

Light rail

Principles

- | | |
|------|---|
| 1.01 | Create a legible and functional transport route |
| 1.02 | Maintain all private property and delivery access |
| 1.03 | Create a safe shared environment for light rail and pedestrians |
| 1.04 | Minimise the visual impact of light rail infrastructure |

**220 buses an hour
will be relocated
from George Street**

Network

Strategy

The Transport Network

Light rail will complement Sydney’s existing mix of private and public transport.

The George Street light rail spine is a key part of a wider network, giving passengers from areas such as Kensington, UNSW and the SCG direct access to the heart of Sydney. It will also connect our major hotels to Circular Quay, and to the new Sydney Convention and Exhibition Centre.

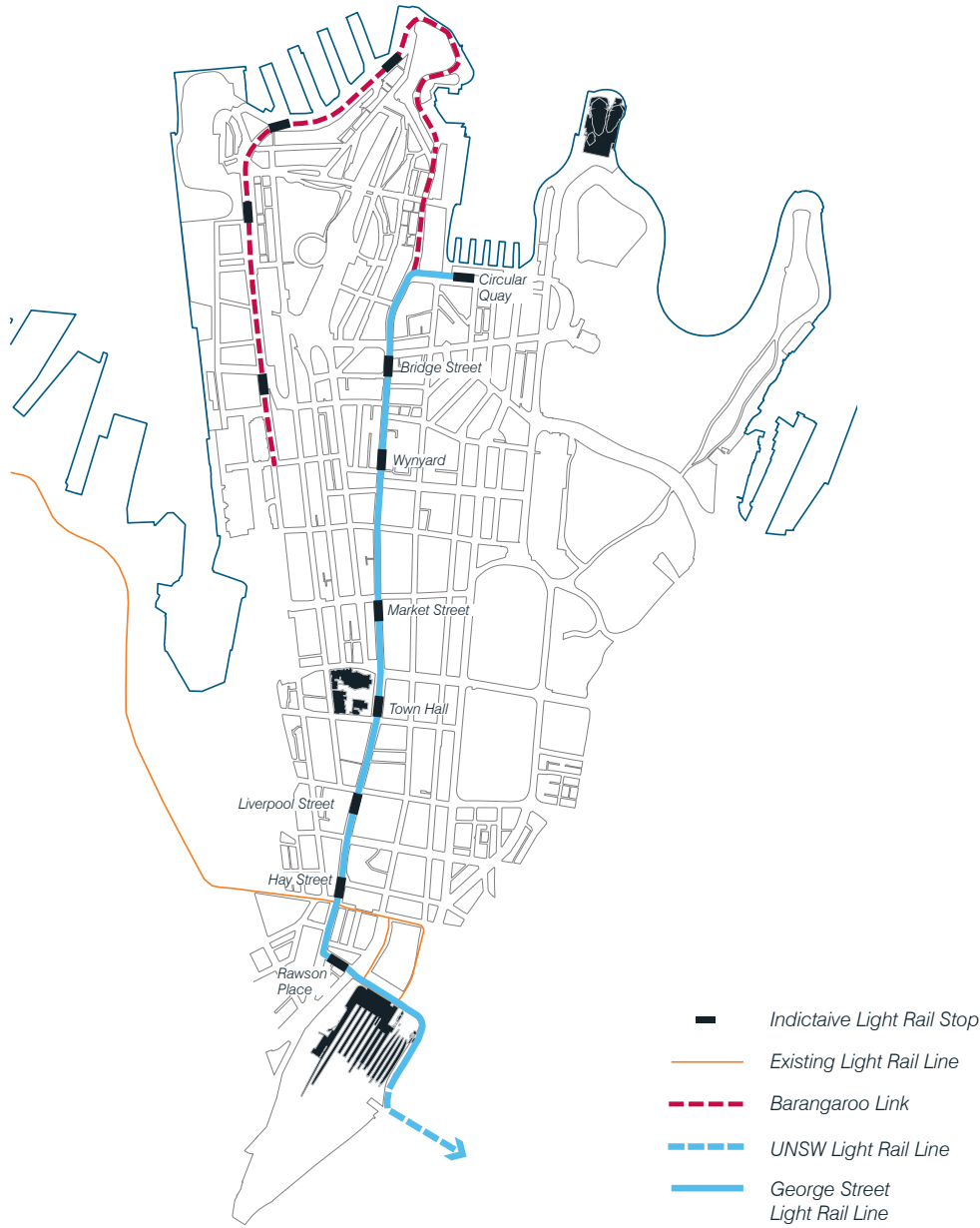
Taxi ranks will be located close to intersections to ensure that people who choose this mode are not disadvantaged.

As the coordinating body for public transport, TfNSW is developing plans for an improved bus network integrated with light rail. Road changes will also be planned to maintain an efficient City Centre traffic network.

Detail

City Centre route

The planned light rail corridor joins George Street at Rawson Place and continues through to Alfred Street in Circular Quay, where the service will terminate and return southwards. Crossovers along the route allow for vehicle turnback if required. This route is ideal in that it connects the key precincts of the City Centre, aligns with interchange opportunities and maximises the access to transport choice.



Stop locations

The proposed stop locations are:

- Rawson Place
- Hay Street
- Liverpool Street
- Town Hall
- Market Street
- Wynyard
- Bridge Street
- Circular Quay

TfNSW will finalise the stop locations in consultation with the City.

Barangaroo link

A link to Barangaroo via Millers Point and Walsh Bay will serve a key tourism and cultural precinct, and help connect Barangaroo and the Headland Park to Circular Quay. While the NSW Government has indicated that it does not consider the Barangaroo light rail link a priority, the City continues to support the project as part of its Sustainable Sydney 2030 vision.

Pedestrianisation

Strategy

Pedestrians and Light Rail

Light rail is critical to the idea of a thriving pedestrian boulevard. An efficient and accessible transport system can provide activity and connectivity along the the street. The City’s vision is that George Street will be closed to traffic between Liverpool and Bridge Street, eliminating kerbs and creating a continuous paving surface free from cars and noisy buses. (See note below on extent).

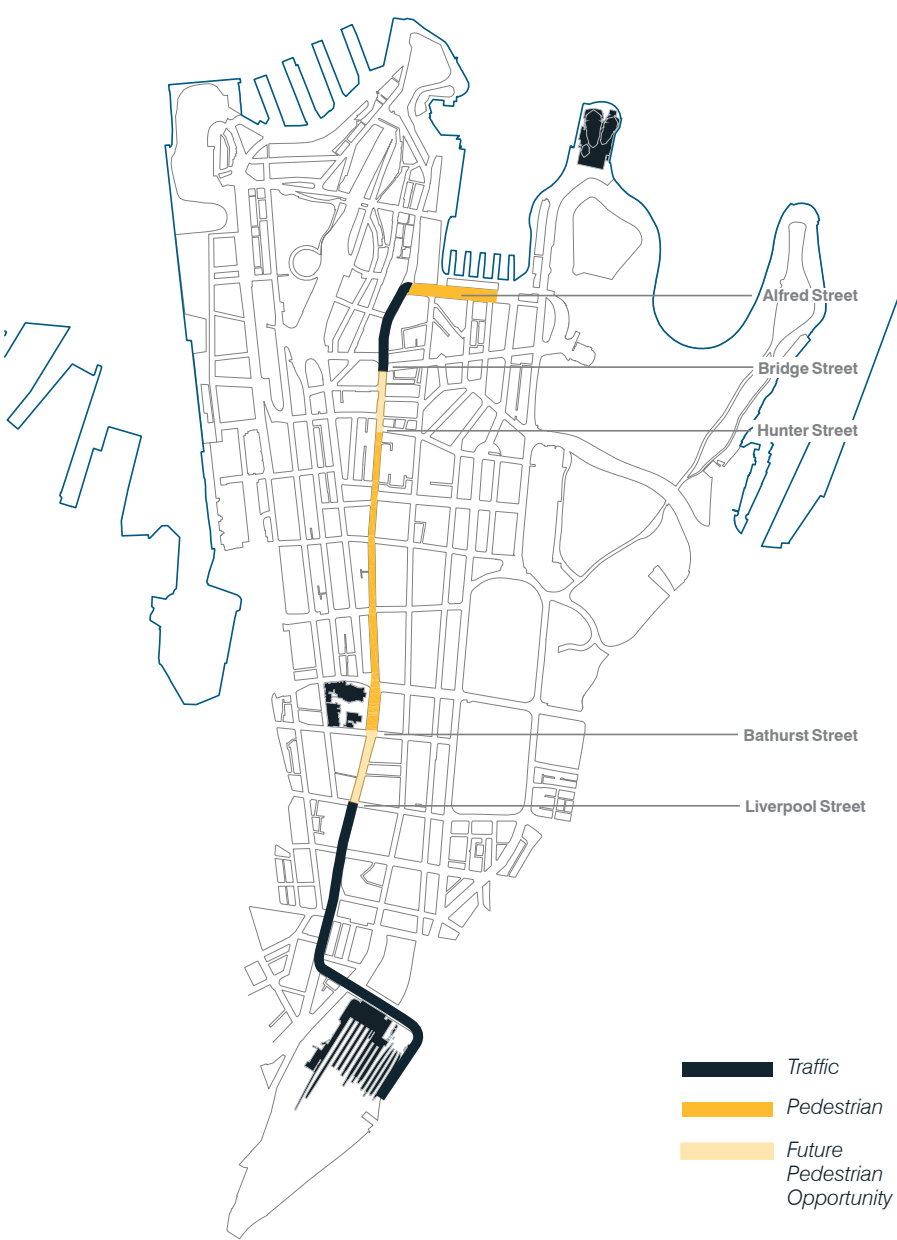
This idea preserves alternative north-south traffic routes (e.g. Kent St), maintains the efficiency of traffic flows in the northern part of the City, and passes by only six building driveways, all of which will remain accessible.

Pedestrianisation will help alleviate footpath congestion and will allow George Street to transform into a place for outdoor dining, late night shopping, art and culture.

Detail

Extent

TfNSW propose pedestrianisation of George Street from Bathurst to Hunter Streets. The City advocates an extension of this area from Liverpool to Bridge Streets but notes that this is not included in the project’s current scope. The Concept Design requests that the State’s design does not preclude this from being achieved in the future.



Safety

Across the world, modern light rail often features in pedestrian squares and streets. The City is working with light rail experts and studying international examples to ensure that George Street is safe and attractive for pedestrians, and convenient and reliable for light rail passengers.

Footpath width

By international standards, the footpaths on George Street are narrow. Recent pedestrian counts and observations indicate that they are at capacity. It is important that the light rail project does not impact on this and the footpaths outside of the proposed pedestrian-only area should not be reduced in width.

Keeping the city open

Strategy

Driveways and deliveries

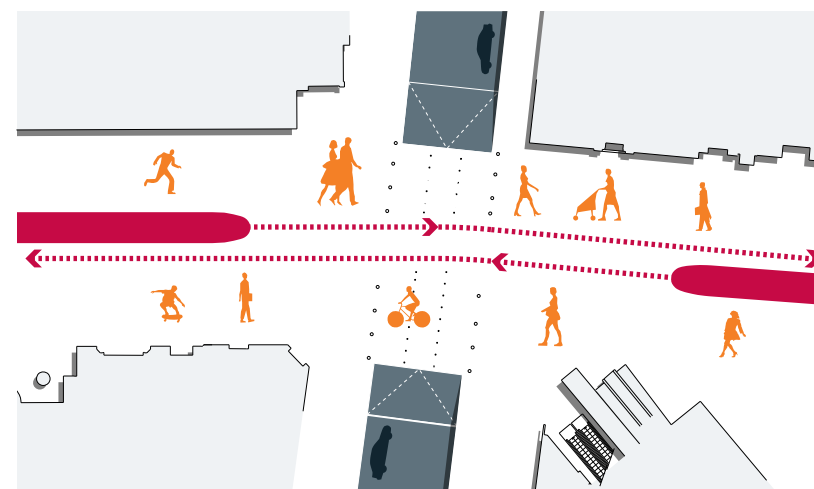
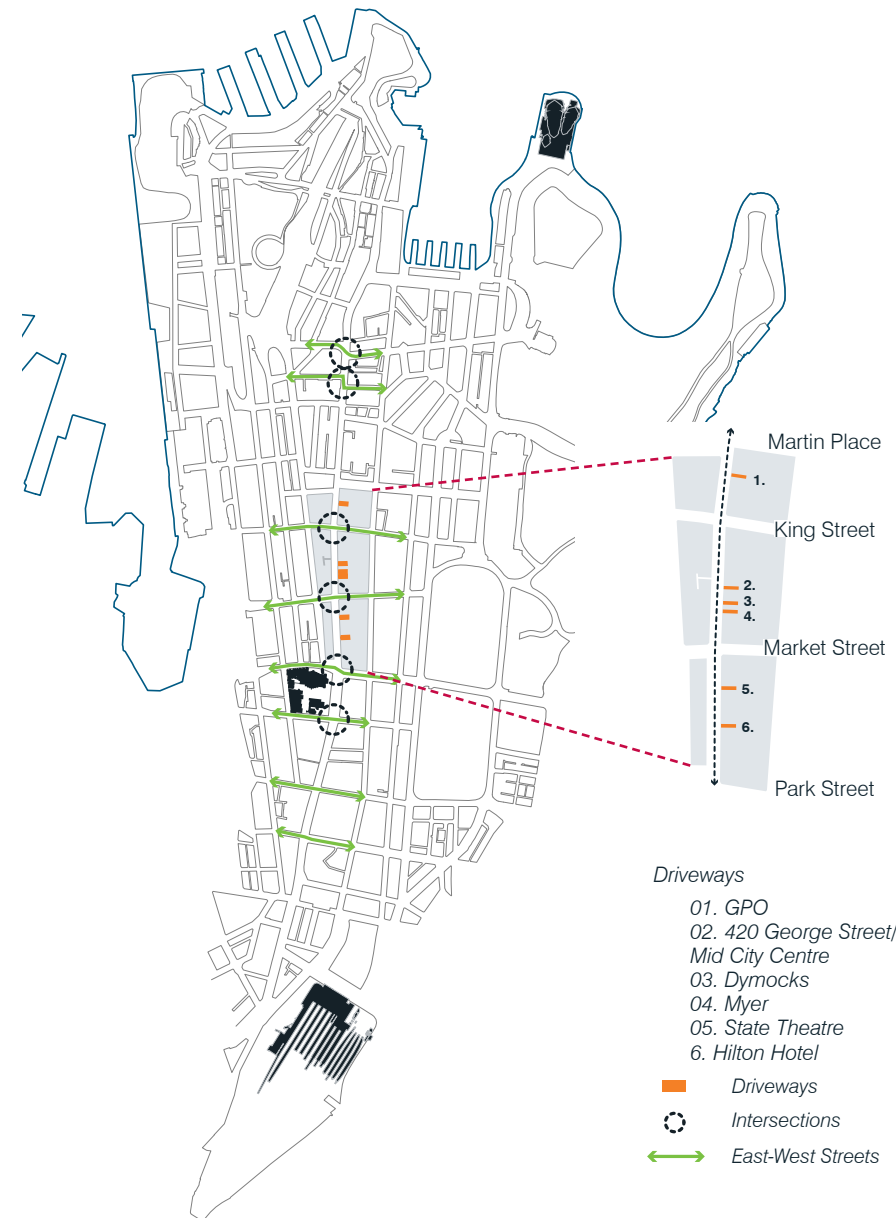
The City proposes that access for tenants, residents and emergency services will be maintained at all times:

- Local access vehicles will be permitted to drive on the light rail tracks at low speeds. The design will ensure they do not block the light rail at intersections
- Timed restrictions will be used to limit heavy vehicle access to George Street at busy times such as lunch hours
- Loading will be permitted on George Street in the evenings and early mornings, ensuring delivery access for older buildings such as the Strand Arcade

Intersections

Light Rail priority

George Street must read as a continuous unified street, not a street cut up into sections by east-west roads. The surface treatment of George Street will continue across all intersections emphasising light rail and pedestrian priority. Cars will ramp up and onto the new paving to cross George Street. The paving texture will indicate a slower zone in which cars should show caution, improving safety for all.



Power supply

Strategy

Minimising clutter

By world standards George Street and its footpaths are considered narrow. Compounding this, our footpaths are punctuated by Smartpoles, signage and infrastructure. With the introduction of light rail and the reclamation of road space we have the opportunity to review and redress this situation.

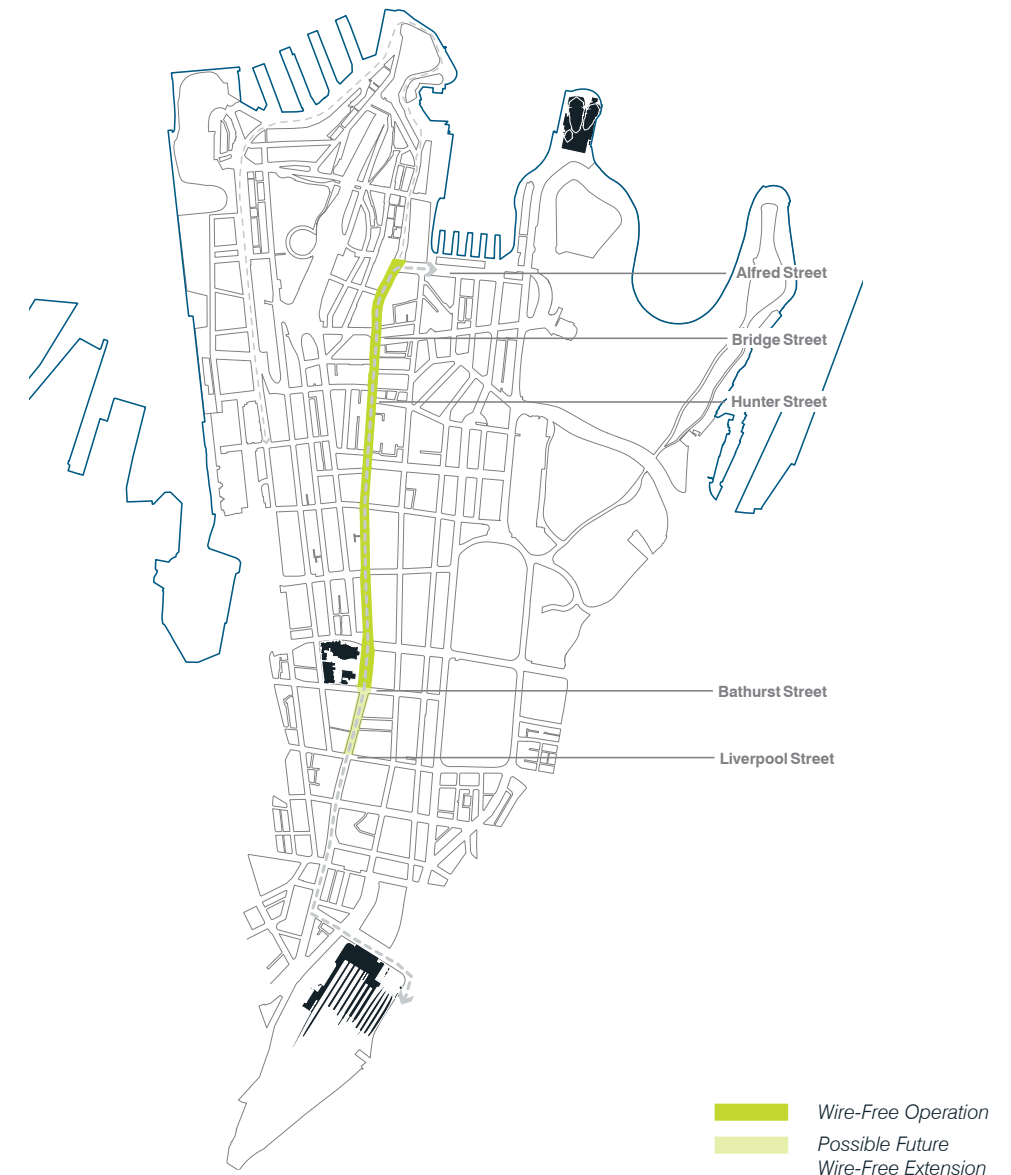
Signage, power and lighting could all easily be incorporated into a new pole.

In the pedestrian zone, however, the City propose a wire-free zone for the light rail. This will ensure that there is minimal infrastructure in the street and that space is preserved for pedestrians. It will also reduce the visual impact of the system, respecting the streetscape of George Street and its heritage buildings.

Detail

Power storage

An increasing number of modern light rail systems use batteries and advanced power electronics to operate for short distances (up to 2km) without overhead wires. This technology removes the need for wires in the pedestrian zone and can even extend beyond to Alfred Street.



Smartpoles

The City's existing Smartpoles are not capable of supporting the load of overhead light rail wires. To avoid the need for an intrusive second set of poles in the street, the City and HUB are developing a new, stronger pole which can carry lighting, overhead wires, signage and signalling.

Overhead wires

In addition to wire-free technology or more traditional pole-mounted wires, overhead power supply could be attached to existing buildings. Building-attachment is already used on Hay Street (Capitol Theatre), and was a feature of Sydney's former tramway. It is also commonly used in Melbourne and European cities to reduce the impact of overhead wires and their supporting structures in historic streetscapes.

Light rail stops

Principles

- | | |
|------|---|
| 2.01 | Minimise clutter and consolidate infrastructure |
| 2.02 | Maximise permeability and accessibility |
| 2.03 | Provide a protected and comfortable waiting environment |
| 2.04 | Create a consistent and identifiable suite of elements |

**Making it easy to
get around**



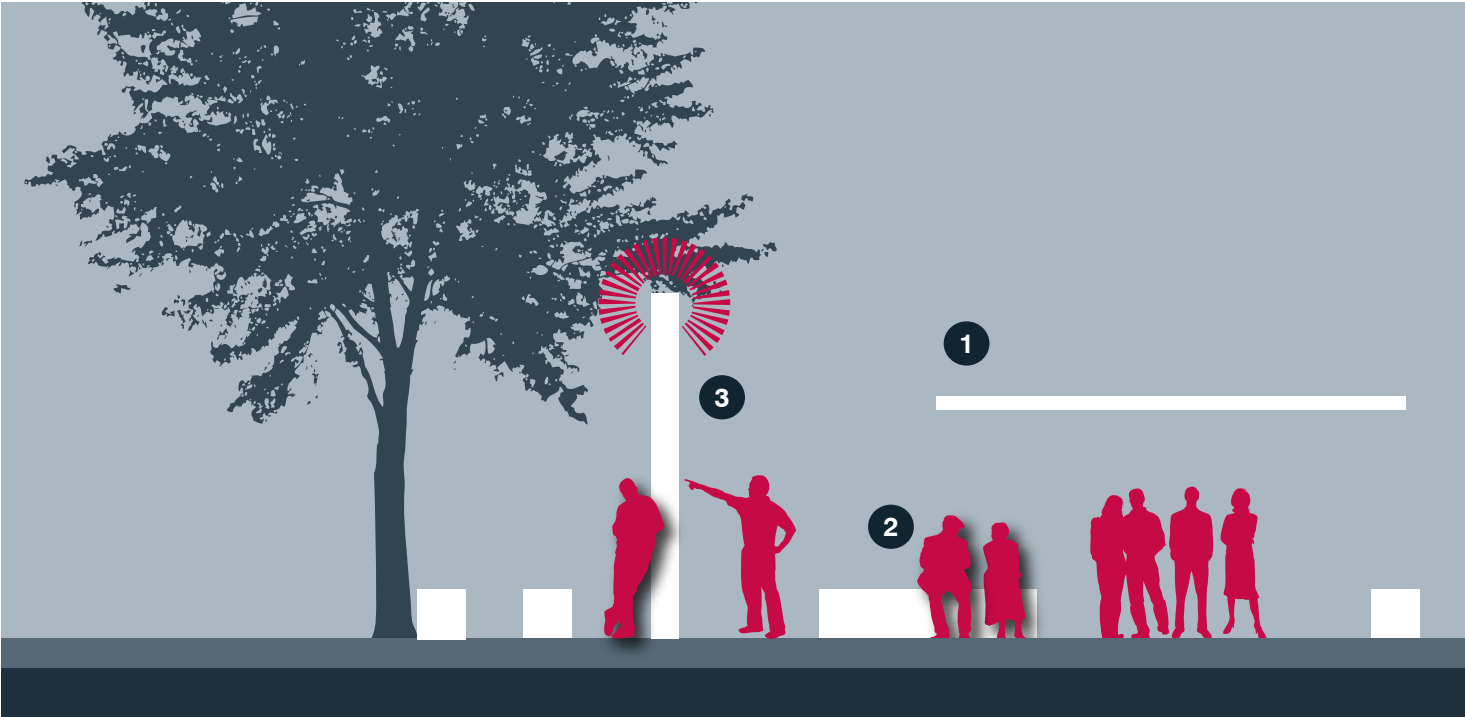
Light rail stops

Strategy

Three Elements: Canopy, Separation Device and Wayfinding

Three elements are envisaged for the light rail stops. These will perform the following functions:

- Weather protection
- Comfortable seating
- Traffic protection
- Wayfinding
- Departure and route information
- Electronics housing



Data

Precedent

The City has reviewed light rail stops from around the world and believe that the most successful stops are the ones with the least infrastructure. Rationalising the location and number of bins, bollards, fences and electronics will ensure an uncluttered stop and streetscape.

Recommendations

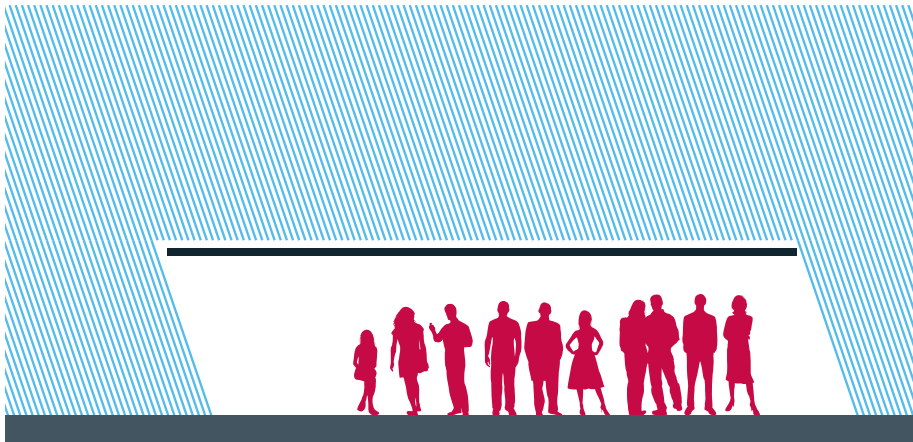
In considering the best stops from around the world, the City recommends the following:

- No advertising
- A lightweight canopy over only part of each stop
- Real-time travel information provided by LCD screens
- No vending machines
- Smart ticketing, avoiding machines at the stops
- No fences or solid walls
- Signage integrated with the design of the City's wayfinding system

Design

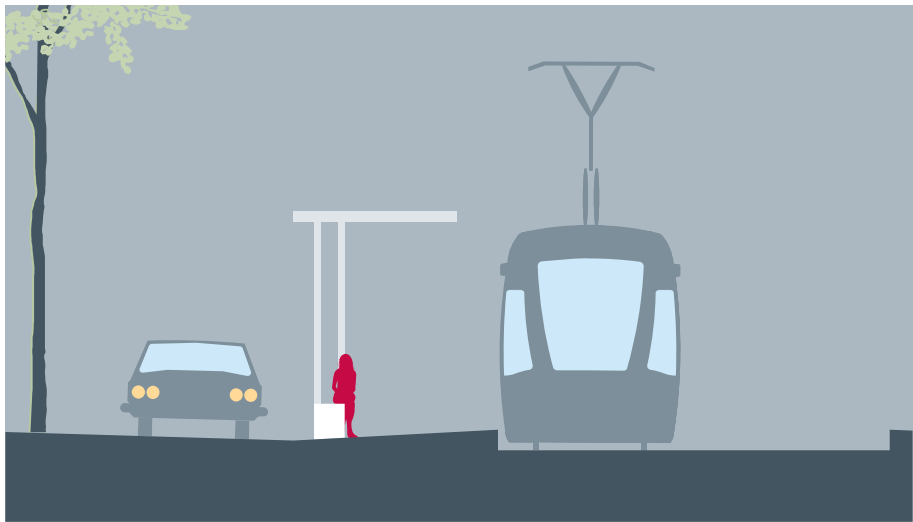
01. Canopy

To minimise clutter in the street, canopies are conceived as a light, floating plane that complements building awnings, street trees and the city public domain furniture suite. A canopy 15 metres by 2.5 metres will provide shelter for up to 100 people (one third of a full light rail vehicle). The shelter design should promote permeability and not act as a barrier for pedestrians. It should be in keeping with the design of the City's public domain furniture palette.



02. Separation Device

The separation devices will perform multiple functions. They will keep cars and people apart, they will conceal light rail electronics and they may also act as seats. Their detailed design will build on the ideas of the paving and public domain furniture palette. Rather than being completely solid, these elements should be designed as permeable to ensure the streetscape is visually open and accessible. The City does not support fencing in the city centre



03. Wayfinding

An information marker will be the primary wayfinding device at each stop. These will indicate stop locations and names, timetable information and landmarks. The marker design will be co-ordinated with the City's wayfinding system described in the Public Domain Design Codes - Sydney Signs Code.

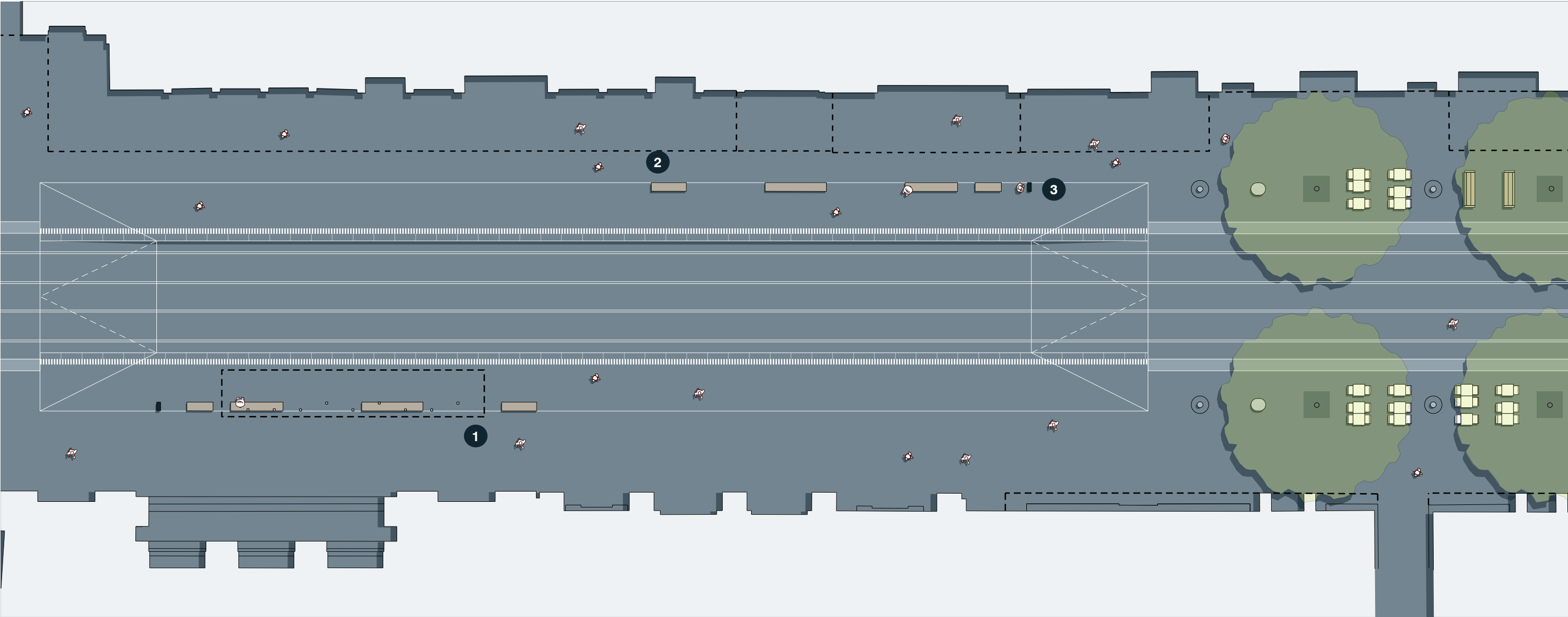


Typical Pedestrian Zone Stop

In keeping with the City’s commitment to maximising space for people, light rail stops in the pedestrian zone should be simple and uncluttered. Where there is an awning in close proximity to the stop, consideration should be given to not providing a shelter. Where there are no awnings, a lightweight shelter should be carefully integrated into the streetscape. One marker on each side of the platform will indicate the stop and provide real-time travel information.

Key

- 1. Canopy
- 2. Separation Device
- 3. Wayfinding



Plan

Typical Pedestrian Zone Stop

Key

- 1. Canopy
- 2. Separation Device
- 3. Wayfinding



Elevation

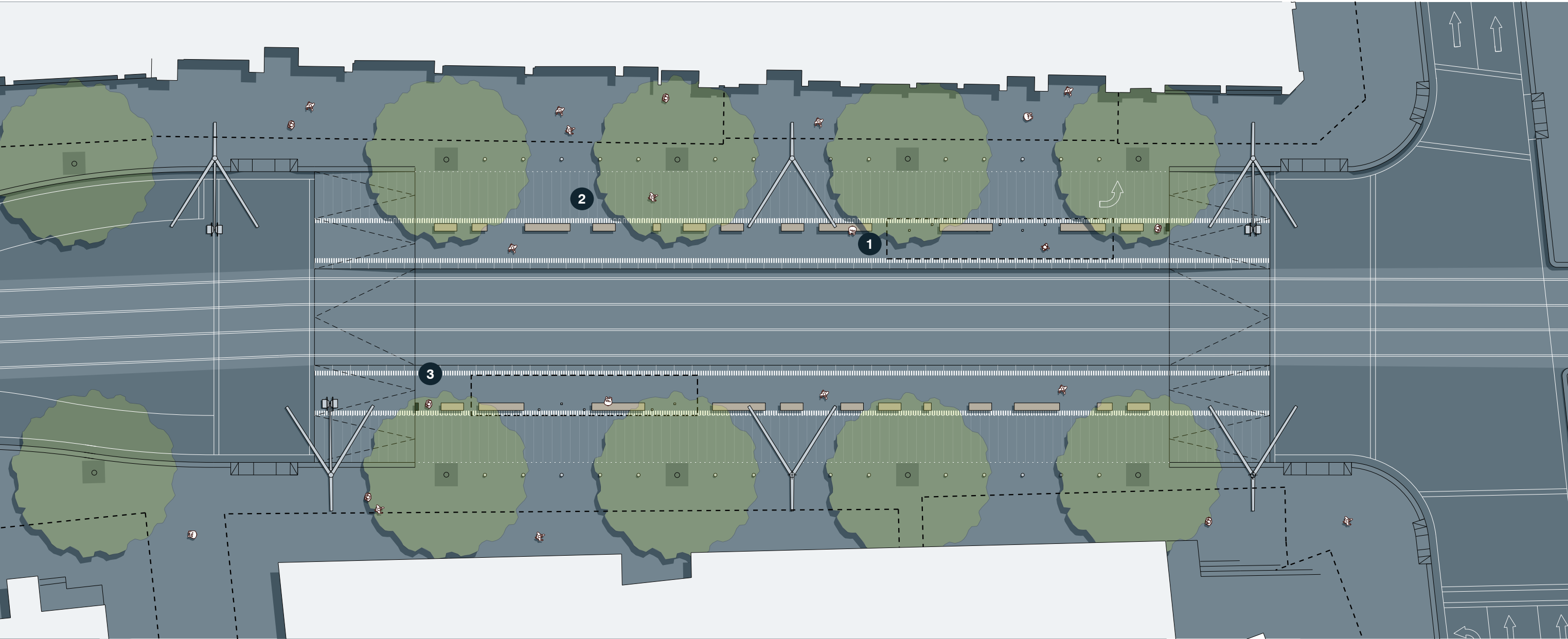
Platform Length 45m

Typical Vehicular Zone Stop

In the sections of George Street where traffic lanes are retained, pedestrian amenity and safety should be the priority. At each stop, multifunctional separation devices should run along the rear side, providing physical separation from traffic. Cars should ramp up to the level of the stop and footpath, creating a slow, shared zone marked by a rougher textured paving. Light rail stops should be accessed from ramps at each end, or across the shared zone, allowing free, safe access for passengers boarding and alighting from light rail.

Key

- 1. Canopy
- 2. Separation Device
- 3. Wayfinding



Plan

Typical Vehicular Zone Stop

Key

- 1. Canopy
- 2. Separation Device
- 3. Wayfinding



Elevation

Platform Length 45m

Paving

Principles

- | | |
|------|---|
| 3.01 | Retain and elaborate on the existing City Centre palette |
| 3.02 | Use paving to define the light rail corridor and enhance safety |
| 3.03 | Reinforce George Street as a unique boulevard |
| 3.04 | Use Australian stone with a reliable supply |

**25,000m² of road space
will be reclaimed for
pedestrians**

Paving

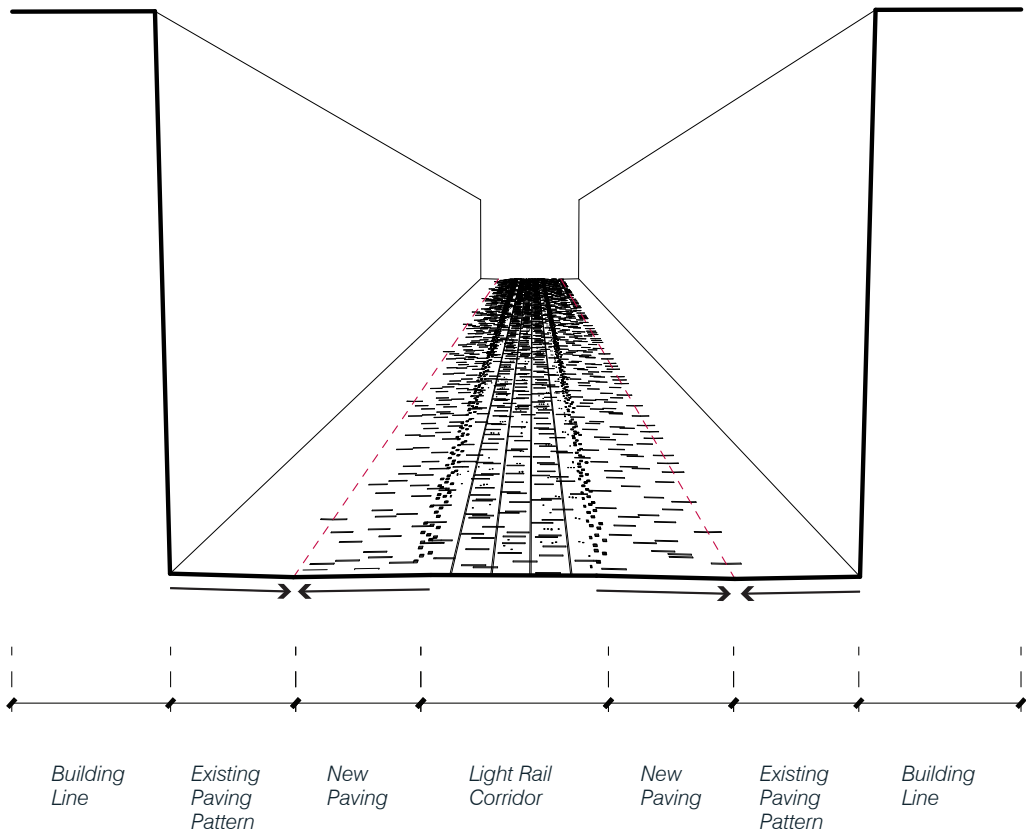
Strategy

A unique avenue

The new paving design for George Street will build on the existing palette of Austral Black granite, embellishing the light rail corridor with a lighter, more detailed design. The new design will introduce different sized granite pavers, with varying surface finishes and tones. LED lights and stainless insets will play with reflection and recall the sparkling light on Sydney Harbour.

The logic behind this is threefold:

- A lighter paving stone will help visually define the light rail corridor, reinforcing pedestrian awareness and assisting with safety.
- An embellished paving pattern will help to create a distinct boulevard.
- The central light rail corridor should have fewer underground services than footpath areas. More detailed paving in the central location is therefore less likely to be disturbed by future maintenance works.



New paving will comply with Sydney Streets Code 2013 and Sydney Streets Technical Specifications 2013

Detail

Space for people

25,000m² of road space will be reclaimed for pedestrians in the City's extended scheme; providing opportunity for tree planting, outdoor dining, new public domain furniture and events. This new surface will tie into our existing paving palette and will be a special design that sets the street apart from others by simply building on the pattern and layout of the existing.

A proven palette

The existing CBD paving palette has proven to be a robust and elegant solution. The design intent is to retain this pattern for most of the street, embellishing it towards the centre. We have researched stone types, suppliers and quarries and identified alternatives which we can draw on to provide the contrasting colour shown in the design.

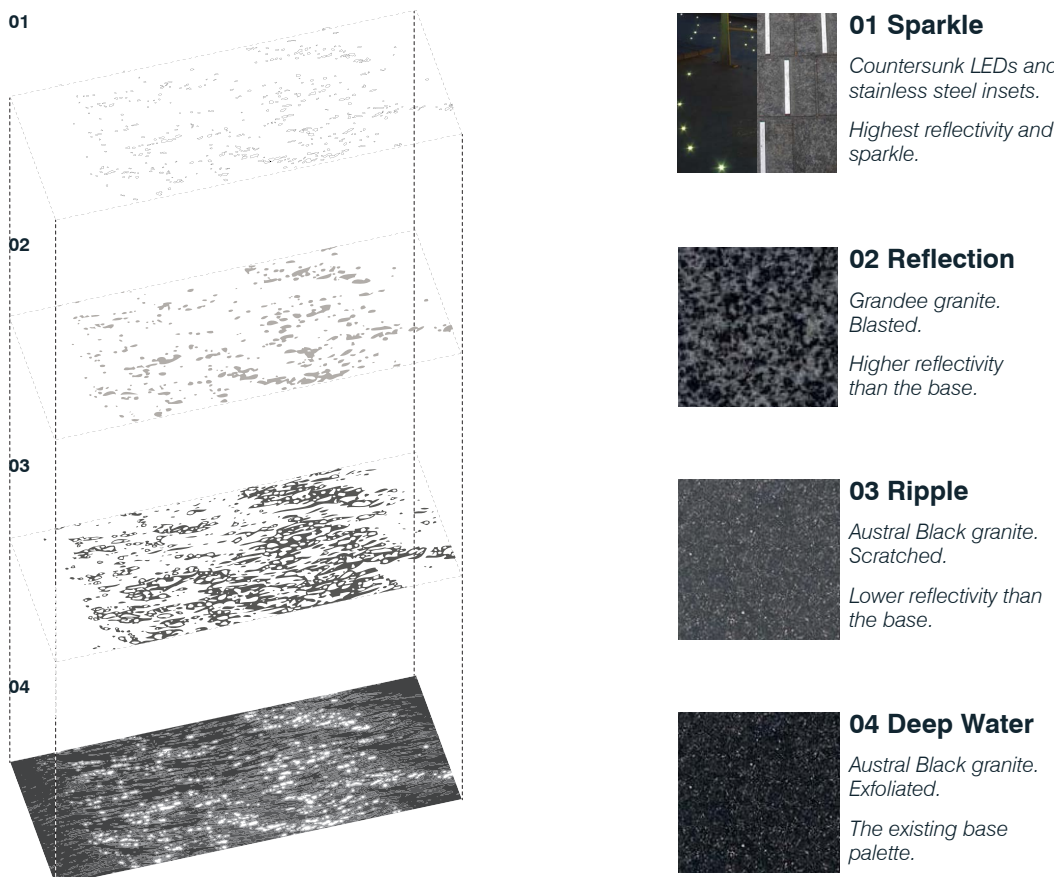
Safety and accessibility

One of the challenges of this project is ensuring the safety of pedestrians without resorting to fences or kerbs. Working with access experts, our paving design will address these issues through changes of luminance and texture. Rough textures indicate the light rail corridor and sparkling, light elements reinforce the visual message to stay clear.

Design

A lighter street

The paving pattern is an abstraction of light reflecting on the water of Sydney Harbour. Different shades and textures of stone serve to enhance safety and to lighten the feel of the street.



01 Sparkle

Countersunk LEDs and stainless steel insets.
Highest reflectivity and sparkle.

02 Reflection

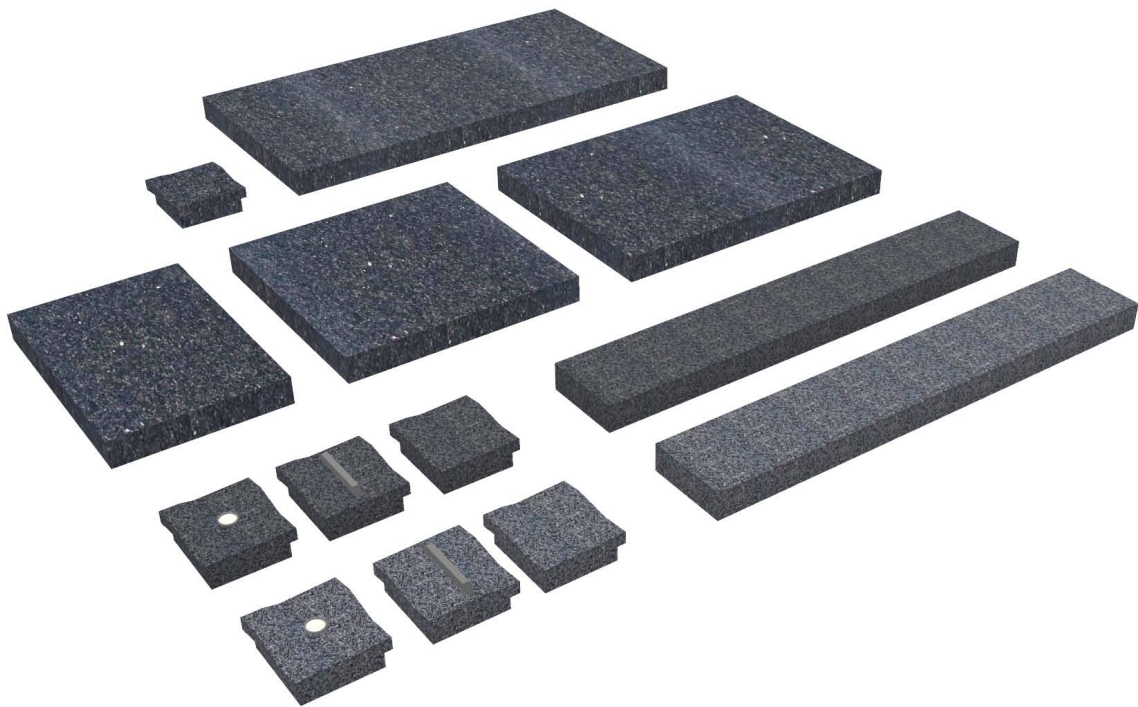
Grande granite. Blasted.
Higher reflectivity than the base.

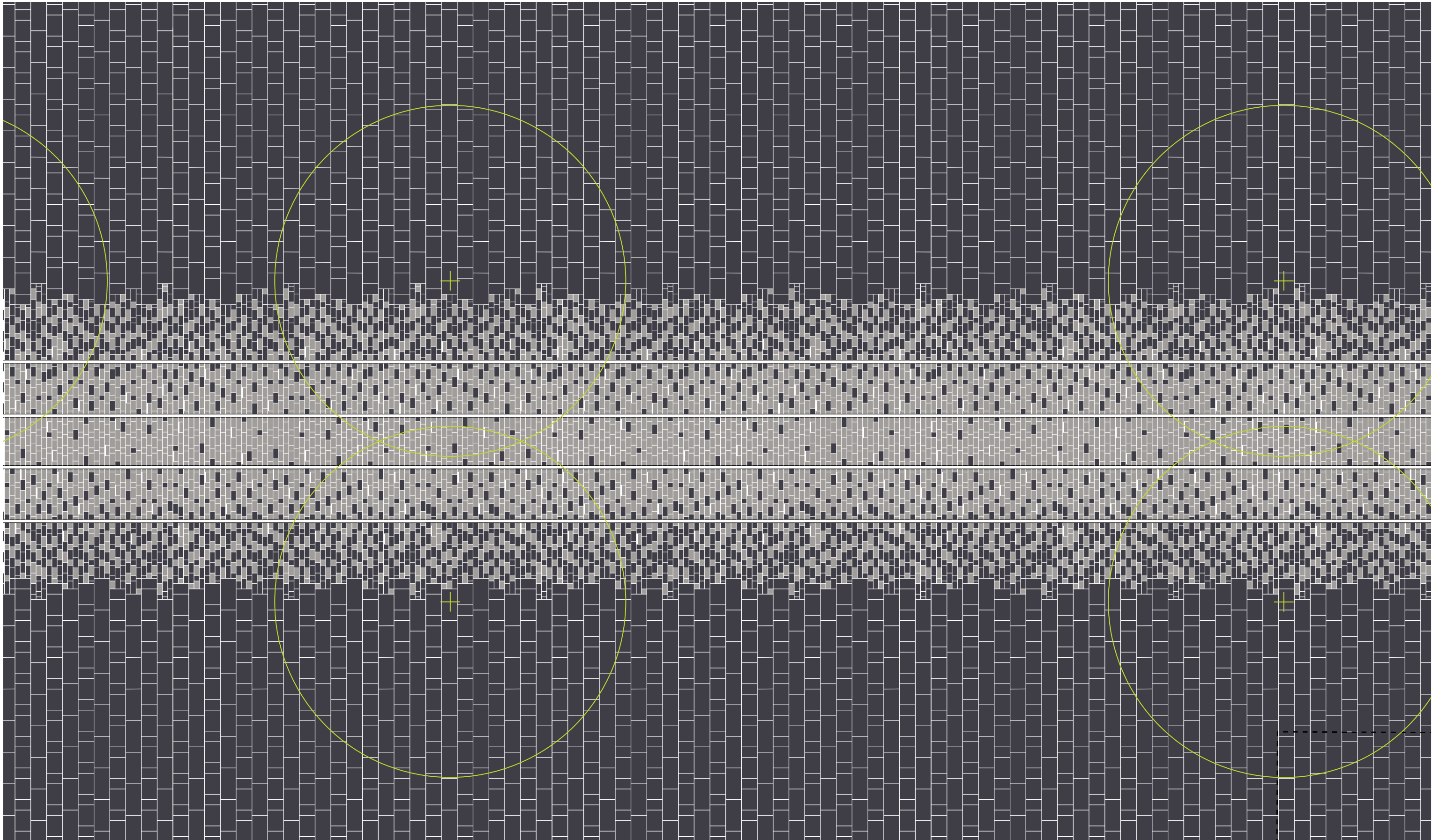
03 Ripple

Austral Black granite. Scratched.
Lower reflectivity than the base.

04 Deep Water

Austral Black granite. Exfoliated.
The existing base palette.





George Street Proposed Paving Design