hastings corridor individual design

hastings street design

ning han

crossgrain masterplan : hastings corridor individual design

sustainable urbanism : the hastings corridor

ubc urban studio : fall 2008

Hastings Street Design

The Hastings Street Corridor in Burnaby

Date: December 2nd, 2008
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ubc urban studio : fall 2008

sites

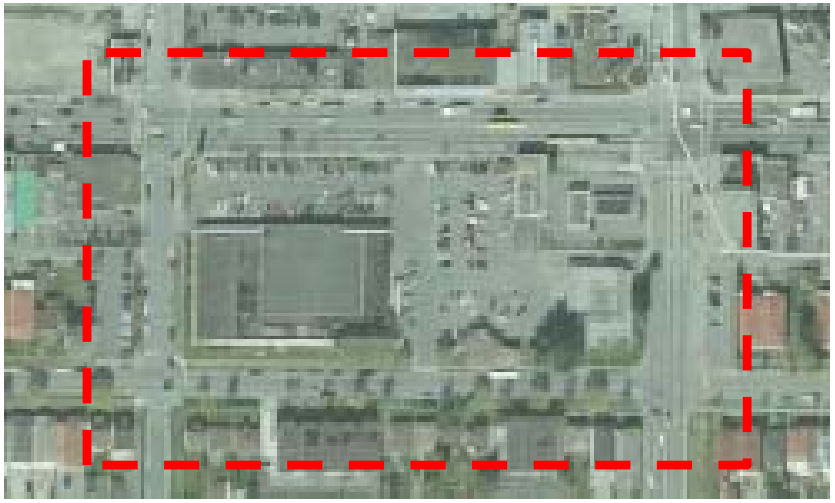
This project is street design in next 10 to 50 year for Burnaby.
Study site is four blocks area located in Vancouver Heights, Burnaby, bounded by Gilmore Ave, Willington Ave, Pandora street and Frances street.

The idea is to make four blocks as one unit. Create a template to use alone Hastings corridors in Vancouver Heights.

Design area is one block, bounded by Hastings street, Willington Ave, Pender street and Rosser Ave.

Study site

Design site



research

Movement is a major part in this research. Other researches including infrastructure and open spaces are secondary research part to aid to understand the whole systems.

Site issues

There are many issues on site. The following issues are identified from categories of movement, infrastructure and open spaces.

➢Less movement connection between north area and south area:
Most trips concrete on east and west orientation. There are not a strong link between north and south area. In addition, transit systems also are not strong connection between north and south.

➢"Highway" feeling streets:
The High Occupancy Vehicle (HOV) lanes on arterial roads in Burnaby to accommodate HOV vehicles is intended to promote transit use, encouraging commuters to carry more people in private vehicles and reducing the travel time for buses and carpools. However, during rush hours, parking lanes are replaced by HOV. The cars and busses move between 50 and 65kpm, thus creating an unsafe feeling "freeway" atmosphere on the sidewalks.

➢Unsafe movement for pedestrian:
There are no planting strips between sidewalk and street. Thus, when parking lanes are replaced by HOV, Hastings Street and Willington Ave is not the pedestrian friendly street. Only few people walk along the major commercial corridor.

➢Disconnected cycling systems:
This street system is no comprehensive alternative system for moving pedestrians and bicycles. There are no connected cycling systems, especially in north to south orientation. Bike routes only along quiet residential streets, thus it is not safe and easy for cyclists to access the commercial area.

Site issues

➢ Long blocks isolated pedestrian access:
Block sizes on site are typically 155m in length. There are no pedestrian access points for residents so that it creates the unfriendly atmosphere and inconvenience for pedestrian, especially senior people, to access to the commercial area and transit services.

➢Unpleasant shopping atmosphere:
Shop owners on Hastings Street notice a significant decline in business at rush hour. Dust, noise and no barriers for pedestrian safety obstruct people shopping in this area.

➢Gray, traditional and engineering stormwater infrastructure on right of way:
Roads and parking lots covered by impervious pavement generate large amount of runoff. Additionally, traditional trenches and curbs are used along all streets and they do not provide any treatment for stormwater, thus all runoff flow into the stream system directly. It seriously decreases water quality as well as damage the stream habitat.

➢Fragment of open spaces:
Open spaces are fragile on whole Burnaby. It does not perform a good and effective function on stormwater management, species migration and human recreation.

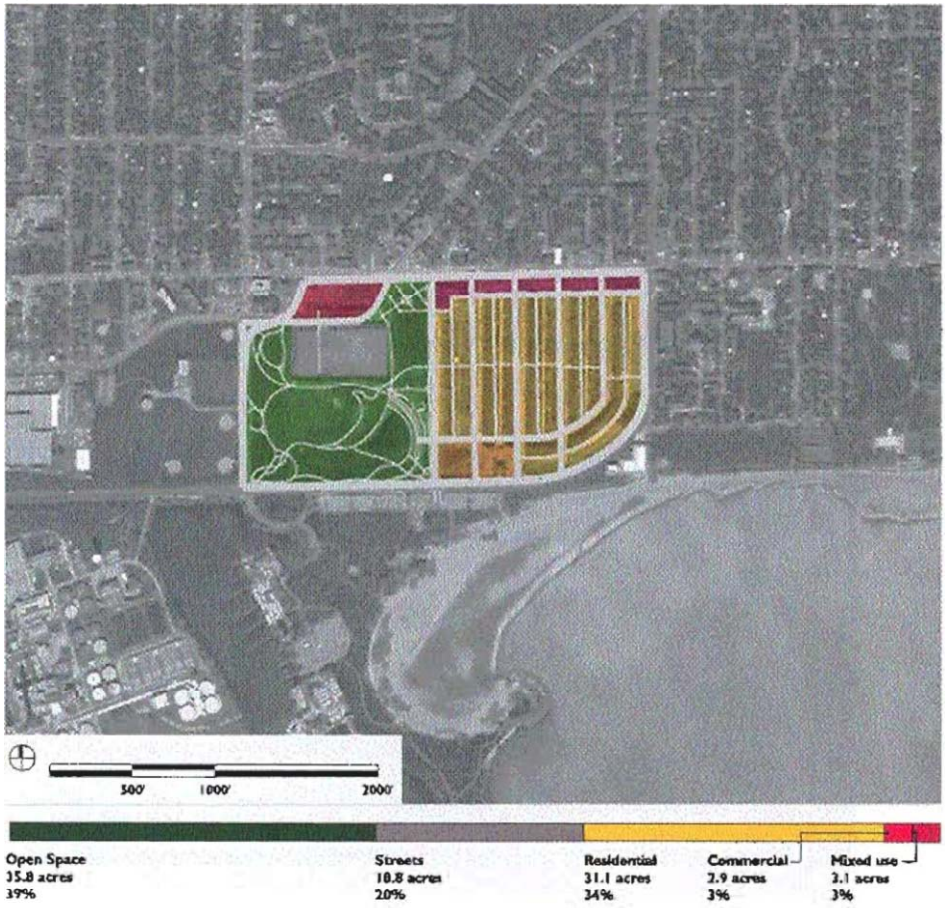
➢Streets provide single function:
Streets on site only provide the movement function. There are no recreation and gathering function for public.

➢No attractive characteristics on streets
Streets are less aesthetic consideration. As the major commercial street, Hastings Street is short of beautiful feature, building and site furniture to encourage pedestrian walking. Streetscape on Willington Ave is not pretty and attractive too. Actually, Willington Ave has a large opportunity to provide a unique view and characteristics since it directly connect to the waterfront.

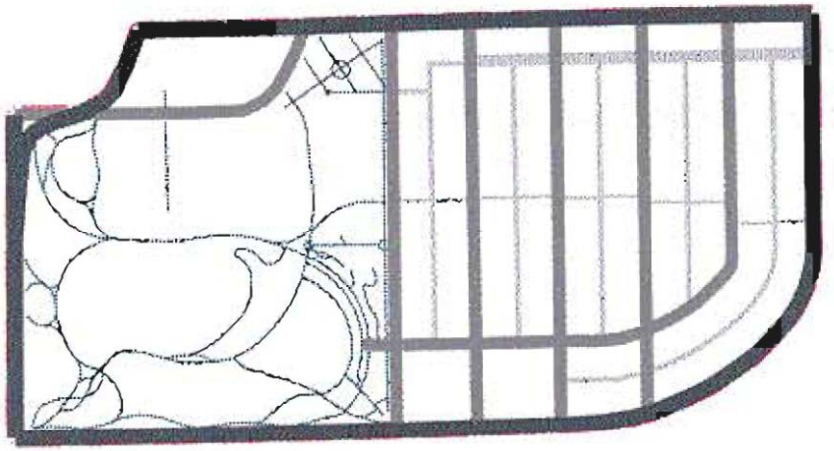
precedent studies

The Beach, Toronto

The breach, redevelopment of the Greenwood Racetrack, is a new neighborhoos and park located within the city of Toronto, Canada. Roughly half of site has been redeveloped as a park and the other half is the residential neighourhood. Streets extend the existing grid from Queen street to Lakeshore Boulevard. An east-west pedestrian path provides access to the park. Mixed-use buildings with commercial at grade and condominium housing above, line Queen street.



The breach plan



The beach's street network

Collector streets at the commercial edges

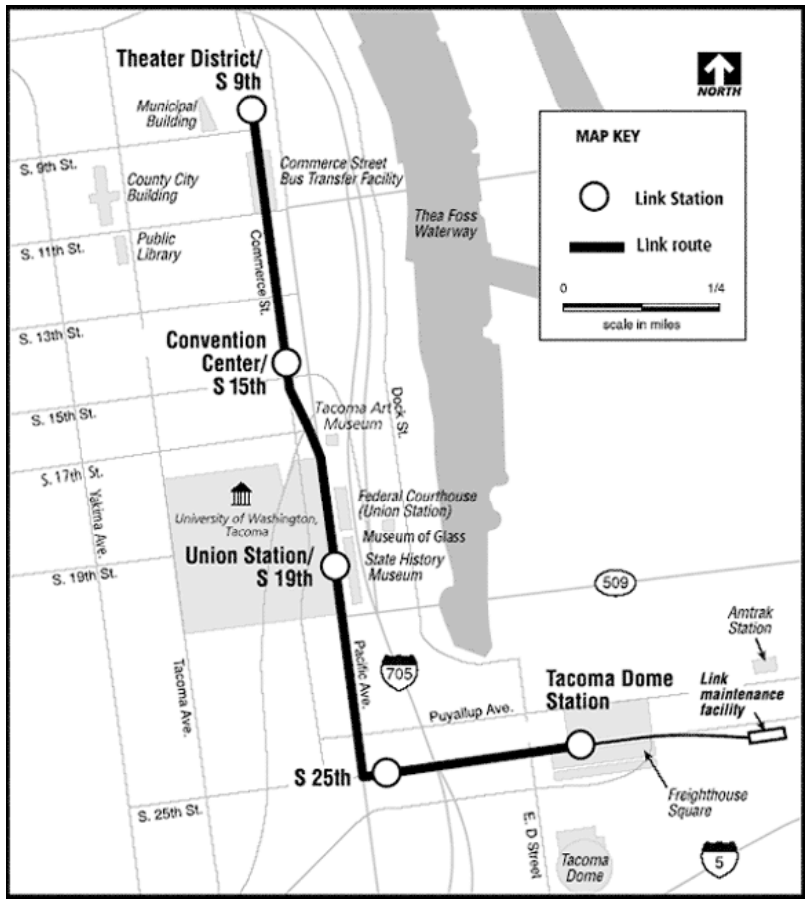
Streetcar routes along Queen Street

East-west midblock paths between buildings

precedent studies

Tacoma, Washington

Tacoma's modern streetcar system opened in 2003, connecting the Tacoma Dome station (a regional bus and commuter rail hub) with Downtown Tacoma. This relatively short line does not charge a fare and provides service on ten minute headways throughout most of the day. The fast, convenient service attracted almost 900,000 riders in 2006. 2008 projections are for 955,000 riders (*source: Sound Transit*).

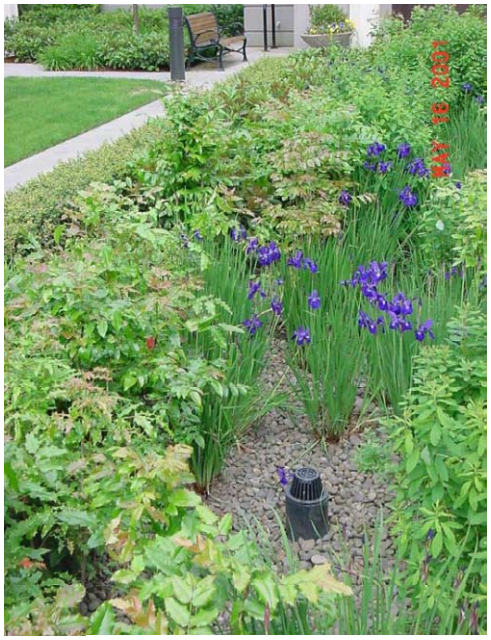


Tacoma streetcar plan

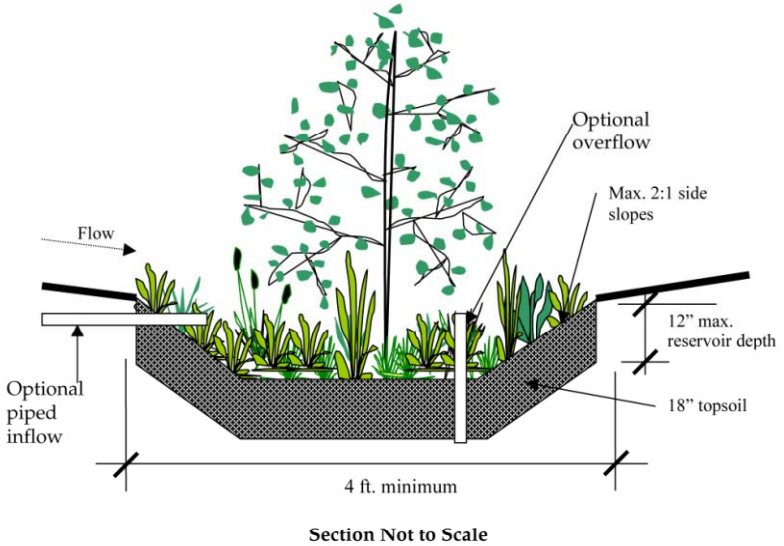
The "platforms" for the Convention Center station on Commerce St. are located on the sidewalks.

precedent studies

Buckman Heights Apartments, Portland



A redevelopment project in the combined sewer area designed in 1996 and opened in 1998. The buildings are organized around a main courtyard; the traditional layout is articulated with low seating walls off the sidewalk and two large planting beds designed as landscape infiltration areas to filter and absorb the storm water from the building's downspouts. The parking areas are designed with care and detail to reduce the presence of the automobile and absorb the water runoff from the paved surface.



Landscape Infiltration Planters

goal & objectives

Goals:
Create efficient, accessible, sustainable and livable streets for communities

Objectives:
•Provide the efficient street network for car, transit, bike and pedestrian movement. (movement)

•Provide the pedestrian and bike friendly streets for the community and promote safety for both. (movement)

•Provide streets as multiple uses.

•Restore and conserve the natural process and functions. Mitigate the impact of streets runoff on water quality and quantity to enhance local watershed health and Treat stormwater as a resource not a hazard. (Green infrastructure)

•Preserve local open spaces and habitat. (Green Network)

•Create unique and attractive streetscapes to protect and enhance livability for commercial and residential. (Street as amenity)

principles

Movement

➢Interconnected street systems:
- Provide good accessibility and connectivity for Hastings Street with adjacent streets to reduce number and length of automobile trips and enhance walking, biking and transit use. Create north area and south area connection

➢Reduce traffic volume on hasting street:
Using adjacent collectors to relieve traffic volume from Hasting street.

➢Reduce traffic speed:
- using traffic claim and traffic lights to reduce the speed of traffic to provide safety and walkability for pedestrian and pleasure shopping atmosphere as well as reduce noise on hasting street.

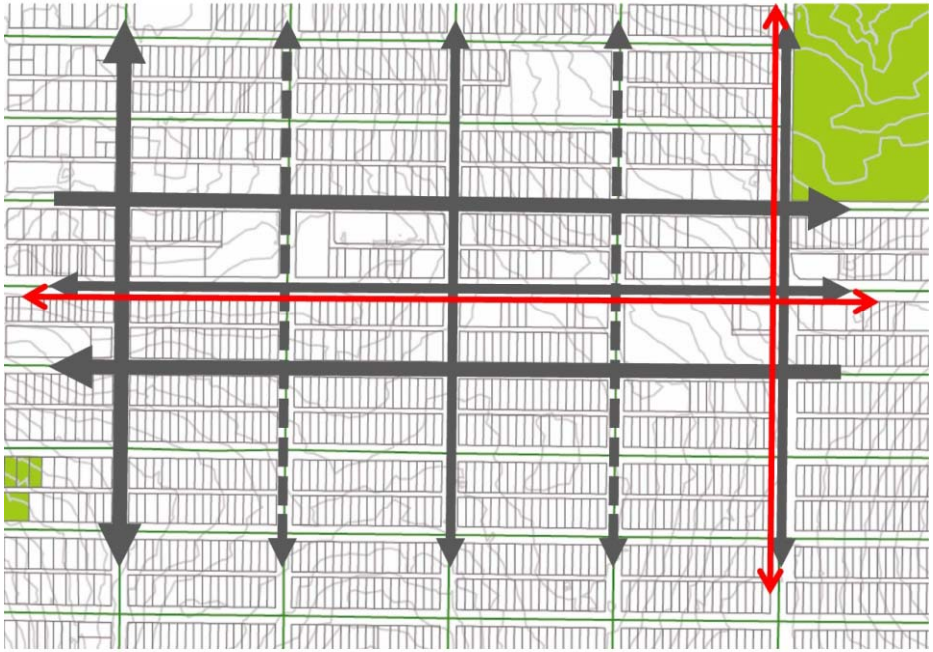
➢Alternative transportation:
Provide multiply choice of transportation for all kinds of trips.
- Transit routes (streetcars) alone the major commercial corridor and street. Reduce number of automobiles uses and trips and provide opportunities for residents to access services while enhance positive economy in local area.
- Shared uses for streetcars and traffic.

➢Pedestrian and biking friendly streets:
- Continuous, well-connected, and accessible sidewalks and bicycle lanes provide linkage for residents with service they need.
- Major pedestrian routes located alone primary commercial corridor and streets.
- Low-volume local streets are replaced as Queuing streets to reduce traffic speeds and area of impermeable pavement and enhance pedestrian walking and bike uses.
- Subdivide blocks by providing north- south oriented midblock paths to invite residents and cycling to Hasting Street.

➢Improve pedestrian and bike safety:
- Increase physical buffers exist, such as planting stripe and lines of parked cars between and the sidewalk.
- Bike routes are located on the One-way collectors provide safety for bike movement.

principles

Automobile and transit movement



Primary car movement
Secondary car movement
Queuing street
Streetcar route

Bike and pedestrian movement

Bike route
Primary Pedestrian movement
Secondary Pedestrian movement

principles

Green networks:

Make streets as a park of green network and provide the connected green spaces to preserve habitat and provide recreation and movement function for residents, visitor and employees.

- Link green spaces (schools, parks, neighbourhood parks) with streets and paths to create continuous, well-connected green network
- Provide street trees for all type of streets.
- Easy to access green spaces.

Green Infrastructure and natural drainage systems:

Encourage stomwater accumulation, treatment and infiltration on street right of way and adjacent open space to minimize negative impact of runoff on habitat and improve water quality.

- involve green street designs solution into various types of street design. Provide detention, retention, infiltration and water quality treatment functions into the overall right of way. Solutions include Street trees, curbs, permeable pavements, planting strips swales, detention wells & trenches, bio-infiltration basin and tree wells.
- Adjacent pedestrian path can play a function of detention trenches to aid small runoff infiltration.
- Big open space and absorb large stormwater which is conveyed by the swale.
- select proper native vegetations for streets.

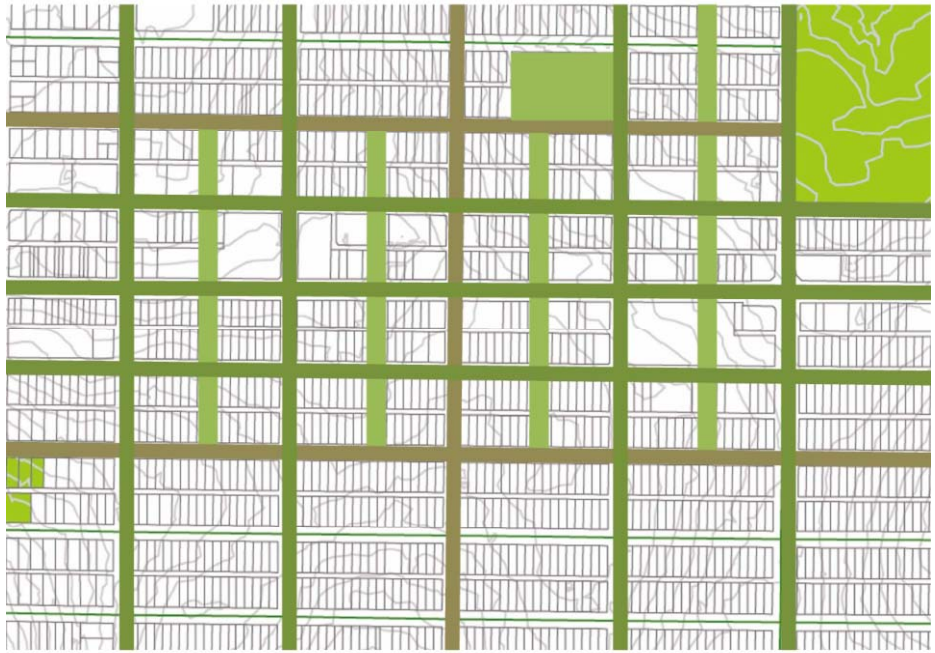
Streets as amenities:

Streetscapes with attractive feature and unique characters protect and enhance livability for commercial and residential. Streets involve recreation functions.

- Midblock paths can play multiple uses, such as pedestrian movement, stormwater infiltration and recreation.
- Consider new commercial and mix-use commercial building setback for rest and eating place.
- Incorporate existing street furniture to create attractive and functional site furnitures for people use.
- Create aesthetic green street elements.

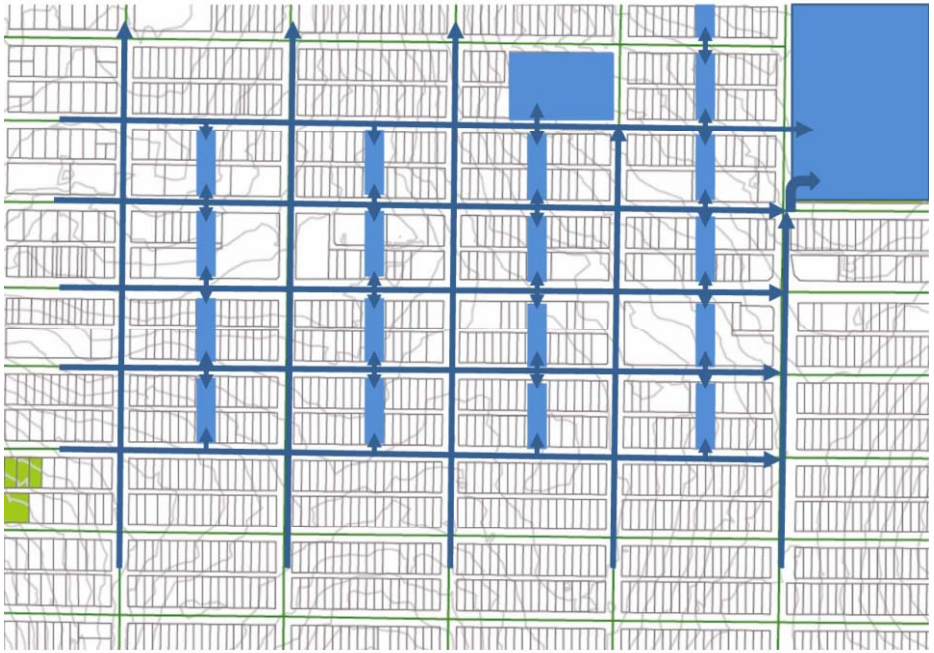
principles

Green network



Green streets
Streets with street trees
Open space

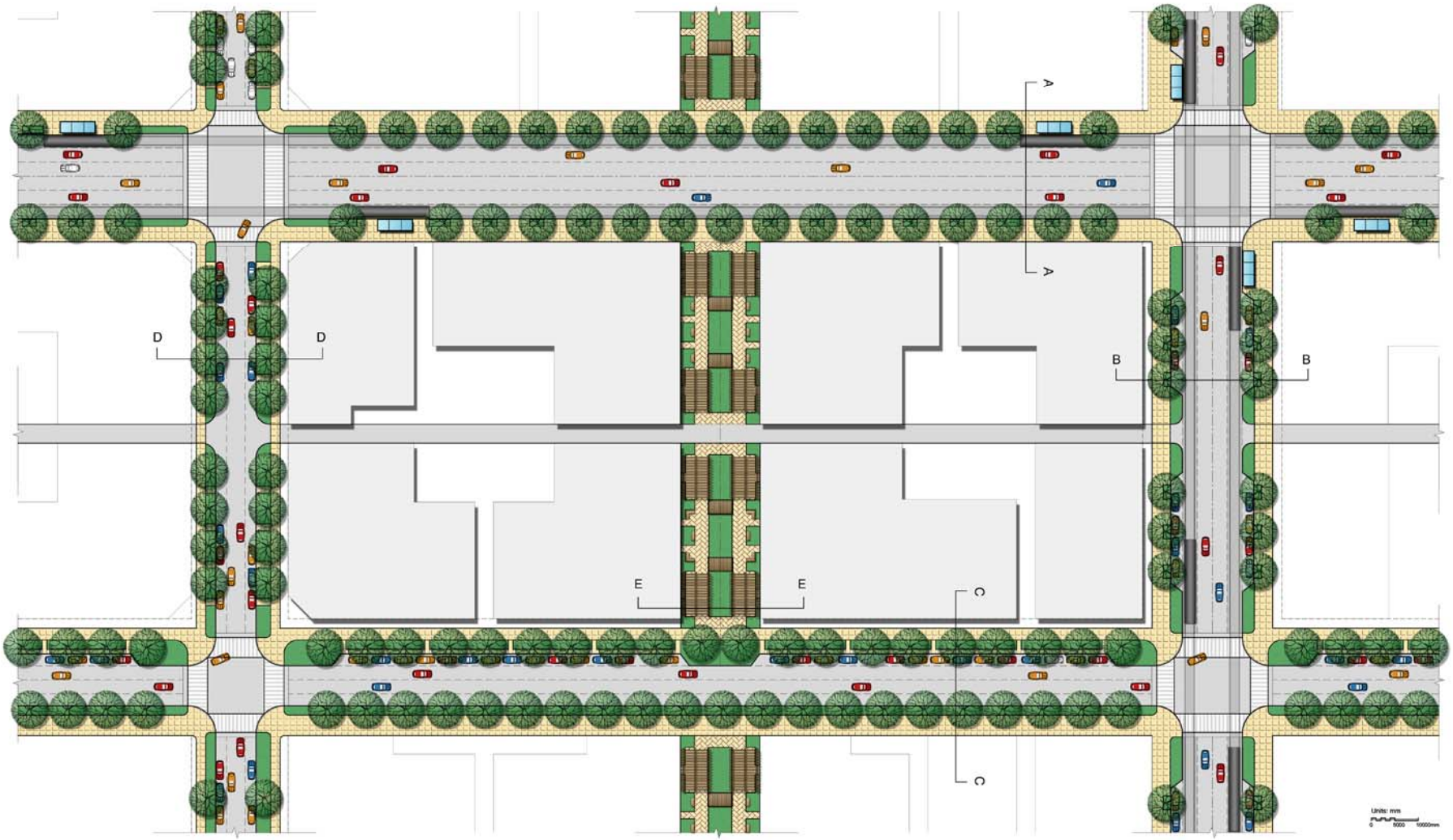
Green infrastructure



Runoff direction
Infiltration basins

streets master plan

Hastings street & Willington Ave master plan

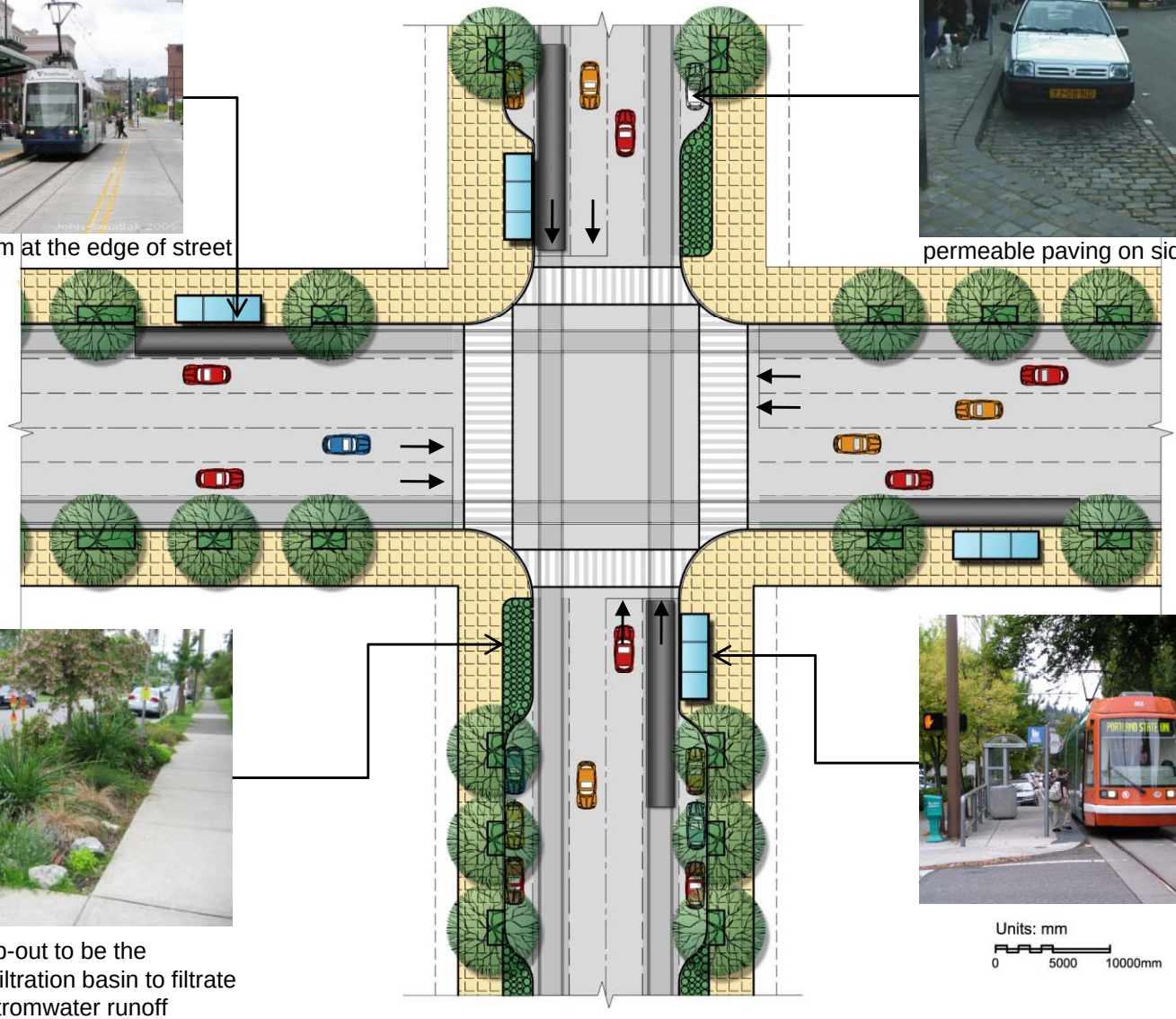


streets intersections

Hastings street & Willington Ave intersection

Streetcar platform at the edge of street

permeable paving on sidewalk and on-street parking



Using the bump-out to be the landscaping infiltration basin to filtrate and infiltrate stromwater runoff

Units: mm

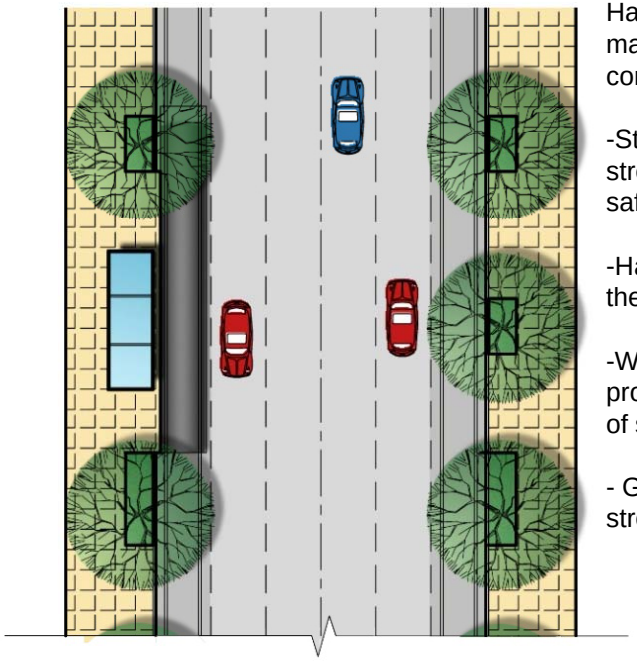
0 5000 10000mm

Streetcar platform at the bump-out

streets topology

arterial

Hastings street



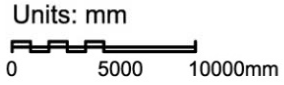
Hastings Street and Willington Ave are major arterials and major commercial corridors.

-Streetcars are provided on both side of street edge to encourage the pedestrian safety.

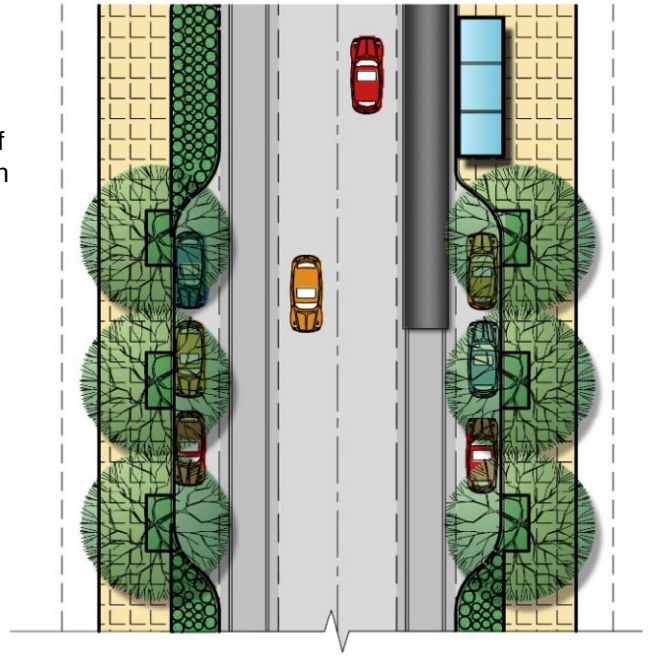
-Hastings street has 4 traffic lanes on the middle, and no on-street parking .

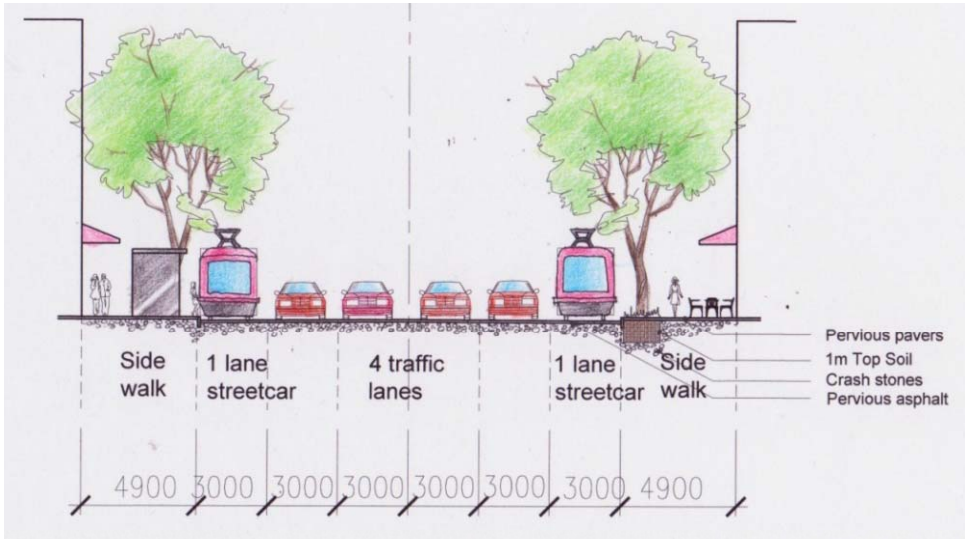
-Willington Ave has 2 traffic lanes and provides on-street parking on both side of street .

- Green infrastructure is used to do stromwater management on the street.

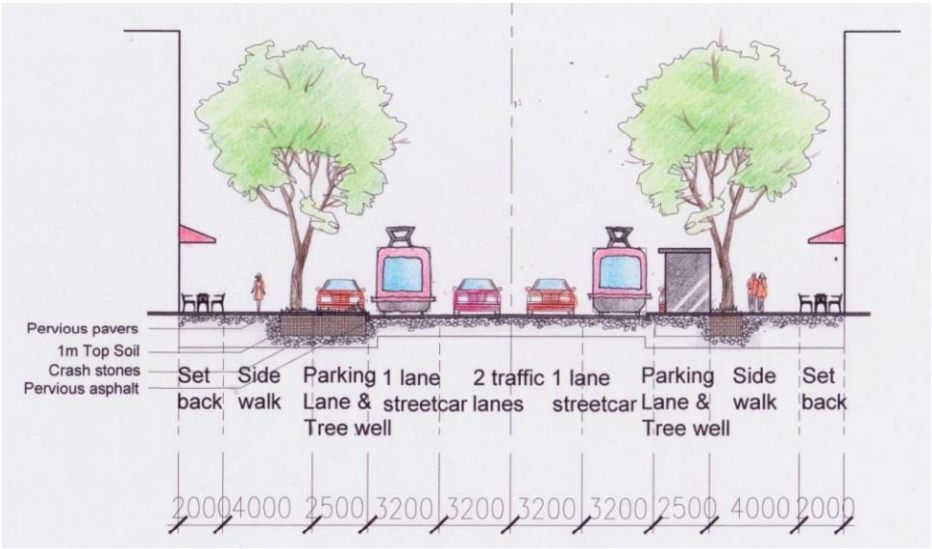


Willington Ave





A - A section



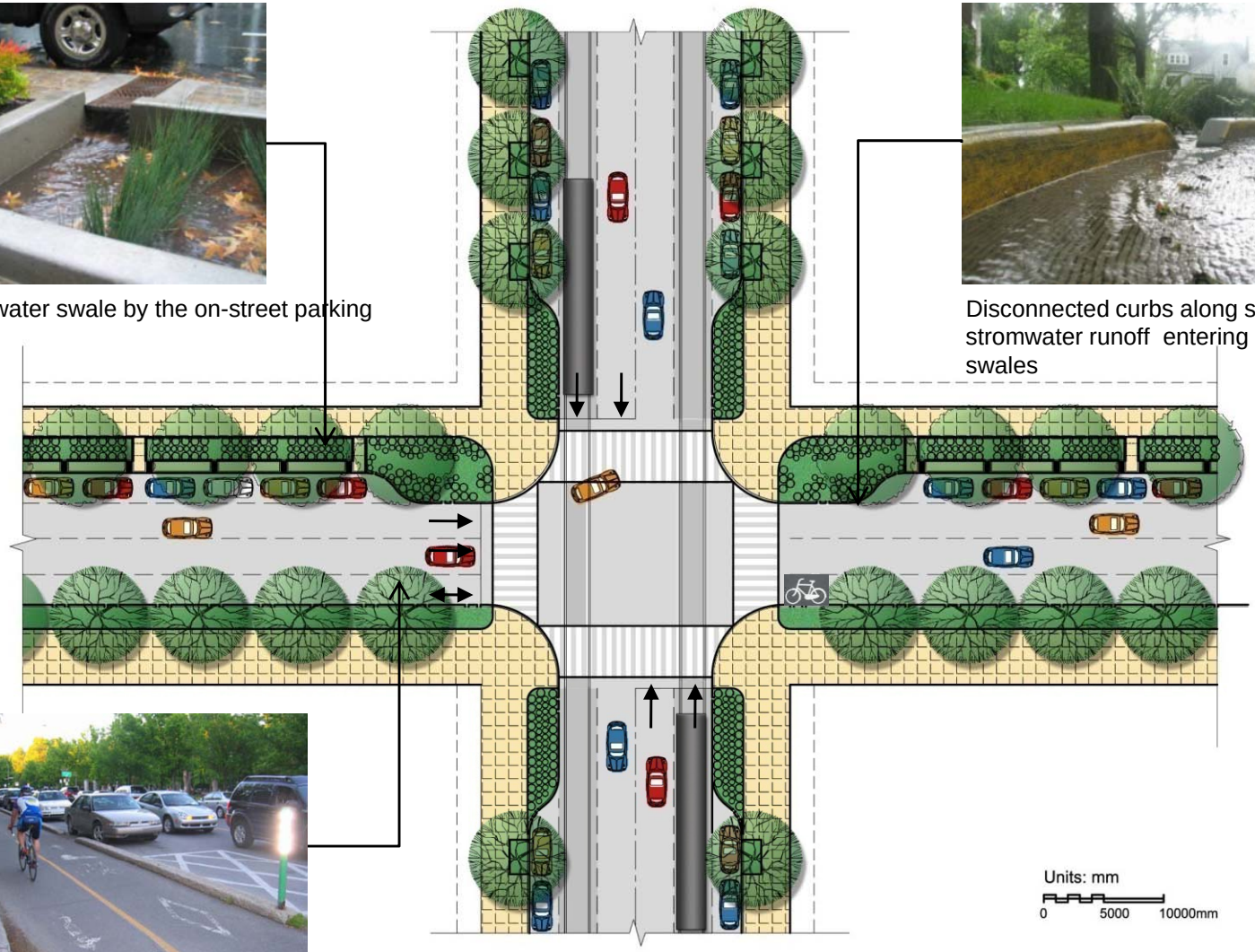
B - B section

streets intersections

Willington Ave & Pender street intersection

The stromwater swale by the on-street parking

Disconnected curbs along streets allow stromwater runoff entering landscaping swales



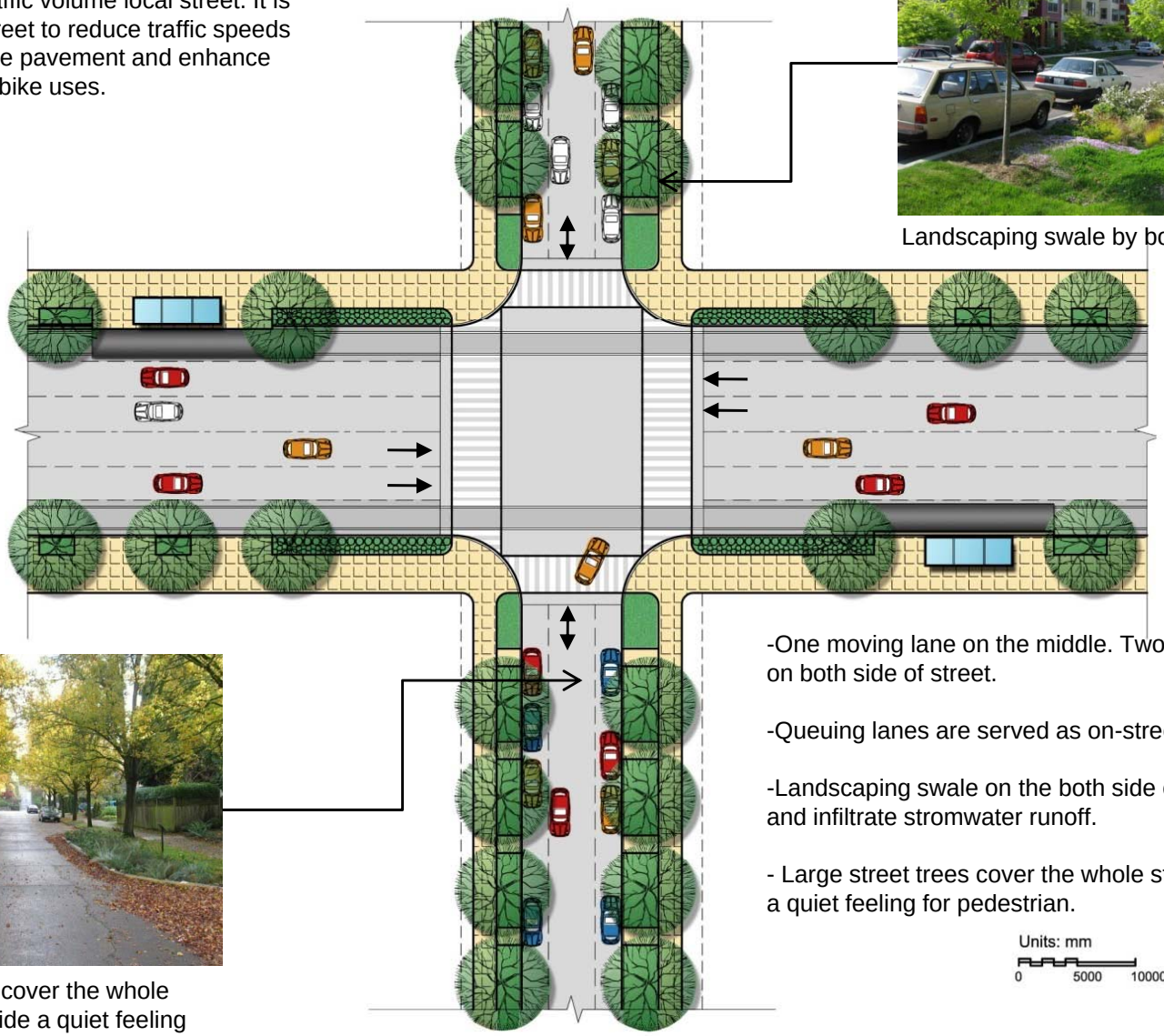
Two- way bike lane on Pender street

streets intersections

Hastings street & Rosser Ave intersection

Rosser Street is low- traffic volume local street. It is designed as queuing street to reduce traffic speeds and area of impermeable pavement and enhance pedestrian walking and bike uses.

Landscaping swale by both side of on-street parking



Large street trees cover the whole street so that provide a quiet feeling for pedestrian.

-One moving lane on the middle. Two queuing lanes are on both side of street.

-Queuing lanes are served as on-street parking

-Landscaping swale on the both side of street to convey and infiltrate stromwater runoff.

- Large street trees cover the whole street so that provide a quiet feeling for pedestrian.

Units: mm

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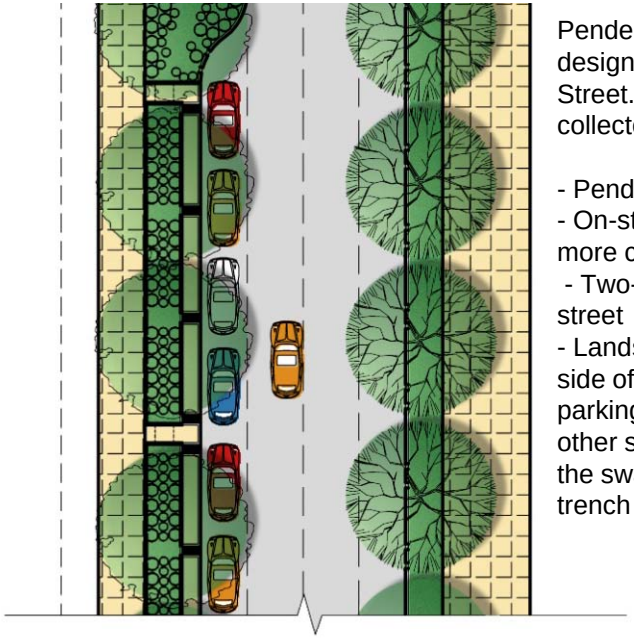
streets topology

collector Pender street



Pender Street is one-way corrector. It is designed to relieve traffic volume from Hastings Street. Bike routes are located on this one-way collector provide safety for bike movement.

- Pender street has two one-way traffic lanes
- On-street parking on one side where have more commercial opportunity
- Two- way bike lane is provided on Pender street
- Landscaping swales are designed on the both side of street. Solutions of swale by on-street parking are different from these of swale on the other side. Parking egress zone are set beside the swale. 12” Curb cut with the ornamental trench grate convey runoff into the swale

Units: mm

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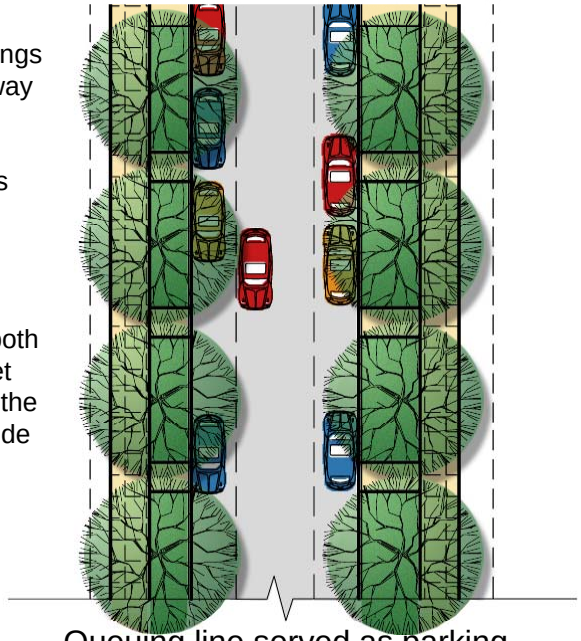
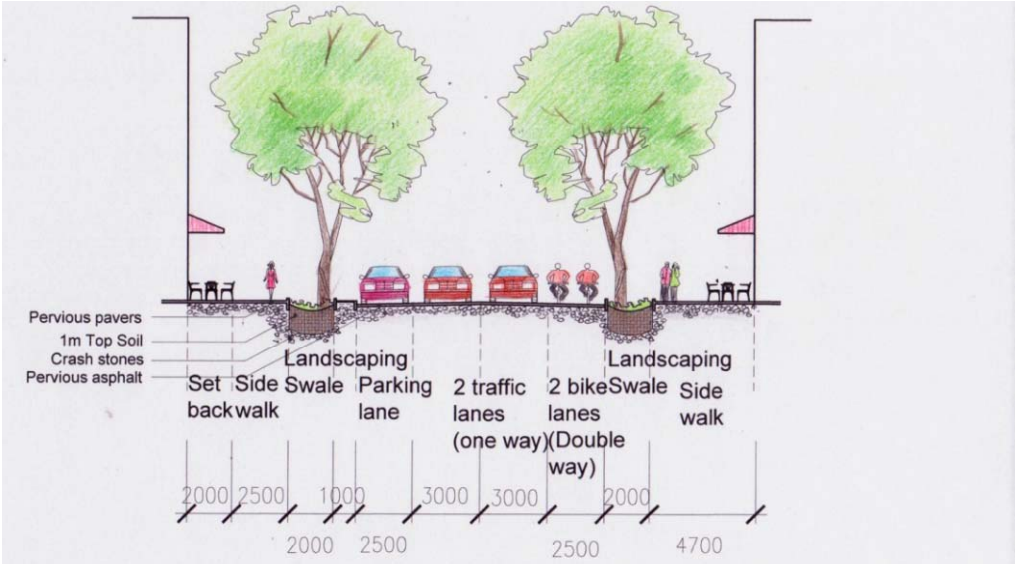
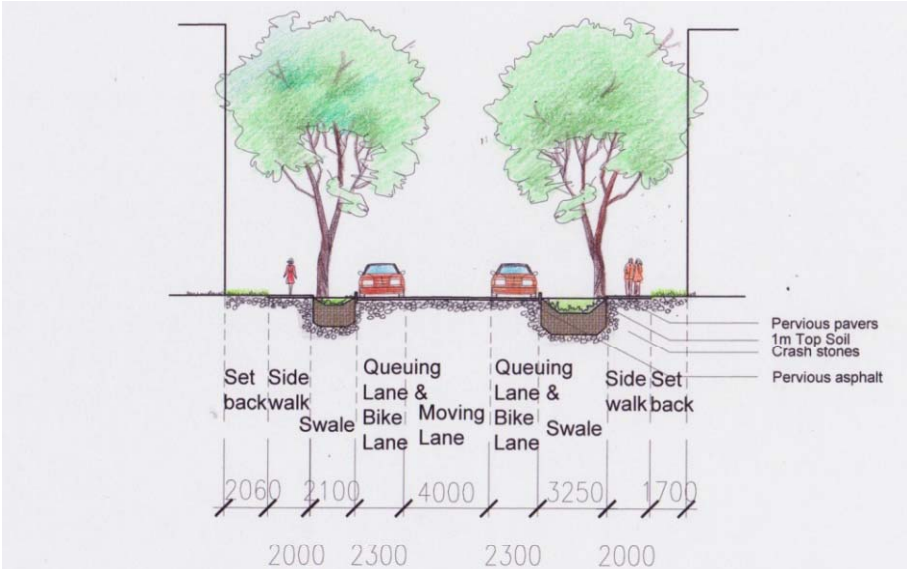
local street Rosser Ave



Queuing line served as parking



C- C section



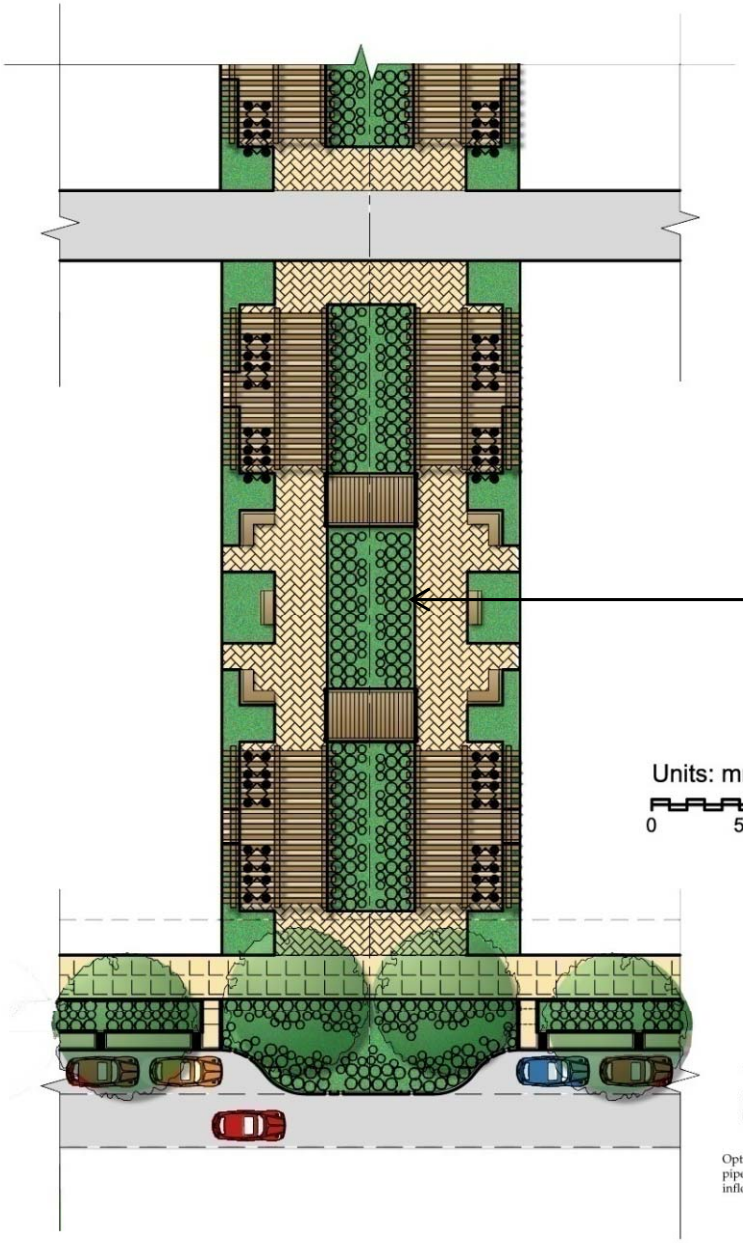
D- D section

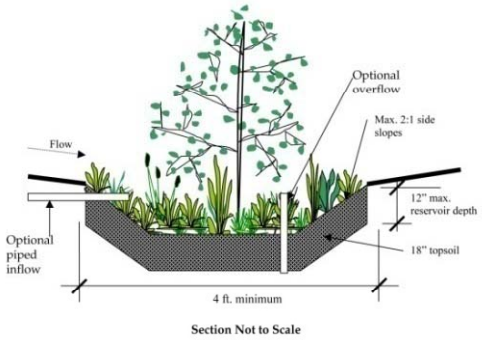
streets intersections

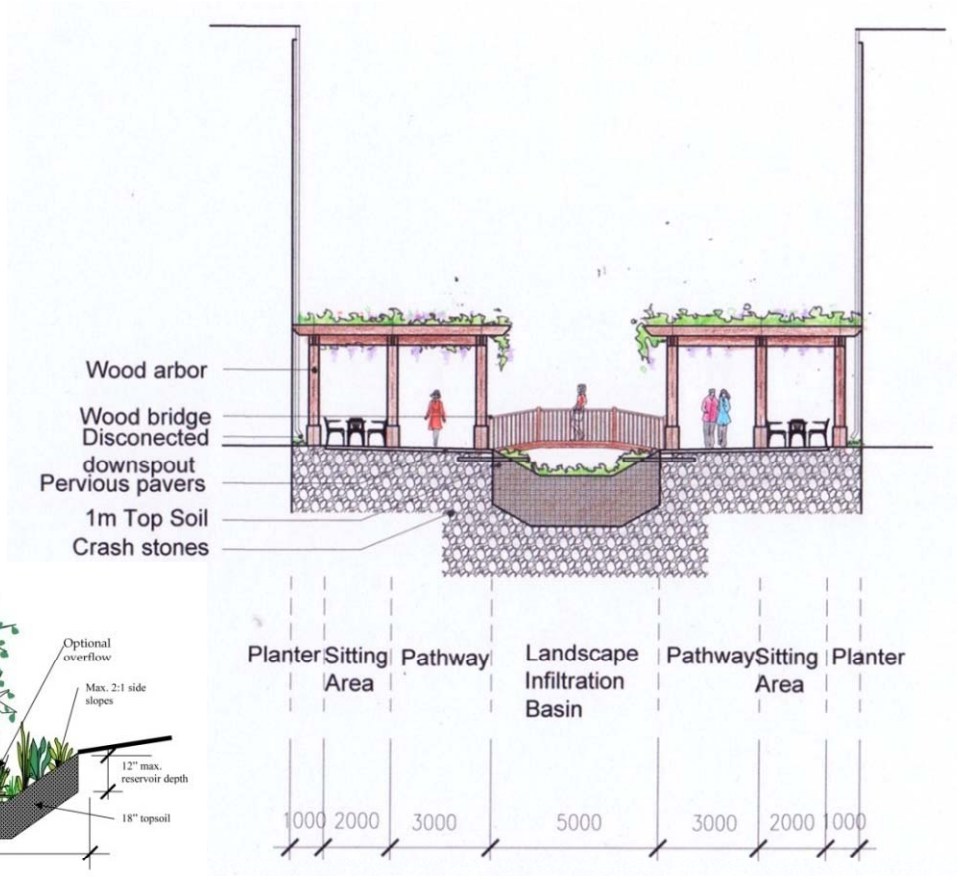
Midblock pedestrian path

Major function of midblock is to invite residents to Hasting Street. It also performs shopping, recreation and stormwater infiltration functions.

- Two paths are for pedestrian movement and two bridge connect both paths
- Commercial activity provide on this area. Restaurants set on the corner. Store access on the middle.
- Eating area and outdoor café are at the edge of building. Sitting area is out of the store.
- Infiltration basins are on the middle to treat small stromwater runoff which is conveyed from the street.
- Downspouts are disconnected with traditional trenches and make rain water infiltrate into the planter.
- Wood is major material of structure to reduce the cost and infiltrate the rainwater.







E- E section

streets perspectives

Hastings street

Streetscape of Hastings Street is proposed to be modern style. Major commercial activity is shopping.

streets perspectives

Willington Ave

Willington Ave is special area in Burnaby. It own unique characteristics and views because it directly connect to the waterfront. Thus, streetscape of Willington Ave is proposed to be historical or town feeling style. Use warm color to provide the friendly and lovely atmosphere for walking, sitting and eating. Major commercial activity is the catering business. More restaurants are involved in this street.

Midblock pedestrian path

Arbores with creepers irrigated by the rainwater from disconnected downspouts are located on the head of pedestrian paths and eating areas. Wood bridges are cross the pretty landscaping infiltration basin. Midblock pedestrian path is a sweet, peaceful and neat small space for pedestrian to meeting, walking, eating and shopping. Additionally, besides the aesthetic and environmental function, it also provides an education function for public about the sustainable knowledge.

conclusions

Hastings street redevelopment is a challenge project. Making design principles and solutions do not only consider Hastings street condition but integration of adjacent streets networks. Hastings Street and adjacent streets can be segregated into distinguished part and make different solutions and treatments in terms of different situation and characteristics. Thus, this project is base on street condition and characterises at the part of Vancouver heights district.

The project is to provide the transit and pedestrian oriented street network as well as tend to create pedestrian and bike friendly streets. In addition, it also focuses on mitigating impact of streets on environment as well as providing multiple uses on street while attractive and unique streetscapes for public to enhance liveability.

Redeveloped Hastings Street with good accessibility and connectivity will perform more benefits on enhance walking, biking and transit use. Relieve a part of traffic volume from Hasting street to adjacent collectors and reduce traffic speed promote safety and walkability for pedestrian and pleasure shopping atmosphere. Using street car along the Hastings street and Willington Ave reduce number of automobiles trips, provide opportunities for residents to access services, enhance positive economy in local area and strengthen the linkage between north and south district. Midblock paths, queuing street and interconnected bike route create pedestrian and biking friendly streets. Green infrastructure and natural drainage systems on street right of way and adjacent open space minimize negative impact of runoff on habitat and improve water quality. Linked green space and streets provide recreation and movement function for residents, visitor and employees. Unique characteristics of street encourage public to access and provide attractive features for city of Burnaby.