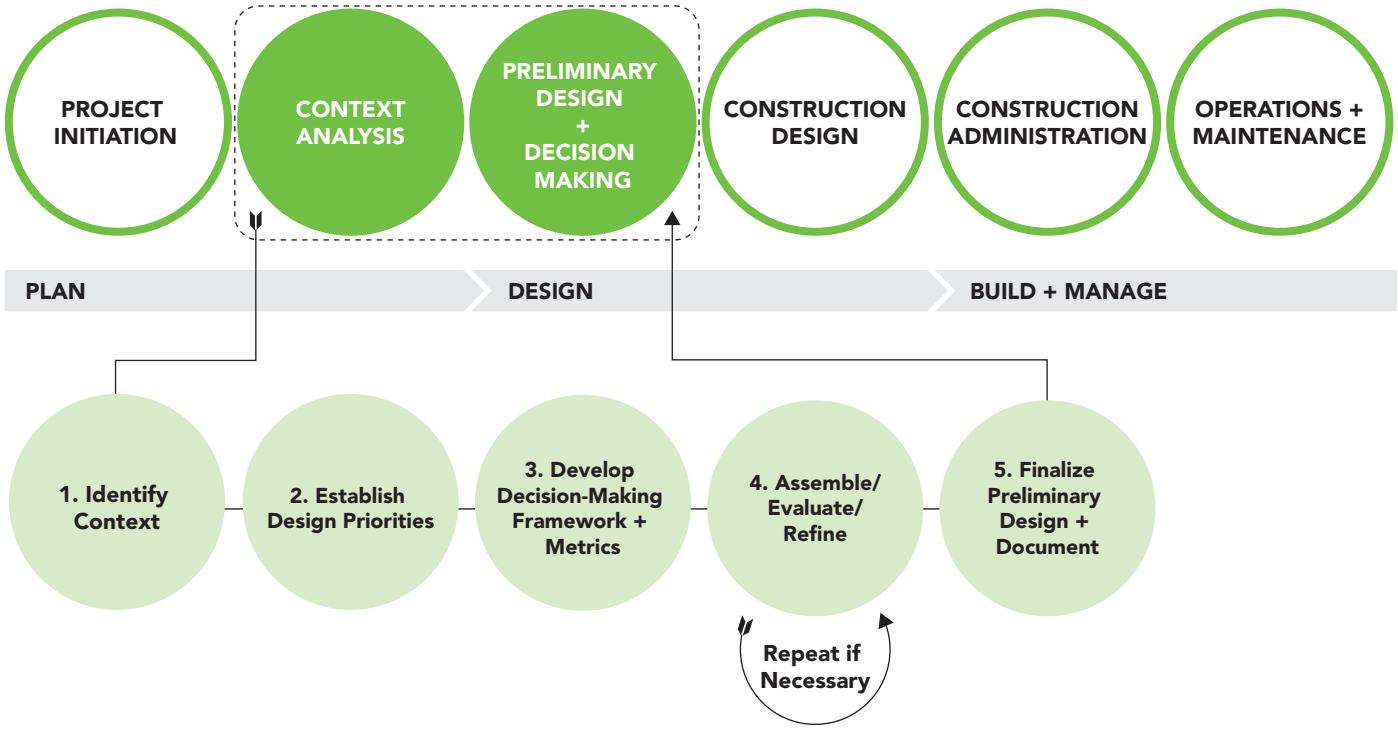
3.0 STEPS TO STREET DESIGN

3.1

STEPS TO STREET DESIGN

The five general steps to street design are illustrated in Figure 3-1 and described in more detail on the following pages. This process is best suited to large projects such as major reconstructions and Environmental Assessment studies, but adaptable to many different project types.

Step 1: Identify Context & Street Type
Step 2: Establish Design Priorities & Objectives
Step 3: Develop Decision-Making Framework & Metrics
Step 4: Assemble, Evaluate, Refine & Repeat
Step 5: Finalize Design & Document



COLLABORATION WITH CITY STAFF, STAKEHOLDERS AND PUBLIC

Transportation Services
- Beautiful Streets, Pedestrian Projects, and Street Furniture
- Cycling Infrastructure & Programs
- Traffic Operations
- Traffic Safety
- Traffic Signals (installation & maintenance)
- Traffic Planning & Right-of-Way Management
- Infrastructure Asset Management & Programming
- Road Operations

Toronto Transit Commission
- Strategy & Service Planning

Emergency Access – Divisions
- Fire Services, Paramedic Services and Police

Operational Access – Divisions
- Waste Management
- Parks

City Planning
- Community Planning
- Transportation Planning
- Urban Design
- Heritage
- Environment

Parks, Forestry & Recreation
- Urban Forestry

Economic Development & Culture
- BIA Office
- Film Office

Municipal Licensing & Standards
- Business Licensing & Regulatory Services

Utilities
- E.g., Toronto Hydro, Toronto Water, others including Major Capital Infrastructure Coordination

Councillors and their staff
Local residents, businesses, and institutions (schools, hospitals, seniors facilities, business improvement areas, etc.)

Community organizations, advocacy groups and other industries
- Pedestrians and transit riders
- Disabilities groups (e.g., for vision, mobility, hearing and cognitive)
- Cycling groups
- Drivers, motorcyclists, and goods deliveries (e.g., couriers and logistics)
- Parks, conservation authorities, environmental groups
- Arts, cultural groups, and film industry
- Taxi, car-sharing, and tourism
- Developers and property managers

Figure 3-1: Steps to Street Design

3.1.1

STEP 1: IDENTIFY CONTEXT & STREET TYPE

Understanding the variety of roles and relationships of a street with its surrounding context is a critical step in the street design process.

Using the approach outlined in Chapter 2, undertake a comprehensive review of available information to create a thorough and holistic understanding of the different aspects of a street's context. When gathering and reviewing policies, plans, and other data, also identify strategies to address significant information gaps or deficiencies. Using the analysis of information gathered, select one of the Street Types outlined in Chapter 2 as a starting point for setting design priorities and objectives.

Figure 3- 2: Many factors inform the understanding and identification of street types

STEP 1: CHECKLISTS

Identify the street's "placemaking" context:

- ☐ Consult Official Plan policies and maps (eg, urban structure, land use designations, secondary plans or other area plans, heritage conservation plans, etc)
- ☐ Consult public realm and streetscape policies (e.g, Streetscape Manual, Vibrant Streets Guidelines, urban design guidelines, etc)
- ☐ Consult the Green Streets Technical Guidelines including policies, maps and the Low-Impact Design feature selection tool (eg, planting conditions, stormwater plans, tree canopy, etc). Identify grades, drainage, stormwater flow, catch basin locations, etc.)
- ☐ Is the street located in a Business Improvement Area (BIA) and are there streetscape or master plans?
- ☐ What are the street's trip generators and destinations, e.g., schools, institutions, parks, etc.?
- ☐ Identify the past, present and future characteristics of the place and users of the street (e.g, cultural heritage, social history and new development).
- ☐ Research and identify any encroachment or easement agreements on the street segment.

Identify the street's "movement" context:

- ☐ Consult Official Plan policies, network plans and maps (e.g, rapid transit network, surface transit priority network, planned right-of-way widths, etc)
- ☐ Align with the City's pedestrian-related policies and obtain data, (e.g. existing and future volumes, trip generators, safety heat maps, walking conditions, OTM Book 15, etc.).
- ☐ Consult the Cycling Network Plan, OTM Book 18, and obtain data, e.g, existing and future volumes, trip generators, and safety conditions.
- ☐ Collect and review data (e.g. collisions, existing and future volumes, truck volumes, speed, and travel times)
- ☐ Identify curbside and operational uses (e.g. parking (on- and off-street supply), deliveries, taxi stands, food trucks, bike parking, Bike Share stations, snow storage, etc).
- ☐ Review multimodal demand and connectivity. Consult Road Classification System.
- ☐ Identify existing street right-of-way widths and allocation of space.

Identify profile of street users:

- ☐ Conduct site assessments and gather observational data
- ☐ What are the current and future demographics (e.g. seniors)? Who uses the street? Consider people of all ages, abilities and genders, and universal design.
- ☐ Identify activities and any permit holders (e.g, cafés, marketing displays, street vendors, food trucks, boulevard parking, filming, etc.).
- ☐ Consider all times of the day, different days of the week, and times of the year (all seasons)
- ☐ Consider anticipated routes for different users, and their desire lines (typical paths and destinations)
- ☐ Consider emergency services, operations and maintenance, and utilities (year-round, all times of day)
- ☐ Consider utilities and their location and placement, both above and below ground
- ☐ What consultation (e.g., public and stakeholder input and feedback) has been conducted on the above roles and users of the street, and the potential street type(s) that contribute to the street project's objectives?
- ☐ Identify potential funders and maintenance partners.

Identify street type(s):

- ☐ Which street type(s) are most similar to the aspirational role of the street (i.e., vision and goals)?

3.1.2

STEP 2: ESTABLISH DESIGN PRIORITIES & OBJECTIVES

Develop the design priorities and objectives through a collaborative process—agreed upon as much as possible by the parties involved, and reviewed later in the process to evaluate how they are being met. They should align with the City's Official Plan and other city policies, as well as the complete streets vision, goals, and guidance outlined in this document. In some cases, previous policy or guidance (such as Secondary Plan, EA Terms of Reference, BIA Public Realm Plan, etc) may exist to inform design objectives for a street or area.

Design priorities and objectives should reflect the most recent context information developed through Step 1. On larger projects, review and revise objectives as the design proceeds, with changes and decisions documented for transparency.

STEP 2: CHECKLISTS

Confirm that project objectives align with the City's policies and plans and bylaws:

- ☐ Alignment with Official Plan's city-building vision and goals
- ☐ Alignment with Toronto's Complete Streets vision, goals, and design guidance
- ☐ Align with network plans and local area studies or plans that exist or are underway
- ☐ Consult appropriate bylaws in Toronto Municipal Code (e.g., streets and sidewalks, street vending, etc.)

Confirm that the project objectives are informed by design objectives for the selected Street Type in Step 2:

- ☐ Design objectives for moving pedestrians, cyclists, transit, and motorized vehicles
- ☐ Design objectives for place-making, green infrastructure, and users of the street
- ☐ Compare project objectives with the street type(s) design objectives

Confirm that project objectives have received input and feedback through consultation and engagement:

- ☐ Internal consultations of key stakeholders (all relevant Divisions, Agencies, Commissions and units) have informed the project's objectives (think of all modes and users)
- ☐ External consultations with key stakeholders have informed the project's objectives (think of all modes and users)

What are the funding sources for the project?

- ☐ Internal and external discussions on funding capital, operations and maintenance.

3.1.3

STEP 3: DEVELOP DECISION-MAKING FRAMEWORK & METRICS

An evidence-based decision-making framework and a set of metrics are essential to evaluate street design options and make difficult choices and trade-offs. Organize the decision-making framework and metrics according to the design priorities and objectives established in Step 2. Develop both qualitative and quantitative metrics for each of the priorities or objectives to assess how they can be achieved.

Involve a variety of interdisciplinary professionals to provide specific advice in their area of expertise. Consultation and stakeholder engagement will also help inform the decision-making framework. Collect "before" and "after" data to provide a baseline set of metrics to track and monitor impacts and progress over time. It is important to document how decisions are being made.

STEP 3: CHECKLISTS

Establish an evidence-based decision-making framework:

- ☐ Review the decision-making framework template (Figures 3-2a and 3-2b)
- ☐ Incorporate priorities and objectives resulting from Step 2 into the framework
- ☐ Conduct internal and external stakeholder consultation for input on the framework
- ☐ Identify qualitative and quantitative measures for the evaluation criteria
- ☐ Collect any data required to produce the qualitative and quantitative analysis including consulting multidisciplinary and subject matter experts for advice. Ideally, "before" data is collected at this stage to provide a baseline against which "after" data can be compared once the project has been completed to track impacts over time.

TEMPLATE FOR DEVELOPING DECISION MAKING FRAMEWORK

Vision: _____

Goal(s): _____

Priority and/or Objective(s): _____

Criteria and/or Metric(s): _____

Figure 3-2a: Sample Decision Making Framework Template

STREETS FOR PEOPLE	STREETS FOR PLACEMAKING	STREETS FOR PROSPERITY
Improve Safety and Accessiblity	**Create Beautiful and Vibrant Public Space**	**Support Economic Vitality**
Shorter Crossing Distance at Intersections	Wide Pedestrian Clearway and Furnishing/Planting Zone	Adequate On- and Off-Street Parking and Loading; Wider Sidewalks and Setbacks for Outdoor Cafes
Give People Choices and Connected Networks	**Respond to Local Area Context**	**Enhance Social Equity**
Length (km) of Missing Links for Pedestrians and Cyclists	Alignment with Area and Community Plans	Increased Transit Access (5-10 Minute Walk) to Low-Income Households; Expanded Bicycle Network to Transit Stops/Stations
Promote Healthy and Active Living	**Improve Environmental Sustainability**	**Balance Flexibility and Cost Effectiveness**
Safety Features for All Road Users (i.e. Rightsize Lanes and Curb Radii)	Number and Type of Green Infrastructure Added	High, Medium, Low Costs Over The Long Term (for Operations and Maintenance)

Figure 3-2b: Sample Criteria and Metrics

3.1.4

STEP 4: ASSEMBLE, EVALUATE, REFINE, & REPEAT

Step 4 is an iterative step that is often repeated as trade-offs and choices are made to refine the design of a street. Design choices and trade-offs should be evaluated and refined through internal and external consultation and engagement using the evidence-based decision-making framework from Step 3.

The amount of iteration will depend on the scale, scope and nature of the street project. For example, a small scale neighbourhood safety and beautification project will likely not involve as many steps or iterations as a major streetscape improvement that encompasses a whole street segment that involves many external stakeholders.

Assemble: Design options should be prepared using schematic drawings of street cross-sections as well as the plan view of an entire block or intersection. The street type(s) and design priorities and objectives should be used as a starting point to select and help prioritize street elements.

Street types may lead to more than one cross-section option for different street segments. Designers may also not be able to achieve all design objectives on a street project due to context-sensitive considerations. For more information on cross-section elements, see Chapters 4 through 9 which provide an overview of some key design objectives for pedestrians, cyclists, transit, green infrastructure, roadways, and intersections.

Evaluate: Once the options are developed, they should be evaluated using the evidence-based decision-making framework and metrics from Step 3. This evaluation is important because there are often physical space allocation choices that need to be addressed before proceeding to detailed design. Difficult trade-offs may need to be made after being evaluated and documented using an evidence-based approach.

Evaluating using this approach ensures that design priorities and objectives for a project are applied in a context-sensitive manner, and that decisions are explained and documented for how they achieve the overall complete streets vision and goals.

Refine & Repeat: Street design options should be refined through collaboration and creative problem-solving, as well as the use of various design standards and best practices

Repeated refinement is often necessary to better achieve project objectives. This is typically an iterative step that involves multi-disciplinary collaboration among key stakeholders, as well as external consultation and engagement with the community and public.

Refinements to the street design should result from a thoughtful and collaborative discussion of trade-offs between competing uses on the street and within the available right of way. This discussion requires all stakeholders to understand the perspectives and needs of others.

This is a critical step that demonstrates transparent and accountable decision making.

STEP 4: CHECKLISTS

Assemble street cross-section(s):

- ☐ Review and apply project design objectives – prioritizing space and attention to design for priorities resulting from Checklists for steps 1, 2 and 3
- ☐ Review and apply key design principles and select elements using the Chapters on Pedestrians, Cycling, Transit, Green Infrastructure, Roadways and Intersections
- ☐ Review and apply additional resources including specific design guidelines, construction standards, and best practices (e.g. City's Lane Width and Curb Radii Engineering Guidelines, On-Street Bikeway Design Guidelines, Green Streets Technical Guidelines, Streetscape Manual, etc.)
- ☐ Coordinate designs with other projects in the area (e.g. new buildings or developments), and permitted activities or businesses (e.g, cafés, etc.)
- ☐ Assemble street cross-sections and plan views using a multi-disciplinary, collaborative approach with key stakeholders and produce the schematic drawings

Evaluate options using the evidence-based decision-making framework from Step 3:

- ☐ Review each design option against the framework (developed from Step 3) and document the pros/cons of each option, any trade-offs made in the option, and any qualitative and quantitative measures
- ☐ Ensure that all users of the street are taken into account, e.g., a road user risk assessment for the safety of the most vulnerable road users
- ☐ Collect any data required to produce the qualitative and quantitative analysis of the design options (including consulting interdisciplinary and subject matter experts for advice)
- ☐ Conduct internal and external stakeholder consultation for feedback on the evaluation of options including life cycle costs
- ☐ Document the evaluation using qualitative and quantitative data and analysis and feedback

Refine street design and repeat Step 4, if necessary:

- ☐ Foster collaborative problem-solving among key stakeholders, using a multi-disciplinary approach, to address issues that arise and to refine street design options
- ☐ Review and apply additional resources including specific design guidelines, construction standards, and best practices
- ☐ Refine and produce the preferred street designs, including schematics and streetscape details
- ☐ Consult internal and external key stakeholders, using a multi-disciplinary approach to gather input and feedback on their needs
- ☐ Document the rationale for any trade-offs made, conflict resolution measures and innovative solutions to design issues including life-cycle costs and obtain agreement and approvals on operations and maintenance (i.e. who will maintain the street elements)

3.1.5

STEP 5: FINALIZE DESIGN & DOCUMENT

The completion of all of the previous steps, including any additional public and stakeholder input, should provide enough rationale to select the design option that best matches the context and future expectations relative to the street project.

It is important that the design team documents the process that was followed, including consultation and engagement activities, so that it can inform future similar street projects, and serve as a reference for any questions that may arise about why a particular decision was made.

STEP 5: CHECKLISTS

Finalize the preferred street design:

- ☐ Finalize the preferred street design, including cross-sections, plan views (of the whole block, segments and/or intersections and approaches to the intersection), and streetscape details
- ☐ Include documentation of any analysis
- ☐ Include documentation on consultations
- ☐ Include documentation on the evaluation
- ☐ Include documentation on the written agreement and approvals on operations and maintenance for the long term (i.e. who will maintain the street elements for the long-term)
- ☐ Note that, depending on the lead division or agency, some streetscape elements will require a formal agreement with the City. (e.g, for maintenance, encroachments, or easements).

Examples of street elements that require an agreed-upon and approved maintenance owner include, but are not limited to:

- ☐ Street trees, landscaping and planters
- ☐ Pavers (e.g. in the furnishing or edge zones, sidewalk, or roadway)
- ☐ Green infrastructure such as permeable materials
- ☐ Other streetscape details, e.g., lighting, street furniture, decorative installations
- ☐ Others, as needed

Examples of maintenance owners that need to provide agreement and approval include, but are not limited to:

- ☐ Transportation Services
- ☐ Toronto Water
- ☐ Parks, Forestry and Recreation
- ☐ Business Improvement Areas (BIAs)
- ☐ Property managers (e.g. commercial or condominium building owners)
- ☐ Toronto Hydro
- ☐ Others, as needed

3.2

PERFORMANCE MEASUREMENT

This section outlines what project teams should consider in assessing how well a project performs in terms of meeting its complete streets objectives.

Queensway: Before


Queensway: After

MEASURING STREET PROJECTS

"Before" and "after" data help to assess and communicate the results and benefits of street projects. Resources for data collection, analysis, and communications are often not included in budgets. Ideally, resources for measuring street performance are considered in advance and integrated into the project budgets, commensurate with the scale of the project.

While the City of Toronto and its partners currently collect some data related to streets and the transportation system, more often than not, there would be a need for project-specific qualitative and quantitative data for "before" and "after" monitoring, such as:

- Volumes of pedestrians, cyclists, transit passengers and vehicles (at intersections and mid-block)
- Collision data and observational data (e.g. conflict and near misses) for motor vehicles, pedestrians and cyclists
- Motor vehicle speeds
- Transit and motor vehicle travel times
- Provision of new infrastructure (e.g. length and type of new sidewalks, bike facilities, transit priority measures, street trees or landscaping, street furniture, parking supply (on- and off-street)
- Use of public space (e.g. observation studies, surveys or safety audits)
- Socio-economic data (e.g. mix of land uses, employment data, café permits, vacancy rates, etc.)
- Environmental and public health benefits (e.g. tree cover)
- Photographs and visuals to demonstrate the changes in the street design

3.3 EXCEPTIONS

This section addresses the issue of exceptions and the need for professional judgment by practitioners in using the latest best practices in their field.

As noted earlier, implementing Toronto's Complete Streets vision and goals is the responsibility of all staff involved in street projects. If the street design team believes that an exception to applying the Complete Streets Guidelines is warranted, they must document the rationale at each stage of project planning and design, and where conflicts arise, seek approval from senior management.

Documentation should include:

- A description and schematic diagram of the recommended street design, including e.g. right-of-way width, proposed cross section and/or plan view, and photos of the existing conditions and graphics that illustrate the desired condition
- Explanation for the requested exception and details on why the desired condition is a better solution to achieving the City's objectives and outline these stated objectives
- Description of the street context and how the desired condition serves the existing and future uses and users of the street
- Description of how the desired condition satisfies the City's plans and policies (e.g. Official Plan, network plans, master plans, City's design guidelines, etc.)